STORM WATER MANAGEMENT PROGRAM PLAN (SWMPP)
FOR
THE UNIVERSITY OF MICHIGAN

ANN ARBOR, DEARBORN & FLINT CAMPUSES
& OTHER REGULATED UM PROPERITES

PREPARED FOR NPDES CERTIFICATE OF COVERAGE #MIS040090

PREPARED BY:

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REVISED
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STORM WATER MANAGEMENT PROGRAM PLAN (SWMPP) FOR THE UNIVERSITY OF MICHIGAN ANN ARBOR, DEARBORN & FLINT CAMPUSES AND OTHER REGULATED UM PROPERTIES (LOCATED WITHIN URBANIZED AREAS)

1.0 INTRODUCTION AND GENERAL REQUIREMENTS

This Storm Water Management Program Plan (SWMPP) is prepared to meet requirements of the Michigan National Pollutant Discharge Elimination System Storm Water Certificate of Coverage (COC) Number MIS040090, issued by the Michigan Department of Environmental Quality (MDEQ) to the University of Michigan (UM), effective April 15, 2009 (see Appendix A for a copy of the Permit). In accordance with conditions in Part I.A.3 of the Permit, UM is required to submit a SWMPP and implementation schedule to the MDEQ Jackson District Supervisor on or before February 1, 2010 as specified in the COC. The SWMPP will address the following:

- Total Maximum Daily Loads
- A public education and outreach program on storm water impacts
- Public involvement and participation
- An illicit discharge elimination program
- A post construction storm water management program for new development and redevelopment projects
- Construction storm water runoff control
- Pollution prevention and good housekeeping practices for University Operations

1.0.1 Contact Person

As previously designated by the UM, the following individual is the contact person for the regarding this Permit:

Mr. Timothy R. Cullen, QEP
Manager, Environmental Protection & Permitting Program
Occupational Safety & Environmental Health
The University of Michigan
1239 Kipke Drive, Ann Arbor, MI 48109-1010
Phone: (734) 763-5267
Fax: (734) 763-1185
e-mail: trcullen@umich.edu

For clarification purposes, the following acronyms/definitions are used throughout this document:

BMPs	Best Management Practices
City	The City of Ann Arbor, Dearborn or Flint, as appropriate
CEP	UM-Flint Central Energy Plant
COC	Certificate of Coverage for the NPDES Permit
CPP	UM Central Power Plant
CSS	UM-Dearborn Department of Campus Safety & Security
Department	References in the General Permit and the SWMPP to the Department shall be defined at the Jackson District Supervisor of the Water Bureau
DPS	UM Department of Public Safety
EHS	UM-Flint Environment, Health and Safety Department
ERCP	Emergency Response Contingency Plan maintained by OSEH (also known as the Emergency Response Plan at UM-Flint)
FM	Facilities Management at UM-D or UM-F
G&WM	Plant Operations Grounds and Waste Management Department
HRPAP	Huron River Pollution Abatement Program
Illicit Connection	A physical connection to the drainage system that 1) primarily conveys illicit discharges into the drainage system or 2) is not authorized or permitted by the local authority (where a local authority requires such authorization or permit).
Illicit Discharge	Any discharge or seepage that is not composed entirely of storm water into the drainage system, except for discharges specified in Parts I.A.1.b. and c. of the permit. Illicit discharges include dumping of motor vehicle fluids, hazardous wastes, grass clippings, leaf litter, domestic animal wastes, litter or unauthorized discharges of sewage, industrial waste, food services wastes, or any other non-storm water waste into the drainage system.
MDEQ	Michigan Department of Environmental Quality
MDNR	Michigan Department of Natural Resources
MDOT	Michigan Department of Transportation
MEP	Maximum Extent Practicable - met by adherence to the requirements of the MDEQ approved Parts 3 and 4 of this SWMPP.
NPDES	National Pollutant Discharge Elimination System

NREPA	State of Michigan Natural Resources Environmental Protection Act, Act 451
OSEH	UM Department of Occupational Safety and Environmental Health
Permit	The NPDES Storm Water Permit Number MI0053902 issued by MDEQ to the UM, effective October 1, 2001
PIPP	Pollution Incident Prevention Plan prepared for the CPP
Plant Extension	This division includes architects, engineers, construction managers, and the planner involved in facilities design activities
Plant Operations	This division includes G&WM, Utilities, Parking Services, Maintenance Services and other activities associated with maintenance of the facilities
PPP	Pollution Prevention Plan
SWMPP	Storm Water Management Program Plan prepared for the Permit and approved by MDEQ
UM	The University of Michigan, Ann Arbor, Dearborn & Flint
UM-A2	The University of Michigan Ann Arbor Campus
UM-D	The University of Michigan Dearborn Campus
UM-DFC	The University of Michigan Dearborn – Fairlane Center
UM-F	The University of Michigan Flint Campus
UMHHC	The University of Michigan Hospitals and Health Centers
University	The University of Michigan, Ann Arbor, Dearborn & Flint
UPO	The University of Michigan, Planner's Office

1.1 Background Information

Storm water runoff from urban areas has been identified in both federal and state studies as a leading cause of pollution in our nation's waters. Pollutants of concern in storm water from a general standpoint include organic materials which have a high biochemical oxygen demand, suspended solids, metals, nutrients, bacteria, and traces of toxic materials. These pollutants have the potential to adversely affect the health of natural water systems. Reducing pollutant loads on water bodies is not, however, the only reason for storm water management programs. In a general sense, effective storm water management programs and properly operating storm water conveyance systems are necessary to prevent flooding in urban areas and to maintain groundwater quality and recharge rates.

Recognizing the impact storm water discharges have on the environment, and with authorization from the 1987 amendments to the Clean Water Act, the United States

Environmental Protection Agency initiated Phase I of the National Pollutant Discharge Elimination System in 1990. The Phase I NPDES storm water program requires permit coverage of storm water discharges from municipal separate storm sewer systems serving areas with populations of 100,000 people or more. The UM-A2's system alone does not serve such a population. It is, however, connected to the City of Ann Arbor's storm water system and together the two systems do serve more than 100,000 people. As a result, in 1995 the UM-A2 voluntarily entered into the NPDES permit program to support the goals of the Clean Water Act amendments, in lieu of falling under the City of Ann Arbor permit.

The University's participation, including UM-Dearborn and UM-Flint, became mandatory under the NPDES permit Phase II program which regulates small municipal separate storm sewer systems (MS4s) located within an "urbanized area." On March 10, 2003 the University requested a modification of NPDES Permit #MI0053902 to include UM-D and UM-F under the University's existing NPDES permit.

The UM was issued a Certificate of Coverage #MIS040090 under the Jurisdictional NPDES General Permit on April 15, 2009. This permit covers storm water discharges on the University's Ann Arbor, Dearborn and Flint campuses, along with some additional properties throughout the state that fall within the EPA's defined Urbanized Area boundaries.

1.2 Discharge Points/Receiving Waters

The Permit issued to the UM authorizes the discharge of storm water listed in *Part I, Section A.1* of the permit to waters of the State from all existing outfalls of the University of Michigan's storm water drainage system. Any new outfalls will be installed and operated in accordance with the requirements of *Part I, Section A.2.*

The UM has identified outfalls from its storm water drainage system in Appendix B. A portion of the outfalls discharge directly into surface waters of the state, and the balance discharge into drainage systems operated by the City or MDOT. The UM storm water drainage system discharges, either directly or indirectly into the following surface water bodies:

- Allen Creek
- Fleming Creek
- Flint River
- Huron River

- Malletts Creek
- Millers Creek (also known as the North Campus Drain)
- Rouge River
- Traver Creek

Appendix B identifies the outfall identification number, location of discharge and the name of the receiving water. If any changes should be identified for this list, the changes will be provided to the Department.

Like all surface waters of the State, these water bodies are protected by water quality standards for specific designated uses. The designated uses are for aquatic life (either cold water or warm water) and wildlife support; agricultural, industrial, and municipal water supply; navigation; and total body contact recreation. The Permit does not authorize the discharge of non-storm water discharges, such as rainwater and snow-melt runoff, as well as discharges of certain non-storm waters that are common and widespread but are not expected to pose a threat to water quality (e.g., runoff from lawn watering and irrigation, individual car washing, and foundation drain systems). A more complete listing of non-storm water discharges is presented in *Part I, Section A.7 of the Permit.*

1.3 Administrative Requirements of Permit

1.3.1 Legal Authority

Unlike a municipality, the UM does not maintain the equivalent of a city code to regulate storm water discharges. In this regard, the UM bears a close resemblance to a private industry. However, the UM does operate and maintain a separate storm water system which collects runoff from areas involved in a wide variety of uses including: student housing; institutional, and research activities; food service; science laboratories; and recreational facilities. In this regard, the University's storm water system is representative of similar systems owned by municipalities.

1.3.1.1 Authority Under State Constitution

The UM has the authority to implement storm water management programs and to control, regulate, and enforce discharges to the storm water system through Article VIII-5 of the Constitution of the State of Michigan of 1963.

> *Sec 5.* "The Regents of the University of Michigan and their successors in office shall constitute a body corporate known as the Regents of the University of Michigan. Each board shall have general supervision of its institution and the control and direction of all expenditures from the institution's funds."

Article VIII-5 of the State Constitution allows the Board of Regents of the UM to have general supervision of its institution and the control and direction of all expenditures. The UM, through the Board of Regents, therefore has the power to promulgate regulations for the operation, management, and maintenance of the storm water system, as well as the power to control illicit discharges, spills, and dumping. The UM has the legal authority to operate its storm water system in a manner necessary to comply with the applicable regulations.

1.3.1.2 Application of Authority Under State Constitution

The UM has adopted policies, procedures, and practices for the operation and maintenance of its storm water system, and to control the contribution of pollutants to the system, in order to meet the requirements of the Permit. Best Management Practices (BMPs) have been, and will continue to be developed to support the adopted policies, procedures, and practices. Information on these BMPs is provided in subsequent sections of this document.

The NPDES regulations establish a definition of storm water associated with industrial activity in 40 CFR 122.26(b)(14) as the discharge from any conveyance which is used for collecting and conveying storm water and is directly related to manufacturing, processing of raw materials, or storage areas. Industries required to obtain storm water NPDES discharge permits are specifically defined in the regulations by industrial category or through the identification of Standard Industrial Classification (SIC) codes. If future UM activities are determined to meet applicable requirements for a separate NPDES permit, the appropriate permit will be applied for.

1.3.1.3 Control of Discharges Through Interagency Agreements

The UM storm water system does interconnect with portions of the City of Ann Arbor, MDOT, City of Dearborn and MDOT storm water systems. UM notified the Jackson District Supervisor of all drainage system co-operators what will be relied upon to satisfy terms and conditions of this permit for drainage system(s) co-operated with the permittee by April 1, 2003. At the same time, a copy of the notice was sent to each drainage system co-operator named in the notice submitted to the Jackson District Supervisor.

1.3.1.4 Control Through Ordinance

The Regents of the UM adopted *An Ordinance to Regulate Parking and Traffic, and to Regulate the Use and Protection of the Buildings and Property of the Regents of the University of Michigan* in January 1995. This ordinance is enforceable by law enforcement officers of the City, County, Michigan State Police, as well as Campus Safety Services, and the UM DPS. The ordinance does specify penalties for violation. Violation of this Article of the ordinance is considered a civil infraction punishable by a fine of not more than $50.00. Among the provisions of this ordinance is the following:

"No person shall place, deposit, throw, scatter, or leave any refuse, waste, garbage, or litter on the streets or grounds, or within any building or structure of the University of Michigan, except that which is generated because of activities or business related to the University, which properly belongs on University property, and which is deposited in receptacles provided for such purposes."

1.3.1.5 Compliance and Surveillance

The UM has formalized or enhanced several existing programs and policies to meet the requirements and intent of the applicable regulations. The UM authorized representatives have the authority to inspect, monitor, and conduct all surveillance necessary of activities on the UM property in order to ensure compliance with Permit conditions.

1.3.2 Storm Water Management Program Resources

Management, maintenance and operation of the storm water Permit and system is performed by several UM departments. The primary responsibilities are within the Business and Finance department under the direct control of the Executive Vice President and Chief Financial Officer. Within Business and Finance, OSEH is the unit with primary responsibility for day-to-day management of environmental issues, compliance with environmental regulations, and interaction with regulatory agencies on behalf of the UM. The day-to-day management of environmental issues, compliance, etc. is the responsibility of the Environment, Health & Safety Department at UM-F and Campus Safety Services at UM-D. OSEH is responsible for the development and oversight of the SWMPP, and interacts with UM-D CSS and UM-F EHS, along with all other UM departments, to ensure that the requirements of the permit are met. OSEH additionally maintains trained personnel to address and handle hazardous material responses and clean-ups as well as routine management of hazardous materials and their disposal.

At UM-D, the primary day-to-day management of environmental issues, compliance, etc. responsibilities are managed by the Director of Environmental Health, & Safety and

Emergency Management. The Department of Campus Safety & Security is the unit responsible for the oversight of environmental issues. CSS interacts with regulatory agencies on behalf of UM-D and provides recommendations for compliance with environmental regulations to UM-D departments to ensure requirements are met. UM-D CSS coordinates the routine management of hazardous material disposal. Minor material responses and clean up are managed within the unit where the incident occurs. Large material responses and clean ups are coordinated through CSS and contracted to a vendor.

At the UM-Flint Campus, the responsibilities for administering, monitoring, complying and enforcing the SWMPP requirements and related guidelines are shared between the EHS, Facilities Management and DPS departments. All three departments report and are funded through the Vice Chancellor of Administration unit at UM-F. The EHS department has primary responsibility for the oversight of environmental health and occupational safety issues. EHS interacts with regulatory agencies on behalf of UM-Flint. Additionally, EHS develops, administers, monitors and provides recommendations for compliance with environmental health and occupational safety regulations to other UM-F departments. This includes, but is not limited to the management of hazardous waste, emergency preparedness planning and spill response, SESC activities, EHS training and other related activities.

The UM has developed draft BMPs to outline the roles and responsibilities for its departments related to storm water management. For purposes of example, a copy of the draft version of the document to describe how Plant BMPs are created is attached as Appendix C.

Funding resources for each of the UM divisions/departments with storm water management responsibilities come through slightly differing channels. Funding for OSEH is through the University General Fund. A separate fund for environmental projects, controlled by OSEH, is generated through a unit tax system and storm water projects may be funded from this. Plant Operations budget is the primary source of funding for storm water operation and maintenance of the system. Costs for the department are passed directly to other UM units; therefore increases in storm water system management will result in increased costs for all UM units, many of which are also funded through the General Fund. Funding for Plant Extension activities for new projects can come from three main areas: 1) state bonds, 2) internal capital funds, and 3) donor funds. Funding sources vary by campus, but generally fall into the categories outlined above.

Actual expenditures and proposed upcoming annual budgets for the various areas are provided to the MDEQ in the Reports, when required, and are not shown in this SWMPP.

1.3.3 Contact Person

> *Part I, Section B.1.d of the Permit:* "The permittee shall designate a storm water program manager to serve as the contact person for the Department regarding activities carried out to comply with this permit. The permittee may replace the program manager at any time and shall notify the Jackson District Supervisor within ten days after the replacement."

Contact information for this permit is provided in section 1.0.1 on page 1-1. Additionally, the following individuals are the site contacts for environmental health and occupational safety issues at their respective campuses:

Permit Contact, Ann Arbor Campus & Outlying Areas-

Mr. Timothy R. Cullen, QEP
Manager, Environmental Protection & Permitting Program
Occupational Safety & Environmental Health
The University of Michigan
1239 Kipke Drive, Ann Arbor, MI 48109-1010
Phone: (734) 763-5267
Fax: (734) 763-1185
e-mail: trcullen@umich.edu

Dearborn Campus –

Ms. Laura Drabczyk
Director, Environmental Health & Safety and Emergency Management
The University of Michigan – Dearborn Campus
4901 Evergreen, Dearborn, MI 48128
Phone: (313) 593-4914
Fax: (313) 436-9161
e-mail: ldrabczy@umich.edu

Flint Campus -

Mr. Michael Lane
Manager, Environment, Health & Safety
The University of Michigan – Flint Campus
204 University Pavilion (UPAV)
303 East Kearsley, Flint, MI 48502
Phone: (810) 766-6763
Fax: (810) 424-5572
e-mail: mjlane@umflint.edu

1.3.4 Storm Water Management Program Modification

Any modifications required for this Management Program, once approved by the Jackson District Supervisor, will be made following requirements of *Part I, Section B.4 of the Permit*.

Once the storm water management program plan is approved, it may be modified in the following ways, per the requirements of *Part I, Section B.4.a*:

1. The addition of (but not subtracting or replacing) components, controls, or requirements to the approved storm water management program may be made at any time upon written notification to the Jackson District Supervisor. Such notification will contain a description of the modification.

2. The replacement of ineffective or unfeasible BMPs specifically identified in the Storm Water Management Program with an alternative BMP may be requested at any time by written notification to the Department. Unless denied by the Department, the modification shall be deemed approved and may be implemented by the permittee 60 days from submittal of the request. Such requests will include the following:
    a. an analysis of why the BMPs are ineffective or unfeasible (including cost prohibitive);
    b. expectations on the effectiveness of the replacement BMPs; and
    c. an analysis of why the replacement BMPs are expected to achieve the goals of the BMPs to be replaced.

In addition, per the requirements of *Part I, Section B.4.b*, the MDEQ may require UM to modify the Storm Water Management Program to:

1. Address contributions by the drainage system discharges which impair receiving water quality;
2. Include more stringent requirements necessary to comply with new state or federal statutory or regulatory requirements; or
3. Include such other conditions deemed necessary by the Department to comply with the goals and requirements of the Federal Act or the Michigan Act, including the requirement to reduce the discharge of pollutants from the MS4 to the maximum extent practicable.

1.4 Assessment of Storm Water Management Program Effectiveness

Part I, Section B.1.b of the Permit: "The permittee shall describe the status of compliance with the standards permit requirements in Part I.A. and any approved alternatives. The report shall describe the progress made towards achieving the identified measurable goals for each of the BMPs, and specific evaluation criteria for the PEP, the IDEP, and TSS ."

The compliance status information will be compiled and presented in the Progress Reports, as required by Part I, Section B.1.b.1 of the Permit.

1.5 Reporting Requirements

The reporting requirements under this Permit are presented in *Part I, Section B,* and are divided into two distinct types of reports:

- Progress Report
- Phase I Annual Report

The subsections below describe the reporting details for each.

1.5.1 Progress Report

The progress reports must be submitted to the Department twice during the permit period: on or before October 1, 2011 & October 1, 2013 per Rachel Matthews at MDEQ. The report is required to describe the status of compliance with the standard permit requirements in Part I.A. of the permit. The report is required to include the following elements:

- Compliance Assessment: The report must include descriptions of the progress made towards achieving the identified measurable goals for each of the BMPs, and specific evaluation criteria for the PEP, IDEP and TSS reduction.
  - PEP: provide a summary of the evaluation of the PEP's overall effectiveness, using the evaluation methods prescribed in the PEP.
  - IDEP: Evaluate the progress made toward the measurable goals, provide documentation of the actions taken to eliminate illicit discharges. For identified illicit discharges, summarize the total estimated volume & pollutant loading eliminated for the main pollutant(s) of concern, and the location(s) of the discharge(s) into both the permittee's MS4 and the receiving water.

    - Assess TSS reduction in accordance with Part I.A.10.c.2 of this permit. Include descriptions of the current level of control related to TSS discharges from paved surfaces and estimate the load reduction from existing controls. In the second report, identify needs to achieve the goal of 25% TSS load reduction
- Water Quality Assessment: An updated assessment of the water quality conditions within its jurisdiction. Show any obvious changes in the receiving waters since the previous progress report.
- Water Quality Stress Update: Describe any water quality stresses identified since the previous progress report.
- Discharge Point Location: Provide updated information, in accordance with Part I.A.2.a of this permit that was not previously submitted for newly identified, constructed, or installed MS4 discharge points. Provide an update on areas added to or removed from the MS4.
- Data & Results: Provide a summary of all of the information collected and analyzed, including monitoring data, if any, during the reporting cycle.
- Upcoming Activities: The first year report must include a summary of the storm water activities to be implemented during the next annual reporting cycle.
- BMP: Describe any planned changes in identified BMPs or measurable goals for any of the standard permit requirements.
- Notice of Changes in Nested Jurisdiction Agreements or Reliance on Permitted MS4 Operators: Identify any nested jurisdictions that enter into or terminate permit agreements with the permittee which were not identified in the SWMPP. Describe any changes in the need to rely on other permitted MS4 operators to satisfy the terms and conditions of this permit, as described in Part I.B.1.a.7.

1.5.2 Phase I Annual Report

Per the requirements of *Part I, Section B.1.c,* the Phase I Annual Report must be provided to the Department on or before October 1, 2009 and annually thereafter. The report will include a brief summary of information for the period of time following the last annual report and will include the following information:

- Implementation Status: Describe the status of implementing the components of the SWMPP.
- Environmental Impacts: Provide an assessment of the pollution reduction and probably receiving water quality impacts associated with program

implementation. When applicable, include a statement regarding any negative water quality impacts that may have occurred as a result of any illicit discharges or accidental spills during the report cycle.

- Revised Fiscal Analysis: Pursuant to the permit application requirements specified in 40 CFR 122.26(d)(2)(vi), provide a summary of the revisions to the fiscal analysis reported during the previous permit.
- Data Summary: Provide a summary of all of the information collected and analyzed, including monitoring data, that is accumulated during the reporting cycle. [40 CFR 122.42(c)(4)]
- Annual Budget: Provide the previous reporting cycle's annual expenditures and the proposed budget for the reporting cycle following the report.
- PEP Reporting and Program Enforcement: Per the requirements in 40 CFR 122.42(c)(6), provide a summary describing the number and nature of enforcement actions, inspections, and public education programs.

1.5.3 Submittals

Copies of the Phase I Annual Report, Progress Reports, SWMPP, outfall additions, Permit modifications, or other requests will be submitted to the Jackson District Supervisor at:

Jackson District Supervisor
MDEQ – Water Bureau
301 East Louis Glick Highway
Jackson, MI 49201-1556
Phone: (517) 780-7690
Fax: (517) 780-7855

1.5.4 Retention of Records

*Part I, Section B.3 of the Permit: "*The latest version of the SWMP plan developed in accordance with this permit shall be retained by the permittee and available for inspection in accordance with Part II.D.9. of this permit. All records and information resulting from the preparation of previous SWMP plans or the progress reports, including all records of analyses performed, calibration and maintenance of instrumentation and recordings from continuous monitoring instrumentation, and recordings from continuous monitoring instrumentation, shall be retained by the permittee for a minimum of three years or as described in Part II.B.5. of this permit."

The records will be retained in files maintained by OSEH, CSS and/or EHS.

1.6 Notification Requirements

In accordance with *Part I, Section B.2 of the Permit*, the UM will make notification to the MDEQ Jackson District Supervisor under the following circumstances:

1.6.1 Discharges Which May Endanger Public Health or the Environment

The permittee shall verbally notify the Department within 24 hours of becoming aware of any discharges to or from the MS4 that the permittee suspects may endanger public health or the environment. After regular working hours, call PEAS at 1-800-292-4706. The notification include the following information:

- Name of the person responsible for the discharge (if known),
- Location of the discharge,
- Location where the MS4 discharges to the surface waters of the state,
- Nature of the discharge,
- Pollutants,
- Clean-up and recovery measures taken or planned.

1.6.2 Non-Compliance Notification

Per Part II,C.5 of the permit, any non-compliance shall be reported to the Jackson District Supervisor as follows:

- 24-Hour Reporting – Any noncompliance which may endanger health or the environment (including maximum daily concentration discharge limitation exceedances) shall be reported, verbally, within 24 hours from the time the permittee becomes aware of the noncompliance. A written submission shall also be provided within five (5) days.
- Other Reporting – The permittee shall report, in writing, all other instances of noncompliance not described above, at the time monitoring reports are submitted; or, in the case of self-monitoring, within five (5) days from the time the permittee becomes aware of the noncompliance.

The written documentation will include the following information:

- A description of the circumstances, including the type of noncompliance, and description of the discharge (if applicable);
- The period of noncompliance (if known), including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance.

1.6.3 Additional Notification and Authorization Requirements

In addition to the *Part I, Section A.11* notification requirements, the Permit requires the following notifications and authorizations:

- Tracer Dye Discharges: Per the requirements of *Part I, Section A.11.a*, UM must receive authorization from MDEQ for the discharge of tracer dyes. A copy of the UM *Storm Water System Dye Testing Guidelines* are provided for reference in Appendix D.
- Water Treatment Additives: Per the requirements of *Part I, Section A.11.b*, UM must receive authorization from MDEQ for the discharge of any water additives.
- Identification of Additional Point Source Discharges of Storm Water: Per the requirements of *Part I, Section A.2* if any additional points are identified in the system that are not listed in Table 1-1, UM will submit an updated map clearly showing the location of the discharge point, unique identification code or number, the latitude and longitude of the discharge point, and the receiving waters of the state to the Chief of the Permit Section, Water Bureau, Michigan Department of Environmental Quality, P.O. Box 30273, Lansing, MI 48909-7773.
- Expiration and Reissuance: Per the requirements of *Part I, Section B.5*, if UM wishes to continue a discharge authorized under the permit beyond the permit's expiration date, UM will submit a written request to the Jackson District Supervisor on or before October 1, 2012.

1.7 Management Requirements

The UM recognizes the general management requirements specified in *Part II, Section D of the Permit* and has incorporated such requirements into appropriate parts of this SWMPP. The management requirements include a duty to comply, proper operation and maintenance of the system, provide containment facilities, recording of results, reporting of additional results, minimizing adverse impacts, and proper handling and disposal of removed substances.

2.0 TOTAL MAXIMUM DAILY LOADS (TMDL)

> *Part I, Section A.4 of the Permit:* "The SWMP shall identify and prioritize actions to reduce pollutants in storm water discharges from the MS4 in order to make progress in meeting the Water Quality Standards."

The U-M participates in TMDL reduction efforts throughout the permit cycle for Total Phosphorus – Ford & Belleville Lakes; E.coli – Geddes Pond; Biota – Malletts Creek; E.coli – Rouge River; and Biota – Rouge River. Management activities addressing these specific TMDLs have been identified and prioritized in Appendix I.

For E. coli and Total Phosphorus TMDL reaches within the UM regulated watersheds, the following additional activities will be undertaken in accordance with permit requirements:

Measurable Goal: Review existing outfalls to identify major discharge points discharging directly to surface waters of the state within the portion of the TMDL. Major discharge points are pipes or open conveyances measuring 36 inches or more at its widest cross section. A list of major outfalls will be created in 2010 and kept on file.

Measurable Goal: By April 15, 2012, UM will take samples of at least 50% of the major discharge points within the portion of the TMDL watershed in the urbanized area. At a minimum, these samples will be analyzed for the applicable TMDL parameter (E. coli or total phosphorus). The sampling results will be retained and reported in the second progress report.

Measurable Goal: By October 1, 2013, sampling results and other available information will be reviewed. A plan will be developed to reduce the discharge of the applicable TMDL parameter (E. coli or total phosphorus). These prioritized actions will be reported in the second progress report with implementation targeted during the 5-year permit cycle that begins 2013.

3.0 PUBLIC EDUCATION PROGRAM

> *Part I, Section A.5 of the Permit:* "The PEP shall promote, publicize, and facilitate watershed education for the purpose of encouraging the public to reduce or prevent the discharge of pollutants in storm water…."

Recognizing the need for public involvement in the effort to reduce storm water pollutants, the UM has developed a broad and aggressive storm water education and outreach program. This multi-faceted program is closely connected to the UM's pollution prevention (P2) program and its many initiatives. Specifically, the storm water education curriculum is designed to promote, publicize, and facilitate watershed education while encouraging the P2 practices developed under the UM's environmental stewardship agenda. The intended audience for the program is all persons associated with the University who could potentially affect the quality of storm water discharges, including, but not limited to: campus residents; University faculty, staff, and students; visitors to the campus; contractors and vendors working on the campus; and commercial and industrial operations on campus. U-M's overall goal for the PEP is to bring awareness of storm water issues to 70% of the University community by the end of 2013. Levels of storm water awareness are anticipated to vary widely among the different community groups, with more emphasis given to key staff having greater potential to impact storm water quality during their day-to-day work activities. The remainder of the University community is targeted through other means, such as brochures, posters, websites, storm drain markers, PSAs, etc.

The following is a description of each of the public education topics identified in the permit, to be included as appropriate, based on the potential impact on the receiving waters:

- Educate the public of hazards associated with illicit discharges and improper disposal of waste. Part of this education is to encourage public reporting of the presence of illicit discharges or improper disposal of materials into the UM drainage system.
- Educate the public concerning the water body that would be potentially impacted by improper actions at or near a person's home.
- Educate the public on the availability, location and requirements for household hazardous waste disposal, travel trailer sanitary wastes, chemicals, grass clippings, leaf litter, animal wastes and motor vehicle fluids.
- Educate the public regarding acceptable application and disposal of pesticides, herbicides, and fertilizers, including the use of phosphorus-free fertilizer alternatives, as appropriate.

- Educate the public on preferred car cleaning agents and procedures for noncommercial car washing.
- Educate property owners with a septic system on proper maintenance and how to recognize system failure.
- Educate riparian land owners of management of lands to protect water quality.
- Educate the public about their responsibilities and stewardship of their watershed.
- Educate the public on the benefits of using native vegetation instead of non-native vegetation.
- Educate commercial and institutional entities likely to have significant storm water impacts. (At a minimum, commercial food services shall be educated to prevent grease and litter discharges to the MS4).

Specific educational materials utilized in addressing the PEP, the key messages/topics each material includes, responsible parties, target audiences, and the delivery mechanism type are provided in Appendix J.

The following Best Management Practices will be carried out to meet these requirements:

3.1 Storm Water Education Brochures

In cooperation with the UM School of Natural Resources and Environment (SNRE), the UM Department of Occupational Safety and Environmental Health (OSEH) developed a series of brochures to assist various members of the University community in preventing storm water pollution on campus. The brochures have been designed to meet the overall program objectives for specific audiences.

> **Measurable Goal:** Review existing brochures and update as needed. Create additional brochures, tip cards, posters, etc. as new needs are identified. The number of new or revised brochures, flyers or other educational media created will be tracked for inclusion in the progress reports. Copies of brochures (and other handouts/postings) will be kept on file.
>
> **Measurable Goal:** A minimum of 1,800 brochures will be distributed annually during presentations, training courses and new employee orientation sessions. The quantity of brochures distributed throughout the year will be tracked for subsequent inclusion in the progress reports.

Brochures - Additional Task Implementation Timeframe

Timeframe	Goal	Recordkeeping
Ongoing	Review & update existing brochures; periodic review	Keep brochures, revision dates, etc.
2010-2011	Develop/add additional brochures to fill any gaps in the topics needed to meet the permit requirements.	Keep brochures with dates finalized
2011-2012	Create dissemination strategy to reach the target audiences and any new audiences identified by UM.	Identify educational information available/developed for each target audience applicable at UM. Keep on file.
2012-2013	Implement new dissemination plan	Tally # distributed for reporting.

3.2 Storm Water Education Web Sites

Developed in cooperation with the UM SNRE and maintained by OSEH, the Storm Water Education Web site builds upon the information contained in the brochures and disseminates it to the general University community and the public at large. This web site is intended to help students, employees, and visitors in the UM community understand how the University's storm water system operates, various legal requirements, and what individuals can do to reduce contamination in the storm water system from surface runoff. As viewers move through the site they learn about storm water, what they can do to help protect it, how regulations impact the University's operation, and various safe practices. The UM-D and UM-F websites also provide topical information for practices potentially impacting storm water.

The OSEH website is updated on a regular basis to include pertinent information related to storm water management and pollution prevention. Current material on the web site can be viewed by visiting http://ehs.umich.edu/environmental/water/stormwater/.

> **Measurable Goal:** The number of visitors to the websites will be tracked annually for subsequent reporting. The goal is to have 2,000 website hits annually. This website is intended to help students, employees, and visitors in the UM community understand how the University's storm water system operates, various legal requirements, and what individuals can do to reduce contamination in the storm water system from surface runoff. This website tally may also serve as an indication of the community seeking additional storm water information from the link provided in the brochures, as detailed above.

Websites - Additional Task Implementation Timeframe

Timeframe	Goal	Recordkeeping
Ongoing	Review & update existing websites; periodic review	Print a copy of website changes made, note date of revisions, etc.
2010-2011	Create website information dissemination and coordination strategy (all campuses) to reach the target audiences	Identify educational information available/developed for each target audience applicable at UM. Keep on file.
2011-2012	Develop/add additional topics, weblinks, etc. to fill any gaps in the topics needed to meet the permit requirements	Print a copy of website changes made, note date of revisions, etc.
2012-2013	Implement new dissemination plan	Tally number of website hits for reporting.

3.3 Storm Water Management at the University of Michigan - Video & Public Service Announcements

The video *Storm Water Management at the University of Michigan* provides viewers with an overview of storm water issues as they pertain to University operations and activities. The video begins with an overview of the UM-A2's storm water drainage system and it's receiving bodies followed by a synopsis of the legal requirements that mandate the NPDES permit and the development of a storm water management program. The remainder of the video focuses on how storm water can become polluted because of human activities. It proceeds to inform viewers of the University's actions to protect storm water quality in the following areas: salt use and deicing activities, waste management and spill response, campus planning and expansion, cleaning outdoor equipment and vehicles, chemical disposal practices, and food vendor training.

This video or other storm water video content is offered for viewing on an as needed basis for inclusion in faculty and staff presentations, classes, workshops, etc.

> **Measurable Goal:** The number of offerings of storm water videos will be tracked annually for subsequent reporting in the progress reports. A listing of available storm water videos will be kept on file.
>
> **Measurable Goal:** Storm water, waste disposal, and recycling related Public Service Announcements will be distributed annually for use during the six or seven Football season home games. These short educational messages will provide storm water information to visitors, students, staff and contractors

attending the UM football games. The total anticipated audience for these messages is over 107,000 per game.

3.4 Storm Water Education Presentations

OSEH provides storm water education presentations to key staff having greater potential to impact storm water quality during their day-to-day work. The remainder of the University community is targeted through other means. The presentations discuss the storm water drainage system; the need for protecting the quality of storm water discharges; the NPDES permit, its legal requirements, and the storm water management program; and the most common storm water pollutants and ways to limit their effects on storm water. The presentations can also feature the storm water video.

Storm water education is provided during new employee orientation sessions (all employees at the UM), new laboratory employee training classes and at new Plant employee training classes. In addition, presentations including storm water topics are provided on an annual basis to UM-A2 Plant staff which includes the following sub-groups:

- Building Services,
- Construction Services (including the Cabinet, Sign, Glass, and Upholstery shop departments),
- Facilities Maintenance (including HVAC, Plumbing, Pumps, Steam Distribution & Insulation, Electrical, Fire Systems, Elevators, Roofing, Metal Crafts & Machine Repair shop departments),
- Grounds & Waste Management Services,
- Utilities & Plant Engineering (includes purchasing, generation, distribution, conservation, and accounting of utilities for the University), and the
- Work Control group (responsible for single point of contact for services, all estimates and preventive maintenance planning).

Measurable Goal: Storm water topics will be included in a minimum of 50 classes, workshops or presentations annually. The number of sessions including training on storm water issues will be tracked for subsequent reporting.

Measurable Goal: A minimum of 500 laboratories will be inspected annually. The inspections will include a review of issues impacting storm water quality, chemical storage, waste management and disposal. These inspections may also serve as an indicator of the effectiveness of storm water education received, or the

need for additional education. The number of inspections performed annually will be tracked for subsequent reporting.

Measurable Goal: All outdoor food vendors will receive training/education including related storm water issues annually. Food establishment inspections will include items to ensure storm water BMPs are being followed. These inspections may also serve as an indicator of the effectiveness of storm water education received, or the need for additional education. The number of inspections performed will be tracked for subsequent reporting.

4.0 PUBLIC INVOLVEMENT AND PARTICIPATION

> *Part I, Sections B.2 of the Permit:* "Public input shall be encouraged in all aspects of the storm water management program…"

The University encourages public input in all aspects of its storm water management program. In order to facilitate public participation, this plan and information related to the storm water management program are made available on the storm water web site. By viewing the Annual Reports that are placed on the web site, the general public and members of local stream and watershed protection organizations can make themselves aware of activities the University carries out under its storm water management program. In addition, when new storm water management program plans are developed and finalized, the City, County, and interested local stream and watershed protection organizations are allowed to review and comment on them. Website feedback link(s) will be provided to facilitate feedback on the SWMPP from the community.

One public awareness group that UM-A2 works with on a regular basis is the Huron River Watershed Council (HRWC). Many of the HRWC's goals are consistent with the University's ideals for the preservation and protection of the surrounding natural water bodies. As a result, the University has established an informal partnership with the HRWC and has provided input to the HRWC on issues concerning the Total Maximum Daily Load program for water bodies that lie within the Huron River Watershed.

Measurable Goal: The SWMPP and NPDES reports will be made available on the UM storm water web site. The date of addition to the website will be tracked for subsequent reporting.

Measurable Goal: The UM will attend a minimum of ten (10) meetings annually with local watershed/creekshed organizations like the Huron River Watershed Council (HRWC), Washtenaw County Drain Commission, City of Ann Arbor (A2), the Millers Creek Action Team (MCAT), Flint River Corridor Alliance, Flint River Watershed Coalition, Friends of the Rouge or other local stream protection organizations for collaboration on storm water issues in the community. UM's participation in meetings, community events, etc. with these groups will be tracked for subsequent reporting.

Measurable Goal: The City, County and interested local stream and watershed protection organizations will be notified of the online availability of the UM SWMPP for review and comment on the same frequency the information is provided to the Department. The SWMPP will be accessible on the UM website

for review by the public. Any comments received will be reviewed by UM OSEH and evaluated for inclusion in the SWMPP. Comments submitted and any actions taken in response to comments will be documented and kept on file.

Measurable Goal: The UM will participate in meetings of the Middle Huron Initiative (typically semi-annual) to address the Ford & Belleville Lake TMDL on phosphorus reduction throughout the permit cycle. Attendance at these meetings will be tracked for subsequent reporting.

Measurable Goal: The UM will participate in Geddes Pond – E. coli TMDL efforts throughout the permit cycle. Management activities addressing E. coli include dry weather screening and illicit discharge elimination, semi-annual catch basin cleaning, pollution prevention, and public education. These efforts as well as attendance at meetings/events on this issue will be documented for subsequent reporting.

Measurable Goal: The UM will sponsor/offer a semi-annual volunteer opportunity for participants to get involved with storm water improvement and education programs. Examples of opportunities include storm drain stenciling/marking and invasive species removal projects. The number of volunteer events offered will be tracked annually for subsequent reporting. The number of participants in volunteer stewardship events will be tracked for subsequent reporting.

PIP - Additional Task Implementation Timeframe

Timeframe	Goal	Recordkeeping
February 2010	Follow notification requirements to publicize updated SWMPP and locations for review	Keep records of notifications made, comments received, etc. Include website printouts.
2010-2011	Meet with local watershed/creek groups to identify joint activities and opportunities meet permit requirements.	Identify local creek/watershed groups, etc. timeframes, staffing, and participation opportunities.
2011-2012	Develop participation plan for all campuses.	Keep records of meetings attended, possible opportunities for coordination with local groups, etc.
2013	Implement participation plan	Tally number of meetings attended for future reporting.

5.0 ILLICIT DISCHARGE ELIMINATION PROGRAM

> *Part I, Section B.3 of the Permit:* "The permittee shall develop, implement and enforce a program to prohibit and effectively eliminate illicit discharges, including discharges of sanitary wastewater, to the permittee's drainage system…"

The removal of illicit discharges is an ongoing program being conducted by the UM. As illicit discharges are identified, they are discontinued or otherwise corrected. The program described in this section will be used to determine the existence, location, and extent of possible illicit connections and discharges to the storm water drainage system. At a minimum, it will address the elements presented in *Part I, Section B.7 of the Permit.*

The UM-A2 has been involved in an ongoing program for identifying and controlling non-point source pollution to the Huron River. The Huron River Pollution Abatement Project was developed from a grant from the federal Clean Water Act and used by the UM-A2 to identify illicit connections to the storm water system. The project was completed in 1990.

The UM will continue to encourage reporting of water quality problems and possible illicit connections and discharges to the storm water system. OSEH, Plant Operations, and/or Facilities Management will receive reports of water quality problems and possible illicit connections and perform follow-up investigations, leading to elimination where appropriate.

The key elements of this plan are described in the following subsections of this document.

5.1 Storm Sewer Map

A storm sewer system map is required in Part I.A.7.b.1 of the Permit. The map must include the location of all discharge points the permittee owns or operates, and the names and location of all surface waters of the state which receive discharges from the MS4.

> **Measurable Goal:** By February 1, 2011 the UM will create a storm sewer system map identifying the location of all if its discharge points and the names and locations of all the surface waters that the MS4 discharges into.

Measurable Goal: The storm sewer system map will be updated periodically as discharge points are identified or added. The dates of modification of the system map will be tracked and kept on file.

5.2 Survey of Facility Discharge Points Into the System

OSEH has implemented a program to identify discharge points from facilities into either the sanitary sewer or storm water systems. The first phase of this program began several years ago and resulted in the identification of facility discharge points on the Ann Arbor Campus. Information collected included water usage rates, category of activity, and categorization of water flows as domestic or non-domestic based on the activity occurring at the facility.

The second phase of the identification of facility discharge points will be implemented as part of this SWMPP. The second phase will consist of a continual observation process performed by OSEH, EHS & CSS personnel as they perform other activities across campus facilities. The activities associated with this program are conducted as illicit discharges are identified. They are prioritized and discontinued or otherwise corrected.

Measurable Goal: UM will create a prioritized listing for the performance of dry-weather screening considering the criteria in Part I.A.7.b.2 of the permit. The list will be developed in 2011 to ensure the use of the most up to date storm sewer system map/information will be utilized. The list will be kept on file.

5.3 Dry Weather Screening

In accordance with Part I, Section A.7.b of the permit, the purpose of dry weather field screening is to determine the existence, location, and extent of possible illicit discharges into the UM storm water drainage system. The screening program has been designed to target discharge points within the storm water system that will help identify non-storm water flow. The current procedure used for dry weather screening is attached as Appendix E. This procedure will be updated periodically, and the most current copy of the procedure will be available for review in the OSEH, EHS or CSS offices.

For the purposes of dry weather screening, the UM will be divided into five regions. The UM-D and UM-F will comprise one region for screening purposes. The remaining four regions will be comprised of UM-A2 areas determined from the outfall prioritization task in section 5.2 above. The regions are as follows:

- UM-Dearborn & UM-Flint

- UM-A2 I
- UM-A2 II
- UM-A2 III
- UM-A2 IV

Measurable Goal: The UM will perform dry weather screening on each MS4 discharge point at least once every 5-years beginning on February 1, 2010, (per Part I.A.7.b.3) to determine the existence, location, and extent of possible illicit discharges into the UM storm water drainage system on all three campuses. This is typically done during four to five rounds of screening. Any issues identified for further investigation or correction will be tracked for subsequent reporting. The number of illicit discharges and connections identified and subsequently corrected or removed will be tracked for subsequent reporting.

5.4 Minimizing Seepage to the Storm Water Drainage System

Where practical, the UM attempts to design sanitary sewer or storm water drainage systems so that the sanitary sewers are always at a lower invert elevation. Good engineering practice, proper installation, and final inspection will be exercised by Plant Extension and Plant Operations to limit seepage from sanitary sewers to the storm water drainage system on campus.

Infiltration of seepage from sanitary sewers to the storm water drainage system will be monitored during normal scheduled and non-scheduled maintenance activities. If possible, seepage identified during maintenance activities will be corrected as it is identified. If immediate correction is not feasible, a plan for corrective action and a time schedule will be prepared to track progress on the correction.

5.5 Public Reporting of Illicit Discharges

Public involvement in the reporting of illicit discharges to the storm water system is a voluntary program. G&WM currently coordinates extensive recycling promotions with student housing and individual colleges on campus. These promotions include information regarding reporting of illicit discharges to OSEH for follow-up. By means of its public education program, UM advises the University community to report discharges for appropriate investigative and follow-up action.

The University maintains a 24-hour 911 emergency response system (also 734-763-1131 at UM-A2) which is coordinated and manned by the Department of Public Safety. Any calls reporting dumping, accidental spills, etc. are dispatched from DPS to OSEH for emergency response, containment and control. In addition, calls can be made to OSEH directly reporting such incidents for emergency response.

> **Measurable Goal:** The emergency response system on campus will be maintained by DPS (24/7) for use by the public to report illegal dumping, spills or suspicious discharges at the University throughout the permit term. The number of calls received by the DPS/OSEH emergency response call system on potential discharges to the storm water system will be tracked for subsequent reporting. The number of incidents remedied as a result of these calls will also be tracked and reported annually.

5.6 Follow-up Corrective Action

Identification of illicit discharges and connections is the first stage of the illicit discharge elimination program. Once the discharges are identified, they must be effectively eliminated to prevent future impacts on the receiving waters of the State. The following program for corrective action has been proven effective in removing identified illicit connections and discharges.

5.6.1 Correction of Illicit Connections

Illicit connections are physical connections to the storm water drainage system that can convey a discharge that should not be entering it. These connections typically require the involvement of Plant Operations, Facilities Management, or Plant Extension personnel for correction. Activities involved in the corrective action include:

- Identify the source of the discharges to the illicit connection and stop the discharges.
- Notify the owner of the discharge point and ask them to contact Plant Operations/Facilities Management through the work order system to initiate the removal of the connection.
- Plant Operations/Facilities Management will prioritize the problem with other maintenance activities underway on campus. A higher priority will be assigned if the connection presents an immediate concern. A lower priority will be assigned if the owner can operate without discharging to the connection until repairs are implemented.

- A schedule for corrective action will be included with the progress reports if the illicit connection cannot be removed within a reasonable time. It will be listed as identified and corrected if the connection can be removed prior to the reports.

5.6.2 Correction of Illicit Discharges

Identification of potential illicit discharges will come from either public involvement in reporting or from CSS, EHS or OSEH staff members identifying problems during routine activities at University facilities. Every individual in the University community has a responsibility for reporting illicit discharges to EHS/CSS/OSEH if they are observed. The education program is designed to enhance this effort. Once identified, OSEH/EHS/CSS will perform follow-up actions to remove the discharge and prevent future occurrences.

The correction of an illicit discharge typically involves modifying an unwanted behavior. The following actions will be taken by OSEH once the responsible individual or unit is identified:

- The activities of the individual or unit will be reviewed to determine the appropriate disposal method to use. The discharge will be reviewed for appropriate reporting requirements under environmental regulations.
- The individual or unit will be directed to stop discharging and change operations to the appropriate disposal method.
- OSEH will respond to the area for cleanup if the discharge can be removed from the system. An outside contractor with vacuum truck capabilities may be required to remove the material.
- OSEH will perform appropriate follow-up with the supervisor of the individual or unit to ensure future discharges do not occur.
- A review will be performed of similar operations that could have similar concerns. Education efforts will be made with individuals or units associated with the similar activities, if appropriate.

5.7 Other Measures to Prohibit Illicit Discharges

Under the legal authority described in Section 1.2.1, UM has adopted policies in the following areas to prohibit illicit connections and illicit discharges including the direct dumping or disposal of materials other than storm water into the drainage system:

- Erosion Control – Part 91 of the NREPA provides for a statewide soil erosion and sedimentation control program. This program outlines the proper provisions for water disposal and the protection of soil surfaces during and after construction and is adhered to by the UM.
- Employee Training and Education – UM personnel involved in the application of herbicides, pesticides, and fertilizers have been trained and are licensed applicators. All applicators in the following departments are trained and licensed: G&WM, Facilities Management Grounds Department, Matthaei Botanical Gardens, Nichols Arboretum, Radrick Farms, and Athletics. In addition to the courses taken through the Michigan Department of Agriculture, G&WM also employs a foreman to train all of its employees. Training programs will also be conducted to address the purpose and operation of BMP activities under this SWMPP. In addition, staff in various departments have received, or are in training to receive certification from MDEQ in Storm Water Management – Construction Site, Storm Water Management – Industrial Site or Soil Erosion & Sedimentation Control.
- Recycling Efforts – The UM promotes environmental awareness by sponsoring recycling programs on campus. Educational materials have been developed by G&WM which address student contributions to the UM recycling effort, educate students on the types of recyclables and where they may be taken for recycling, and educate students on the impact that recycling has on the environment.
- Hazardous Materials Response – OSEH, EHS & CSS are instrumental in maintaining a safe and healthy environment for faculty, staff, students, and visitors. Routine training is provided to new faculty, staff, and students regarding hazardous materials and conditions at UM facilities. OSEH also maintains a spill response team that can quickly and efficiently respond to and mitigate releases of hazardous materials.
- Hazardous Waste Disposal – OSEH is responsible for the appropriate collection and disposal of hazardous waste and hazardous materials used and generated by the UM units. The program ensures tracking of the materials from point of generation through collection and ultimate disposal. Personnel are properly trained and appropriately licensed to handle the material and transport the waste on campus. Qualified contractors are used for ultimate transport and disposal off site.
- Plan Review – OSEH, CSS & EHS review all plans for the renovation of existing structures and the construction of new facilities. The plans are reviewed by all OSEH divisions to identify potential concerns appropriate

for that division. Plan reviews include environmental concerns and the protection of storm water quality and the storm water drainage system.

- Storm Water Basins – Storm water management basins are used to reduce the impact of storm water discharges from campus locations. Although the primary function of these basins is to provide first-flush holding capacity for storm water, the design also provides for sediment deposition within the basin structure which can significantly reduce pollutant loads in receiving waters.

5.8 Recordkeeping

Once an illicit discharge or connection is identified and appropriate follow-up actions are initiated, the following items will be investigated and recorded. The records will be maintained by OSEH, EHS or CSS as appropriate.

- Steps will be taken to mitigate the situation immediately. All actions initiated to eliminate the discharge and effect cleanup will be noted. These records may involve memoranda prepared by OSEH regarding actions taken and cleanup efforts. They may also involve discussions with Plant Operations or Plant Extension regarding correction of illicit connections.
- The material or pollutant discharged will be identified. This can typically be obtained through interviews, reviews of inventory data, and Material Safety Data Sheets.
- The location of the discharge to the UM storm water drainage system will be identified. This information will be tracked through discussions with the Plant Operations personnel, review of drawings, or dye testing if needed.
- The location of the storm water system outfall to waters of the State will be identified. This information will be obtained through review of the storm water drainage plans for the UM property.

5.9 Illicit Discharge Elimination Program Education

OSEH provides IDEP education presentations to key staff having greater potential to identify illicit discharges during their day-to-day work. The IDEP educational material is provided at new Plant employee training classes and on an annual basis to key Plant, Facilities & Operations and Facilities Maintenance staff (e.g., HVAC, Plumbing, Pumps, Steam Distribution & Insulation, Electrical, Fire Systems, Elevators, Roofing, Metal Crafts & Machine Repair shop departments). Training sessions involving IDEP will be recorded under SWMPP Section 3.4.

6.0 POST CONSTRUCTION STORM WATER MANAGEMENT PROGRAM FOR NEW DEVELOPMENT AND REDEVELOPMENT PROJECTS

> *Part I, Section A.8 of the Permit:* "The permittee shall develop, implement, and enforce standards . . .to address storm water runoff from all new and redeveloped projects that disturb one (1) acre or more, including projects less than one (1) acre that are part of a larger common plan of development or sale that would disturb one (1) acre or more."

The UM has a program to address storm water runoff from new development and redevelopment projects. As part of this program, the UM manages, reviews, and continually updates campus-wide planning to address storm water runoff from each new regulated development and redevelopment project. This program helps to ensure that controls are in place that will minimize and in some cases prevent impacts on water quality from new development and redevelopment projects that disturb areas greater than one acre or disturb areas less than one acre but which are part of a larger common plan of development.

6.1 Controls for Limiting the Effects of Urbanization

Stream hydrology and morphology change rapidly as land is developed and the terrain changes. Common effects of urbanization include stream flashiness, increased stream bank erosion, increased stream temperature, increased stream pollutant load, reduced stream-bank vegetation, and degraded fish habitat. Under its plan for new development and redevelopment projects, UM encourages the development and implementation of measures to control such effects. Example controls that are used on campus may include but are not limited to the following:

- Standards for directing growth to specifically identified areas
- Protecting sensitive areas such as wetlands and riparian areas
- Maintaining or increasing open space
- Encouraging in-fill development in higher density urban areas and areas with existing infrastructure
- Coordinating release rates for detention basins to minimize flow conditions that may cause stream bank erosion

6.2 Post Construction Storm Water Runoff

The University continues to review options for regional storm water management systems at locations where current or future construction is anticipated. This regional detention would include storage for construction or renovation projects that have limited space for on-site systems. The goal of the University is to protect receiving water quality and limit the rate at which surface water runoff discharges from any specific site during and following development or redevelopment to not exceed the pre-development hydrologic regime.

On previous projects where detention on site is not feasible the University has required a minimum of structural BMPs to improve the water quality leaving the site (sedimentation traps, etc.) and proposed regional containment within the runoff basin as the quantity control.

Examples of regional detention systems constructed on campus include: a 1,000,000 gallon (approximately 3 acre feet) detention basin under the parking structure for the Life Sciences Institute/Palmer Drive complex which manages runoff from over 60 acres of Central Campus, and a detention system (approximately 11 acre feet) to manage storm water runoff from over 90 acres of North Campus.

Storm water management practices and facilities for new development and redevelopment projects may be designed with any or all of the following objectives:

- Incorporate design standards that control water quantity and quality;
- Encourage innovative storm water management practices that meet the criteria contained within UM's storm water permit;
- Ensure future maintenance of facilities by planning for it as part of system design;
- Make the safety of the facility a priority;
- Strengthen the protection of natural features; and
- Encourage more effective soil erosion and sedimentation control measures.

Measurable Goal: By August 1, 2009 UM issued the Post-Construction Storm Water Requirements guideline which details the minimum treatment volume standard and the channel protection criteria. The guideline is provided in Appendix G.

6.2.1 Non-structural and Structural BMPs

To meet the objectives, UM may implement various non-structural and structural BMPs where appropriate. Non-structural BMPs are preventative actions that involve management and source controls. Examples of issues that are covered in non-structural BMPs used on campus include but are not limited to the following:

- Buffers along sensitive water bodies
- Education programs for developers and the public about project designs that minimize water quality and quantity impacts
- Minimum disturbance of soils and vegetation;
- Restrictions on directly connected impervious areas;
- Preservation of the natural environment;
- Minimization of impervious surfaces; and
- Use of vegetated swales and natural storage.

Structural BMPs are physical controls, including storage practices, which improve water quality. Examples of issues covered in structural BMPs used on campus include but are not limited to the following:

- Wet ponds and extended detention outlet structures;
- Filtration practices such as grassed swales, sand filters, and filter strips; and
- Infiltration practices such as infiltration basins and infiltration trenches.

Measurable Goal: OSEH/EHS/CSS and/or the University Planner's Office will review all construction and renovation plans for use of structural and non-structural BMPs to prevent receiving water quality from the impacts of development and limit the rate at which surface water runoff discharges from any specific site to not exceed the pre-development hydrologic regime. The number of sites implementing various non-structural and structural BMPs will be tracked annually for subsequent reporting. Examples of BMPs to be tracked for reporting may include but are not limited to those identified above.

6.2.2 Operation and Maintenance of BMPs

Any non-structural BMPs that are implemented at a facility are incorporated into day to day activities for the operation of the facility or into maintenance schedules. Structural BMPs related to storm water detention and retention basins are subject to scheduled maintenance inspections. Non-scheduled activities are completed as they arise.

Measurable Goal: Storm water management basins on campus will be inspected annually, at a minimum. The number and frequency of inspection of storm water basins will be tracked for subsequent reporting. Maintenance issues identified during these inspections will be tracked until corrected.

6.2.3 Site Plan Review

The UM has established programs to control the quality of storm water runoff from development or redevelopment activities through the review of site plans. This program is the same as that used for controlling storm water runoff on construction sites. Please see Section 6.1.1 of this plan for a complete description of the site plan review program.

Measurable Goal: OSEH/CSS/EHS and/or the University Planner's Office review all plans to ensure projects have adequate post construction storm water management controls. The number of plan reviews will be tracked for subsequent reporting.

6.3 Commercial Operations

The site plans for any commercial operations that conduct business on UM property are reviewed to ensure that storm drain inlets are adequately isolated from pollutant sources, equipment washing and waste material handling operations at these institutions does not result in discharges of waste to the storm water drainage system and all regulated polluting materials are handled in areas with secondary containment systems in accordance with state and federal regulations.

7.0 CONSTRUCTION STORM WATER RUNOFF CONTROL

Part I, Section A.9 of the Permit requires UM to provide notice to the Department when soil, sediment or other wastes are discharged. UM will continue to provide the Department with notice of reportable discharges from construction sites in accordance with Part I.B.2.a of the Permit.

7.1 Sedimentation and Erosion Control Program

In 1982, the UM received approval from the Michigan Department of Natural Resources to operate as an Authorized Public Agency (APA) under the authority of Part 91, Soil Erosion and Sedimentation Control (SESC) of the Natural Resource & Environmental Protection Act, 1994 PA 451, as amended (Part 91). Reauthorization of UM's APA status was received in 2004 from the Michigan Department of Environmental Quality. APA status allows the UM to establish and manage the Soil Erosion and Sedimentation Control procedures on its properties. Construction activity at UM may involve contractor or in-house construction activities performed by Plant Operations.

The SESC procedures apply in varying degrees to construction and maintenance activities at the UM conducted by contractors and in-house personnel. The need for and extent of a formal written soil erosion control plan will vary, depending on the project. The campus follows the MDEQ-approved UM Soil Erosion and Sedimentation Control Procedures (August 2004) to control storm water runoff from construction areas on UM property. New development projects are subjected to the UM internal review process to ensure adequate storm water control is provided during construction activities.

Earth disturbances not stabilized within 24 hours of the initial earth disturbance and which are not exempted under MI Part 17 SESC Rule 323.1705, meeting either of the following criteria require a fully developed, written, erosion and sediment control plan that complies with Part 91:

- Earth disturbances of 1 acre or more.
- Earth disturbances within 500 feet of "Waters of the State"

All other projects must maintain methods to control runoff that enters the existing storm water system and protects it from sedimentation.

Maintenance activities, disturbing less than one acre and greater than 500 feet from "Waters of the State" as defined in the Glossary, do not typically have a design or specification prepared. These activities are performed on a work order or emergency

basis by Plant Operations or other UM departments such as UM Hospitals & Health Centers (UMHHC) or Athletics. The supervisor of the maintenance activity, shall notify the OSEH SESC inspector of the proposed activity and shall arrange for OSEH inspections to ensure appropriate erosion control and sediment control measures are implemented during fieldwork.

7.1.1 Site Plan Reviews

The UM has established programs to control the quality of storm water runoff from development or redevelopment activities. Plans for new development are subjected to a UM internal review process to ensure that storm water quality is adequately controlled during construction and after completion of the new development. Efforts are underway to insert storm water management controls into the front end of all projects. Examples of efforts on projects include control of sedimentation using silt screens or other measures, controlling sediment tracking from construction areas through increased street sweeping, and using hydroseeding to control runoff once construction efforts are completed. Reviews of all projects are performed by the Plant Extension or The University of Michigan Hospitals and Health Centers (UMHHC) architect or engineering staff.

> **Measurable Goal:** Formal SESC plans are required for sites with earth disturbance (greater than 24 hours) of 1 acre or greater and projects (of any size) within 500 feet of "Waters of the State." The number of SESC site plan reviews will be tracked annually for subsequent reporting. This review process allows OSEH/EHS/CSS to require projects to insert storm water management controls into the front end of all projects.

7.1.2 Best Management Practices

Best Management Practices are used for construction projects to prevent soil erosion and sedimentation from leaving the property. As specified above, UM utilizes practices specified in the Manual. The following list represents examples of erosion and sedimentation controls for which specific BMPs have been developed. Copies of the BMPs can be found in the Manual and are used, as appropriate, based on the specific needs for a construction site. Note that not all sites will need to use all of these practices.

- Access Roads
- Construction Barriers
- Tree Protection
- Buffer and Filter Strips
- Filter Fencing

- Storm Drain Inlet Filter Fabric
- Street Sweeping

Measurable Goal: The use of BMPs is required on all projects under the approved SESC Procedures for the University. The number of projects using the Best Management Practices identified above for SESC will be tracked annually for subsequent reporting. BMPs will be selected as appropriate for site conditions.

7.2 Site Inspections

Inspections of work sites are essential to controlling erosion and sedimentation concerns. Personnel from several departments have received SESC training from the MDEQ. This provides a strong base of personnel to draw upon to regularly review maintenance, renovation, and construction sites. The inspections focus on requirements of site-specific erosion and sedimentation control plans for the project. Conditions can change at maintenance, renovation, and construction sites and the inspectors should make adjustments to the erosion and sedimentation control measures, as needed.

OSEH/CSS/EHS or their designee, who have received a MDEQ SESC certificate of training, will inspect sites weekly during maintenance, renovation, and construction activities and following significant rain events to ensure compliance with the UM SESC procedures and Part 91. Sites 1 acre and above will be inspected within 24 hours of the rain event to comply with National Pollution Discharge Elimination System (NPDES) inspection requirements.

Issues and concerns will be referred to the project/construction manager or designee for correction. The contractor will make any necessary repairs or corrections to the control measures within 24 hours, if waters of the state are being impacted. Other corrections, not impacting waters of the state will be made within 5 days. The project/construction manager will report any issues that cannot be corrected within 5 days to OSEH. Additional detail as to why the correction cannot be made in that time frame will be required.

Measurable Goal: Sites will be inspected weekly and after rain events until final stabilization of the project site. The number of SESC inspections performed annually on UM sites will be tracked for subsequent reporting.

Measurable Goal: Select staff from OSEH, CSS, EHS and the University Planner's Office will be SESC trained by MDEQ. The number of UM staff who

have received MDEQ SESC training will be tracked annually for subsequent reporting.

Measurable Goal: Select UM staff from OSEH University Planner's Office and Construction Management/AEC will be certified in Storm Water Management for Construction Sites. The number of UM staff who have received MDEQ certification will be tracked annually for subsequent reporting.

7.3 Sedimentation Control During Maintenance Activities

Some maintenance activities do not typically have a formal design or specification prepared. They are performed on a work order or emergency basis by Plant Operations or other UM departments such as UMHHC or Athletics. The supervisor overseeing the maintenance activity will be responsible for ensuring appropriate sedimentation control measures are implemented during field work. These procedures will be used for routine operations; however, in emergency situations human life and the safety and operation of the facilities and infrastructure are of overall importance. In those cases, work will be performed to minimize any immediate danger and stabilize the situation, and sedimentation control actions will follow. This chain of actions may require the use of an outside contractor to clean the storm water drainage system following the maintenance activities to prevent or minimize sediment transport to the Huron River. In addition to the BMPs listed above, the following BMPs will be used by the maintenance supervisor during activities that disturb soil to the degree where sediment transport could occur.

- Evaluate the site to determine the location of the nearest inlet to the storm water drainage system.
- Determine if soil will be excavated or disturbed during the maintenance activity.
- Remove any unused soil from the site as soon as maintenance activities are completed.
- Contact G&WM to grade and re-vegetate the work area if necessary.
- Remove all erosion and sedimentation control devices from the site once final site stabilization has been completed.
- Evaluate the need to have nearby catch basins cleaned and initiate appropriate actions.
- Evaluate the need to have the street or surface parking area cleaned following completion of the work and initiate the appropriate actions.

- Report any sediment releases into the storm water drainage system to OSEH during all stages of the project.

Measurable Goal: The use of SESC controls is required for all maintenance projects involving earthwork. The number of SESC inspections performed annually on UM sites will be tracked for subsequent reporting.

7.4 Notifications

7.4.1 Outside Agencies

As an authorized public agency, the UM has the authority to implement its own soil erosion and sedimentation control procedures with regard to earth changes undertaken on its property. In the event construction activities result in soil erosion and sedimentation that deposits or threatens to deposit solids into the drainage system, OSEH will be notified. OSEH will investigate the incident and will take the necessary steps to prevent further deposit of solids into the drainage system. In addition, OSEH will make any necessary notifications to the Department in accordance with Part I.B.2 of the permit.

7.4.2 Internal Operations

Public comments, complaints, or other information regarding construction activities or construction site storm water runoff leading into the storm water drainage system are welcomed by the UM Department of Public Safety, OSEH, CSS and EHS offices. All calls are subsequently investigated and handled by OSEH/CSS/EHS and any corrective actions or notifications are made.

8.0 POLLUTION PREVENTION/GOOD HOUSEKEEPING FOR UNIVERSITY OPERATIONS

> *Part I, Section A.10 of the Permit*: "The permittee shall develop, implement and ensure compliance with a program of operation and maintenance of BMPs with the ultimate goal of preventing or reducing pollutant runoff to the maximum extent practicable from municipal operations that discharge storm water to the surface waters of the state."

The University's storm water pollution prevention and good housekeeping initiatives include, but are not limited to the following six areas:

- Structural Controls
- Roadways
- Fleet Maintenance
- Storm Sewer Labeling
- Flood Control Projects
- Pesticides and Fertilizers

Each area has operation and maintenance BMPs with the ultimate goal of reducing and in some cases preventing pollutant runoff from University operations to the maximum extent practicable. The University's storm water pollution prevention and good housekeeping initiatives are described in the following sections.

8.1 Structural Controls

Structural controls are permanent physical features that control and prevent storm water pollution. Each structural control has routine scheduled maintenance and long-term inspection procedures to ensure that they remove storm water pollutants to the maximum extent practicable.

Several retention and detention basins have been identified as part of the UM storm water system. These structures receive direct run-off from the UM storm water system and are defined in Appendix F. The U-M has provided a spreadsheet identifying additional structural controls with inspection and maintenance schedules in Appendix K.

G&WM is responsible for administration of the inspection program for storm water retention facilities. Maintenance activities for the retention facilities are scheduled by G&WM based on results of the inspections.

Most inlets to the storm water drainage system have catch basins in them to collect sediments and other debris so it does not enter the system. Plant Operations or Facilities Management is responsible for maintenance of the catch basin system. Basins are cleaned on a periodic basis, with emphasis on higher traffic areas. Any debris that is collected from the catch basins is temporarily stored at a collection site before disposal at a solid waste landfill. Liquid that is collected with the debris is decanted into a sanitary sewer prior to offloading at the temporary storage location.

Liquid waste from storm water maintenance activities will be drained to an approved sanitary sewer location. If vacuum services are performed at an off-site location, the vacuum truck operator shall decant the liquids back to a sanitary drain prior to leaving the site. Solid waste generated from these activities is taken off-site for disposal.

> **Measurable Goal:** Storm water management basins will be inspected annually during the permit term. The number and frequency of inspections on the UM retention basins and detention basins will be tracked for subsequent reporting.
>
> **Measurable Goal:** Maintenance cleaning of the catch basins and storm sewer system piping will be performed periodically, with higher traffic areas and those identified via service requests receiving more attention. The goal will be to clean all catch basins in the system at least once per 5-year cycle. The number of catch basins maintained will be tracked for subsequent reporting.
>
> **Measurable Goal:** By October 1, 2011 a list of municipal properties and structural storm water controls owned or operated by UM will be created, which includes the type and number of properties and structural controls. This listing will be kept on file.

8.2 Roadways and Parking Structures

The University maintains numerous parking structures and surface parking lots throughout its campuses. Maintenance of the UM roadways and parking structures incorporates sediment control activities. Street sweeping removes potential storm water pollutants before they are carried into receiving waters in runoff from a storm event. Street sweeping and leaf and litter collection is performed by the University in an effort to prevent large debris from entering the storm water system. Litter is disposed as normal municipal waste and leaves are composted in two locations that are well away from system catch basins or inlet structures. Maintenance activities on these structures and surfaces include street sweeping, leaf pick-up, litter and pollution controls, snow and ice

removal, and roadside vegetative maintenance. These activities are discussed in greater detail below.

Measurable Goal: Street sweeping, leaf and litter collection will be performed periodically throughout the permit term. The cost for disposal and estimated quantity of debris, trash, dirt, etc. disposed from the maintenance and cleaning/sweeping of numerous parking structures, surface lots and roadways throughout the University will be tracked for subsequent reporting.

Measurable Goal: A strategy to reduce the runoff of TSS from paved surfaces to the maximum extent practicable, with a goal of reducing the annual TSS loading by 25% as compared to annual loading with no suspended solids controls will be developed (2010-2012) and implemented (2013) at the University. An estimate of the TSS loading reduction achieved through this strategy will be provided in the progress reports.

Measurable Goal: Develop BMPs to control dust and suspended solids in runoff from unpaved roads and parking lots. A list of unpaved roads and parking lots will be created (2010-2011).

Measurable Goal: The use of coal tar emulsions to seal asphalt surfaces will be prohibited, as required in the permit. Plan reviews for construction and renovation projects involving asphalt will include comments from OSEH/CSS/EHS prohibiting the use of coal tar emulsions for UM projects. Comments on construction and renovation projects are kept on file at the OSEH/CSS/EHS offices.

8.2.1 Street and Parking Structure Sweeping and Leaf Pick-up Program

Personnel in G&WM and Facilities Management are responsible for cleaning the UM-A2 street system. Street sweeping occurs monthly throughout the year, weather permitting. Personnel in Parking Services are responsible for sweeping UM parking lots and structures. All lots (approximately quarterly) and structures (typically weekly) are cleaned on a routine basis, as needed, and are cleaned following special functions. Annual cleaning of structures (water only) is performed following sweeping operations. Sweeping operations at UM-D and UM-Flint occur periodically.

Leaf collection occurs during the fall season each year by G&WM and Facilities Management. During this time, leaves are cleaned from curbs and storm drains and sent to two locations to be composted. These locations are well away from system catch basins or inlet structures to prevent any compost from entering receiving waters. If any

catch basins are found to be broken or defective during leaf collection, they are reported to Plant Operations or Facilities Management for repair.

8.2.2 Litter and Pollution Controls

G&WM is responsible for the daily collection of litter on campus. In addition, students from the student service and Greek Council participate in a litter pick-up program twice per year. Litter is collected and sent for off-site disposal as municipal waste.

8.2.3 Snow and Ice Removal

G&WM predominantly uses salt for performing snow maintenance activities on the streets. Both rock salt and salt brine are used depending on the weather conditions. Brine reduces the amount of rock salt used. The rock salt is pre-wet to enhance its melting power. This results in an overall reduction of salt used, because lower application rates are employed. Sidewalks are de-iced using alternative liquid de-icing products. These products are less corrosive than salt and more environmentally friendly than sand. Sand is only used in extreme cases.

The G&WM implements Best Management Practices (BMPs) to reduce the amount of pollutants produced from snow management activities. Proper calibration of de-icer application equipment and training of equipment operators is emphasized in this program. The UM also ensures that proper storage procedures are used for the salt, liquid, and other de-icers used for snow maintenance. This provides environmental protection of the site and prevention of possible loss of materials. Other BMPs include: closing areas that are not frequently traveled, initiating night time snow removal crews, and alternative de-icing products, anti-icing techniques, and innovative application equipment.

> **Measurable Goal:** Incremental annual reduction in the use of salt for de-icing to reach 50% reduction based on an average annual use of 2600 tons per year from 1989 to 1999. The quantity of salt used for deicing will be tracked on an annual basis.
>
> **Measurable Goal:** Increase the use of alternative de-icers annually to replace/supplement salt use. The quantity of alternative de-icers will be tracked on an annual basis.

8.2.4 Roadside Vegetative Maintenance

G&WM is responsible for the vegetative maintenance of campus property. The UM uses slow release fertilizers twice per year on grass areas. A broad leaf herbicide is applied

annually and is only done selectively. Dormant oil and some insect control agents are also used, as needed.

The University employs applicators certified by the State of Michigan to train technicians in pesticide and fertilizer use. Additionally, all applicators are certified.

The UM presently has a policy of minimizing pesticide and herbicide use. In addition, G&WM is examining alternative landscaping measures for low maintenance vegetation along roadways and other public areas. One such measure is by using a "no mow" approach in several areas so that the grass will develop an extensive root system. This measure allows grass roots to grow deeper, which creates a greater plant mass to increase the ability of the vegetation to retain water.

Maintenance schedules for vegetation are based on classification of the area into one of the following categories:

- Priority three lawns are in areas of campus where the lawn is mostly observed from a distance and not actively used. A reduced mowing schedule is instituted and a taller lawn height is maintained. No mowing areas have been established and include around 1 million square feet of lawn. In addition, no fertilizer, pesticides, or weed control are used in these areas.

- Priority two lawns are around general academic buildings which are highly visible and used in moderation. Mowing is performed 4 times per month. Fertilizer is applied 3 times per season, if needed, and weed control is performed once per season. Pesticide application is limited to target problem areas.

- Priority One lawns are considered a part of the ornamental landscape of highly active buildings or areas. Mowing is performed 6 times per month. Fertilizer is applied 4 times per season, if needed, and weed control performed twice per year.

  Measurable Goal: All applicators (technicians) will be trained in pesticide and fertilizer use. The number of pesticide and fertilizer technicians will be tracked on an annual basis.

  Measurable Goal: Eliminate the need for vegetative replacement due to salt damage to the maximum extent practicable. The need for replacement vegetation will be tracked for subsequent reporting.

8.2.5 Road Repairs

The UM presently has the practice of scheduling road work, as much as possible, during the summer months to reduce the possibility of debris from entering the storm water system during the rainy season.

During all road repair, or other practices (i.e., cutting, grinding, drilling, hydrodemolition) which may disturb the concrete or asphalt, protective measures are taken to protect the storm water drainage system.

8.3 Fleet Maintenance

The UM owns and operates a large fleet of vehicles, including buses and cars, that is maintained by the Transportation Department. The UM also owns and operates a fleet of equipment, including lawn mowers and rototillers that is maintained by G&WM and Facilities Management. All vehicles and equipment are regularly maintained to ensure proper and effective operation as well as prevent impacts on storm water quality.

8.3.1 Equipment Washing

The UM's fleet maintenance areas are properly managed to prevent the release of polluting materials to the waters of the State of Michigan. Maintenance area floor drains are routed through oil interceptors, which are connected to the sanitary sewer system.

The vehicle fleet maintained by the Transportation Department is washed at the Transportation Service bus wash on an as needed basis. In order to prevent oil or other fluids from going into the sanitary sewer, the wastewater is discharged to an oil/water separator. Also, a sediment/water separator was installed to prevent any sediments, floatables or associated pollutants from going into the drainage system.

Equipment maintained by G&WM is washed at their shop on North Campus. During washing, care is taken to make sure neither wash water nor equipment fluids enter any storm drains. In order to prevent oil or other fluids from going into the sanitary sewer, the wastewater is discharged to an oil/water separator. The Grounds facilities on South Campus and Fuller Road are also equipped with oil/water separators.

8.3.2 Vehicle Fluid Dispensing

All vehicle fluids are stored and transferred at the fleet maintenance areas in accordance with the Michigan Part 5 regulations and the Spill Prevention Control and Countermeasures (SPCC) requirements.

There are two primary fueling facilities located on the Ann Arbor campus; one is located on North Campus at the North Campus Transfer Facility and the other is located on South Campus at Transportation Services. To assure that fuel dispensing activities do not impact storm water runoff quality, structural precautions were instituted to stop runoff from passing through fueling areas. These include sloped pavement around the perimeter of the fueling area and a cover over the fueling area, which prevents runoff from washing away pollutants. Dispensing hoses are equipped with automatic shutoff valves and areas around fuel tanks are designed to contain at least 110% of the tank's volume.

University workers are trained in the proper fueling procedures and how to respond quickly to spills, in case of an accident. Signs are posted around the fueling areas instructing fuel pump operators not to overfill gas tanks or leave them unattended while fueling. Also, UM workers are instructed to conduct routine maintenance a part of the fueling procedure so that any fluid leaks can be immediately cleaned and repaired. In case of a spill, the OSEH Emergency Response Contingency Plan has information on the name(s) of clean-up coordinators, the location of clean-up materials, and whom to contact in case of a spill.

8.3.3 Storm Water Pollution Prevention Plan (SWPPP)

In accordance with Permit Part I.A.10.d, the UM will develop and implement SWPPP for all municipal fleet maintenance and storage yards/facilities that are not regulated as industrial activities. The SWPPP will be developed in accordance with the Appendix to the Permit and will be implemented prior to the end of the current permit cycle. The following fleet maintenance and storage yards have been identified at UM and do not currently have SWPPPs developed:

- UM-A2 Transportation Services (South Campus)
- UM-A2 Plant Operations (South Campus)
- UM-A2 Grounds (G&WM) (North Campus)
- UM-A2 Waste Management (North Campus)
- UM-A2 Grounds @ Fuller (Medical Campus)
- UM-A2 Facilities Services (North Campus)
- UM-D Grounds Building
- UM-F Hubbard Building & Parking Lot
- UM-F Storage (adjacent to Industrial & James P. Cole)

SWPPP

Timeframe	Goal	Recordkeeping
2010-2012	Develop SWPPP for all fleet maintenance and storage yards/facilities at UM.	Keep copies of all finalized components developed for inclusion in the SWPPPs.
2013	Implement all SWPPP for fleet maintenance and storage yards/facilities at UM	Keep a copy of the SWPPP signed by the facility manager & the certified storm water operator or Storm Water Program Manager at the facility which generates the storm water discharge.

8.4 Storm Sewer Labeling

As of March 10, 2004, any outfall structure that the UM constructs or installs that discharges storm water directly to waters of the State will provide permanent identification (e.g. label, color coding, or other identifying characteristic).

The storm drains placed on campus come with the message "Dump No Waste - Drains to Waterways" engraved on it. Storm drain grates already in place will be marked with a curb marker with the message "Keep our Michigan Waters Blue: Dump No Waste - Flows to River" or similar.

> **Measurable Goal:** All UM storm drains will be marked with the message "Dump No Waste - Drains to Waterways", "Keep our Michigan Waters Blue: Dump No Waste - Flows to River" (or similar message) during the permit cycle. The number of storm drains marked will be tracked annually for subsequent reporting.

8.5 Wastewater Associated with Concrete

Per Permit Part I, Section A.11.c, the UM, ". . .shall not discharge to the surface waters of the state any wastewater generated from cutting, grinding, drilling, or hydrodemolition of concrete. . ." UM will educate staff and contractors involved in construction or renovation projects of these requirements through plan review comments which are incorporated into project specifications and/or drawings. This topic will also be included in any new educational brochures directed at construction projects on campus.

8.6 Pesticides and Fertilizers

The application of pesticides and fertilizers is controlled by several departments including G&WM, Facilities Management, Athletics, Matthaei Botanical Gardens, Radrick Farms and Nichols Arboretum, depending on the location. The University employs Integrated Pest Management (IPM) methodology, an ecological approach to pest management, in University buildings. All available techniques are used to reduce pest populations to acceptable levels while minimizing the potential impact of pesticides upon humans and the environment.

G&WM schedules for fertilization are based on classification of the area into one of the following categories:

- Priority three lawns are in areas of campus where the lawn is mostly observed from a distance and not actively used. A reduced mowing schedule is instituted and a taller lawn height is maintained. No mowing areas have been established and include around 1 million square feet of lawn. In addition, no fertilizer, pesticides, or weed control are used in these areas.

- Priority two lawns are around general academic buildings which are highly visible and used in moderation. Mowing is performed 4 times per month. Fertilizer is applied 3 times per season, if needed, and weed control is performed once per season. Pesticide application is limited to target problem areas.

- Priority one lawns are considered a part of the ornamental landscape of high use buildings or areas. Mowing is performed 6 times per month. Fertilizer is applied 4 times per season, if needed, and weed control performed twice per year.

G&WM uses slow release, non-phosphorous fertilizers twice a year, as needed. A broad leaf herbicide is used annually and is done selectively to areas requiring treatment. Dormant oil and some insect control agents are also used selectively on campus. The other departments use formulations of pesticides and fertilizers designed to give the best performance for the type of activity.

To further minimize the discharge of pollutants to the storm water drainage system, G&WM maintains a chemical free buffer strip in lawn areas that border any streams or ponds. Also, all priority 3 lawns are currently left untreated, but maintained to a 4 to 6 inch height to allow a more extensive root system to be established. By creating a deep root system and allowing a greater plant mass to be established, the soil is able to retain more storm water, which reduces soil erosion and sedimentation.

8.6.1 Employee Training

The University employs applicators certified by the State of Michigan to train technicians in pesticide and fertilizer use. Employees have been trained and are licensed applicators, where appropriate. Employees are trained in proper storage, handling and use of pesticides, herbicides, and fertilizers on the UM campus prior to use.

8.6.2 Soil Testing for Turfgrass

Per Part I.A.10.e.2 of the permit, phosphorus may be added to turfgrass at UM only if soils are tested for nutrients (N/P/K) a minimum of every four (4) years AND a need for phosphorus is demonstrated. Phosphorus fertilizers will be applied to UM turfgrass only as prescribed in the soil test results.

Timeframe	Goal	Recordkeeping
2010-2011	Develop an education program for UM staff involved in fertilization of turfgrass at UM. Also include a strategy to disseminate the requirements to contractors at UM.	Keep a record of the strategy for education, classes, training brochures, etc.
2011-2012	Implement turfgrass fertilization education program for appropriate UM staff and contractors.	Identify educational information available/developed for each target audience applicable at UM. Keep on file.

8.7 Employee / Contractor Training

Employee/Contractor Training - Additional Task Implementation Timeframe

Timeframe	Goal	Recordkeeping
Ongoing	Provide storm water topics in annual training for Plant and Facilities personnel. Continue to provide storm water information at new employee orientations.	Keep a record of the number of classes/training sessions where storm water topics are included. Keep a record of the number of brochures distributed.
2010-2011	Create training strategy specific to contractors at UM. Also include strategy to reach the target audiences at all campuses.	Identify educational information available/developed for each target audience applicable at UM. Keep on file.
2011-2012	Develop/add additional topics, weblinks, brochures, posters, etc. to	Print a copy of website changes made, note date of revisions, etc.

	fill any gaps in the topics needed to meet the permit requirements	
2013	Implement training plan for all target audiences appropriate at UM. Review program periodically for improvements, new information, revised target audiences, etc.	Keep a copy/list of all materials for inclusion in the training program, key contacts. Keep records of training sessions, number of materials distributed, etc.

Appendix A

The University of Michigan NPDES
Certificate of Coverage No. MIS040090

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING

JENNIFER M. GRANHOLM
GOVERNOR

STEVEN E. CHESTER
DIRECTOR

April 15, 2009

Mr. Terrance Alexander, Executive Director
University of Michigan
UM-OSEH
1239 Kipke Drive, OSEH-CSSB
Ann Arbor, Michigan 48109

Dear Mr. Alexander:

SUBJECT: National Pollutant Discharge Elimination System (NPDES)
Certificate of Coverage No. MIS040090
Designated Name: UM MS4

Your Certificate of Coverage (COC), issued under NPDES General Permit No. MIS049000, has been processed in accordance with the appropriate State and Federal regulations.

The issuance of this COC does not authorize the violation of any federal, state, or local laws or regulations, nor does it obviate the necessity of obtaining such permits, including any other Department of Environmental Quality (DEQ) permits, or approvals from other units of government as may be required by law.

Please carefully review the requirements contained in Certificate of Coverage No. MIS040090, which is enclosed, and General Permit No. MIS049000. If you need a copy of the General Permit, one can be obtained via the Internet at: (http://www.michigan.gov/deqnpdes - click on "General NPDES Permits" which is under the Permits banner), or you may call 517-241-1346 to request a paper copy. These requirements are subject to the criminal and civil enforcement provisions of both State and Federal law. Permit compliance and violations are audited by the DEQ and the United States Environmental Protection Agency.

The following Total Maximum Daily Loads (TMDLs) apply: a TMDL for Biota for the River Rouge Watershed, including Bishop and Tonquish Creeks, Washtenaw, Wayne, and Oakland counties (August 2007); a TMDL for *E. coli* for the Rouge River, Wayne and Oakland counties (August 2007); a TMDL for Biota for Malletts Creek, Washtenaw County (August 2004); a TMDL for *Escherichia coli* in Geddes Pond and the Huron River, Washtenaw County (August 2001); and a TMDL for Phosphorous in Ford and Belleville Lakes (September 2004). Copies of the TMDLs can be obtained via the Internet at: http://www.michigan.gov/deq/0,1607,7-135-3313_3686_3728-12464--,00.html.

You must comply with the requirements and other responsibilities in accordance with General Permit No. MIS049000 and Certificate of Coverage No. MIS040090. Any reports, notifications,

or questions regarding the NPDES program, the enclosed COC, or the General Permit should be directed to the DEQ office indicated on your COC.

Sincerely,

Stephanie Swart

Stephanie Swart
Lakes Erie and Huron Permits Unit
Permits Section
Water Bureau
517-335-6721

ss/sea

Enclosure: Certificate of Coverage No. MIS040090
cc/enc: Mr. Timothy Cullen, Manager, OSEH-EP3, University of Michigan
Ms. Heather Blatnik, CHMM, OSEH-EP3, University of Michigan
Mr. Jon Russell, Supervisor, Jackson District Office, Water Bureau, DEQ
Ms. Rachel Matthews, Jackson District Office, Water Bureau, DEQ
Ms. Susan Ashcraft, Water Bureau; Superseded NPDES Permit No. MI0053902
PCS Unit, Water Bureau; Superseded NPDES Permit No. MI0053902
File

DEQ

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER BUREAU
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
Authorized by Michigan Act 451, Public Acts of 1994, as amended, Part 31

CERTIFICATE OF COVERAGE (COC)

Under General Permit No. MIS049000
MS4 Jurisdiction General Permit

COC NO.:	MIS040090
DESIGNATED NAME:	UM MS4
PERMITTEE:	University of Michigan
MAILING ADDRESS:	OSEH-CSSB 1239 Kipke Drive Ann Arbor, Michigan 48109

This COC authorizes the University of Michigan – Ann Arbor, Dearborn, and Flint Campuses to discharge storm water through a separate storm water drainage system to waters of the state, including but not limited to the Flint River, the Huron River, the Rouge River, an unnamed tributary of the Huron River (Allens Creek), Malletts Creek, Fleming Creek, and Millers Creek. After COC issuance, discharges identified in accordance with Part I.A.1.b. of the General Permit are authorized after submittal of the updated map to the Permits Section, Water Bureau, Michigan Department of Environmental Quality (the "Department").

This authorization also includes nested jurisdictions for which the permittee has accepted responsibility. Discharges are authorized, from nested jurisdictions for which agreements are obtained after COC issuance, after submittal to the Department of the information required by Part I.B.1.b. of the General Permit.

In accordance with Part I.A.4. of the General Permit, the following approved Total Maximum Daily Loads (TMDLs) apply to the permittee:

Name of TMDL	Pollutant of Concern
River Rouge	Flow, Sedimentation/Siltation (Biota)
River Rouge	*E. coli*
Mallets Creek	Flow (Biota)
Geddes Pond	*E. coli*
Ford/Belleville Lakes	Phosphorous

On or before October 1st of each year, the permittee shall submit Phase I Annual Progress Reports in accordance with Part I.B.1.c. of the General Permit,

The permittee shall continue to implement the existing Storm Water Management Program (SWMP) until the revisions to the SWMP plan are submitted. On or before February 1, 2010, the permittee shall submit a revision to the SWMP plan in accordance with Part I.A.3. and Part I.B.1.a. of the General Permit. The permittee shall implement the SWMP upon submittal with the exception that alternative approaches shall be implemented upon Department approval in accordance with Parts I.A.4.a.4), I.A.4.b.4), I.A.7.b.3), and I.A.8. of the General Permit.

On or before August 1, 2009, the permittee shall submit the applicable mechanism that implements the minimum treatment volume standard and channel protection criteria that existed prior to application submittal.

On or before February 1, 2011, a storm sewer system map for the program to find and eliminate illicit connections and discharges to the MS4 shall be submitted or otherwise made available to the Department in accordance with Part I.A.7.b.1) of the General Permit. The storm sewer system map shall show the location of all discharge points the permittee owns or operates and the names and location of all of the surface waters of the state that receive discharges from the permittee's MS4.

Designated Name: UM MS4
COC No.: MIS040090

References in the General Permit to the Department shall be defined as the Jackson District Supervisor of the Water Bureau. The Jackson District Office is located at 301 East Louis Glick Highway, Jackson, Michigan 49201-1556, telephone: 517-780-7690, fax: 517-780-7855.

Any person who is aggrieved by this certificate of coverage may file a sworn petition for a contested case hearing on this COC with the State Office of Administrative Hearings and Rules of the Michigan Department of Labor and Economic Growth in accordance with the provisions of R323.2192(c) of the Michigan Administrative Code. The Department may reject any petition filed more than 60 days after issuance as being untimely.

The issuance of this COC does not authorize violation of any federal, state or local laws or regulations, nor does it obviate the necessity of obtaining such permits, including any other Department of Environmental Quality permits, or approvals from other units of government as may be required by law.

This COC is based on a complete application received by the Department of Environmental Quality on December 29, 2008, as amended through March 31, 2009. The permittee is subject to all conditions specified in General Permit No. MIS049000 issued May 22, 2008, expiring April 1, 2013. This COC may be modified, terminated, reissued, or revoked as allowed for in General Permit No. MIS049000. On the effective date of this COC, this COC shall supersede COC No. MI0053902, issued September 26, 2001.

A request to continue authorization to discharge under the General Permit, after April 1, 2013, shall be submitted on or before October 4, 2012, in accordance with Part I.B. of the General Permit.

This COC takes effect on the date of issuance.

April 15, 2009
Date Issued

Michael J. Bray, P.E., Chief
Lakes Erie and Huron Permits Unit
Permits Section
Water Bureau

EQP 4677 (9/03)

PERMIT NO. MIS049000

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
WASTEWATER DISCHARGE GENERAL PERMIT

Storm Water Discharges from
Municipal Separate Storm Sewer Systems (MS4s) – Jurisdictional General Permit

In compliance with the provisions of the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq.; the "Federal Act"), Michigan Act 451, Public Acts of 1994, as amended (the "Michigan Act"), Parts 31 and 41, and Michigan Executive Orders 1991-31, 1995-4, and 1995-18, storm water discharges from MS4s are authorized to be discharged by permittees specified in individual "certificates of coverage" in accordance with the conditions set forth in this general National Pollutant Discharge Elimination System (NPDES) permit (the "permit").

The applicability of this permit shall be for discharges of storm water by MS4 owners or operators that have submitted complete applications for coverage under this permit. Discharges that have been determined by the Michigan Department of Environmental Quality (the "Department") to need an individual NPDES permit, are not authorized by this permit.

In order to constitute a valid authorization to discharge, this permit must be complemented by a Certificate of Coverage (COC) issued by the Department. The items to be identified in the COC are listed on the following page.

Unless specified otherwise, all contact with the Department required by this permit shall be to the position indicated in the COC.

This permit shall take effect upon issuance.

The provisions of this permit are severable. After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked in whole or in part during its term in accordance with applicable laws and rules.

This permit shall expire at midnight, **April 1, 2013**.

Issued May 22, 2008.

William Creal, Chief
Permits Section
Water Bureau

PERMIT FEE REQUIREMENTS

In accordance with Section 324.3118 of the Michigan Act, the permittee shall make payment of an annual storm water fee to the Department for each January 1 the permit is in effect regardless of the occurrence of a discharge. The permittee shall submit the fee in response to the Department's annual notice. The fee shall be postmarked by March 15 for notices mailed by February 1. The fee is due no later than 45 days after receiving the notice for notices mailed after February 1.

CONTESTED CASE INFORMATION

The terms and conditions of this permit shall apply to an individual permittee on the effective date of a COC for the permittee. The Department of Labor and Economic Growth may grant a contested case hearing on this permit in accordance with the Michigan Act. Any person who is aggrieved by this permit may file a sworn petition with the State Office of Administrative Hearings and Rules of the Michigan Department of Labor and Economic Growth, setting forth the conditions of the permit which are being challenged and specifying the grounds for the challenge. The Department of Labor and Economic Growth may grant a contested case hearing on the COC issued to an individual permittee under this permit in accordance with Rule 2192(c) (Rule 323.2192 of the Michigan Administrative Code).

ITEMS TO BE IDENTIFIED IN THE COC

All of the following will be identified in the COC.

- Submittal dates for the Storm Water Management Program (SWMP) plan or plan revisions
- Receiving waters to which the permittee discharges
- Implementation date for the SWMP plan or plan revisions, if other than implementation upon submittal. Individual parts of the plan may be authorized for implementation on different dates
- Approved Total Maximum Daily Loads (TMDLs) and the pollutants applicable to the receiving waters and storm water discharges
- Any nested jurisdictions for which the permittee is assuming responsibility for permit requirements
- Submittal dates for the Progress Reports

PUBLIC PARTICIPATION IN A PROPOSED COC

Proposed COCs, their applications, and other documents related to requests for coverage under this permit will be posted on the Department Web site for a period of 14 days prior to issuance of each COC. Any person may file comments with the Department on these documents. Any person may request a public hearing on a proposed COC. The Department may reject as untimely any comments or public hearing requests filed after the 14-day public notice period.

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APPENDIX 36

PART I

Section A. Effluent Limitations and Monitoring Requirements

1. Authorized Discharges

a. Eligible Permittees

Except as excluded below, any public body that owns or operates an MS4 may be eligible for coverage under this permit.

A permittee may have within its political or territorial boundaries "nested" MS4s owned or operated by public bodies that include, but are not limited to, public school districts; public universities; or county, state, or federal agencies. If the permittee assumes responsibility for the permit requirements where a nested jurisdiction owns or operates an MS4, including identification of the discharge points for the nested jurisdiction's MS4, then the nested jurisdiction does not need to apply for an MS4 permit and the permittee is authorized for the MS4 discharges from the nested jurisdiction. Otherwise, the nested jurisdiction shall apply for a permit.

b. Storm Water Discharges by the Permittee

This permit authorizes the discharge of storm water from MS4s to the surface waters of the state, only from those discharge points identified in the application submitted by the permittee for coverage under this permit. The discharge points authorized include those identified as a set of discharge points by category in the application. The permittee may obtain authorization for additional discharge points by providing an updated list of discharge points to the Department's Water Bureau, Permits Section.

c. Discharges Authorized under Other NPDES Permits

This permit does not prohibit the use of an MS4 for other discharges authorized under other NPDES permits, or equivalent Department approval under the Michigan Act or the Federal Act.

2. Discharge Point Requirements

a. Discharge Point Location

The permittee shall identify the location of each storm water discharge point (i.e., points discharging directly to the surface waters of the state or to any other entity's separate storm sewer system) from the MS4 it owns or operates, as follows:

1) For discharge points identified, constructed, or installed after submittal of the application, the permittee shall provide an updated map clearly showing the location of the discharge point, a unique identification code or number assigned to the discharge point, the latitude and longitude of the discharge point, and the receiving surface waters of the state. Submittals of information for discharge points identified, constructed, or installed after submittal of the application are required for obtaining authorization from the Department to discharge from those discharge points.

2) Permittees that have identified a set of discharge points by category related to their MS4s in their permit applications shall identify the location of each discharge point for which specific location information has not yet been determined as follows:

(a) For permittees with less than 1,500 estimated discharge points to identify, this requirement shall be completed by the due date for discharge point locations in the permittee's COC issued under this permit. For each discharge point identified, the permittee shall include in the progress report at Part I.B.1.b.4, the latitude and longitude of the discharge point, a unique identification code or number, and the receiving surface water of the state.

(b) For permittees with more than 1,500 estimated discharge points to identify, this requirement shall be completed within this and the next permit cycle by the due date for discharge point locations in the permittee's COC issued under this permit. For each discharge point identified, the permittee shall include in the progress report at Part I.B.1.b.4, a latitude and longitude of the discharge point, a unique identification code or number, and the receiving surface water of the state.

PART I

Section A. Effluent Limitations and Monitoring Requirements

In both cases, reasonable and regular progress shall be made in the identification of discharge points. Such progress shall be documented in the progress reports.

All discharge point locations shall be submitted to the Chief of the Permits Section, Water Bureau, Michigan Department of Environmental Quality, P.O. Box 30273, Lansing, Michigan 48909-7773.

b. MS4 Discharge Point Labeling
The permittee shall provide permanent identification (e.g., label, color coding, or other identifying characteristic) for any discharge point structure that the permittee constructs or installs after March 10, 2004, that discharges storm water to the surface waters of the state. Following the addition of permanent identification, the primary operator of the MS4 shall be readily identifiable by observation of the discharge point.

3. Storm Water Management Program (SWMP) Plan

a. General Requirements
The permittee shall implement Best Management Practices (BMPs) to comply with the standard requirements identified in Part I.A.3.-10. of this permit. The permittee shall revise/develop, implement, and enforce a SWMP plan to accomplish the following.

1) Reduce the discharge of pollutants from the MS4 to the Maximum Extent Practicable (MEP). The MEP requirement shall be met by the following:

- Implementing BMPs to comply with the requirements in Part I.A.3.-10. of this permit
- Demonstrating that measurable goals were met for individual BMPs
- Demonstrating the effectiveness of the Public Education Program and Illicit Discharge Elimination Program required by this permit

2) Reduce pollutants in storm water discharges from the MS4 as appropriate to be consistent with Total Maximum Daily Loads (TMDL) approved by the United States Environmental Protection Agency (USEPA). Applicable TMDLs and pollutants are identified in the permittee's COC.

b. SWMP Development and Implementation

1) A SWMP plan or revisions to the permittee's existing SWMP plan to meet the standard requirements of this permit shall be submitted to the Department on or before the date specified in the COC issued under this permit. The permittee shall implement the SWMP plan upon submittal. The permittee is encouraged to collaborate with the Department on major SWMP components prior to SWMP plan submittal. A SWMP shall be considered complete and approved upon submittal if it meets the requirements identified in Part I.A.3.-10. of this permit.

2) Revisions to the SWMP may include schedules for phasing in storm water management actions to meet the standard requirements during the term of this permit.

3) All actions shall be implemented (i.e., put into action, operation, service, or practice) over the term of this permit unless the permittee has a shortened permit term and the Department agrees to another schedule.

c. Reopener Clause
The Department may notify the permittee that the SWMP is deficient in meeting the permit requirements and request modification of the SWMP to address specific permit requirements. The permittee shall be given 90 days to address the specific concerns, unless a longer timeframe is agreed to by the Department.

The Department may, after notice and opportunity for hearing, modify permit coverage for the permittee, including requiring an individual permit pursuant to Parts I.B.4. and I.B.6. of this permit.

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Section A. Effluent Limitations and Monitoring Requirements

4. Total Maximum Daily Loads (TMDL)

In order for the SWMP to be consistent with the requirements and assumptions of the TMDL approved by the USEPA, as identified in the COC issued under this permit, the SWMP shall identify and prioritize actions to reduce pollutants in storm water discharges from the MS4 in order to make progress in meeting the Water Quality Standards.

In addition, the following specific actions shall be taken by the permittee:

a. E. coli. For MS4 discharges to waterbodies that are covered by a TMDL for the pollutant E. coli; the permittee shall conduct the following activities:

1) Within three years of COC issuance, the permittee shall take at least one representative sample of a storm water discharge from at least 50 percent of the major discharge points discharging directly to surface waters of the state within the portion of the TMDL watershed in the urbanized area. A major discharge point is a pipe or open conveyance measuring 36 inches or more at its widest cross section. At a minimum, the sample shall be analyzed for E coli.

2) The permittee shall retain these results and report them in the second progress report.

3) The permittee shall use these results and other available information to develop and prioritize actions to reduce the discharge of E. coli to be consistent with the TMDL. These prioritized actions shall be reported to the Department in the second progress report, with implementation targeted during the five-year permit cycle that begins in 2013.

4) In the event that the permittee already has information and a plan for prioritizing and controlling the discharge of E. coli consistent with the TMDL, other than the standard requirements under Part I.A.7. of this permit, that plan may be submitted as an alternative approach to paragraphs 1) through 3) above.

b. For MS4 discharges to waterbodies that are covered by a TMDL for the pollutant Total Phosphorus, the permittee shall conduct the following activities:

1) Within three years of COC issuance, the permittee shall take at least one representative sample of a storm water discharge from at least 50 percent of the major discharge points discharging directly to surface waters of the state within the portion of the TMDL watershed in the urbanized area. A major discharge point is a pipe or open conveyance measuring 36 inches or more at its widest cross section. At a minimum, the sample shall be analyzed for Total Phosphorus.

2) The permittee shall retain these self-monitoring results and report them in the second progress report.

3) The permittee shall use these results and other available information to develop and prioritize actions to reduce the discharge of Total Phosphorus to be consistent with the TMDL. These prioritized actions shall be reported to the Department in the second progress report, with implementation targeted during the five-year permit cycle that begins in 2013.

4) In the event that the permittee already has information and a plan for prioritizing and controlling the discharge of Total Phosphorus consistent with the TMDL, other than the standard requirements under Part I.A.7. of this permit, that plan may be submitted as an alternative approach to paragraphs 1) through 3) above.

5. Public Education Program (PEP) - Education and Outreach on Storm Water Impacts

The PEP shall promote, publicize, and facilitate watershed education for the purpose of encouraging the public to reduce or prevent the discharge of pollutants in storm water to the maximum extent practicable. Combining or coordinating existing PEPs for public stewardship of water resources is encouraged.

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Section A. Effluent Limitations and Monitoring Requirements

To assist permittees with the PEP requirement, the Department has developed a "Public Education Plan (PEP) Guidance" document. It is available on the internet at www.michigan.gov/deqstormwater; under Information; select "Municipal Program / MS4 Permit Guidance."

a. At a minimum, conduct public education on the following topics, as appropriate, based on the potential impact on the receiving waters:

1) Hazards associated with illicit discharges and the improper disposal of waste. Encourage public reporting of the presence of illicit discharges or the improper disposal of materials into the permittee's MS4, and develop and publicize a hotline for public reporting. Common illicit discharges are construction site wastes and sediment, carpet cleaner wastes, household wastes and motor vehicle fluids from home owners, septic and other commercially-transported wastes, and commercial power washing (except residual street washing water discharges that are allowable under Part I.A.7).

2) The water body that would be potentially impacted by improper actions at or near a person's home

3) The availability, location, and requirements of facilities for the collection and/or disposal of household hazardous wastes, travel trailer sanitary wastes, chemicals, grass clippings, leaf litter, animal wastes, and motor vehicle fluids

4) The acceptable application and disposal of pesticides, herbicides, and fertilizers, including the use of phosphorus-free fertilizer alternatives, as appropriate

5) Preferred car cleaning agents and procedures for noncommercial car washing

6) For property owners with a septic system, proper septic system maintenance and how to recognize system failure

7) For permittees with riparian land owners, management of riparian lands to protect water quality

8) Public responsibilities and stewardship in their watershed

9) The benefits of using native vegetation instead of non-native vegetation

10) Educate commercial, industrial, and institutional entities likely to have significant storm water impacts. At a minimum, commercial food services, primarily restaurants, shall be educated to prevent grease and litter discharges to MS4s

b. For all applicable topics, the PEP shall identify the:

1) Target audience(s).
2) Key message(s).
3) Delivery mechanism(s).
4) Timetable.
5) Responsible party (or parties).

c. Describe a method for determining the effectiveness of the implemented PEP.

6. Public Involvement and Participation

Public input shall be encouraged in all aspects of the SWMP. The following minimum actions shall be taken to encourage public input:

a. The permittee shall follow local public notice requirements, as appropriate, when notifying the public that a SWMP is or will be implemented. Copies of the SWMP plan shall be available for public review, and the public shall be notified of when and where it is available.

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Section A. Effluent Limitations and Monitoring Requirements

b. The permittee shall participate in a citizen advisory committee for the purpose of encouraging public involvement in all aspects of the SWMP. The permittee may participate in an existing citizen advisory committee or may establish and implement its own.

c. The permittee shall foster cooperation with local stream or watershed protection organizations, if any exist, by informing them of activities under the SWMP; providing copies of the SWMP plan and pursuing input on the plan; seeking volunteer assistance, including water quality monitoring support; and seeking ways to meet permit requirements by assisting the local organizations with their ongoing programs for water resource protection and enhancement.

7. Illicit Discharge Elimination Program (IDEP)

The permittee shall develop, implement, and enforce a program to detect and eliminate illicit connections and discharges to MS4s. Illicit discharges are not authorized by this permit.

The following non-storm water discharges are not authorized by this permit, but do not need to be prohibited by the permittee in accordance with Part I.A.7.a.2. below, unless the permittee identifies them as significant contributors of pollutants:

- Water line flushing and discharges of potable water sources
- Landscape irrigation runoff, lawn watering runoff, and irrigation waters
- Diverted stream flows and flows from riparian habitats and wetlands
- Rising groundwaters and springs
- Uncontaminated groundwater infiltration [as defined by 40 CFR 35.2005(20)]
- Pumped groundwaters (except for groundwater cleanups not specifically authorized by NPDES permits), foundation drains, water from crawlspace pumps; footing drains, and basement sump pumps
- Air conditioning condensates
- Waters from noncommercial car washing
- Residual street wash waters
- Discharges or flows from emergency fire fighting activities
- Dechlorinated swimming pool waters from single, two, or three family residences. Water from a swimming pool operated by the permittee shall not be discharged to a separate storm sewer or to the surface waters of the state without specific NPDES permit authorization from the Department.

At a minimum, the IDEP shall include the following:

a. An ordinance and program, or other regulatory mechanism where an ordinance is not feasible or appropriate, to effectively prohibit illicit discharges into the MS4 owned or operated by the permittee that implements appropriate enforcement actions. At a minimum, the ordinance or other regulatory mechanism shall:

1) Regulate the contribution of pollutants to the MS4 owned or operated by the permittee.

2) Prohibit illicit discharges, including the direct dumping or disposal of materials into the MS4 owned or operated by the permittee.

3) Establish the authority to investigate, inspect, and monitor suspected illicit discharges into the MS4 owned or operated by the permittee.

4) Require and enforce elimination of illicit discharges and connections into the MS4 owned or operated by the permittee.

b. A program to find and eliminate illicit connections and discharges to the MS4 from commercial, industrial, private educational, public, and residential sources. The program to find and eliminate illicit discharges and connections shall include the following:

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Section A. Effluent Limitations and Monitoring Requirements

1) A storm sewer system map, showing the location of all discharge points the permittee owns or operates, and the names and location of all the surface waters of the state that receive discharges from the permittee's MS4. A separate storm sewer system includes: roads, catch basins, curbs, gutters, parking lots, ditches, conduits, pumping devices, and man-made channels. Maps may include available diagrams such as certification maps, road maps showing rights-of-way, as-built drawings, diagrams, or other hard copy or digital representation of the storm sewer system.

By the date identified in the COC for the first progress report, or another date as agreed to by the Department for a portion of the storm sewer system, the permittee shall have the above information. The information shall be retained by the permittee and made available to the Department upon request. System information shall be maintained and updated as discharge points are identified or added.

2) Identification of areas prioritized by the permittee for dry-weather screening or other investigation methods for the purpose of maximizing the detection and elimination of illicit discharges. Prioritization shall consider the criteria in Table 1. Highest priority criteria are generally listed toward the top of the table, but a permittee's priority order may vary and some criteria may not be applicable.

TABLE 1

Prioritization Criteria	Key Characteristics to Consider for Prioritization
Poor dry weather water quality	Areas where TMDLs have been developed to address pollutants that could originate from illicit discharges or where the available data shows that dry-weather water quality criteria are exceeded two or more times in a year are high priorities.
Density of aging on-site sewage disposal systems (OSDS)	Older private septic systems that exceed their design life may have failure rates of 25 to 30 percent or more. Areas where the OSDS designs would not be permitted today because of poor soils or small lot sizes, but where older OSDS are still in operation, have a high illicit discharge potential.
Aging or failing sewer infrastructure	Areas where sewer age exceeds its design life, and where clusters of pipe breaks, spills, overflows, or infiltration and inflow are known problems, should be given a high priority.
Discharge complaints and reports	Any MS4s owned or operated by the permittee with a history of discharge complaints should be given a high priority.
Age and density of industrial operations	Older industrial operations often have floor drains, waste handling areas, gray water, and sanitary facilities connected to storm sewers. Industrial areas also commonly have storm water pollutants related to poor housekeeping practices, so a higher density of industrial activities increases the likelihood of contaminated discharges.
Age of development	Areas where the average age of the majority of the development exceeds 50 years should be given a higher priority.
MS4 discharge point density	A density of more than 20 of the permittee's MS4 discharge points per stream mile (include both sides of the stream) indicates a high illicit discharge potential. Count just the discharge points that discharge directly to the surface waters of the state.
Sewer conversion areas	Areas where sanitary sewers were added in the last 30 years, and residents switched from septic systems, have a high potential for illicit taps of sanitary water to MS4s.
Historic combined sewer systems	Sewer systems that were once combined, but were subsequently separated, have a high illicit discharge potential if oversight of the projects was not documented.
Type of commercial activity	Non-industrial businesses, especially those that handle liquids, including oils and greases (e.g., auto maintenance, food service, and carpet cleaners) may remain unaware of storm water pollution concerns from improper waste disposal and "hopper juice" from trash compactors.
Other potential pollutant-generating sites	Conditions unique to the permittee's jurisdiction should be considered.

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Section A. Effluent Limitations and Monitoring Requirements

3) A plan and procedures to perform dry-weather screening of each MS4 discharge point at a minimum of every five (5) years, beginning on the due date for the SWMP plan submittal, unless the permittee submits an alternative plan for approval. Alternatives should be based on the identification of priority areas in Table 1, and shall demonstrate that other methods for identifying illicit connections and discharges will be at least as effective as dry-weather screening every five (5) years.

At a minimum, dry-weather screening shall include recorded observations of MS4 discharge point flows and receiving water characteristics, including: water clarity, color, and odor; the presence of suds, oil sheens, sewage, floatable materials, bacterial sheens, algae, and slimes; staining of the banks and unusual vegetative growth. MS4 discharge structures shall be observed for unusual vegetative growth, staining, undocumented connections, and integrity of the structure.

If flow is observed from the MS4 discharge point, then the permittee shall do one of the following:

- Where an illicit discharge and its source are obvious, it shall be eliminated, and additional analysis or sampling is not required, or
- Conduct a field assessment of the dry-weather flow to analyze, at a minimum: pH, ammonia, surfactants, and temperature. The analysis may be conducted using a field kit.

4) If an illicit discharge is detected, but the source has not been identified, the source shall be confirmed by one or more of the following methods: indicator parameter testing, which may include chemical and bacterial sampling; dye testing; video testing; smoke testing; documented visual observation or physical indicators; homeowner surveys and surface condition inspections for on-site sewage disposal systems; and drainage area investigations. The discharge of tracer dyes shall be authorized in accordance with Part I.A.11.a. of this permit.

5) Procedures for eliminating illicit discharges and pursuing enforcement action, including responding to spills and emergency situations. The procedure shall specify measures for expeditious response to, and elimination of, each identified illicit discharge, spill, and emergency situation. If not already existing, the permittee shall develop a system to track the elimination status of illicit discharges and enforcement actions. The system shall also track confirmation that illicit connections are removed or the discharge permanently ceased. The permittee shall make records associated with this activity available to the Department upon request.

c. A program to train staff, especially those involved in illicit discharge-related activities and those who have field jobs with the potential for witnessing illicit discharges and connections. At a minimum, the training shall include the following:

- The definition of illicit discharges, illicit connections, and sanitary seepage
- Techniques for locating illicit discharges, including field screening, source identification, and recognizing illicit discharges and connections
- Methods for eliminating illicit discharges and the proper enforcement response
- Proper procedures for responding to spills and emergency situations
- A training schedule and a requirement for the initial training of appropriate staff, with refresher training every three (3) years

8. Post-Construction Storm Water Control for New Developments and Redevelopment Projects

The permittee shall develop, implement, and enforce standards through an ordinance or other regulatory mechanism to address post-construction storm water runoff from all new and redeveloped projects that disturb one (1) acre or more, including projects less than one (1) acre that are part of a larger common plan of development or sale that would disturb one (1) acre or more. The program shall include the following general requirements:

- A *minimum treatment volume standard* to address water quality impacts
- *Channel protection criteria* to address resource impairment resulting from flow volumes and rates

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- Operation and maintenance requirements
- Enforcement mechanisms with recordkeeping procedures
- A requirement for the project developer to prepare and implement site plans, which shall incorporate the requirements of this section of the permit

The permittee shall retain records associated with this activity in accordance with Part II.C.2. of this permit.

The permittee shall establish structural storm water BMP design standards by meeting any of the following:

- The permittee identified in its application a schedule to develop and place in effect an ordinance or other regulatory mechanism that incorporates the *minimum treatment volume standard* and the *channel protection criteria* listed in a) and b) below.
- The permittee identified in its application for coverage under this general permit its applicable local ordinance or other regulatory mechanisms that implement a standard for storm water treatment and criteria for stream channel protection that existed before the permittee submitted its application.
- The permittee identified in its application for coverage under this general permit applicable local procedures that implemented a standard for storm water treatment and criteria for channel protection criteria that existed before submittal of its application, and these local procedures will be converted into an ordinance or other regulatory mechanism by the date specified in the COC for SWPPI submittal.
- The permittee submits with the SWMP an alternative approach based on low-impact development (LID) that provides an equivalent or greater level of water quality and stream channel protection. The alternative is subject to Department approval.

Any combination of existing regulatory mechanism or procedure, approved alternative approach, or adoption of an ordinance or regulatory mechanism in accordance with the requirements of a) and b) below, may be used to establish the necessary minimum treatment volume standard and channel protection criteria, provided that they are applied to all new developments and redevelopment projects that disturb one (1) acre or more, including projects less than one (1) acre that are part of a larger common plan of development or sale that would disturb one (1) acre or more. Amendments made to ordinances or other regulatory mechanisms do not have to be submitted to the Department if the amendments do not reduce the level of channel protection or water quality treatment that were provided prior to the amendment.

a. The *minimum treatment volume standard* shall be either:

1) One inch of runoff from the entire site, or

2) The calculated site runoff from the 90 percent annual non-exceedance storm for the region or locality according to (a) or (b) below, respectively:

a) The statewide analysis by region for the 90 Percent Annual Non-Exceedance Storms is summarized in a memo dated March 24, 2006, which is available on the Internet at www.michigan.gov/deqstormwater; under Information, select "Municipal Program/MS4 Permit Guidance," then go to the Storm Water Control Resources heading.

b) The analysis of at least ten years of local published rain gauge data following the method in the memo "90 Percent Annual Non-Exceedance Storms" cited above. This approach is subject to review by the Department.

Treatment methods shall be **designed** on a site-specific basis to achieve the following:

- A minimum of 80 percent removal of total suspended solids (TSS), as compared with uncontrolled runoff, or
- Discharge concentrations of TSS not to exceed 80 milligrams per liter (mg/l)

A *minimum treatment volume standard* is not required where site conditions are such that TSS concentrations in storm water discharges will not exceed 80 mg/l.

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b. The *channel protection criteria* established in this permit is necessary to 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. "Existing levels" means the runoff volume and peak flow rate for the last land use prior to the planned new development or redevelopment. Where more restrictive channel protection criteria already exists, or is needed to meet the goals of reducing runoff volume and peak flows to less than existing levels on lands being developed or redeveloped, permittees are encouraged to use the more restrictive criteria rather than the standard permit requirements.

An acceptable source of rainfall data for calculating runoff volume and peak flow rate is *Rainfall Frequency Atlas of the Midwest,* Huff & Angel, NOAA Midwest Climate Center and Illinois State Water Survey, 1992.

Methods for estimating pre- and post-development runoff shall follow curve number evaluations as described in guidance available on the Internet at www.michigan.gov/deqstormwater. Select "Municipal Program/MS4 Guidance," then go to the Storm Water Control Resources heading and select "Guidance for Calculating Runoff Volume and Peak Flow Rate."

The permittee shall request approval from the Department to use other rainfall data sources and runoff models.

Channel protection criteria shall be required for all surface waters of the state within regulated urbanized areas except in the following water bodies:

- The Great Lakes or connecting channels of the Great Lakes
- The Rouge River downstream of the Turning Basin
- The Saginaw River
- Mona Lake and Muskegon Lake in Muskegon County
- Lake Macatawa and Spring Lake in Ottawa County

c. All structural and vegetative BMPs installed as a requirement under this section of the permit shall include a plan for maintaining maximum design performance through long-term operation and maintenance (O & M). The permittee shall develop, track, and enforce a program through the ordinance or other regulatory mechanism to ensure long-term O & M plans for the water quality treatment and channel protection controls the permittee requires. The permittee shall make records associated with this activity available to the Department upon request.

9. Construction Storm Water Runoff Control

The Department has determined that Part 91 of the Michigan Act and Michigan's Permit-by-Rule (Rule 323.2190) are qualifying local programs for the control of wet weather discharges from construction activities that result in land disturbance of greater than or equal to one (1) acre, or disturb less than one (1) acre that is part of a larger common plan of development or sale. A qualifying local program provides control for soil erosion, off-site sedimentation, and other construction-related wastes, consistent with the Federal Phase 2 storm water control requirements for MS4 permittees.

To ensure adequate protection of the MS4, the permittee shall develop and implement the following:

a. A procedure to provide notice as follows when pollutants are discharged from construction activity in violation of Section 9116 of Part 91 of the Michigan Act, Michigan's Permit-by-Rule at R 323.2190(2)(a), or the prohibition of non-storm water discharges in Part I.A.7.a.2. of this permit; and the pollutants enter the MS4 owned or operated by the permittee:

1) Notify the Part 91 permitting entity and the Department when soil and sediment are discharged, or

2) Notify the Department when other wastes are discharged.

If the permittee suspects the discharge may endanger public health or the environment, the violations shall be reported in accordance with Part I.B.2.a. of this permit.

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b. A procedure to ensure that preliminary site plans adequately allow space for future soil erosion and sedimentation controls, as applicable.

c. A procedure for the receipt and consideration of complaints or other information submitted by the public regarding construction activities discharging wastes to the MS4.

10. Pollution Prevention/Good Housekeeping for Municipal Operations

Municipal operations cover a wide variety of activities and land uses that are potential sources of storm water pollutants. These operations 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.

The permittee shall develop, implement, and ensure compliance with a program of operation and maintenance of BMPs, with the ultimate goal of preventing or reducing pollutant runoff to the maximum extent practicable from municipal operations that discharge storm water to the surface waters of the state. The permittee is encouraged to use BMP guidance and training materials that are available from federal, state, or local agencies, or other organizations.

The program shall meet the following requirements:

a. Employee/Contractor Training
The permittee shall ensure there is training for appropriate staff on topics that affect the water quality entering the MS4, such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, storm water system maintenance, and any other activity included in the standard requirements of Part I.A.10.b-f. (below). Timing for training shall include the following:

- For existing employees, one (1) training session prior to the expiration of this general permit
- For new employees, one (1) training session during the first year of employment
- For contractors, the permittee shall ensure that they are trained before they perform the contract work. Permittees may conduct the training or provide training materials relating to storm water management activities, which may include local pollution control specifications, before they perform work for the permittee.

b. Structural Storm Water Control Effectiveness
Structural storm water controls include, but are not limited to, vegetated swales; infiltration, sedimentation and bioretention facilities; storm water devices (e.g., catch basins and oil/water separators); and any controls installed or operated by the permittee to remove pollutants from storm water. They shall have routine maintenance performed, and maintenance schedules shall be adequate to maintain pollution removal effectiveness at design performance and to ensure that the controls are maintained in a condition (e.g., adequately stabilized, seeded, functional) to reduce contribution of pollutants to the surface waters of the state.

1) The permittee shall inspect all such controls at a frequency appropriate for the BMP design and site conditions. Inspection frequencies shall be identified in the SWMP.

2) The permittee shall include in the SWMP a summary list of municipal properties and structural storm water controls owned or operated by the permittee. The list shall include the type and number of municipal properties and structural storm water controls. The permittee shall have location information for all municipal properties and structural storm water controls by the date specified in the COC for the submittal of the first progress report. The location information shall be updated whenever new municipal properties and structural storm water controls are added. The location information shall be retained by the permittee and, upon request, provided to the Department for review.

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The following are examples of municipal properties: police or fire station(s), library(ies), administration building(s) (e.g., city or township hall), public works facility(ies) such as maintenance garages or storage yards, park(s), cemetery(ies), waste disposal areas or unregulated landfills/dumps, open or vacant land, or any other type (describe) of property maintained by the permittee.

3) The permittee shall describe and implement procedures to dispose of the following materials in accordance with Part 111 (hazardous waste), Part 115 (solid waste), and Part 121 (liquid industrial waste) of the Michigan Act: operation and maintenance waste, such as dredge spoil, accumulated sediments, floatables, and other debris the permittee removes from the MS4. Options for the disposal of wastes removed from catch basin sumps or other parts of an MS4 are included in the Department publication entitled "Guidance for Catchbasin Cleaning Activities," which is available on the Internet at: www.michigan.gov/deqstormwater, under the information link named "Municipal Program/MS4 Permit Guidance."

4) When the permittee adds facilities or structural controls for water quantity or pollution treatment or removal, it shall design and install the controls based on the *minimum treatment volume standard, channel protection criteria,* and requirements for operation and maintenance established under Part I.A.8. of this permit. Permittees are encouraged to upgrade and rehabilitate existing facilities or structural controls based on the treatment volume standard, channel protection criteria, and requirements for operation and maintenance in Part I.A.8.

c. Roadways, Parking Lots, and Bridges

1) The permittee shall construct, operate, and maintain its streets, roads, highways, parking lots, and other permittee-owned or operated impervious infrastructure in a manner so as to reduce the discharge of pollutants into the MS4 and the surface waters of the state, including pollutants related to snow removal practices.

2) The permittee shall reduce the runoff of TSS from all of its paved surfaces to the maximum extent practicable, with a goal of reducing the annual TSS loading from paved surfaces to surface waters by 25 percent, as compared to annual loading from runoff with no suspended solids controls.

TSS reductions may be achieved by any combination of pollution prevention (e.g., improved materials handling, or altered land uses or traffic patterns), removal (cleaning streets and catch basins), or treatment (settling filtration or infiltration).

Reductions of sediment from activities otherwise regulated or prohibited, such as sediment track-out or runoff from construction sites, shall not be counted toward the TSS reduction goal. As a method of assessing progress in storm water pollution prevention, the permittee's progress reports shall provide an estimate of the TSS loading reduction achieved.

3) Salt and sand applied for improved traction shall be prevented from entering MS4s and receiving steams to the maximum extent practicable. Good housekeeping shall be required at salt and sand storage facilities to prevent the discharge of salt and sand from these areas. The permittee shall also comply with the salt storage requirements of the Part 5 Rules (Rules 324.2001 to 324.2009 of the Michigan Administrative Code).

4) The permittee shall investigate and implement appropriate BMPs to control dust and suspended solids in runoff from unpaved roads and parking lots.

5) The permittee shall not use coal tar emulsions to seal asphalt surfaces.

d. Fleet Maintenance and Storage Yards/Facilities

1) A Storm Water Pollution Prevention Plan (SWPPP) shall be implemented for all municipal fleet maintenance and storage yards/facilities that are not regulated as industrial activities. The SWPPP shall be developed in accordance with the Appendix to this permit.

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Section A. Effluent Limitations and Monitoring Requirements

The MS4 owner or operator shall have a certified storm water operator, in accordance with Part II.D.2, to oversee storm water controls at all facilities with SWPPPs.

2) The permittee's SWMP shall identify its fleet maintenance and storage yard facilities (including those for nested jurisdictions, if applicable), and shall indicate if a SWPPP has been developed for each facility and if it was implemented under the supervision of a certified storm water operator.

3) The completed SWPPP shall be signed by the facility manager and the certified storm water operator or Storm Water Program Manager, as applicable, and retained on-site at the facility which generates the storm water discharge. The permittee shall retain the SWPPP, reports, log books, storm water discharge sampling data (if collected), and supporting documents in accordance with Part II.C.2 of this permit.

4) Fleet maintenance activities include, but are not limited to, adding or changing vehicle fluids, including fuel, lubrication, mechanical repairs, parts degreasing, and vehicle or equipment washing. Storage yards include, but are not limited to, areas where vehicles are stored or impounded, and where vehicle and road maintenance materials and other chemicals in bulk are stored and handled. Discharge of vehicle or maintenance facility wash water is not authorized by this permit. Vehicles and equipment shall be maintained for clean and effective operation to prevent impacts on storm water quality.

5) The permittee shall also investigate and implement appropriate BMPs to prevent the discharge of pollutants to the MS4 from the storage, collection, transport, and disposal of refuse by the permittee or for the permittee under contract.

e. Managing Vegetated Properties
The permittee shall minimize the discharge of pollutants related to the management of vegetation on land that the permittee owns or operates. BMPs required under this measure include:

1) A process to train employees and contractors on the proper storage, handling, and use of pesticides, herbicides, and fertilizers before they handle or apply them

2) Use of only phosphorus-free fertilizers on turfgrass. Phosphorus may be added to turfgrass only if soils are tested for nutrients (nitrogen/phosphorus/potassium) a minimum of every four (4) years and a need for phosphorus is demonstrated. Phosphorus fertilizers shall be applied to lands that the permittee owns or operates only as prescribed in the soil test results.

3) A program to minimize storm water impacts from all of the permittee's managed vegetated properties

11. Discharges Requiring Separate Authorizations

a. Tracer Dye Discharges
This permit does not authorize the discharge of tracer dyes without approval from the Department. Requests to discharge tracer dyes shall be submitted to the Department.

b. Water Treatment Additives
This permit does not authorize the discharge of water additives without approval from the Department. Water additives include any material that is added to water discharged through the MS4 to condition or treat the water.

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Section A. Effluent Limitations and Monitoring Requirements

In the event a permittee proposes to discharge water additives, the permittee shall submit a request to discharge water additives to the Department for approval. Such requests shall be sent to the Surface Water Assessment Section, Water Bureau, Department of Environmental Quality, P.O. Box 30273, Lansing, Michigan 48909-7773, with a copy to the Department. Instructions to submit a request electronically may be obtained via the Internet (http://www.michigan.gov/deq; on the left side of the screen click on Water, Water Quality Monitoring, Assessment of Michigan Waters; then click on the Water Treatment Additive List, which is under the Information banner). Written approval from the Department to discharge such additives at specified levels shall be obtained prior to discharge by the permittee. Additional monitoring and reporting may be required as a condition for the approval to discharge the additive.

A request to discharge water additives shall include all of the following water additive usage and discharge information:

1) Material Safety Data Sheets

2) The proposed water additive discharge concentration

3) The discharge frequency (i.e., the number of hours per day and the number of days per year)

4) The monitoring point from which the product is to be discharged

5) The type of removal treatment, if any, that the water additive receives prior to discharge

6) Product function (i.e., microbiocide, flocculant, etc.)

7) A 48-hour LC50 or EC50 for a North American freshwater planktonic crustacean (either *Ceriodaphnia sp.*, *Daphnia sp.*, or *Simocephalus sp.*)

8) The results of a toxicity test for one other North American freshwater aquatic species (other than a planktonic crustacean) that meets a minimum requirement of Rule 323.1057(2) of the Water Quality Standards

Prior to submitting the request, the permittee may contact the Surface Water Assessment Section by telephone at 517-335-4184 or via the Internet at the address given above to determine if the Department has the product toxicity data required by items 7) and 8) above. If the Department has the data, the permittee will not need to submit product toxicity data.

c. Wastewater Associated with Concrete

The permittee shall not discharge to the surface waters of the state any wastewater generated from cutting, grinding, drilling, or hydrodemolition of concrete without authorization under an NPDES wastewater discharge permit.

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Section B. Program Assessment and Reporting

1. Submittals and Reporting

a. SWMP Plan

A SWMP plan submitted on or before the date specified in the COC for this permit shall include the following:

1) BMPs

The SWMP plan shall include descriptions of the BMPs that will be or have been implemented for all of the standard requirements in Part I.A. of this permit. The plan shall identify the years (and months as appropriate) that BMPs are proposed to begin and the frequency of the actions, if appropriate, such as the maintenance frequency for structural BMPs and the implementation frequency of nonstructural BMPs, so that the SWMP will be implemented within five (5) years of the effective date of the COC.

2) Measurable Goals

The SWMP plan shall include a description of the measurable goals for each listed BMP. Measurable goals for an individual BMP may include a description of BMP *actions* and/or *results* related to an environmental benefit.

a) Example descriptions of *actions* include the number of MS4 discharge points or buildings inspected for illicit discharges, the number of fliers mailed or informational programs conducted for public education, the number of volunteers for in-stream biological surveys or the extent of the stream surveyed, and the frequency of street sweeping or catch basin cleaning as a pollution prevention activity.

b) Examples of *results* related to an environmental benefit include the number and types of illicit connections identified and corrected, survey results showing a change in public awareness of storm water issues; the mass or volume of solids removed during street sweeping and catch basin cleaning operations, or the measurable or observable improvements in water quality, aquatic habitat, or biological diversity.

3) Receiving Water Quality Status

The permittee shall provide a description of the status of the water quality in the surface waters of the state within the permittee's political, territorial, property, or right-of-way boundaries. The description of water quality status may be narrative or numeric, or both. Narrative descriptions may include, but are not limited to, reports of unnatural physical properties such as turbidity, color, oil film, floating solids, foams, settleable solids, suspended solids, or deposits; the presence or absence of indicator animals, algae, or bacteria; the presence of trash and floatables; and streambank and streambed conditions. For numeric descriptions, the Department encourages the permittee to seek alternatives to instream water chemistry monitoring or to limit chemical monitoring to a small number of parameters. Biological indices are acceptable numeric descriptions. The permittee may gather its own information; join a group to gather information, or report information collected by someone else, including county, state, or federal governments.

4) Receiving Water Quality Stresses

The permittee shall identify and prioritize the stresses on the waters of the state within the permittee's political, territorial, property, or right-of-way boundaries. "Stresses" mean negative impacts on surface water quality, navigation, industrial water supply, public water supply at the point of water intake, fish and other indigenous aquatic life and wildlife, human body contact recreation (i.e., public health violations), and agricultural uses. Water quality stress reporting shall consist of descriptions of the known or suspected pollutant sources leading to water quality concerns, if any.

5) Upcoming Activities

The permittee shall provide a summary of the storm water activities scheduled for implementation during the next reporting cycle.

6) Notice of MS4 Operators Nested within Community Boundaries

A city, village, township, or county (primary jurisdiction) shall identify in its SWMP plan nested jurisdictions with which it has established cooperative agreements. The primary jurisdiction shall be responsible for ensuring compliance with this permit for those nested jurisdictions with which they have entered into an agreement.

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7) Sharing Permit Responsibilities

Permittees may share permit responsibilities when two or more permittees coexist in the same geographical area. Each permittee shall report the permit responsibilities that will be shared and shall identify the other permittee with whom they will be shared.

b. Progress Reports

Progress reports shall be submitted to the Department twice during the permit period, by the dates identified in the COC issued under this permit. The Department may approve alternate dates for progress report submittal if requested and adequately justified by the permittee. The progress reports shall contain the following information:

1) Compliance Assessment

The permittee shall describe the status of compliance with the standard permit requirements in Part I.A. and any approved alternatives. The report shall describe the progress made towards achieving the identified measurable goals for each of the BMPs, and specific evaluation criteria for the PEP, the IDEP, and TSS reduction as follows:

a) For the PEP, provide a summary of the evaluation of the PEP's overall effectiveness, using the evaluation methods prescribed in the PEP.

b) For the IDEP, in addition to evaluating the progress made toward the measurable goal, provide documentation of the actions taken to eliminate illicit discharges. For identified illicit discharges, the permittee shall summarize the total estimated volume and pollutant load eliminated for the main pollutant(s) of concern, and the location(s) of the discharge(s) into both the permittee's MS4 and the receiving water.

c) Assess TSS reduction in accordance with Part I.A.10.c.2. of this permit by reporting the following:

- Describe the current level of control related to TSS discharges from paved surfaces
- Estimate the load reduction from existing controls
- In the second annual report, identify needs to achieve the goal of 25 percent TSS load reduction

2) Water Quality Assessment

The permittee shall provide an updated assessment of the water quality conditions within its jurisdiction. Use of data collected by other sources or participation in a group monitoring program is encouraged. Narrative descriptions or a combination of narrative and numeric descriptions may be submitted. The purpose of this update is to show any obvious changes in the receiving waters since the previous progress report.

3) Water Quality Stress Update

The permittee shall provide a description of any water quality stresses identified since the previous progress report.

4) Discharge Point Location

The permittee shall provide updated information, in accordance with Part I.A.2.a. of this permit, that was not previously submitted for newly identified, constructed, or installed MS4 discharge points.

The permittee shall provide an update on areas added to or removed from the MS4 due to annexation, other statutory processes (if applicable), or properties bought or sold.

5) Data and Results

The permittee shall provide a summary of all of the information collected and analyzed, including monitoring data, if any, during the reporting cycle.

6) Upcoming Activities

The permittee shall provide a summary of the storm water activities to be implemented during the next reporting cycle.

7) BMP and Measurable Goal Changes

The permittee shall describe any planned changes in identified BMPs or measurable goals for any of the standard permit requirements.

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Section B. Program Assessment and Reporting

8) Notice of Changes in Nested Jurisdiction Agreements or Reliance on Permitted MS4 Operators
The permittee shall identify any nested jurisdictions that enter into or terminate permit agreements with the permittee which were not identified in the SWMP plan. All permittees shall describe any changes in the need to rely on other permitted MS4 operators to satisfy the terms and conditions of this permit, as described in Part I.B.1.a.7.

c. Phase I Annual Reporting Requirements (Phase I Permittees Only)
The operator of a large or medium separate storm sewer system who was permitted under Phase 1 of the Federal storm water regulations shall submit the following information annually, on or before the anniversary date of the COC's issuance:

1) Implementation Status [40 CFR 122.42(c)(1)]
The permittee shall describe the status of implementing the components of the SWMP.

2) Environmental Impacts [40 CFR 122.42(c)(7)]
The permittee shall provide an assessment of the pollution reduction and probable receiving water quality impacts associated with program implementation. When applicable, a statement shall be included regarding any negative water quality impacts that may have occurred as a result of any illicit discharges or accidental spills during the report cycle.

3) Revised Fiscal Analysis [40 CFR 122.42(c)(3)]
The permittee shall provide a summary of revisions, if necessary, to the fiscal analysis reported during the previous permit. Permit application requirements at 40 CFR 122.26(d)(2)(vi) may be used to guide reporting.

4) Data Summary [40 CFR 122.42(c)(4)]
The permittee shall provide a summary of data, including monitoring data, that is accumulated throughout the reporting year.

5) Annual Budget [40 CFR 122.42(c)(5)]
The permittee shall provide the previous reporting cycle's expenditures and proposed budget for the reporting cycle following the report.

6) PEP Reporting and Program Enforcement [40 CFR 122.42(c)(6)]
The permittee shall provide a summary describing the number and nature of enforcement actions, inspections, and public education programs.

d. Facility Contact Person
The permittee shall identify a facility contact person to act as a storm water program manager responsible for overseeing compliance with the requirements of this permit. The facility contact person may be replaced at any time, and the permittee shall notify the Department within ten days after the replacement.

e. Signatory Requirements
All reports required by this permit, and other information requested by the Department, shall be signed by either a principal executive officer or ranking elected official, or by a duly authorized representative of that person in accordance with 40 CFR 122.22(b).

2. Notification Requirements

The permittee shall verbally notify the Department within 24 hours of becoming aware of any discharges to or from the MS4 that the permittee suspects may endanger public health or the environment.

Notification should include (if known) the name of the person responsible for the discharge, the location of the discharge into the MS4, the location where the MS4 discharges to the surface waters of the state, the nature of the discharge and the pollutants, and clean-up and recovery measures taken or planned. If the notice is provided after regular working hours, call the Department's 24-Hour Pollution Emergency Alerting System telephone number: 1-800-292-4706.

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Section B. Program Assessment and Reporting

3. Recordkeeping

The latest version of the SWMP plan developed in accordance with this permit shall be retained by the permittee and available for inspection in accordance with Part II.D.9. of this permit. All records and information resulting from the preparation of previous SWMP plans or the progress reports, including all records of analyses performed, calibration and maintenance of instrumentation, and recordings from continuous monitoring instrumentation, shall be retained by the permittee for a minimum of three years or as described in Part II.B.5. of this permit.

4. SWMP Modification

a. Modifications Requested by the Permittee
The SWMP may be modified by the permittee as follows.

1) Modifications adding (but not replacing or subtracting) components, controls, or requirements to the SWMP may be made by the permittee at any time upon written notification to the Department. Notification shall include a description of the modification.

2) Modifications replacing an ineffective or unfeasible BMP specifically identified in the SWMP plan with an alternative BMP may be requested at any time by written notification to the Department. Unless denied by the Department, or another implementation date is approved, the modification shall be implemented by the permittee 60 days from submittal of the request. Such requests must include the following:

a) An analysis of why the BMP is ineffective or unfeasible (including cost prohibitive)

b) A measurable goal for the replacement BMP

c) An analysis of why the replacement BMP is expected to achieve the goals of the BMP to be replaced

3) Modifications subtracting an ineffective or unfeasible BMP specifically identified in the SWMP plan may be requested by written notification to the Department. The identified BMP shall not be subtracted from the SWMP unless the subtraction is approved by the Department. The request shall include an analysis of:

a) Why the BMP is ineffective or unfeasible (including cost prohibitive)

b) Why the removal of the BMP will not hinder the permittee's ability to comply with the permit requirements or be consistent with a TMDL, if applicable

b. Modifications Required by the Permitting Authority
The Department may require the permittee to modify the SWMP as needed to:

1) Address contributions by the MS4 discharges that impair receiving water quality.

2) Include more stringent requirements necessary to comply with new state or federal statutory or regulatory requirements.

3) Include such other conditions deemed necessary by the Department to comply with the goals and requirements of the Federal Act or the Michigan Act, including the requirement to reduce the discharge of pollutants from the MS4 to the maximum extent practicable.

5. Expiration and Reissuance

On or before October 1, 2012, a permittee seeking continued authorization to discharge under this permit beyond the permit's expiration date shall submit to the Department a written request containing such information, forms, and fees as required by the Department. Without an adequate request, a permittee's authorization to discharge will expire on

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April 1, 2013. With an adequate request, a permittee shall continue to be subject to the terms and conditions of the expired permit until the Department takes action on the request, unless this permit is terminated or revoked.

If this permit is terminated or revoked, all authorizations to discharge under the permit shall expire on the date of termination or revocation.

If this permit is modified, the Department will notify the permittee of any required action. Without an adequate response, a permittee's authorization to discharge will terminate on the effective date of the modified permit. With an adequate response, a permittee shall be subject to the terms and conditions of the modified permit on the effective date of the modified permit, unless the Department notifies the permittee otherwise.

6. Requirement to Obtain Individual Permit

The Department may require any permittee that is authorized to discharge under a COC and this permit to apply for and obtain an individual NPDES permit if any of the following circumstances apply:

a. The discharge is a significant contributor to pollution as determined by the Department on a case-by-case basis.

b. The discharger is not complying with, or has not complied with, the conditions of the permit.

c. A change has occurred in the availability of demonstrated technology or practices for the control or abatement of waste applicable to the point source discharge.

d. Effluent standards and limitations are promulgated for point source discharges subject to this permit.

e. The Department determines that the criteria under which the permit was issued no longer apply.

Any person may request the Department to take action pursuant to the provisions of Rule 2191 (Rule 323.2191 of the Michigan Administrative Code).

7. Switching from Another MS4 General Permit

A permittee with coverage under another MS4 general permit, such as the MS4 Watershed-Based General Permit (Permit No. MIG610000 or Permit No. MIG619000), under which a WMP was already developed and submitted to the Department as a permit requirement, that wishes to seek coverage under this permit, shall submit to the Department a complete SWMP plan, as described in Parts I.A.3. and I.B.1.a. of this permit, as part of the application for coverage under this permit or in accordance with an alternate schedule set by the Department.

PART II

Section A. Definitions

This list of definitions may include terms not applicable to this permit.

Acute toxic unit ***(TU_A)*** *means $100/LC_{50}$, where the LC_{50} is determined from a whole effluent toxicity (WET) test which produces a result that is statistically or graphically estimated to be lethal to 50 percent of the test organisms.*

Best Management Practices (BMP) means structural devices or nonstructural 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.

Bioaccumulative chemical of concern (BCC) means a chemical which, upon entering the surface waters, by itself or as its toxic transformation product, accumulates in aquatic organisms by a human health bioaccumulation factor of more than 1000 after considering metabolism and other physiochemical properties that might enhance or inhibit bioaccumulation. The human health bioaccumulation factor shall be derived according to R 323.1057(5). Chemicals with half-lives of less than eight weeks in the water column, sediment, and biota are not BCCs. The minimum bioaccumulation concentration factor (BAF) information needed to define an organic chemical as a BCC is either a field-measured BAF or a BAF derived using the biota-sediment accumulation factor (BSAF) methodology. The minimum BAF information needed to define an inorganic chemical as a BCC, including an organometal, is either a field-measured BAF or a laboratory-measured bioconcentration factor (BCF). The BCCs to which these rules apply are identified in Table 5 of R 323.1057 of the Water Quality Standards.

Biosolids are the solid, semisolid, or liquid residues generated during the treatment of sanitary sewage or domestic sewage in a treatment works. This includes, but is not limited to, scum or solids removed in primary, secondary, or advanced wastewater treatment processes, and a derivative of the removed scum or solids.

Bulk biosolids means biosolids that are not sold or given away in a bag or other container for application to a lawn or home garden.

Chronic toxic unit (TU_C) means $100/MATC$ or $100/IC_{25}$, where the maximum acceptable toxicant concentration (MATC) *and IC_{25} are expressed as a percent effluent in the test medium.*

Class B biosolids refers to material that has met the Class B pathogen reduction requirements or equivalent treatment by a Process to Significantly Reduce Pathogens (PSRP) in accordance with the Part 24 Rules. Processes include aerobic digestion, composting, anaerobic digestion, lime stabilization, and air drying.

Daily concentration is the sum of the concentrations of the individual samples of a parameter divided by the number of samples taken during any calendar day. If the parameter concentration in any sample is less than the quantification limit, regard that value as zero when calculating the daily concentration. The daily concentration will be used to determine compliance with any maximum and minimum daily concentration limitations (except for pH and dissolved oxygen). When required by the permit, report the maximum calculated daily concentration for the month in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the Discharge Monitoring Reports (DMRs).

For pH, report the maximum value of any individual sample taken during the month in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs and the minimum value of any individual sample taken during the month in the "MINIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs. For dissolved oxygen, report the minimum concentration of any individual sample in the "MINIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs.

Daily loading is the total discharge by weight of a parameter discharged during any calendar day. *This value is calculated* by multiplying the daily concentration by the total daily flow and the appropriate conversion factor. The daily loading will be used to determine compliance with any maximum daily loading limitations. When required by the permit, report the maximum calculated daily loading for the month in the "MAXIMUM" column under "QUANTITY OR LOADING" on the DMRs.

Department *means the Michigan Department of Environmental Quality.*

Detection level means the lowest concentration or amount of the target analyte that can be determined to be different from zero by a single measurement at a stated level of probability.

PART II

Section A. Definitions

Discharge point is any location on the MS4 owned or operated by the permittee that discharges directly to a surface water of the state, or any location on the MS4 owned or operated by the permittee that discharges to any other separate storm sewer system before discharging to a surface water of the state.

EC_{50} means a statistically or graphically estimated concentration that is expected to cause one or more specified effects in 50 percent of a group of organisms under specified conditions.

Effluent limitation means any restriction on quantities, rates, and concentrations of chemical, physical, biological, and other constituents discharged from point sources.

Fecal coliform bacteria monthly is the geometric mean of the samples collected in a calendar month (or 30 consecutive days). The calculated monthly value will be used to determine compliance with the maximum monthly fecal coliform bacteria limitations. When required by the permit, report the calculated monthly value in the "AVERAGE" column under "QUALITY OR CONCENTRATION" on the DMRs.

Fecal coliform bacteria 7-day is the geometric mean of the samples collected in any 7-day period. The calculated 7-day value will be used to determine compliance with the maximum 7-day fecal coliform bacteria limitations. When required by the permit, report the maximum calculated 7-day concentration for the month in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs.

Flow proportioned sample is a composite sample with the sample volume proportional to the effluent flow.

Grab sample is a single sample taken at neither a set time nor flow.

IC_{25} means the toxicant concentration that would cause a 25 percent reduction in a nonquantal biological measurement for the test population.

Illicit discharge means any discharge (or seepage) to the MS4 that is not composed entirely of storm water or uncontaminated groundwater. Examples of illicit discharges include, but are not limited to, the dumping of motor vehicle fluids, household hazardous wastes, grass clippings, leaf litter, or domestic animal wastes, or the unauthorized discharges of sewage, industrial waste, restaurant wastes, or any other non-storm water waste into an MS4.

Illicit connection means a physical connection to the MS4 that 1) primarily conveys illicit discharges into the MS4, or 2) is not authorized or permitted by the local authority (where a local authority requires such authorization or permit).

Interference is a discharge, which alone or in conjunction with a discharge or discharges from other sources, both:
1) inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal; and
2) therefore, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or, of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent state or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including Title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including state regulations contained in any state sludge management plan prepared pursuant to Subtitle D of the SWDA), the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act. [This definition does not apply to sample matrix interference.]

Land application means spraying or spreading biosolids or a biosolids derivative onto the land surface, injecting below the land surface, or incorporating into the soil so that the biosolids or biosolids derivative can either condition the soil or fertilize crops or vegetation grown in the soil.

LC_{50} means a statistically or graphically estimated concentration that is expected to be lethal to 50 percent of a group of organisms under specified conditions.

PART II

Section A. Definitions

Maximum acceptable toxicant concentration (MATC) means the concentration obtained by calculating the geometric mean of the lower and upper chronic limits from a chronic test. A lower chronic limit is the highest tested concentration that did not cause the occurrence of a specific adverse effect. An upper chronic limit is the lowest tested concentration which did cause the occurrence of a specific adverse effect and above which all tested concentrations caused such an occurrence.

Maximum extent practicable: means implementation of best management practices by a public body to comply with an approved storm water management program as required in 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

MGD *means million gallons per day.*

Monthly frequency of analysis refers to a calendar month. When required by this permit, an analytical result, reading, value, or observation must be reported for that period if a discharge occurs during that period.

Monthly concentration is the sum of the daily concentrations determined during a reporting month (or 30 consecutive days) divided by the number of daily concentrations determined. The calculated monthly concentration will be used to determine compliance with any maximum monthly concentration limitations. When required by the permit, report the calculated monthly concentration in the "AVERAGE" column under "QUALITY OR CONCENTRATION" on the DMRs.

For minimum percent removal requirements, the monthly influent concentration and the monthly effluent concentration shall be determined. The calculated monthly percent removal, which is equal to 100 times the quantity [1 minus the quantity (monthly effluent concentration divided by the monthly influent concentration)], shall be reported in the "MINIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs.

Monthly loading is the sum of the daily loadings of a parameter divided by the number of daily loadings determined in the reporting month (or 30 consecutive days). The calculated monthly loading will be used to determine compliance with any maximum monthly loading limitations. When required by the permit, report the calculated monthly loading in the "AVERAGE" column under "QUANTITY OR LOADING" on the DMRs.

MS4 discharge point means an outfall from an MS4 to the surface waters of the state, or a point where an MS4 discharges into a system operated by another entity.

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 the disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under state law, such as a sewer district, flood control district, drainage district, or similar entity, or a designated or approved management agency under Section 208 of the federal act that discharges to 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.

National Pretreatment Standards are the regulations promulgated by or to be promulgated by the Federal Environmental Protection Agency pursuant to Section 307(b) and (c) of the Federal Act. The standards establish nationwide limits for specific industrial categories for discharge to a POTW.

No observed adverse effect level (NOAEL) means the highest tested dose or concentration of a substance which results in no observed adverse effect in exposed test organisms where higher doses or concentrations result in an adverse effect.

Noncontact cooling water is water used for cooling which does not come into direct contact with any raw material, intermediate product, by-product, waste product, or finished product.

Nondomestic user is any discharger to a POTW that discharges wastes other than or in addition to water-carried wastes from a toilet, kitchen, laundry, bathing, or other facilities used for household purposes.

PART II

Section A. Definitions

On-Site Sewage Disposal System (OSDS) means a natural system or mechanical device used to collect, treat, and discharge or reclaim wastewater from one or more dwelling units without the use of community-wide sewers or a centralized treatment facility.

POTW is a publicly-owned treatment works as defined at 40 C.F.R. §403.3.

Partially-treated sewage is any sewage, sewage and storm water, or sewage and wastewater, from domestic or industrial sources that is treated to a level less than that required by the permittee's National Pollutant Discharge Elimination System permit, or that is not treated to national secondary treatment standards for wastewater, including discharges to the surface waters from retention treatment facilities.

Point source means a discharge point from an MS4 to the 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.

Public means all persons who potentially could affect the authorized storm water discharges, including, but not limited to, residents, visitors to the area, public employees, businesses, industries, and construction contractors and developers.

Quantification level means the measurement of the concentration of a contaminant obtained by using a specified laboratory procedure calculated at a specified concentration above the detection level. It is considered the lowest concentration at which a particular contaminant can be quantitatively measured using a specified laboratory procedure for monitoring of the contaminant.

Quarterly frequency of analysis refers to a three month period, defined as January through March, April through June, July through September, and October through December. When required by this permit, an analytical result, reading, value, or observation must be reported for that period if a discharge occurs during that period.

Redevelopment means the alteration of developed land that changes the footprint of the site or building, or offers a new opportunity for storm water controls. The term is not intended to include such activities as exterior remodeling, which would not be expected to cause adverse storm water quality impacts.

Regional Administrator is the Region 5 Administrator, USEPA, located at R-19J, 77 West Jackson Boulevard, Chicago, Illinois 60604.

Sanitary seepage means infiltration into the MS4 of sanitary wastewater which has leaked from public or private sewerage systems, including, but not limited to, onsite sewage disposal systems such as septic tanks and drain fields.

Separate storm sewer means a conveyance or system of conveyances designed or used for collecting or conveying storm water, which is not a combined sewer; and which is not part of a publicly-owned treatment works as defined in the Code of Federal Regulations at 40 CFR 122.2.

Separate storm sewer system means a system of drainage, including, but not limited to, roads, catch basins, curbs, gutters, parking lots, ditches, conduits, pumping devices, or man-made channels, which has the following characteristics:

- The system is not a combined sewer where storm water mixes with sanitary wastes.
- The system is not part of a publicly-owned treatment works.

PART II

Section A. Definitions

Significant industrial user is a nondomestic user that: 1) is subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N, or 2) discharges an average of 25,000 gallons per day or more of process wastewater to a POTW (excluding sanitary, noncontact cooling, and boiler blowdown wastewater); contributes a process wastestream which makes up five (5) percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant, or is designated as such by the permittee as defined in 40 CFR 403.12(a) on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's treatment plant operation or violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

Storm water means storm water runoff, snow melt runoff, and surface runoff and drainage.

Surface 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
- Other surface bodies of water within the confines of the state

Tier I value means a value for aquatic life, human health, or wildlife calculated under R 323.1057 of the Water Quality Standards using a tier I toxicity database.

Tier II value means a value for aquatic life, human health, or wildlife calculated under R 323.1057 of the Water Quality Standards using a tier II toxicity database.

Toxicity Reduction Evaluation (TRE) means a site-specific study conducted in a stepwise process designed to identify the causative agents of effluent toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in effluent toxicity.

Treatment means the removal of pollutants through settling, filtration, infiltration, or the equivalent.

Uncontaminated groundwater means groundwater that will not contribute substantially to the violation of a water quality standard or will not be a significant contributor of pollutants upon discharge to surface waters of the state.

Urbanized area means a place and the adjacent densely-populated territory that together have a minimum population of 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, Water Resources Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451), being Rules 323.1041 through 323.1117 of the Michigan Administrative Code.

Weekly frequency of analysis refers to a calendar week which begins on Sunday and ends on Saturday. When required by this permit, an analytical result, reading, value, or observation must be reported for that period if a discharge occurs during that period.

Yearly frequency of analysis 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 must be reported for that period if a discharge occurs during that period.

24-hour composite sample is a flow-proportioned composite sample consisting of hourly or more frequent portions that are taken over a 24-hour period.

PART II

Section A. Definitions

3-Portion composite sample is a sample consisting of three equal volume grab samples collected at equal intervals over an 8-hour period.

7-day concentration is the sum of the daily concentrations determined during any 7 consecutive days in a reporting month divided by the number of daily concentrations determined. The calculated 7-day concentration will be used to determine compliance with any maximum 7-day concentration limitations. When required by the permit, report the maximum calculated 7-day concentration for the month in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs.

7-day loading is the sum of the daily loadings of a parameter divided by the number of daily loadings determined during any 7 consecutive days in a reporting month. The calculated 7-day loading will be used to determine compliance with any maximum 7-day loading limitations. When required by the permit, report the maximum calculated 7-day loading for the month in the "MAXIMUM" column under "QUANTITY OR LOADING" on the DMRs.

PART II

Section B. Monitoring Procedures

1. Representative Samples

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge.

2. Test Procedures

Test procedures for the analysis of pollutants shall conform to regulations promulgated pursuant to Section 304(h) of the Federal Act (40 CFR Part 136 - Guidelines Establishing Test Procedures for the Analysis of Pollutants), unless specified otherwise in this permit. Requests to use test procedures not promulgated under 40 CFR Part 136 for pollutant monitoring required by this permit shall be made in accordance with the Alternate Test Procedures regulations specified in 40 CFR 136.4. These requests shall be submitted to the Chief of the Permits Section, Water Bureau, Michigan Department of Environmental Quality, P.O. Box 30273, Lansing, Michigan 48909-7773. The permittee may use such procedures upon approval.

The permittee shall periodically calibrate and perform maintenance procedures on all analytical instrumentation at intervals to ensure accuracy of measurements. The calibration and maintenance shall be performed as part of the permittee's laboratory Quality Control/Quality Assurance program.

3. Instrumentation

The permittee shall periodically calibrate and perform maintenance procedures on all monitoring instrumentation at intervals to ensure accuracy of measurements.

4. Recording Results

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information: 1) the exact place, date, and time of measurement or sampling; 2) the person(s) who performed the measurement or sample collection; 3) the dates the analyses were performed; 4) the person(s) who performed the analyses; 5) the analytical techniques or methods used; 6) the date of and person responsible for equipment calibration; and 7) the results of all required analyses.

5. Records Retention

All records and information resulting from the monitoring activities required by this permit, including all records of analyses performed, calibration and maintenance of instrumentation, and recordings from continuous monitoring instrumentation shall be retained for a minimum of three (3) years, or longer if requested by the Regional Administrator or the Department.

PART II

Section C. Reporting Requirements

1. Start-up Notification

If the permittee will not discharge during the first 60 days following the effective date of the facility's certificate of coverage, the permittee shall notify the Department within 14 days following the effective date of the certificate of coverage, and then 60 days prior to the commencement of the discharge.

2. Retained Self-Monitoring Requirements

If instructed on the effluent limits page (or otherwise authorized by the Department in accordance with the provisions of this permit) to conduct retained self-monitoring, the permittee shall maintain a year-to-date log of retained self-monitoring results and, upon request, provide such log for inspection to the staff of the Department (Department as defined on the certificate of coverage). Retained self-monitoring results are public information and shall be promptly provided to the public upon written request from the public.

The permittee shall certify, in writing, to the Department, on or before January 10th of each year, that: 1) all retained self-monitoring requirements have been complied with and a year-to-date log has been maintained; and 2) the application on which this permit is based still accurately describes the discharge. With this annual certification, the permittee shall submit a summary of the previous year's monitoring data. The summary shall include maximum values for samples to be reported as daily maximums and/or monthly maximums, and minimum values for any daily minimum samples.

Reissuance or modification of this permit, or reissuance or modification of an individual permittee's authorization to discharge, shall not affect previous approval or denial for retained self-monitoring unless the Department provides notification in writing to the permittee.

3. Additional Monitoring by Permittee

If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified above, the results of such monitoring shall be included in the calculation and reporting of the values required in the Discharge Monitoring Report. Such increased frequency shall also be indicated.

Monitoring required pursuant to Part 41 of the Michigan Act or Rule 35 of the Mobile Home Park Commission Act (Act 96 of the Public Acts of 1987) for assurance of proper facility operation shall be submitted as required by the Department.

4. Compliance Dates Notification

Within 14 days of every compliance date specified in this permit, the permittee shall submit a written notification to the Department indicating whether or not the particular requirement was accomplished. If the requirement was not accomplished, the notification shall include an explanation of the failure to accomplish the requirement, actions taken or planned by the permittee to correct the situation, and an estimate of when the requirement will be accomplished. If a written report is required to be submitted by a specified date and the permittee accomplishes this, a separate written notification is not required.

PART II

Section C. Reporting Requirements

5. Noncompliance Notification

Compliance with all applicable requirements set forth in the Federal Act, Parts 31 and 41 of the Michigan Act, and related regulations and rules is required. All instances of noncompliance shall be reported as follows:

a. 24-hour reporting - Any noncompliance which may endanger health or the environment (including maximum daily concentration discharge limitation exceedances) shall be reported, verbally, within 24 hours from the time the permittee becomes aware of the noncompliance. A written submission shall also be provided within five (5) days.

b. other reporting - The permittee shall report, in writing, all other instances of noncompliance not described in a. above at the time monitoring reports are submitted; or, in the case of retained self-monitoring, within five (5) days from the time the permittee becomes aware of the noncompliance.

Written reporting shall include: 1) a description of the discharge and cause of noncompliance; and 2) the period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and the steps taken to reduce, eliminate and prevent recurrence of the noncomplying discharge.

6. Spill Notification

The permittee shall immediately report any release of any polluting material which occurs to the surface waters or groundwaters of the state, unless the permittee has determined that the release is not in excess of the threshold reporting quantities specified in the Part 5 Rules (Rules 324.2001 through 324.2009 of the Michigan Administrative Code), by calling the Department at the number indicated in the COC, or if the notice is provided after regular working hours call the Department's 24-Hour Pollution Emergency Alerting System telephone number: 1-800-292-4706 (calls from out-of-state dial 1-517-373-7660).

Within ten (10) days of the release, the permittee shall submit to the Department a full written explanation as to the cause of the release, the discovery of the release, response (cleanup and/or recovery) measures taken, and preventative measures taken or a schedule for completion of measures to be taken to prevent reoccurrence of similar releases.

7. Upset Noncompliance Notification

If a process "upset" (defined as an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee) has occurred, the permittee who wishes to establish the affirmative defense of upset, shall notify the Department by telephone within 24-hours of becoming aware of such conditions; and within five (5) days, provide in writing, the following information:

a. That an upset occurred and that the permittee can identify the specific cause(s) of the upset

b. That the permitted wastewater treatment facility was, at the time, being properly operated

c. That the permittee has specified and taken action on all responsible steps to minimize or correct any adverse impact in the environment resulting from noncompliance with this permit

In any enforcement proceedings, the permittee, seeking to establish the occurrence of an upset, has the burden of proof.

PART II

Section C. Reporting Requirements

8. Bypass Prohibition and Notification

a. Bypass Prohibition - Bypass is prohibited unless:

1) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage.

2) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass

3) The permittee submitted notices as required under 8.b. or 8.c. below.

b. Notice of Anticipated Bypass - If the permittee knows in advance of the need for a bypass, it shall submit prior notice to the Department, if possible at least ten (10) days before the date of the bypass, and provide information about the anticipated bypass as required by the Department. The Department may approve an anticipated bypass, after considering its adverse effects, if it will meet the three (3) conditions listed in 8.a. above.

c. Notice of Unanticipated Bypass - The permittee shall submit notice to the Department of an unanticipated bypass by calling the Department at the number indicated in the certificate of coverage (if the notice is provided after regular working hours, use the following number: 1-800-292-4706) as soon as possible, but no later than 24 hours from the time the permittee becomes aware of the circumstances.

d. Written Report of Bypass - A written submission shall be provided within five (5) working days of commencing any bypass to the Department, and at additional times as directed by the Department. The written submission shall contain a description of the bypass and its cause; the period of bypass, including exact dates and times, and if the bypass has not been corrected, the anticipated time it is expected to continue; steps taken or planned to reduce, eliminate, and prevent reoccurrence of the bypass; and other information as required by the Department.

e. Bypass Not Exceeding Limitations - The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of 8.a., 8.b., 8.c., and 8.d., above. This provision does not relieve the permittee of any notification responsibilities under Part II.C.9. of this permit.

f. Definitions

1) Bypass means the intentional diversion of waste streams from any portion of a treatment facility.

2) Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

9. Notification of Changes in Discharge

The permittee shall notify the Department, in writing, within 10 days of knowing, or having reason to believe, that any activity or change has occurred or will occur which would result in the discharge of: 1) detectable levels of chemicals on the current Michigan Critical Materials Register, priority pollutants or hazardous substances set forth in 40 CFR 122.21, Appendix D, or the Pollutants of Initial Focus in the Great Lakes Water Quality Initiative specified in 40 CFR 132.6, Table 6, which were not acknowledged in the application or listed in the application at less than detectable levels; 2) detectable levels of any other chemical not listed in the application or listed at less than detection, for which the application specifically requested information; or 3) any chemical at levels greater than five times the average level reported in the complete application (see the certificate of coverage for the date(s) the complete application was submitted). Any other monitoring results obtained as a requirement of this permit shall be reported in accordance with the compliance schedules.

PART II

Section C. Reporting Requirements

10. Changes in Facility Operations

Any anticipated action or activity, including, but not limited to, facility expansion, production increases, or process modification, which will result in new or increased loadings of pollutants to the receiving waters must be reported to the Department by a) submission of an increased use request (application) and all information required under Rule 323.1098 (Antidegradation) of the Water Quality Standards or b) by notice if the following conditions are met: 1) the action or activity will not result in a change in the types of wastewater discharged or result in a greater quantity of wastewater than currently authorized by this permit; 2) the action or activity will not result in violations of the effluent limitations specified in this permit; 3) the action or activity is not prohibited by the requirements of Part II.C.12.; and 4) the action or activity will not require notification pursuant to Part II.C.9. Following such notice, the permit may be modified according to applicable laws and rules to specify and limit any pollutant not previously limited.

11. Bioaccumulative Chemicals of Concern (BCC)

Consistent with the requirements of Rules 323.1098 and 323.1215 of the Michigan Administrative Code, the permittee is prohibited from undertaking any action that would result in a lowering of water quality from an increased loading of a BCC unless an increased use request and Antidegradation Demonstration have been submitted and approved by the Department.

12. Transfer of Ownership or Control

In the event of any change in control or ownership of facilities from which the authorized discharge emanates, the permittee shall submit to the Department 30 days prior to the actual transfer of ownership or control a written agreement between the current permittee and the new permittee containing: 1) the legal name and address of the new owner; 2) a specific date for the effective transfer of permit responsibility, coverage and liability; and 3) a certification of the continuity of or any changes in operations, wastewater discharge, or wastewater treatment.

If the new permittee is proposing changes in operations, wastewater discharge, or wastewater treatment, the Department may propose modification of this permit in accordance with applicable laws and rules.

PART II

Section D. Management Responsibilities

1. Duty to Comply

All discharges authorized herein shall be consistent with the terms and conditions of this permit and the permittee's COC. The discharge of any pollutant identified in this permit and/or the permittee's COC more frequently than or at a level in excess of that authorized shall constitute a violation of the permit.

It is the duty of the permittee to comply with all the terms and conditions of this permit and the permittee's COC. Any noncompliance with the Effluent Limitations, Special Conditions, or terms of this permit or the permittee's COC constitutes a violation of the Michigan Act and/or the Federal Act and constitutes grounds for enforcement action; for COC termination, revocation and reissuance, or modification; or denial of an application for permit or COC renewal.

2. Operator Certification

The permittee shall have the waste treatment facilities under direct supervision of an operator certified at the appropriate level for the facility certification by the Department, as required by Sections 3110 and 4104 of the Michigan Act.

3. Facilities Operation

The permittee shall, at all times, properly operate and maintain all treatment or control facilities or systems installed or used by the permittee to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance includes adequate laboratory controls and appropriate quality assurance procedures.

4. Power Failures

In order to maintain compliance with the effluent limitations of this permit and prevent unauthorized discharges, the permittee shall either:

a. Provide an alternative power source sufficient to operate facilities utilized by the permittee to maintain compliance with the effluent limitations and conditions of this permit, or

b. Upon the reduction, loss, or failure of one or more of the primary sources of power to facilities utilized by the permittee, to maintain compliance with the effluent limitations and conditions of this permit, the permittee shall halt, reduce, or otherwise control production and/or all discharge in order to maintain compliance with the effluent limitations and conditions of this permit.

5. Adverse Impact

The permittee shall take all reasonable steps to minimize any adverse impact to the surface waters or groundwaters of the state resulting from noncompliance with this permit, including, but not limited to, such accelerated or additional monitoring as necessary to determine the nature and impact of the discharge in noncompliance.

6. Containment Facilities

The permittee shall provide facilities for containment of any accidental losses of polluting materials in accordance with the requirements of the Part 5 Rules (Rules 324.2001 through 324.2009 of the Michigan Administrative Code). For a Publicly-Owned Treatment Work (POTW), these facilities shall be approved under Part 41 of the Michigan Act.

PART II

Section D. Management Responsibilities

7. Waste Treatment Residues

Residuals (i.e., solids, sludges, biosolids, filter backwash, scrubber water, ash, grit, or other pollutants or wastes) removed from or resulting from treatment or control of storm water or wastewaters, including those that are generated during treatment or left over after treatment or control has ceased, shall be disposed of in an environmentally compatible manner and according to applicable laws and rules. These laws may include, but are not limited to, the Michigan Act, Part 31 for protection of water resources, Part 55 for air pollution control, Part 111 for hazardous waste management, Part 115 for solid waste management, Part 121 for liquid industrial wastes, Part 301 for protection of inland lakes and streams, and Part 303 for wetlands protection. Such disposal shall not result in any unlawful pollution of the air, surface waters, or groundwaters of the state.

8. Right of Entry

The permittee shall allow the Department, any agent appointed by the Department or the Regional Administrator, upon the presentation of credentials:

a. To enter upon the permittee's premises where an effluent source is located or in which any records are required to be kept under the terms and conditions of this permit.

b. At reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit; to inspect process facilities, treatment works, monitoring methods, and equipment regulated or required under this permit; and to sample any discharge of pollutants.

9. Availability of Reports

Except for data determined to be confidential under Section 308 of the Federal Act and Rule 2128 (Rule 323.2128 of the Michigan Administrative Code), all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Department and the Regional Administrator. As required by the Federal Act, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the Federal Act and Sections 3112, 3115, 4106, and 4110 of the Michigan Act.

PART II

Section E. Activities Not Authorized by This Permit

1. Discharge to the Groundwaters

This permit does not authorize any discharge to the groundwaters. Such discharge may be authorized by a groundwater discharge permit issued pursuant to the Michigan Act.

2. Facility Construction

This permit does not authorize or approve the construction or modification of any physical structures or facilities. Approval for such construction for a POTW must be by permit issued under Part 41 of the Michigan Act. Approval for such construction for a mobile home park, campground, or marina shall be from the Water Bureau, Michigan Department of Environmental Quality. Approval for such construction for a hospital, nursing home, or extended care facility shall be from the Division of Health Facilities and Services, Michigan Department of Consumer and Industry Services, upon request.

3. Civil and Criminal Liability

Except as provided in permit conditions on "Bypass" (Part II.C.8. pursuant to 40 CFR 122.41(m)), nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance, whether or not such noncompliance is due to factors beyond the permittee's control, such as accidents, equipment breakdowns, or labor disputes.

4. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee may be subject under Section 311 of the Federal Act except as are exempted by federal regulations.

5. State Laws

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authority preserved by Section 510 of the Federal Act.

6. Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize the violation of any federal, state, or local laws or regulations, nor does it obviate the necessity of obtaining such permits, including any other Department of Environmental Quality permits, or approvals from other units of government as may be required by law.

APPENDIX

STORM WATER POLLUTION PREVENTION PLANS FOR FLEET MAINTENANCE AND STORAGE YARDS

These requirements apply to areas of fleet maintenance and storage yards in accordance with Part I.A.10.d.

1. Source Identification

To identify potential sources of significant materials that can pollute storm water and subsequently be discharged from the facility, the Storm Water Pollution Prevention Plan (SWPPP) shall, at a minimum, include the following items:

a. A site map identifying the following:

1) Buildings and other permanent structures
2) Storage or disposal areas for significant materials
3) Secondary containment structures and descriptions of what they contain
4) Storm water discharge points (numbered for reference)
5) Location of storm water and non-storm water inlets contributing to each discharge point
6) Location of NPDES-permitted discharges other than storm water
7) Outlines of the drainage areas contributing to each discharge point
8) Structural runoff controls or storm water treatment facilities
9) Areas of vegetation (with a brief description, such as lawn, old field, marsh, wooded, etc.)
10) Areas of exposed and/or erodible soils
11) Impervious surfaces (roofs, asphalt, concrete)
12) Name and location of receiving water(s)
13) Areas of known or suspected impacts on surface waters as designated under Part 201 (Environmental Response) of the Michigan Act.

b. A list of all significant materials that could pollute storm water. For each material listed, the SWPPP shall include each of the following descriptions:

1) Ways in which each type of material has been or has a reasonable potential to become exposed to storm water (e.g., spillage during handling; leaks from pipes, pumps, and vessels; contact with storage piles, contaminated materials, or soils; waste handling and disposal; deposits from dust or overspray; etc.).

2) An evaluation and written description of the reasonable potential for contribution of significant materials to run off from at least the following areas or activities:

a. Loading, unloading, and other material-handling operations
b. Outdoor storage, including secondary containment structures
c. Outdoor manufacturing or processing activities
d. Significant dust or particulate-generating processes
e. Discharge from vents, stacks, and air emission controls
f. On-site waste disposal practices
g. Maintenance and cleaning of vehicles, machines, and equipment
h. Areas of exposed and/or erodible soils
i. Sites of Environmental Contamination listed under Part 201 (Environmental Response) of the Michigan Act
j. Areas of significant material residues
k. Areas where animals congregate (wild or domestic) and deposit wastes
l. Other areas where storm water may contact significant materials.

3) Identification of the discharge point(s) through which the material may be discharged if released.

APPENDIX

STORM WATER POLLUTION PREVENTION PLANS FOR FLEET MAINTENANCE AND STORAGE YARDS

Significant materials include any material which could degrade or impair water quality, including, but not limited to: raw materials; fuels; solvents, detergents, and plastic pellets; finished materials, such as metallic products; hazardous substances designated under Section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (See 40 CFR 372.65); any chemical the facility is required to report pursuant to Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA); polluting materials (oil and any material, in solid or liquid form, identified as a polluting material under the Part 5 Rules [Rules 324.2001 through 324.2009 of the Michigan Administrative Code]); Hazardous Wastes as defined in Part 111 of the Michigan Act; fertilizers; pesticides; and waste products, such as ashes, slag, sludge, and plant and animal wastes that have the potential to be released with storm water discharges

c. A listing of significant spills and significant leaks of polluting materials that occurred at areas that are exposed to precipitation or that otherwise discharge to a point source at the facility. The listing shall include spills that occurred over the three (3) years prior to the effective date of a COC authorizing discharge under this permit. The listing shall include the date, volume and exact location of the release, and the action taken to clean up the material and/or prevent exposure to storm water runoff or contamination of the surface waters of the state. Any release that occurs after the SWPPP has been developed shall be controlled in accordance with the SWPPP and is cause for the SWPPP to be updated as appropriate within 14 calendar days of obtaining knowledge of the spill or loss.

d. A summary of existing storm water discharge sampling data (if available) describing pollutants in storm water discharges associated with industrial activity at the facility. This summary shall be accompanied by a description of the suspected source(s) of the pollutants detected.

2. Preventive Measures and Source Controls, Non-Structural

To prevent significant materials from contacting storm water at the source, the SWPPP shall, at a minimum, include each of the following non-structural controls:

a. A program which includes a schedule for routine preventive maintenance. The preventative maintenance program shall consist of routine inspections and maintenance of storm water management and control devices (e.g., cleaning of oil/water separators and catch basins, routine housekeeping activities, and cleaning out catch basins), as well as inspecting and testing plant equipment and systems to uncover conditions that could cause breakdowns or failures resulting in discharges of pollutants to surface waters. The routine inspection shall include those areas of the facility in which significant materials have the reasonable potential to contaminate runoff. A log of the inspections and corrective actions shall be maintained on file by the permittee, and shall be retained in accordance with the Appendix, Section 5.

b. A schedule for comprehensive site inspection, including a visual inspection of the equipment, plant areas, and structural pollution prevention and treatment controls, to be performed at least quarterly. The permittee may request Department approval of an alternate schedule for comprehensive site inspections. A report of the results of the comprehensive site inspection shall be prepared and retained in accordance with the Appendix, Section 5. The report shall identify any incidents of noncompliance with the SWPPP or this permit. If there are no reportable incidents of noncompliance, the report shall contain a certification that the facility is in compliance with this permit.

c. A description of good housekeeping procedures to maintain a clean, orderly facility. Good housekeeping procedures shall include routine inspections of the areas of the facility in which the procedures are implemented. The routine inspections of good housekeeping procedures may be combined with the routine inspections for the preventative maintenance program.

d. A description of the material-handling procedures and storage requirements for significant materials. Equipment and procedures for cleaning up spills shall be identified in the SWPPP and made available to the appropriate personnel. The procedures shall identify measures to prevent spilled materials or material residues on the outside of containers from being discharged into storm water. The SWPPP may include, by reference, requirements of either a Pollution Incident Prevention Plan (PIPP) prepared in accordance with the Part 5 Rules (Rules 324.2001 through 324.2009 of the Michigan Administrative Code); a Hazardous Waste Contingency Plan prepared in accordance with 40 CFR 264 and 265 Subpart D, as required by Part 111 of the Michigan Act; or a Spill Prevention Control and Countermeasure (SPCC) plan prepared in accordance with 40 CFR 112.

APPENDIX

STORM WATER POLLUTION PREVENTION PLANS FOR FLEET MAINTENANCE AND STORAGE YARDS

e. Identification of areas which, due to topography, activities, or other factors, have a high potential for significant soil erosion. The SWPPP shall also identify measures used to control soil erosion and sedimentation.

f. A description of the employee training programs which will be implemented to inform the appropriate personnel at all levels of responsibility of the components and goals of the SWPPP. The SWPPP shall identify periodic dates for such training.

g. Identification of significant materials expected to be present in storm water discharges following implementation of the nonstructural preventative measures and source controls.

3. Structural Controls for Prevention and Treatment

Where implementation of the measures required by the Appendix, Section 2, does not control storm water discharges to prevent contact with significant materials to the maximum extent practicable, the SWPPP shall provide a description of the location, function, and design criteria of structural controls for prevention and treatment. Structural controls may be necessary:

1) To prevent uncontaminated storm water from contacting or being contacted by significant materials.

2) If preventive measures are not feasible or are inadequate to keep significant materials at the site from contaminating storm water. Structural controls shall be used to treat, divert, isolate, recycle, reuse, or otherwise manage storm water in a manner that reduces the level of significant materials in the storm water to the maximum extent practicable.

4. Keeping Plans Current

a. The permittee shall review the SWPPP annually after it is developed and maintain written summaries of the reviews. Based on the review, the permittee shall amend the SWPPP as needed to ensure continued compliance with the terms and conditions of this permit.

b. The SWPPP developed under the conditions of a previous permit shall be amended as necessary to ensure compliance with this permit.

c. The SWPPP shall be updated or amended whenever changes or spills at the facility increase or have the potential to increase the exposure of significant materials to storm water, or when the SWPPP is determined by the permittee or the Department to be ineffective in achieving the general objectives of controlling pollutants in storm water discharges associated with industrial activity. Updates based on increased activity or spills at the facility shall include a description of how the permittee intends to control any new sources of significant materials or respond to and prevent spills in accordance with the requirements of the Appendix, Sections 1, 2, and 3.

d. The Department may notify the permittee at any time that the SWPPP does not meet the minimum requirements. Such notification shall identify why the SWPPP does not meet the minimum requirements. The permittee shall make the required changes to the SWPPP within 30 days after such notification from the Department, and shall submit to the Department a written certification that the requested changes have been made.

e. Amendments shall be signed, dated, and retained with the SWPPP.

5. Record Keeping

The permittee shall maintain records of all SWPPP-related inspections and maintenance activities. Records shall also be kept describing incidents such as spills or other discharges that can affect the quality of storm water runoff. All such records shall be retained for three years. The following records are required by this permit:

- Routine maintenance inspections (Appendix, Section 2.a.)
- Good housekeeping inspections (Appendix, Section 2.c.). The routine maintenance inspection and good housekeeping inspection may be combined.
- Comprehensive inspection reports (Appendix, Section 2.b.)
- Written summaries of the annual SWPPP review (Appendix, Section 4.a)

Appendix B

List of University of Michigan Outfalls

Appendix B - Outfalls of The University of Michigan Drainage System

Outfall ID #	Location of Discharge	Name of Receiving Water	Ultimate Receiving Water
O-1	S of Jefferson & Division	City of Ann Arbor	Allens Creek
O-2 (revised)	Jefferson & Division St.	City of Ann Arbor	Allens Creek
O-3	William & Thompson	City of Ann Arbor	Allens Creek
O-4	S Division & Hill	City of Ann Arbor	Allens Creek
O-5	S Division & Hill	City of Ann Arbor	Allens Creek
O-6	SW of S Div. & Hoover	City of Ann Arbor	Allens Creek
O-7	SW of S Div. & Hoover	City of Ann Arbor	Allens Creek
O-8	E of Green & Hoover	City of Ann Arbor	Allens Creek
O-9	S Division & Hoover	City of Ann Arbor	Allens Creek
O-10	Sybil & Hoover	City of Ann Arbor	Allens Creek
O-11	N of Stadium Blvd.	City of Ann Arbor	Allens Creek
O-12	State St. Sports Ser. Bldg.	City of Ann Arbor	Allens Creek
O-13	State St. Sports Ser. Bldg.	City of Ann Arbor	Allens Creek
O-14	State St. SE Corner Yost	City of Ann Arbor	Allens Creek
O-15	State St. NE Corner Yost	City of Ann Arbor	Allens Creek
O-16	NW of Fuller & Glen	Huron River	Huron River
O-17	S University & Church	City of Ann Arbor	Allens Creek
O-18	Monroe & Oakland	City of Ann Arbor	Allens Creek
O-19	Hill & E University	City of Ann Arbor	Allens Creek
O-20	Church & Hill	City of Ann Arbor	Allens Creek
O-21	E of William & E Univ.	City of Ann Arbor	Allens Creek
O-22	Willard btwn E Univ. & Church	City of Ann Arbor	Allens Creek
O-23	S of Willard & Church	City of Ann Arbor	Allens Creek
O-24	E of Nichols Dr.	Huron River	Huron River
O-25	E of Nichols Dr.	Huron River	Huron River
O-26	E of Nichols Dr.	Huron River	Huron River
O-27	N of Nichols Dr.	Huron River	Huron River
O-28	W of Plymouth & Bdwy	Traver Creek	Huron River
O-29	S of Gilbert & Baits	U-M Retention Pond	Huron River
O-30	Fuller & Bonisteel	City of Ann Arbor	Huron River
O-31	E of McIntyre	City of Ann Arbor	Millers Creek
O-32	E of McIntyre	City of Ann Arbor	Millers Creek
O-33	NE of Bishop & Plymouth	U-M Detention Pond	Traver Creek
O-34	Beal & Glazier Way	City of Ann Arbor	Millers Creek
O-35	Beal & Glazier Way	City of Ann Arbor	Millers Creek
O-36	SE of Baxter & Hur. Pkwy	Millers Creek	Huron River
O-37	SE of Baxter & Hur. Pkwy	Millers Creek	Huron River
O-38	SE of Baxter & Hur. Pkwy	Millers Creek	Huron River
O-39	S of Baxter E. of ITI	Millers Creek	Huron River
O-40	S of Baxter	Millers Creek	Huron River
O-41	S of Baxter (NE incin.)	Millers Creek	Huron River
O-42	S of Baxter E of ITI	Millers Creek	Huron River
O-43	S of Baxter E of ITI	Millers Creek	Huron River

Outfall ID #	Location of Discharge	Name of Receiving Water	Ultimate Receiving Water
O-44	S of Baxter	Millers Creek	Huron River
O-45	NE Hubbard & Huron Pkwy.	Millers Creek	Huron River
O-46	E Hubbard & Huron Pkwy.	Millers Creek	Huron River
O-47	E. Huron Pkwy (SW corner Northwood 5)	Millers Creek	Huron River
O-48	SW Hubbard & Huron Pkwy.	Millers Creek	Huron River
O-49	Varsity Tennis Retention Pond	City of Ann Arbor	Malletts Creek
O-50	Varsity Tennis Driveway	City of Ann Arbor	Malletts Creek
O-51	Eisenhower and Briar Wood Circle – south	City Retention Pond	Malletts Creek
O-52	Eisenhower and Briar Wood Circle – middle	City of Ann Arbor	Malletts Creek
O-53	Plaza Drive and Briar Wood Circle	City of Ann Arbor	Malletts Creek
O-54	Eisenhower and Industrial Parkway	City of Ann Arbor	Malletts Creek
O-55	Wolverine Tower – north	City of Ann Arbor	Malletts Creek
O-56	Wolverine Tower – south	City of Ann Arbor	Malletts Creek
O-57	Wolverine Tower – east	City of Ann Arbor	Malletts Creek
O-58	State Street Commuter Lot	Malletts Creek	Malletts Creek
O-59	University Stores	City of Ann Arbor	Malletts Creek
O-60	E.Washington Heights and North of Burnham House	School Girls Glen	Huron River
O-61	E.Washington Heights and North of Burnham House	School Girls Glen	Huron River
O-62	E.Washington Heights and south of E.Medical Center Dr.	School Girls Glen	Huron River
O-63	Southeast of E.Medical Center Dr.	School Girls Glen	Huron River
O-64	Northwest Mitchell Field	Huron River	Huron River
O-65	S. State Street Parking Lots SC-34 and SC-39 connecting roadway	Tributary of Malletts Creek	Malletts Creek
O-66	Hill Street E of Greene Street and W of RR tracks	City of Ann Arbor	Allens Creek
O-67	S. State St. at Hill St.	City of Ann Arbor	Allens Creek
O-68	Tappan Avenue at Hill	City of Ann Arbor	Allens Creek
O-69	S. Forest St. at Willard St.	City of Ann Arbor	Allens Creek
O-70	Madison Avenue at Fourth Avenue	City of Ann Arbor	Allens Creek
O-71	E.Madison Ave W of Packard Rd.	City of Ann Arbor	Allens Creek
O-72	S. University Avenue at Oxford Rd.	City of Ann Arbor	Malletts Creek
O-73	Jefferson at Division St.	City of Ann Arbor	Allens Creek

Outfall ID #	Location of Discharge	Name of Receiving Water	Ultimate Receiving Water
O-74	W-11 Parking lot (NE corner) - Krause St.	City of Ann Arbor	Allens Creek
O-75	4th St. and William St.	City of Ann Arbor	Allens Creek
O-76	S.State St.at Huron St.	City of Ann Arbor	Allens Creek
O-77	North Ingalls at Kingsley	City of Ann Arbor	Huron River
O-78	Fuller Street W of Glenn (UM Grounds Maintenance Shop area)	City of Ann Arbor	Huron River
O-79	Wall Street at Island Drive	City of Ann Arbor	Huron River
O-80	Island Drive N of Wall Street	City of Ann Arbor	Huron River
O-81	Southeast Canal St.	City of Ann Arbor	Huron River
O-82	NC-62 Parking Lot (NE corner) - N of Baxter Rd.	Millers Creek	Huron River
O-83	NC-61 Parking Lot (SW corner) - N of Baxter Rd.	Millers Creek	Huron River
O-84	Glazier Way (NE corner) at Huron Parkway	City of Ann Arbor	Millers Creek
O-85	Hubbard & Hayward Parking Lot NC-53	Tributary of Millers Creek	Millers Creek
O-86	Green Road Commuter Parking Lot - NW	Millers Creek	Huron River
O-87	Plymouth Rd - E of Earhart Rd	City of Ann Arbor	Fleming Creek
O-88	Fuller Road - E. of Bonisteel	City of Ann Arbor	Huron River
UNIVERSITY OF MICHIGAN - DEARBORN CAMPUS			
DOF-001	West Outfall at Rouge River, W. of Fairlane Drive	Rouge River	Rouge River
DOF-002	Henry Ford Estate 1, at Rouge River, W. of Fairlane Drive	Rouge River	Rouge River
DOF-003	Henry Ford Estate 2, at Rouge River, W. of Fairlane Drive	Rouge River	Rouge River
DOF-004	Henry Ford Estate 3, at Rouge River, W. of Fairlane Drive	Rouge River	Rouge River
DOF-005	Henry Ford Estate 4, at Rouge River, W. of Fairlane Drive	Rouge River	Rouge River
DOF-006	South Outfall at Rouge River, W. of Fairlane Drive	Rouge River	Rouge River
DOF-007	19000 Hubbard Drive E. of Evergreen (Fairlane Center)	City of Dearborn	Rouge River
UNIVERSITY OF MICHIGAN - FLINT CAMPUS			
FOF-001	Pavilion at Union St.	City of Flint	Flint River
FOF-002	Harrison St. at Union St.	City of Flint	Flint River
FOF-003	E. of Hamilton Dam at Flint River	Flint River	Flint River

Outfall ID #	Location of Discharge	Name of Receiving Water	Ultimate Receiving Water
FOF-004	W. of Stevens St. Bridge, near E. Boulevard Drive	Flint River	Flint River
FOF-005	N. of Recreation Building, E. Boulevard, W. of Campus Drive	Flint River	Flint River
FOF-006	E. Boulevard, N. of Campus Drive	Flint River	Flint River
FOF-007	E. Boulevard, E. of Campus Drive	Flint River	Flint River
FOF-008	E. of Hamilton Dam in Riverbank Park	Flint River	Flint River
FOF-009	LAX - Kearsley at Harrison	City of Flint	Flint River
U of M - Other			
Categorical	Roads/Ditches within Urbanized Areas at UM		
Categorical	Buildings within Urbanized Areas at UM		

Appendix C

Storm Water Best Management Practice Examples for Operations at the University of Michigan

Storm Water Best Management Practice Examples for Operations at the University of Michigan

1.0 Introduction

The University of Michigan (UM) has two different systems to deal with the wastewater and storm water that is generated on campus. One of them is the sanitary sewer system and the other is the storm water drainage system.

The sanitary sewers collect the wastewater that is generated inside laboratories, offices, homes, and other buildings. This system delivers the wastewater to the local Wastewater Treatment Plant (WWTP) where it goes through a number of physical and chemical processes that remove pollutants and disinfect the water. After treatment at the plant, all of the treated water is discharged to the river.

The storm water drainage system is intended to prevent flooding by quickly diverting rain water and snowmelt away from areas where we do not want standing pools of water. Unlike the sanitary sewer system, the storm water drainage system does not provide treatment for the water. All water that flows down the storm drains is discharged directly into the river. As the water quickly flows over streets and sidewalks, it can carry contaminants with it down the drain. Care must be taken to prevent this from occurring because the river is the source of drinking water for many communities. If contaminants are carried into the river, they have the potential to harm the plants and animals that inhabit it and to degrade the quality of our drinking water.

Recognizing the impact storm water discharges have on the environment, the US Environmental Protection Agency began issuing municipal storm water permits under the National Pollutant Discharge Elimination System (NPDES). In 1995, the UM-A2 voluntarily applied for a storm water permit to support the goals of the NPDES program. Under the terms of the permit, the University is required to implement a storm water management program and regulate the materials that are discharged to its storm drains. The only materials that are permitted to enter the storm water drainage system are storm water runoff and clean untreated water from a few very specific sources.

One required component of the storm water management program is the development of best management practices (BMPs) that reduce the potential for discharges to the storm water drainage system. This document is intended to identify activities for UM Operations that have the potential to affect the quality of storm water discharges or the storm water drainage system and to assist in the development of appropriate BMPs.

Operations at UM are comprised of a wide range of activities throughout all of the University's campuses that have the potential to affect the storm water drainage system or the quality of storm water discharges; each division should therefore customize its own BMPs for the activities identified below. Many of the activities identified herein may be performed according to BMPs that are already in place or that are currently being

developed. Please note that this document is intended to provide an initial and inclusive assessment of the services at UM and the appearance of an activity in a list below does not necessarily mean that any of its current BMPs are inadequate or require revision.

2.0 Building Services

Building services maintains facilities to provide a clean, safe, and pleasant environment for the University of Michigan's students, faculty, and guests. Though many building services activities are performed indoors, some of them may still have the potential to affect the sanitary sewer and storm water drainage systems. The following activities and issues have been identified to have that potential:

- All waste handling procedures – Proper waste handling procedures are critical to maintaining effective drainage systems and ensuring that water quality standards are met. Written procedures and BMPs should be in place for all wastes that Building Services generates or disposes. Examples of possible wastes include, but are not limited to: mop water, de-scaling agents, and floor finish.

- Facility equipment – Having the proper means for waste collection and disposal is a necessary element of any waste management program. Each building on campus should be evaluated for the adequacy of its waste disposal facilities. Buildings without strainers for their drains should be identified for further investigation and management. In addition, proper chemical use and storage areas should be established and maintained in a manner so as to prevent the spillage or release of chemicals.

- Building plumbing and piping – The plumbing in facilities can be greatly impacted by the materials that flow through it. Materials that corrode or build up in building piping should never be allowed to enter a drain. Instead, these materials should be collected for disposal by the OSEH, CSS or EHS programs on campus. Please be advised that even dirt and other sediments have the potential to collect in piping and should therefore not be allowed to enter drains.

- Carpet and upholstery cleaning – Carpet and upholstery cleaning often generates large amounts of wastewater. This wastewater should never be discharged to the ground or be allowed to drain outdoors. When large-scale carpet and upholstery cleaning operations are going to take place, OSEH, CSS or EHS should be contacted for an evaluation of the wastewater disposal options. Specific guidance from the Michigan Department of Natural Resources and Environment is available on these activities if needed.

- Outdoor window washing – Outdoor window washing often involves the generation of wastewater. This water should not be discharged to the ground or be allowed to enter a drain outdoors. If any outdoor window or building washing

takes place, OSEH, CSS or EHS should be contacted for an evaluation of the wastewater disposal options, which may include acquiring state authorization to discharge to ground.

- Disaster cleanup – Disaster recovery efforts often involve the disposal of waste or the generation of wastewater. It is essential that all waste be managed in a proper way according to the established BMPs. In the case of flooding, water may come in contact with materials inside the building and should therefore be directed to the sanitary sewer.

- Pest management – When not used properly, pesticides have the potential to cause serious harm to the environment. BMPs should be developed and strictly followed for the use and storage of all pesticides and Integrated Pest Management procedures should be followed.

- Vehicle and equipment fueling – The University owns and operates a large vehicle fleet. When fueling vehicles or refilling fluids, care should be taken to avoid allowing fluids to drip or accumulate on the ground.

3.0 Construction Services

Construction services provides the University community with the resources, skills, equipment, and knowledge of a full service contractor. The activities in this section are comprised of the Cabinetry Shop, Masonry Shop, Paint Shop, Renovations, Sign Shop, and Upholstery Shop. Because many of the activities conducted by these divisions are performed outside, employees in these groups should be especially attentive to any actions that may affect the storm water drainage system. The following activities have been identified:

- Earthwork – Any work that disrupts the topsoil has potential soil erosion and sedimentation concerns.

- Concrete placement and cleanup – These activities often occur outdoors where there may not be facilities appropriate for washing equipment and disposing the unused or waste materials. Concrete and cement often contain large amounts of sediment that is unacceptable for discharge to both the storm water drainage system and the sanitary sewer system. The pH of these materials often makes them unacceptable for discharge as well.

- Brick cutting – When cutting brick, sediments may be generated that should not be allowed to enter the storm water drainage system or the sanitary sewer system.

- Masonry cleaning – The potential issues involved with masonry cleaning vary depending on the methods that are used. If the masonry is sand blasted, sediments

must be properly managed. In other cases, chemical treatments are used and the wastewater that is generated should not be allowed to drain onto the ground or enter the sanitary sewer or storm water drainage systems. Some materials of specific concern include acids, detergents, and materials containing phosphorus. Instead, all wastewater should be collected for proper disposal. OSEH, CSS or EHS may be contacted for an evaluation of the collection and disposal options.

- Exterior painting/handling of waste from exterior and interior painting operations – No materials involved in exterior painting should be allowed to affect the environment. If paint must be removed from a surface prior to painting, samples of the paint chips may need to be collected if it is suspected they contain lead. The wash water generated from washing brushes used to apply latex paint may be discharged to the sanitary sewer. Wash water containing oil-based paint however, should not be allowed to enter a sanitary drain and should be collected for disposal by OSEH. Any unused paint should be offered for re-use. If it can't be used, let small amounts of unwanted latex paint dry out and dispose of the can in the trash. Unusable oil-based paint and latex paint containing lead should not be allowed to dry out; instead, collect it for disposal by OSEH HazMat, CSS or EHS.

- Chemical usage, storage, and disposal – all chemicals should be used, stored, and disposed according to proper chemical hygiene practices. Some chemicals contain constituents that are not acceptable for discharge to the sanitary sewer. OSEH, CSS or EHS should be contacted if any questions arise about the appropriate method of disposal of certain materials. Examples of materials that might be investigated further are those used for carpet removal or glass repair.

- Graffiti removal – Any waste that is generated by graffiti removal operations should be collected for disposal and should not be allowed to discharge to the ground.

- Any other outdoor work – Any outdoor work that is not covered by the above topics should be evaluated by the UM department for potential storm water concerns.

- Vehicle maintenance – The University owns and operates a large vehicle fleet. When fueling vehicles or performing maintenance on them, care should be taken to avoid allowing fluids to drip or accumulate on the ground.

4.0 Facilities Maintenance

Facilities Maintenance provides building maintenance, operation, and environmental monitoring of campus buildings and facilities. Centralized service shops include HVAC, Plumbing, Pumps, Steam Distribution and Insulation, Electrical, Fire Systems, Elevators, Roofing, Metal Crafts, and Machine Repair. The following activities conducted by

Facilities Maintenance should be evaluated for potential storm water concerns and be carried out according to BMPs.

- Any outdoor work – Any outdoor work that generates waste or involves earth changes or excavations should be evaluated for potential storm water concerns.
    - Electric Shop – trenching and earthwork involved with outdoor lighting
    - Plumbing Shop – excavations, work involving the vacuum truck
    - Roofing Department – clean up procedures for roofing activities; cleaning of roof drains, gutters, and downspouts
    - Sheet metal – any outdoor work, disposal of metal shavings
    - Zone Maintenance – any activity that might impact the outdoors

- Flood abatement in elevator shafts and buildings – When floods occur, the water may come in contact with materials inside the building. As a result, the water should always be disposed in the sanitary sewer and in some cases it may need to be sampled prior to disposal.

- Work involving oil reservoirs in hydraulic elevators

- Work involving the restoration of compromised indoor plumbing – If plumbing is repaired due to excessive corrosion or plugging, OSEH, CSS or EHS should be contacted for an investigation into the cause of the problem and possible methods for preventing its recurrence.

- Asbestos abatement

- Parking Structures (water) annual wash down

- Proper storage, use, and maintenance of refrigerants

- Operation and maintenance of chiller systems

- Vehicle maintenance – The University owns and operates a large vehicle fleet. When fueling vehicles or performing maintenance on them, care should be taken to avoid allowing fluids to drip or accumulate on the ground.

5.0 Grounds and Waste Management

Grounds and Waste Management maintains campus grounds and landscaping, provides moving and trucking service, and manages waste and recycling collection. The employees of this department conduct a large portion of their work outdoors and they should therefore be especially watchful of all potential storm water concerns related to their activities. The following activities should be conducted according to BMPs.

- Application of herbicides and fertilizers – When not applied properly, herbicides and fertilizers have the potential to cause significant harm to the environment. Crews should be especially careful when using fertilizers containing phosphorus. Before applying fertilizers the soil should be tested and if possible, fertilizers with no or low phosphorus should be used.

- General lawn care and irrigation – Excessive irrigation can lead to increased amounts of storm water runoff. When landscaping or caring for lawns, efforts should be made to limit the amount of runoff that is generated.

- Use of mulch – Mulch is often placed under bushes and shrubs around the perimeters of buildings. Care must be taken to avoid allowing mulch to enter the storm water drainage system. In addition, if there are sanitary sewer manholes or storm water inlets in the area, they should be left exposed and not covered with landscaping materials.

- Vehicle maintenance – The University owns and operates a large vehicle fleet. When fueling vehicles or performing maintenance on them, care should be taken to avoid allowing fluids to drip or accumulate on the ground.

- Salt and sand use – Large quantities of salt and sand are applied to paved surfaces on campus during the winter months. The materials should be applied in a manner that minimizes their adverse impacts on the environment and University infrastructure.

- Pest management – Insecticides are another material that have the potential to cause great harm to the environment. These materials should be applied according to BMPs and in limited quantities. Whenever pesticides are used, Integrated Pest Management practices should be used.

- Tree planting or removal – Planting or removing trees may involve earth changes or excavations. In these cases, the disturbed earth should be managed in a manner that prevents it from entering the storm water drainage system.

- Mowing – grass clippings generated from mowing operations should not be left on sidewalks or other paved surfaces and they should never be allowed to enter the storm water drainage system.

- Seeding – Areas of land where new grass seed is being planted should be covered so as to prevent soil erosion and sedimentation.

- Rototilling – Tilled areas should not be left uncovered or exposed to prevent soil erosion and sedimentation.

- Waste management activities – All dumpsters and waste disposal and collection areas should be kept clean. In addition, all outdoor dumpsters should be covered.

6.0 Utilities and Plant Engineering

Utilities and Plant Engineering provides for the purchasing, generation, distribution, conservation, and accounting of utilities for the University. This department also provides engineering for operations, maintenance, energy management, and utilities. The following activities should be conducted according to BMPs.

- All outdoor electrical work involving trenching, excavation, or other earth changes

- Operations and Maintenance activities – Operations planning, environmental trouble shooting, and preventative maintenance should all be conducted with regard to possible storm water concerns.

- Vehicle maintenance – The University owns and operates a large vehicle fleet. When fueling vehicles or performing maintenance on them, care should be taken to avoid allowing fluids to drip or accumulate on the ground.

7.0 Work Control Group

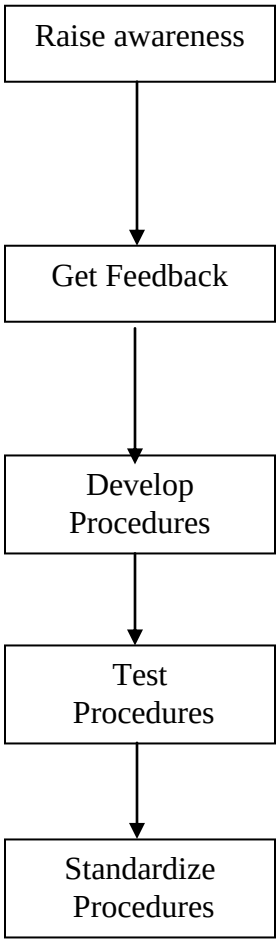
Work Control serves as the single point of contact for Plant Operations with the University community. Using the Facilities Management System, work requests are created, triaged, and sent to the responsible shop for completion. Work Control is also responsible for all estimates and preventive maintenance planning. The following activities should be conducted according to BMPs.

- Estimating – All estimates should include costs for storm water controls

- Vehicle maintenance – The University owns and operates a large vehicle fleet. When fueling vehicles or performing maintenance on them, care should be taken to avoid allowing fluids to drip or accumulate on the ground.

8.0 Developing BMPs

Because the UM employees are most familiar with the work that they do, BMPs will be most effective and easiest to implement if the employees themselves develop them. The process of developing BMPs consists of multiple steps and OSEH, CSS and EHS will be available to guide departments through each of them. The following chart provides a general outline of the process.



Before BMPs can be developed, employees must be aware of the need for them. All UM employees should receive awareness training so they understand the impacts that storm water discharges have on the environment and they recognize the practical and legal importance of maintaining the quality of those discharges.

After employees receive awareness training, they will be asked to evaluate their work activities to determine whether or not they have potential storm water concerns. At this point, employees should also document current practices to serve as a benchmark. Practices should be documented often, especially after revisions are made.

After all of the activities with potential concerns have been identified, OSEH, CSS or EHS will work with departments to develop BMPs a needed. Any obstacles to developing and implementing BMPs will be identified and addressed.

After the draft BMPs have been developed, they will be tested and used in daily activities. If problems are identified, the BMPs may be revised and re-tested. This refinement process may take multiple iterations before the BMPs are feasible and effective at accomplishing their goals.

After the BMPs have been refined and it has been determined that they achieve their desired results, they should be formally documented and made standard practice. At this point all current and new employees should be made aware that they are expected to conduct their business activities according to the written procedures.

Appendix D

Storm Water System Dye Testing Guidelines for UM-A2

STORM WATER SYSTEM DYE TESTING GUIDELINES

The guideline below is for dye testing of the storm water and sanitary sewer systems on the University of Michigan (UM) Ann Arbor Campus. Dye testing is conducted as part of University of Michigan Storm Water Municipal Certificate of Coverage No. MIS040090 in order to check for illicit connections. Dye testing is regulated under Rule 97 of Michigan Water Quality Standards. This regulation requires that the Michigan Department of Environmental Quality (MDEQ) approve all dye testing.

1) Call Occupational Safety & Environmental Health (OSEH) at 936-1920, **twenty-four (24) hours** prior to any dye testing. The MDEQ requires this advance notice.

2) Provide the location of the proposed dye test. Be specific, so that the potential receiving water can be determined by OSEH through a review of the campus storm water system maps. If a possible cross connection is suspected or there is potential of visible dye reaching a water body, contact the Plumbing Shop foreman at 647-2038, to have the UM vacuum truck (or other equipment) available to remove any dye from the storm water drainage system.

3) OSEH will forward this information to the MDEQ Jackson District Office. OSEH will also notify other units on campus that should be aware of the activities, such as the Plumbing Shop, the Department of Public Safety and the OSEH on-call emergency responder. OSEH will also contact the City of Ann Arbor Waste Water Treatment Plant, the Washtenaw County Drain Commissioner, and Washtenaw County Department of Environmental Health.

4) After the dye testing notification has been made, dye can be obtained from the Plumbing Shop foreman. Before obtaining the dye, review the guidelines and sign the attached form agreeing to follow these guidelines. Follow the manufacturer's recommendation on the amount of dye used. Norlab, Inc. liquid powder tracing dye yellow green is the approved color for use on campus. Norlab, Inc. recommends using 1 oz. dye per 250 gallons of water or 1 oz. of dye per 100 gallons of water with high turbidity.

5) Check for dye downstream of the testing location in manholes on the storm and sanitary systems to determine the sewer line connections. The time required for monitoring will vary, depending on flow in the lines that are tested. In order to make sure the test is properly conducted, the individual checking the downstream manholes should be in place prior to the introduction of the dye. Based on the circumstances at each location, additional people may be needed to monitor multiple locations. It is recommended that radios be utilized to maintain contact during the dye test.

6) If connections to the storm water drainage system are suspected, have the vacuum truck available and positioned by what is thought to be a downstream storm water manhole. If necessary, use the vacuum truck to remove any of the water and dye

from the storm water system prior to it reaching a water body. Discharge the dye and water mixture to an approved sanitary sewer location.

If any illicit connections are discovered, report them to OSEH **immediately**. Provide information about the actions that will be taken to prevent the illicit discharge (if possible) and to correct the cross connection. OSEH will verbally notify the MDEQ Jackson District Supervisor within 24 hours of any confirmed illicit connection that is suspected of being a danger to health or the environment as specified under NPDES Certificate of Coverage #MIS040090. For discharges that do not pose imminent danger to health or the environment, OSEH will provide notification to the MDEQ Jackson District Supervisor, verbally or in writing, within 5 days of discovery. Written documentation will be submitted to the MDEQ within 14 days in either case. This information is also included in the permit reports, which are submitted to the MDEQ.

These dye testing guidelines will be reviewed on a periodic basis to determine if any modifications are required. Contact OSEH at 936-1920 with any questions regarding this guideline.

Revised: January 2010

I have reviewed the storm water system dye testing guidelines and agree to follow these guidelines.

Print Name	Signature	Date

Appendix E

Dry Weather Screening Program Guidelines

Dry Weather Screening Program Guidelines for the University of Michigan

January 2010

The guideline below is for dry weather screening of the storm water system at the UM. The purpose of the dry weather screening program is to preliminarily determine the existence, location and extent of possible illicit discharges into the UM storm water system. The screening program will target discharge points within the storm water system to evaluate non-storm water flow. Where non-storm water flows are present at the screening points, samples will be collected for observations of physical properties and measurements of specific chemical parameters. Evaluation of both the physical properties and the chemical parameters provide information about the presence of possible illicit discharges into the system.

1. Selection of Sample Points

For the purposes of dry weather screening, the UM Ann Arbor campus will be divided into four sampling region (I-IV). The UM-D and UM-F campuses together represent sampling region V.

Dry weather screening will be performed on each campus region, until the UM campuses have been covered within the 5-year cycle, which begins in February 2010. Typically, four or five rounds of screening are performed over the 5-year cycle. The outfall priority list will be utilized to set the sampling regions at UM-A2. Each MS4 discharge point will be screened, a minimum of every 5 years. Each outfall will be referenced by its assigned unique identification number/code for tracking purposes.

2. Sampling Procedures

At each dry-weather screening point, the storm water drainage system is observed for flow. If no flow is observed, the result is recorded and the next location is evaluated. If flow is observed, an initial sample is collected and a follow-up sample is collected between 4 and 24 hours later.

At points where flow is observed, visual/olfactory inspections for color, odor, clarity, suds, oil sheens, bacterial sheens/algae/slimes, staining of the banks, unusual vegetative growth and floatables are logged; the pH, temperature, and estimated flow rate are recorded; samples are collected and analyzed for ammonia and surfactants either utilizing field kits or through laboratory analysis; and the flow is backtracked to the source building, structure, or inlet. When samples are collected, the sample collection device is cleaned and rinsed with distilled water before use at subsequent sampling locations. The flow rate may be estimated by measuring the cross-sectional area of the flow and estimating the velocity by using the most practicable method. The flow rate may alternatively be estimated by measuring the volume of water collected over a specific time period at an outfall.

3. Weather Conditions

Because the purpose of field screening is to identify illicit discharges, all field screening activities must take place during dry weather. For the purposes of this program, dry weather conditions are defined as less than 0.1inch of rain during a 48 hour period. Sampling will not occur for 72 hours after a major storm event, defined as more than 1 inch of rain over a 24 hour period. Sampling will also not occur for at least 48 hours after the end of the event for rain events between these limits.

Some rain events may be too short or too low an intensity to cause storm water to enter the storm water drainage system. It will be the responsibility of the field sampler to determine whether or not it is appropriate to postpone sampling if precipitation occurs during field screening activities. In the event that non-dry weather conditions arise in the time between two sample collections at a single location, the first sample will be repeated and a second sample will be collected between 4 and 24 hours later.

4. Parameters for Evaluation

Table A lists the physical and chemical parameters that are evaluated during field screening activities. Field test kits or laboratory analysis will be used for the chemical analyses of water samples collected during the field screening activity.

Table A – Physical and Chemical Parameters

Physical	Chemical
Temperature	pH
Color	Ammonia
Odor	Surfactant/Detergent
Clarity	Phenol
Suds	Copper
Oil Sheen	Chlorine
Sewage	
Bacterial Sheen	
Algae & Slimes	
Staining of Banks	
Unusual Vegetative Growth	
Floatables	
Undocumented Connections	
Structure Integrity	

- Chlorine
  Chlorine is a highly reactive gaseous element not found in nature. In aqueous solution, chlorine has strong oxidizing properties and is an excellent biocide. It is commonly used to treat potable waters, municipal wastes, and swimming pools. Chlorine is also used in the manufacture of many chemical products including insecticides, plastics, solvents, and cleaning agents. The presence of chlorine in water samples may indicate the presence of household or non-domestic discharges.

- Copper
  Copper is found naturally in the Earth's crust and is often used as a catalyst in oxidation reactions. Copper is also an important component of fungicides and insecticides. Copper-containing fungicides are often used to control biological growth in non-potable water systems. Copper and its compounds are used extensively in the electrical industry, agricultural chemicals, and in analytical chemistry.

- Detergent/Surfactant
  Detergents enter waters and waste waters mainly by discharge from laundering and other cleaning operations. Detergents impart properties such as foaming, emulsification, and particle suspension to receiving waters. Concentrations of detergents in typical domestic wastewater are found in the range of 1 to 20 mg/L. Generally, detergents are found in natural waters at levels less than 0.1 mg/L, except near an outfall or other point of entry.

- pH
  Natural waters usually have pH values in the range of 4 to 9, and most are slightly basic because of the presence of bicarbonates and carbonates of the alkali and alkaline earth metals. Typical potable well waters have pH values ranging from 6.5 to 8 and the City water has a pH as high as 9.5. A pH value outside of those limits may indicate the presence of an illicit discharge.

- Phenols
  Phenols are the simplest forms of a group of organic chemicals that include cresols, xylenols, and catechols. Phenols are also common ingredients of disinfectants. The presence of high concentrations of phenols can indicate contamination from a waste discharge.

- Temperature
  Temperature extremes, either high or low, may indicate the presence of illicit discharges.

5. Identification of Illicit Discharges

Follow-up tracking activities will be initiated if the dry weather screening and sampling identifies a discharge. In such an event, the following procedures will be carried out:

- The storm water system maps will be checked to identify potential sources of the discharge.
- Additional access points will be reviewed between the identified sample point and other potential discharge points if available.
- Connections will be surveyed inside the building once a discharge is tracked back to a specific facility. This may involve a review of construction plans, dye testing, in-line camera work, or other measures.
- Follow-up actions will be initiated as discussed in Section 5.6 of the SWMPP once the connection is specifically identified.

6. Quality Assurance and Quality Control (QA/QC)

The QA/QC procedures for the field screening work are designed to assure that the information obtained is precise, complete, and reliable. The QA/QC procedures are:

- One person in each crew will fill out the log sheets. The other crew member will check the sheet for completeness, verify the location information, and initial the form prior to leaving the screening location.
- Duplicate analyses will be run routinely on 5 percent of the samples.
- The field supervisor will routinely check the sampling procedures used by the field crews.
- The field supervisor will check the field logs each day to ensure that they are filled out completely, that re-sampling is done as necessary, and that duplicate analyses are performed.
- A retest will be conducted for constituents with values outside of a specified range. A third test will be performed if the second test shows a substantially different result. All results will be recorded on a data sheet. The specified ranges that require a retest are specified in Table B below:

Table B – Analytical Results Requiring a Retest

Analyte	Result
Chlorine	> 5 mg/L
Copper	> 12 mg/L
Detergents	> 5 mg/L
pH	< 6.0 or > 9.0
Phenols	> 10 mg/L

Appendix F

Storm Water Management Basin List

Appendix F: Storm Water Management Basin List

UM utilizes several storm water management basins which are located throughout the campus. Basins outside of the regulated Urbanized Area are identified by an asterisk (*). The following structures receive direct runoff from the UM storm water system:

Basin ID	Basin Name
B-01*	Arbor Lakes Basin #1 (Northwest)
B-02*	Arbor Lakes Basin #2 (Southeast)
B-03	East Arbor Health Center Basin
B-04	Eisenhower Corporate Park Basin
B-05	Fuller Park Parking Lot Basin (City-owned)
B-06	M-76 Wall Street/Maiden Lane Parking Lot Basin
B-07	Moore Music Building Basin
B-08	North Campus Administrative Complex Basin #1 (North)
B-09	North Campus Administrative Complex Basin #2 (Northwest)
B-10	North Campus Administrative Complex Basin #3 (Southwest)
B-11	North Campus Administrative Complex Basin #4 (Southeast)
B-12	North Campus Administrative Complex Basin #5 (East)
B-13	North Campus Biomedical Engineering Basin
B-14	North Campus Commuter Lot Basin #1 (North)
B-15	North Campus Commuter Lot Basin #2 (Central)
B-16	North Campus Commuter Lot Basin #3 (South)
B-17	North Campus Grounds Pond #1 (West)
B-18	North Campus Grounds Pond #2 (East)
B-19	North Campus Constructed Wetland (4 cells)
B-20	SC35 Parking Lot Basin
B-21	State Street Commuter Lot Basin
B-22	University of Michigan Hospital and Health Center Basin
B-23	University Golf Course Basin
B-24	Varsity Tennis Center/Women's Gymnastics Facility Basin
B-25*	Matthaei Botanical Gardens Constructed Wetlands
B-26*	Matthaei Botanical Gardens Willow Pond
B-27*	Matthaei Botanical Gardens Parker Pond
B-28	North Campus Contractor Lot Basin
B-29	South Campus Contractor Lot Basin
B-30	Tennis Center Road Swale & Basin
B-31	East Ann Arbor Health Center Wetland #1 (West)
B-32	East Ann Arbor Health Center Wetland #2 (East)
B-33	East Ann Arbor Health Center Wetland #3 (North)
B-34	State Street Commuter Lot/ Tennis Center Road
B-35	North Campus Research Complex Basin #1
B-36	North Campus Research Complex Basin #2

Basin ID	Basin Name
B-37	North Campus Research Complex Basin #3 & 2 settling basins
B-38	North Campus Research Complex Basin #4 & 1 settling basin
B-39	North Campus Research Complex Basin #5 (2 sections) & 2 settling basins
B-40	North Campus Research Complex Basin A (2 sections)
B-41	North Campus Research Complex Basin B (2 sections)
B-42	North Campus Research Complex Basin C
B-43	North Campus Research Complex Basin D (2 sections)
B-44	North Campus Research Complex Basin E (3 sections)

Appendix G

Storm Water Management - Post Construction Requirements
(for construction & redevelopment projects at UM)

OSEH Occupational Safety & Environmental Health	OCCUPATIONAL SAFETY AND ENVIRONMENTAL HEALTH GUIDELINE

Subject: Storm Water Management – Post-Construction Requirements (EP3-001)		
Date: 07/28/2009	**Revision: 0**	**Page: 1 of 6**

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Appendix E	Post-Construction Storm Water Worksheet	

SUMMARY:

Construction and redevelopment projects on UM property are regulated under a National Pollutant Discharge Elimination System (NPDES) permit #MIS040090 for storm water discharges, as issued by the Michigan Department of Environmental Quality (MDEQ). The Storm Water Management Post-Construction Requirements Guideline has been developed to provide guidance regarding responsibilities and actions to meet the Permit conditions for construction and renovation projects on UM properties, which include but are not limited to, the Ann Arbor, Dearborn and Flint campuses.

The post-construction storm water plan for regulated projects is required to include:

1. A minimum treatment volume standard to address water quality impacts;
2. Channel protection criteria to address resource impairment resulting from flow volumes and rates; and an
3. Operation & Maintenance Plan

REFERENCE REGULATIONS:

Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq.)
Michigan Act 451, Public Acts 1994, as amended, Part 31.
Michigan Executive Orders 1991-31, 1995-4, and 1995-18.

SCOPE:

As required by the NPDES permit for UM, the scope of this Guideline includes all construction and renovation projects on UM properties that involve either:

a. earth disturbance of one (1) acre or greater,
   OR
b. earth disturbance of less than one (1) acre, but which are part of a larger common plan of development or sale that would disturb one (1) acre or more.

Note: "Regulated site" in this guideline refers to projects meeting a. or b. above.

ACRONYMS:

BMPs – Best Management Practices
EHS – Environment, Health & Safety at UMF and Environmental Health & Safety at UMD
MDEQ – Michigan Department of Environmental Quality
NOAA – National Oceanic & Atmospheric Administration
NPDES – National Pollutant Discharge Elimination System
O&M – Operation & Maintenance
OSEH – Department of Occupational Safety & Environmental Health
SOP – Standard Operating Procedure
TSS – Total Suspended Solids
UAO – University Architect's Office
UAs – Urbanized Areas
UM – The University of Michigan
UMD – The University of Michigan, Dearborn campus
UMF – The University of Michigan, Flint campus

RESPONSIBLITY:

This Guideline applies only to units involved in construction or renovation activities meeting one of the scope criteria. These responsibilities do not apply to units not involved in construction or renovation activities.

OSEH Executive Director

- Promote an environment where UM staff and other personnel are directed and encouraged to follow this guideline.

Directors & Facility Managers

- Provide support to units/staff with responsibilities for storm water management, including ensuring appropriate notifications, information, data, etc. are provided to OSEH or EHS (UMD & UMF).
- Assure that staff and contractors are aware of the requirements outlined in this guideline and instructed on the details of implementation in accordance with the NPDES permit. This includes providing information developed by OSEH/EHS to personnel

regarding the importance of storm water management planning and controls.

Program Managers & Supervisors

- Assure that staff and contractors are aware of the requirements outlined in this guideline and instructed on the details of implementation in accordance with the NPDES permit. This includes providing information developed by OSEH/EHS to personnel regarding the importance of storm water management planning and controls.
- Maintain documentation on all of the above and/or provide OSEH with data for tracking these activities.

AEC & Other Project Managers (Plant, Grounds, Athletics, UAO, etc.)

- Provide OSEH/EHS with advance notification of regulated projects.
- Work with the Project Developers & Contractors to ensure that the project prepares and implements site plans which incorporate the post-construction storm water requirements of the NPDES permit for UM (#MIS040090, April 2009), including the minimum treatment volume standard, channel protection criteria and operation & maintenance plan requirements.
- Work with the Project Developers & Contractors to provide the documentation, certifications and plans to UM-OSEH/EHS for the post-construction storm water controls.
- Initiate enforcement of the post-construction storm water control requirements, with OSEH/EHS support.

Project Developers & Contractors

- Submit the post-construction storm water plan with supporting documentation to UM-OSEH/EHS for review, comment and recordkeeping.
- Provide UM-OSEH/EHS with certification that the design complies with the post-construction storm water control requirements.
- Prepare and implement site plans which incorporate the post-construction storm water requirements of the NPDES permit for UM (#MIS040090, April 2009), including the minimum treatment volume standard, channel protection criteria and operation & maintenance plan requirements.
- Provide UM-OSEH/EHS with certification that the construction of the post-construction storm water controls meets the required volume and treatment standards identified in the permit.

OSEH / EHS

- Review and revise the Guideline.
- Coordinate the storm water management program for UM and act as primary contact with MDEQ. Administer and enforce (with the

support and participation of AEC and Other Project Managers) the storm water management program for UM, including developing and maintaining procedures, guidance, information, etc. to aid UM staff and contractors in complying with the post-construction requirements for storm water management on regulated sites.

- Develop, track and enforce (with the support and participation of Plant, Grounds, AEC and Other Project Managers) a program to ensure long-term O&M plans for the water quality treatment and channel protection controls installed as a requirement under this guideline.
- Maintain and retain records on post-construction storm water management for all regulated sites, in accordance with NPDES permit #MIS040090.

PROCEDURES:

1. The post-construction plan for storm water management on regulated sites shall include:

- A minimum treatment volume standard to address water quality impacts;
- Channel protection criteria to address resource impairment resulting from flow volumes and rates;
- Operation & Maintenance requirements.

Refer to UM NPDES permit #MIS040090 and the Post-Construction Storm Water Worksheet for additional details on these requirements.

The project team (AEC, Other Project Manager, Project Developer and/or Contractors) shall develop the post-construction storm water management plan in accordance with this guideline and the NPDES permit #MIS040090. Preferred design elements are identified in the Post-Construction Storm Water Worksheet.

1.1 Minimum Treatment Volume Standard

The minimum treatment volume standard shall be either:

a. One (1) inch of runoff from the entire site,
   OR
b. The calculated site runoff from the *90 Percent Annual Non-Exceedance Storms*, as summarized in MDEQ's memo dated March 24, 2006.

1.2 Minimum Treatment Volume Standard – TSS Removal

The treatment methods shall be designed on a site-specific basis to achieve the following:

a. A minimum of 80 percent removal of total suspended solids (TSS), as compared with uncontrolled runoff,
   OR
b. Discharge concentrations of TSS not to exceed 80 milligrams per liter (mg/l).

Note: A minimum treatment volume standard is not required where site conditions are such that TSS concentrations in storm water discharges will not exceed 80 mg/l.

2.0 Channel Protection Criteria

The channel protection criteria must 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. "Existing levels" means the runoff volume and peak flow rate for the last land use prior to the planned new development or redevelopment. More restrictive channel protection criteria may be utilized by UM on a case-by-case basis, as appropriate.

2.1 Rainfall data

The rainfall data for calculating runoff volume and peak flow rate shall be the *Rainfall Frequency Atlas of the Midwest*, 1992 (NOAA - Huff & Angel).

2.2 Methods for estimating pre- and post-development runoff

The methods used for estimating pre- and post development runoff shall follow curve number evaluations as described in MDEQ's *Computing Flood Discharges from Small Ungaged Watersheds*, June 2008.

3.0 Operation & Maintenance Plans

All structural and vegetative BMPs installed as a requirement under this section of the permit shall include a plan for maintaining maximum design performance through long-term operation and maintenance.

OSEH/EHS will oversee annual inspections of the BMPs, and report the findings to the facility manager(s) for remedy.

More frequent inspections of BMPs may be required, based on the O&M plan. All inspections, other than the annual inspection by OSEH/EHS shall be the responsibility of the facility manager. A copy of all inspection reports shall be forwarded to OSEH/EHS for recordkeeping.

4.0 Project Submittals

The project team (AEC, developer and/or contractors) shall submit the post-construction storm water management plan, all calculations, and BMP details, including TSS designed removal rates and the O&M plan to UM-OSEH/EHS for review and comment.

The project team must ensure that the storm water plan and all supporting information are deemed acceptable by UM-OSEH prior to beginning any earth disturbance.

A statement is required to be signed by a Professional Engineer familiar with the project, certifying that the design meets the minimum treatment

volume standard and channel protection criteria.

A second certification from the engineer is required after construction has been completed, stating that the as-built conditions meet the post-construction storm water requirements required in the permit.

5.0 Enforcement

OSEH/EHS will administer and enforce the storm water management program for UM, including developing and maintaining procedures, guidance, information, etc. to aid UM staff and contractors in complying with the post-construction requirements for storm water management on regulated sites. Enforcement may include, but is not limited to, letters of warning, stop work orders, withholding SESC permits, withholding payment to the contractor, etc. and shall be implemented with the participation of AEC or Other Project Managers at UM.

TECHNICAL SUPPORT: All referenced regulations and other documents are available through the OSEH Environmental Protection & Permitting Program (734-936-1920) or EHS at UMD (313-593-4914) or UMF (810-766-6763).

ATTACHMENTS:

A. UM Storm Water Permit – NPDES #MIS040090, April 2009
B. 90 Percent Annual Non-Exceedance Storms, March 2006 – MDEQ
C. Rainfall Atlas of the Midwest, 1992 – NOAA
D. Computing Flood Discharges for Small Ungaged Watersheds, June 2008 - MDEQ
E. Post-Construction Storm Water Worksheet

Appendix H

Receiving Water Quality Status & Stresses

- Huron River
- Rouge River
- Flint River

Receiving Water Quality Status & Stresses

- Huron River

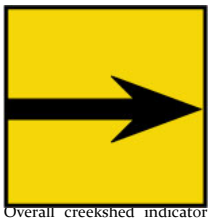
Environmental Indicators: Creeksheds

Overall creek condition fair, stable – but some creeks poor

BY MATT NAUD DECEMBER 2, 2009

Editor's Note: This is the first of what The Chronicle intends to become a series of pieces on the environmental indicators used by the city of Ann Arbor in its State of Our Environment Report. The report is designed as a citizen's reference tool on environmental issues and as an atlas of the management strategies underway that are intended to conserve and protect our environment. The newest version of the report is organized around 10 Environmental Goals developed by the city's Environmental Commission and adopted by City Council in 2007.

The first in the series is an introduction to the creeksheds indicator by the city's environmental coordinator, Matt Naud.



Overall creekshed indicator for Ann Arbor: fair (yellow) and stable (level arrow).

The overall creekshed indicator for the city is yellow (fair) and stable (level arrow). But that overall picture is composed of individual indicators for each of the creeksheds that drain into the Huron River – the central natural feature of Ann Arbor. More than 10 miles of the Huron are located within the city limits.

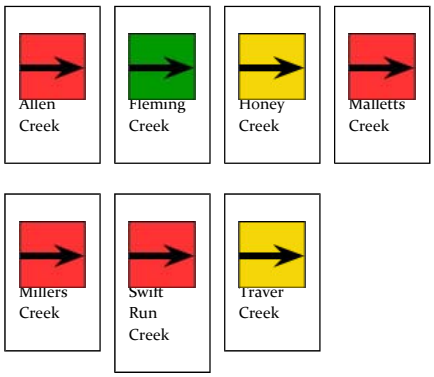
We assess individual creeksheds, not just the Huron River watershed as whole, because that allows us to focus on exactly the areas that need the most improvement. Seven different creeks within the city of Ann Arbor flow into the Huron: Allen Creek, Fleming Creek, Honey Creek, Malletts Creek, Millers Creek, Swift Run Creek and Traver Creek.

Individual Creeksheds in Ann Arbor

We used monitoring data from the Huron River Watershed Council to develop the individual creekshed indicator ratings.

The Huron River Watershed Council collected and analyzed the original data and provided input on the final indicator ratings. Adrienne Marino, an environmental programs assistant in the city's Systems Planning Group, developed the indicator pages and maps associated with each creekshed. Each of those pages provides a description of current conditions and links to more detailed fact sheets for each monitoring site within a creekshed.

The indicator icons below link to the respective pages for each creekshed (green is "good," yellow is "fair," red is "poor" – the level arrow indicates "stable"):



While the colors correspond to what seem like subjective judgments of "good," "fair," and "poor," those evaluations reflect a quantitative analysis. And the arrows reflect that this analysis has been performed over time for an evaluation of "stable" – neither getting better nor getting worse.

Data on Creeks: The Adopt-a-Stream Program

The long-term monitoring data on the physical and biological stream conditions – which we use for determining the creekshed indicators – are available through the Huron River Watershed Council's Adopt-a-Stream Program.

The HRWC's Adopt-a-Stream Program includes more than 400 volunteers, who monitor biological communities, water quality, and stream habitat at 71 river and tributary sites across the Huron River watershed.

What kind of data are gathered? On a single day in April and September of each year, a mix of trained and casual volunteers collect a sample of the benthic macroinvertebrate population at the stream sites. In January, volunteers search for winter stoneflies. During the spring, fall, and winter monitoring, volunteers collect a sample of stream water to measure conductivity. Volunteers also measure the weekly in-stream maximum and minimum temperatures in July and August, and assess the habitat quality of each study site once every few years.

What does this data look like? Here's an excerpt from the Fleming Creek survey:

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Site #   Location          Insects    EPT   Sensitive   5-yr trend
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  9      Fleming Creek:        12       7        2        Stable
         Botanical Gardens

Counts refer to the number of families caught.
EPT: Ephemeroptera-Plecoptera-Trichoptera (Mayflies-Stoneflies-Caddisflies)
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For the complete Fleming Creek survey report as well as the other Adopt-a-Stream data, visit the HRWC Adopt-a-Stream Monitoring Reports web page.

In more detail, the biological measures include:

- **Number of insect families:** Insect diversity, as measured by the number of different aquatic insect families, indicates good stream quality. Greater diversity at a site means the water is unpolluted, and there are healthy conditions for a variety of creatures.
- **Number of sensitive insect families:** Many benthic families living in the Huron River system are sensitive to organic pollution. The presence of these sensitive families at a site indicates that the site, and the upstream portion of it, has high quality.
- **Number of EPT families:** EPT denotes Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies). Many mayflies, stoneflies, and caddisflies are sensitive to the quality of a site, and a variety of these families present at a site is another indicator of good water quality.
- **Number of winter stonefly families:** Stonefly nymphs are extremely sensitive to most pollutants, and they cannot survive if a stream's dissolved oxygen concentration falls below a critical level. Presence of winter stonefly families is indicative of high water quality.

Physical measures include:

- **Habitat assessment score:** Based on creekshed-wide measurements of land cover, land use, and percent impervious surface, as well as site-specific habitat measurements including stream bottom composition, water temperature, and width of riparian vegetation. Some indicators of a high quality stream include stable banks with a broad corridor of native vegetation, riffles free of silt deposition, and stable water temperatures.
- **Conductivity:** An estimate of the total dissolved salts, or ions, in the water. A conductivity measurement of 800 µS is considered normal for the Huron River system.

Analysis of Creek Data

How are Adopt-a-Stream data analyzed? HRWC staff use the Wiley Stream Health Model, an integrative model created for the Huron River system by University of Michigan aquatic ecologist Dr. Mike Wiley. This model uses information about aquatic insect populations, stream habitat, stream temperature, and stream size – the kind of data collected through the Adopt-a-Stream program – to predict the overall health of a stream or river. Specific model inputs include biological and physical habitat measures.

In 2008, HRWC staff re-calibrated the model to the most recent data, and they have used it to make evaluations of stream health in the Huron River watershed.

The scores calculated using the Wiley model reflect the difference between expected versus observed numbers, measured in standard deviations. Adopt-a-Stream monitoring sites are thus rated as poor, fair, good, or excellent based on the Wiley Stream Health Model output. The descriptions corresponding to scores are as follows:

- >1 Excellent. Much better than an average stream of the same size
- >0 Good. Slightly better than an average stream of the same size
- <0 Fair. Slightly worse than an average stream of the same size
- <-1 Poor. Much worse than an average stream of the same size

So who decides what the overall indicator icon should look like – where we are now and where we are going? For the most part, it is the city's environmental commission, and specifically the State of Our Environment committee, that makes that determination. That committee meets monthly to review the indicators, update the data, and decide on what new indicators can be developed to help reflect our progress (or lack thereof) toward our environmental goals.

The city's environmental commission also makes decisions about where indicators fit within the city's 10 environmental goals. For example, the creekshed indicator is a part of the Viable Ecosystems Goal, not the Clean Water Goal. While many of the indicators could fit under more than one of the city's environmental goals, the environmental commission made a decision to place each indicator under just one goal to simplify the presentation.

Paths to Contribution

One of the goals of this series is to present some information about who's already working on improving indicator scores and to suggest some specific ways members of the community can contribute to achieving the city's environmental goals. All water resources planning initiatives by the city of Ann Arbor are summarized on the city's website.

For Allen Creek specifically, the Allen Creek Stormwater Initiative is a planning group that includes Ann Arbor Public Schools, University of Michigan, Allen Creek Watershed Group, Allen Creek Greenway Conservancy, Friends of West Park, the Huron River Watershed Council, and Peter Allen & Associates.

A website created as part of the Millers Creek Watershed Improvement Plan, funded by Pfizer Global Research and Development, summarizes and organizes activities for Millers Creek. One example is the Millers Creek Film Festival, which has an entry deadline of Feb. 2, 2010 – winning entries will be shown at the festival on March 19, 2010 on the big screen at the Michigan Theater.

Materials on the Malletts Creek Restoration Plan and contact information for the Malletts Creek Association are hosted on the county's water resources commissioner's website.

The water resources commissioner also operates a Riversafe Homes program for homeowners as a part of its water quality efforts.

And for all creeksheds, the HRWC Adopt-a-Stream program is a way for people to actually get out into the environment and lend a hand with data collection.

The purpose of sharing this indicator through The Chronicle is to share the State of Our Environment Report with the community and hear what you think. As the city's environmental coordinator, I will be following any comments readers leave here.

Readers who'd prefer to send an email can use MNaud [at] a2gov.org. An easy chance for an in-person chat would be when the city's environmental commission meets – the fourth Thursday of each month at 7 p.m. in the city council chambers at at city hall. Because of the Thanksgiving holiday, the commission's next meeting is on Thursday, Dec. 3.

Receiving Water Quality Status & Stresses

- Rouge River

Environmental Results To Date

The Long-Term Monitoring Network of the Rouge Project includes continuous measurement of Rouge River dissolved oxygen (DO) content at five key locations. Adequate dissolved oxygen content is one key element of a healthy river ecosystem. The DO measurements are made from mid-April through mid-November each year, and most sites have been monitored since 1994. Since the measurements are continuous, they show the combined effect of dry and wet weather conditions in the river. A review of the preliminary 2001 data from these long-term monitoring locations is summarized below.

The water quality in the Rouge River continued to show the very encouraging trend of continuous improvement because of these efforts and others. The MDEQ water quality standard for DO is 5 mg/l. The mean DO in the lower reaches of the Rouge River has increased from 4.5 mg/l in 1994 to almost 7.0 mg/l in 2001. The percent of DO readings that violated the DO standard of 5 mg/l dropped from 61 percent in 1994 to less than 4 percent in 2001. Similar improvements occurred at all stations in the watershed where those stations met the standard 100% of the time. The water quality improvements that are occurring clearly reflect the benefits of the watershed management strategies that have been implemented to address and control both dry and wet weather pollution sources in the watershed.

Because of these efforts and others, the water quality in the Rouge River continues to show significant improvement. For example, during the year 2000 at the lower end of the River the mean dissolved oxygen (DO) increased from 4.5 mg/l in 1994 to almost 7.0 mg/l in 2000. The percent of DO readings that violated the State water quality standard of 5 mg/l dropped from 61 percent in 1994 to less than 4 percent in 2000. Similar improvements occurred at all stations in the watershed where those stations met the standard 100% of the time. It is important to note that these figures are for the entire year, during both wet and dry periods. The water quality has not been at these levels in decades.

Coupled with the water quality improvements, the ecosystem health continues to improve as well. This improvement is demonstrated by the results of the 4th Annual Friends of the Rouge Frog and Toad Survey. Over 400 volunteers listened for the mating calls of nine different species of frogs and toads in the areas of Wayne, Oakland and Washtenaw Counties within the Rouge River Watershed. They heard a greater number of green frogs and northern leopard frogs during the 2001 survey than they did in the previous year.

Another indicator that the ecosystem health of the Rouge River is improving is by the presence of insects and other invertebrates. Friends of the Rouge Bug Hunt Days are an opportunity to see the amazing variety of aquatic insects, crayfish, snails and clams that make up the bottom of the river food chain. Twice a year, teams of volunteers visit sites throughout the headwaters of the watershed and search for mayflies, stoneflies and other aquatic invertebrates. The presence or absence of these streambed creatures reflects the quality of the water and habitat. May 2002 Spring Bug Hunt Results

Spring Bug Hunt Results - May 13, 2002

Friends of the Rouge

The Day

On Saturday April 13, 60 volunteers participated in the spring bug hunt despite rain that had been constant since the evening before. Luckily, the rain cleared, the sun came out, and the 10 teams were able to sample 18 sites. High water made it impossible to sample at one site. Following the sampling, 14 volunteers attended bug ID day on April 27. Bug ID day is an opportunity for volunteers to hone their identification skills by verifying field identifications. Nicole Vidales, an aquatic biologist from the MDEQ, further identified aquatic insects to family (team leaders only identify to Order).

Friends of the Rouge's benthic monitoring program was designed to involve a large number of volunteers in sampling the creeks of the Rouge River for the small insects, snails, clams and worms that live in the streambed. These organisms vary in their sensitivities to water pollution and the type and number of organisms found can be used to assess the health of a creek site. Volunteers sample two sites under the direction of a trained team leader. Samples of each organism are collected and field identifications are verified in the lab. The sampling program began May 2001 and is supported by a Volunteer Monitoring Program grant from the MDEQ and by the National Wet Weather Demonstration Project.

New This Spring

Five new sites were added this year, and the Waterford Bend site that had consistently dangerously high water was eliminated. New sites include two on the lower branch in Canton and three on the upper branch.

New Sites

1. Lower branch: Cherry Hill and Napier, Canton
2. South Fellows Creek (Lower): Ford and Ridge, Canton
3. Upper branch: Shiawassee Park, Farmington
4. Seeley Drain (Upper): 13 Mile and Haggerty, Farmington Hills
5. Tarabusi Creek (Upper): 8 Mile and Gill, Livonia

Spring sampling was scheduled earlier in the spring this year to avoid missing aquatic insects that hatch in the early spring. Future spring sampling will be scheduled in mid-April to maintain consistency.

Cherry Hill and Napier site
(Bob Belaire)

Comparisons to Last Spring

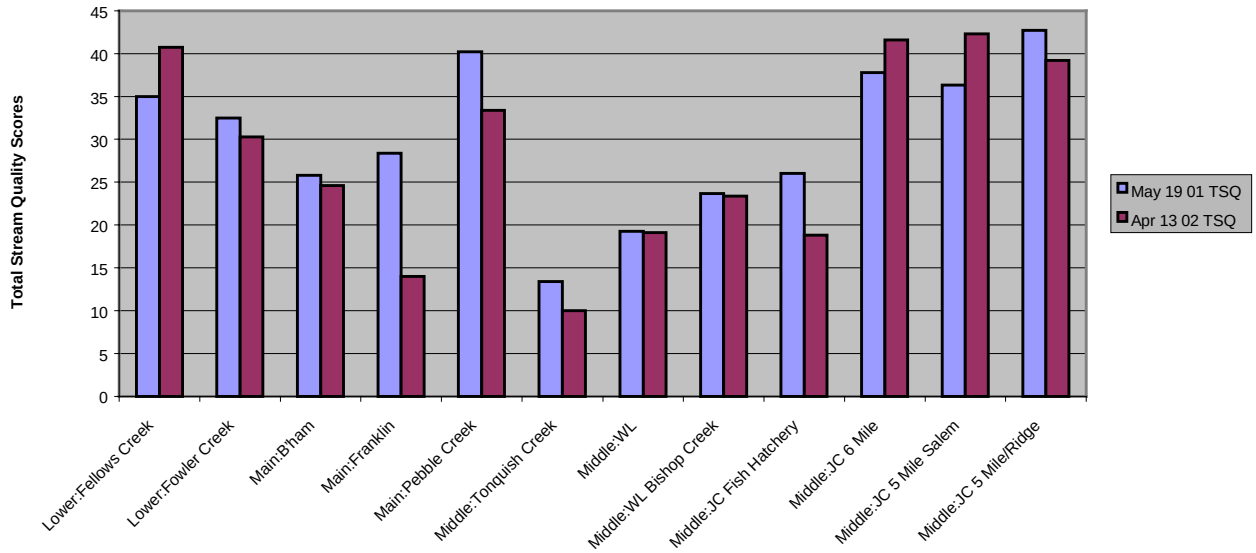
This is a long-term study and several years of gathering baseline data will be necessary before any true comparisons can be made. If volunteers are using consistent methods and sites are not changing, total stream quality scores (TSQ) and number of taxa for each site are expected to be similar from spring to spring. Observing the charts on pg. 2, TSQ scores and number of taxa were generally consistent for each site as compared to last spring.

Total stream quality scores are determined by allocating points to each type of organism found based on sensitivity and adding the numbers up. A higher score = a healthier site. In the Rouge, scores range from 2-45.

Taxa refers to the number of different families found and is a rough measure of diversity.

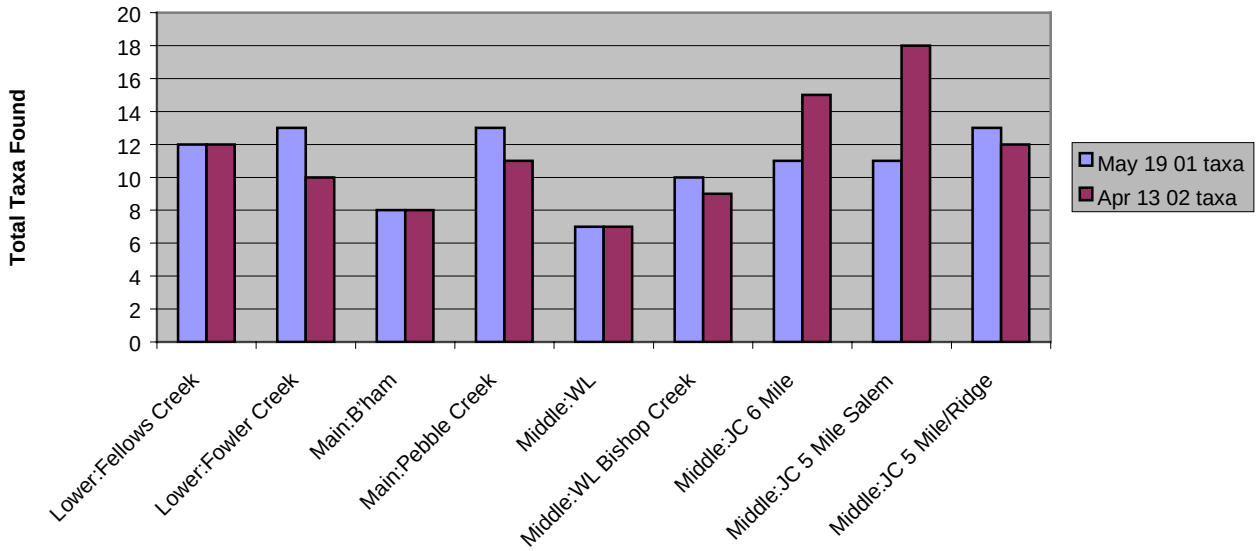
One site had far lower numbers than last year. The Franklin site at the Franklin Cider Mill had a TSQ score of 14 this spring, down from 28 last spring. While it is too early to draw any conclusions based on the data from 2 springs, there is concern about whether the intense construction at this site will have a long term effect.

Spring Bug Hunt 2001 & 2002
Total Stream Quality Scores



JC = Johnson Creek
WL = Walled Lake

Spring Bug Hunt 2001 & 2002
Taxa Found



New Families Found

Some new families of caddisfly were found this spring. Two of these families are considered very sensitive: humpless case makers (Brachycentridae) and saddle-case makers (Glossosomatidae). The humpless case makers were found by Tim Polonkey's team at the Johnson Creek site on 6 Mile. The saddle-case makers were found by Joe Rathbun's group at Seeley Drain. Additionally, Joe's group found long-horned case makers at Shiawassee Park.

Caddisfly larvae (Trichoptera) protect themselves from predators by building cases out of a variety of materials including grass, sticks, small pebbles, and even precious stones.

Dobsonfly larvae (Corydalidae) were found at 2 sites: Pebble Creek and the Johnson Creek on 5 Mile in Salem. This was the first time Friends of the Rouge volunteers found this very sensitive aquatic insect.

Perlodid stonefly
(Brian McEwen)

Stoneflies

Perlodid stoneflies were found at 4 sites this spring. This is double the number of sites from last spring and includes 1 new site: the Lower Rouge at Cherry Hill and Napier. The other sites were Fellows Creek, and the Johnson Creek at 6 Mile Road and at 5 Mile Road in Salem. Stoneflies are very sensitive and only found in very cold, clean, fast moving water.

Sampling at Johnson Creek
(Brian McEwen)

Friends of the Rouge website:
wwww.therouge.org

Public Involvement Programs
Sally Petrella
(313) 792-9621
picoordinator@therouge.org

Total Stream Quality Scores (TSQ) and Taxa Spring 2001 & 2002

stream	Apr 13 02 TSQ	Apr 13 02 taxa	Apr 13 sensitive families	May 19 01 TSQ	May 19 01 taxa
Lower:Fellows Creek	**40.7**	**12**	**Perlodidae**	35	12
Lower:Fowler Creek	**30.3**	**10**	**Perlodidae**	32.5	13
Lower: Cherry Hill E of Napier	**16.5**	**6.0**	**Perlodidae**		
Lower: S. Fellows	**23.5**	**12.0**			
Main:B'ham	**24.6**	**8**		25.8	8
Main:Franklin	**14**	**5**		28.4	
Main:Pebble Creek	**33.4**	**11**	**Corydalidae**	40.2	13
Main: Forest Lakes Outflow	**15.2**	**7.0**			
Middle:Tonquish Creek	**10**	**5**		13.4	
Middle:WL	**19.1**	**7**		19.3	7
Middle:WL Bishop Creek	**23.4**	**10**		23.7	9
Middle:JC Fish Hatchery	**18.8**	**8**		26	
Middle:JC 6 Mile	**41.6**	**15**	**Brachycentridae, Perlodidae**	37.8	11
Middle:JC 5 Mile Salem	**42.3**	**18**	**Corydalidae, Perlodidae**	36.3	11
Middle:JC 5 Mile/Ridge	**39.2**	**12**		42.7	15
Upper:Shiawassee Park	**17.2**	**6.0**			
Upper: Seeley Drain	**22.0**	**11.0**	**Glossosomatidae**		
Upper: Tarabusi	**18.2**	**6.0**			

Mark your calendar now for the
Fall Bug Hunt
Saturday, October 12

Receiving Water Quality Status & Stresses

- Flint River

State Government

Several State of Michigan agencies have jurisdiction within the Flint River basin. MDEQ administers statutes to protect the aquatic resource (Tables 8a and 8b). Under Part 301 of the Natural Resources and Environmental Protection Act (P.A. 451 of 1994), MDEQ is the lead agency in regulating: dredging and filling lake or stream bottoms, bridge, dam, and seawall construction, culvert installation, beach sanding, draining and filling of wetlands, placement of permanent fishing and boating piers, and boat ramp construction.

MDNR operates State game areas and State recreation areas providing public recreational opportunities within the Flint River basin. These include the Shiawassee State Game Area in Saginaw County, the Seven Lakes State Park and Holly State Recreation Area in Oakland County, the Ortonville State Recreation Area in Oakland and Lapeer counties, and the Metamora-Hadley State Recreation Area and Lapeer State Game Area in Lapeer County.

MDNR, Fisheries Division has designated sections of six streams as trout streams. These are: Kearsley Creek from the Oakland County line upstream to its origin; Duck Creek, Oakland County, from Section 8, Township 5 North, Range 9 East upstream to its origin; Thread Creek, Genesee County, from Section 33, Township 7 North, Range 7 East upstream to Oakland County, Section 5, Township 5 North, Range 8 East; the South Branch Flint River from Section 15, Township 7 North, Range 10 East, upstream to the Oakland County line including its tributaries; Gravel Creek, Lapeer County, from Section 19, Township 9 North, Range 11 East upstream to its origin; and Bottoms Creek, Lapeer County, from Section 20, Township 9 North, Range 11 East upstream to its origin. This designation sets the water quality standards for that reach and governs fishing seasons and fishing gear that can be used.

Water Quality

Overview

Water quality for Michigan streams is protected by law for specific designated uses (MDEQ 1998a). The law protects for multiple use of a river system and the water resource. The protected designated uses for the Flint River are aquatic life and wildlife support; agricultural, industrial, and municipal water supply; navigation; partial body recreation; and total body contact recreation (MDEQ, 1997a). MDEQ, Surface Water Quality Division is the lead regulatory agency for water quality in Michigan. To protect water quality, Michigan has developed Water Quality Standards after the Natural Resources and Environmental Protection Act (P.A. 451 of 1994) (MDEQ 1997a).

Water quality affects aquatic life and is critical in determining the health of a watershed. Many water-degrading pollutants demand oxygen during their breakdown process. This can limit or even eliminate oxygen needed to support fish and other aquatic organisms. Nutrients can lead to excessive aquatic vegetation that can further deplete oxygen concentrations through decay and bacterial respiration. Metals, pesticides, and other toxic chemicals can accumulate in the aquatic food chain and may have harmful effects on fish and aquatic organisms. Sedimentation can inundate fish and macroinvertebrate habitat and can suffocate eggs affecting survival. Other pollutants may pose human health threats affecting use of a river system.

A complete review of Flint River water quality is not within the scope of this report, however, a brief discussion on historic and current water quality parameters is appropriate. Detailed accounts of Flint River water quality are available from MDEQ (2000), MDEQ (1994a), MDEQ (1994b), MDNR

(1988), Roycraft and Buda (1979), Beck (1977), Wuycheck (1977), and Michigan Water Resources Commission (MWRC) (1969).

Historical information on water quality upstream of Flint is limited. In general, water quality was considered fair to good depending on the location. High nutrient content, particularly with phosphate, has been a concern in the North and South Branch Flint rivers, Holloway Reservoir, and Mott Lake (Bryant 1992; D. Nelson, MDNR, Fisheries Division, personal communication). Accelerated nutrient loading has been attributed to nonpoint source runoff from agricultural land in some river reaches.

Historically, the Flint River downstream of Flint suffered from poor water quality due to unregulated discharges by industries and municipalities. Also, unstable flow resulting from watershed development and systematic land drainage exacerbated water quality problems. During high flow periods, pollutant transport is accelerated. During low flow periods, flow augmentation by the manipulation of upstream dams aids in discharge dilution. In 1969, Flint River water quality downstream of Flint was severely degraded (MWRC 1969). Degraded water quality, caused by treated and untreated waste discharge, persisted into the late 1970s (Roycraft and Buda 1979). Water degradation was attributed to the presence of fecal coliform bacteria, low dissolved oxygen, plant nutrients, oils, and toxic substances. By the mid-1980s, after municipal wastewater treatment plant renovations and implementation of more restrictive water quality standards, water quality showed some improvement with declines in total phosphorus, ammonia, biological oxygen demand, and suspended solids. However, water quality monitoring from 1991 to 1993 found the Flint River to have the most degraded water quality among the Saginaw River tributaries (MDEQ 1994a). Compared to other Saginaw River tributaries, the Flint River was ranked as a high priority of concern for total phosphorus, biological oxygen demand, and chlorophyll *a*. Also, the Flint River had the highest concentrations for all parameters except total suspended solids and nitrite-nitrate (MDEQ 1994a).

Point Source Pollution

Point source pollution is regulated by the Clean Water Act (P.A. of 1972). National Pollution Discharge Elimination System (NPDES) permits issued by MDEQ, Surface Water Quality Division (SWQD) regulate point source discharges. There are 201 permitted discharges in the Flint River watershed (Table 9). These include storm water discharge from industrial activities (141), individual permit discharge (40), waste water discharge from petroleum or gasoline clean up activities (8), waste water discharge from stabilization lagoons (7), non-contact cooling water discharge (3), waste water discharge from municipal potable water supply (1), waste water discharge from sand and gravel mining (1), and waste water discharge from hydrostatic pressure testing (1). There are no combined sewer overflows permitted in the Flint River basin. Major municipal dischargers in the Flint River basin include the Lapeer, Flint, Genesee County Ragnone, and Flushing wastewater treatment plants (MDEQ 1994b).

Flow augmentation for effluent dilution is a special condition of the Flint Waste Water Treatment Plant (WWTP) NPDES permit. Under the terms of the NPDES permit, during the period that waste water discharge is authorized, the city of Flint shall carry out the Holloway Reservoir Management Plan (HRMP) in order to maintain a 95% exceedence flow of approximately 85 cfs immediately above the Flint WWTP outfall. The HRMP further requires the city maintain a minimum outflow of 65 cfs until the level of the reservoir falls to an elevation of 752.7 feet. Once at an elevation of 752.7 feet, the city shall operate the dam such that outflow does not exceed the inflow. However, during drought periods, Holloway Reservoir outflow can drop below inflow due to evaporation of reservoir water.

MDEQ works with industrial and municipal dischargers to maintain compliance and not cause water quality degradation beyond that allowed by State Water Quality Standards. Regulated industrial sources are required to implement pollution prevention for storm water discharge. However, non-regulated storm water dischargers implement little or no pollution prevention and can have significant effects on water quality.

Nonpoint Source Pollution

Nonpoint source is a pollutant that does not originate at a specific point of discharge and enters surface water through either atmospheric deposition or water transport. Nonpoint pollution is made up of sediments, nutrients, bacteria, organic chemicals, and inorganic chemicals. They are diffuse, often intermittent, and are often difficult to identify or quantify. Airborne pollutants are carried by winds, and deposited in watercourses directly, or on land and are transported as surface water runoff. Other sources of water transported pollutants include septic systems, stream bank erosion, agricultural erosion, fertilizers, and pesticides, road crossing erosion, construction sites, animal wastes, urban runoff, forest erosion, residential fertilizers and pesticides, golf courses, irrigation, and mining.

Nonpoint source pollution is a significant contributor to Flint River water quality degradation. Wind and water erosion of agricultural land, resulting in sediment and nutrient loading, is the largest source of nonpoint pollution in the Saginaw River watershed (MDEQ 1994b). Storm water runoff from urban areas also contributes significantly to sediment and nutrient stream loading in the Flint River, and on a per unit area basis, exceeds agricultural contributions (MDEQ 1994b).

Nonpoint source pollution issues may be addressed through best management practices (BMPs) that have been developed and distributed by MDEQ, SWQD and the Natural Resources Conservation Service (Peterson et al. 1993). BMPs are structural, vegetative, or managerial practices used to prevent, treat, or reduce negative effects to water quality. Also, studies, plans, and practices continue to be developed and implemented by communities at the local level, using grant awards and incentive payments that target nonpoint source pollution prevention and remediation.

Sites of Environmental Contamination (Part 201 Sites)

MDEQ, Environmental Response Division (ERD), has identified 134 sites of environmental contamination within the Flint River watershed (Table 10). These sites are regulated under Part 201 of the Natural Resources and Environmental Protection Act (P.A. 451 of 1994). This act provides for identification, risk assessment, evaluation, and clean up of these sites. Pollutants from these sites have potential to enter a river through surface water runoff or by groundwater contamination and may adversely affect the environment, aquatic resources, or pose public health hazards. Typical sources of these sites include manufacturing, commercial and industrial facilities, mining and oil drilling, landfills, and agricultural lands with heavy pesticide and fertilizer use. The Metamora and Forest Waste Disposal landfills are also listed on the national priority list for remedial action under the Federal Comprehensive Environmental Response Compensation and Liability Act of 1980 (Superfund Program).

MDEQ, Storage Tank Division (STD), by authority of Part 213 of the Natural Resources and Environmental Protection Act (P.A. 451 of 1994), is the lead regulatory agency for under ground and above ground storage tanks. Leaking oil and gasoline tanks are a potential source of environmental contamination that may affect water quality. However, most leaking storage tank contamination in the Flint River watershed is contained to the soils at site locations and does not pose a significant threat to water quality (B. Muench, MDEQ, STD, personal communication). The clay soils, common to the watershed, retard movement of these pollutants into groundwater by acting as a barrier or by chemical

bonding to the pollutant. Leaking storage tanks that threaten water quality are addressed by NPDES permits or Part 213 corrective action.

Water Parameters

Chemical and physical characteristics of water, such as temperature and oxygen, are important parts of fish habitats. Physiologically, fish communities are characterized as coldwater, coolwater, or warmwater types. Coldwater fish communities require mean water temperatures below 70 °F (21 °C) and are influenced by groundwater inflow and stream bank shading. Warmwater fish communities are found where mean water temperatures are greater than 70 °F (21 °C). Coolwater fish communities operate in the transitional area where cold mixes with warm water. Most of the Flint River is characterized by a warm water temperature regime. Cold or cool water temperature regimes are found in the upper reaches of the South Branch Flint River, Pine, Bottom, Gravel, Duck, Kearsley, and Thread creeks (Figure 18). These cold or cool water river reaches are associated with good groundwater inflows and unperturbed landscapes.

Dissolved oxygen (DO) is a critical water quality factor affecting aquatic communities (Hynes 1970). Water quality standards for dissolved oxygen have been established by law to protect fish and other aquatic organisms. For cold-water designated streams, the dissolved oxygen water quality standard is 7.0 ppm. For warm water streams, the dissolved oxygen water quality standard is 5.0 ppm. The South Branch Flint River, upstream of Winns Pond, and the upstream reaches of Kearsley and Thread creeks are designated for cold water DO protection (Figure 18). Fish and macroinvertebrate sampling conducted in 1997 and 1998 found good presence of intolerant species indicating the dissolved oxygen water quality standard is being attained. However, DO downstream of Flint fluctuates above and below the standard of 5.0 ppm, as a result of biological oxygen demand from the nutrient rich environment (MDEQ 1994a).

Chemical water quality parameters of the Flint River and select tributaries were monitored in 1998 (Appendix 1). Caution should be used in interpreting the results because sampling was conducted over an extended period of time and affects of storm events could result in wide variations of parameters measured. For parameters measured, water quality standards are generally being met throughout the Flint River basin. However, nutrient loading, particularly phosphorus and ortho-phosphate, remain a concern (M. Walterhouse, MDEQ, SWQD, personal communication). Also, exceptions to water quality standards often follow storm events when transport of pollutants is worsened, or during extreme low flow conditions when pollutants are concentrated.

Bacteria

Bacteria are important as potential health hazards to humans and animals. A high level of certain bacteria indicates the potential presence of untreated human waste and suggests the presence of other pathogenic microorganisms. The County Health Departments are the lead agencies for monitoring bacteria. Since it is too difficult to measure all harmful bacteria, an indicator species is usually selected for monitoring. *Escherichia coli* is the bacteria commonly used to indicate the presence of human and animal waste. The Water Quality Standard for *Escherichia coli* is a 30-day geometric mean of 130 counts/100 milliliters for total body contact recreation (MDEQ 1997a). The County Health Department will advise against body contact when daily *Escherichia coli* samples are greater than 1000 counts/100 milliliters.

Information on bacteria levels in the Flint River is limited. Routine monitoring has been limited to the swimming beaches of Holloway Reservoir and Mott Lake, where full body contact recreation occurs. Expanded monitoring in the Flint area by the Genesee County Health Department has happened after

a severe sewage discharge into the river in 1999. An estimated 20 million gallons of undiluted sewage was discharged into the river in Flint when trenching equipment ruptured a sewer line. This expanded monitoring has indicated that daily *Escherichia coli* levels exceed 2400 counts/100 ml after precipitation at locations both upstream and downstream of the 1999 sewage discharge (D. Gonzales, Genesee County Public Health Department, personal communication). High bacteria levels are now believed to come from multiple sources including faulty and illegal sewer hook-ups, failing septic systems, animal wastes, and storm water runoff.

Sediment Parameters

Sediment quality is not regulated directly, but is considered a component of water quality, since contaminants in river waters can be deposited in the sediments (MDEQ 1998a). Sediment contaminants accumulate and can enter the aquatic food chain through ingestion, absorption, or can be re-suspended into water when roiled. Some sediment contaminants can have adverse affects on fish and other aquatic life, or pose significant risk to human life.

Sediment quality is typically evaluated by MDEQ through chemical comparisons of other Michigan rivers with similar ecoregion characteristics, guidelines established by the United States Environmental Protection Agency, and guidelines established by the Ontario Ministry of the Environment (MDEQ 1999; Persaud et al. 1992). These comparisons help identify normal background chemical parameters as well as areas of human induced contamination.

In 1988, sediment sampling of Saginaw Bay and Saginaw River tributaries found the mouth of the Flint River to have the highest concentrations of total phosphorus, ortho-phosphorus, Kjeldahl nitrogen, and ammonia nitrogen indicating excessive nutrient loading (MDEQ 1994a). Sediment chemistry of the Flint River and select tributaries were also monitored in 1998 (Appendix 2). Caution should be used in interpreting results because sampling represents a single sample and may not be entirely representative of the area. Values for parameters measured in 1998 vary between sites but most are comparable to other rivers in the Southern Michigan Northern Indiana Till Plain Ecoregion.

Fish Contaminants

Fish are a highly nutritious food to many anglers. However, fish can accumulate and store contaminants in their body tissue and, sometimes, concentrations can pose health risks to humans. The Michigan Fish Contaminant Monitoring Program (FCMP) is coordinated by MDEQ, SWQD, in cooperation with MDNR, Fisheries Division, Michigan Department of Community Health (MDCH), and the Michigan Department of Agriculture.

> "The goals of FCMP are to: (1) evaluate whether fish contamination problems exist in specific surface waters; (2) identify spatial differences and temporal trends in the quality of Michigan's surface waters with respect to persistent, bioaccumulative chemicals; (3) evaluate whether existing pollution prevention, regulatory, and remedial programs are effectively eliminating or reducing chemical contamination in the aquatic environment; and (4) support the establishment or removal of public health sport fish consumption advisories by the MDCH" (MDEQ 1998b).

Michigan FCMP collects fish samples from lakes and streams throughout Michigan. MDCH is responsible for establishing, modifying, and removing fish consumption advisories for Michigan's surface waters. Edible portions of fish are monitored for contaminants and compared to the fish consumption advisory trigger levels to determine the need for sport fish consumption advisories (Table 11). Whole fish are analyzed to track spatial and temporal trends and to determine the

ecological risk to birds and mammals that feed on fish. Also, caged fish studies are used to determine spatial trends in contaminant concentrations.

Elevated mercury concentrations have been detected in fish from approximately two thirds of the monitored inland lakes and impoundments in Michigan. MDCH has issued a statewide fish consumption advisory covering all inland lakes and impoundments in Michigan due to elevated concentrations of mercury. Mercury occurs naturally in the environment or as an airborne pollutant released by burning wastes, coal, and other fossil fuels. Natural processes convert elemental mercury into a more toxic form called methyl mercury. Fish accumulate methyl mercury as they feed or absorb it when water passes over their gills. Methyl mercury accumulates in the flesh and special trimming and cooking methods do not remove it. Typically, only large fish accumulate methyl mercury at concentrations hazardous to wildlife and humans. No one should eat more than one meal a week of rock bass, yellow perch, or crappie over nine inches or bass, walleye, northern pike, or muskellunge of any size from inland lakes and impoundments (MDCH 2000). Women of child bearing age and children under 15 years of age should restrict their consumption of these fish to one meal per month (MDCH 2000).

Since 1980, fish contaminant sampling has occurred at five locations in the Flint River watershed (Table 12). Sampling resulted in fish consumption advisories for specific fish species at three locations based on elevated concentrations of polychlorinated biphenyl (PCB) (MDCH 2000). PCBs are synthetic organic compounds that were primarily used as insulating fluids in electrical equipment such as transformers and capacitors. They have also been used in sealant, rubber, paint, plastic, printing ink, and insecticide. Due to the health risks associated with PCBs, its production was banned in the United States in 1977. Women and children under 15 years of age should restrict their consumption of channel catfish from Holloway Reservoir to one meal per month. The general population should restrict their consumption of carp from Thread Lake to one meal per week. Women of child bearing age and children under 15 years of age should restrict their consumption of carp from Thread Lake, less than 14 inches, to one meal per month, restrict their consumption of carp between 14 and 22 inches to 6 meals per year, and not consume carp greater than 22 inches. For the Flint River downstream of Flint, no one should consume carp greater than 30 inches and women of child bearing age and children under 15 years of age should restrict their consumption of carp less than 30 inches to one meal per month. Additionally, women of child bearing age and children under the age of 15 should restrict their consumption of smallmouth bass to one meal per week.

In 1988, the FCMP conducted a caged fish study using channel catfish on the Saginaw, Flint, Tittabawassee, Shiawassee, and Cass rivers (Morse 1993). The Flint River showed net bioaccumulation of total chlordane, heptachlor epoxide (HPE), total dichloro-diphenyl-trichloroethane (DDT), total PCB, and hexachlorobenzene (HCB) indicating that these contaminants were present in the Flint River during the 28-day study period. Bioaccumulation of DDT, HCB, and total PCB in the Flint River was relatively low compared to the Saginaw, Tittabawassee, Shiawassee, and Cass rivers. However, although still relatively low, the HPE final net concentration was highest in the Flint River. DDT and chlordane are banned or cancelled pesticides that are frequently detected in fish at relatively low concentrations (R. Day, MDEQ, SWQD, personal communication). HCB was used as a fungicide and is a by-product of some industrial processes and combustion when certain precursors are in the waste stream. HPE is a breakdown product of the banned pesticide heptachlor and is also frequently detected in fish at low concentrations (R. Day, MDEQ, SWQD, personal communication).

Summary by valley segments

To ascertain whether Michigan's water quality standards are being met, MDEQ has developed a monitoring program that consists of eight interrelated monitoring elements: biological integrity,

physical habitat, water chemistry, sediment chemistry, fish contaminants, stream flow, wildlife contaminants, and inland lake quality and eutrophication (MDEQ 1998a, MDEQ 1997b). Biological integrity and physical habitat are discussed in detail under the heading Biological Communities, and stream flow is discussed under the heading Geology and Hydrology. A brief summary by valley segment follows:

Upper South Branch Flint River

There are 5 NPDES permits and 3 sites of environmental contamination in this segment (Tables 9 and 10). Water quality standards for water and sediment chemistry, biological integrity, and physical habitat are being met (MDEQ 2000). The upper South Branch Flint River maintains good biological integrity with high fish and macroinvertebrate diversity. Water and sediment chemistry values fall within the range considered acceptable for the Southern Michigan Northern Indiana Till Plain Ecoregion (Appendices 1 and 2). Stream flow is stable with moderate groundwater inflow. No fish or wildlife contaminant sampling has been conducted in this segment.

Middle South Branch Flint River

There are 23 NPDES permits and 14 sites of environmental contamination in this segment (Tables 9 and 10). Most permits are for industrial and municipal facilities within the city of Lapeer. Water quality standards for water and sediment chemistry, biological integrity, and physical habitat are generally being met however, some drains and tributaries have been identified impaired. Biological integrity and physical habitat of lower Pine Creek has been compromised due to ditching resulting in the loss of a brook trout fishery, a reduction of intolerant macroinvertebrates, increased water temperatures, and physical habitat loss. Elevated bacteria levels and nutrient loading from suspected failing septic systems, sewage lagoon discharge, and other nonpoint sources are a concern in unidentified drains located in Metamora, Elba, Mayfield, and Lapeer townships in Lapeer County (MDEQ 2000). Upper Pine, upper Farmers, Mill, and Plum creeks were found to be meeting Water Quality Standards and designated use. Water and sediment chemistry values for the middle South Branch Flint River and its tributaries fall within the range considered acceptable for the Southern Michigan Northern Indiana Till Plain Ecoregion (Appendices 1 and 2). Fish contaminant sampling is limited to Lake Nepessing where the statewide advisory for mercury applies. No wildlife contaminant information is available.

Lower South Branch Flint River

There are 11 NPDES permits and 2 sites of environmental contamination in this segment (Tables 9 and 10). Historical and current land use practices have resulted in impaired biological communities and reduced biological integrity. Biological community impairment in the North Branch Flint River is attributed to heavy shifting sediment loads, high turbidity, and elevated nutrients. Sediment arsenic levels are elevated but believed to be of natural origin (M. Walterhouse, MDEQ, SWQD, personal communication). Reduced biological integrity of this segment is attributed to affects resulting from agricultural land use. Stream flow is less stable due to low groundwater inflow, wetland loss, and extensive ditching. No fish or wildlife contaminant sampling has been conducted.

Upper Flint River

There are 136 NPDES permits and 92 sites of environmental contamination in this segment (Tables 9 and 10). Most permits are for industrial and municipal facilities within the city of Flint. Biological community impairment is attributed to reduced biological integrity resulting from habitat loss. Water Quality Standards are not being attained due to PCB contamination in fish. Point source and nonpoint source pollution occurs at an accelerated rate due to land development. Biological integrity for most tributaries is reduced in downstream progression due to extensive ditching resulting in unstable flow, habitat loss, reduced species richness, and increased sediment loading. Water chemistry parameters indicate elevated nutrient levels. Sediment loading and eutrophication in Holloway Reservoir and

Mott Lake occurs at an accelerated rate. Contaminated sediments are in the mainstem at Flint and in Thread Lake (J. Innes, MDEQ, ERD, personal communication). Gilkey Creek is heavily affected by various urban land use practices and petroleum products are present in the sediment (MDEQ 2000). Fish contaminant advisories are in effect for Holloway Reservoir, Thread Lake, and the entire Flint River downstream of Hamilton Dam in Flint. Designated use for total body contact recreation is not being met due to elevated bacteria counts after any form of precipitation accompanied with storm water runoff. No wildlife contamination information is available.

Middle and Lower Flint River

There are 12 NPDES permits and 18 sites of environmental contamination in the middle Flint segment and 14 NPDES permits and 5 sites of environmental contamination in the lower Flint segment (Tables 9 and 10). Water quality in the middle and lower Flint are greatly affected by point and nonpoint source pollution occurring upstream. Biological community impairment is attributed to reduced biological integrity resulting from habitat loss. Biological integrity for most tributaries is reduced in downstream progression due to extensive ditching resulting in unstable flow, habitat loss, reduced species richness, and increased sediment loading. Water Quality Standards are not being attained due to PCB contamination in fish. Water chemistry parameters indicate elevated nutrient levels and with exceedence in the dissolved oxygen standard downstream of Flint. Nutrient loading has resulted in abundant plant growth in the mainstem downstream of Flint. Respiration processes associated with excessive plant growth oftentimes results in diurnal fluctuations in dissolved oxygen content of the water. Fish contaminant advisories are present for the entire Flint River downstream of Hamilton Dam in Flint. Total body contact recreation is not recommended after any form of precipitation due to elevated bacteria counts. No wildlife contamination information is available.

River Classification by Fisheries Division

In 1967, MDNR, Fisheries Division developed a Michigan Stream Classification system for the purpose of fisheries management. This classification system identified stream reaches of similar temperature regimes, water characteristics, and sport fish characteristics. Stream classifications were identified as: 1) top-quality cold water streams capable of supporting self-sustaining populations of trout; 2) second-quality cold water streams that contain significant trout populations maintained by stocking; 3) top-quality warm water streams that contain self-sustaining warm water (and cool water) sport fish; 4) second-quality warm water streams that have limited sport fish populations due to pollution, competition, inadequate reproduction, or lack of suitable habitat. Three classifications were identified in the Flint River basin (Figure 19). The upper reaches of Hunters and Kearsley creeks were identified as second-quality cold water streams. The mainstem, upstream of the confluence of Butternut Creek, and the North and South Branch Flint rivers were classified as top-quality warm water streams. The remaining basin and all of its tributaries were classified as second-quality warm water streams.

The Michigan Stream Classification system is largely based on the distribution and abundance of sport fish. The presence or absence of sport fish, however, limits application of this classification system. Non-sport fish such as mottled sculpin and longnose dace are indicative of good water quality and need be considered for protection. Also, other intrinsic habitat attributes such as flow, channel morphology, thermal regime, and energy sources are important for ecosystem management and protection. Seelbach et al. (1997) developed a landscape-based ecological classification system using valley segments to describe homogeneous portions of the river channel that share common features and flow through specific landscape units (see **Geography**). This classification system is based on the fact that rivers are strongly influenced by the configuration of the landscape and by regional climatic characteristics. This system also takes into account predictable changes in physical and biological characteristics with stream size. Yet, isolated variances may occur in landscape-based ecological

Appendix I

Total Maximum Daily Load
Activities & Priorities

University of Michigan
TMDL - Phosphorus-Ford-Belleville
Actions and Priority List

	A	B	C	D	E	F	G
1	**TMDL**	**Priority 1=High**	**Project Name**	**Purpose**	**Activity**	**Schedule**	**TMDL AREA**
2	TP	1	Construction Site Runoff Control (SESC)	Minimize the impact on water quality through enforcement of Soil Erosion and Sedimentation Control Act, Part 91.	Monitor and correct sediment discharges, changes of drainage patterns from construction activities. Site plan review and best management practices developed.	Ongoing; no end date.	Ford & Belleville Lakes
3	TP	1	Illicit Discharge Elimination Program	Remove non-storm discharges to the storm water drainage system by investigating illicit connections .	Dry weather screening program which complies with the NPDES permit.	Formerly 20 locations/year; Currently developing program to screen each outfall at least once within the permit cycle.	Ford & Belleville Lakes
4	TP	1	Information and Public Education through the Internet	Raise awareness and provide education on water quality, guidelines for activities that may result in the pollution of the storm water system.	Provide information regarding local water quality issues to the public and residents visiting the stormwater webpage: www.oseh.umich.edu/stormwater	Ongoing; no end date.	Ford & Belleville Lakes
5	TP	1	Post-Construction Site Runoff Control	Prevent discharges from storm water runoff from new development.	Implement and enforce a program to address storm water runoff from new development and redevelopment projects. Site plan review and best management practices developed.	Ongoing; no end date.	Ford & Belleville Lakes
6	TP	1	Public Education Program	Awareness and education on storm drain pollution prevention and impacts on water quality. Encourage the public to reduce discharge of pollutants to storm water.	Provide/distribute water quality information and information on the hazards associated with illicit discharges and proper waste disposal techniques. Methods may include brochures, posters, tip cards, flyers, newsletter articles, calendars, PSAs, training workshops, etc.	Ongoing; no end date.	Ford & Belleville Lakes
7	TP	1	Rules and Ordinances for Storm Water Management	Prevent flooding, control flow, treat storm water, discourage geese by using native landscape buffers by waterways and ponds.	Ongoing, rules revised as needed, based on permit changes.	Ongoing; no end date.	Ford & Belleville Lakes
8	TP	1	Structural Control Maintenance	Maximize effectiveness of structural controls in removing pollutants from stormwater	Routine inspection and maintenance, as needed, for any structural controls intended to remove pollutants from stormwater. Includes proper disposal procedures for any materials removed from the drainage systems.	Stormwater basins inspected annually; periodic maintenance cleaning of catch basins and storm sewer piping with the goal of cleaning each UM catch basin at least once per permit cycle, with higher traffic areas receiving more frequent cleaning, and others as needed.	Ford & Belleville Lakes
9	TP	2	Education on Pet Waste	Raise awareness on the impacts of pet waste on surface water quality.	Pet waste education on UM website	Ongoing; no end date.	Ford & Belleville Lakes

University of Michigan
TMDL - Phosphorus-Ford-Belleville
Actions and Priority List

	A	B	C	D	E	F	G
1	**TMDL**	**Priority 1=High**	**Project Name**	**Purpose**	**Activity**	**Schedule**	**TMDL AREA**
10	TP	2	Pesticides and Fertilizers / Lawn Maintenance Program	Minimize discharge of pollutants related to storage, handling and use of pesticides, herbicides and fertilizers.	Employee training - Integrated Pest Management; Soil testing requirements for turfgrass - so fertilizers can be applied in accordance with soil test results.	Ongoing; no end date.	Ford & Belleville Lakes
11	TP	2	Spill Clean-ups	Prevent discharge of pollutants from accidental spills.	OSEH responds to minor chemical spills that do not result in release to the environment. Where the spill results in an actual or potential release to the storm water system, the data will be examined for improvements to the response system or educational efforts.	Ongoing; no end date.	Ford & Belleville Lakes
12	TP	2	Storm Water Drain Marking	Reduce discharges to storm water drainage system by marking each storm drain with a warning that it drains to the river.	Markers are continuously being placed on drains; markers are replaced, as needed, when markers fade or have been displaced. New curb storm drains have the message "Dump No Waste - Drains to Waterways" engraved on them.	Ongoing; no end date.	Ford & Belleville Lakes
13	TP	2	Street Sweeping	To prevent sediment and debris in street from entering storm sewer system.	Street sweeping occurs monthly throughout the year.	Ongoing; no end date.	Ford & Belleville Lakes
14	TP	2	Yard Waste Management	Encourage proper disposal of yard trimmings	Leaf cleaning from curbs and storm drains occurs October through November	Ongoing; no end date.	Ford & Belleville Lakes
15	TP	3	Miller's Creek Action Team	Improve the health of the creek and creekshed which is degrading due to excessive upland and in-stream erosion.	The Miller's Creek Watershed Improvement Plan includes numerous suggested activities to reduce phosphorus inputs. UM will continue to implement actions to improve storm water quality and volume reductions in this region.	Ongoing; no end date.	Ford & Belleville Lakes
16	TP	3	RV Waste Disposal Education	Prevent the illicit discharge of black water from RVs.	Handout flyers on sanitary waste to RV owners to educate them on the impact human waste from RVs can have on water quality; Prohibit RV overnight parking in UM lots except for posted Hospital RV parking.	Develop/Update in 2011	Ford & Belleville Lakes

University of Michigan
TMDL - E.coli - Geddes
Actions and Priority List

	A	B	C	D	E	F	G
1	**TMDL**	**Priority 1=High**	**Project Name**	**Purpose**	**Activity**	**Schedule**	**TMDL AREA**
2	E.coli	1	Illicit Discharge Elimination Program	Remove non-storm discharges to the storm water drainage system by investigating illicit connections .	Locate and eliminate any illicit connections and sanitary and storm pipes, thus preventing untreated sewage flow to the Huron River.	Ongoing; no end date.	Geddes
3	E.coli	1	Information and Public Education through the Internet	Raise awareness and provide education on water quality, guidelines for activities that may result in the pollution of the storm water system.	Provide information regarding local water quality issues to the public and residents visiting the stormwater webpage: www.oseh.umich.edu/stormwater	Ongoing; no end date.	Geddes
4	E.coli	1	Rules and Ordinances for Storm Water Management	Prevent flooding, control flow, treat storm water, discourage geese by using native landscape buffers by waterways and ponds.	Ongoing, rules revised as needed, based on permit changes.	Ongoing; no end date.	Geddes
5	E.coli	2	Education on Pet Waste	Raise awareness on the impacts of pet waste on surface water quality.	Pet waste education on UM website	Ongoing; no end date.	Geddes
6	E.coli	2	Storm Water Drain Marking	Reduce discharges to storm water drainage system by marking each storm drain with a warning that it drains to the river.	Markers are continuously being placed on drains; markers are replaced, as needed, when markers fade or have been displaced. New curb storm drains have the message "Dump No Waste - Drains to Waterways" engraved on them.	Ongoing; no end date.	Geddes
7	E.coli	3	Miller's Creek Action Team	Improve the health of the creek and creekshed which is degrading due to excessive upland and in-stream erosion.	The Miller's Creek Watershed Improvement Plan includes numerous suggested activities to reduce phosphorus inputs. UM will continue to implement actions to improve storm water quality and volume reductions in this region.	Ongoing; no end date.	Geddes
8	E.coli	3	RV Waste Disposal Education	Prevent the illicit discharge of black water from RVs.	Handout flyers on sanitary waste to RV owners to educate them on the impact human waste from RVs can have on water quality; Prohibit RV overnight parking in UM lots except for posted Hospital RV parking.	Ongoing; no end date.	Geddes

University of Michigan
TMDL - Biota - Malletts
Actions and Priority List

	A	B	C	D	E	F	G
1	**TMDL**	**Priority 1=High**	**Project Name**	**Purpose**	**Activity**	**Schedule**	**TMDL AREA**
2	Biota	1	Illicit Discharge Elimination Program	Remove non-storm discharges to the storm water drainage system by investigating illicit connections .	Locate and eliminate any illicit connections and sanitary and storm pipes, thus preventing untreated sewage flow to the Huron River.	Ongoing; no end date.	Malletts
3	Biota	1	Post-Construction Site Runoff Control	Prevent discharges from storm water runoff from new development.	Implement and enforce a program to address storm water runoff from new development and redevelopment projects. Site plan review and best management practices developed.	Ongoing; no end date.	Malletts
4	Biota	1	Public Education Program	Awareness and education on storm drain pollution prevention and impacts on water quality. Encourage the public to reduce discharge of pollutants to storm water.	Provide/distribute water quality information and information on the hazards associated with illicit discharges and proper waste disposal techniques. Methods may include brochures, posters, tip cards, flyers, newsletter articles, calendars, PSAs, training workshops, etc.	Ongoing; no end date.	Malletts
5	Biota	1	Structural Control Maintenance	Maximize effectiveness of structural controls in removing pollutants from stormwater	Routine inspection and maintenance, as needed, for any structural controls intended to remove pollutants from stormwater. Includes proper disposal procedures for any materials removed from the drainage systems.	Stormwater basins inspected annually; periodic maintenance cleaning of catch basins and storm sewer piping with the goal of cleaning each UM catch basin at least once per permit cycle, with higher traffic areas receiving more frequent cleaning, and others as needed.	Malletts
6	Biota	2	Street Sweeping	To prevent sediment and debris in street from entering storm sewer system.	Street sweeping occurs monthly throughout the year.	Ongoing; no end date.	Malletts

University of Michigan
TMDL - E.coli - Rouge
Actions and Priority List

	A	B	C	D	E	F	G
1	**TMDL**	**Priority 1=High**	**Project Name**	**Purpose**	**Activity**	**Schedule**	**TMDL AREA**
2	E.coli	1	Education on Pet Waste	Raise awareness on the impacts of pet waste on surface water quality.	Pet waste education on UM-Dearborn website and in the CSS Bldg located long a county trail. (CSS Bldg is a common stopping point for visitors on the trail.)	Ongoing; no end date.	Rouge
3	E.coli	1	Good Housekeeping	To prevent trash, sediment and debris in street from entering storm sewer system.	Provide periodic trash removal from parking lots and on University grounds. Litter pick up in parking lots and high traffic areas occurs six times per week.	Ongoing; no end date.	Rouge
4	E.coli	1	Illicit Discharge Elimination Program	Remove non-storm discharges to the storm water drainage system by investigating illicit connections.	Locate and eliminate any illicit connections and sanitary and storm pipes, thus preventing untreated sewage flow to the Rouge River.	Ongoing; no end date.	Rouge
5	E.coli	1	Public Education Program	Awareness and education on storm drain pollution prevention and impacts on water quality. Encourage the public to reduce discharge of pollutants to storm water.	Provide/distribute water quality information and information on the hazards associated with illicit discharges and proper waste disposal techniques. Methods may include brochures, posters, tip cards, flyers, newsletter articles, calendars, PSAs, training workshops, etc.	Ongoing; no end date.	Rouge
6	E.coli	1	Rules and Ordinances for Storm Water Management	Prevent flooding, control flow, treat storm water, discourage geese by using native landscape buffers by waterways and ponds.	Ongoing, rules revised as needed, based on permit changes. UM-Dearborn utilizes "Fly Away Home Goose Management".	Ongoing; no end date.	Rouge
7	E.coli	1	Storm Water Drain Marking	Reduce discharges to storm water drainage system by marking each storm drain with a warning that it drains to the river.	Markers are continuously being placed on drains; markers are replaced, as needed, when markers fade or have been displaced. New curb storm drains have the message "Dump No Waste - Drains to Waterways" engraved on them will be used during renovation or new construction.	Ongoing; no end date.	Rouge
8	E.coli	1	Structural Control Maintenance	Maximize effectiveness of structural controls in removing pollutants from stormwater	Routine inspection and maintenance, as needed, for any structural controls intended to remove pollutants from stormwater. Includes proper disposal procedures for any materials removed from the drainage systems.	Periodic, as needed, cleaning of catch basins; street sweeping twice per year.	Rouge
9	E.coli	2	Information and Public Education through the Internet	Raise awareness and provide education on water quality, guidelines for activities that may result in the pollution of the storm water system.	Provide information regarding local water quality issues to the public and residents visiting the stormwater webpage: http://www.umd.umich.edu/324001/	Ongoing; no end date.	Rouge
10	E.coli	2	Street Sweeping	To prevent sediment and debris in street from entering storm sewer system.	Street sweeping occurs twice per year. Parking structure is swept once per year.	Ongoing; no end date.	Rouge

University of Michigan
TMDL - Biota - Rouge
Actions and Priority List

	A	B	C	D	E	F	G
1	**TMDL**	**Priority 1=High**	**Project Name**	**Purpose**	**Activity**	**Schedule**	**TMDL AREA**
2	Biota	1	Good Housekeeping	To prevent trash, sediment and debris in street from entering storm sewer system.	Provide periodic trash removal from parking lots and on University grounds. Litter pick up in parking lots and high traffic areas occurs six times per week.	Ongoing; no end date.	Rouge
3	Biota	1	Illicit Discharge Elimination Program	Remove non-storm discharges to the storm water drainage system by investigating illicit connections .	Locate and eliminate any illicit connections and sanitary and storm pipes, thus preventing untreated sewage flow to the Rouge River.	Ongoing; no end date.	Rouge
4	Biota	1	Pesticides and Fertilizers / Lawn Maintenance Program	Minimize discharge of pollutants related to storage, handling and use of pesticides, herbicides and fertilizers.	UM-Dearborn contracts with TruGreen to maintain turfgrass. TruGreen has a "no phosphorus" corporate policy.	Ongoing; no end date.	Rouge
5	Biota	1	Post-Construction Site Runoff Control	Prevent discharges from storm water runoff from new development.	Implement and enforce a program to address storm water runoff from new development and redevelopment projects. Site plan review and best management practices developed.	Ongoing; no end date.	Rouge
6	Biota	1	Public Education Program	Awareness and education on storm drain pollution prevention and impacts on water quality. Encourage the public to reduce discharge of pollutants to storm water.	Provide/distribute water quality information and information on the hazards associated with illicit discharges and proper waste disposal techniques. Methods may include brochures, posters, tip cards, flyers, newsletter articles, calendars, PSAs, training workshops, etc.	Ongoing; no end date.	Rouge
7	Biota	1	Structural Control Maintenance	Maximize effectiveness of structural controls in removing pollutants from stormwater	Routine inspection and maintenance, as needed, for any structural controls intended to remove pollutants from stormwater. Includes proper disposal procedures for any materials removed from the drainage systems.	Periodic, as needed, cleaning of catch basins; street sweeping twice per year; parking structure sweeping once per year.	Rouge
8	Biota	2	Street Sweeping	To prevent sediment and debris in street from entering storm sewer system.	Street sweeping occurs twice per year; parking structure sweeping once per year.	Ongoing; no end date.	Rouge

Appendix J

Public Education Materials

University of Michigan

Public Education Program - Topics and Audience

Public Education Program Elements **Timing: Ongoing through the end of the permit term (April 1, 2013).**	Public Education Topic Number from Permit MIS049000, Section A.5.a.	Car Care Brochure	Carefully Store and Dispose of Household Cleaners, Chemicals, and Oil (SEMCOG)	Choose Earth-Friendly Landscaping (SEMCOG)	Clean Up After Your Pet (SEMCOG)	Custodian, Trades and Public Safety - Storm Water Management Training	Dearborn Best Management Practices - Storm Water	Dearborn Storm Water General Population Presentation	Fertilize Caringly (SEMCOG)	Fertilizing Brochure	Friends of the Rouge - Benthic Monitoring	Friends of the Rouge - Regional Outreach	Friends of the Rouge - River Restoration Program	Friends of the Rouge - Rouge Rescue	HazCom / Lab Safety Training	Help Keep Pollution Out of Storm Drains (SEMCOG)
Key Message(s)																
Hazards of Illicit Discharge (ID) & Improper Disposal of Waste	1		●		●	●	●	●	●						●	●
Public Reporting of ID or Improper Disposal; Hotline	1	●				●	●	●		●					●	
Common ID - Construction Sites, sediment, carpet cleaner wastes, household wastes, motor vehicle fluids from home owners, septic and commercially-transported wastes; commercial power washing	1	●	●		●		●	●	●	●					●	●
Water body potentially impacted by improper actions at or near a person's home	2	●	●		●		●	●	●	●					●	●
HHW - availability, location, requirements of facilities for the collection and/or disposal of	3	●														
Travel trailer sanitary wastes - availability, location, requirements of facilities for the collection and/or disposal of	3		●													
Chemicals - availability, location, requirements of facilities for the collection and/or disposal of	3	●													●	
Grass clippings, leaf litter - availability, location, requirements of facilities for the collection and/or disposal of	3			●												●
Animal wastes - availability, location, requirements of facilities for the collection and/or disposal of	3				●		●	●								
Motor Vehicle Fluids - availability, location, requirements of facilities for the collection and/or disposal of	3	●					●	●								
Pesticide, herbicide, fertilizers - acceptable application & disposal; use of phosphorus-free fertilizer alternatives	4		●	●					●	●						●
Car cleaning - Preferred cleaning agents & procedures for non-commercial car washing	5	●				●										
Septic System - Proper maintenance and how to recognize system failure	6															
Riparian - management of land to protect water quality	7															
Watershed - Public responsibilities & stewardship	8					●	●	●			●	●	●	●	●	
Native vegetation vs. non-native vegetation - benefits	9			●					●				●	●		
Food Services (Commercial) - prevent grease and litter discharge to MS4s	10															
UM - Responsible Party																
Ann Arbor-Occupational Safety & Environmental Health																
Dearborn-Environmental Health Safety & Emergency Management		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Flint-Environment, Health & Safety																
Target Audience(s)																
Construction Projects / Vendors		●	●	●	●				●	●						●
Faculty & Staff		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Students		●	●	●	●				●	●	●	●	●	●		●
Vendors / Contractors		●	●	●	●				●	●						●
Visitors		●	●	●	●				●	●	●	●	●	●		●
Delivery Mechanism(s)																
Brochure / Poster / Flyer / Display, etc.		●	●	●	●				●	●		●				●
Event											●	●	●	●		
Plan / Program / Inspection																
Training / Workshop / Presentation / Class						●	●	●			●				●	
Video / PSA																
Website (scheduled addition date noted if not already online)		●					●	●		●		●				

University of Michigan
Public Education Program - Topics and Audience

Public Education Program Elements **Timing: Ongoing through the end of the permit term (April 1, 2013).**	Public Education Topic Number from Permit MIS049000, Section A.5.a.	Household Waste Brochure	Painting Brochure	Pesticide Brochure	Pet Brochure	Practice Good Car Care (SEMCOG)	Rouge River Gateway Master Plan	Rouge Water Festival - Annual	Save Water (SEMCOG)	Seven Simple Steps to Clean Water (SEMCOG)	SPCC / PIPP and Storm Water Management Training	Storm Water - A Shared Responsibility	Website www.umd.umich.edu/324001	"Our Actions can Affect Michigan Rivers" (Be Stormwater Savvy) flyers... updated with UMF specific reporting of spills	DLD Hazwaste Training at UM-Flint	Earth Day Website	Earth Day2009 tables, booth, and handouts by many organizations
Key Message(s)																	
Hazards of Illicit Discharge (ID) & Improper Disposal of Waste	1	●	●	●	●	●				●		●		●	●		●
Public Reporting of ID or Improper Disposal; Hotline	1	●	●	●	●						●	●		●	●		●
Common ID - Construction Sites, sediment, carpet cleaner wastes, household wastes, motor vehicle fluids from home owners, septic and commercially-transported wastes; commercial power washing	1	●	●	●	●	●			●	●		●		●			●
Water body potentially impacted by improper actions at or near a person's home	2	●	●	●	●	●		●	●	●		●				●	●
HHW - availability, location, requirements of facilities for the collection and/or disposal of	3	●	●	●						●			●	●			●
Travel trailer sanitary wastes - availability, location, requirements of facilities for the collection and/or disposal of	3																
Chemicals - availability, location, requirements of facilities for the collection and/or disposal of	3	●	●	●							●	●			●	●	●
Grass clippings, leaf litter - availability, location, requirements of facilities for the collection and/or disposal of	3								●								●
Animal wastes - availability, location, requirements of facilities for the collection and/or disposal of	3				●									●			●
Motor Vehicle Fluids - availability, location, requirements of facilities for the collection and/or disposal of	3					●						●			●		●
Pesticide, herbicide, fertilizers - acceptable application & disposal; use of phosphorus-free fertilizer alternatives	4								●	●		●					●
Car cleaning - Preferred cleaning agents & procedures for non-commercial car washing	5					●				●				●			●
Septic System - Proper maintenance and how to recognize system failure	6																
Riparian - management of land to protect water quality	7																
Watershed - Public responsibilities & stewardship	8						●	●				●	●				●
Native vegetation vs. non-native vegetation - benefits	9						●			●							●
Food Services (Commercial) - prevent grease and litter discharge to MS4s	10											●					
UM - Responsible Party																	
Ann Arbor-Occupational Safety & Environmental Health																	
Dearborn-Environmental Health Safety & Emergency Management		●	●	●	●	●	●	●	●	●	●	●	●				
Flint-Environment, Health & Safety														●	●	●	●
Target Audience(s)																	
Construction Projects / Vendors		●	●	●	●	●	●		●	●		●	●			●	●
Faculty & Staff		●	●	●	●	●	●	●	●	●	●		●	●	●	●	●
Students		●	●	●	●	●	●		●	●			●	●		●	●
Vendors / Contractors		●	●	●	●	●	●		●	●		●	●	●		●	●
Visitors		●	●	●	●	●	●		●	●			●	●		●	●
Delivery Mechanism(s)																	
Brochure / Poster / Flyer / Display, etc.		●	●	●	●	●			●	●		●		●			
Event								●									●
Plan / Program / Inspection							●				●						
Training / Workshop / Presentation / Class											●				●		
Video / PSA																	
Website (scheduled addition date noted if not already online)		●	●	●	●							●	●			●	

University of Michigan

Public Education Program - Topics and Audience

Public Education Program Elements **Timing: Ongoing through the end of the permit term (April 1, 2013).**	Public Education Topic Number from Permit MIS049000, Section A.5.a.	Environmental Due Care Notification and Contractor Signature page	March April Earth Day 2009, Zoomerang survey to All campus employees & students, posted results with tips on the web site4/2009 - feb 2010	Supplemental Environmental Conditions included into contracts by UM-Flint Purchasing	SWM, SPCC, SESC and Due Care training	UM Flint EHS Website	UM-Flint DPS All in One EHS Training	UM-Flint EHS Display Boards at 2009 & 2010 Earth Day events	UM-Flint Haz Com Training and PPT slides	UM-Flint Respiratory/Mold remediation Training and PPT slides	Year round "earth Day Every Day" Display Case in Student Center	Chemical Hygiene Plan	Compendium for Laboratory Facilities	Concrete Washout
Key Message(s)														
Hazards of Illicit Discharge (ID) & Improper Disposal of Waste	1	●		●	●		●	●	●	●	●			●
Public Reporting of ID or Improper Disposal; Hotline	1	●		●	●				●					
Common ID - Construction Sites, sediment, carpet cleaner wastes, household wastes, motor vehicle fluids from home owners, septic and commercially-transported wastes; commercial power washing	1	●		●	●			●						●
Water body potentially impacted by improper actions at or near a person's home	2				●	●		●	●	●				
HHW - availability, location, requirements of facilities for the collection and/or disposal of	3		●					●			●			
Travel trailer sanitary wastes - availability, location, requirements of facilities for the collection and/or disposal of	3													
Chemicals - availability, location, requirements of facilities for the collection and/or disposal of	3				●		●		●	●				
Grass clippings, leaf litter - availability, location, requirements of facilities for the collection and/or disposal of	3				●									
Animal wastes - availability, location, requirements of facilities for the collection and/or disposal of	3				●			●			●			
Motor Vehicle Fluids - availability, location, requirements of facilities for the collection and/or disposal of	3				●			●	●					
Pesticide, herbicide, fertilizers - acceptable application & disposal; use of phosphorus-free fertilizer alternatives	4				●									
Car cleaning - Preferred cleaning agents & procedures for non-commercial car washing	5				●									
Septic System - Proper maintenance and how to recognize system failure	6													
Riparian - management of land to protect water quality	7													
Watershed - Public responsibilities & stewardship	8				●							●	●	
Native vegetation vs. non-native vegetation - benefits	9													
Food Services (Commercial) - prevent grease and litter discharge to MS4s	10				●									
UM - Responsible Party														
Ann Arbor-Occupational Safety & Environmental Health												●	●	●
Dearborn-Environmental Health Safety & Emergency Management														
Flint-Environment, Health & Safety		●	●	●	●	●	●	●	●	●	●			
Target Audience(s)														
Construction Projects / Vendors		●		●		●		●						●
Faculty & Staff			●		●	●	●	●	●	●	●	●	●	
Students			●			●		●			●	●	●	
Vendors / Contractors		●	●	●		●		●			●			●
Visitors						●		●			●			
Delivery Mechanism(s)														
Brochure / Poster / Flyer / Display, etc.								●			●			●
Event								●						
Plan / Program / Inspection		●		●	●							●	●	
Training / Workshop / Presentation / Class					●		●		●	●				
Video / PSA														
Website (scheduled addition date noted if not already online)			ends 2/10		2010	●	2010		2010	2010		●	●	

University of Michigan

Public Education Program - Topics and Audience

Public Education Program Elements **Timing: Ongoing through the end of the permit term (April 1, 2013).**	Public Education Topic Number from Permit MIS049000, Section A.5.a.	Construction Safety Requirements	Construction Site - Silt Fence	Construction Site - Silt Sack Installation	Construction Site - Trackout	Dock - Do Not Dump Outside the Building	Emergency Flip Chart	Food Service Licensing, Regulation and Enforcement	Food Vendors - Grey Water Disposal for Outdoor Events	Household Grease	Household Hazardous Waste Poster	Human Resources New Employee Orientation - SW brochure	Laboratory Inspections	OSEH - Comprehensive Laboratory Safety Training - SW brochure & ppt	Public Service Announcements - Football Games	Sawcut Slurry	Soil Erosion & Sedimentation Control Poster
Key Message(s)																	
Hazards of Illicit Discharge (ID) & Improper Disposal of Waste	1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Public Reporting of ID or Improper Disposal; Hotline	1	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●
Common ID - Construction Sites, sediment, carpet cleaner wastes, household wastes, motor vehicle fluids from home owners, septic and commercially-transported wastes; commercial power washing	1	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●
Water body potentially impacted by improper actions at or near a person's home	2					●						●		●	●		
HHW - availability, location, requirements of facilities for the collection and/or disposal of	3										●						
Travel trailer sanitary wastes - availability, location, requirements of facilities for the collection and/or disposal of	3																
Chemicals - availability, location, requirements of facilities for the collection and/or disposal of	3												●	●			
Grass clippings, leaf litter - availability, location, requirements of facilities for the collection and/or disposal of	3																
Animal wastes - availability, location, requirements of facilities for the collection and/or disposal of	3																
Motor Vehicle Fluids - availability, location, requirements of facilities for the collection and/or disposal of	3																
Pesticide, herbicide, fertilizers - acceptable application & disposal; use of phosphorus-free fertilizer alternatives	4																
Car cleaning - Preferred cleaning agents & procedures for non-commercial car washing	5																
Septic System - Proper maintenance and how to recognize system failure	6																
Riparian - management of land to protect water quality	7																
Watershed - Public responsibilities & stewardship	8												●	●	●		
Native vegetation vs. non-native vegetation - benefits	9																
Food Services (Commercial) - prevent grease and litter discharge to MS4s	10							●	●	●							
UM - Responsible Party																	
Ann Arbor-Occupational Safety & Environmental Health		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Dearborn-Environmental Health Safety & Emergency Management																	
Flint-Environment, Health & Safety																	
Target Audience(s)																	
Construction Projects / Vendors		●	●	●	●	●	●	●								●	●
Faculty & Staff						●	●	●			●	●	●	●	●		
Students						●					●				●		
Vendors / Contractors		●	●	●	●	●	●	●	●	●						●	●
Visitors						●									●		
Delivery Mechanism(s)																	
Brochure / Poster / Flyer / Display, etc.			●	●	●	●	●		●	●	●	●		●		●	
Event																	●
Plan / Program / Inspection		●						●					●				
Training / Workshop / Presentation / Class														●			
Video / PSA															●		
Website (scheduled addition date noted if not already online)		●						●									

University of Michigan
Public Education Program - Topics and Audience

Public Education Program Elements **Timing: Ongoing through the end of the permit term (April 1, 2013).**	Public Education Topic Number from Permit MIS049000, Section A.5.a.	Stadium Food Safety & Grease Management	Storm Watch - Video	Storm Water - Faculty & Staff	Storm Water - General Information	Storm Water - Students	Storm Water - Vendors & contractors	Storm Water Management - Post-Construction Requirements	Storm Water Management Program Plan	UM Storm Water Management at the University of Michigan - Video	Website - www.oseh.umich.edu/stormwater	Your Guide to What Can Go Down the Drain at the University of Michigan	Your Guide to What Can Go Down the Drain in Plant	Your Guide to What Can Go Down the Drain in the Arts	Your Guide to What Can Go Down the Drain in the Lab
Key Message(s)															
Hazards of Illicit Discharge (ID) & Improper Disposal of Waste	1	●	●	●	●	●	●		●	●	●	●	●	●	●
Public Reporting of ID or Improper Disposal; Hotline	1	●	●	●	●	●	●		●	●		●	●	●	●
Common ID - Construction Sites, sediment, carpet cleaner wastes, household wastes, motor vehicle fluids from home owners, septic and commercially-transported wastes; commercial power washing	1	●	●	●	●	●	●		●	●	●				
Water body potentially impacted by improper actions at or near a person's home	2			●	●	●	●		●	●	●	●	●	●	●
HHW - availability, location, requirements of facilities for the collection and/or disposal of	3					●					●				
Travel trailer sanitary wastes - availability, location, requirements of facilities for the collection and/or disposal of	3														
Chemicals - availability, location, requirements of facilities for the collection and/or disposal of	3		●						●	●	●	●	●	●	●
Grass clippings, leaf litter - availability, location, requirements of facilities for the collection and/or disposal of	3		●						●						
Animal wastes - availability, location, requirements of facilities for the collection and/or disposal of	3														
Motor Vehicle Fluids - availability, location, requirements of facilities for the collection and/or disposal of	3		●						●		●				
Pesticide, herbicide, fertilizers - acceptable application & disposal; use of phosphorus-free fertilizer alternatives	4		●						●	●	●				
Car cleaning - Preferred cleaning agents & procedures for non-commercial car washing	5								●		●				
Septic System - Proper maintenance and how to recognize system failure	6														
Riparian - management of land to protect water quality	7								●		●				
Watershed - Public responsibilities & stewardship	8		●					●	●	●	●	●	●	●	●
Native vegetation vs. non-native vegetation - benefits	9								●		●				
Food Services (Commercial) - prevent grease and litter discharge to MS4s	10	●							●		●				
UM - Responsible Party															
Ann Arbor-Occupational Safety & Environmental Health		●	●	●	●	●	●	●	●	●	●	●	●	●	●
Dearborn-Environmental Health Safety & Emergency Management								●							
Flint-Environment, Health & Safety								●							
Target Audience(s)															
Construction Projects / Vendors					●		●	●	●	●	●	●			
Faculty & Staff			●	●	●			●	●	●	●	●	●	●	●
Students					●	●			●	●	●	●	●	●	●
Vendors / Contractors		●			●		●	●	●	●	●	●			
Visitors					●				●	●	●	●			
Delivery Mechanism(s)															
Brochure / Poster / Flyer / Display, etc.		●		●	●	●	●		●			●	●	●	●
Event		●													
Plan / Program / Inspection								●							
Training / Workshop / Presentation / Class															
Video / PSA			●							●					
Website (scheduled addition date noted if not already online)				2011	2011	2011	2011	●	●	●	●	●	●	●	●

Appendix K

Structural Controls
Inspection & Maintenance Schedules

Structural Controls Inspection & Maintenance Schedule

Item	Location	Inspection Frequency	Inspection Responsibility	Maintenance*
Basins (detention & retention)	Various (See Appendix F)	Annual	Grounds & Waste Management	Based on inspection
Bioswale	SC-39 Parking Lot	Annual	Parking	Annual vegetation repair/upkeep as needed.
Bioswale / Rain garden	NC-78 Parking Lot	Annual	Parking	Annual vegetation repair/upkeep as needed.
Catch Basins on UM property	UMD, UMF, UMA2 (various)	Minimum Once/permit cycle	Plumbing Shop / Facilities	Cleaning performed at least once per permit cycle, with higher traffic areas and those identified by service requests receiving more attention.
Green Roof	Ross School of Business	Annual	Building Maintenance	Annual vegetation repair; additional work as needed.
Hydrodynamic Separator	NC-27	Annual	Plumbing Shop	Based on inspection; annual suggested
Hydrodynamic Separator	Mitchell Field	Annual	Plumbing Shop	Based on inspection; annual suggested
Hydrodynamic Separator	Museum of Art	Annual	Plumbing Shop	Based on inspection; annual suggested
Hydrodynamic Separator	NC-20 Parking Lot	Annual	Plumbing Shop	Based on inspection; annual suggested
Hydrodynamic Separator	NC-26 Parking Lot	Annual	Plumbing Shop	Based on inspection; annual suggested
Hydrodynamic Separator	School of Public Health	Annual	Plumbing Shop	Based on inspection; annual suggested
Infiltration Swale	Rachel Upjohn Building	Annual	UMH	Annual vegetation repair; additional work as needed.
Oil Interceptor	Ann Street Parking Structure	Quarterly & Annual	SPCC & OSEH	Based on inspection
Oil Interceptor	CVC (3) Parking Structure	Quarterly & Annual	SPCC & OSEH	Based on inspection
Oil Interceptor	Palmer Drive Parking Structure (2)	Quarterly & Annual	SPCC & OSEH	Based on inspection
Oil Interceptor	Rackham Graduate Studies Building	Quarterly & Annual	SPCC & OSEH	Based on inspection
Porous Pavement	NC-78 Parking Lot	Annual	Parking	Sweep/vacuum twice per year.
Porous Pavement	W-16 Parking Lot	Annual	Parking	Sweep/vacuum twice per year.
Rain garden	Environmental Interpretive Center	Annual	UMD	Annual vegetation repair; additional work as needed.
Underground SW Detention System	Children's & Women's	Annual	Plumbing Shop	Based on inspection
Underground SW Detention System	Elbel Field	Annual	Plumbing Shop	Based on inspection
Underground SW Detention System	Palmer Drive Parking Million Gallon Cistern	Annual	Plumbing Shop	Based on inspection
Underground SW Detention System	Rachel Upjohn Building	Annual	Plumbing Shop	Based on inspection
Underground SW Detention System	SC-36 Parking Lot	Annual	Plumbing Shop	Based on inspection
Underground SW Detention System	Weill Hall	Annual	Plumbing Shop	Based on inspection
Vegetated Swale	SC-34 to SC-39 Road	Annual	Grounds & Waste Management	Annual vegetation repair; additional work as needed.

Note: * Maintenance for all structural controls will be scheduled as needed, based on inspection results, and may occur more frequently based on service requests.