

**THE UNIVERSITY OF MICHIGAN
MUNICIPAL STORM WATER NPDES PERMIT MI0053902
FISCAL YEAR 2000-2001 ANNUAL REPORT**

In accordance with Part III, paragraph C-1 of NPDES Permit MI0053902, the University of Michigan (University) is required to submit an annual report of activities associated with the storm water system program. This program is a requirement of the NPDES permit issued by the Michigan Department of Environmental Quality Surface Water Quality Division on December 19, 1995. This report covers the period July 1, 2000 through June 30, 2001 and follows the format identified in the permit.

1. *Provide a brief summary of the implementation status of the plans for the elimination of illicit discharges, public education, and storm water pollution prevention.*

The University has undertaken several items in the management of storm water runoff and pollution prevention.

Illicit Discharge Investigation

- An on-going survey of University owned/managed facilities is being conducted by the Department of Occupational Safety and Environmental Health (OSEH) in an effort to identify discharge points into the storm and sanitary systems. The work has concentrated on the sanitary system sampling. The initial phase of this sampling was completed in the fall of 1999. Confirmation sampling was initiated in February 2000 and was completed in March 2001. Sanitary sewer sampling is now taking place at dormitories and kitchens. The first round of this sampling should be completed in October 2001. As part of this survey, any areas that contain suspect flows are noted for potential dye testing.

In addition to this work, the plumbing shop is currently evaluating footing and roof drains throughout the entire campus. Although scope of this work is intended to locate and remove these drains from the sanitary system, the project is also helping to identify potential cross connections. Status sheets for this program are attached.

- According to the Storm Water Program plan submitted to MDEQ, the University is divided into 4 distinct areas based on geographical separation - South Campus, Central Campus, Medical Campus, and North Campus. One campus area will be selected each year for 4 years to conduct a dry weather-screening program. Last summer's follow-up screening of Medical Campus identified two potential illicit connections to the storm water system. Refer to Paragraph 2 below for a description of those concerns. At this time all four campus areas have been screened once. We are now starting on a second round of screening on each campus area. This summer the Central Campus has been selected for the screening. This work should be performed during August and September, with any required follow-up activity during the ensuing months. A final report of this activity will be provided in the 2001 Mid-Year Report.

Education

- Education programs reported in the mid-year report are continuing. The OSEH department and the School of Natural Resources (SNRE) storm water educational video has been televised on UM cable TV.
- The University of Michigan football stadium will be making storm water educational announcements during the home games this season.

- *DUMP NO WASTE-FLOWS TO RIVER* curb markers were deployed at over 1,000 storm water inlets throughout the campus this spring. There are a few pros and cons worth noting. The pros are that the markers are getting noticed, as conversation with a variety of people has indicated. They also have the potential to last longer than traditional paint stenciling, which quickly wears off the curb, especially if the surface is not well cleaned in preparation of the actual stenciling. The cons are that the markers are somewhat of a novelty item and are often removed by individuals as a trophy. The second con is that automobile and bus tire rubs cause markers that are deployed on the vertical surface of a curb to detach. The markers should be glued to the top of the curb to avoid this situation. A curb marker is included with this report.
- OSEH provided training classes on storm water pollution prevention, with particular emphasis on soil erosion and sedimentation control. This training was given to Construction Management and Plant Operations, including Outdoor Lighting, Grounds, Masonry, and Painting.
- The University Hospital hosted two brown bag sessions on environmental stewardship, including storm water management.
- OSEH is working with Building Services to improve their cleaning procedures to include specific instructions for handling waste generated from each different operation.
- The OSEH Web page at www.umich.edu/~oseh is being updated. This site contains a variety of articles on storm water quality management and pollution prevention.

Pollution Prevention

- The installation of a 1 million-gallon storm water detention cistern is underway at the site of the future Life Sciences Institute. The expected completion/operational date for this cistern is March 2002. Refer to number 4 below for a detailed description.
- *The Salt Use Quality Improvement Team* has made considerable progress in identifying and employing a variety of liquid and solid materials on campus. The goal of the team is to promote *Best Management Practices* for de-icing that minimize deterioration to buildings, infrastructures, and the environment without compromising the safety of the University's students, faculty, staff, and guests.

In October of 2000 the Salt Use Quality Improvement Team established and submitted an implementation strategy to reduce salt used in winter maintenance activities fifty percent by 2003. This reduction goal is based on average annual use (2600 tons per year) over the period from 1989 to 1999. Additionally, it is expected that the use of abrasives, (sand), be sharply curtailed and used only in emergency situations. The 2000-2001 winter season yielded many positive indications that these best management practices can succeed in reducing total deicing materials usage, as an 8.8 percent reduction was realized. This was accomplished by the calibration of traditional salt application systems and the usage of new liquid freeze point depression mixtures. These materials are applied in the traditional, direct application method following mechanical snow removal and in anti-icing applications with a pre-storm application to reduce snow and ice bonding to paved surfaces.

The liquid deicer program will expand further in the upcoming years and additional studies will look at using various blends of deicing agents. The effect of alternative deicers on

vegetation, cost benefit on infrastructure maintenance, and safety issues will also be looked at. There is difficulty in judging the success of these new practices due to the variable winter conditions that we experience year to year. These investigations will continue in the 2001-2002 winter season. The usage summary tables and charts are attached.

- Pollution prevention efforts continue through catch basin cleaning, street/parking lot sweeping, and litter collection programs. Soil erosion control efforts were implemented at a variety of construction projects during this past year. This includes the continuous operation of a street sweeper during work hours at the Palmer Drive construction project. Other practices implemented at construction projects include the use of filter fence, filter fabric, and plastic sheeting to cover soil piles.

In addition to these standard practices, new storm water protection products are being evaluated. StreamGuard™ catch basin inserts for sediment only were purchased for evaluation as an alternative to ordinary filter fabrics. Results of this trial are still pending. A copy of the brochure is attached. These efforts all help reduce the quantity of sediment that may reach the Huron River.

2. *Provide a report of illicit discharges and illicit connections removed, and schedule for illicit connections and their associated discharges yet to be removed.*

- The following “illicit discharges” were identified and eliminated during this reporting period:
 - ◇ As in the previous year, a field survey was performed of food vendors from Ann Arbor Art Fair during site preparation for the events to determine how gray water was handled and disposed. A central location was provided for vendors on University property for disposal into the sanitary system. Drums were also provided for the separate disposal of oil and grease. Vendors were educated on transporting gray water to the proper disposal point. Proper disposal methods of gray water have been incorporated as a condition of their contract with the University.
 - ◇ U-M OSEH sanitarians are working on a continual basis with kitchen and food vendor personnel in facilities across campus to ensure proper waste handling and disposal methods are used.
- The following “illicit connections” were identified and could not be eliminated during this reporting period.
 - ◇ Pharmacy: Work has begun to repair cross-connected floor drains in the Pharmacy building. This work was started the week of July 13, 2001 and should be completed in six weeks.
 - ◇ Mosher Jordan Dormitory: A potential cross connection was identified at the Mosher Jordan Dormitory on Central Campus through the dry weather screening program. Upon initial investigation, it was found that discharges inside the building are routed to manholes that are split into both sanitary and storm water. University of Michigan plumbing services planned to install a cap over the storm water side in September 2000 to remove the potential for the waters to cross in the event of a back-up. This work was postponed to further investigate the potential cross connection. Dye testing of the lines at

this location has revealed that the storm water and sanitary sewer pipes leading to the road may have eroded, allowing the water from either pipe to mix with the flow from the other. Further investigation at both Mosher Jordon and Alice Lloyd dormitories revealed that a laundry and a kitchen drain are also cross-connected to the storm water system. The first phase of the work to correct these cross-connections is slated to begin the week of September 3, 2001. This will involve installing a new manhole for each of the separate flows (sanitary sewer and storm water) and the removal of the manhole with the split flow. The separate flows that were contained in this manhole will be hard piped, eliminating the potential for a cross-connection at the manhole.

- ◇ Phoenix Memorial Laboratory: A potential cross connection has been identified on a building drawing. Floor drains in a mechanical room may be connected to the storm water system. The suspect drains are located under large slabs of concrete that need to be moved prior to completing the investigation. Dye testing will be performed in the next two months to verify flow to the sanitary sewer.
 - The following potential illicit discharges were identified during the 2000 Medical Campus dry weather field screening.
 - ◇ Thomas Francis Jr. Public Health Building: An enclosed pipe was discovered discharging water to a storm water manhole. Low level of chlorine indicates possible non-contact cooling water discharge. Further investigation is underway.
 - ◇ Glen Avenue and Catherine Street: A manhole was identified that contained a high flow of water. Chemical analysis indicated the presence of chlorine at a level consistent with that of drinking water. Backtracking was unsuccessful at locating the source of this flow. Further investigation and dye testing will be performed to identify the source.
 - OSEH is working with Facility Maintenance to improve the system of tracking cross-connections and their repair.
3. *Provide an evaluation and summary of the effectiveness of the Storm Water Management Program. The report shall include an assessment of the pollution reduction and probable receiving water 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 year.*

In accordance with Part III-A, methods to evaluate effectiveness of the program can vary, depending on the type of activity undertaken. The following factors are being reported during this period:

- Item 2 above discusses the effectiveness of “illicit discharge” identification and reduction.
- During this reporting period OSEH Hazardous Material personnel responded to approximately 48 incidents, involving spills and leaks of materials that could have potentially impacted storm water. The majority of the spills were small, ranging from a few milliliters to a few gallons. At most locations, no discharge to the storm system was noted and materials were well below reportable quantities. The materials were contained with spill kits; cleaned

up using absorbent materials, and removed for appropriate disposal by OSEH's on-call emergency response team. Response activities involved leaks and spills of diesel, gasoline, hydraulic oil, latex paint, blood, and ethylene glycol based anti-freeze in parking areas, driveways, and other outdoor places. A few examples of such releases and the corresponding response actions are given below.

- ◇ Approximately 40 gallons of diesel fuel leaked from a bus in the Transportation Services bus storage facility to two storm water catch basins. The diesel fuel and contaminated water were pumped out of both basins and sent out for proper disposal. The spill was contained within the two basins and no other water was impacted.
 - ◇ Approximately 2 gallons of hydraulic oil leaked from a truck that was unloading at the University of Michigan Hospital dock. Hospital personnel contained the spill with shop towels until UM OSEH responded with oil dry. The oil was cleaned up and sent out for proper disposal. No hydraulic oil impacted the storm water system in the area.
 - ◇ Approximately 1 quart of anti-freeze was released from an automobile at the emergency room parking lot. The spill was cleaned up using oil dry absorbent. No discharge to the storm drain was noted.
- A catch basin cleaning program utilizing the university owned vacuum truck continued again this year. Catch basins across the campus were cleaned and the sewer lines rodded out. The liquid waste was drained to approved sanitary locations and the remaining 9,700 gallons of non-hazardous sediment and debris was transported for disposal off-site. To more effectively handle the storm and sanitary cleaning solids, the University of Michigan constructed a storage pad for drying the solids. The solids are then loaded onto a dump truck or a roll-off container and transported to a sanitary landfill for proper disposal.
 - The University Parking Services and Grounds and Waste Management Department (G&WM) conduct street and parking lot-cleaning programs. During this period approximately 250 cubic yards of sediment were collected and sent off site for proper disposal. This was done to improve customer service, decrease the damage to structures from use of salt, prevent clogging of drains due to sand, and to improve the environment. The G&WM performs a litter collection program, where approximately 1,650 compacted cubic yards of litter was collected and sent for off-site disposal as normal municipal waste.

4. *Provide proposed modifications and updates to the Storm Water Management Program, including an update on areas added to the University's municipal separate storm water drainage system due to annexation or other statutory processes. Proposed modifications and updates shall include schedules for implementation when appropriate.*

Construction activities for the Life Sciences building began in September 2000. When construction is complete, a 1 million-gallon storm water detention cistern under the new parking deck will be in place. This cistern will handle storm water flow from the Palmer Drive area as well as some rerouted flow from south of the area. This will help to alleviate flooding at the Dana/Randall buildings. The university plans to install an oil/water separator in this system to remove potential floating contaminants. The cistern itself will act as a settling tank for silt and other heavier than water debris. A pump will introduce the detained storm water into the storm line after the storm event has subsided.

5. *Provide revisions, if necessary to the assessments of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) & (v).*

No revisions are proposed at this time.

6. *Provide a summary of any data, including water testing or screening data, that has been developed since the previous annual report and which is not reported elsewhere in the annual report.*

Monitoring data on the storm water system dry weather screening for the Central Campus will be provided in the 2001 Mid-Year Report. A copy of the Medical Campus follow-up dry weather screening is included with this report.

7. Provide the previous year's annual expenditures and proposed budget for the fiscal year following the report.

The expenditures and budget are shown in the following table.

ACTIVITY	00-01 UNIVERSITY LABOR AND MATERIALS ¹	00-01 CONTRACTOR COST OR DIRECT PAYMENTS	01-02 BUDGET ESTIMATE
Permit administration	\$20,000		\$20,000
Survey of building connections to storm system	\$105,000	\$11,500	\$110,000
Construction site soil erosion control	\$7,250	\$150,000	\$444,000
Storm water detention pond construction			\$2,900,000
Storm water education program	\$10,000	\$3,500	\$10,000
Catch basin maintenance and cleaning program	\$278,613		\$500,000
Street sweeping program	\$41,300	\$6,300	\$50,000
Waste Management Department Litter collection & disposal	\$394,800	\$39,600	\$500,000
Parking structure cleaning program	\$429,100	\$124,357	\$500,000
Storm water utility charges paid to Ann Arbor		\$233,178	\$300,000
OSEH spill response activity		Footnote 2	
Plant Extension Division		Footnote 2	
TOTALS	\$1,286,063	\$568,435	\$5,334,000

Footnotes: 1 - University labor costs include estimated base salary, 28% for benefits, and 52% for indirect cost recovery charges.

2 - These departments and divisions have moderate storm water costs and are not tracked separately by the University budget system.

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ATTACHMENTS