

## STAKEHOLDER INVOLVEMENT WORKS TO

# Reclaim the Rouge River

**T**he Rouge River—part of a 436-sq mi watershed encompassing portions of three counties and 48 municipalities, and home to 1.5 million residents—was plagued by combined sewer overflows (CSO) and poor stormwater quality for decades. An urban, suburban, and rural river, the Rouge flows through metropolitan Detroit on its way to the Detroit River. Under the leadership of Wayne County, Michigan, and through the efforts of many stakeholders, the Rouge has undergone major improvements over the past 10 years through the Rouge River National Wet Weather Demonstration Project.



This award-winning project, to restore and protect water quality; control CSOs and other nonpoint sources of pollution; and implement watershed management practices, began in 1992. Fueled by \$359 million in local funding and federal grants from the EPA, the project included pollution control facilities and best management practices to restore the river's degraded aquatic and riparian habitats. Many of the lessons learned from the Rouge's cleanup of CSOs, illicit discharges, nonpoint sources of pollution, and leaking septic tanks now guide similar projects across the U.S. This multi-stage, multi-faceted project was awarded the esteemed American Academy of Environmental Engineers (AAEE) 2002 Superior

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Achievement Award in the annual Excellence in Environmental Engineering competition.

Wayne County, Michigan, which developed the project, hired CDM to serve as program manager. CDM led the program team in developing and conducting CSO assessments and control strategies; stormwater and nonpoint source pollution control programs; watershed assessments,

monitoring, and management; water quality modeling; wetland resource protection and assessments; geographical information system and data management; and public involvement strategies.

### INTEGRATING CONTROLS

The project originally focused on controlling CSOs in the older, urban core of the watershed's downstream end. The CSO control program was broken into three phases as estab-

**Above left:** Due to improved water quality, residents and visitors now enjoy many recreational activities on the Rouge River and Newburgh Lake.

**Above right:** Since the project's inception, there has been an increase in fish and wildlife returning to the river and its banks.



Left: Stormwater and nonpoint source pollution control systems, like this stormwater retention basin, were designed in conjunction with CSO controls. Right: CSO controls include sewer separation, storage transport tunnels, and variations on the conventional storage-treatment scheme.

lished through the National Pollutant Discharge Elimination System (NPDES) permit:

- Phase I included the elimination of raw sewage and the protection of public health for approximately 40 percent of the combined sewer area.
- Phase II includes public health protection for the remaining combined sewer area.
- Phase III includes meeting water quality standards in the Rouge River.

Within two years of starting the Phase I design work and conducting initial sampling, it was evident that other sources of pollution in addition to CSOs were major contributors to poor water quality, and full control of CSOs would not result in the attainment of water quality standards. Stormwater runoff and illicit sewer connections were identified as major sources of pollutants entering the river. Therefore, the project team implemented an approach that addressed both the stormwater and CSO issues concurrently.

Combining the CSO and stormwater programs has saved significant money and produced major water quality benefits. The phased approach to CSO control and use of demonstration-size basins, coupled with a mix of technologies, yielded more than \$400 million in savings compared to the expected cost of

building the CSO controls to a presumptive size for the 25-year, one-hour design storm.

Annual water quality measurements are already showing improved dissolved oxygen levels. While the lower portion of the river seldom met dissolved oxygen standards of five mg/L in dry or wet weather at the start of the project in 1992, it met dissolved oxygen standards in dry weather 94 percent of the time from 1998 to 2001.

#### STAKEHOLDER DRIVEN PROCESS

An important driver of the project has been the U.S. District Court, Eastern District, Southern Michigan Division, but the decisions on means and methods have been a collaborative approach among the Michigan Department of Environmental Quality (MDEQ), EPA Region V, three county governments, and 48 municipal governments. The implementation mantra has been "bottom up, stakeholder driven" rather than "top down, command and control." The project's watershed process provided regulatory flexibility and an adaptive management approach for local communities to address environmental programs on a site-specific basis.

Elements of this approach includ-

ed CSO controls, stormwater permits, subgrants, and seven subwatershed advisory groups (SWAGs). In 2001, seven subwatershed management plans were completed cooperatively by the SWAGs and submitted to the MDEQ. They included more than 250 types of management practices and activities as well as more than 1,100 activities for participating communities and agencies. The plans addressed various environmental issues, including:

- stormwater, nutrient, flow, and soil erosion management;
- wetlands restoration and banking;
- aesthetics, ecosystem, and habitat improvements;
- recreation amenities;
- human resources training;
- regulation and local ordinance development;
- air deposition of mercury and other contaminants;
- leachate control from abandoned solid waste dumps; and
- financial and institutional planning.

The project is a working demonstration of a watershed-wide approach to restoring and protecting an urban river system by using a cooperative, locally based approach to pollution control. The watershed management tools developed by the project have aided decision-makers

and the general public in evaluating options for preventing, reducing, and minimizing pollution loading impacts on the Rouge River. The watershed management tools facilitate the prioritization and tailoring of pollution control and ecosystem restoration solutions to specific river reaches while coordinating efforts throughout the watershed.

#### **TAILORED CSO CONTROLS**

Under Phase I, six communities have separated their sewers and eight communities have constructed 10 retention treatment basins. Each of these basins is sized for different design storms and several employ innovative technology. Facilities also incorporate various additional features or variations in compartment sizing and sequencing in an effort to improve their effectiveness. The retention treatment basins capture most wet weather flows for later conveyance to Detroit's publicly owned treatment works for treatment. Flows from large wet weather events that are not captured by the retention treatment basins receive screening, skimming, settling, and disinfection before discharge. These projects have effectively eliminated or controlled the discharge of untreated sewage from about half of the watershed CSOs. The completed basins are controlling overflows at a rate of approximately four billion gallons per year, with water quality and aesthetic improvements and increased recreational use.

#### **MANAGING ONSITE SEWAGE DISPOSAL SYSTEMS**

When not maintained properly, onsite sewage disposal systems, or septic systems, also negatively impacted the Rouge River. With more than 17,000 systems in the watershed, failure rates were as high as 20 percent. In 1999, Washtenaw and Wayne counties enacted new ordinances for the management of onsite disposal systems. The regulations require the inspection of all residential systems by private evaluators when a property is sold. In 2001



**The project's watershed process provided regulatory flexibility and allowed local communities to address environmental programs on a site-specific basis.**

alone, there were 100 inspections performed in Wayne County as a result of the ordinance. A total of 32 failed systems were found and addressed. A time-of-sale ordinance and periodic inspection of systems are under consideration in other counties.

#### **FROM PUBLIC AWARENESS TO STEWARDSHIP**

Shortly after the inception of the project, it was clear that a comprehensive public involvement and education program was necessary to support Rouge River's restoration activities. A survey of watershed residents determined that while few people viewed the Rouge River as a viable resource because of its pollution, the majority broadly supported and were optimistic about efforts to improve its quality. This necessitated creating a strong consensus-building public involvement program to address the concerns of area residents, educate the community about the effect of their current activities on the watershed, and include all stakeholders in the mission to restore the Rouge River. A Rouge River public involvement action plan was devised based upon the survey.

The action plan's goals were to engage numerous stakeholders, educate them, and gain support in changing their behaviors to help achieve and maintain a healthy watershed. The public involvement strategy used the philosophy that

communication with Rouge River watershed stakeholders must be continual, consistent, truthful, and collaborative. In addition, since many of those surveyed thought the causes of pollution to the Rouge River were from industrial sources, a public education campaign was launched to explain the impact of stormwater and nonpoint source pollution on the river. Finally, the campaign explained to stakeholders their personal responsibility in Rouge River restoration efforts.

These public education efforts reinforced public awareness of environmental protection, enhanced trust in Wayne County, and supported local community watershed protection.

#### **A RECLAIMED ROUGE**

There are approximately 127 miles of larger streams and tributaries in the watershed. By 2002, approximately 89 of those miles were free of the adverse impacts of CSO discharges, a 51 percent reduction in the past six years. The dissolved oxygen water quality standard (five mg/L) is being met during dry weather at many locations in the river for the first time in years. The aesthetics of the river are greatly improved; there are more sightings of larger and more diverse species of fish, and the river's recreational use is expanding at an increasing rate.

The project's approach demonstrates that a watershed can be "man-

## WATERSHED MANAGEMENT

aged." When water quality objectives can only be reached through CSO control, stormwater, and nonpoint sources, then watershed management must involve the active participation of local units of government.

The project's success will be enjoyed for generations to come. Continuous water quality and habitat monitoring, coupled with ongoing improvements, will extend this project for many years. The reclaimed Rouge River benefits all communities in the watershed—from the headwaters to the mouth of the Detroit River. Residents now enjoy canoeing and fishing at Newburgh Lake, activities that were not possible before this project, and restored wetlands at a golf course allow for educational opportunities for local schoolchildren.

In addition to environmental, aesthetic, and ecosystem improvements, this project also helps the local economy and job market. Statistics show that for every \$1 billion spent on pollution control, 50 to 70 thousand jobs are created, boosting the economy and the employment rate. In addition, the project met and continues to meet goals for contracting to minority- and woman-owned businesses, including a 30-percent goal for services. New firms were continually involved in these programs as the nature of the work progressed.

The collective achievements through seven subwatershed advisory groups, communities, stakeholders, and consultants proved that collaborative local efforts could restore an urban watershed. Dry weather dissolved oxygen levels continue to improve, and remaining sources of bacteria from onsite sewage disposal systems and contaminated storm drains are being located and isolated. Communities across Michigan now use the Rouge project as an example of how to utilize the state's watershed-based stormwater permit, and communities across the country continue to access the Rouge River Web site ([www.rougeriver.com](http://www.rougeriver.com)) to learn from the experience.

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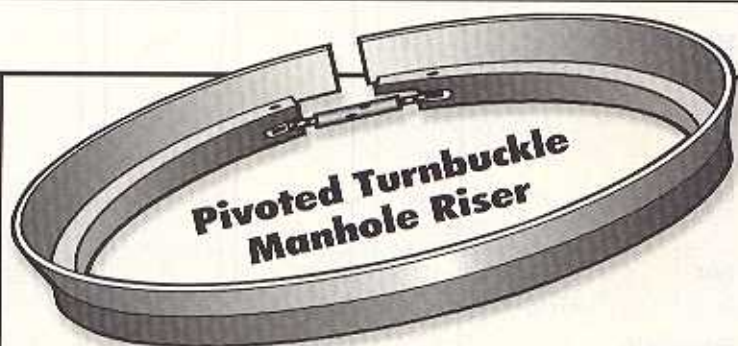
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