

**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 reissued by the Michigan Department of Environmental Quality Surface Water Quality Division on October 1, 2001. This report covers the period July 1, 2001 through June 30, 2002 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 was then initiated at dormitories and kitchens. The first round of this sampling was completed in December 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 evaluated 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 also helped 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. At this time, we are conducting a second round of screening for each of the campus areas. This summer the South Campus area was selected for dry weather screening. The initial field screening was conducted in June of this year. Six of the twenty locations selected for screening contained non-storm water flow. Flow at each of these locations will be backtracked to determine if the source is from an illicit connection.

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 have been deployed at many storm water inlets throughout the University. 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. This spring, the University of Michigan placed an order for 1,000 additional markers.

- 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.
- OSEH is continuing work 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 continually updated. This site contains a variety of articles on storm water quality management and pollution prevention, as well as copies of past years NPDES storm water reports.

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 2001-2002 winter season was not characteristically normal in that the area experienced a higher standard mean temperature and less snow accumulation than past years. These conditions, combined with best management practices and alternative deicers yielded an overall reduction in total deicing materials usage of 30 percent.

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 2002-2003 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. 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.
 - ◇ 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 were routed to a manhole that was split into both sanitary and storm water. University of Michigan plumbing services removed the manhole basin that contained both storm and sanitary flows, and installed separate basins for each of the flows. Further investigation at both Mosher Jordan and Alice Lloyd dormitories revealed that a laundry and a kitchen drain were also cross-connected to the storm water system. The laundry drain in Mosher Jordan was rerouted to the sanitary.
 - ◇ Alice Lloyd Dormitory: A cross connection from the kitchen was identified during the Mosher Jordan investigation. An area of the concrete floor in the lower level of the dormitory was broken up to reveal and reconnect the line to the sanitary sewer.
 - ◇ Pharmacy: Work was completed to repair cross-connected floor drains in the Pharmacy building. This work was completed in August of 2001.
 - ◇ Chemistry: Dry weather screening identified a manhole with flow coming from the cooling tower, which is broken and discharging into the roof drains. The cooling tower system was repaired.

- The following “illicit connections” were identified and could not be eliminated during this reporting period.
 - ◇ Law Quad: Dry weather screening identified a manhole with flow coming from this building. One source of flow is storm inlets in the lawn area that allow groundwater infiltration to drain to the storm water drainage system. An additional source of water was identified as a hot water return line.
 - ◇ Tappan Hall: Dry weather screening identified a manhole with flow coming from Angell Hall. The University identified the source as water from the cooling tower flowing to the roof drains on Angell Hall. This discharge is being evaluated to determine if these discharges can be permitted to drain to the storm water drainage system or rerouted to the sanitary sewer.
 - ◇ School of Education: Dry weather screening traced flow upstream to a manhole with flow coming from both East and West Hall buildings. This discharge was identified as water from the cooling tower systems. This discharge will be evaluated to determine if it can be permitted to drain to the storm water drainage system or rerouted to the sanitary sewer.
 - ◇ Ruthven Museum: Dry weather screening identified a manhole with flow coming from two sources, Ruthven Museum and Central Campus Recreational Building (CCRB). The Ruthven Museum flow is suspected to be cooling tower water from the roof drains, but will be investigated to determine the source. The other source of flow was identified as coming from CCRB. The University is permitted to discharge dechlorinated water from the CCRB pool to the storm water drainage system.
 - ◇ Randall: The source of water is a condensate receiver connected to an ejector tank that is connected to the storm water system. The steam condensate receiver will be disconnected from the ejector tank by the end of the summer in 2002.
 - ◇ Kraus: Cooling tower water is suspected to be discharging to storm water cisterns. Dye testing was performed and was inconclusive. The plumbing shop is confident that the flow from the cisterns do not go to the storm water system.

- The following potential illicit discharges were identified during the 2002 South Campus dry weather field screening.
 - ◇ Yost Ice Arena: Non-storm water flow containing an elevated level of e-coli was observed in a manhole located South State Street. Follow-up investigation will take place to determine if there is a cross connection at Yost Ice Arena or Fisher Stadium.
 - ◇ Miscellaneous: Five other locations were observed as containing non-storm water flow. None of these screening points contained analytes of concern above action levels, however the flows will be backtracked to verify the sources.

- 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 34 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. 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, kitchen grease, 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 5 gallons of diesel fuel leaked from a bus on to asphalt road surface on North Campus. UM OSEH personnel responded with oil dry. The street surface was cleaned utilizing a street sweeper. The used oil dry was sent out for proper disposal.
 - ◇ Approximately 10 gallons of hydraulic oil leaked from failed hydraulic line on a truck at the South Quad loading dock. UM OSEH personnel 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 3 gallons of ethylene glycol anti-freeze was released from an air compressor at the Heavy Equipment Garage. The spill was cleaned up using oil dry absorbent. Some of the antifreeze entered a storm water catch basin, where it was contained. UM OSEH personnel utilized a bucket to remove the liquid from the catch basin, and sent it off for proper disposal.
- 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 12,120 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 as non-hazardous, non-regulated waste.
- The University Parking Services and Grounds and Waste Management Department (G&WM) conduct street and parking lot-cleaning programs. During this period approximately 330

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 1,280 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 South Campus is attached.

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	01-02 UNIVERSITY LABOR AND MATERIALS ¹	01-02 CONTRACTOR COST OR DIRECT PAYMENTS	02-03 BUDGET ESTIMATE
Permit administration	\$20,000		\$20,000
Storm and sanitary repair	\$325,000		\$110,000
Construction site soil erosion control	\$122,400	\$190,000	\$400,000
Storm water detention pond construction			\$
Storm water education program	\$10,000		\$10,000
Catch basin maintenance and cleaning program	\$81,000		\$500,000
Street sweeping program	\$66,000		\$50,000
Waste Management Department Litter collection & disposal	\$394,800		\$500,000
Parking structure and lot cleaning program	\$443,000	\$100,323	\$500,000
Storm water utility charges paid to Ann Arbor		\$245,168	\$300,000
OSEH spill response activity		Footnote 2	
Plant Extension Division		Footnote 2	
TOTALS	\$1,462,200	\$535,491	\$2,390,000

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