Storm Water Permitting: A Watershed Perspective

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The Rouge River National Wet Weather Demonstration Project (Rouge Project) has provided an unique opportunity for a watershed-wide approach to municipal storm water discharge regulation under the Clean Water Act. This paper discusses some of the shortcomings of the existing storm water regulatory program as it applies to the Rouge Watershed, offer solutions for removing the barriers to issuing a watershed-wide storm water permit, and presents the approach taken by the Rouge Project to initiate this permitting process.

The Rouge River, a tributary to the Detroit River in Southeast Michigan, has been documented as a significant source of pollution to the Great Lakes System. The Rouge River Watershed spans approximately 438 square miles in three counties and is home to over 1.5 million residents. The eastern portion of the watershed consists of much of the old industrial areas of Detroit and Dearborn. The western and northern portions consist of newer suburban communities and areas under heavy development pressure.

Historically, the major sources of pollution to the river were industrial and municipal point sources, wet weather sanitary sewer bypasses, and combined sewer overflows (CSOs). The point sources and sanitary sewer overflows have been successfully controlled by an aggressive National Pollutant Discharge Elimination System (NPDES) permitting process administered by the Michigan Department of Environmental Quality (MDEQ). However, the river still fails to meet water quality standards due to a wide range of sources such as CSOs, storm water runoff, illicit connections, failing septic systems, interflow from abandoned dumps, and resuspension of contaminated bottom sediment.

The Rouge Project team has developed its watershed-wide management program based on the concept that each citizen has the right to expect clean water from their upstream neighbor and are also expected to assure that their downstream neighbor is given the same courtesy. To restore water quality and beneficial uses in the Rouge River under current institutional arrangements, each jurisdiction must implement measures to eliminate pollution. It is increasingly more evident that managing water quality necessitates looking beyond political boundaries and focusing on the hydrologic units for assessment and remedial action.

The Rouge Project initiated the watershed-wide management approach in southeast Michigan by facilitating CSO control and permitting based on common requirements throughout the watershed. Rouge communities served by combined sewers have entered into permits with the MDEQ and the United States Environmental Protection Agency (USEPA) requiring a base level of abatement construction throughout the watershed followed by assessment of water quality impacts and future construction phases to meet public health and water quality standards.

In the separated sewer areas of the Rouge River watershed, currently only one of the 48 communities and select industries are required to obtain NPDES stormwater permits. Stormwater permitting and management only in select areas of the watershed, combined with the CSO efforts, will not achieve the

water quality and beneficial use objectives for the river. Therefore, the Rouge Project team, comprised of communities and counties, industries, local/regional agencies, MDEQ, and USEPA, is working to develop a consensus-based design for a watershed-wide storm water management and permit program meeting the needs of all local communities while focusing on the instream water quality issues facing the Rouge River watershed.

The Rouge Project team has defined a five component strategy designed to identify and overcome the barriers that have previously hindered watershed-wide permitting. The components are:

1. Define working groups with a focused local purpose;
2. Develop a common set of basic technical information;
3. Identify and prioritize specific sub-watershed problems;
4. Develop a long-term strategy and implementation process;
5. Allow for a watershed-wide NPDES permit or an alternate program.

The first component, define working groups with a focused local purpose, is the key to establishing the local interest and support fundamental to watershed issues. It is the intent of these groups to define the requirements of an effective storm water management program, and it is understood that these requirements will vary from one area of the watershed to another. The involvement of citizens and their local community officials is best encouraged by identifying a specific local issue that is a component of the overall watershed-wide problem. It is easier for the general public to understand how drainage affects their backyards than to comprehend the complexities of the entire watershed.

Within the Rouge watershed we have, thus far, established three working groups focused on specific sub-watershed areas. Each of these groups is facilitated by project staff working closely with community leaders to identify local issues of concern and to convene appropriate involvement from citizens and municipal officials. Once the issues are drawn along water quantity or quality lines effecting specific individuals, the problems associated with municipal boundaries can be overcome.

Our first working group was formed within the Upper Rouge 2 sub-watershed (see **Figure 1**). This area encompasses about two-thirds of the City of Livonia together with portions of five surrounding municipalities. Upon completing a sewer separation project in a small area of the city, Livonia will be required to obtain a Phase I NPDES municipal storm water permit. It was these impending permit requirements that became the catalyst for Livonia city officials to champion the working group involved in this sub-watershed. Their efforts are directed at developing processes and procedures to evaluate in-stream water quality as a determinant of needed Best Management Practices rather than undertaking the "end-of-pipe" analysis associated with previous permit requirements. This group is also examining institutional and financial barriers to watershed management at the local level. Incentives are also being identified to encourage a watershed approach to storm water regulation at the local, state, and federal levels.

The second working group has been formed within the Middle Rouge 1 sub-watershed, a relatively rural area facing intense development pressure. This effort was championed by a citizens group concerned with the condition of Northville Mill Pond, and has garnered the support of all upstream municipalities.

The group is addressing issues associated with the effects of development on the river and on in-stream impoundments. A key activity for this group is implementation of consistent stormwater management requirements for new development in the six communities in the sub-watershed.

The third working group is comprised of communities within the Middle Rouge 3 sub-watershed. This area is comprised of older suburban communities which have areas served by both separate and combined sewer systems. This group is the most recently formed, and is beginning to consider the problems of storm water management in densely developed areas, and the equity issues created by the need to address both CSO abatement and storm water management within a single municipality. The findings and recommendations of these groups will provide the basis for expanding the watershed management effort to the entire Rouge River watershed.

The next component of the Rouge watershed storm water strategy, develop a common set of basic technical information, is required in order to provide benefit/cost information on alternative pollution controls to the watershed decision makers. This effort is based on the construction or implementation and evaluation of pilot pollution controls, as well as information from the literature, and is providing consistent information across the entire watershed. While local issues and priorities may differ, it is important that a common base be used to evaluate the proposed remedial measures from one sub-watershed to another. Additionally, it will become necessary to evaluate watershed-wide impacts of local improvement efforts.

The third component of the Rouge watershed storm water strategy is to identify and prioritize specific sub-watershed problems. This effort is initially being done by the working groups and will be expanded throughout the watershed. This effort is based on the extensive information being developed for the watershed, including comprehensive in-stream water quality monitoring and modeling programs (e.g., watershed analysis programs). This effort is identifying problems outside of local areas of concern and will prioritize these problem areas across the entire watershed. This approach may substantially reduce the costs and increase the effectiveness of wet weather pollution remediation measures in this large urban watershed.

The sources of pollution vary considerably by sub-watershed and the level of anticipated use for each reach of urban river is also different. It is therefore necessary to consider a number of factors in establishing priorities for addressing specific problems. These include bacterial contamination (i.e., human health concerns), flow variability, water column chemistry, aesthetics, and the ability to support an appropriate biological community as well as technical and economic limitations. The Rouge Project has developed an index system which is being used to define the present quality of river use in each sub-watershed and to compare and assess the impacts proposed management practices will make on the increased usability of the resource. This tool is proving useful for communicating complex and technical information to watershed stakeholders with widely varying technical backgrounds.

The fourth component of the Rouge watershed storm water strategy requires the integration of all local sub-watershed efforts through the development of a long-term strategy and implementation process. While problem identification and consensus building must proceed from the bottom up, it is critical that the process be established to unite the individual sub-watershed groups, and the municipalities they overlap, within a single strategy for managing the watershed on a long-term basis. Only if the initial

watershed analysis programs are continued to be utilized after the initial remediation measures are implemented and future measures implemented as needed will progress toward meeting water quality goals be attained.

We believe that responsibility for the majority of remedial and preventive watershed management measures remains at the local community level. However, certain aspects of the long-term implementation may be best served by a watershed-wide association. These include baseline water quality sampling and analysis, regional pollution controls (where appropriate), consistent standards for new development, bank stabilization, and certain aspects of flow control (e.g., logjam removal).

The institutional arrangements required to implement this association will differ widely from watershed to watershed throughout the country. These arrangements will be based on specific issues being addressed, existing agencies or associations, state enabling legislation, and regulatory agency requirements. Yet, before any agreements can be forged between local units of government and the regulatory agencies, the basic foundation established through Rouge watershed storm water strategy components one through three must be in place.

The fifth component of the strategy presumes that the Rouge watershed management effort encompasses the purpose and intent of both NPDES point source and storm water efforts. This effort allows for a watershed-wide NPDES permit or an alternate program to be developed which will meet the requirements in a manner acceptable to both the local regulatory agency and the USEPA.

For certain sources such as traditional point sources or CSOs, the existing NPDES permit process should remain basically unchanged but with modifications to consider the effects of specific outfalls on specific receiving water and watershed concerns. However, for non-point and urban storm water sources, an alternative to the formal permit issued to each municipality may be preferable. In these cases, the communities may be considered to be permitted by rule as long as they are actively participating in the watershed management process, supporting those general activities such as baseline sampling and analysis, and implementing the Best Management Practices called for within their particular subwatersheds.

For this process to be successful, the regulatory agencies need also to redirect their emphasis. It is hoped that by mutually defining a program in the Rouge River watershed based upon local consensus to address storm water management, the river will realize improvement much earlier than would be realized through a protracted command-and-control permitting procedure.

The Rouge River National Wet Weather Demonstration Project is working to establish an enforceable stormwater management system on a watershed basis. Communities within the watershed have joined with state and federal representatives to implement a five-component strategy to develop technical, institutional, and regulatory options to cost-effectively manage stormwater and other sources of pollution on a watershed basis. It is hoped that the lessons learned from this effort will be beneficial to others across the nation to achieve the goals of the Clean Water Act.

Figure 1. Rouge River Watershed