Rouge River National Wet Weather Demonstration Project

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The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

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Introduction

The Rouge River National Wet Weather Demonstration Project (Rouge Project) demonstrated development and implementation of a systematic watershed approach to pollution management. This cost-effective, holistic approach was shared in order to provide solutions to other urban watersheds throughout the country on how to restore a polluted urban waterway. The Rouge Project was initiated in 1992 by the Department of the Environment, Wayne County, Michigan. The Rouge River Watershed located in Southeast Michigan is largely urbanized, spans approximately 466 square miles, is home to more than 1.5 million people in 48 communities and three counties, and is a tributary to the Detroit River. Multi-year federal grants from the United States Environmental Protection Agency and additional funding from local communities support this cooperative effort between federal, state and local agencies. These grants were managed by Wayne County.

The early focus of the Rouge Project was on the control of combined sewer overflows (CSOs) in the watershed. Although control of pollution from CSOs was identified as a major priority, it was determined that CSO control alone would not provide sufficient improvements to meet water quality standards in the watershed. This is because nonpoint source pollutants — such as storm water runoff, discharges from illicit connections, discharges from failed on-site septic systems, and other sources — would continue to degrade the river. In addition, it was determined that wetlands, habitat restoration, lake restoration, erosion and flow variability all needed to be controlled before full restoration of the river would be achieved throughout the watershed.

Using the watershed approach requires a number of tools such as a comprehensive sampling and monitoring program, various types of water quality and water quantity modeling, and a geographic information system. The Rouge Project aggressively invested in these tools and others in order to develop a holistic watershed management strategy.

The Rouge River National Wet Weather Demonstration Project is an unqualified success, using any of several measures of achievement. Major progress has been made in the control of pollution being discharged to the Rouge River. For example, CSO pollutant loads to the river have been cut by 90 to 100 percent during most events. In previous years certain water quality standards were violated most of the time at many places in the watershed. Now, the majority of the waters in the Rouge River watershed meet many standards. Coupled with the water quality improvements, the ecosystem health continues to improve as well. This is demonstrated by several measures such as increased sightings of fish and

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wildlife along the river since 1999. Improvements in the water quality and removal of contaminated sediment in Newburgh Lake resulted in the lifting of the fish consumption advisory for some species of fish in the lake. This is the first time fish caught in the Rouge River system have been safe for consumption in decades. This extensive web site contains technical reports, maps, and other information about the details of the Rouge Project.

Mission Statement

The mission of the Rouge River National Wet Weather Demonstration Project is to demonstrate effective solutions to water quality problems facing an urban watershed highly impacted by wet weather and develop potential solutions and implement projects which will lead to the restoration of water quality in the Rouge River. The project addresses both conventional and toxic pollutants to:

- Provide a safe and healthy recreational river resource for present and future generations;
- Re-establish a healthy and diverse ecosystem within the Rouge River Watershed;
- Protect downstream water resources such as the Detroit River and Lake Erie; and
- Help to ensure compliance with federal, state and local environmental laws which protect human health and the environment.

This was accomplished through the development, implementation and financial integration of technical, social and institutional frameworks leading to cost-efficient and innovative watershed-based solutions to wet weather problems. This watershed-based national demonstration project will provide other

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municipalities across the nation facing similar problems with guidance and potentially effective solutions.

Highlights

- **Rouge River Restoration Summary - 1994-2014**
  2013 Rouge River Progress Report
  2012 Rouge River Progress Report
  2013 Rouge River Monitoring and Assessment Report
  2012 Rouge River Monitoring and Assessment Report
  Rouge 2009 Presentation - Preserving Our Future

New Items

- **Updated Rouge Publications Clearinghouse Order Form**

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Overview

The Rouge River National Wet Weather Demonstration Project (Rouge Project) has been a working example of how a systematic watershed approach to pollution management can result in cost-effective and ultimately greater and faster achievement of designated uses in a water body. The Project provided solutions to other urban watersheds throughout the country on how to restore a polluted urban waterway. The Rouge Project was initiated in 1992 by the Department of the Environment, Wayne County, Michigan. This cooperative effort between federal, state and local agencies has been supported by multi-year federal grants from the United States Environmental Protection Agency and additional funding from local communities.

The early focus of the Rouge Project was on the control of combined sewer overflows (CSOs) in the watershed. Although control of pollution from CSOs was identified as a major priority, it was determined that CSO control alone would not provide sufficient improvements to meet water quality standards in the watershed. This is because nonpoint source pollutants, such as stormwater runoff, discharges from illicit connections, discharges from failed on-site septic systems, and other sources would continue to degrade the river. In addition, it was determined that wetlands, habitat restoration, lake restoration, erosion control and flow variability all needed to be controlled before full restoration of the river would be achieved throughout the watershed. Major progress has been made in the control of pollution being discharged to the Rouge River from the above named sources.

Based upon what was learned, the focus of the Rouge Project became more holistic to consider the impacts from all sources of pollution and use impairments in a receiving water. This watershed management method is based on the use of a cooperative, locally based approach to pollution control. The use of the watershed approach is working in the Rouge River.

Using the watershed approach requires such tools as a comprehensive sampling and monitoring program, various water quality and water quantity modeling tools, data management and a geographic information system. The Rouge Project aggressively invested in these tools in order to develop a holistic watershed management strategy. Use of the watershed approach has proven to be very efficient and cost effective in dealing with wet weather issues.

The Rouge Project developed an effective public information and education 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.

The Rouge Project learned a great deal about what it takes to restore an urban waterway to its beneficial uses. Using the various tools of the watershed approach, the Rouge Project stands as a model in pollution management based upon the results to date. A watershed-wide strategy to restore the Rouge River has been implemented through a unique partnership of local agencies and communities, state agencies, non-profit organizations, businesses and citizens.

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This web site contains a great amount of this information. We urge you to explore the site!

ROUGE PROJECT MISSION STATEMENT

The mission of the Rouge River National Wet Weather Demonstration Project was to demonstrate effective solutions to water quality problems facing an urban watershed highly impacted by wet weather and develop potential solutions and implement projects which will lead to the restoration of water quality in the Rouge River. The project addressed both conventional and toxic pollutants to:

- provide a safe and healthy recreational river resource for present and future generations;
- reestablish a healthy and diverse ecosystem within the Rouge River Watershed;
- protect downstream water resources such as the Detroit River and Lake Erie; and
- help ensure compliance with federal, state and local environmental laws which protect human health and the environment.

This was accomplished through the development, implementation and financial integration of technical, social and institutional frameworks that led to cost-efficient and innovative watershed-based solutions to wet weather problems. This watershed-based national demonstration project provided other municipalities across the nation facing similar problems with guidance and effective solutions.

Technical Papers & Reports

Key for Document Reading Level
* No scientific background required for understanding
** Some scientific and/or technical background helpful
***Scientific and/or technical background suggested

Rouge River Restoration Summary Report 1992 - 2014

Kelly Cave

Technical Report, November 2014, 14 pages, Order Number: Rouge Summary 1992-2014

The Rouge Project was initiated in 1992 by Wayne County, Michigan. This cooperative effort between federal, state and local agencies was supported through June 2014 by over $350,000,000 in multi-year federal grants from the United States Environmental Protection Agency with additional funding from local communities and other stakeholders. This report highlights the many accomplishments and achievements of this watershed restoration effort that spanned nearly 22 years.

View this document now: Rouge Summary 1992-2014 (3.9 MB- PDF file)

2013 Progress Report: Rouge River National Wet Weather Demonstration Project

RPO Staff

Technical Report, June 2014, 174 pages, Order Number: PR-2013 *

This report provides an overview of Rouge Project activities during 2013, all of which were conducted under U.S. EPA Grant No. XP995743-09 (Rouge Project Grant 10). This Rouge Project grant funded numerous watershed restoration efforts including community and subwatershed demonstration projects and watershed-wide activities. Activities were completed by Rouge River Watershed communities and agencies and Wayne County. Brief descriptions for all of these activities are included in this report, as is a consolidated financial report for the grant.

During 2013, watershed stakeholders implemented a wide range of activities to manage storm water, control combined sewer overflows (CSOs) and sanitary sewer overflows (SSOs), address streambank erosion, improve habitat, and increase recreational opportunities throughout the watershed. There were 18 community projects to restore the Rouge River underway during 2013, with funding from three rounds of Rouge Project subgrants: Round IX, Round X, and Round XI. Six Rouge Project funded river restoration projects were completed, with approximate total project costs of $ 1,079,000. All projects met one or more of the goals of the Rouge River Watershed Management Plan and also helped address the requirements of a community's National Pollutant Discharge Elimination System (NPDES) stormwater

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permit or wastewater system NPDES permit. The variety of projects undertaken in 2013 reflects the varying needs of communities and actions taken to address Rouge River pollution at the source.

View this document now: PR-2013 (4.1 MB - PDF file)

2012 Progress Report: Rouge River National Wet Weather Demonstration Project

RPO Staff

Technical Report, January 2014, 206 pages, Order Number: PR-2012 *

This report provides an overview of Rouge Project activities during 2012. All 2012 activities were conducted under U.S. EPA Grant No. XP995743-09 (Rouge Project Grant 10). This Rouge Project grant funded numerous watershed restoration efforts including community and subwatershed demonstration projects and watershed-wide activities. Activities were completed by Rouge River Watershed communities and agencies, Wayne County, and the Wayne County Rouge Project Office (RPO). Brief descriptions for all of these activities are included in this report, as is a consolidated financial report for the grant.

During 2012, watershed stakeholders implemented a wide range of activities to manage storm water, control combined sewer overflows (CSOs) and sanitary sewer overflows (SSOs), address streambank erosion, improve habitat, and increase recreational opportunities throughout the watershed. During 2012,There were 17 community projects to restore the Rouge River underway during 2012, with funding from three rounds of Rouge Project subgrants: Round IX, Round X, and Round XI. Eleven Rouge Project funded river restoration projects were completed, with approximate total project costs of $ 3,613,000. All projects met one or more of the goals of the Rouge River Watershed Management Plan and also helped address the requirements of a community's National Pollutant Discharge Elimination System (NPDES) stormwater permit or wastewater system NPDES permit. The variety of projects undertaken in 2012 reflects the varying needs of communities and actions taken to address Rouge River pollution at the source.

View this document now: PR-2012 (6.3 MB - PDF file)

2011 Progress Report: Rouge River National Wet Weather Demonstration Project

RPO Staff

Technical Report, July 2012, 216 pages, Order Number: PR-2011 *

This report provides an overview of Rouge Project activities during 2011. All 2011 activities were conducted under U.S. EPA Grant No. XP995743-09 (Rouge Project Grant 10). This Rouge Project grant funded numerous watershed restoration efforts including community and subwatershed demonstration projects and watershed-wide activities. Activities were completed by Rouge River Watershed communities and agencies, Wayne County, and the Wayne County Rouge Project Office (RPO). Brief descriptions for all of these activities are included in this report, as is a consolidated financial report for the grant.

During 2011, watershed stakeholders implemented a wide range of activities to manage storm water, control combined sewer overflows (CSOs) and sanitary sewer overflows (SSOs), address streambank erosion, improve habitat, and increase recreational opportunities throughout the watershed. During 2011, there were 27 Rouge River restoration projects funded under Round IX and X Rouge Project subgrants undertaken by watershed communities and agencies. Eleven Rouge Project funded river restoration projects were completed, with approximate total project costs of $2,222,000. All projects met one or more of the goals of the Rouge River Watershed Management Plan and also helped address the requirements of a community's National Pollutant Discharge Elimination System (NPDES) stormwater permit or wastewater system NPDES permit. The variety of projects undertaken in 2011 reflects the varying needs of communities and actions taken to address Rouge River pollution at the source.

View this document now: PR-2011 (3.8 MB - PDF file)

2010 Progress Report: Rouge River National Wet Weather Demonstration Project

RPO Staff

Technical Report, February 2012, 224 pages, Order Number: PR-2010 *

This report provides an overview of Rouge Project activities during 2010. All 2010 activities were conducted under U.S. EPA Grant No. XP995743-09 (Rouge Project Grant 10). This Rouge Project grant funded numerous watershed restoration efforts including community and subwatershed demonstration projects and watershed-wide activities. Activities were completed by Rouge River Watershed communities and agencies, Wayne County, and the Wayne County Rouge Project Office (RPO). Brief descriptions for all of these activities are included in this report, as is a consolidated financial report for the grant.

The efforts of the Rouge Watershed communities and agencies, Wayne County, the RPO, and numerous other stakeholders during 2010 have combined to make significant strides in restoring and protecting the Rouge River. There are tangible benefits of our collective efforts in the areas of combined sewer overflow (CSO) and sanitary sewer overflow (SSO) control, storm water management and other watershed management activities. Water quality and overall ecosystem health have shown continuous, dramatic improvement for the past five years, fish and wildlife populations have grown, and recreational opportunities along the river have increased. The remaining Rouge federal grants for the Rouge Project will assist with the numerous ongoing watershed management efforts to continue to improve the Rouge River system.

View this document now: PR-2010 (3.4 MB - PDF file)

2009 Progress Report: Rouge River National Wet Weather Demonstration Project

RPO Staff

Technical Report, August 2010, 150 pages, Order Number: PR-2009 *

This report provides an overview of Rouge Project activities during 2009. All 2009 activities were conducted under U.S. EPA Grant No. XP995743-09 (Rouge Project Grant 10). This Rouge Project grant funded numerous watershed restoration efforts including community and subwatershed demonstration projects and watershed-wide activities. Activities were completed by Rouge River Watershed communities and agencies, Wayne County, and the Wayne County Rouge Project Office (RPO). Brief descriptions for all of these activities are included in this report, as is a consolidated financial report for the grant.

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View this document now: PR-2009 (2.9 MB - PDF file)

2008 Progress Report: Rouge River National Wet Weather Demonstration Project

RPO Staff

Technical Report, May 2009, 122 pages, Order Number: PR-2008 *

This report provides an overview of Rouge Project activities during 2008. All 2008 activities were conducted under U.S. EPA Grant No. XP995743-06 (Rouge Project Grant 7) and XP995743-08 (Rouge Project Grant 9). These Rouge Project grants funded numerous watershed restoration efforts including community and subwatershed demonstration projects and watershed-wide activities. Activities were completed by Rouge River Watershed communities and agencies, Wayne County, and the Wayne County RPO (Rouge Program Office). Brief descriptions of all of these activities are included in this report, as is a consolidated financial report for each grant.

The efforts of the Rouge Watershed communities and agencies, Wayne County, the Wayne County RPO, and numerous other stakeholders during 2008 have combined to make significant strides in restoring and protecting the Rouge River. There are tangible benefits of our collective efforts in the areas of combined sewer overflow (CSO) and sanitary sewer overflow (SSO) control, storm water management and other watershed management activities. Water quality and overall ecosystem health has shown continuous, dramatic improvement for the past five years, fish and wildlife populations have grown, and recreational opportunities along the river have increased. The remaining Rouge federal grants for the Rouge Project will assist with the numerous ongoing watershed management efforts to continue to improve the Rouge River system.

View this document now: PR-2008 (4.2 MB - PDF file)

2007 Progress Report: Rouge River National Wet Weather Demonstration Project

RPO Staff

Technical Report, December 2008, 150 pages, Order Number: PR-2007 *

This report provides an overview of Rouge Project activities during 2007. All 2007 activities were conducted under U.S. EPA Grant No. XP995743-06 (Rouge Project Grant 7) and XP995743-08 (Rouge Project Grant 9). These Rouge Project grants funded numerous watershed restoration efforts including community and subwatershed demonstration projects and watershed-wide activities. Activities were completed by Rouge River Watershed communities and agencies, Wayne County, and the Wayne County RPO (Rouge Program Office). Brief descriptions of all of these activities are included in this report, as is a consolidated financial report for each grant.

The efforts of the Rouge Watershed communities and agencies, Wayne County, the Wayne County RPO, and numerous other stakeholders during 2007 have combined to make significant strides in restoring and protecting the Rouge River. There are tangible benefits of our collective efforts in the areas of combined sewer overflow (CSO) and sanitary sewer overflow (SSO) control, storm water management and other watershed management activities. Water quality and overall ecosystem health has shown continuous, dramatic improvement for the past five years, fish and wildlife populations have grown, and recreational opportunities along the river have increased. The remaining Rouge federal grants for the Rouge Project will assist with the numerous ongoing watershed management efforts to continue to improve the Rouge River system.

View this document now: PR-2007 (3.6 MB - PDF file)

2006 Progress Report: Rouge River National Wet Weather Demonstration Project

RPO Staff

Technical Report, July 2007, 150 pages, Order Number: PR-2006 *

The Alliance of Rouge Communities (ARC) held its first meeting in January 2006. Oakland County, Orchard Lake Village, and the Wayne County Airport Authority joined the ARC in 2006, bringing the membership to 42. The Southeastern Oakland County Water Authority (SOCWA) and the Friends of the Rouge (FOTR) also joined the ARC as Cooperating Partners. The ARC applied for and received its first grant as a public entity in 2006. The project Bacterial Source Tracking was awarded $50,000 from Michigan's Clean Michigan Initiative. Negotiation with MDEQ on storm water permit compliance issues was a key ARC activity for 2006. Templates were developed by the ARC for the Illicit Discharge Elimination Program (IDEP) and Public Education Plan (PEP) sections of the Storm Water Pollution Prevention Initiative (SWPPI) required by the Michigan watershed-based storm water permit, available for use by all Rouge communities. Twenty one watershed restoration projects were completed in 2006 through the investment of over $43 million (partially supported by Rouge Project grant funding). These projects included two Rouge River Water Festivals for children, several educational programs provided by Friends of the Rouge, design and construction of facilities to control combined sewer overflows (CSOs) and sanitary sewer overflows (SSOs), lawn and landscape education, improvements to a nature center, storm water detention basin enhancements, development of a storm water management practice tracking system, streambank erosion inventory and stabilization projects, and implementation of the Rouge River Gateway Partnership Master Plan. Watershed-wide monitoring continued during2006. The long-term monitoring program in 2006 included continuous monitoring of dissolved oxygen (DO) and temperature at two stations and river level and flow monitoring at nine stations. Precipitation data were collected from 16 stations. The 2006 monitoring program also included intermittent wet and dry weather sampling in two subwatersheds, the Lower 1 SWMA and Lower 2 SWMA. Samples were collected and analyzed for pollutants such as E. coli bacteria, ammonia (NH3), total suspended solids (TSS), 5-day carbonaceous biochemical oxygen demand (CBOD5), and total phosphorus (TP).

View this document now: PR-2006 (2.8 MB - PDF file)

2005 Progress Report: Rouge River National Wet Weather Demonstration Project

RPO Staff

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Technical Report, June 2006, 160 pages, Order Number: PR-2005

The year 2005 was highlighted by the passage of state legislation to authorize local governments to form watershed alliances which was signed into law on January 3, 2005. In November 2005, the Rouge Assembly became the public entity “Alliance of Rouge Communities (ARC) when 20 eligible members approved the bylaws (modeled after the former MOA for operation of the Assembly) developed under the Watershed Alliance Act. The ARC was successful in receiving MDEQ approval to act on behalf of member communities on storm water compliance issues with MDEQ. Thirty-six watershed restoration projects were completed in 2005 through the investment of over $13 million (partially supported by Rouge Project grant funding). These projects included the reduction of sanitary sewer overflows (SSOs), a creekshed study, streambank stabilization, implementing illicit discharge program and eliminating illicit discharges, storm water detention system and detention basin enhancements, erosion control projects, streambank inventories, facilities and operational changes to reduce combined sewer overflows (CSOs), flow control, rain garden education and construction, downspout disconnection, use of underdrains in swales, instream dissolved oxygen augmentation, assessment of alternative funding mechanisms for maintenance of privately owned storm water detention facilities, wetland protection, Rouge River Water Festivals, educational exhibits, interpretative wetland recreational trail, flow reduction, improvements to a nature center visitors center and watershed signs.

Public education and involvement activities within the Rouge River watershed continue to increase awareness of the Rouge River watershed and the various water quality issues in Southeast Michigan. A variety of outreach events and activities were conducted during 2005.

Watershed-wide monitoring continued during 2005, and several new tools were developed for accessing and analyzing Rouge River water quality monitoring data collected to date.

In 2005, the Michigan DO standard was met more than 95 percent of the time at four of the eight locations continuously monitored. The instances in 2005 when the DO standard was not met were usually during a wet weather event. The water quality improvements measured in the dry, hot conditions in 2005 demonstrate the benefits of the watershed management strategies that have been implemented to address and control dry and wet weather pollution sources in the watershed.

View this document now: PR-2005 (4.7 MB - PDF file)

2005 Rouge River Report Card

Rouge Remedial Action Plan Advisory Council

Miscellaneous Report, December 2005, 4 pages, Order Number: RRC-2005 **

The Rouge River Report Card provides a brief description of current conditions and progress being made to protect and restore our Rouge River watershed, an Area of Concern (AOC). Eighteen indicators are judged to determine trends since 1999.

View this document now: RRC-2005 (1 MB - PDF file)

Review of Year 2004: Rouge River National Wet Weather Demonstration Project

Rouge Program Office

Technical Report, July 2005, 60 pages, Order Number: RPO-WMGT-TR62 *

In the year 2004, the Rouge River National Wet Weather Demonstration Project (Rouge Project) continues to restore and protect designated water uses through a watershed-based management approach. The Rouge Project is also providing solutions to other urban watersheds throughout the country on how to restore polluted urban waterways. The Rouge Project was initiated in 1992 by the Department of the Environment, Wayne County, Michigan. The Rouge River Watershed in Southeast Michigan is largely urbanized, spans approximately 466 square miles, is home to more than 1.4 million people in 48 communities and three counties, and is a tributary to the Detroit River. Multi-year federal grants from the United States Environmental Protection Agency (EPA) and additional funding from local communities support this cooperative effort between federal, state and local agencies. These grants are managed by Wayne County.

View this document now: RPO-WMGT-TR62 (1.3 MB - PDF file)

Review of Year 2003: Rouge River National Wet Weather Demonstration Project

Rouge Program Office

Technical Report, July 2004, 55 pages, Order Number: RPO-WMGT-TR51 *

The year 2003 was a great year in the decade long effort to restore the Rouge River. Water quality and overall ecosystem health of the river continued to improve, fish and wildlife are returning to the river, and increasing numbers of people are using the river for recreation. The improvements clearly reflect the benefits of the watershed management strategies that have been implemented to address and control the various sources of river impairment, such as dry and wet weather pollution sources in the watershed and highly variable rates of storm water discharge to the river. A major milestone in the Rouge River restoration effort was reached in 2003, when 38 communities and the 3 counties in the watershed signed an agreement to form the Rouge River Watershed Local Management Assembly (Assembly of Rouge Communities). This unique, voluntary organization institutionalizes the management of the watershed at the local level and will guide future efforts to restore and protect the Rouge River. This report summarizes the major progress to restore the Rouge River in 2003.

View this document now: RPO-WMGT-TR51 (1.3 MB - PDF file)

Review of Year 2002: Rouge River National Wet Weather Demonstration Project

Rouge Program Office

Task Product Memorandum, March 2004, 37 pages, Order Number: RPO-WMGT-TR50 *

In the year 2002, the major progress in restoration of the Rouge River included:

- The U.S. EPA's Office of Inspector General issued its report on the nation-wide audit of the national Combined Sewer Overflow (CSO) Control program. The report cites a number of examples of the successes of the Rouge Project's CSO control program. The report calls the watershed approach being utilized on the Rouge Project a "blueprint for success."

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- The water quality and the overall ecosystem health of the river continued to steadily improve in 2002. The improvements 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. The preliminary data shows that the dissolved oxygen standard was met the majority of the time in wet and dry periods at monitoring stations along the river.

- The River Rouge CSO Basin became operational in August 2002. This basin was designed to capture the 10-year 1-hour storm and has a capacity of 5.2 million gallons. All ten of the CSO retention/treatment basins planned for Phase 1 of the Rouge Watershed CSO control program are now in operation.

- The combined sewer overflow (CSO) storage treatment facilities continued to meet or exceed expectations. In 2002, MDEQ certified the three Detroit CSO basins as meeting the Phase II criteria of eliminating raw sewage and protecting public health. Therefore, all nine basins evaluated to date have all been certified as meeting Phase II criteria. In addition, the three Oakland County basins were certified by MDEQ in 2002 as meeting the Phase III requirement of achieving river water quality standards at times of discharge (except for meeting the instream standard for total residual chlorine).

- Storm Water Pollution Prevention Initiatives (SWPPIs), required under the MDEQ watershed-based NPDES permit program for stormwater discharges, were submitted by 43 communities and agencies in the Rouge Watershed and were approved by MDEQ. Implementation of other elements from the 7 Rouge Subwatershed Management Plans, such as the community illicit discharge elimination plans (IDEP) continued, and contributed to the improvements in Rouge River water quality.

- The Rouge Gateway Master Plan is a compendium of planning and design initiatives to transform the Rouge Gateway to a diverse, rich fishery drawing visitors form local communities and around the country to the river for recreation. A major element of the Master Plan, "The Rouge Oxbow Restoration Project - Phase I" was completed in 2002 and is 'open for business'. Work progressed with the Detroit District US Army Corps of Engineers regarding potential restoration of the concrete channel section of the lower Rouge.

- A "Drafting Committee" prepared a Memorandum of Agreement (MOA) establishing the Rouge River Watershed Local Management Assembly. In January 2003, the MOA was distributed for conditional approval by the communities and agencies. Several projects completed as part of the Rouge Project were awarded achievement awards by regional, national, or international organizations; included in this list is the "Superior Achievement Award" awarded to the Rouge Project by the American Association of Environmental Engineers.

- The communities, Counties and agencies in the watershed continue to implement a very impressive number of actions that are furthering the restoration of the Rouge River.

View this document now: RPO-WMGT-TR50 (174 KB - PDF file)

Review of Year 2001: Rouge River National Wet Weather Demonstration Project

Rouge Program Office

Task Product Memorandum, February 2004, 23 pages, Order Number: RPO-TR40 **

In the year 2001, the major progress in restoration of the Rouge River included:

- The water quality and the overall ecosystem health continued to steadily improve in 2001. The improvements 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. The preliminary data shows that the dissolved oxygen standard was met at least 94% of the time in wet and dry periods at several monitoring stations along the river. The combined sewer overflow (CSO) storage treatment facilities continued to meet or exceed expectations.

- Seven subwatershed management plans were completed cooperatively by the Subwatershed Advisory Groups (SWAGs) and submitted to the Michigan Department of Environmental Quality (MDEQ) on May 31, 2002 as required by the General Storm Water Permit.

- Storm Water Pollution Prevention Initiatives (SWPPIs) were finalized by 43 communities and agencies in the Rouge watershed and were submitted to MDEQ by the end of the year as required by the General Storm Water Permit.

- Over 43 communities in the Rouge River watershed have implemented their illicit discharge elimination plans (IDEP) contributing to the improvements in the Rouge River water quality.

- The Rouge Gateway Master Plan report was completed on February 19, 2001. This is a master plan for ecosystem restoration and recreational improvements along the lower seven-mile reach of the Rouge River. As part of this plan, construction was initiated on the Rouge Oxbow Restoration Project. Work progressed with the Detroit District US Army Corps of Engineers regarding potential restoration of the paved channel section of the lower Rouge.

- A Drafting Committee has been established to develop recommendations to present to the Rouge River communities and agencies concerning long-term institutional arrangements to further the Rouge River restoration.

- The communities, Counties and agencies continue to implement a very impressive number of actions that are furthering the restoration of the Rouge River.

View this document now: RPO-TR40 (294 KB - PDF file)

Review of Year 2000: Rouge River National Wet Weather Demonstration Project

Kelly Cave

Task Product Memorandum, April 2004, 23 pages, Order Number: SR-28 **

Major progress in the restoration of the Rouge River took place in year 2000. This includes:

- Certification of 6 combined sewer overflow (CSO) storage treatment facilities by the Michigan Department of Environmental Quality (MDEQ). There are now 130 miles of the Rouge River and its tributaries free from uncontrolled CSO discharges.

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- Successful completion of 15 additional significant projects for water quality improvement, geographic information systems (GIS) and public education by local units of government in the watershed.

- Development of 7 subwatershed management plans.

- Implementation of new ordinances for on-site sewage disposal systems in Wayne and Washtenaw counties and a new Storm Water Ordinance in Wayne County.

- Development of the Rouge Gateway Master Plan - a plan for recreation and ecosystem restoration along the concrete channel section of the Rouge.

- Initiation of work on three Rouge Gateway Master Plan elements.

View this document now: SR-28 (168 KB - PDF file)

Review of Year 1999: Rouge River National Wet Weather Demonstration Project

Jeff Valdahl

Technical Report, February 2000, 33 pages, Order Number: TR13.00 **

In 1999, there was continuing water quality improvement on the Rouge River. There were major institutional steps undertaken to sustain the restoration program. The water is cleaner as evidenced by the dissolved oxygen monitors showing that most days are meeting standards, fish are coming back, and people are saying that the water is cleaner. The 14-month schedule that was started with the U.S. District Court late in 1997 was completed early in 1999 with the restructuring of this Steering Committee and the creation of seven highly effective Subwatershed Advisory Groups (SWAGs) to represent the local interests of communities. This technical report presents a summary of 1999 Rouge Project activities inclusive of reports from the seven SWAGs (Upper, Middle 3, Middle 1, Main 3 & 4, Main 1 & 2, Lower 2, and Lower 1) and a year-end summary of Wayne County General Storm Water Permit activities.

View this document now: TR13.00 (97 KB - PDF file)

1999 Rouge River Report Card

Rouge Remedial Action Plan Advisory Council

Miscellaneous Report, December 1999, 49 pages, Order Number: RRC-1999 **

In 1999, there was continuing water quality improvement on the Rouge River. There were major institutional steps undertaken to sustain the restoration program. The water is cleaner as evidenced by the dissolved oxygen monitors showing that most days are meeting standards, fish are coming back, and people are saying that the water is cleaner. A guiding principal of the institutional arrangement is to leave the solutions to the local communities, and to let the communities identify when county or watershed-wide efforts are needed. The communities did identify county-level ordinances and watershed-wide services that were needed. The counties acted with new ordinances for on-site sewage disposal and stormwater management, and with new training and computer applications for illicit discharges.

View this document now: RRC-1999 (1.9 MB - PDF file)

Review of Year 1998: Rouge River National Wet Weather Demonstration Project

Kelly Cave

Paper, 5 pages, Order Number: 1998-Review *

1998 was a successful year for the Rouge project. Dissolved Oxygen levels rose by 1 mg/L in parts of the Rouge River, and combined sewer overflow (CSO) volumes decreased by hundreds of million gallons. Over 200 acres of lake and waterfront parkland at Newburgh Lake were restored. Over 60 new projects were initiated for source control, wetlands, recreation, geographic information systems (GIS), and septic system management. A step-by-step implementation plan was developed for future work through the year 2001.

View this document now: 1998-Review (14 KB - PDF file)

Final Grant Closeout Summary Report: Rouge Project Grant 10

Kelly Cave, Razik Alsaigh, Noel Mullett, Dean Tuomari, & Michael Flowers

Technical Report, September 2014, 132 pages **

This report provides an overview of activities conducted under EPA Grant No. XP995743-09 (Rouge Project Grant 10).

The County's Department of Public Services (WCDPS) (formerly the Department of Environment) manages the Rouge Project at the local level and is responsible for the overall administration, direction, and quality management including grant administration, reporting, and allocation of grant funds to local communities and agencies to implement projects to restore and protect the river. While Grant 10 started January 1, 2008, all activities and expenses charged to Grant 10 were conducted during the period of January 1, 2009 – June 30, 2014.

Rouge Project Grant 10 funded numerous watershed restoration efforts including community and subwatershed emonstration projects and watershed-wide activities. Activities were completed by Rouge River Watershed communities and agencies, the Alliance of the Rouge Communities, Wayne County, and others. There were 47 community projects to restore and protect the Rouge River completed with Rouge Project Grant 10 funding as follows: control of CSOs and sanitary sewer overflows (14 projects); educate and involve the public in Rouge River restoration (11 projects); implementation of a variety of storm water management measures (12 projects); implementation of projects to stabilize stream banks and/or improve riverine habitat (8 projects); and implementation of projects to enhance riverine recreational opportunities (2 projects).

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Watershed-wide activities implemented by Wayne County, the Rouge Program Office, the Alliance of Rouge Communities and others under Rouge Project Grant 10 also assisted the overall effort to restore and protect the Rouge River. These activities included water quality and ecosystem health monitoring, illicit discharge investigation and elimination activities, public education and involvement, ongoing management of a geographic information and data management system for the Rouge watershed, implementation of various watershed management projects such as "grow zones" in Rouge riparian corridors, and overall management of the grants and coordination of efforts conducted by various stakeholders. Brief descriptions of these efforts are included in the report.

View this document now: Grant 10 FInal Report September 2014 (2.8 MB - PDF file)

Final Grant Closeout Summary Report: Rouge Project Grant 9

Razik Alsaigh & Kelly Cave

Technical Report, December 2009, 86 pages **

This report provides an overview of activities conducted under EPA Grant No. #XP995743-08 (Rouge Project Grant 9). All activities were conducted during the period of March 1, 2002 through June 30, 2008. Total funding in Grant 9 was $51,547,297 and the federal grant share was $28,351,013.Rouge Project Grant 9 funded numerous watershed restoration efforts including community and subwatershed demonstration projects and watershed-wide activities. Activities were completed by Rouge River Watershed communities and agencies, the Alliance of the Rouge Communities, Wayne County, and the Wayne County Rouge Program Office. There were 31 community projects completed under five areas of Rouge Project Grant 9.

In addition, Rouge Grant 9 funds were used to construct two Rouge River restoration projects managed directly by Wayne County; these projects are known as Rouge Corridor Management and Dearborn Combined Sewer Overflow.

The combined efforts of the 48 Rouge Watershed communities, Wayne County, and the Wayne County Rouge Program Office under Rouge Project Grant 9 have helped to restore the Rouge River. There are tangible benefits of our collective efforts in the areas of combined sewer overflow control, storm water management, and other watershed management activities. Water quality and overall ecosystem health has shown continuous, dramatic improvement for the past five years, fish and wildlife populations have grown, and recreational opportunities along the river have increased. The Rouge Project will continue to improve the Rouge River Watershed through its work under the remaining Rouge Project grants.

View this document now: Grant 9 Final Report December 2008 (513 KB - PDF file)

Final Grant Closeout Summary Report: Rouge Project Grant 7

Razik Alsaigh, Kelly Cave and Barry Johnson

Technical Report, July 2009, 117 pages **

This report provides an overview of activities conducted under EPA Grant No. #XP995743-06 (Rouge Project Grant 7). All activities were conducted during the period of January 1, 2002 through December 30, 2008. Total funding in Grant 7 was $34,232,033 and the federal grant share was $18,827,619. Rouge Project Grant 7 funded numerous watershed restoration efforts including community and subwatershed demonstration projects and watershed-wide activities. Activities were completed by Rouge River Watershed communities and agencies, the Alliance of the Rouge Communities, Wayne County, and the Wayne County Rouge Program Office. There were 55 community projects completed under eleven areas of Rouge Project Grant 7.

Extensive outreach and technology transfer activities were conducted to other local/regional/national watersheds under the time period covered by Rouge Project Grant 6. The purpose of performing outreach and technical transfer is to demonstrate to others how the Rouge Project is controlling wet weather and how those controls are integrated into the overall watershed approach that is being used by the Project.

The combined efforts of the 48 Rouge Watershed communities, Wayne County, and the Wayne County Rouge Program Office under Rouge Project Grant 7 have helped to restore the Rouge River. There are tangible benefits of our collective efforts in the areas of combined sewer overflow control, storm water management, and other watershed management activities. Water quality and overall ecosystem health has shown continuous, dramatic improvement for the past five years, fish and wildlife populations have grown, and recreational opportunities along the river have increased. The Rouge Project will continue to improve the Rouge River Watershed through its work under the remaining Rouge Project grant.

View this document now: Grant 7 Final Report July 2009 (1.2 MB - PDF file)

Final Grant Closeout Summary Report: Rouge Project Grant 6

Razik Alsaigh, Kelly Cave and Barry Johnson

Technical Report, August 2005, 64 pages, Order Number: RPO-WMGT-TR64 **

This report provides an overview of activities conducted under EPA Grant No. #XP995743-05 (Rouge Project Grant 6). All activities were conducted during the period of January 1, 1999 through December 31, 2004. Total funding in Grant 6 was $12,128,866 and the federal grant share was $6,453,551. Rouge Project Grant 6 funded numerous combined sewer overflow (CSO) control projects. Projects completed under Rouge Grant 6 include construction of 10 CSO retention treatment basins, separation of combined sewers in six communities, and seven other combined sewer overflow control projects.Brief descriptions of all of these projects are included in the report.

Extensive outreach and technology transfer activities were conducted to other local/regional/national watersheds under the time period covered by Rouge Project Grant 6. The purpose of performing outreach and technical transfer is to demonstrate to others how the Rouge Project is controlling wet weather and how those controls are integrated into the overall watershed approach that is being used by the Project.

The efforts of the Rouge Project have been noteworthy to date. The health of the river continues to improve and people are returning to the river. The combined efforts of the 48 Rouge Watershed communities, Wayne County, and the Wayne County Rouge Program Office under Rouge Project Grant 6 have helped to restore the Rouge River. There are tangible benefits of our collective efforts in the areas of combined sewer overflow control, storm water management, and other watershed management activities. Water quality and overall ecosystem health has shown continuous, dramatic improvement for the past five years, fish and wildlife populations have grown, and recreational opportunities along the river have increased. The Rouge Project will continue to improve the Rouge River Watershed through its work under the remaining Rouge Project grants.

View this document now: RPO-WMGT-TR64 (611 KB - PDF file)

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Final Grant Closeout Summary Report: Rouge Project Grant 5

Razik Alsaigh, Kelly Cave, Barry Johnson, & Amy Ploof

Technical Report, October 2004, 74 pages, Order Number: RPO-WMGT-TR57 **

This report provides an overview of activities conducted under EPA Grant No. #XP995743-04 (Rouge Project Grant 5). All activities were conducted during the period of June 1, 1998 through December 31, 2003. Total funding in Grant 5 was $19,987,731 and the federal grant share was $10,809,605. Rouge Project Grant 5 funded numerous watershed restoration efforts including community and subwatershed demonstration projects and watershed-wide activities. Activities were completed by Rouge River Watershed communities and agencies, Wayne County, and the Wayne County Rouge Program Office. 91 community projects were completed under Rouge Project Grant 5 and include storm water management, combined sewer/sanitary sewer overflow control, recreation and habitat, wetlands, onsite sewage disposal systems, and geographic information system projects. Watershed-wide activities included public involvement, subwatershed management, and overall coordination of efforts conducted by various stakeholders. Brief descriptions of these efforts are included in the report. Extensive outreach and technology transfer activities were conducted to other local/regional/national watersheds under Rouge Project Grant 5. A summary of all technology transfer efforts is presented in the report. The efforts of the Rouge Project have been noteworthy to date. The health of the river continues to improve and people are returning to the river. The combined efforts of the 48 Rouge Watershed communities, Wayne County, and the Wayne County Rouge Program Office under Rouge Project Grant 5 have helped to restore the Rouge River. There are tangible benefits of our collective efforts in the areas of combined sewer overflow control, storm water management, and other watershed management activities. Water quality and overall ecosystem health has shown continuous, dramatic improvement for the past five years, fish and wildlife populations have grown, and recreational opportunities along the river have increased. The Rouge Project will continue to improve the Rouge River Watershed through its work under the remaining Rouge Project grants.

View this document now: RPO-WMGT-TR57 (436 KB - PDF file)

Final Grant Closeout Summary Report: Rouge Project Grant 4

Razik Alsaigh, Kelly Cave, Barry Johnson, & Amy Ploof

Technical Report, June 2004, 61 pages, Order Number: RPO-WMGT-TR56 *

This report provides an overview of activities conducted under EPA Grant No. #XP995743-03 (Rouge Project Grant 4). All activities were conducted during the period of February 28, 1997 through December 31, 2003. Rouge Project Grant 4 funded numerous watershed restoration efforts including Community and Subwatershed Demonstration Projects and Watershed-wide Activities. Activities were completed by Rouge River Watershed communities, Wayne County, and the Wayne County Rouge Program Office. Fourteen community projects were completed under Rouge Project Grant 4 and included: streambank stabilization and woody debris management, water quality monitoring, combined sewer basin evaluation, initiation of the Rouge River Gateway Project, wetland restoration and a wetland banking system, illicit discharge training and investigations and geographic information (GIS) development. Watershed-wide activities included water quality and ecosystem health assessment and reporting, public involvement, data management efforts, and overall coordination of efforts conducted by various stakeholders. Brief descriptions of these efforts are included in the report. Extensive outreach and technology transfer activities were conducted to other local/regional/national watersheds under Rouge Project Grant 4. A summary of all technology transfer efforts is presented in the report. The efforts of the Rouge Project have been noteworthy to date. The health of the river continues to improve and people are returning to the river. The combined efforts of the 48 Rouge Watershed communities, Wayne County, and the Wayne County Rouge Program Office under Rouge Project Grant 4 have helped to restore the Rouge River. There are tangible benefits of our collective efforts in the areas of combined sewer overflow control, storm water management, and other watershed management activities. Water quality and overall ecosystem health has shown continuous, dramatic improvement for the past five years, fish and wildlife populations have grown, and recreational opportunities along the river have increased. The Rouge Project will continue to improve the Rouge River Watershed through its work under the remaining Rouge Project grants.

View this document now: RPO-WMGT-TR56 (375 KB - PDF file)

Final Grant Closeout Summary Report: Rouge Project Grant 3

Razik Alsaigh, Kelly Cave, Barry Johnson and Amy Ploof

Technical Report, March 2005, 55 pages, Order Number: RPO-WMGT-TR54 **

This report provides an overview of activities conducted under EPA Grant No. #C-264000-01 (Rouge Project Grant 3). All activities were conducted during the period of December 16, 1994 through March 31, 2004. Total funding in Grant 3 was $252,949,562 and the federal grant share was $139,122,259. Rouge Project Grant 3 funded numerous watershed restoration efforts including community and subwatershed demonstration projects and watershed-wide activities. Activities were completed by Rouge River Watershed communities and agencies, the Assembly of the Rouge Communities, Wayne County, and the Wayne County Rouge Program Office. There were 28 community projects completed under four areas of Rouge Project Grant 3 funding as follows: July 30, 2000 Watershed General Permit - Round IIA subgrant program (9 projects), February 14, 2001 Watershed General Permit - Round IIB subgrant program (4 projects), January 9, 2002 Watershed General Permit - Round III subgrant program (8 projects), and April 23, 2003 Permit Compliance Activities Round V subgrant program (7 projects).

Extensive outreach and technology transfer activities were conducted to other local/regional/national watersheds under the time period covered by Rouge Project Grant 3. The purpose of performing outreach and technical transfer is to demonstrate to others how the Rouge Project is controlling wet weather and how those controls are integrated into the overall watershed approach that is being used by the Project.

The efforts of the Rouge Project have been noteworthy to date. The health of the river continues to improve and people are returning to the river. The combined efforts of the 48 Rouge Watershed communities, Wayne County, and the Wayne County Rouge Program Office under Rouge Project Grant 3 have helped to restore the Rouge River. There are tangible benefits of our collective efforts in the areas of combined sewer overflow control, storm water management, and other watershed management activities. Water quality and overall ecosystem health has shown continuous, dramatic improvement for the past five years, fish and wildlife populations have grown, and recreational opportunities along the river have increased. The Rouge Project will continue to improve the Rouge River Watershed through its work under the remaining Rouge Project grants.

View this document now: RPO-WMGT-TR54 (818 KB - PDF file)

Final Grant Closeout Summary Report: Rouge Project Grant 2

Kelly Cave, Barry Johnson & Razik Alsaigh

Technical Report, July 2006, 142 pages, Order Number: RPO-WMGT-TR59a **

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

This report provides an overview of activities conducted under EPA Grant No. #XP995743-02 (Rouge Project Grant 2). All activities were conducted during the period of March 7, 1994 through September 30, 2004. Rouge Project Grant 2 funded numerous watershed restoration efforts including community and subwatershed demonstration projects and watershed-wide activities. Activities were completed by Rouge River Watershed communities and agencies, the Assembly of Rouge Communities, Wayne County and the Wayne County Rouge Program Office. One hundred seventy-six projects were completed under Rouge Project Grant 2 and included:17 projects relating to control of combined sewer overflows, including funding for 4 projects using innovative treatment processes;38 storm water and water management projects which included public education, storm water management, illicit discharge investigations, river recreation enhancements, and preparation of a state storm water permit;11 areas of Wayne County activity to conduct a number of watershed-wide activities to assist the overall effort to restore and protect the Rouge River, including program management, water quality monitoring, illicit discharge investigations, technology transfer, and construction of storm water management projects; 83 Rouge Project Office work plans to conduct a number of watershed-wide activities to assist the overall effort to restore and protect the Rouge River, ranging from policy initiatives such as developing the new statewide watershed-based storm water permit program to grass roots initiatives such as activities to educate and involve the public in the Rouge River restoration effort to development of watershed management tools such as the geographic information system; 27 contracts for support services provided by other agencies for education, designs, legal assistance, water resources investigation and audit of Rouge Project Grant 1; and 7 storm water strategy projects for community projects which included public education, storm water management, illicit discharge investigations and recreation enhancements.

Extensive outreach and technology transfer activities were conducted under Rouge Project Grant 2 to assist other local/regional/national watersheds. The purpose of performing outreach and technical transfer is to demonstrate to others how the Rouge Project is controlling wet weather and how those controls are integrated into the overall watershed approach used by the Project.

The efforts of the Rouge Project have been noteworthy to date. The health of the river continues to improve and people are returning to the river.

View this document now: RPO-WMGT-TR59a (1 MB - PDF file)

Grant 1 Final Project and Report

Kelly Cave, Carl Johnson, & Sandra Kiser

Supplemental Report, October 1999, 25 pages, Order Number: WMGT-SR19.00 **

The Grant 1 Final Project Report for the Rouge Project is a concise description of achievements under Rouge Project Grant 1 to aid in the understanding of project expenditures. The audience is the USEPA Office of Inspector General and USEPA Project Officer. Work under Rouge Project Grant 1 (No. #X995743-01) began in 1992 and extended to December 1997. The Rouge Project efforts continue under succeeding grants (Nos. Grant #X995743-02, 03 and 04 and #C995743-01). This report identifies the approaches initiated under Grant 1 and includes a list of project deliverables in the appendix.

View this document now: WMGT-SR19.00 (159 KB - PDF file)

Quality Management Plan 2005 - 2008

Technical Report, August 2007, 70 pages, Order Number: RPO-QMP-2005-08 *

The QMP documents the quality management and assurance polices, procedures, roles and responsibilities, and identifies the methods by which continual improvement of quality management will be achieved and monitored. This QMP and the associated quality management system components have been developed with the assistance of EPA Region V Quality Assurance Section and Water Quality Division. The QMP was approved by both the EPA and WCDOE.

View this document now: RPO-QMP-2005-08 (619 KB - PDF file)

Quality Management Plan 2001 - 2004

Carl Johnson

Technical Report, July 2004, 60 pages, Order Number: RPO-WMGT-TR58 *

The QMP documents the quality management and assurance polices, procedures, roles and responsibilities, and identifies the methods by which continual improvement of quality management will be achieved and monitored. This QMP and the associated quality management system components have been developed with the assistance of EPA Region V Quality Assurance Section and Water Quality Division. The QMP was approved by both the EPA and WCDOE.

View this document now: RPO-WMGT-TR58 (479 KB - PDF file)

Quality Management Plan 1999

Razik Alsaigh

Technical Report, October 1999, 110 pages, Order Number: QMP02.00 **

The QMP documents the quality management and assurance polices, procedures, roles, and responsibilities, and identifies the methods by which continual improvement of quality management will be achieved and monitored. The QMP will be mutually approved by both the EPA and WCDOE. Upon approval, authority for approval of the associated quality assurance documents, (Quality Assurance Project Plan, field sampling plans, standard operating procedures, and guidance documents) becomes the responsibility of Wayne County and that the Management System Reviews (MSRs) will be done both internally and in collaboration with the EPA to oversee the quality system established for the Rouge Project. No environmental measurements will be made without: an approved Quality Assurance Project Plan, field sampling plan, and standard operating procedures; and the planning phase including the Data Quality Objective (DQO) process as described in the document "Guidance for the Data Quality Objectives Process" (EPA A/G-4).

View this document now: QMP02.00 (233 KB - PDF file)

Achieving Multiple Objectives Through a Single Watershed Plan

Kelly Cave

Paper, July 2000, 25 pages, Order Number: Watershed 2000-01 **

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

The paper identifies what the Rouge Project has found to be the elements of a "comprehensive watershed management plan" which will achieve multiple program objectives, such as the reissuance of NPDES permits on a watershed basis, implementation of the water quality trading programs that are currently under development, implementation of the Section 319 non-point source program, development and implementation of Watershed Restoration Action Strategies envisioned under the Clean Water Action Plan, implementation of monitoring programs and for addressing the requirements of the TMDL program. The paper presents information on the implementation of the comprehensive watershed management plans to meet the elements of individual water resource management programs. It discusses challenges and successes of the overall effort. Finally, the paper presents information on lessons learned that will be useful to other geographic areas in their development and implementation of comprehensive watershed management plans.

View this document now: Watershed 2000-01 (70 KB - PDF file)

Community Project Guide

Supplemental Report, October 1997, 14 pages, Order Number: NPS-SR16.00 **

The purpose of the Community Project Guide is to provide communities receiving grant sponsorship for projects through the Rouge Project with information, policies and procedures to administer project funds in accordance with applicable federal guidelines. By referring to this Guide along with the appropriate Code of Federal Regulations when necessary, the community can meet the fiscal and accounting requirements needed for EPA compliance and effective project reporting.

View this document now: NPS-SR16.00 (401 KB - PDF file)

Meeting Objectives For Watershed Planning: A Decision Assessment Framework

Vyto Kaunelis, Carl Johnson, David Hunscher & John Spittler

Paper, October 1996, 12 pages, Order Number: WEF96-02.00 **

The Decision Assessment Framework (DAF) is a decision framework tool aimed at regularly assessing the completeness and relevancy of the Program Team's efforts toward accomplishing the Rouge Program's mission. This paper discusses the process of developing the DAF tool, its usefulness for tracking progress towards intangible targets, the lessons learned, and other concepts relevant to watershed management and planning.

View this document now: WEF96-02.00 (668 KB - PDF file)

Rouge 2009 - Preserving Our Future

Kelly C. Cave

Presentation, March 2010, 30 pages, Order Number: ROUGE2009-PRESERVE *

Slide show originally presented at the Rouge 2009 conference at the University of Michigan - Dearborn. This document presents accomplishments of the Rouge Project to date.

View this document now: ROUGE2009-PRESERVE (3.3 MB - PDF file)

Rouge Project Outreach Binder: Implementing An Urban Watershed Approach

Rouge Project Office

Supplemental Report, February 1997, 90 pages, Order Number: WMGT-SR14.00 **

This notebook is used to present an overview of the activities being undertaken to restore and protect beneficial uses in the Rouge River under the Rouge Project. The notebook accompanies a slide presentation "Implementing an Urban Watershed Approach" used to describe the Rouge Project, its accomplishments to date and future directions to both local and national audiences. Each section of the notebook corresponds to a slide from the presentation and also contains examples of selected Rouge Project programs and work efforts. The notebook is periodically updated to reflect progress of the Rouge Project in restoring the Rouge River.

Rouge River Gateway Ecosystem Restoration Project Wayne County, Michigan

Rouge Project Office

Project Profile, March 2003, 3 pages, Order Number: GATE-00 *

The Rouge River Gateway Ecosystem Restoration Project is proposed as a three-phase project:

- Phase 1 Planning. The planning involves all stakeholders, and it is establishing guidelines for the restoration of wetlands, riparian shoreline, fish, and wildlife consistent with goals of the Michigan Department of Natural Resources. It is creating a vision of what the river corridor can be. It is identifying public uses along the corridor, including walkways, parks and water tours.

- Phase 2 Early Restoration Areas. One or two areas along the concrete channel and within the public-right-of-way will be selected for pilot restoration to soften the edges. These areas will be selected to complement ongoing redevelopment projects along the river.

- Phase 3 Full Restoration. The final phase will continue the restoration work along the concrete channel and the navigable part of the river downstream of the channel.

View this document now: GATE-00 (382 KB - PDF file)

Rouge River National Wet Weather Demonstration Project

James E. Murray & John M. Bona

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Paper, October 1993, 6 pages, Order Number: PI-PAPER-01.00 *

The range of water quality problems which impact urban rivers is being studied utilizing a unique cooperative effort among governmental agencies at the federal, state, county and local levels. The Rouge River National Wet Weather Demonstration Project (Rouge Project) is a comprehensive analysis of an entire watershed and the pollutant sources which impact the river's water quality. It looks at sources of pollution without regard to the political jurisdiction in which they are located. The project is designed to analyze these various sources of pollution and the technologies currently available for their remediation. At completion, the Rouge Project is expected to establish a method for determining the mix of control measures which provides greatest water quality improvement at most reasonable public expenditure.

Rouge River Project Watershed Management Technical Handbook

Carl Johnson

Technical Memorandum, May 1997, 26 pages, Order Number: WMGT-TM24.00 **

This handbook has been assembled to provide a quick reference for communities, state environmental agencies and others that are interested in Wayne County Department of Environment's (WCDOE) experience in the Rouge Project for restoring the Rouge River.

Rouge River Watershed Management: Implementing a Remedial Action Plan

James E. Murray

Paper, October 1994, 10 pages, Order Number: WEFTEC94-04 *

Water quality within the Great Lakes and their connecting waterways has historically been viewed as an issue by both local, state, and national officials, and by our Canadian neighbors. In its 1981 study of the Great Lakes, the International Joint Commission (IJC) identified as most severe, that portion of Southeast Michigan tributary to the Detroit River, including flows from the Rouge River. Over 1.5 million inhabitants in 48 communities and three counties exist within the watershed, including the City of Detroit. This paper provides the historical background for the Michigan Department of Natural Resources (MDNR) Rouge River Remedial Action Plan (RAP) and Wayne County's implementation of the Rouge Project, a project funded, in part by the Environmental Protection Agency (EPA).

View this document now: WEFTEC94-04 (28 KB - PDF file)

Rouge Watershed Peer Review Findings Report wtih Recommendations September 23-27, 1996

Jim Meek, Nancy Phillips, Eric Livingston, Earl Shaver, Tom Schueler, Don Roseboom, & Tom Davenport

Supplemental Report, September 1996, 32 pages, Order Number: WMGT-SR12.00 **

RPO contracted with the Conservation Technology Information Center (CTIC) for a peer review panel to do an in-depth review of the Project in September of 1996, approximately three years after the project's inception. The review was to evaluate the overall project design, assess the status of implementation, assess institutional arrangements, and make recommendations concerning possible improvements. This report contains the findings of the review team and their recommendations.

The Successes in Implementing an Urban Watershed Approach - The Rouge River National Wet Weather Demonstration Project

James E. Murray & Dale S. Bryson

Paper, October 1996, 6 pages, Order Number: WEF96-04.00 **

The Rouge River in southeast Michigan does not meet water quality standards. Wayne County applied for and obtained a national demonstration project grant to develop an approach to watershed-wide quality management that will achieve water quality standards.

View this document now: WEFTEC96-04 (1 MB - PDF file)

What Does The Rouge Project Know That May Save You Money On Wet Weather Controls

James E. Murray, Dale S. Bryson, and Kelly A. Cave

Paper, October 1998, 13 pages, Order Number: WEFTEC98-01.00 **

The Rouge Project is a working example of how a systematic watershed approach to pollution management can result in cost-effective and ultimately greater and faster achievement of designated uses in a water body. The Rouge Project was initiated in 1992 by the Department of the Environment, Wayne County, Michigan. The Rouge Project is a USEPA granted funded program designed to restore the water quality of the Rouge River, a tributary of the Detroit River in Southeast Michigan. The Rouge Project is designed to identify the most efficient and cost effective controls of wet weather pollution, while assuring maximum use of the resource. Sources of pollution to the river include industrial and municipal point sources, combined sewer overflows, storm water runoff, interflow from abandoned dumps, discharges from illicit connections, discharge from failed on-site septic systems, and resuspension of contaminated sediment. Innovative storm water control technologies are also being evaluated under the Rouge Project. A total of 60 pilot storm water management projects are being implemented throughout the watershed by 25 different communities and agencies. Categories of pilot storm water management projects currently underway include wetlands creation and restoration, structural practices such as grassed swales and detention ponds, illicit discharge elimination, erosion controls, stream bank stabilization and habitat restoration to name a few. Innovative, readily transferable tools have been developed and are being employed by the Project. These tools include a suite of computer models to simulate the water quality and quantity response of the Rouge River during wet weather events for existing and future conditions under various CSO and storm water runoff management alternatives; a comprehensive geographic information system (GIS); a relational database designed and implemented to manage the wealth of data collected under the Project (DataView and Rouge Information Manager); and the use of a holistic watershed approach. These tools are being shared with other cities and state agencies.

View this document now: WEFTEC98-01.00 (40 KB - PDF file)

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Rouge River Gateway Ecosystem Restoration Project

The Rouge River Gateway Corridor is one of the most important natural and cultural assets of southeast Michigan. It includes the Rouge River's final eight miles and five neighboring communities. This area has all the ingredients of a vibrant urban place: nature, culture, people, and economic strength.

Enthusiastic stakeholders, realizing the potential of an improving river environment combined forces to create a vision for sustainable development within this unique area. The Rouge River Gateway Partnership formed in 1999 from a diverse leadership group representing Wayne County, five municipalities, cultural institutions (including the University of Michigan-Dearborn and The Henry Ford), and private businesses.

Under the guidance of the Partnership, a master plan was developed in 2001 that encourages people, ecology, and economy to coexist equitably and sustainably in the landscape. The plan included a number of projects to restore relationships between the Rouge and its natural and social systems. The first update to the Gateway Master Plan was published in 2005 that highlighted the numerous projects which had already been completed or were underway, such as the greening of the Ford Rouge Center, restoration of a river oxbow in The Henry Ford-Greenfield Village, and completion of an Environmental Interpretive Center along the banks of the Rouge River at the University of Michigan-Dearborn.

In 2011, the Rouge Gateway Master Plan was updated again to mark 10 years of progress toward reaching the goal of strengthening economic development while restoring the ecosystem, increasing recreation, and preserving the area's rich heritage. The 2011 Rouge Gateway Master Plan highlighted numerous additional projects that have been completed, including:

- the first phase of the Rouge Greenway, linking Wayne County's Hines Park to Henry Ford Community College, the University of Michigan-Dearborn campus, the Henry Ford Estate, and the Michigan Avenue corridor;
- the Army Corps of Engineers completing initial plans for partial removal of the concrete channel to create new fish habitat and natural riverbanks; and
- the billions of dollars of corporate investment along the banks of Rouge River in the last decade.

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Rouge Oxbow Restoration

A key element of the Rouge Gateway Master Plan is restoration of an oxbow of the Rouge River located at The Henry Ford in Dearborn, Michigan. This project is restoring valuable fish and wildlife habitat along with wetlands that have been lost due to channelization of the river in this area. Phase I of the Rouge Oxbow Restoration Project was completed in 2002 and included excavation of the oxbow to provide a 2,200-ft channel surrounded by 3 acres of submergent and emergent wetland systems that is hydraulically connected to the main branch of the Rouge River. Within a matter of months, numerous fish species had inhabited the restored oxbow as follows (abundance shown in parentheses): common carp (high), black bullhead (high), yellow bullhead (high), bluntnose minnow (high), fathead minnow (high), largemouth bass (low), smallmouth bass (low), bluegill sunfish(high), green sunfish (medium), goldfish (low), white sucker (medium), golden shiner (low), gizzard shad (high), channel catfish (low).

Construction Images




Phase II of the project will involve modifications to a City of Dearborn CSO discharge that transects the oxbow. This effort is underway and will improve the hydraulic connection between the two segments of the oxbow.

In 2006, Ford Motor Company constructed an open connection on the east end of the oxbow to the Rouge River as part of a larger project they implemented. This effort initiated Phase III of the project. In 2013, the Alliance of Rouge Communities (ARC) received a grant from the National Oceanic and Atmospheric Administration (NOAA) to design the open channel connection on the west end of the oxbow. For more information about the Phase III effort see **www.allianceofrougecommunities.com**.

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Historical information on the Rouge Oxbow Restoration project

Technical Papers & Reports

Rouge Gateway

- Rouge Gateway Master Plan Update, June 2011
- Rouge Gateway Master Plan Update, 2005
- Rouge Gateway Master Plan, July 2001
- Henry Ford Estate Heritage and Wildlife Education and Recreation Plan, May 2000
- Rouge Gateway Project Overview
- 2002 Honor Award-Michigan Chapter of the American Society of Landscape Architects

Oxbow Restoration

- Rouge Oxbow Restoration Project
- Rouge Oxbow Fish Survey 2002

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Combined Sewer Overflow

The Rouge River National Wet Weather Demonstration Project (Rouge Project) has been an unqualified success story in many ways including the control of combined sewer overflows (CSOs). This has been confirmed by independent sources. During the latter part of 2001, USEPA's Office of Inspector General (OIG) conducted a nationwide audit of the national CSO control program. The OIG issued their final Evaluation Report on **"Wastewater Management - Controlling and Abating Combined Sewer Overflows"** in August 2002.

The following is a quote from that report about the Rouge Project's CSO control program and the watershed approach being utilized:

"Rouge River Project a Blueprint for Success - The Rouge River National Wet Weather Demonstration in Michigan is an excellent example of how utilizing a watershed approach can help to achieve water quality goals more efficiently. We have previously described in this report some of the successful results that have been achieved by this project."

The restoration of the Rouge River began by focusing on the primary public health pollutant threat and source: combined sewer overflows. At the start of the program, 168 CSOs were identified, with a tributary service area of approximately 59,300 acres (approximately 20% of the watershed). CSO controls were to be implemented in the Rouge Project through three phases as established by National Pollutant Discharge Elimination System (NPDES) permit:

Phase I: elimination of raw sewage and the protection of public health for approximately 40 percent of the combined sewer area

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Phase II: public health protection for the remaining combined sewer area

Phase III: meet water quality standards in the Rouge River

Under Phase I, six communities separated their sewers and eight communities constructed 10 retention treatment basins. Each of these basins is sized for different design storms and several employed innovative technology. These CSO basins also incorporate a variety of 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 the Detroit Wastewater Treatment Plant. Flows from very large wet weather events that are not completely captured by the retention treatment basins receive screening, skimming, settling, and disinfection prior to discharge. These CSO control projects have effectively eliminated or controlled the discharge of untreated sewage from approximately half of the watershed CSOs.

Working with the local communities, the Michigan Department of Environmental Quality (MDEQ) established rigorous "**Criteria for Success in CSO Treatment**" to evaluate whether the CSO basins meet the Phase I and II goals of elimination of raw sewage discharges and protection of public health and the Phase III goal of achieving water quality standards. The development of an evaluation process provided an innovative forum for stakeholders to collaboratively establish objectives for CSO controls within the goals of urban watershed restoration. Since wet weather control is expensive, having a well defined, technical evaluation process to determine compliance with regulatory requirements is important.

A detailed evaluation study of each of the CSO control basins was completed to examine the performance of the facilities and the resulting water quality impacts of their **discharges**. The results of the evaluation study, coupled with efforts to control storm water and other pollution sources in the watershed, has provided valuable technical information for use in establishing the basis for deciding on the Phase II and Phase III CSO control program on the remaining CSO sources in the watershed. In addition, the evaluation of design storms and control technologies has provided valuable technical information for communities embarking on such controls in other watersheds in the country.

As the CSO control program was implemented, additional valuable lessons were learned in the success of the control technology selected at the various basins. Standard operation and maintenance procedures are ensuring that the basins are meeting effluent limits and keeping the basins as good neighbors to surrounding land uses, which include nature centers, a golf course, and recreational facilities. A very noteworthy finding was that while the technology was selected, installed and operated so as to meet the Phase I objective (elimination of raw sewage and the protection of public health), it was learned that the Phase III objective (meeting water quality standards in the Rouge River) was also achieved in many instances.

USEPA's 1994 National CSO Control Policy has been fully implemented through the Rouge Project.

It is very important to note that the CSO control program, while at the heart of the Rouge Project, is but

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one element of the overall Rouge River restoration effort. The impressive improvements in water quality and recreational use in the Rouge River can be attributed to the multitude of other Rouge Project programs including illicit connection elimination, storm water management activities, and developing better public, industry and community awareness of pollution control and prevention. These programs and others are all part of the **watershed management approach** being successfully implemented in the Rouge River watershed.

The Rouge River Wet Weather Demonstration Program has been successful in identifying efficient and cost effective CSO basins for control of combined sewer overflows. The wisdom of controlling CSOs at remote locations versus trying to convey all of the combined sewage at one time to the central treatment plant was confirmed. Combined sewer overflow pollutant loads to the river have been cut by 90 to 100 percent during most wet weather events. Demonstration basins, built to a smaller size than what would have been required by presumptive criteria, have reduced release of pollution to the river with excellent environmental protection results. Protection of human health, elimination of the discharge of raw sewage, and meeting water quality standards have been achieved, with the exception of TRC, which is still being investigated. Phased implementation has allowed lessons learned to be used in subsequent phases, affording greater efficiencies in developing and implementing controls for the remaining CSOs with a very large savings in capital expenditures. The completed basins are controlling overflows at a rate of approximately 4 billion gallons per year with outstanding water quality and aesthetic improvements and increased recreational usage in the Rouge River.

What are Combined Sewer Overflows (CSOs)?

When it rains, a combined sewer system can't handle the large volume of sewage and storm water. This is called a combined sewer system because both sewage and storm water flow into one pipe. Instead of allowing water to back up into people's basements during a rainstorm, the combined sewer system allows the polluted water to be discharged directly into the Rouge River. This discharge into the river is known as a combined sewer overflow or CSO.

At the beginning of the Rouge Project in 1992, combined sewers serviced about 20 percent of the Rouge River Watershed, with 168 CSO discharge locations. This mixture of sewage and storm water contained pollutants that resulted in a public health threat to those that came into contact with the water. At present, only a fraction of the uncontrolled CSO discharges still exist. Each of those remaining discharges is under a program to be controlled by 2005.

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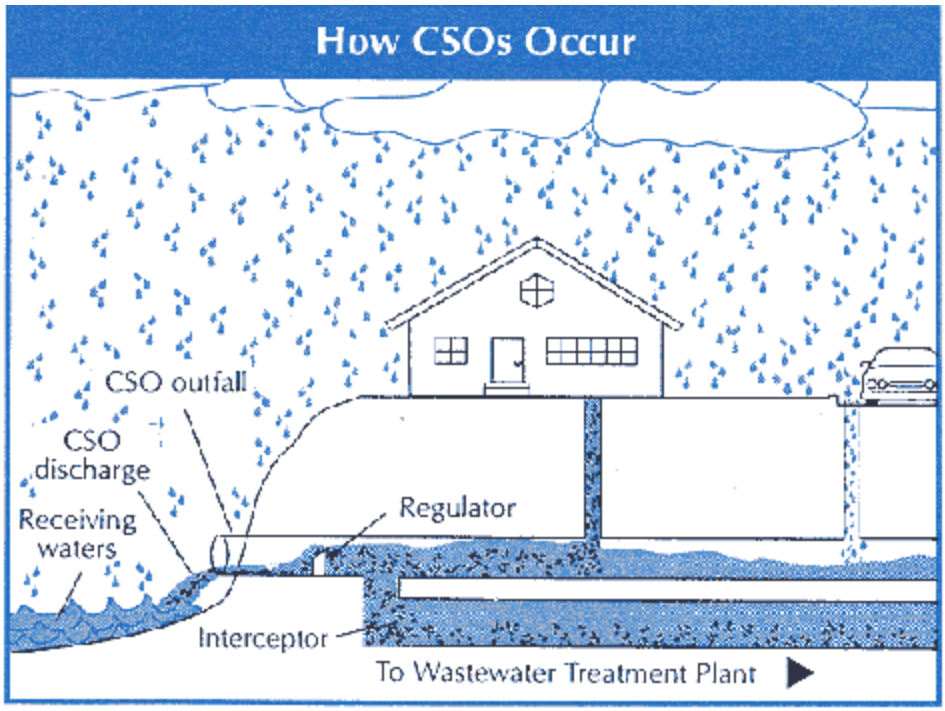


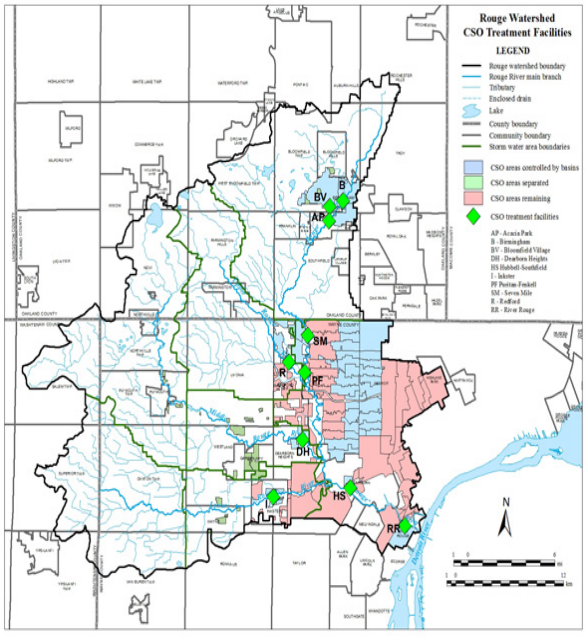
Background materials

- Overview Description of the Rouge Watershed CSO Control Program
- Michigan Department of Environmental Quality (MDEQ) Criteria for Success in CSO Treatment
- CSO Facility Performance
- Environmental Results

CSO Abatement Projects

CSO Treatment Facilities

- Acacia Park Retention Basin
- Birmingham Retention Basin
- Bloomfield Retention Basin
- Dearborn Heights Retention Basin
- Dearborn CSO Control Program
- Hubbell-Southfield Retention Basin
- Inkster Retention Basin
- Puritan-Fenkell Retention Basin
- Redford Township Retention Basin
- River Rouge Retention Basin
- Seven Mile Retention Basin



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Sewer Separation Projects

- **Bloomfield Hills**
- **Garden City**
- **Livonia**
- **Plymouth Township**
- **Westland**
- **Wayne**

Demonstration Projects

Combined Sewer Overflow (CSO)

CSO 009 Sewer Separation Project (RIXA-03)

City of Dearborn

Project Profile/Report, September 2009, 6 pages, Order Number: RIXA-03

The purpose of this project is to perform sewer separation of a section of CSO 009 drainage area on Morley Street between Monroe and Military Streets. Sewer separation was selected as the most feasible option for this section in a larger study to optimize the design of CSO control facilities for outfalls 008 and 009 of West Dearborn Phase B CSO Control Project. The objective of the project is to eliminate CSO discharges to the Lower Rouge River, thus eliminating a major pollution source and restoring the quality of the river water.

View this document now: RIXA-03 (173 KB - PDF file)

CSO Outfall 13 Storage and Treatment Facility, West Dearborn - Phase A (RVIA-19)

City of Dearborn

Project Profile/Report, October 2006, 21 pages, Order Number: RVIA-19

This project is a part of the City of Dearborn's Combined Sewer Overflow (CSO) Program. It is part of the West Dearborn CSO Control Project-Phase A. Project RVIA-19 consists of the construction of new facility to control CSO from an existing CSO outfall 13. Major construction activities included: the abandonment of existing outfall; relocation of outfall sewer; construction of a large capture shaft; construction of screening facility and outfall, and work related to the removal of the combined sewer through the Rouge River Oxbow at the Henry Ford. This facility will reduce combined sewer overflows to the Rouge River. Also, this project is required to comply with the State's CSO permit to the City of Dearborn.

View this document now: RVIA-19 (2.5 MB - PDF file)

CSO Outfall 17 Storage and Treatment Facility, East Dearborn (RVIA-20)

City of Dearborn

Project Profile/Report, September 2008, 27 pages, Order Number: RVIA-20

This project reduced the occurrence of combined sewer overflow events throughout the Dearborn area. This was accomplished with the construction of a large storage and treatment facility.

View this document now: RVIA-20 (4.7 MB - PDF file)

CSO Outfall L49 Sewer Separation and Relief Sewer to Andover Pump Station, Inkster (RVIIA-02)

City of Inkster

Project Profile/Report, March 2009, 13 pages, Order Number: RVIIA-02

This project provided combined sewer separation of a 25-acre area generally located east of Henry Ruff Road, between Andover Avenue and Liberty Avenue. This project included providing a relief sewer upstream Andover pumping station.

View this document now: RVIIA-02 (1.3 MB - PDF file)

Dearborn CSO Control Project Phase A (RIV-14)

City of Dearborn

Project Profile/Report, August 2006, 28 pages, Order Number: RIV-14

This project controlled combined sewer overflows (CSOs) with the implementation of a new storage system. Capture shafts were implemented to store excess combined sewer flow, thus improving the overall water quality of the Rouge River Watershed.

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

View this document now: RIV-14 (2.3 MB - PDF file)

Dearborn Heights Phase II CSO Design and Construction (RIV-11)

City of Dearborn Heights

Project Profile/Report, April 2005, 7 pages, Order Number: RIV-11

This project consisted of the design and construction of a collector sewer to transport CSO flows from outfalls M-18, M-19, and 3A to the existing Dearborn Heights CSO Basin and the adjustment of CSO regulators M-15, M-16, M-17, M-18, and M-19.

View this document now: RIV-11 (350 KB - PDF file)

Dearborn Sewer Separation Analysis for CSO Reduction at Outfalls 13 and 14 (RXA-07)

City of Dearborn

Project Profile/Report, October 2012, 106 pages, Order Number: RXA-07

The project is located in the City of Dearborn, near The Henry Ford at the intersection of Oakwood and Rotunda. Phase 1 of the sewer separation investigation study evaluated the cost effectiveness of sewer separation within the study area based on a preliminary field reconnaissance. The phase 1 evaluation found that sewer separation appeared to be cost effective for the Districts 13, 14 and the Ford Proving Grounds. The phase 2 approach involved performing a more detailed field investigation and performing flow monitoring and preliminary modeling to assess the feasibility of providing surface storage in District 14. The Phase 2 work also involved updating the planning level cost estimates and cost effectiveness analysis.

View this document now: RXA-07 (10.4 MB - PDF file)

Footing Drain Disconnection Pilot Program (RVIA-01)

City of Melvindale

Project Profile/Report, September 2006, 5 pages, Order Number: RVIA-01

The City of Melvindale conducted footing drain disconnection activities in homes to reduce the number of sanitary sewer overflows (SSOs). Homeowners were reimbursed for costs associated with this project.

View this document now: RVIA-01 (138 KB - PDF file)

North Huron Valley / Rouge Valley Sewer System Short Term Corrective Action Plan (STCAP) (RIXA-08)

Wayne County

Project Profile/Report, November 2010, 3 pages, Order Number: RIXA-08

The purpose of the Short Term Corrective Action Plan is to reduce inflow and infiltration (I/I) and surcharging within the Rouge Valley Sewer Disposal System in accordance with the guidelines outlined in the Final Order of Abatement (ACO-SW06-010). Removal of I/I will consist of rehabilitation of sewers, regulator structures and manholes, as well as improvements to the Wayne County Park System comfort stations.

View this document now: RIXA-08 (23 KB - PDF file)

Reduction of Excess Peak Flows through Evaluation and Modification of In-line Storage (RIV-08)

City of Garden City

Project Profile/Report, September 2005, 30 pages, Order Number: RIV-08

This project will evaluate, and modify as needed, the existing in-line storage system to maximize its value for reducing and controlling Garden City's peak wet weather design flows to the North Huron Valley/Rouge Valley (NHV/RV) Middle Rouge Interceptor system. The Project consists of two phases: an evaluation phase and an implementation phase. During the evaluation phase, a dynamic Storm Water Management Model (SWMM) of the current sewer/storage system would be developed and used to evaluate alternatives and establish the recommended system modifications. The implementation phase will consist of constructing the recommended modifications.

View this document now: RIV-08 (924 KB - PDF file)

Sewer Separation of CSO Outfall 012 (RVIIIA-02)

City of Dearborn

Project Profile/Report, January 2009, 8 pages, Order Number: RVIIIA-02

The purpose of this project is the elimination of CSO outfall 012 through the sewer separation of its area combined system. Separation of this outfall will eliminate the CSO generated from its tributary area to the Lower Rouge River. Combined sewer overflow is a major pollutant to surface waters, and its reduction or elimination is a key to meeting the requirements of water quality standards.

View this document now: RVIIIA-02 (261 KB - PDF file)

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Total Residual Chlorine Reduction Project for Acacia Park, Bloomfield Village and Birmingham Retention Treatment Basins (RIXA-06)

Oakland County Drain Commissioner

Project Profile/Report, February 2010, 7 pages, Order Number: RIXA-06

This project implemented upgrades to piping, pumps, dosing equipment and instrumentation to further reduce the amount of chlorine residual in the permitted discharges from the retention treatment basins. Residual chlorine concentrations associated with overflow events were identified at levels, which the Michigan Department of Environmental Quality (MDEQ) contends, presented a risk to downstream fish habitats.

View this document now: RIXA-06 (329 KB - PDF file)

Two Balancing Chambers to Improve the Efficiency of the Lower Rouge Interceptor (RIV-10)

Wayne County Department of Environment

Project Profile/Report, April 2006, 6 pages, Order Number: RIV-10

The Wayne County Department of Environment initiated the Balancing Chamber Project as a North Huron Valley/Rouge Valley (NHV/RV) regional system improvement to maximize use of the existing Lower Rouge and Michigan Avenue Interceptors during wet weather conditions.

View this document now: RIV-10 (48 KB - PDF file)

West Village Drive from Mason Street to Monroe Street Sewer Separation Project (RXA-01)

City of Dearborn

Project Profile/Report, September 2011, 7 pages, Order Number: RXA-01

As part of the City's West Village Storm Sewer Separation Project, the City of Dearborn constructed new storm sewers to remove all storm water drainage from the existing combined sewers. The existing combined sewers were then converted to sanitary sewers and a new sanitary sewer was constructed as required west of Monroe. The surface drainage from parking lots in this service area was also disconnected from the combined system and connected to a storm sewer. The execution of this project helped eliminate CSO generated from this drainage area which previously entered the Lower Rouge River at CSO 009.

View this document now: RXA-01 (1.6 MB - PDF file)

Sanitary Sewer Overflow (SSO)

Allen Park SSO Outfall Closure and Wet Weather Pump Station (RVIA-11)

City of Allen Park

Project Profile/Report, November 2006, 65 pages, Order Number: RVIA-11

This project constructed a new pump station along with a new flap gate. These measures reduced the occurrence of sanitary sewer overflows (SSOs) and thereby improved the surface water quality of area watersheds.

View this document now: RVIA-11 (3 MB - PDF file)

Bloomfield Orchards Subdivision Flow Metering Analysis (RVIA-16)

City of Auburn Hills

Project Profile/Report, March 2006, 115 pages, Order Number: RVIA-16

This project consisted of disconnecting foot drains in approximately 500 homes. By doing so, the occurrence of sanitary sewer overflows would decrease. Further, the reduction of storm water inflow into the sanitary sewer system would reduce flows to below the Town Outlet Capacity (TOC).

View this document now: RVIA-16 (31 MB - PDF file)

CSO Sewer Separation - Sanitary Sewer Construction on Omaha Beach Drive and Normandy Lane (RXIA-04)

City of Dearborn

Project Profile/Report, July 2014, 12 pages, Order Number: RXIA-04

The objective of this project is to eliminate untreated CSO discharges to the Lower Rouge River thus eliminating a major pollution source and restoring the quality of the river water. The project completed a sewer separation for a portion of CSO 003 drainage area. The streets included in the sewer separation are Michigan Avenue, Omaha Beach Drive, alley north of Michigan Avenue, east of Woodcroft and Rouge River Crossing.

View this document now: RXIA-04 (960 KB - PDF file)

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Documentation of Existing Sanitary Sewer System (RVIA-15-1)

City of Westland

Project Profile/Report, September 2006, 146 pages, Order Number: RVIA-15-1

The purpose of this project was to conduct a Sanitary Sewer Evaluation Survey (SSES) in the northeast part of the City of Westland and a small portion in the south to address high wet weather flows in this area. The project was designed to identify points of possible inflow and infiltration through the use of manhole inspections, sewer televising, and smoke testing.

View this document now: RVIA-15-1 (6.7 MB - PDF file)

Edwards Relief Drain Siphon Removal (RIV-03)

Oakland County Drain Commission

Project Profile/Report, November 2003, 13 pages, Order Number: RIV-03

This project consists of design and construction for the removal of four sanitary sewer siphons at the Oakland County interceptor (14 Mile – Maple Road Arm) at crossings of the Edwards Relief Drain. Siphons proposed for removal are at Maple Road - west of Orchard Lake, Leslee Crest Drive, Beverly Crest Drive, and Heather Heath Drive. The existing siphons will be replaced with sanitary sewers passing through the Edwards Drain. The Edwards Drain cross-section, which is enclosed at each siphon location, would be enlarged in the vicinity of the sewer crossings so that the storm drain flow capacity will not be reduced.

View this document now: RIV-03 (584 KB - PDF file)

Farmington to Evergreen SSO Interceptor & Walnut Pump Station #1 with CSO Regulator Adjustments - Part II (RVIA-18)

Oakland County Drain Commission

Project Profile/Report, November 2006, 21 pages, Order Number: RVIA-18

This project consisted of constructing a new pump station and associated sewer piping. The new pump station reduced the occurrence of sanitary sewer overflows by diverting some flow to other interceptors.

View this document now: RVIA-18 (750 MB - PDF file)

Flow Metering and I&I Evaluation in City of Westland (RVIIA-01)

City of Westland

Project Profile/Report, august 2008, 389 pages, Order Number: RVIIA-01

Flow meters purchased by the City of Westland were used to provide a comprehensive data set for the numerous local sanitary sewer connection points along the Wayne County interceptor sewers. In order to monitor all of the sanitary sewer sub-districts, the metering was performed in four separate monitoring periods. Hydrologic modeling was performed in order to cross-compare the sub-district flows for the four rounds of flow metering.

View this document now: RVIIA-01 (69 MB - PDF file)

Footing Drain Disconnection Program (RVIA-15-2)

City of Westland

Project Profile/Report, September 2006, 197 pages, Order Number: RVIA-15-2

In this project, the City of Westland conducted a pilot footing drain disconnection program. The project proposed to remove up to 20 footing drain connections to eliminate storm water inflow into the City's sanitary sewer system. The footing drain disconnection project involved four major tasks: public education and participation; design of footing drain disconnections; construction of footing drain disconnections; and post disconnection measurement of success.

View this document now: RVIA-15-2 (1.2 MB - PDF file)

Footing Drain Disconnect Program in Chatham Hills Subdivision (RVIA-13)

City of Farmington

Project Profile/Report, July 2006, 12 pages, Order Number: RVIA-13

This project consisted of implementing a footing drain disconnection program. This program reduced the occurrence of sanitary sewer overflows by removing abundant storm water inflow into the sanitary sewer system.

View this document now: RVIA-13 (10.8 MB - PDF file)

Investigate & Rehabilitate Sewers in Hickory Heights Separated Sanitary Sewer District (RXA-03)

Bloomfield Township

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Project Profile/Report, May 2002, 6 pages, Order Number: RXA-03

The purpose of the grant project was to eliminate or reduce the occurrence of Sanitary Sewer Overflows (SSOs) in the Evergreen Farmington Sewage Disposal System (EFSDS) by eliminating sources of excess inflow and infiltration (I / I) in the separated sanitary sewer system. As a result of sewer metering work on the EFSDS as well as local portions of the sanitary sewer system, the Township became aware of potential excess I / I in the Hickory Heights, Bloomfield Hunt and Bridle Subdivisions, located in Section 13 of Bloomfield Township. The Township undertook this project to remove these sources of I / I to improve the system as a whole.

View this document now: RXA-03 (546 KB - PDF file)

Local Sanitary Sewer Improvement to Reduce SSOs to Evergreen Farmington System -Troy (RVIA-22)

City of Troy

Project Profile/Report, December 2006, 14 pages, Order Number: RVIA-22

This project decreased the amount of infiltration/inflow (I/I) into the sanitary sewer system. This was done by implementing 4 flow meters, which identified areas of excess I/I. One area of excess flow was identified. Rehabilitation of the sewer pipes in this area was completed, which successfully decreased I/I flow levels.

View this document now: RVIA-22 (1.4 MB - PDF file)

Minimizing Clear Water Flow in the Sanitary Sewer System (RVIA-17)

City of Romulus

Project Profile/Report, November 2006, 51 pages, Order Number: RVIA-17

This project minimized the flow of storm water runoff into the sanitary sewer system. This was done by identifying sewer system upgrades that needed to be executed, including the removal of dilapidated piping as well as debris.

View this document now: RVIA-17 (2.8 MB - PDF file)

Modify Regulators Setting and Identification and Correction of Inflow Sources (RVIA-10)

City of Inkster

Project Profile/Report, November 2007, 7 pages, Order Number: RVIA-10

This project served to reduce the occurrence of sanitary sewer overflows. This was done by identifying and replacing 4 regulators, thereby decreasing the flow to the Wayne County interceptor.

View this document now: RVIA-10 (166 KB - PDF file)

North Huron Valley / Rouge Valley Sewer System Evaluation Project (RVIIIA-01)

Wayne County

Project Profile/Report, June 2008, 44 pages, Order Number: RVIIIA-01

This project included design and construction improvements outlined within the short-term corrective action plan to the North Huron Valley/Rouge Valley Sewage Disposal System.

View this document now: RVIIIA-01 (203 KB - PDF file)

Pilot Footing Drain Disconnection Program (RXIA-05)

City of Livonia

Project Profile/Report, July 2014, 15 pages, Order Number: RXIA-05

The Pilot Footing Drain Disconnection Program is located in the City of Livonia. The West Chicago Neighborhood of sewer district 16 was targeted based on a 2011 Sanitary Sewer Evaluation Survey (SSES) which showed high peak wet weather flows. The purpose of the pilot program is to evaluate the potential quantity of wet weather flow that may be contributing to the sanitary sewer system through footing drains in this district.

View this document now: RXIA-05 (6.7 MB - PDF file)

Outfalls 11, 20 and 25 Cross Connection Correction and Ongoing Public Education Program Project (RVIB-13)

City of Inkster

Project Profile/Report, November 2007, 10 pages, Order Number: RVIB-13

This project consisted or removing illicit discharge sources that were identified during investigation activities. A 15-inch relief sewer, along with a new 12-inch sewer would be installed to reduce the amount of storm water infiltrating into the sanitary sewer system.

View this document now: RVIB-13 (316 KB - PDF file)

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Rear Yard Catch Basin Disconnect Program (RVIA-14)

City of Westland

Project Profile/Report, August 2006, 59 pages, Order Number:RVIA-14

This project rehabilitated sanitary manhole structures. Twenty-one area sanitary manhole covers had, over the years, been incorrectly replaced with storm water manhole covers. This project replaced these storm water manhole covers with sanitary manhole covers, thereby decreasing the inflow of storm water runoff entering the sanitary sewer system.

View this document now: RVIA-14 (3.2 MB - PDF file)

Relief of East Lincolnshire SSO (RVIA-03)

City of Farmington Hills

Project Profile/Report, October 2006, 66 pages, Order Number: RVIA-03

This project consisted of constructing two large diameter storage/relief sewers within the East Lincolnshire subdivision. These two storage units served to reduce the occurrence of sanitary sewer overflows during wet weather events.

View this document now: RVIA-03 (2.6 MB - PDF file)

Removal of Storm Water from Sanitary Sewer along Ann Arbor Trail (RVIA-12)

City of Livonia

Project Profile/Report, November 2006, 4 pages, Order Number: RVIA-12

This project consisted of placing an underdrain alongside roads to reduce the amount of storm water runoff entering into the sanitary sewer system. A system of swales and an underdrain successfully reduced storm water flows into the sanitary sewer system.

View this document now: RVIA-12 (219 KB - PDF file)

Rochester Hills Rouge District Sanitary Sewer Rehabilitation (RXIA-07)

City of Rochester Hills

Project Profile/Report, June 2014, 40 pages, Order Number: RXIA-07

The sanitary sewer system in the southwest corner of the City of Rochester Hills is located in the Rouge Main 1-2 subwatershed. In 2010 Rochester Hills obtained a Round X Part A grant to undertake an inflow and infiltration study for this area. The study was completed in 2011 and the report identified needed rehabilitation work. Round XI funding (approximately $36,000) was used to complete the rehabilitation work as identified in the Round X Final Report. This rehabilitation work will help prevent basement flooding and sanitary sewer overflows (SSOs).

View this document now: RXIA-07 (1.1 MB - PDF file)

Sanitary Pump Station with SSO Tank (RVIA-02)

City of Melvindale

Project Profile/Report, December 2006, 41 pages, Order Number: RVIA-02

This project consisted of designing and building an equalization basin system to store excess flow during wet weather events. This new system reduced the occurrence of SSOs that occurred after wet weather events.

View this document now: RVIA-02 (361 KB - PDF file)

Sanitary Sewer Improvement to Reduce SSOs to Evergreen Farmington System (RVIA-05)

Village of Beverly Hills

Project Profile/Report, March 2006, 71 pages, Order Number: RVIA-05

This project consisted of metering flows in 4 areas to identify potential sources of excessive infiltration/inflow (I/I). By identifying these areas, the Village of Beverly Hills could prioritize I/I reduction projects, which in turn would benefit area watersheds.

View this document now: RVIA-05 (1.1 MB - PDF file)

Sewer Televising and Assessment Project (RXIA-08)

City of Lathrup Village

Project Profile/Report, January 2015, 10 pages, Order Number: RXIA-08

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

This project is a part of the City of Lathrup Village's continued effort to reduce the inflow and infiltration (I/I) of stormwater into the city's sewer system and the probability of Sanitary Sewer Overflows (SSO's) into the Rouge River ecosystem. The purpose of this project was to videotape and assess the current conditions of the south sanitary sewer system located in a defined and separated area of Lathrup Village which acts independently of the sewer system located to the north of I-696.

View this document now: RXIA-08 (517 KB - PDF file)

Van Buren Wet Weather Sanitary Flow Metering and Analysis (RVIA-04)

Van Buren Township

Project Profile/Report, October 2005, 6 pages, Order Number: RVIA-04

This project implemented 14 flow meters to record both dry and wet weather flow rates. By identifying high inflow sources, steps could be taken to reduce this inflow, thus reducing the occurrences of flow above system capacity. In turn, a reduction in sewer back-ups and releases to surface waters would occur.

View this document now: RVIA-04 (157 KB - PDF file)

Water Quality Based Determination of SSO Design (RIIA-02)

Garden City

Project Profile/Report, February 2004, 94 pages, Order Number: RIIA-02

The purpose of this project was to collect additional information about current sanitary sewer excess flows or SSOs and the impacts on water quality. This information will further the discussion on the selection of a design storm for sizing cost-effective control facilities.

View this document now: RIIA-02 (19 MB - PDF file)

West Bloomfield Sanitary System Sewer Evaluation Survey Pilot Study (RVIA-21)

West Bloomfield Township

Project Profile/Report, November 2006, 17 pages, Order Number: RVIA-21

This project consisted of identifying sources of infiltration/inflow in a pilot study area. Investigation activities included televising sewer lines and smoke testing to identify illicit connections. Where necessary, footing drain disconnections were then completed in these pilot study homes.

View this document now: RVIA-21 (610 KB - PDF file)

Wing Lake Sanitary Sewer Rehabilitation (RXIA-02)

Bloomfield Township

Project Profile/Report, May 2014, 3 pages, Order Number: RXIA-02

The purpose of the grant project was to investigate and rehabilitate the Township-owned sanitary sewers located along the edge of Wing Lake in order to reduce groundwater infiltration and wet weather inflow (I/I) into the sanitary sewer system, and reduce peak flows downstream to help reduce the frequency of sanitary sewer overflows (SSOs) on the Evergreen Farmington Sewage Disposal System (EFSDS). The project objectives were to: 1) investigate the sanitary sewer manholes and sewers; 2) rehabilitate mainline sewers via sewer lining; 3) rehabilitate manholes; and 4) meeting the goals of the Rouge River Main 1-2 Watershed Management Plan.

View this document now: RXIA-02 (46 KB - PDF file)

Whitehall and Bloomfield Site Subdivisions Sanitary Sewer Investigation and Rehabilitation (RXIA-01)

City of Rochester Hills

Project Profile/Report, November 2013, 16 pages, Order Number: RXIA-01

The purpose of the project was to eliminate or reduce the occurrence of Sanitary Sewer Overflows (SSOs) in the Evergreen Farmington Sewage Disposal System (EFSDS) by eliminating sources of excess inflow and infiltration (I/I) in the City's separated sanitary sewer system. The City has been very proactive in performing these types of projects to reduce excess flow in the system. As a result of sewer metering work on the EFSDS as well as local portions of the sanitary sewer system, the City became aware of potential excess I/I in the Whitehall and Bloomfield Site Subdivisions, located in Section 11 of Bloomfield Hills. The City undertook this project to remove these sources of I/I to improve the system as a whole. The project objectives were to: 1) Investigate the sewer systems and identify sources of excess I/I; 2) perform rehabilitation on the sanitary sewers and manholes to eliminate or reduce excess flows; 3) reduce the number and size of SSO events and conveyance inefficiencies in the local sanitary sewer system and the EFSDS by eliminating excess flows; 4) protect water resources and the entire watershed by eliminating or reducing SSOs.

View this document now: RXIA-01 (1.2 MB - PDF file)

Septage/Waste Management

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Continue IDEP, Public Education, Subwatershed Planning and Central Waste Oil Collection Facility Planning (RIIB-27)

City of Wayne

Project Profile/Report, May 2003, 29 pages, Order Number: RIIB-27

The City of Wayne is committed to improving the water quality of the Rouge River in the Lower 2 Subwatershed by continuing development and implementation of its Subwatershed Planning, Public Education Plan and Illicit Discharge Elimination Plan, as well as research for a potential central waste oil collection facility for the City. This project continues programs that have recently been implemented or provided for development and implementation of activities, which were outlined in the City's Storm Water Pollution Prevention Initiative (SWPPI).

View this document now: RIIB-27 (3.2 MB - PDF file)

Development of OSDS Evaluation and Maintenance Program (OSS-04)

Wayne County Environmental Health

Project Profile/Report, January 2000, 5 pages, Order Number: OSS-04

An OSDS ordinance to evaluate OSDS at the time of property transfer and when septic tanks are pumped was developed and implemented. Initially, all communities in the Rouge Watershed were covered. After five years the ordinance will be in effect in the whole County.

View this document now: OSS-04 (164 KB - PDF file)

Homeowners OSDS Public Education Material (OSS-05)

Wayne County Environmental Health

Project Profile/Report, October 2002, 2 pages, Order Number: OSS-05

This project included the development of public education materials that will be used to educate homeowners in the Middle 3 Subwatershed in OSDS operation and maintenance. The materials included a video and other forms to facilitate documentation of homeowner OSS maintenance activities.

View this document now: OSS-05 (152 KB - PDF file)

Onsite Wastewater System Evaluation Training (OSS-03)

Michigan State University

Project Profile/Report, July 2001, 5 pages, Order Number: OSS-03

Michigan State University developed two modules to be used in a training program for onsite sewage system evaluators at the Michigan Onsite Wastewater Training and Educational Center at the MSU Tollgate Center in Novi. The content and materials for the two modules was developed and a test training program was conducted to evaluate the modules.

View this document now: OSS-03 (51 KB - PDF file)

Septage Unloading Site (OSS-01)

Oakland County

Project Profile/Report, December 2002, 56 pages, Order Number: OSS-01

The Oakland County Drain Commissioner's office has built a septage unloading facility in Pontiac to provide for disposal of septage waste from private septic tanks and a vactor dump drying bed. The facility is on 7.9 acres of land and includes a maintenance building, paved entrance and exit, fencing, lighting, landscaping and a security and billing system. The facility was dedicated in October 2001. The facility opened for use on March 15, 2002.

View this document now: OSS-01 (5.3 MB - PDF file)

Septic System Database & Evaluation (M3-08)

Wayne County Environmental Health

Project Profile/Report, March 1999, 12 pages, Order Number: M3-08

A computerized database of septic systems was developed. Each septic system in a study area was evaluated. Work was completed with municipalities on education and corrective actions. Target areas were Canton Township, Northville Township, Plymouth Township, Dearborn Heights, Garden City, Livonia, and Westland. The project reduced health risks related to sewage.

View this document now: M3-08 (115 KB - PDF file)

Washtenaw County OSDS Management Project (OSS-02)

Washtenaw County

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Project Profile/Report, March 1999, 12 pages, Order Number: OSS-02

Washtenaw County proposed a new regulation that will require inspection and evaluation of an OSDS whenever there is a property change of use or transfer. This project assisted in implementing the regulation through a training program, development of an evaluation process, and public awareness efforts.

View this document now: OSS-02 (645 KB - PDF file)

Technical Papers & Reports

Key for Document Reading Level
* No scientific background required for understanding
** Some scientific and/or technical background helpful
***Scientific and/or technical background suggested

Acacia Park CSO Basin

Project Profile, June 2004, 4 pages, Order Number: CSO-12 *

This project profile summarizes the Acacia Park CSO Basin. This CSO basin seeks to control CSO discharges and to meet applicable requirements including water quality standards.

View this document now: CSO-12 (131 KB - PDF file)

Birmingham CSO Basin

Birmingham CSO Basin Project Profile, May 2004, 4 pages, Order Number: CSO-14 *

This project profile summarizes the Birmingham CSO Basin. This CSO basin seeks to control CSO discharges and to meet applicable requirements including water quality standards.

View this document now: CSO-14 (133 KB - PDF file)

Bloomfield Village CSO Basin

Project Profile, June 2004, 4 pages, Order Number: CSO-13 *

This project profile summarizes the Bloomfield Village CSO Basin. This CSO basin seeks to control CSO discharges and to meet applicable requirements including water quality standards.

View this document now: CSO-13 (416 KB - PDF file)

Combined Sewer Overflow Innovative Funding

Fayek Zabaneh and Jerry Neibert

Miscellaneous Report, April 1994, 5 pages, Order Number: VE-MM03.06 **

At the onset of the Rouge Project, representatives from Wayne County (Michigan), Michigan Department of Natural Resources (MDNR), Federal Court, and Rouge River Watershed communities developed a plan to construct detention treatment facilities at 10 locations and sewer separation projects in 6 municipalities. For the purpose of demonstration, the detention criteria for the storage and treatment facilities were varied in order to test a range of detention and treatment criteria and to identify effective combinations of design parameters for future combined sewer overflow (CSO) control facilities in the Rouge River Watershed. The municipalities and the engineering consultants for the 10 retention facilities were invited to propose "demonstration processes" to be incorporated in their designs, with the understanding that some proposed demonstrative unit processes would be funded from a separate portion of the grant extended by the U.S. Environmental Protection Agency (EPA). This memorandum presents the unit processes that each community proposed as innovative. Also presented is a suggested funding priority list. Appendices includes 42 pages of design and financial documentation.

Criteria for Success, Goal 2 - Protection of Public Health Elimination of Raw Sewage, Evaluation of Oakland County and Wayne County CSO Facilities

Carol Hufnagel

Project Profile, April 2001, 27 pages, Order Number: RPO-SR30 **

MDEQ published the Criteria for Success in CSO Treatment in August 1998. The Criteria for Success identifies the basis for the determination of whether Basin CSO Discharges meet the objectives of eliminating raw sewage and protecting public health (Phase II requirements). This criteria, and the performance of the Rouge CSO facilities is examined in this document. This document reflects monitoring performed at the Wayne County (Inkster, Redford, Dearborn Heights) and Oakland County (Acacia, Bloomfield Village, Birmingham) CSO facilities.

View this document now: RPO-SR30 (646 KB - PDF file)

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

CSO Basin Evaluation Plans - Data Collection and Transfer Guide

Carol Hufnagel and Chris Catalfio

Technical Memorandum, August 1999, 46 pages, Order Number: NPS-TM33.00 ***

This technical memorandum summarizes procedures for the transfer of CSO basin data. The Rouge Program Office (RPO) has the role of comparing data collected at different CSO control facilities, providing comparative analysis, and providing a repository for basin data collected as part of the community basin evaluation monitoring programs. In order to ensure consistency of data, general guidelines for data transfer are provided in this document. All data received by the RPO will be loaded to the program database. This requires consistency of format in order to ensure that all needed information is provided and that data is correctly recorded in the database.

View this document now: NPS-TM33.00 (171 KB - PDF file)

CSO Basin Monitoring and Analysis Study Plan Being Finalized

Vito P. Kaunelis

Project Profile, July 1997, 2 pages, Order Number: WERF97-02 **

In its combined sewer overflow (CSO) technology evaluation, the Rouge Program Office (PRO) collected and analyzed CSO data from several existing treatment facilities. This project profile discusses this evaluation.

View this document now: WERF97-02 (665 KB - PDF file)

CSO Basins: Getting the Most Performance from Your Pollution Control Dollar

Phil Brink, Dale Bryson, Edward Kluitenberg, Carl Johnson, and Carol Hufnagel

Technical Report, June 2005, 44 pages, Order Number: RPO-CSO-TR52 **

This report summarizes the results of the detailed evaluations of the ten combined sewer overflow (CSO) retention basins that were constructed to meet the requirements of National Pollutant Discharge Elimination System permits. The report addresses four main questions associated with the CSO control program as follows:

- How can compliance with NPDES permits and water quality standards be measured?
- What treatment and hydraulic processes are most effective?
- What is needed for operational effectiveness?
- What is the proper size for CSO basins to comply with regulatory requirements?

The answers to those questions are provided in the report. The methodology by which the CSO basins were evaluated in order to answer the above questions is discussed. A number of the most significant lessons learned for each of those four questions as related to the performance of the Rouge Project CSO basins are summarized. Conclusions on the overall success of the CSO control program are drawn.

View this document now: RPO-CSO-TR52 (3.1 MB - PDF file)

CSO Basins: Technology and Results, September 1999

Carol L. Hufnagel

Technical Report , September 1999,38 pages, Order Number: CSO-104 ***

Slide presentation to the Japan Institute for Waste Water Technology, September 28, 1999.

View this document now: CSO-106 (1.4 MB - PDF file)

CSO Demonstration Facilities Design Parameter Report

Razik Alsaigh

Technical Report, August 1994, 92 pages, Order Number: CSO-TR02.00 ***

This report summarizes the CSO abatement projects that the 12 communities in the Rouge River Watershed are constructing. Key design parameters for the retention treatment basins, retention treatment tunnel and sewer separation projects are identified. Estimates of costs, flows and other features of each system; and plans and diagrams showing facilities are included.

View this document now: RPO-CSO-TR02 (2.6 MB - PDF file)

CSOs: Two Phased Permitting for the Watershed

Kaunelis, Vyto P., and Jerry S. Neibert

Paper, October 1994, 11 pages, Order Number: WEFTEC94-01 **

The Rouge River in southeast Michigan is classified as one of the most polluted rivers in the United States. Wayne County, the local communities, MDNR, U.S. District Court, and the EPA have developed a plan to demonstrate and evaluate alternative CSO control strategies in the Rouge River Watershed. A two-phased National Pollution Discharge Elimination System (NPDES) permit was issued to facilitate the demonstration and evaluation (Phase 1) of alternatives. In 1997, MDNR will establish criteria for addressing CSOs throughout the Rouge River Watershed. Communities will be required to construct these improvements by 2005 (Phase 2). Wayne County received an EPA grant to study the CSO treatment alternatives and provide the results to guide future CSO control in the Rouge River Watershed. The results are expected to provide valuable insight on CSO treatment alternatives throughout the nation. Figures and tables are included.

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

View this document now: WEFTEC94-01 (2.7 MB - PDF file)

Dearborn CSO Control Program

Project Profile, March 2006, 2 pages, Order Number: CSO-21

The City of Dearborn Combined Sewer Overflow (CSO) Control program seeks to control CSO discharges and to meet applicable requirements including water quality standards.

View this document now: CSO-21 (33 KB - PDF file)

Dearborn Heights CSO

Charlotte Nichols

Project Profile, June 2003, 4 pages, Order Number: CSO-02 *

The Dearborn Heights CSO project seeks to control CSO discharges and to protect water quality for public health.

View this document now: CSO-02 (128 KB - PDF file)

Dearborn Heights CSO Basin Evaluation Interim Final Report, March 2000

Wade-Trim & Associates

Technical Report, February 2005, 92 pages, Order Number: CSO-TR23.00 **

This report presents the results of the Retention Basin Evaluation for the City of Dearborn Heights Combined Sewer Overflow (CSO) Retention Basin. The CSO control program for the Rouge River uses a phased approach. The City of Dearborn Heights Retention Basin is part of Phase I which requires the elimination of raw sewage and the protection of public health for the basins that serve approximately 40 percent of the combined sewer area. A two-year period was established in the National Pollutant Discharge Elimination System (NPDES) Permit to evaluate the performance of the Phase I CSO control basins. Evaluation findings would then establish the level of control needed for the remaining CSOs in the watershed. Specifically, the report explains the methodology used in the basin evaluation and includes information on the number of overflow events, effluent quality, influent flow rate, first flush profile, screenings, dewatering, disinfection, retention time, and runoff coefficient. This report also summarizes the Michigan Department of Environmental Quality Phase I retention basin evaluation criteria and presents conclusions on how the Dearborn Heights basin is meeting its NPDES requirements.

View this document now: RPO-CSO-TR23.00 (1.3 MB - PDF file)

Detroit's CSO Controls

Gary Fujita

Project Profile, April 1997, 5 pages, Order Number: WERF97-01 **

The Detroit Water and Sewerage Department (DWSD) is responsible for managing three combined sewer overflow (CSO) retention basins as part of the Rouge River National Wet Weather Demonstration Project. This project profile describes the CSO control program technologies and design features of the Detroit CSO facilities.

View this document now: WERF97-01 (1.1 MB - PDF file)

Evaluation of In-Stream Impacts of CSO Control Facilities

Carl Johnson and Vyto Kaunelis

Project Profile, 20 pages, Order Number: Watershed 2000-02 **

Nine new facilities for storing and treating CSO discharges have been constructed and placed into operation along the Rouge River since 1997. A detailed evaluation is underway to examine the performance of the facilities and the water quality impacts of their discharges. This paper focuses on the in-stream evaluation of four criteria:
- The water quality standard for dissolved oxygen
- The physical characteristics standard
- The total residual chlorine standard
- The health of the biological community (as a surrogate for toxic materials)

View this document now: Watershed 2000-02 (229 KB - PDF file)

Field Survey of the Total Residual Chlorine (TRC) Plume in the Rouge River from the Hubbell-Southfield CSO Detention Basin Overflow

Carol Hufnagel

Technical Report, May 2005, 11 pages, Order Number: RPO-CSO-TR53 ***

The objective of this field survey and evaluation was to establish the extent of the total residual chlorine (TRC) plume in the ambient water of the Rouge River, downstream of the Hubbell-Southfield CSO Detention Basin (H-S basin) discharge outfall.

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

The field survey was conducted during a wet weather event where the H-S basin was discharging (overflowing) to the Rouge River. The field survey measured TRC concentrations in the receiving waters at various locations along the Rouge River (both upstream and downstream of the H-S Basin discharge) and at various points in the cross-section at each location. The basin effluent discharge was also monitored for TRC during this time. The extent of mixing between the ambient water and the H-S basin discharge was estimated from these TRC measurements.

View this document now: RPO-CSO-TR53 (175 KB - PDF file)

Hubbell-Southfield CSO

Charlotte Nichols

Project Profile, June 2003, 4 pages, Order Number: CSO-03 *

The Hubbell-Southfield CSO project seeks to control CSO discharges and to protect water quality for public health.

View this document now: CSO-03 (122 KB - PDF file)

Hubbell-Southfield CSO Detention Basin Evaluation

Detroit Water and Sewer Department

Supplemental Report, November 2005, 722 pages, Order Number: RPO-CSO-SR33 *

This report presents the results of the Retention Basin Evaluation for DWSD's Hubbell-Southfield facility. The CSO control program for the Rouge River uses a phased approach. The basin is part of Phase I which requires the elimination of raw sewage and the protection of public health for the basins that serve approximately 40 percent of the combined sewer area. A two-year period was established in the National Pollutant Discharge Elimination System (NPDES) Permit to evaluate the performance of the Phase I CSO control basins. Evaluation findings would then establish the level of control needed for the remaining CSOs in the watershed. Specifically, the report explains the methodology used in the basin evaluation and includes information on the number of overflow events, effluent quality, influent flow rate, first flush profile, screenings, dewatering, disinfection, retention time, and runoff coefficient. This report also summarizes the Michigan Department of Environmental Quality Phase I retention basin evaluation criteria and presents conclusions on how the DWSD Hubbell-Southfield basin is meeting its NPDES requirements.

View this document now: RPO-CSO-SR33 (5.4 MB - PDF file)

Implementation of CSO Controls Based on Watershed Approach

Carol L. Hufnagel, Edward H. Kluitenberg, and Vyto P. Kaunelis

Paper, May 1998, 7 pages, Order Number: WEFSPEC98-05 **

The Rouge Project is implementing watershed planning in the Rouge River Watershed. As part of the wet weather demonstration program, CSO and stormwater quality controls are being implemented. An assessment of project prioritization and the determination of level of control is influenced by the current limiting factors in the river conditions which impact its viability as a resource. To identify limiting factors which impact river use, a group of water quality indicators and public use categories were developed to provide a measure of existing river quality. The indicators resulted in a good, fair or poor ranking of the river based on parameters of dissolved oxygen, river flow, bacteria, aquatic life and stream habitat. Use categories were used to rate representative river sites on the basis of fishing, wading/body contact and general aesthetic conditions.

View this document now: WEFSPEC98-05 (222 KB - PDF file)

Initial CSO Findings Report

Hufnagel, Carol and Peter Klaver

Technical Memorandum, May 1997, 39 pages, Order Number: CSO-TM14.00 **

Data collected at several CSO facilities was analyzed to identify the impacts of CSO controls. In particular, the question of the importance of capture of flow volume, versus treatment of CSO discharges was examined. Several "findings" were identified. This findings included identification of first flush, the importance of optimizing interceptor capacity, the relative impacts of CSO versus stormwater loads, and the cause of CSO pollutant load reduction at a CSO basin.

Inkster CSO Basin Evaluation Interim Final Report, March 2000

Wade-Trim & Associates

Technical Report, March 2000, 101 pages, Order Number: RPO-CSO-TR24.00 **

This report presents the results of the Retention Basin Evaluation for the City of Inkster Combined Sewer Overflow (CSO) Retention Basin. The CSO control program for the Rouge River uses a phased approach. The City of Inkster Retention Basin is part of Phase I which requires the elimination of raw sewage and the protection of public health for the basins that serve approximately 40 percent of the combined sewer area. A two-year period was established in the National Pollutant Discharge Elimination System (NPDES) Permit to evaluate the performance of the Phase I CSO control basins. Evaluation findings would then establish the level of control needed for the remaining CSOs in the watershed. Specifically, the report explains the methodology used in the basin evaluation and includes information on the number of overflow events, effluent quality, influent flow rate, first flush profile, screenings, dewatering, disinfection, retention time, and runoff coefficient. This report also summarizes the Michigan Department of Environmental Quality Phase I retention basin evaluation criteria and presents conclusions on how the Inkster basin is meeting its NPDES requirements.

View this document now: RPO-CSO-TR24.00 (1.6 MB - PDF file)

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Inkster Retention Basin

Charlotte Nichols

Project Profile, June 2003, 4 pages, Order Number: CSO-10 *

The Inkster CSO project seeks to control CSO discharges and to protect water quality for public health.

View this document now: CSO-10 (128 KB - PDF file)

Integration of Wayne County CSO Controls in the Rouge River Watershed

Vito P. Kaunelis

Project Profile, October 1996, 3 pages, Order Number: WERF96-02 **

The water quality in the Rouge River has been degraded for many years by combined sewer overflows (CSOs). In October 1989, National Pollutant Discharge Elimination System (NPDES) permits were issued to CSO owners requiring retention treatment facilities to eliminate raw sewage discharges into the Rouge River. This project profile describes the CSO control program technologies implemented in Phase I of the project.

View this document now: WERF96-02 (658 KB - PDF file)

Interim CSO Report NPDES Permit No. MI 0026123

Rouge Project Combined Sewer Overflow Work Element

Supplemental Report, September 1993, 225 pages, Order Number: CSO-SR04 ***

The Interim CSO Report (ICR) is vital to the Rouge Project's success in meeting the challenge of controlling CSO pollution and minimizing incurred costs. The report defines ways to optimize operation of the existing sewer systems and CSO regulators, lists all potential sources of high pollutants, documents responses to wet weather events and information on discharges, and defines uses of the receiving waters. This report is a result of the collective efforts by combined sewer owners and operators. Its goal is to better understand the existing sewer system, its response to different wet weather events, and to identify potential high pollutant sources. The report presents the components for the existing system, potential and ongoing problems, and the needed levels of CSO control. Included are maps, tables and data.

Meeting Report for the Rouge River Watershed CSO Technology Demonstration

Wagner, Edward, Heckler Phil, Richards Tyler, Smith Robert & Claudia Zahorcak

Supplemental Report, April 1997, 15 pages, Order Number: CSO-SR11.00 **

The Water Environment Research Foundation (WERF) performed a peer review of the CSO basin evaluation activities of the Rouge Program Office (RPO). The initial meeting, held in April, 1997, included a review of the basin characteristics and monitoring program as well as the goals of the study effort. This report summarizes material presented at the peer review meeting and includes recommendations of the project subcommittee to the RPO. These recommendations focus on efforts which would improve the completeness of the evaluation and would assist in transferability to other locations.

Monitoring the Benficial Impacts of CSO Control Implementation (Reno, Nevada)

Hufnagel, Carol L. and Vyto P. Kaunelis

Paper, July 1998, 17 pages, Order Number: MonitConf98-01.00 **

The Rouge Project is a watershed-based restoration effort for the Rouge River, which is located in Southeast Michigan. The Rouge River is impacted by a number of pollutant sources, including CSOs and urban stormwater. A $420 million investment in CSO Controls is underway with the construction of eight sewer separation and 10 CSO control facilities (retention treatment basins) that are designed to achieve a significant reduction in the CSO loadings to the river under wet weather conditions. These CSO Control facilities are starting up operation between January 1997 and December 1998. These facilities were designed based on a range of sizing criteria reflecting presumptive and demonstrative approaches to CSO control. As the CSO facilities become operational, a two-year facility evaluation program is being implemented in concert with an instream monitoring evaluation.

View this document now: MonitConf98-01.00 (43 KB - PDF file)

Monitoring and Modeling of Dissolved Oxygen (DO) Impacts from CSO Facility Effluent

Edward H. Kluitenberg, Vyto P. Kaunelis, and Kurt Spieles

Paper, October 2001, 16 pages, Order Number: CSO-110 **

The Rouge River National Wet Weather Demonstration Program (Rouge Project) evaluated the performance of ten demonstration combined sewer overflow (CSO) control basins in the Rouge River watershed. Using a consensus-based approach, work groups including State personnel, CSO community representatives and consultants have reviewed the CSO basin evaluation results to date and concluded that the demonstration basins can eliminate raw sewage, protect public health and achieve water quality standards, including the dissolved oxygen standard. This demonstration approach to CSO control has been an unqualified success and resulted in a significant savings in costs compared to the presumptive approach.

View this document now: CSO-110 (367 KB - PDF file)

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

One Size Does Not Fit All: Stormwater is a Bigger Issue Since Local Communities Have No Regulatory Requirements Through CSO Controls

James W. Ridgway, Robert Tolpa, Ellen Lindquist, and Roy Schrameck

Paper, June 1996, 4 pages, Order Number: Watershed 96-05 *

Increased budgetary pressures coupled with new congressional guidance have caused regulatory agencies to re-evaluate the ways in which they manage water resources. The Rouge Project is exploring ways to integrate the various federal, state, and local statutes and regulations to improve water quality in the Rouge River Watershed.

View this document now: Watershed96-05 (979 KB - PDF file)

Operating Experiences with Large CSO Control Facilities

Carl R. Johnson, Tony Igwe, Daniel Mitchell, & Vyto P. Kaunelis

Project Profile, June 1997, 20 pages, Order Number: WEFTEC2000-01 **

Nine facilities for storing and treating combined sewer overflows (CSO) are in operation on the Rouge River in metropolitan Detroit. These facilities provide screening, chlorination and storage of CSO, and they have a total peak flow capacity of 3,600 cfs and a storage volume of 60 million gallons. The facilities are being monitored to assess their performance and water quality benefits for future phases of CSO control in the Rouge. In the meantime, the operating data collected since June 1997 provide important information on design. This paper discusses several aspects of CSO facility operations: Staff Training; Overall O&M Costs; Use of SCADA and Mobile Staffing; Pacing and Control of Hypochlorite Dosage; Solids Flushing Procedures; Dealing with Low Influent Flow Rates; and Exploring Potential New Operating Practices. The nine CSO facilities include three operated by the City of Detroit Water and Sewerage Department, three operated by the Oakland County Drain Commissioner, and three operated by the Wayne County Department of Environment. All of these facilities have been constructed as part of watershed restoration efforts on the Rouge River. These other efforts include illicit discharge elimination, storm water management, abandoned dump remediation, and habitat and recreational improvements. Overall, the operating experience with the Rouge River CSO control facilities is providing valuable information for designing future phases of CSO control on the Rouge and for communities engaged in CSO control in other watersheds. It is also helpful in identifying opportunities to enhance operational practices for CSO control.

View this document now: WEFTEC2000-01 (53 KB - PDF file)

Operators' Forum Report

Carol Hufnagel

Technical Report, December 2004, 25 pages, Order Number: RPO-CSO-TR39 **

The Rouge National Wet Weather Demonstration Project has included the construction of nine Combined Sewer Overflow (CSO) Control Facilities, put into operation between 1997 and 1999. A group of hands-on operators of the CSO facilities have formed an "Operators' Forum" to provide feedback on the equipment and operational characteristics of their facilities. A summary of the various process systems at the facilities, a summary of their operation, and a listing of operators' comments are provided in this report.

View this document now: RPO-CSO-TR39 (138 KB - PDF file)

Percent Treated Analysis of Demonstration Combined Sewer Overflow Control Facilities

Kluitenberg, Edward, H., and Clinton Cantrell

Technical Memorandum, October 1994, 27 pages, Order Number: MOD-TM17.00 ***

A computer modeling analysis was conducted to determine how 11 proposed demonstration combined sewer overflow (CSO) control facilities in the Rouge River Watershed compares to the United States Environmental Protection Agency (EPA) CSO Control Policy issued in April 1994. The 11 demonstration facilities comprise a variety of design features and different hydraulic design criteria for facility sizing. The analysis evaluates each facility individually rather than on a system-wide basis. Percent treated, as defined in the EPA policy, and the number of overflow events per year were calculated on an annual average basis using the TRTSTORM hydrologic mass balance model. The TRTSTORM model was developed by the Wayne County Rouge Program Office (RPO) and is similar to the Hydrologic Engineering Center's Storage, Treatment, Overflow, Runoff Model (HEC-STORM). The model uses a minimum hydraulic detention time as the sole criterion for determining whether a particular facility overflow receives the equivalent of primary clarification. Model results are presented for each facility for each of three different operating scenarios. The results are also presented for a range of values (1/2 to 3 hours) of minimum hydraulic detention time, which is the criterion used by the model to define primary clarification. A sensitivity analysis of the model results is also presented.

View this document now: MOD-TM17.00 (972 KB - PDF file)

Physical Characteristics of Treated Effluent from Oakland and Wayne County Demonstration CSO Facilities

Ed Kluitenberg, P.E.

Supplemental Report, November 2000, 17 pages, Order Number: CSO-SR27.00 **

View this document now: CSO-SR27.00 (54 KB - PDF file)

Preliminary Hydrologic Comparison of Demonstration CSO Facilities

Ed Kluitenberg, P.E.

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Supplemental Report, August 1999, 18 pages, Order Number: CSO-SR25.00 ***

Preliminary Hydrologic Comparison of Demonstration CSO Facilities: The purpose for this study was to compare the hydraulic performance of each basin to the design storm estimates, and to demonstrate the facilities ability to meet the criteria from the Michigan Department of Environmental Quality for adequate treatment.

View this document now: CSO-SR25.00 (95 KB - PDF file)

Preliminary Value Engineering Report of 30 Percent Design Completion of CSO Basin Demonstration Projects for Inkster, Dearborn Heights and Redford Township

Rouge Project Value Engineering Work Element

Preliminary Value Engineering Report, July 1993, 26 pages, Order Number: VE-PVER3.00 **

A value engineering (VE) review was conducted on CSO designs at 30 percent design completion. The goal is to meet National Pollutant Discharge Elimination System (NPDES) permit requirements and optimize investment. The VE review was conducted in three phases: pre-workshop, workshop, and post-workshop. Workshop attendees included senior level engineers. The pre-workshop prepared instructions for VE team members, and collected various background reports, designer's work products, cost estimates, and preliminary progress prints. The workshop itself, was conducted using the EPA-approved VE Job Plan and Methodology. The post-workshop phase included preparing this Preliminary Value Engineering Report, the decision making process, and a final report. Included in this VE preliminary report are details of all VE recommendations and design options considered during the workshop process, documentation of the decision process, and details of the cost/benefit process. Appendices include 150+ pages, containing designs, charts, and workshop worksheets.

Puritan-Fenkell and Seven Mile CSO Detention Basins Evaluation

Detroit Water and Sewer Department

Supplemental Report, November 2004, 219 pages, Order Number: RPO-CSO-SR34 *

This report presents the results of the Retention Basin Evaluation for DWSD's Puritan-Fenkell and Seven Mile CSO facilities. The CSO control program for the Rouge River uses a phased approach. These basins are part of Phase I which requires the elimination of raw sewage and the protection of public health for the basins that serve approximately 40 percent of the combined sewer area. A two-year period was established in the National Pollutant Discharge Elimination System (NPDES) Permit to evaluate the performance of the Phase I CSO control basins. Evaluation findings would then establish the level of control needed for the remaining CSOs in the watershed. Specifically, the report explains the methodology used in the basins evaluation and includes information on the number of overflow events, effluent quality, influent flow rate, first flush profile, screenings, dewatering, disinfection, retention time, and runoff coefficient. This report also summarizes the Michigan Department of Environmental Quality Phase I retention basin evaluation criteria and presents conclusions on how the DWSD Puritan-Fenkell and Seven Mile basins are meeting its NPDES requirements.

View this document now: RPO-CSO-SR34 (7.1 MB - PDF file)

Puritan-Fenkell CSO Basin

Charlotte Nichols

Project Profile, December 2002, 4 pages, Order Number: CSO-04 **

The Puritan-Fenkell CSO project seeks to control CSO discharges and to protect water quality for public health.

View this document now: CSO-04 (104 KB - PDF file)

Redford CSO

Charlotte Nichols

Project Profile, June 2003, 4 pages, Order Number: CSO-17 *

The Redford CSO project seeks to control CSO discharges and to protect water quality for public health.

View this document now: CSO-17 (127 KB - PDF file)

Redford CSO Basin Evaluation Interim Final Report, March 2000

Wade-Trim & Associates

Technical Report, March 2000, 92 pages, Order Number: CSO-TR22.00 **

This report presents the results of the Retention Basin Evaluation for the City of Redford Combined Sewer Overflow (CSO) Retention Basin. The CSO control program for the Rouge River uses a phased approach. The City of Redford Retention Basin is part of Phase I which requires the elimination of raw sewage and the protection of public health for the basins that serve approximately 40 percent of the combined sewer area. A two-year period was established in the National Pollutant Discharge Elimination System (NPDES) Permit to evaluate the performance of the Phase I CSO control basins. Evaluation findings would then establish the level of control needed for the remaining CSOs in the watershed. Specifically, the report explains the methodology used in the basin evaluation and includes information on the number of overflow events, effluent quality, influent flow rate, first flush profile, screenings, dewatering, disinfection, retention time, and runoff coefficient. This report also summarizes the Michigan Department of Environmental Quality Phase I retention basin evaluation criteria and presents conclusions on how the Redford basin is meeting its NPDES requirements.

View this document now: CSO-TR22.00 (1.2 MB - PDF file)

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Retention Basin Evaluation for the Acacia Park CSO RTB

Hubbell, Roth & Clark, Consulting Engineers

Technical Report, March 2000, 32 pages, Order Number: CSO-TR16.00 **

Retention Basin Evaluation for the Acacia Park CSO RTB: This report was compared in compliance with the Michigan Department of Environmental Quality (MDEQ) proposed schedule for the Retention Basin Evaluation for the Acacia Park CSO. The goal of this evaluation was to determine compliance are meet to MDEQ Phase two criteria in treating Combined Sewer Overflows (CSOs) discharges statewide. Phase two criteria summarizes the facility's ability to meet the Michigan Department of Environmental Quality (MDEQ) Criteria of Success focus which is: 1) Estimate actual detention times at design storms for each facility, and compare basins on a common basis; 2) Determine if basin protects public health (effluent disinfection); and 3) Determine if basin eliminates raw sewage by evaluating ability to remove sanitary trash and identifiable sanitary solids.

View this document now: CSO-TR16.00 (109 KB - PDF file)

Retention Basin Evaluation for the Birmingham CSO RTB

Hubbell, Roth & Clark, Consulting Engineers

Technical Report, March 2000, 31 pages, Order Number: CSO-TR17.00 **

Retention Basin Evaluation for the Birmingham CSO RTB: This report was prepared in compliance with the Michigan Department of Environmental Quality (MDEQ) proposed schedule for the Retention Basin Evaluation Program for the Birmingham CSO RTB. The purpose for this evaluation was to determine compliance to Phase two (2) criteria and study the operation and performance of the demonstration RTBs. The following summarizes the facility's ability to meet the Michigan Department of Environmental Quality (MDEQ) Criteria of Success: (1) Estimate actual detention times at design storms for each facility, and compare basins on a common basis; (2) Determine if basin protects public health effluent disinfection; and (3) Determine if basin eliminates raw sewage by evaluating ability to remove sanitary trash and identifiable sanitary solids.

View this document now: CSO-TR17.00 (108 KB - PDF file)

Retention Basin Evaluation for the Bloomfield Village CSO RTB

Hubbell, Roth & Clark, Consulting Engineers

Technical Report, March 2000, 33 pages, Order Number: CSO-TR15.00 **

Retention Basin Evaluation for the Bloomfield Village CSO RTB: This report was prepared in compliance with the Michigan Department of Environmental Quality (MDEQ) proposed schedule for the Retention Treatment Basin (RTB) Evaluation program. The goal of this evaluation was to determine compliance to Phase two criteria, and to study the operation and performance of the demonstration of the RTBs. Phase 2 criteria summarizes the facility's ability to meet the MDEQ Criteria of Success which is to: (1) Estimate actual detention times at design storms for each facility, and compare basins on a common basis; (2) Determine if basin protects public health (effluent disinfection); and (3) Determine if basin eliminates raw sewage by evaluating ability to remove sanitary trash and identifiable sanitary solids.

View this document now: CSO-TR15.00 (115 KB - PDF file)

River Rouge CSO

Charlotte Nichols

Project Profile, June 2003, 3 pages, Order Number: CSO-18 *

The River Rouge CSO project seeks to control CSO discharges and to protect water quality for public health.

View this document now: CSO-18 (119 KB - PDF file)

Rouge River CSO Program to be Peer Reviewed

Vyto P. Kaunelis

Project Profile, July 1996, 6 pages, Order Number: WERF96-01 **

The Rouge River National Wet Weather Demonstration Project address multiple water quality issues. This multi-objective program has implemented an aggressive study to assess the effectiveness of multiple control strategies in different combined sewer overflow (CSO) basins.

View this document now: WERF96-01 (1 MB - PDF file)

Rouge River National Wet Weather Demonstration Project CSO Basin Evaluation Study

Hufnagel, Carol L., Kaunelis, Vyto P., & Suresh K. Sangal

Paper, September 1997, 11 pages, Order Number: WEFTEC97-01.00 **

The Rouge Project was initiated in 1992 to identify and implement measures to improve water quality in the Rouge River. The watershed approach included the construction of 10 CSO retention treatment basins to control a portion of the CSO discharges. An evaluation of the effectiveness of these facilities will assist in determining the design criteria for future CSO control projects. The evaluation will help to identify the relative impacts of CSO versus stormwater discharges, to further facilitate evaluation of various projects on a financial basis. Five CSO facilities are currently in operation as of July, 1997 and the remainder will be operational in late 1997 or in 1998. This paper is intended to describe the basin and supporting river monitoring studies and intended outcomes of the evaluation study.

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

View this document now: WEFTEC97-01.00 (37 KB - PDF file)

Rouge River Sewer Separation Projects

Charlotte Nichols

Project Profile, June 2003, 1 pages, Order Number: CSO-20 *

Several sewer separation projects were constructed to eliminate combined sewer overflows (CSO) in six communities of the Rouge Watershed. In general, the separation projects were located in communities that already had areas of both combined sewer systems and separate sewer systems. The separation projects replaced the combined systems with separated sanitary and storm lines.

View this document now: CSO-20 (113 KB - PDF file)

Rouge River Watershed Combined Sewer Overflow Case Study

Vyto P. Kaunelis and Edward H. Kluitenberg

Report, June 2001, 5 pages, Order Number: CSO-109 *

A case study of the Rouge River Watershed combined sewer overflow (CSO) activities. This was developed for an EPA Report to Congress on Implementation and Enforcement of the CSO Control Policy.

View this document now: CSO-109 (96 KB - PDF file)

Rouge Stream Data Committee Interim Report

Rouge Stream Data Committee

Technical Report, February 2001, 17 pages, Order Number: CSO-TR25.00 **

In April of 1999, the Rouge Stream Data Committee (RSDC) and the CSO Work Group were established as part of a process for analyzing data on the effectiveness of Rouge River combined sewer overflow (CSO) demonstration basins. This document is an Interim Report from the RSDC to the CSO Work Group indicating its conclusions of whether the receiving water downstream from each individual Retention/Treatment Basin (RTB) is achieving the Phase III criteria for success and, if not, to what extent the RTB discharge is contributing to the problem. The Michigan Department of Environmental Quality (MDEQ) Phase III criteria for success state that achievement of state water quality standards (WQS) at times of discharge will be measured by the following criteria:
- the dissolved oxygen (DO) standard;
- the physical characteristics standard;
- the total residual chlorine (TRC) standard; and
- the health of the biological community (as a surrogate for toxic materials and other pollutants).

Each of these four criteria has been addressed separately by the RSDC. While the evaluation process involves a total of ten RTBs, the evaluation monitoring, and hence the RSDC evaluation, has only been initiated at six of these ten facilities.

View this document now: CSO-TR25.00 (7 MB - PDF file)

Seven Mile CSO Retention Basin

Charlotte Nichols

Project Profile, June 2003, 4 pages, Order Number: CSO-05 *

The Seven Mile CSO project seeks to control CSO discharges and to protect water quality for public health.

View this document now: CSO-05 (129 KB - PDF file)

Status of Performance Evaluation – CSO Basins in Oakland County, Wayne County and the City of Detroit

Phil Argiroff

Technical Report , April 2001, 2 pages, Order Number: CSO-107 ***

Report to Judge Feikens, U.S. District Court Hearing on April 19, 2001.

View this document now: CSO-107 (13 KB - PDF file)

Status of Performance Evaluation – CSO Basins in Oakland County, Wayne County and the City of Detroit

Edward H. Kluitenberg

Technical Report , April 2001, 11 pages, Order Number: CSO-108 ***

Report to Judge Feikens, U.S. District Court Hearing on April 19, 2001.

View this document now: CSO-108 (35 KB - PDF file)

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Surrogate CSO Detention Basins Sampling CSO Program Element

Fayek Zabaneh

Field Sampling Plan, May 1995, 153 pages, Order Number: CSO-FSP08.00 **

The task of the Surrogate Basin Study Sampling Program is to sample and monitor flow at selected existing CSO detention basins through a number of wet weather events. This monitoring program is geared to assess the efficiency of the surrogate basins in removing CSO carried pollutants under various rainstorm events. Sampling data collected at the influent and effluent of a basin will be used to identify the performance of the basin under different influent rates resulting from different rainstorm events. This performance data will then be used to estimate the pollutant removal efficiencies of the Rouge Watershed demonstration CSO basins.

View this document now: CSO-FSP08.00 (1.4 MB - PDF file)

Wet Weather Control Demonstration Activities in Southeast Michigan: Some Lessons Learned

James E. Murray, Kelly A. Cave and Dale S. Bryson

Paper, September 1998, 16 pages, Order Number: CSO-105 **

The Rouge River National Wet Weather Demonstration Project (Rouge Project) is a working example of how a systematic watershed approach to pollution management can result in cost-effective and ultimately greater and faster achievement of designated uses in a water body. The Rouge River Project has learned a great deal on what it takes to restore an urban waterway to its beneficial uses. The purpose of this document is to present some of the lessons learned to date.

View this document now: CSO-105 (42 KB - PDF file)

What Performance Monitoring Tells Us About How to Improve the Design of CSO Storage / Treatment Basins

Carol L. Hufnagel, Vyto P. Kaunelis, Edward H. Kluitenberg, and Jerry S. Neibert

Paper, October 1999, 8 pages, Order Number: WEFTEC99-01 **

The Wayne County Rouge Program Office collected and analyzed data from six CSO demonstration facilities in the Rouge River watershed from June 1997 through September 1998. As part of this monitoring and evaluation effort, a number of design and operational considerations were identified. These results indicate ways in which additional pollutant load can be conveyed to publicly owned treatment works (POTW) for an equivalent capital outlay. Operational experience with the facilities has also provided insight on design of facilities from an operational perspective and other measures that can improve facility performance.

View this document now: WEFTEC99-01 (29 KB - PDF file)

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Storm Water Management

The early focus of the Rouge Project was on the control of Combined Sewer Overflows (CSOs). The CSOs in the Rouge watershed are primarily located in the older urban core portion, downstream regions of the watershed. Within two years of the first sampling conducted under the Rouge Project in 1993, it became evident that sources of pollution upstream of the CSOs were a major contributor to the impaired uses observed in the river. Storm water runoff and illicit discharges to separate storm water systems were identified as a major source of pollutants entering the river. Without efforts to address these issues, the major capital investments to control CSOs in downstream areas would not result in significant improvements in water quality or beneficial uses of the river. Later studies revealed the need to control storm water runoff to reduce the frequency, volume and velocity of flood flows in the river. These excessive flows that followed wet weather events were shown to be responsible for **significant impairments** to aquatic habitat and riparian properties.

Based upon what was learned, the focus of the Rouge Project shifted to become more holistic and to take a **watershed management approach** to address the pollution sources and restore the ecological integrity of the Rouge River.

The **Overview Description of Storm Water Management in the Rouge Watershed** document provides a historical summary of the Rouge Project storm water management efforts including the development of a voluntary storm water permit. **Michigan's Watershed Based Storm Water Permit** established the process for developing watershed management plans to address the control of storm water and other sources of pollution. The Rouge Project developed extensive Guidance Material for Applying for a Watershed Based Storm Water Permit.

Overview Materials

Overview Description of Storm Water Management for the Rouge River
Michigan General Storm Water Permit
Original Application for Michigan General Storm Water Permit
Guidance Materials for Applying for a General Storm Water Permit

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Phase II Federal Storm Water Rule

Subwatershed Management Planning

Subwatershed Management Planning for Storm Water Management

The following information describes the history of subwatershed management planning for the Rouge River Watershed. For current activities regarding watershed management planning and storm water management in the Rouge River Watershed, please visit the Alliance of Rouge Communities website www.allianceofrougecommunities.com.

The early focus of the Rouge Project was on the control of the 168 CSOs in the older urban core portion of the downstream areas of the Rouge watershed. For a more detailed discussion of the CSO control program of the Rouge Project, click here.

Based upon what was learned in the early days of the Project, the focus became more holistic to consider the impacts from all sources of pollution and use impairments in receiving waters by using the watershed management approach. There is a clear inter-relationship of the pollution sources within a watershed that demands an inter-related approach in order to efficiently improve water quality and restored designated uses within a watershed. A piecemeal approach of focusing only on sources of pollution or a group of sources will not achieve the desired results nor will it achieve the acceptance of the residents of the watershed. The use of the watershed approach therefore has emerged as the most cost-effective and logical approach to water resource management in the Rouge Watershed.

As discussed in greater detail in the "Overview Description of Storm Water Management in the Rouge Watershed", the control of storm water emerged as a major component in the restoration of the Rouge River. An ad hoc Rouge River Storm Water Advisory group developed a storm water control strategy. After review and endorsement of that Strategy by local communities and the Rouge River Steering Committee, the Strategy was implemented.

At the heart of the storm water management approach implemented under the Rouge Project was the Watershed Based Michigan General Storm Water Permit. This voluntary permit established the process for developing watershed management plans to address the control of storm water and other sources of pollution.

Subwatershed Advisory Groups

Leading up to the issuance of the Watershed Based Michigan General Storm Water Permit, the Rouge Project formed three demonstration subwatershed advisory groups (SWAGs) for the Middle 1, Middle 3, and the Upper Rouge. These groups consisted of the Rouge Program Office (RPO) staff together with representatives of the subwatershed communities and agencies. Through a series of meetings and technical work, supported by the Rouge Project, these three demonstration SWAGs developed subwatershed management studies to identify issues of concern and goals for water quality and quantity within each subwatershed and develop ideas for management alternatives.

To view these original subwatershed management studies see:

- **Management Study for the Middle 1 Subwatershed**

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

- **Management Study for the Middle 3 Subwatershed**
- **Management Study for the Bell Branch and Tarabusi Creek Subwatershed**

With the release of the Watershed Based Michigan General Storm Water Permit, all of the Rouge communities began to work together in seven subwatershed advisory groups to develop the required subwatershed management plans. Click on the links below to view background information and view the original watershed management plans developed for each SWAG.

- **Main 1-2 Subwatershed Advisory Group**
- **Main 3-4 Subwatershed Advisory Group**
- **Upper Subwatershed Advisory Group**
- **Middle 1 Subwatershed Advisory Group**
- **Middle 3 Subwatershed Advisory Group**
- **Lower 1 Subwatershed Advisory Group**
- **Lower 2 Subwatershed Advisory Group**

For current activities regarding watershed management planning and storm water management in the Rouge River watershed, please visit the Alliance of Rouge Communities website **www.allianceofrougecommunities.com**.

Green Infrastructure

Rouge Project funding was instrumental in assisting Wayne County with the establishment and implementation of the County's Green Infrastructure education and implementation efforts. During the years of the Rouge Project, these efforts evolved from a focus on biotechnical streambank stabilization, to riparian corridor management principles and practices, to Low Impact Development (LID) to now embrace and promote green infrastructure at all scales and across the various land uses with the Rouge River watershed and Wayne County. Many of the **Watershed Restoration Demo Projects** funded by the Rouge Project (particularly under the Storm Water Management category) were, in fact, **Green Infrastructure projects** before the term became popular.

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.


Demonstration Projects

Construction, Retrofit and Restoration of Detention/Sedimentation Basins

Assessment of Alternative Funding Mechanisms for Maintenance of Privately Owned Storm Water Detention Facilities (RV-20)

City of Farmington Hills

Project Profile/Report, March 2004, 92 pages, Order Number: RV-20

This project investigated alternative methods for Farmington Hills to fund the maintenance/repair/enhancement of existing privately-owned storm water detention facilities.

View this document now: RV-20 (3.3 MB - PDF file)

Caddell Drain Regional Detention Pond Retrofit (U2-04)

Oakland County Drain Commissioner

Project Profile/Report, Project Number: U2-04

A new outlet was developed to increase detention in an existing, large, in-line regional upstream pond (Caddell Drain Storage Facility #5).

Canton Community Detention Basin Enhancements (RIIA-05)

Canton Township

Project Profile/Report, December 2003, 69 pages, Order Number: RIIA-05

This project included the design of retrofits for various detention facilities and construction of these enhancements in selected detention basins. The project also included educating the detention basin owners of the need for retrofitting.

View this document now: RIIA-05 (2.4 MB - PDF file)

Canton Community Detention Basin Enhancements - Phase II (RVIB-11)

Canton Township

Project Profile/Report, September 2006, 21 pages, Order Number: RVIB-11

This project consisted of upgrading 5 detention ponds. Enhancements included dredging, soil erosion control, use of native vegetation, and outlet modifications. Public awareness and education was also a large part of this project.

View this document now: RVIB-11 (1.9 MB - PDF file)

Canton Detention Basin Enhancement (RVIIIB-19)

Canton Township

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Project Profile/Report, November 2008, 16 pages, Order Number: RVIIIB-19

The goal of this project was to better understand fish community development in retrofitted detention basins and the creation of fish community Best Management Practices (BMP's) to assist homeowner associations and basin designers.

View this document now: RVIIIB-19 (687 KB - PDF file)

Carpenter Lake Restoration Project (RV-28)

City of Southfield

Project Profile/Report, January 2008, 25 pages, Order Number: RV-28

This project rehabilitated Carpenter Lake for purposes of storm water management, public recreation, and wildlife habitat. Activities included the removal and replacement of a dam, sediment removal, improved aesthetics, and establishment of wildlife features in the lake.

View this document now: RV-28 (2.3 MB - PDF file)

Construction of Idyl Wyld Regional StormWater Treatment Facility (RIIA-26)

City of Livonia

Project Profile/Report, January 2005, 5 pages, Order Number: RIIA-26

This project described funding of a storm water detention/retention system at the Idyl Wyld Golf Course. This regional system would serve to attenuate flow surges, thus decreasing soil erosion, reducing pollution run-off, and enhancing area habitats.

View this document now: RIIA-26 (210 KB - PDF file)

Costick Activites Center Stormwater Retrofit Project (RV-13)

City of Farmington Hills

Project Profile/Report, July 2007, 19 pages, Order Number: RV-13

This project consisted of retrofitting an existing drainage ditch to accommodate storm water run-off more effectively. A swale with an underlain system was used to construct 4 bio-detention cells.

View this document now: RV-13 (727 KB - PDF file)

Detention Basin Conversion to Improve Treatment (WET-03)

Plymouth Township

Project Profile/Report, March 2002, 12 pages, Order Number: WET-03

Existing stormwater detention facilities that will be enhanced through the addition of water quality best management practices were identified. The project included design and construction of a water quality retrofit for an existing storm water detention pond.

View this document now: WET-03 (488 KB - PDF file)

Detention Pond Retrofit and Monitoring Project (RVIB-24)

Northville Township

Project Profile/Report, January 2006, 22 pages, Order Number: RVIB-24

This project consisted of improving the Sump Drain in Northville Township. Activities included targeted phosphorus monitoring, a streambank erosion inventory, and a fish habitat assessment.

View this document now: RVIB-24 (5 MB - PDF file)

Dunbarton Detention Basin Improvement Implementation (RV-18)

City of Novi

Project Profile/Report, December 2007, 295 pages, Order Number: RV-18

This project discussed improvements made to the Dunbarton Detention Basin. These improvements included the installation of a flow diversion structure, increasing the basin size, and the introduction of native plants. These improvements attenuated peak flows to Miller Creek and the Rouge Watershed.

View this document now: RV-18 (70 MB - PDF file)

Dunbarton Regional Detention Basin (SW-18.3)

City of Novi

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Project Profile/Report, Project Number: SW-18.3

The project will add additional storage to the existing Civic Center Regional Detention Basin, an earthen dam and outlet works for the Dunbarton Regional Storm Water Detention Basin and some downstream streambank stabilization along the Miller and Thornton Creeks. The project consists of the construction of an earthen dam and outlet works and some limited downstream streambank stabilization along the Miller and Thornton Creeks upstream of the Walled Lake Branch of the Middle Rouge.

Enviro-Friendly Mixed Use Development (M1-03)

Wayne County Jobs & Economic Development

Project Profile/Report, May 1999, 11 pages, Order Number: M1-03

Schematic design, engineering documents, and guidelines for an integrated stormwater management system were developed for a large scale residential community.

View this document now: M1-03 (413 KB - PDF file)

Farmington Hills Longwood Basin Retrofit (RXIB-04)

City of Farmington Hills

Project Profile/Report, May 1999, 11 pages, Order Number: RXIB-04

The purpose of the grant project was to rehabilitate the City-owned detention basin, located on Longwood Drive, west of Farmington Road, in a residential subdivision. The project objectives were to: 1) extend the existing inlet/outlet to the north for easier access and maintenance; 2) install a gravel filter berm; 3) divert the stormwater from the ditch to the n01th to create a step pool and two-cell wet basin; 4) install native aquatic species to replace the invasive and riparian plantings along the side slopes for ease of maintenance; 5) educate subdivision homeowners and City residents alike on the importance of detention basin maintenance and low impact development alternatives; 6) update the existing operation and maintenance checklist to include retrofit features; and 7) meeting the goals of the Rouge River Main 1-2 Watershed Management Plan and the City's Storm Water Pollution Prevention Initiative.

View this document now: RXIB-04 (979 KB - PDF file)

Fellows Creek Regional Detention and Public Education Programs (SP-02)

Canton Township

Project Profile/Report, February 2000, 2 pages, Order Number: SP-02

A detention pond study was conducted that included the following tasks: exploration of a funding mechanism for ongoing maintenance of detention ponds, development of a program for detention pond maintenance training of citizen groups and others, and conduct a survey of existing detention ponds to evaluate their current condition.

View this document now: SP-02 (103 KB - PDF file)

Haggerty Regional Detention Basin (SW-18.2)

City of Novi

Project Profile/Report, May 2006, 6 pages, Order Number: SW-18.2

This project consisted of constructing the Haggerty Regional Detention Basin. This detention basin aimed at decreasing the occurrence of downstream flooding and to improve overall water quality.

View this document now: SW-18.2 (272 KB - PDF file)

Jacobs Drain-Pebble Creek Tributary Regional Detention and Enhancement Project - Part II (RVIIB-10)

Jacob Drainage District

Project Profile/Report, Project Number: RVIIB-10

The Jacobs Drain Regional Detention Basin and Enhancement Project addressed flow variability issues, removed obstructions, stabilized bank erosion, improved water quality, and increased public awareness of watershed stewardship.

Longwood Basin Retrofit (RXIB-04)

City of Farmington Hills

Project Profile/Report, May 2014, 10 pages, Order Number: RXIB-04

The purpose of the grant project was to rehabilitate the City-owned detention basin, located on Longwood Drive, west of Farmington Road, in a residential subdivision. The project objectives were to: 1) extend the existing inlet/outlet to the north for easier access and maintenance; 2) install a gravel filter berm; 3) divert the stormwater from the ditch to the n01th to create a step pool and two-cell wet basin; 4) install native aquatic species to replace the invasives and riparian plantings along the side slopes for ease of maintenance; 5) educate subdivision homeowners and City residents alike on the importance of detention basin maintenance and low impact development alternatives; 6) update the existing operation and maintenance checklist to include retrofit features; and 7) meeting the goals of the Rouge River Main 1-2 Watershed Management Plan and the City's Storm Water Pollution Prevention Initiative.

View this document now: SW-18.2 (4.6 MB - PDF file)

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Main 1-2 Storm Water Detention Pond Inventory & Assessment (RIIA-13)

Oakland County Drain Commissioner

Project Profile/Report, March 2004, 4 pages, Order Number: RIIA-13

The purpose of this project is to identify and make recommendations for detention pond improvements for existing detention facilities in the Main 1-2 Subwatershed. This project will 1) Inventory the existing stormwater detention basins within the Main 1-2 Subwatershed, 2) Identify the existing capacity and outlet structure, 3) Recommend improvements to each basin, and 4) Prioritize the basin improvements.

View this document now: RXIB-04 (128 KB - PDF file)

Northville Mill Pond Restoration (M1-01)

City of Northville

Project Profile/Report, June 2001, 6 pages, Order Number: M1-01

The project developed a design and implementation plan to restore the mill pond and enhance its function to treat stormwater while providing opportunities to increase educational, recreational, environmental, and neighborhood aesthetic potential. The products included analysis and preparation of a preliminary design report and final design.

View this document now: M1-01 (450 KB - PDF file)

Pebble Creek Tributary Regional Detention and Enhancement Project (RV-15)

Oakland County Drain Commissioner

Project Profile/Report, October 2005, 160 pages, Order Number: RV-15

This project consisted of creating a storm water wetland, capable of storing storm water during wet events while creating an aesthetically pleasing feature. This wetland would have native vegetation along with nature trails complete with informative signage.

View this document now: RV-15 (75 MB - PDF file)

Pheasant Run Golf Club Detention Basins Enhancements Project (RIXB-04)

Canton Township

Project Profile/Report, June 2011, 13 pages, Order Number: RIXB-04

The goal of this project was to upgrade up to three older storm water detention facilities on the Pheasant Run Golf Course and bring them as feasibly as possible into compliance with Wayne County's current Storm Water Management Program. This included incorporating the new vegetation standards in these basins.

View this document now: RIXB-04 (941 KB - PDF file)

Pilot Swale with Underdrain Project (RIII-09)

Village of Beverly Hills

Project Profile/Report, December 2003, 27 pages, Order Number: RIII-09

The Village of Beverly Hills constructed a pilot swale with an underdrain as an alternative to constructing enclosed storm drains. The purpose of the project was to address citizen concerns about poor drainage, while minimizing the environmental impacts on the receiving water body. The swale with underdrain system consists of a shallow grass lined swale with a perforated plastic pipe underdrain. The systems are designed to allow infiltration into the plastic pipe along the entire length of the swale. However, in order to provide drainage during the design event (such as the 10-year, 1-hour storm) surface drainage in the swale is also directed to a catch basin.

View this document now: RIII-09 (564 KB - PDF file)

Regional Basins Retrofit for Water Quality Improvements (RVIIIB-05)

City of Novi

Project Profile/Report, January 2009, 72 pages, Order Number: RVIIIB-05

This project consisted of retrofitting two regional detention basins. The Taft Basin is located along the Walled Lake Branch of the Middle Rouge River, and the Bishop Basin is located along Bishop Creek. The benefit of this project will be the reduction in stream bank erosion and increase in habitat for fish and macro-invertebrates. Water quality improvement was the goal for both basins and their associated streams due to a decrease in sedimentation.

View this document now: RVIIIB-05 (14.5 MB - PDF file)

Regional Basin Retrofits for Water Quality Improvements 2012 (RXB-13)

City of Novi

Project Profile/Report, November 2012, 87 pages, Order Number: RXB-13

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

The project involved designing and constructing detention basin retrofits at the Leavenworth, Lexington Green, and Thornton regional detention basins in the City of Novi. The project included a topographic survey, a hydraulic analysis to evaluate attenuation concerns, and design and construction of improvements. The recommended improvements were based on the hydraulic evaluation and also included retrofitting outlet structures to provide additional regional attenuation for the more frequent events (1-year and 2-year recurrence intervals), dam modifications, habitat creation, removal of invasive species, and planting native vegetation buffers.

View this document now: RXB-13 (26 MB - PDF file)

River Oaks (Old Orchard) Storm Water Detention Basin Retrofit/Restoration (SN2-08)

City of Dearborn Heights

Project Profile/Report, Project Number: SN2-08

The Old Orchard Pond was restored to create a wetland natural habitat and improve water quality along the Rouge River. Sediment that has filled the pond was tested and removed, the outlet structure was reconstructed to the original design, and the pond banks were stabilized. This is a collaborative effort between local residents, the City of Dearborn Heights and Wayne County. This project is part of a bigger project that will include a new wetland that will receive the discharge from the Old Orchard Pond.

Storm Water BMP Tracking System (RV-29)

Van Buren Township

Project Profile/Report, 2006, 19 pages, Order Number: RV-29

This project established a storm water system maintenance tracking system. Included in this plan was a way to track who is responsible for what maintenance, a schedule of recommended maintenance activities, and a periodic check that all units were being operated correctly.

View this document now: RV-29 (3 MB - PDF file)

Storm Water Master Plan (RIIA-04)

City of Westland

Project Profile/Report, 2002, 13 pages, Order Number: RIIA-04

This project created a tool for the City of Westland to use in order to reach watershed management goals and objectives. In particular, issues such as streambank erosion, culverts, removal of debris, and best management practices are all discussed.

View this document now: RIIA-04 (761 KB - PDF file)

Sustainable Water Resources Management & Public Education Plan (SN2-06)

Cranbrook Educational Community

Project Profile/Report, November 2002, 23 pages, Order Number: SN2-06

The project provided an environmental characterization report of the area around Cranbrook, established a baseline monitoring program for the hydrologic ecosystem, developed a master plan for restoration of the hydrologic system, developed comprehensive sustainable site plan guidelines for the campus, prepared a plan for a new wetland to receive storm water, prepared plans so Grotto Lake can become a treatment wetland for stormwater, and provided for additional stormwater storage.

View this document now: SN2-06 (635 KB - PDF file)

Tonquish Creek Ponds & Bank Improvement (SN2-04)

Plymouth Township

Project Profile/Report, January 2002, 13 pages, Order Number: SN2-04

The project provided physical improvements within the south branch of the Tonquish Creek in the form of water quality enhancement features incorporated into the Hilltop Golf Course Pond and repaired bank erosion utilizing bioengineering technology.

View this document now: SN2-04 (46 KB - PDF file)

Willows Storm Water Dentention Basin (RXB-15)

City of Livonia

Project Profile/Report, June 2013, 40 pages, Order Number: RXB-15

The goals of the project are to attenuate excessive peak flows and minimize resulting streambank erosion downstream of the proposed Whispering Willows stormwater detention basin. The project consisted of design and construction of a regional stormwater detention pond at the Whispering Willows Golf Course along the West Bell Branch (east of Newburgh Road and south of 8 Mile Road). By reducing the frequency of bankfull events, known problem erosion areas downstream will improve. Banks will naturally reestablish vegetation, reduce sediment loading and improve water quality and habitat.

View this document now: RXB-15 (11.2 MB - PDF file)

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Control of Street Runoff & Pollutants

Beech Woods Greening Project Phase I (RIXB-11)

City of Southfield

Project Profile/Report, September 2011, 8 pages, Order Number: RIXB-11

Beechwoods Park, located on the Main Branch of the Rouge River in southwest Southfield, is undergoing a major site renovation to improve aesthetics, function and storm water management. This phase of the project replaced an existing parking lot with a new permeable surface parking area and bioswale, sidewalks and landscaping. The project will demonstrate how storm water runoff from an existing facility can be mitigated by introducing storm water best management practices (BMPs) to reduce storm water runoff and minimize soil erosion and sedimentation to the Rouge River.

View this document now: RIXB-11 (508 KB - PDF file)

Beech Woods Greening Project II (RXB-17)

City of Southfield

Project Profile/Report, September 2011, 8 pages, Order Number: RXB-17

Beechwoods Park, located on the Main Branch of the Rouge River in southwest Southfield, is undergoing a major site renovation to improve aesthetics, function and storm water management. This phase of the project replaced an existing parking lot with a new permeable surface parking area and bioswale, sidewalks and landscaping. The project will demonstrate how storm water runoff from an existing facility can be mitigated by introducing storm water best management practices (BMPs) to reduce storm water runoff and minimize soil erosion and sedimentation to the Rouge River.

View this document now: RXB-17 (504 KB - PDF file)

Catch Basin Cleaning & Street Sweeping Program (M3-01)

City of Dearborn Heights

Project Profile/Report, November 2001, 39 pages, Order Number: M3-01

Storm sewer catch basins were inventoried and entered into an existing GIS system. Catch basins were cleaned at the start and completion of the project. Streets were swept once a week through the fall.

View this document now: M3-01 (1.2 MB - PDF file)

City of Wayne Stormwater Project (SW-14)

City of Wayne

Project Profile/Report, Project Number: SW-14

The project included a public education program, inventory and maintenance of the existing system, and design and construction of a storm water retrofit to existing storm water system.

Dearborn DPW Yard Storm Water Management (RVIIB-14)

City of Dearborn

Project Profile/Report, 2008, 24 pages, Order Number: RVIIB-14

In this project storm water best management practices (BMPs) were used to design and construct a process for the treatment of storm water within the DPW yard and advance the “greening” of the Main 3-4 Subwatershed, the most downstream and industrialized area of the Rouge River Watershed, with a significant amount of impervious surfaces such as roofs, parking lots, roadways and sidewalks.

View this document now: RVIIB-14 (2.5 MB - PDF file)

Demonstration Rain Gardens Project (RVIB-15)

City of Livonia

Project Profile/Report, 2007, 13 pages, Order Number: RVIB-15

This project consisted of implementing two rain gardens for storm water management. This technique is an alternative to normal storm water management activities, and the Rouge River Watershed benefits from this practice.

View this document now: RVIB-15 (796 KB - PDF file)

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Franklin (Jones Building) Rain Garden (RXIB-01)

Village of Franklin

Project Profile/Report, September 2013, 9 pages, Order Number: RIXB-01

This Village of Franklin project excavated a portion of an existing asphalt parking lot and created an island for a rain garden, extended an existing pathway through the island to improve walkability, improved the area aesthetics and modified the flow of traffic in the parking lot to reduce road hazards. An interpretive sign notating the type of garden and its purpose was added for additional publicity and as an example of how projects can be both beneficial to the environment while resolving other issues.

View this document now: RIXB-01 (1.8 MB - PDF file)

Implement Manhole Rehabilitation and Continue Public Education (RIIB-13)

City of Westland

Project Profile/Report, March 2004, 36 pages, Order Number: RIIB-13

Public education activities consistent with the Public Education Plan submitted as part of the General Permit application were conducted. The City implemented recommendations of the manhole rehabilitation program where the City conducted manhole inspections of 480 sanitary manhole structures to identify repairs necessary for eliminating inflow and infiltration of storm water into the sanitary system.

View this document now: RIIB-13 (2 MB - PDF file)

Inglenook Park Storm Water BMP Retrofit Project (RXIB-03)

City of Southfield

Project Profile/Report, August 2014, 5 pages, Order Number: RXIB-03

This project is a part of the City of Southfield's continued effort to promote the restoration and stewardship of the Rouge River ecosystem. The main objective of this project was to retrofit an existing parking lot in the city park with storm water best management practices (BMP's) including expansion of a portion of the parking lot with new, permeable surface parking area and use of bioswale and native landscaping for storm water management. The project demonstrated to the public how storm water runoff from an existing facility can be mitigated by introducing pervious pavement and bioswale storm water BMPs. An interpretive sign illustrates the function of the lot and BMPs.

View this document now: RXIB-03 (2.3 MB - PDF file)

Henry Ford Community College Green Roof & Rain Garden (RXB-19)

Henry Ford Community College

Project Profile/Report, January 2013, 11 pages, Order Number: RXB-19

This subgrant supported the construction of the green roof and rain garden to facilitate storm water treatment/control from the addition that was constructed for the current Science Building. The primary goal of this project is to enhance the quality and reduce the quantity of storm water discharged from the Science Building to the Rouge River. In addition, both the green roof and the rain garden are being utilized to provide an educational opportunity for the students at HFCC. Community outreach will provide an opportunity for the surrounding area to also profit from educational opportunities focused on the rain garden and other environmentally friendly projects within HFCC.

View this document now: RXB-19 (13.3 MB - PDF file)

Meadowlake Farms Bioswale Project (RVIB-08)

Bloomfield Township

Project Profile/Report, November 2006, 18 pages, Order Number: RVIB-08

This project consisted of constructing a bioswale to remove pollutants before they enter Meadow Lake. This constructed bioswale served to remove daily pollutants, thus improving water quality of Meadow Lake.

View this document now: RVIB-08 (1 MB - PDF file)

Michigan Avenue Boulevard Bio-Swale and Native Planting Project (RXB-03)

Canton Township

Project Profile/Report, July 2013, 4 pages, Order Number: RXB-03

The objective of this grant was to turn portions of the existing median into native flower/plant gardens and bio-swales. Much of the boulevard did exist with a swale down the center and this provided the perfect opportunity for development of bio-swales. Development of native plants in the boulevard is expected to not only reduce maintenance costs associated with mowing, but it will hopefully educate some of the people that travel this route.

View this document now: RXB-03 (81 KB - PDF file)

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Pebble Creek Sediment Removal and Stream Improvement Project (RV-14)

Jamian Drainage District

Project Profile/Report, December 2005, 10 pages, Order Number: RV-14

This project consisted of improving storm water drainage by removing sediment and employing streambank stabilization techniques. Upon completion of these activities, the occurrence of local flooding has diminished around the Jamian Drain.

View this document now: RV-14 (481 KB - PDF file)

Rear Yard Catch Basin Disconnect Program (RVIA-14)

City of Westland

Project Profile/Report, August 2006, 59 pages, Order Number: RVIA-14

This project rehabilitated sanitary manhole structures. Twenty-one area sanitary manhole covers had, over the years, been incorrectly replaced with storm water manhole covers. This project replaced these storm water manhole covers with sanitary manhole covers, thereby decreasing the inflow of storm water runoff entering the sanitary sewer system.

View this document now: RVIA-14 (3.2 MB - PDF file)

Regional Stormwater Management Facility (U2-09)

City of Livonia

Project Profile/Report, December 2004, 9 pages, Order Number: U2-09

The off-line regional stormwater management facility manages stormwater from a 2,700 acre area which is approximately 65% developed into residential, commercial, industrial, and highway uses. The facility attenuates surge flows and alleviates stream bank erosion problems occurring downstream of the proposed facility. It was designed to provide significant pollutant removal from the stormwater before discharge downstream.

View this document now: U2-09 (162 KB - PDF file)

Roadway Source Controls (U2-03)

Redford Township

Project Profile/Report, Project Number: U2-03

Three types of best management practices (BMPs) were tested as part of an innovative road maintenance program: in-line restrictors, catch basin cleaning, and street sweeping.

Source Controls (SP-15)

City of River Rouge

Project Profile/Report, Project Number: SP-15

The project will use in-line catch basin restrictors, catch basin cleaning, and street cleaning to determine the effectiveness of each in reducing solids and floatables from stormwater runoff. Test locations will be selected from within the watershed and baseline conditions will be established for each source control. Flow monitoring and sampling will be conducted at selected reaches of the combined sewer system. Samples will be analyzed to confirm source of pollutants and reduction of pollutants by implementing the various source controls. A final summary report will be prepared at the end of the project. Phase I will study the potential for the detention of storm water on the surface by delaying the entry of water into the piping system at catch basins and inlets. The net effect of these actions will be to create localized ponds around inlets during the peak of the storm event, thereby reducing the peak of the storm surge.

Stafford Street Swale with Underdrain Project (RV-06)

Village of Beverly Hills

Project Profile/Report, December 2004, 44 pages, Order Number: RV-06

This project studied existing drainage problems along Stafford Street and made several recommendations to rectify the problems. The main recommendation was to install a swale with an underlain system. This would allow for proper storm water drainage.

View this document now: RV-06 (1.5 MB - PDF file)

Stormwater System Evaluation & Maintenance (Catch Basin Cleaning Study) (U2-08F)

City of Farmington Hills

Project Profile/Report, November 2004, 2 pages, Order Number: U2-08F

The project inventoried, developed, and implemented a variety of maintenance and cleaning programs for catch basins within a 2,200 acre area consisting primarily of residential, commercial, and highway land uses.

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

View this document now: U2-08F (92 KB - PDF file)

Stormwater System Evaluation & Maintenance (U2-08L)

City of Livonia

Project Profile/Report, December 2004, 2 pages, Order Number: U2-08L

The project inventoried, developed and implemented a variety of maintenance and cleaning programs for catch basins within a 2,200 acre area consisting primarily of residential, commercial, and highway land uses.

View this document now: U2-08L (105 KB - PDF file)

Erosion Control Projects

Franklin Branch Watershed Study (RIIB-14)

Franklin Subwatershed Drainage District

Project Profile/Report, November 2004, 166 pages, Order Number: RIIB-14

The purpose of the Franklin Subwatershed Study is to identify current flooding, streambank erosion, sedimentation, and non-point source pollution problems in the subwatershed.

View this document now: RIIB-14 (42 MB - PDF file)

Pebble Creek Soil Erosion and Sedimentation Control Study (SP-10)

City of Farmington Hills

Project Profile/Report, February 1998, 65 pages, Order Number: SP-10

A study of existing erosion control practices at construction sites was conducted. Ordinances were evaluated to determine whether they can be strengthened to provide better erosion control.

View this document now: SP-10 (238 KB - PDF file)

Rummell Drain Improvement (RIII-18)

Oakland County Drain Commissioner

Project Profile/Report, December 2003, 12 pages, Order Number: RIII-18

This project consisted of improving the Rummell Drain. Activities included stream bank stabilization, reducing area flooding by widening stream channels, and restoring open water aesthetics and water quality.

View this document now: RIII-18 (458 KB - PDF file)

Soil Erosion Control Blanket Program (M1-09)

City of Novi

Project Profile/Report, April 2000, 50 pages, Order Number: M1-09

The project tested the effectiveness of erosion control blankets to reduce soil erosion at a new subdivision site.

View this document now: M1-09 (3.6 MB - PDF file)

Storm Water Education and Erosion Control Projects (RV-17)

Northville Township

Project Profile/Report, December 2004, 29 pages, Order Number: RV-17

This project consisted of several ways to improve upon watershed management. Public education and streambank stabilization activities were just a couple of avenues in which communities could improve their watershed quality.

View this document now: RV-17 (2.5 MB - PDF file)

Streambank Erosion Control Demonstration Project – Caddell Drain (RXIB-07)

Oakland County Water Resourcs Commissioner (OCWRC)

Project Profile/Report, June 2014, 26 pages, Order Number: RXIB-07

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

The goal of the project was to develop and implement detailed engineering/design plans for non-traditional streambank stabilization measures in the Caddell Drain located in the Upper Rouge watershed. Efforts from the project intended to reduce sediment loading to the Upper Rouge, improve water quality, provide for public health and safety and achieve Rouge River watershed goals. The design incorporated erosion control techniques that protected streambanks from the effects of high velocity flows and repeated flows approaching bankfull conditions. During the construction phase of the project, there were several rain events that occurred that provided many opportunities to see the improvements in action and determine what modifications needed to be applied.

View this document now: RXIB-07 (3.7 MB - PDF file)

Valley Woods Trail Head and Storm Water Improvement Project (RIXB-12)

City of Southfield

Project Profile/Report, September 2011, 8 pages, Order Number: RIXB-12

This project created an attractive and functional storm water structure as a component of a new park entrance for the Valley Woods Nature Preserve at Civic Center Drive east of Telegraph Road. The project eliminated an exisitng erosion problem and improved conveyance from surface streets. In addition, it provided a safe and aesthetic access point to the Valley Woods Nature Preserve.

View this document now: RIXB-12 (1.4 MB - PDF file)

Illicit Discharge Elimination

2004 Illicit Discharge Elimination and Public Education Activities (RIII-12)

City of Inkster

Project Profile/Report, December 2004, 15 pages, Order Number: RIII-12

Dye testing and smoke testing were administered to the City of Inkster's storm water systm to identify illicit discharge sources. This testing was successful in identifying several illicit discharge sources.

View this document now: RIII-12 (337 KB - PDF file)

Continuation of IDEP, PEP and Watershed Planning Activities (RIIB-23)

City of Livonia

Project Profile/Report, December 2002, 11 pages, Order Number: RIIB-23

This project further implemented Livonia's illicit discharge elimination and public education programs, as well as continued subwatershed plan implementation activities. The project included outfall inspection and tracking of questionable outfalls, public education, and continuation of subwatershed planning activities.

View this document now: RIIB-23 (472 KB - PDF file)

Continue IDEP, Public Education, Subwatershed Planning and Central Waste Oil Collection Facility Planning (RIIB-27)

City of Wayne

Project Profile/Report, May 2003, 29 pages, Order Number: RIIB-27
The City of Wayne is committed to improving the water quality of the Rouge River in the Lower 2 Subwatershed by continuing development and implementation of its Subwatershed Planning, Public Education Plan and Illicit Discharge Elimination Plan, as well as research for a potential central waste oil collection facility for the City. This project continues programs that have recently been implemented or provided for development and implementation of activities, which were outlined in the City's Storm Water Pollution Prevention Initiative (SWPPI).

View this document now: RIIB-27 (3.2 MB - PDF file)

Continue IDEP, Public Education, Subwatershed Planning and Johnson Creek Protection Group Support (RIIB-28)

Northville Township

Project Profile/Report, Project Number: RIIB-28

Northville Township is committed to improving the water quality of the Rouge River in the Middle 1 and Upper Subwatersheds by continuing development and implementation of its Subwatershed Planning, Illicit Discharge Elimination Plan and Public Education Plan as well as the coordination of activities associated with the Johnson Creek Protection Group. The activities in this project continued programs that have been recently implemented or provided for development and implementation for activities outlined in Northville Township's Storm Water Pollution Prevention Initiative.

Continue Implementing Illicit Connection Elimination & Public Education Activities (2002-2003) (RIIB-01& 02)

City of Inkster

Project Profile/Report, November 2007, 10 pages, Order Number: RIIB-01-02

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

The City of Inkster is continuing ongoing programs to implement the City's Illicit Discharge Elimination and Public Education Programs in support of the goals and objectives of the Lower 2 Subwatershed Management Plan and the City of Inkster's General Storm Water General Permit.

View this document now: RIIB-01-02 (928 KB - PDF file)

Farmington Hills Illicit Discharge Elimination Project (RIXB-14)

City of Farmington Hills

Project Profile/Report, May 2014, 6 pages, Order Number: RIXB-14

The purpose of this project Was to confirm illicit connections and septic tanks/fields discovered in previous reports; design house leads and septic system abandonments; disconnect and abandon illicit connections and septic tanks/fields; and install house leads and sanitary sewer taps. All of the illicit connections previously identified have been eliminated.

View this document now: RIXB-14 (641 KB - PDF file)

Illicit Connection Elimination & Catch Basin Replacement, Mosquito Control Policies & Public Education (RV-04)

City of Inkster

Project Profile/Report, November 2007, 10 pages, Order Number: RV-04

This project consisted of removing and repairing 8 catch basins as well as identifying an illicit dishcarge source. Both of these activities serve to improve the City of Inkster's storm water management capacity.

View this document now: RV-04 (318 KB - PDF file)

Illicit Discharge Investigation and Elimination and Sanitary Sewer Evaluation Study (RIIB-08)

City of Melvindale

Project Profile/Report, March 2004, 106 pages, Order Number: RIIB-08

The City of Melvindale conducted an investigation to find the source and document suspicious discharges to the sanitary and storm sewer systems. Melvindale?'s sanitary system carries wastewater from homes, businesses, and groundwater from basement footing drains. This 2004 report summarizes the activities performed and includes the results of laboratory data analyses.

View this document now: RIIB-08 (2.4 MB - PDF file)

Illicit Discharge Investigation And Sewer Inspection Project (RIIB-11)

City of Allen Park

Project Profile/Report, December 2002, 148 pages, Order Number: RIIB-11

This project described a sewer system evaluation survey (SSES) that identified areas of the Allen Park sewer system that required rehabilitation. The investigation included inspections, smoke testing, flow metering, and public relations programs to identify areas in need.

View this document now: RIIB-11 (5.7 MB - PDF file)

Inkster Stormwater Ordinances, Implementation of Illicit Discharge Elimination & Public Education Plans Project (SW-06)

City of Inkster

Project Profile/Report, March 2002, 2 pages, Order Number: SW-06

The project implemented stormwater management activities that are associated with coverage under the Michigan Department of Environmental Quality General Stormwater NPDES Permit.

View this document now: SW-06 (164 KB - PDF file)

Oakland County Illicit Connection Program (SW-19)

Oakland County Drain Commissioner

Project Profile/Report, June 2001, 11 pages, Order Number: SW-19

An intensive illicit connection detection program on Oakland County's storm water system within the Rouge Watershed was conducted. This effort was complemented with a down spout disconnection program.

View this document now: SW-19 (603 KB - PDF file)

Northville Township Continuation of IDEP 2003 and Storm Water Ordinance Modification (RIII-02)

Northville Township

Project Profile/Report, June 2001, 11 pages, Order Number: RIII-02

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

This grant provides for the modification of Northville Township's existing storm water ordinance and the detection and elimination of illicit discharges.

View this document now: RIII-02 (603 KB - PDF file)

Public Education, Pilot Commercial IDEP and IDEP Training (RIIB-15)

City of Dearborn Heights

Project Profile/Report, January 2003, 29 pages, Order Number: IIB-15

This project implemented goals in the Subwatershed Management Plans (SWMP) developed for the Middle 3 and Lower 2 Rouge River subwatersheds and goals in the Dearborn Heights Storm Water Pollution Prevention Initiative (SWPPI). As part of this project public education activities were completed including watershed displays. Commercial businesses were inspected as part of a pilot program for IDEP. Inspectors completed IDEP training.

View this document now: RIIB-15 (1.1 MB - PDF file)

Public Participation, Illicit Discharge and Public Education Continuation Programs (RIIB-20-21)

City of Garden City

Project Profile/Report, November 2002, 11 pages, Order Number: RIIB-20-21

This report summarizes Illicit Discharge Elimination Plan (IDEP) and Public Education Plan (PEP) activities by Garden City to help reduce storm water pollution to the Lower 2 and Middle 3 branches of the Rouge River.

View this document now: RIIB-20-21 (80 KB - PDF file)

Rouge - Oakland Illicit Discharge Elimination Program Activities (RVIIB-06)

Oakland County Drain Commissioner

Project Profile/Report, December 2008, 22 pages, Order Number: RVIIB-06

The purpose of this project was to assist participants (Oakland County, Farmington Hills and Southfield) in meeting their respective Federal Phase II Storm Water Permit requirements for their Illicit Discharge Elimination Programs (IDEP). Permit holders are required to identify and map Discharge Points from their Municipal Separate Storm Sewer Systems (MS4s) and have an IDEP to find, prioritize and eliminate illicit discharges and connections found while conducting dry weather screening activities.

View this document now: RVIIB-06 (3.1 MB - PDF file)

Westland Illicit Connection Investigation (M3-12)

City of Livonia

Project Profile/Report, December 2008, 22 pages, Order Number: M3-12

The purpose of this demonstration project was to determine the effectiveness of a televised inspection system on the determination of existing illicit connections within a public storm sewer system. The project also incorporates the inspection of sanitary sewer systems for illicit storm connections. The data obtained from this project will assist other communities in determining the cost effectiveness of this type of inspection system.

View this document now: M3-12 (1.2 MB - PDF file)

Illicit Discharge Elimination

"Illicit discharge" means any discharge or seepage to the separate storm water drainage system that is not composed entirely of storm water or uncontaminated groundwater. . Examples include, but are not limited to, dumping of motor vehicle fluids, household hazardous wastes, grass clippings, leaf litter, or animal wastes, or unauthorized discharges of sewage, industrial waste, restaurant wastes, or any other non-storm water waste into a separate storm water drainage system. "Illicit connection" is a subset of illicit discharges. It is the physical connection of a sanitary or industrial waste system to the storm sewer system. The Rouge Project found there were a number of illicit discharges that were adversely impacting water quality. Examples found in the Rouge River watershed include toilets, floor drains connected to storm sewers, laundry waste discharging to a drain, swimming pool backwash water discharging to a storm sewer or situations where polluting material can move over land to a storm sewer

The monitoring data on the Rouge River suggested that illicit discharges were contributing to high bacteria counts during dry weather in several parts of the watershed. Further water quality testing found consistently high levels of fecal coliform and E. coli bacteria upstream of locations that had

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combined sewer overflows and in several locations where there were no municipal sanitary systems. Because of the potential threat to public health, a great deal of effort is being placed on regulating illicit discharges

Based upon the above findings, the Rouge Project and the three counties in the watershed initiated an illicit discharge elimination program (IDEP). The focus of the program is the elimination of illegal discharges in the watershed from illicit connections, illegal dumping, and lack of awareness. The IDEP directly results in the annual removal of significant quantities of raw sewage and other pollution that pose a threat to human health and aquatic life.

Wayne County has developed a training program to assist local communities and counties in implementing their own IDEP.

Overview Description of the Illicit Discharge Elimination Program
Illicit Discharge Elimination Training Program

Technical Papers and Reports

Key for Document Reading Level
* No scientific background required for understanding
** Some scientific and/or technical background helpful
***Scientific and/or technical background suggested

1994 Rouge River Headwaters On-Site Sewage Disposal System Survey

Krinn, Keith L., Carlson William T., Cyranski Eugene C., Drescher Paul D., Murphy Brian J., and Laura M. Stasiewicz

Supplemental Report, August 1994, 54 pages, Order Number: NPS-SR04.00 ***

The Oakland County Health Division identified approximately 160 sewage disposal system failures occurring since January of 1990 along the headwaters of the Rouge River system within the cities of Farmington Hills and Southfield. An innovative method of dye testing for on-site sewage disposal system failure was used in order to determine if the nonpoint source (NPS) pollution from failing septic systems degrades the water quality of the Rouge River. Field and laboratory procedures specific for a river project were developed. Fecal coliform sampling was carried out at 46 sites. Over 90 percent of the sample sites exceeded the standard limits for surface water quality. The results of testing showed that water quality standards were met for dissolved oxygen, pH, and temperature. A macroinvertebrate study was also conducted at most of the sites. A total of 65 houses were dye tested, with 52.3 percent and testing positive (34 houses). Included is a detailed discussion of the results. Data, charts and maps are included.

1995 Rouge River Headwaters On-Site Sewage Disposal System Survey

Krinn, Keith, Carlson William, Petitt Julia, Yates Eric, Bungee Kelly and Brian Allen

Supplemental Report, March 1996, 28 pages, Order Number: NPS-SR05.00 **

This document presents the results of the on-site sewage disposal system survey conducted in Oakland County in 1995. Failing on-site systems are known to be sources of pollutants to local receiving streams. This survey was the continuation of the on-site system survey begun by the Oakland County Department of Public Health in 1994. Results are presented from the surveys conducted to define surface water quality (bacteria, pH, temperature, dissolved oxygen, and turbidity), macroinvertebrate communities, and failure rates of individual on-site sewage disposal systems (dye tests).

City of Westland Illicit Connection Program

Barry Johnson

Project Profile, March 2002, 2 pages, Order Number: M3-12 *

This project profile is a summary of the results of a grant funded effort performed with local community funding or in kind services. The summary focuses on the demonstration aspects of the project.

View this document now: M3-12 (162 KB - PDF file)

Comparison Analysis of Alternatives for Finding Illicit Discharges to Storm Water Systems

Technical Report, February 2007, 35 pages, Order Number: RPO-WMGT-TR66 **

Seven years of IDEP data, from 1999 through 2005, were collected from communities and counties in the Rouge River Watershed. The IDEP methods of Outfall Reconnaissance Inventory (ORI), hotline complaint reporting, dye testing, and on-site disposal system (OSDS) inspection were evaluated to assess their overall effectiveness for finding and eliminating illicit discharges to storm water systems. The purpose of this report is to present the findings of the comparative analysis of the data that was received from the communities and counties.

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

View this document now: RPO-WMGT-TR66 (2.3 MB - PDF file)

Development and Implementation of the Regulation for the Inspection of OSDS at the Time of Property Transfer

Barry Johnson

Project Profile, March 2002, 2 pages, Order Number: OSS-02 *

This project profile is a summary of the results of a grant funded effort performed with local community funding or in kind services. The summary focuses on the demonstration aspects of the project.

View this document now: OSS-02 (351 KB - PDF file)

Did You Know...The Impact of On-Site Sewage Systems And Illicit Discharges On The Rouge River

Johnson Barry & Dean Tuomari

Paper, February 1998, 10 pages, Order Number: UrbRetro98-04 **

The Rouge River in southeast Michigan suffers from various pollution sources. The Rouge Project is focusing on restoring the river's water quality, but this will not happen until illicit discharges are eliminated. On-site sewage disposal systems (OSDS) and illicit discharges are major contributors to groundwater and surface water pollution in the Rouge River. The illicit connection program has used several methods to identify these pollutants. This paper presents five methods used by the Rouge Project: dye testing of plumbing and OSDS; visual observations of manholes, outfalls and OSDS; aerial photography; televising storm sewers; and testing for ammonia, surfactants, E. Coli and isotopes of hydrogen and oxygen.

View this document now: UrbRetro98-04 (34 KB - PDF file)

Estimated Total Pollution Delivered to Rouge River by Illicit Connections

Jeff Boerma, Barry Johnson

Activity Book, February 1997, 5 pages, Order Number: ILLICIT *

This memorandum summarizes the methods used to determine an estimate of total pollution delivered to the Rouge River by illegal connections to the storm sewer system (?illicit connections?). Information used to determine total pollution from illicit connections came from the Rouge Program Office Technical Memorandum ? Summary of Illicit Connection Detection Programs in Michigan? (RPO-NPS01A-TM01.00, Pomeroy, 1996), the Illicit Connection Program Annual Reports and the quarterly reports of the Wayne County Department of Public Health Environmental Health Division and Wayne County Department of the Environment, Watershed Management Division (1987- Sept. 1996).

View this document now: ILLICIT (41 KB - PDF file)

Evaluation and Management of On-Site Sewage Disposal Systems: New Challenges, New Initiatives, New Partnerships

Barry Johnson, Richard Fleece, and Steve Tackitt

Paper, April 2001, 11 pages, Order Number: ASAE *

Management of onsite sewage disposal systems (OSDS) is necessary to assure proper performance of these systems, protect public health and protect surface water and groundwater quality. As part of the storm water discharge permits issued by the Michigan Department of Environmental Quality (MDEQ), failing OSDS were required to be addressed. This brought together communities, the private sector, agencies and health departments to determine the best approach to prevent failing OSDS.

View this document now: ASAE (54 KB - PDF file)

Facility Illicit Connection Inspection Program

Dean Tuomari & Susan Thompson

Standara Operating Procedure (SOP), December 2011, 30 Pages, Order Number: IDEP-SOP-2011 **

This standard operating procedure (SOP) addresses the tasks performed by the Wayne County field crews during the on-site inspection portion of the Illicit Discharge and Elimination Program (IDEP). It includes the field procedures for conducting: (1) dye testing of the plumbing fixtures; and (2) evaluating the general housekeeping and chemical storage practices on the premises.

View this document now: IDEP-SOP-2011 (818 KB - PDF file)

From Theory to Implementation-Finding Illicit Connections

Barry Johnson & Dean Tuomari

Paper, May 1998, 7 pages, Order Number: WEFSPEC98-02 **

The Rouge River Watershed located in southeastern Michigan encompasses approximately 438 square miles. A primary objective of the Rouge Project is to demonstrate how to address and correct urban wet weather pollution problems. However, water quality objectives in the Rouge River Watershed will not be achieved unless illicit discharges are eliminated. The Rouge Project illicit connection program has utilized several methods to identify sources of illicit discharges, but first, a method to prioritize areas for detailed evaluations had to be developed. A GIS database was established to assist in this area. This paper focuses on five method used

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to provide information to prioritize areas of the watershed for detailed investigation. Those include: dye testing of plumbing and on-site sewage disposal systems; visual observations of manholes, outfalls and on-site sewage disposal systems; aerial photography; televising of storm sewers; and testing for ammonia, surfactants, E. coli and isotopes of hydrogen and oxygen.

View this document now: WEFSPEC98-02 (21 KB - PDF file)

Homeowners Onsite Sewage Disposal Public Education Project

Barry Johnson

Project Profile, October 2002, 2 pages, Order Number: OSS-05 **

This project was developed to provide educational information to homeowners about onsite disposal systems and how they should be maintained.

View this document now: OSS-05 (156 KB - PDF file)

Identification of Illicit Connections in Storm Sewers: An Innovative Approach Using Stable Isotopes

Suresh Sangal, Pradeep Aggarwal, and Dean Tuomari

Paper, October 1996, 12 pages, presented at WEFTEC - Dallas 1996, Order Number: WEFTEC96-02 **

Illicit connections from domestic, commercial and industrial sources to storm sewers create pollution of receiving water and must be identified and eliminated. An innovative approach to identifying illicit connections is based on the analysis of naturally occurring stable isotopes of oxygen and hydrogen. This paper describes a feasibility study that evaluated the stable isotope approach for the identification of illicit connections within Wayne County.

View this document now: WEFTEC96-02 (1.2 MB - PDF file)

Illicit Connections Investigation Program Annual Report – 1994

Wayne County Department of Public Health - Environmental Health Division

Technical Report, January 1995, 31 pages, Order Number: RPO-NPS-TR48 **

The Rouge River Remedial Action Plan (RAP) has reported illicit connections, the improper discharge of wastewater through storm sewers, as a source of pollution to the river. The County of Wayne has undertaken a program to reduce pollution to the Rouge River by locating and eliminating illicit connections. By agreement between the Wayne County Department of Public Health and the Wayne County Division of Public Works, the dye-testing program to discover illicit connections was performed January 1, 1994 through December 31, 21994. This report summarized activities for the 1994 calendar year.

View this document now: RPO-NPS-TR48 (2.0 MB - PDF file)

IDEP Rouge River Watershed from Residential Areas

Wayne County Department of Public Services

Grant Final Report, August 2011, 81 pages, Order Number: WC-IDEP-CMI-2005-0335

This project had three main objectives: developing cooperative working relationship with communities and other county agencies; utilizing investigative techniques that find illicit connections/discharges in commercial, industrial and residential areas; and continuing the illicit connection and discharge detection efforts currently utilized by the Wayne County Department of Public Services Water Quality Management Division. This report summarizes the activities performed to meet the project objectives.

View this document now: WC-IDEP-CMI-2005-0335 Final Report (985 KB - PDF file) Fact Sheet (210 KB - PDF file)

Oakland County Septage Unloading Facility

Barry Johnson

Project Profile, February 2003, 2 pages, Order Number: OSS-01

The objective of the Oakland County Septage Unloading Facility grant was to provide a septage disposal facility that was easy for septage haulers to use, could accommodate vactor truck waste and would be fully automated and accessible 24 hours a day.

View this document now: OSS-01 (232 KB - PDF file)

Onsite Sewage Disposal System Data Model

Charlie Bristol

Preliminary Data Report, April 1999, 24 pages, Order Number: OSDSDM **

Onsite Sewage Disposal System Data Model: The ultimate goal of this data model is to provide the Rouge River watershed communities with a database design template that focuses on the development of the Onsite Sewage Disposal System (OSDS) coverage's and related attribute tables. The database tables described in this report were developed through several workshop meetings and incorporate comments from Rouge communities. There are three types of Rouge communities who will benefit from this document: (1) Communities that are building just an attribute database for OSDS. This type of community may or may not have GIS tools available to supplement their work; (2) Communities that are building their GIS using ArcView and planning to store the attributes in some desktop database environment; and (3) Communities that are building their GIS using Arc/Info and store their attributes in INFO tables or a relational database management system like ORACLE, Informix or Ingres, linked to Arc/Info.

The information provided in this report assumes that the feature attribute tables presented in this document are going to eventually be a graphic feature in the community GIS. This is very important for those communities building just the attribute tables at this time to meet the requirements of the general permit OR those communities building just the spatial graphic features at this time.

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

View this document now: OSDSDM (85 KB - PDF file)

On-Site Sewage Disposal Systems Project Within the Tonquish Creek Basin and Middle 3 Subwatershed Area

Wayne County Department of Public Health Environmental Health Division

Community Project, October 1998, 6 pages, Order Number: CP-M308-01.00 **

This report is the task product of the Wayne County Department of Public Health - Environmental Health Division "Septic System Database & Evaluation Project" that was completed as part of the original round of community stormwater projects. This report includes the results of field surveys of homes with on-site sewage disposal systems (OSDS) in the communities of Canton Township, Dearborn Heights, Garden City, Livonia, Plymouth Township, Redford, and Westland. The field survey identified failing OSDS and those OSDS with a high potential for failing by evaluating site conditions in the area of the septic field. Observations of vegetation, standing water near the drain field, cheater pipes and raw sewage were recorded. Staff on the project completed 421 field surveys in the seven community study area. The average failure rate for the 421 OSDS surveyed was 21 percent.

View this document now: CP-M308-01.00 (55 KB - PDF file)

OSDS Evaluation and Maintenance Program in Wayne County

Barry Johnson

Project Profile, March 2002, 2 pages, Order Number: OSS-04 *

This project profile is a summary of the results of a grant funded effort performed with local community funding or in kind services. The summary focuses on the demonstration aspects of the project.

View this document now: OSS-04 (196 KB - PDF file)

Quantitative Analysis of Data from the Rouge River On-Site Sewage Disposal System Surveys

Joseph Rathbun & Louis Regenmorter

Technical Memorandum, July 1996, 32 pages, Order Number: NPS-TM11.00.96

A quantitative analysis was performed to defined the relationship between different water quality measures and on-site sewage disposal system (on-site system) performance.

Rouge River Watershed Illicit Sewer Connection Detection Program: A GIS Approach

Dean Toumari, John P. Foley, and Ellen S. Taylor

Paper, May 1995, 14 pages, presented at ESRI User Conference, Palm Springs, CA Order Number: ESRI95-01

This paper presents the background of the existing Wayne County Illicit Connections Program administration and its relationship to the Rouge River National Wet Weather Demonstration Project. The emphasis is on the value of GIS from an administrative perspective in a practical application. As such, the GIS enhancements to the program are discussed in terms of time and cost efficiency, the resulting program effectiveness, and the implications with regard to long-term program support.

View this document now: ESRI95-01 (1.5 MB - PDF file)

Storm Water Drainage Data Definition Document

Activity Book, April 1999, 30 pages, Order Number: SWDATA **

Storm Water Drainage Structure Definition: This document was developed to provide Rouge River watershed communities with an attribute database for their storm water drainage system. The information provide in this report focus on communities that are building their GIS using ArcView and planning to store the attributes in some desktop database environment; and communities that are building their GIS using Arc/Info storing their attributes in INFO tables or a relational database management system like ORACLE, Informix or Ingres. Section one (1) of this report describes the features of the Storm Water Tables. These features consist of all three types (arcs); (points); (nodes); and areas (polygons). A definition table is defined for each storm water drainage feature. Section two (2) features the Storm Water Drainage Look up Tables. These look up tables support the main feature tables by storing commonly used data. A definition table in section is also defined. Section three defines three ArcInfo tables: (1) Node Attribute (NAT); (2) Arc Attribute Table (AAT); and (3) Polygon Attribute Table (PAT). Section four lists the four communities that will be building their storm water drainage database and conducting mapping using ArcView. This document is a great starting point for communities using only database application or ArcView.

View this document now: SWDATA (149 KB - PDF file)

Successes of the Wayne County's IDEP Training Program

Dean Tuomari and Susan Thompson

Paper, August 2002, 11 pages, Order Number: STORMCON2002-01 **

The Wayne County Illicit Connection/Discharge Elimination Training Program was created and implemented in 1999. The program was developed to provide training for local and regional governments responsible for locating and eliminating illicit discharges to surface waters. The key goals of the training program are sharing our expertise with other local units of government involved in stormwater management and collaborating efforts in reducing improper discharges to surface water. The Wayne County Training Program is consistent with the Illicit Discharge Elimination Plan (IDEP) requirements of the Michigan Voluntary Storm Water Permit (MIG6100000) and the EPA Phase II Stormwater Permit Regulations. The training program consists of five (5) modules and specialty training program sessions. The modules are: Overview, Basic Investigations, Advanced Investigations, Combined Basic/Advanced Investigations, and two (2) specialty training sessions. As a result of the training program efforts through May 1, 2002, 82 illicit discharges are eliminated, preventing an estimated 3.5 million gallons/year of polluted water from entering Michigan surface waters.

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View this document now: STORMCON2002-01 (151 KB - PDF file)

Summary of Illicit Connection Detection Programs in Michigan

Pomeroy, Christine, Cave Kelly and Dean Tuomari

Technical Memorandum, February 1996, 81 pages, Order Number: NPS01A-TM01.00 **

This documents summarizes two types of programs used to detect illicit connections to storm sewer systems in Michigan: the trace dye method by the WCDOE and the colormetric test kit field screening method used by municipalities to complete Part 1 NPDES Municipal Storm water Permit Applications.

View this document now: NPS01A-TM01.00 (3.8 MB - PDF file)

The Do's and Don'ts on Implementing a Successful Illicit Connection Program

Dean Tuomari

Activity Book, October 1999, 13 pages, Order Number: SUCILCON **

View this document now: SUCILCON (112 KB - PDF file)

Using GIS Tools to Implement an Illicit Discharge Elimination Program in Livonia, Michigan

Christine Rohrer and Robert Beckley

Paper, July 2000, 7 pages, presented at Watershed 2000 in Vancouver, BC, Order Number: Watershed2000-04 *

The City of Livonia, Michigan is using Geographic Information Systems (GIS) technology to enhance the implementation of its illicit discharge elimination program.As a result of the GIS integration, record keeping is improved, problem areas are identified earlier, and joint efforts with surrounding communities and other agencies with storm drainage jurisdictions in Livonia are simplified. These GIS tools are also part of an overall municipal GIS program for improving the delivery of public works services to businesses and residents.

View this document now: Watershed2000-04 (112 KB - PDF file)

Technical Papers & Reports

Storm Water Management

A Municipal Storm Water Discharge Regulation Strategy

Jay B. Rising, Thomas C. Phillips, Steven E. Chester, and Jack D. Bails

Supplemental Report, April 1996, 23 pages, Order Number: NPS-SR07.00 **

This report is part of a series of analyses performed to investigate the institutional and financial options for management of wet weather flows in the Rouge River watershed under the auspices of the Rouge Project. The report identifies the limitations of existing law and notes the statutory requirements that may now discourage communities from pursuing watershed approaches. It suggests administrative rule changes that may overcome some obstacles to managing storm water on a watershed basis and provides a foundation for further analysis of potential changes in state and federal regulations and policies that could be made to provide incentives for communities to adopt watershed approaches.

View this document now: NPS-SR07.00 (1.5 MB - PDF file)

Achieving Multiple Objectives Through A Single Watershed Plan

Kelly A. Cave, Jim Murray, and Dale Bryson

Paper, August 2002, 7 pages, Order Number: STORMCON2002-02 **

The Rouge Project in Southeast Michigan is a working example of how a systematic watershed approach to pollution management can result in cost-effective and ultimately greater and faster achievement of designated uses in a water body. In addition, multiple program objectives are being achieved through the development of comprehensive watershed management plans.. The Rouge Project has expanded from a program to build and evaluate alternative approaches to control combined sewer overflows (CSOs) to a comprehensive watershed-based pollution abatement initiative. The Rouge River Watershed is largely urbanized, spans approximately 438 square miles and is home to over 1.5 million people in 48 communities and 3 counties.

View this document now: STORMCON2002-02 (161 KB - PDF file)

Adapting Regulatory Frameworks to Accommodate Watershed Approaches to Storm Water Management

Kelly A. Cave, Jack D. Bails

Paper, May 1998, 8 pages, presented at the Storm Water and Watershed Management Seminar, Dallas, TX

The focus of this element of the Rouge Project was to design a regulatory framework that encouraged communities with separated sewers in the upper river areas to voluntarily cooperate in a watershed approach to remediation rather than waiting for a mandate from the federal court overseeing the Rouge River cleanup, or for

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command and controls from state and/or federal regulators. The communities reached a consensus on a draft watershed approach to storm water management under a general permit where communities and public agencies within a watershed are collectively responsible for a watershed plan and individually responsible foractions required to implement the plan. The Michigan Department of Environmental Quality subsequently issued for public notice a statewide, voluntary watershed NPDES storm water permit largely based upon the recommendations of the communities within the Rouge River watershed.

View this document now: DALLAS98-01 (474 kb - PDF file)

Alternative Funding Mechanisms for Stormwater Detention

Public Sector Consultants & Miller Canfield Paddock and Stone

March 2004, 62 pages, Order Number: URBSW_7.20_Alt_Fund_RPT ***

Recent federal and state laws and regulations require that all local units of government (e.g., cities, townships, villages, and counties) in urbanized areas obtain and meet the requirements of a storm water discharge permit. As part of its responsibilities under its watershed-based general storm water discharge permit, Farmington Hills participated in the development of the Subwatershed Management Plan for the Upper Rouge River. That planning process determined that one of the major impairments in the Upper Rouge River was excessive flows. Each community accepted responsibility for implementing various actions to address problems identified in the plan as part of their individually required Storm Water Pollution Prevention Initiative (SWPPI). As one element of its SWPPI, Farmington Hills agreed to assess alternative mechanisms to fund the maintenance/repair/enhancement of existing, privately owned storm water detention facilities. This report presents the results of that assessment.

View this document now: URBSW_7.20_Alt_Fund_RPT (4.97 MB - PDF file)

Analysis of Existing Detention Ponds in the Rouge River Watershed

Amy Ploof and Ashraf Ibrahim

Task Product Memorandum, December 1997, 69 pages, Order Number: NPS-TPM45.00 **

This task product memorandum extrapolates the number of detention ponds in the Rouge River Watershed. Current maintenance guidelines in the Rouge River Watershed are also presented.

View this document now: NPS-TPM45.00 (1.32 MB - PDF file)

Can a Watershed be Managed? Leading the Efforts of Public Acengies and Local Communities in the Rouge River Watershed

Carl R. Johnson, Vyto P. Kaunelis, Kelly A. Cave

Paper, October 1999, 15 pages, presented at WEFTEC 1999, New Orleans, Louisiana

This paper focuses on the way in which the Rouge Project is leading the efforts of many municipalities to reach the goals of water quality improvement. The Rouge Watershed presents a unique management challenge because there are no significant point sources which can be controlled by the action of a single agency, or from which to readily establish an effluent trading scheme. The environmental management goal of the project is the control of flow and wet weather pollution to achieve flow and quality to meet standards. The institutional management goal is to find ways to effectively work with the numerous and diverse parties within the watershed boundary to meet the environmental goal.

View this document now: WEFTEC99-04 (200 kb - PDF file)

Common Appendix for Rouge Subwatershed Management Plans Submitted in Fulfillment of the MDEQ Stormwater General Permit

Rouge Program Office

Technical Report, May 2001, Order Number: RPO-NPS-TR37 **

Seven subwatershed plans were developed for the Rouge River watershed under a unique state program for permitting storm water discharges. These plans were conceived as a part of the Rouge River National Wet Weather Demonstration Project (Rouge Project), funded by the United States Environmental Protection Agency (U.S. EPA). These plans identify current river conditions and propose goals, actions, and progress measures to protect and restore the beneficial uses of the river for the residents of the subwatershed. A technical appendix was developed to support all seven subwatershed management plans. This technical appendix includes: Planning and Cost Estimating Criteria for Best Management Practices; community action scores for water quality improvement; community action cost estimates; a summary of the 1999 public involvement survey; the Rouge River Report Card; comments on year 2000 draft 303(d) list; a list of available maps; river flow data summaries; dissolved oxygen and temperature data summaries; E. Coli data summaries; biological and ecological features, and ecological impairments; and a glossary and list of acronyms.

View this document now: RPO-NPS-TR37 (6.3 MB - PDF file)

Community Project Guide

Supplemental Report, October 1997, 14 pages, Order Number: NPS-SR16.00 **

The purpose of the Community Project Guide is to provide communities receiving grant sponsorship for projects through the Rouge Project with information, policies and procedures to administer project funds in accordance with applicable federal guidelines. By referring to this Guide along with the appropriate Code of Federal Regulations when necessary, the community can meet the fiscal and accounting requirements needed for EPA compliance and effective project reporting.

View this document now: NPS-SR16.00 (495 KB - PDF file)

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Cost Estimating Guidelines: Best Management Practices and Engineering Controls 1997 and 2001

Timothy Ferguson, Robert Gignac, Mark Stoffan, and Bryan Alexander

Supplemental Report, July 1997, 127 pages, Order Number: NPS-SR10.00 **

The 1997 manual was designed to assist community planning and public works managers develop storm water runoff control programs in the most effective manner for their specific concerns. The intent of the manual is to provide an introduction to, and cost information for, common methods used to control storm water runoff. The manual has been organized into six categories to aid you in identifying specific BMPs. The 2001 manual was prepared as a general appendix to the Subwatershed Management Plans. The 2001 document is intended to update the cost estimating manual to make the material more directed, more accessible, and more useful in the implementation of the Subwatershed Management Plans.

View this document now: NPS-SR10.00 (3 MB - PDF file)

Designing the Right Hook: Public Participation in the Watershed Planning Process

Josephine Powell and Zachare Ball

Paper, August 2002, 4 pages, Order Number: STORMCON2002-03 **

This paper will discuss the initiatives and tools used by Wayne County's Rouge River National Wet Weather Demonstration Project (Rouge Project) and Rouge communities to obtain public input and comment during the year-long subwatershed management planning process.

View this document now: STORMCON2002-03 (104 KB - PDF file)

Environmentally Friendly Mixed Use Development, Northville, Michigan

Project Profile, February 2000, 3 pages, Order Number: M1-03 *

This project profile is a summary of the results of a grant funded effort performed with local community funding or in kind services. The summary focuses on the demonstration aspects of the project.

View this document now: M1-03 (141 KB - PDF file)

Evaluation of On-Line Media Filters in the Rouge River Watershed

Razik Alsaigh, Jeff Boerma, Amy Ploof & Louis Regenmorter

Task Product Memorandum, March 1999, 51 pages, Order Number: NPS-TPM59.00 **

This report describes the performance of the on-line media filter demonstration pilot project for the period of October 1995 to June 1997. This best management practice (BMP) uses storm sewer inserts to filter sediments and absorb hydrocarbon products from storm sewer runoff before it reaches surface waters. These inserts were applied as a demonstration project in the Cities of Livonia and Westland, Michigan. These BMPs were recommended to evaluate the costs and benefits of low cost, inlet insert type devices for use in existing urban areas. Four devices were tested as part of this demonstration. The sediments and hydrocarbons collected by the four devices were measured and the results of the four devices were assessed. The operation and maintenance (O&M) considerations, capital cost, and estimated O&M costs are also addressed. All four filters performed well during the 19 month evaluation period and were relatively easy to maintain. The results of this demonstration show that the best filter depends on the conditions at the site and the objective of its installation.

View this document now: NPS-TPM59.00 (1.93 MB - PDF file)

Extended Detention Pond Evaluation

Razik Alsaigh and Jeff Boerma

Task Product Memorandum, October 1996, 60 pages, Order Number: NPS-TPM40.00 **

The purpose of this report is to describe the progress made and the lessons learned from the Cedar Lake dry extended detention pond demonstration project for the period July 15, 1995 to December 31, 1995. This demonstration project is the structural BMP#1 as described in the Rouge Project document "Interim Final Report for the 319 Grant (RPO-NPS01A-TR02.01)".

View this document now: NPS-TPM40.00 (1.5 MB - PDF file)

Fellows Creek Regional Detention and Public Education Programs, Charter Townships of Canton and Plymouth, Michigan

Project Profile, February 2000, 2 pages, Order Number: SP-02 *

This project profile is a summary of the results of a grant funded effort performed with local community funding or in kind services. The summary focuses on the demonstration aspects of the project.

View this document now: SP-02 (103 KB - PDF file)

Ford Park Passive Recreation Project, Northville, Michigan

Project Profile, February 2000, 2 pages, Order Number: M1-14 *

This project profile is a summary of the results of a grant funded effort performed with local community funding or in kind services. The summary focuses on the demonstration aspects of the project.

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

GIS Data for Water Quality Indices and Wetlands Assessment, West Bloomfield, Michigan

Project Profile, September 2000, 2 pages, Order Number: GIS 41 **

The purpose of the project was to expand two GIS capabilities necessary for planning and implementing programs to support the Michigan Department of Environmental Quality General Permit for Storm Water Discharge which supports the Rouge River restoration activities.

View this document now: GIS-41 (70 KB - PDF file)

Guidelines for Conducting a Detention Pond Inventory

Amy Whitens and Ashraf Ibrahim

Task Product Memorandum, June 1997, 67 pages, Order Number: RPO-NPS-TPM46 *

This technical memorandum will serve as a guideline for communities to use to conduct a detention pond inventory. The memorandum gives a methodology to follow if a representative sample, instead of a complete inventory, is required. Blank example tables are provided for communities to use when conducting the inventory. The memorandum also addresses the issue of detention pond operation and maintenance. Proper maintenance of a detention pond is necessary for it to operate as designed. The maintenance of ponds includes such items as inspections, routine maintenance, and non-routine maintenance. Design features to be considered in the design which will minimize maintenance costs are also addressed.

View this document now: RPO-NPS-TPM46.00 (2.8 MB - PDF file)

Implementation of Michigan's Voluntary Storm Water Permit - A Community Perspective

Kelly A. Cave, Dale S. Bryson, Kelly C. Kelly and Jack Bails

Paper, February 2000, 10 pages, presented at the Urban Retrofit Conference, Chicago, Illinois

The purpose of this presentation was to present a summary of the activities and progress of the Rouge Project, to discuss the watershed approach being utilized in the Rouge Project including the use of a general storm water permit, and to summarize a community perspective on this entire effort.

View this document now: URBRETRO 2000-01 (112 KB - PDF file)

Implementing a Model Watershed Approach Through A State General Storm Water NPDES Permit

Kelly A. Cave and Jack Bails

Paper, October 1998, 10 pages, Order Number: WEFTEC98-02.00 **

The Rouge Project funded in part by USEPA grants and administered by the Wayne County Department of Environment, has expanded from a program to build and evaluate alternative approaches to control a comprehensive watershed-based pollution abatement initiative. The Rouge River Remedial Action Plan (RAP) identified the importance of controlling pollution emanating from diffuse storm water and nonpoint sources. A storm water management strategy was initiated for the watershed that culminated in a new regulatory framework centered around a watershed-based general storm water permit. All 48 Rouge Watershed communities had the opportunity to participate in the design of the permit and reached consensus with the Michigan Department of Environmental Quality (MDEQ) on the required permit elements. The permit requires permitees to participate in watershed management planning for a self-determined subwatershed unit. The watershed management plan will form the basis for implementing watershed goals and objectives that will result in improved water quality and pollution control.

View this document now: WEFTEC98-02.00 (140 KB - PDF file)

Improving Community Storm Water Management (A Summary Guide of Ordinances for Rouge River Communities)

Rupal S. Pribak

Supplemental Report, October 1997, 17 pages, Order Number: NPS-SR17.00 **

This guide provides a summary of the types of storm water ordinances currently in force in many of the Rouge Watershed communities. It is a tool to aid communities in creating a comprehensive local ordinance, or a series of ordinances, to reduce the adverse effects of common human activities on our water resources. The summary guide consists of seven areas of developing storm water ordinances: 1) Controlling Storm Water Quantity and Quality, 2) Soil Erosion and Sedimentation Control, 3) Managing Septic Systems, 4) Protecting Wetlands, 5) Maintaining Vegetative Buffer Zones and Stabilizing Streambanks, 6) Floodplain/Watercourse: Maintaining Docks and Other Water Dependent Structures, and 7) Establishing Wildlife Corridors.

View this document now: NPS-SR17.00 (240 KB - PDF file)

Inkster Storm Water Management Project

Barry Johnson

Project Profile, March 2002, 2 pages, Order Number: SW-06 *

This project profile is a summary of the results of a grant funded effort performed with local community funding or in kind services. The summary focuses on the demonstration aspects of the project.

View this document now: SW-06 (164 KB - PDF file)

Lower 1 Rouge River Subwatershed Management Plan

Rouge Program Office

Technical Report, April 2001, 207 pages, Order Number: RPO-NPS-TR34 **

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

The Lower One Rouge River Subwatershed Management Plan is one of seven subwatershed plans developed for the Rouge River watershed under a unique state program for permitting storm water discharges. The plan was conceived as a part of the Rouge River National Wet Weather Demonstration Project (Rouge Project), funded by the United States Environmental Protection Agency (U.S. EPA). This plan provides a framework for the preparation of pollution prevention initiatives to meet state and federal water quality regulations. This Lower One Subwatershed Management Plan is part of a comprehensive, long term effort to protect water resources that are at risk of becoming degraded and to restore water resources that have been impaired by pollution, excessive river flows, and loss of natural features.

View this document now: RPO-NPS-TR34 (3.2 MB - PDF file)

Lower 2 Rouge River Subwatershed Management Plan

Rouge Program Office

Technical Report, May 2001, 88 pages, Order Number: RPO-NPS-TR35 **

The Lower 2 Rouge River Subwatershed Management Plan is one of seven subwatershed plans developed for the Rouge River watershed under a unique state program for permitting storm water discharges. The plan was conceived as a part of the Rouge River National Wet Weather Demonstration Project (Rouge Project), funded by the United States Environmental Protection Agency (U.S. EPA). This plan provides a framework for the preparation of pollution prevention initiatives to meet state and federal water quality regulations. The Lower 2 Subwatershed Management Plan discusses the use impairments to the Rouge River in the Lower 2 Subwatershed, the goals and possible solutions to those impairments, and activities that will be conducted by the Lower 2 communities to support these stated goals.

View this document now: RPO-NPS-TR35 (2.2 MB - PDF file)

Main 1-2 Rouge River Subwatershed Management Plan

Rouge Program Office

Technical Report, May 2001, 103 pages, Order Number: RPO-NPS-TR30 **

The Main 1-2 Rouge River Subwatershed Management Plan is one of seven subwatershed plans developed for the Rouge River watershed under a unique state program for permitting storm water discharges. The plan was conceived as a part of the Rouge River National Wet Weather Demonstration Project (Rouge Project), funded by the United States Environmental Protection Agency (U.S. EPA). This plan provides a framework for the preparation of pollution prevention initiatives to meet state and federal water quality regulations. The Main 1-2 Subwatershed Management Plan discusses the use impairments to the Rouge River in the Main 1-2 Subwatershed, the goals and possible solutions to those impairments, and activities that will be conducted by the Main 1-2 communities to support these stated goals.

View this document now: RPO-NPS-TR30 (2.5 mb - PDF file)

Main 3-4 Rouge River Subwatershed Management Plan

Rouge Program Office

Technical Report, May 2001, 81 pages, Order Number: RPO-NPS-TR36 **

The Main 3-4 Rouge River Subwatershed Management Plan is one of seven subwatershed plans developed for the Rouge River watershed under a unique state program for permitting storm water discharges. The plan was conceived as a part of the Rouge River National Wet Weather Demonstration Project (Rouge Project), funded by the United States Environmental Protection Agency (U.S. EPA). This plan provides a framework for the preparation of pollution prevention initiatives to meet state and federal water quality regulations. The Main 3-4 Subwatershed Management Plan discusses the use impairments to the Rouge River in the Main 3-4 Subwatershed, the goals and possible solutions to those impairments, and activities that will be conducted by the Main 3-4 communities to support these stated goals.

View this document now: RPO-NPS-TR36 (Table of Contents - HTML file)

Management Study for the Bell Branch and Tarabusi Creek Subwatershed (Draft)

Kelly Cave, Michelle VanAllen, Christine Rohrer, & Jack Bails

Task Product Memorandum, October 1997, 91 pages, Order Number: NPS-TPM55.00 **

The Management Study for the Bell Branch and Tarabusi Creek Subwatershed was prepared by the RPO under the guidance of the Subwatershed Advisory Group (SWAG) for the Bell Branch and Tarabusi Creek Subwatershed. Its primary purpose is to share information on the Bell Branch and Tarabusi Creek with local officials, community groups, businesses, environmental organizations, and interested citizens. A variety of information has been collected on the subwatershed, including hydrologic, biologic, and water quality data, public use information, and inventory of storm water management activities, current and projected land use/land cover, and other material critical to understanding the current state of the river, such as its problems and opportunities for restoration.

View this document now: NPS-TPM55.00 (1 MB - PDF file)

Management Study for the Middle 3 Subwatershed (Draft)

Barry Johnson & Christine Rohrer

Task Product Memorandum, January 1998, 59 pages, Order Number: NPS-TPM50.00 **

This report shares information on the Middle 3 Subwatershed with local officials, community groups, businesses, environmental organizations, and interested citizens. The report also includes the goals that the Stormwater Advisory Group has endorsed. A variety of information has been collected on the subwatershed including, hydrologic, biologic, water quality data, public use information, and inventory of stormwater management activities, current and project land use/land cover, and other material critical to understanding the current state of the river, such as its problem and opportunities for restoration.

View this document now: NPS-TPM50.00 (1.2 MB - PDF file)

Middle 1 Rouge River Subwatershed Management Plan

Rouge Program Office

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Technical Report, April 2001, 239 pages, Order Number: RPO-NPS-TR32 **

The Middle One Rouge River Subwatershed Management Plan is one of seven subwatershed plans developed for the Rouge River watershed under a unique state program for permitting storm water discharges. The plan was conceived as a part of the Rouge River National Wet Weather Demonstration Project (Rouge Project), funded by the United States Environmental Protection Agency (U.S. EPA). This plan provides a framework for the preparation of pollution prevention initiatives to meet state and federal water quality regulations. This Middle One Subwatershed Management Plan is part of a comprehensive, long term effort to protect water resources that are at risk of becoming degraded and to restore water resources that have been impaired by pollution, excessive river flows, and loss of natural features.

View this document now: RPO-NPS-TR32 (4 MB - PDF file)

Middle 3 Rouge River Subwatershed Management Plan

Rouge Program Office

Technical Report, October 2001, 134 pages, Order Number: RPO-NPS-TR33 **

The Middle 3 Rouge River Subwatershed Management Plan is one of seven subwatershed plans developed for the Rouge River watershed under a unique state program for permitting storm water discharges. The plan was conceived as a part of the Rouge River National Wet Weather Demonstration Project (Rouge Project), funded by the United States Environmental Protection Agency (U.S. EPA). This plan provides a framework for the preparation of pollution prevention initiatives to meet state and federal water quality regulations. The Middle 3 Rouge River Subwatershed Management Plan is part of a comprehensive effort to restore the uses of the Rouge River impaired by pollution and excessive river flows. The plan addresses the adverse affects of pollution caused by wet weather discharges (e.g., CSOs, SSOs and storm water) as well as those associated with dry weather conditions (e.g., illicit discharges to separate storm sewers). This plan outlines the actions that the Middle 3 communities and Wayne County are planning to control and reduce the adverse impairments that have affected the uses of the river.

View this document now: RPO-NPS-TR33 (3.7 MB - PDF file)

Multi-Chambered Treatment Train

Barry Johnson

Supplemental Report, May 2004, 2 pages, Order Number: RPO-WMGT-SR41 *

The objective of the Multi-Chambered Treatment Train (MCTT) was to evaluate the water quality benefits of a stormwater treatment system for stormwater runoff from a municipal maintenance yard. The MCTT was not funded as part of the Rouge River National Wet Weather Demonstration Project. This project profile summarizes work completed by others and is provided for information to Rouge River watershed communities and others.

View this document now: RPO-WMGT-SR41 (96 KB - PDF file)

Pebble Creek Erosion and Sedimentation Control Study, Farmington Hills, Michigan

Project Profile, February 2000, 3 pages, Order Number: SP-10 *

This project profile is a summary of the results of a grant funded effort performed with local community funding or in kind services. The summary focuses on the demonstration aspects of the project.

View this document now: SP-10 (238 KB - PDF file)

Pilot Structural Best Management Practice Site Selection and Assessment

Richard A. Wagner, James A. Wineka , and Kelly A. Cave

Technical Memorandum, December 1994, 68 pages, Order Number: NPS-TM31.00 ***

This technical memorandum summarizes the methodology used to select and recommend nine pilot structural control BMP demonstration projects. A detailed evaluation of three categories of Rouge River Watershed structural BMP types is presented: existing detention ponds; existing detention pond retrofits; and innovative structural BMPs including swales, media filtration, oil/water separators, and multi-chamber treatment train. Typical design criteria for ponds are documented for existing detention ponds. An analysis of retrofit detention ponds has resulted in the development of several alternative methods of retrofitting. Included in this report is a preliminary assessment of hydraulic conditions at each site; highlights of implementation issues including capital, O & M costs; and evaluations of the preliminary estimate of pollutant removal efficiencies for each site.

View this document now: NPS-TM31.00 (234 KB - PDF file)

Planning and Assessment of Best Management Practices in the Rouge River Watershed

Kelly A. Cave, Carl R. Johnson

Paper, August 2001, 18 pages, Order Number: UEF2001 *

The Rouge River National Wet Weather Demonstration Project in Wayne County, Michigan, has developed an approach to linking the performance of best management practices (BMPs) to receiving water impacts. The approach considers the various stages of the “life cycle” of BMP design and implementation, and it includes a system of performance measurements at each stage. Presented at the United Engineering Foundation at Snowmass, Colorado in August 2001.

View this document now: UEF2001 (65 KB - PDF file)

Plymouth Township Recreational Park Habitat and Recreation Project

Barry Johnson

Project Profile, December 2001, 2 pages, Order Number: RH-03 *

This project profile is a summary of the results of a grant funded effort performed with local community funding or in kind services. The summary focuses on the demonstration aspects of the project. The ARC is now able to contract for services, seek new grant funds, hire staff and manage finances.

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

View this document now: RH-03 (474 KB - PDF file)

Progress Report on Pilot Source Control Best Management Practice Project

Karen Reaume

Task Product Memorandum, January 1997, 33 pages, Order Number: NPS-TPM43.00 **

This technical report summarizes the progress made on the implementation of BMPs in the pilot source control areas. Initially, the memorandum summarized the Rouge Friendly Business and Neighborhood Programs, the program development methodology, suggested pollution control criteria and the implementation approach. The memorandum concludes by summarizing the program development for municipal BMPs, specifically roadways, parking lots and drainage systems.

View this document now: NPS-TPM43.00 (264 KB - PDF file)

Project Evaluation of the Cedar Lake Extended Detention Pond

RazikAlsaigh, Amy Ploof, and Haza Hammad

Task Product Memorandum, January 2000, 27 pages, Order Number: RPO-NPS-TPM62.00 **

Cedar Lake is a dry detention pond located in Northville Township, Wayne County, Michigan. Dry detention ponds are widely used as a stormwater management control practice in the Rouge Watershed. Cedar Lake pond was selected for demonstration to evaluate the potential use of dry detention technology as a best management practice (BMP) option throughout the Rouge Watershed. The Cedar Lake pond was monitored for a period of one year from July 15, 1995 to July 30, 1996. The purpose of this pilot monitoring project was to assess water quality conditions of runoff flowing into Cedar Lake and to evaluate its effectiveness in improving stormwater quality and attenuating peak flow rates during wet weather conditions. This report describes and summarizes the findings of this pilot monitoring effort. A summary of operation and maintenance considerations for such detention ponds is included in this report.

View this document now: RPO-NPS-TPM62.00 (91 KB - PDF file)

Receiving Water Quality Indicators for Judging Stream Improvement

Kelly A. Cave

Paper, February 1999, 21 pages, presented at a seminar on Advancements in Water and Wastewater, Ann Arbor, Michigan

The Rouge Project indicator system from the need to translate the wealth of technical data about the Rouge River and options for its management and restoration to the stakeholders involved in this river restoration effort. The Rouge Project indicator system, along with other watershed management tools developed by the Rouge Project, has aided decision-makers and the general public in evaluating options for preventing, reducing, and minimizing pollution loading impacts on the river under a watershed approach to wet weather pollution management.

View this document now: AA99-01 (547 KB - PDF file)

Regional Street Waste Transfer Facility

Barry Johnson

Project Profile, February 2003, 2 pages, Order Number: M3-10 *

The objective of the City of Livonia Regional Street Waste Transfer Facility was to design and construct a Regional Waste Transfer Facility and to determine the effectiveness this type of facility may have on eliminating waste material runoff from impacting ground and surface waters.

View this document now: M3-10 (56 KB - PDF file)

Rouge River Watershed Management Planning: The Main 3-4 Subwatershed Plan

Kelly A. Cave, Nancy J. Andrews, and James W. Ridgway

Paper, February 2002, 27 pages, Order Number: Watershed2002-01 **

The Main 3-4 SWAG established the following long-term goals:
- Improve water quality in the Rouge River and restore impaired uses.
- Remove sources of pollution that threaten public health.
- Educate the public regarding their impact on the River and the River's existing and future potential as a community asset and recreational resource.
- Improve the water quality of the river to increase recreational opportunities and remove fish consumption advisories.
- Enhance and preserve habitat, especially next to the river, for fish and wildlife compatible with subwatershed land uses.
- Reduce water volumes and velocities in the river during a storm event to minimize bank erosion and flooding.

View this document now: Watershed2002-01 (216 KB - PDF file)

Rouge River Watershed Management Planning: The Main 3-4 Subwatershed Management Plan

Kelly A. Cave, Nancy Andrews, and James Ridgway

Paper, August 2002, 7 pages, Order Number: STORMCON2002-04 **

In 1992, the EPA provided $46 million to Wayne County, Michigan to fund the development of a watershed-wide approach to addressing the problems of an urban river. In May 2001, seven Subwatershed Management Plans were submitted to the Michigan Department of Environmental Quality. This paper describes the most urban of those plans: The Rouge River Main 3-4 Subwatershed Plan.

View this document now: STORMCON2002-04 (224 KB - PDF file)

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Soil Bioengineering Techniques for the Restoration of Johnson Creek, Washtenaw County, Michigan

Project Profile, September 2000, 2 pages, Order Number: M1-05 **

The Soil Bioengineering Techniques for the restoration of Johnson Creek, a unique stream with a cold water fishery in a highly urban area, served four objectives. 1. Educate citizens within the outside of the watershed on the benefits of soil bioengineering. 2. Demonstrate the use of native plants in a residential landscape creating a riparian buffer strip. 3. Stabilize some of the banks of Johnson Creek using various bioengineering techniques, and 4. Incorporate in-stream habitat improvement to support brown trout. This project profile is a summary of the results of a grant funded effort performed with local community funding or in-kind services. The summary focuses on the demonstration aspects of the project.

View this document now: M1-05 (145 KB - PDF file)

Soil Erosion Control Blanket Project

Barry Johnson

Project Profile, November 2001, 3 pages, Order Number: M1-09 *

This project profile is a summary of the results of a grant funded effort performed with local community funding or in kind services. The summary focuses on the demonstration aspects of the project.

View this document now: M1-09 (227 KB - PDF file)

Specifications and Contract Documents for I-696/Minnow Pond Drain Swale Retrofit Construction

Supplemental Report, March 1996, 210 pages, Order Number: NPS-SR06.00 **

This document is the specifications and contract documents that accompanied the plans for the construction of the Interstate 696/ Minnow Pond Drain Swale Retrofit demonstration project. This swale retrofit project is one of the pilot Best Management Practices (BMP) projects for the Wayne County Rouge Program Office (RPO). The swale was constructed within the I-696 right-of-way next to the existing storm sewer outfall that prior to construction discharged untreated highway runoff directly to the Minnow Pond Drain. The construction of the swale will provide stormwater pollutant removal through physical filtration of runoff through the grass cover, and infiltration of runoff into the underlying soil. This document contains the details, specifications, and contract documents necessary to construct the swale to perform as designed.

Stormwater Control Using a Watershed Management Plan

Kelly A. Cave and Dale S. Bryson

Article, October 2001, 10 pages, published in "Stormwater Magazine" November-December 2001 issue

The Rouge Project and others have shown that by holistically addressing all sources of pollution, an effective action plan can be implemented to address impairments and restore river uses. An overall integrated solution that addresses the physical, chemical, and biological stressors in a waterway is the most cost-effective way to proceed. Watershed management plans provide an excellent framework to coordinate the numerous regulatory and nonregulatory programs associated with water resources management.

View this document now: SWWMP (305 KB - PDF file)

Stormwater Management for the Rouge River Watershed

Rouge River National Wet Weather Demonstration Project

Supplemental Report, October 2001, 4 pages, Order Number: NPS-SR13.00 **

This document outlines a strategy designed to develop a practical approach to reduce water quality impacts of storm water discharges to the Rouge River through the application of watershed-wide management approaches. A cooperative effort of the affected communities, state, and federal regulators, and other stakeholders in the watershed, under the auspices of the Rouge Project is outlined and includes, but is not limited to: implement a watershed-wide storm water monitoring program that will efficiently use limited resources to identify problem areas; fund demonstration and pilot projects in selected subwatersheds designed to evaluate the cost effectiveness of alternative approaches to remediate storm water pollution sources; and analyze current legal options for managing storm water.

View this document now: NPS-SR13.00 (249 KB - PDF file)

Stormwater Management in Headwaters: Identifying Sites for Conservation Easements

Barry Johnson

Project Profile, December 2001, 2 pages, Order Number: SP-12 *

This project profile is a summary of the results of a grant funded effort performed with local community funding or in kind services. The summary focuses on the demonstration aspects of the project.

View this document now: SP-12 (148 KB - PDF file)

Subwatershed Baseline Infomation: Characterization and Comparison

Michelle Van Allen, Kelly Stewart, and Jack Bails

Task Product Memorandum, November 1996, 17 pages, Order Number: NPS-TPM41.00 **

This document examines the characteristics and impairments of each of the 11 Rouge River subwatersheds. Factors were identified that will be helpful in comparing existing and potential pollution problems.

View this document now: NPS-TPM41.00 (120 KB - PDF file)

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Summary of the Subwatershed Management Plans for the Rouge River Watershed

Christine Rohrer

Technical Report, June 2002, 22 pages, Order Number: RPO-NPS-TR47 **

This document is a summary of the seven Subwatershed Management Plans that were developed as part of a comprehensive effort to restore the uses of the Rouge River impaired by pollution and excessive river flows. The purpose of these plans is to mitigate the adverse effects of pollution caused by wet weather discharges (e.g., combined sewer overflows (CSO), sanitary sewer overflows (SSO), and stormwater) as well as the effects associated with dry weather conditions (e.g., illicit discharges to separate storm sewers). The plans also outline the steps needed to control and reduce the adverse affects of excessive river flows that impair fish and wildlife values and injure riparian property. This summary will provide an overview of the information detailed in the seven Rouge River Subwatershed Management Plans developed as a requirement of the Michigan Department of Environmental Quality (MDEQ) Voluntary General Storm Water Permit (MIG610000).

View this document now: RPO-NPS-TR47 (113 KB - PDF file)

The Rouge Project: A Watershed Approach to Wet Weather Pollution Management

James E. Murray, Kelly A. Cave, Jack D. Bails, and Dale S. Bryson

Paper, September 1998, 7 pages, presented at the Third Conference on Diffuse Pollution, Edinburgh, Scotland

This paper describes the Rouge Project efforts to build institutional and regulatory framesworks necessary to accomodate a watershed approach to wet weather pollution management. Part of this framework is a new watershed-based general permit for storm water discharges issued under the federal National Pollutant Discharge Elimination System (NPDES) program. This permit is described.

View this document now: SCOTLAND9802 (1.1 MB - PDF file)

The Rouge Project: Implementing a General Storm Water Permit as Part of a Watershed Approach to Wet Weather Pollution Management

James E. Murray, Kelly A. Cave, Dale S. Bryson, and Jack D. Bails

Paper, February 1999, 15 pages, Order Number: USEPA99-01 **

This paper describes the Rouge Project efforts to build institutional and regulatory frameworks necessary to accommodate a watershed approach to wet weather pollution management. Part of this framework is a new watershed-based general permit for storm water discharges issued under the federal National Pollutant Discharge Elimination System (NPDES) program. This storm water permit program was developed jointly by the Rouge communities and state and federal regulators and is based on the concept of cooperative, locally-based storm water and watershed management.

View this document now: USEPA99-01 (120 KB - PDF file)

Upper Rouge River Subwatershed Management Plan

Rouge Program Office

Technical Report, November 2001, 96 pages, Order Number: RPO-NPS-TR31 **

The Upper Rouge River Subwatershed Management Plan was developed through the cooperative efforts of eight cities and townships, two counties, and the Michigan Department of Transportation (MDOT) with the advice and counsel of the Michigan Department of Environmental Quality (MDEQ) and the Rouge River Remedial Action Plan Advisory Council (RRAC). It is one of seven subwatershed plans developed for the Rouge River watershed under a unique state program for permitting storm water discharges. The plan was conceived as a part of the Rouge River National Wet Weather Demonstration Project (Rouge Project), funded by the United States Environmental Protection Agency (U.S. EPA). This plan provides a framework for the preparation of pollution prevention initiatives to meet state and federal water quality regulations. More importantly, the plan identifies current river conditions and proposes goals, actions, and progress measures to protect and restore the beneficial uses of the river for the residents of the subwatershed.

View this document now: RPO-NPS-TR31 (3.8 MB - PDF file)

Water Conservation and Storm Water Management Study

Fayek Zabane

Technical Report, December 1994, 43 pages, Order Number: CSO-TR06.00 **

This report examines different water conservation and storm water management measures that may be implemented in the Rouge River Watershed communities for CSO abatement. Previous studies on water conservation were reviewed and their results documented. Water conservation benefits were investigated for the City of Inkster. Results from the City of Inkster and from previous water conservation studies were used to define the overall benefits that may be obtained from implementing water conservation in the entire Rouge River Watershed. The study determined that water conservation would have little impact on the sizing of CSO detention basins and a small beneficial impact on CSO discharge volumes. If water conservation is implemented watershed-wide, it is estimated that dry weather flows to the Detroit wastewater treatment facility might be reduced by as much as 41 million gallons per day. Storm water management measures and pollution control best management practices (BMPs) are explained in detail. Feasibility of these storm water management measures was found to be dependent upon their workability in the combined sewer communities, their costs, and their direct impact on reducing wet weather flows in combined sewer systems. Communities should evaluate these measures and investigate those which are cost effective to be implemented. Potential benefits are: (1) reduction of storm water runoff entering the combined sewer system, thus reducing CSO volumes and design influent rates into CSO detention basins, and (2) improvement of water quality in CSO discharges.

Will the New Federal Phase 2 Storm Water Program Work? Test Case with Michigan's Voluntary General Storm Water Permit

Kelly A. Cave, Dale S. Bryson, and Jack D. Bails

Paper, October 1999, 15 pages, presented at WEFTEC 1999 in Noew Orleans, Louisiana

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

This paper discusses the advantages of usng the watershed approach to address storm water control. A comparison of the directions the Phase II regulations appear to be taking and the approach of the Rouge PRoject is made and discussed.

View this document now: WEFTEC99-02 (99 kb - PDF file)

Nonpoint Source Pollution

A Lake Reborn

Bill Semion

Restoration Newsletter, June 2004, 2 pages, Order Number: ALakeReborn *

A June 2004 Michigan Out-of-Doors magazine article on the restoration of Newburgh Lake.

View this document now: ALakeReborn (244 KB - PDF file)

Abandoned Dump Site Process Site Survey Summaries-Garden City Park, Joy Road Site, Maybury State Park, Sims Road Site

J. Bokovoy, J. O'Meara, E. Anderson, M. Droze, and D. Tuomari

Task Product Memorandum, December 1995, 15 pages, Order Number: NPS01D-TPM01.00 *

Field surveys were performed on four abandoned dump sites to appraise the effectiveness of the process for evaluating abandoned dump sites in the Rouge River Watershed. This process was developed as a joint effort between Wayne County Department of Environment, Michigan Department of Natural Resources (MDNR), and the EPA.

Abandoned Dump Sites Evaluation and Guidance

Project Profile, March 2004, 2 pages, Order Number: DUMP-01 *

The Rouge Project developed guidelines to demonstrate several aspects of abandoned dump remediations.

View this document now: DUMP-01 (172 KB - PDF file)

Abandoned Dump Sites Field Survey Summary

John O'Meara, Jennifer Bokovoy, and Lynn Craig

Miscellaneous Report, August 1994, 11 pages, Order Number: NPS-MM02.00 ***

This report documents field inspections of 18 abandoned dumps located along the Rouge River. The inspections were performed to identify sites suitable for leachate sampling and monitoring, and to estimate the pollutant loadings on a watershed-wide basis. Abandoned dump sites were mapped on USGS 7.5 minute quadrangle maps for incorporation into the Rouge River National Wet Weather Demonstration Project (Rouge Project) GIS database. Sites were chosen based upon proximity to the Rouge River and its tributaries, amount of available information regarding the site and size information available, and discussions with Wayne County Environmental Health Division (WCEHD) officials. Leachate seeps were observed, some of which flowed into the river or its tributaries. Some seeps unearthed wastes and/or eroded portions of the concrete lining in the channelized segments of the river. Gas seeps, stressed vegetation and insufficient fill cover were observed at several sites. The report provides a summary on each site visited. The appendix contains 98 pages of summary tables, maps and field sketches, and field log sheets.

Abatement of Agricultural Runoff

Project Profile, July 2000, 2 pages, Order Number: M1-15 *

The Abatement of Agricultural Runoff Project served two objectives: 1) Promote wise land use decisions, focusing on nutrient management based upon soil capabilities and crop nutrient needs, and 2) Implement conservation practices that can provide water quality benefits in predominantly agricultural land use areas. This project profile is a summary of the results of a grant funded effort performed with local community funding or in-kind services. The summary focuses on the demonstration aspects of the project.

View this document now: M1-15 (151 KB - PDF file)

Air Deposition Studies: A Review of Air Deposition Literature

Amarjit Sidhu

Technical Memorandum, September 1994, 22 pages, Order Number: NPS-TM03.00 ***

This document presents a summary of the available literature on the topic of wet and dry air deposition and makes recommendations for the design and implementation of air deposition studies to study the water quality of the Rouge River. Detailed summaries of the literature are provided. The information collected will be used to design ambient air monitoring and sampling, analysis, and data reduction parameters for implementation in the next phase of the Rouge Project.

View this document now: RPO-NPS-TM03.00 (90 KB - PDF file)

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Analysis for Newburgh Lake Sediment Demonstration Activities

Jennifer Bokovoy & John M. O'Meara

Task Product Memorandum, December 1994, 7 pages, Order Number: NPS-TPM20.00 ***

The effects of different techniques for the collection, treatment, and disposal of contaminated sediment will each have an inherent potential liability associated with them. This is particularly true with the final disposal process. This analysis is based on the assumption that removal and transportation liabilities will be similar regardless of the recommended disposal method. Disposal methods and a summary of the intended demonstration activities for Newburgh Lake are presented in this report.

View this document now: RPO-NPS-TPM20 (52 KB - PDF file)

Conclusion & Recommendations of the Groundwater Study Group

Louis C. Regenmorter

Task Product Memorandum, November 1996, 11 pages, Order Number: NPS-TPM39.00 **

This report investigates the availability of data and information to define groundwater quality and its presence within the Rouge Watershed.

View this document now: RPO-NPS-TPM39.00 (42 KB - PDF file)

Contaminated Sediments Characteristics and Collection/Removal

John O'Meara & Kelly Cave

Technical Memorandum, August 1994, 24 pages, Order Number: NPS-TM05.00 ***

This paper summarizes existing dredging technology, and is the first in a series on the collection, treatment and disposal options for remediating the contaminated sediment in the Rouge River impoundments. The report discusses characteristics of the sediments found in the Rouge River, and summarizes two published reports discussing the sources of the sediment contamination: the "Rouge River Basin Remedial Action Plan" and "MDNR Surface Water Quality Division 1992 Sediment Survey." The collection and removal component of the remediation process is presented. Descriptions and anticipated results of conventional collection and removal technologies using cutterhead, clam shell, hopper, and matchbox dredges are presented. New and innovative options will be studied before a final selection of the dredging method will be made. Figures, maps and references are included.

Contributions to Surface Water Quality of Atmospheric Deposition in Rouge River Watershed

Nicola Pirrone, Gerald Keeler, Thomas B. Brown, & Mark Mikesell

Technical Memorandum, July 1994, 22 pages, Order Number: NPS-TM20.00 ***

Atmospheric deposition of trace contaminants in urban areas is considered the major diffuse source of loading to urban stormwater. Ambient air concentration data collected at several sampling stations in Wayne County were used to assess these trends over the period from 1982 to 1992. Samples were collected at seven sampling stations situated in residential, commercial, and industrial areas of Wayne County. Analyses were performed by the Wayne County Health Department to determine the ambient concentrations of iron, zinc, lead, nickel, chromium, cadmium, beryllium, and mercury. Analysis of the data shows that the overall variations in dry deposition flux of trace metals to the surface are controlled by the dry deposition velocity, a parameter computed by the authors' model. The dry deposition flux for trace metals associated with smaller particles (zinc, lead, nickel, cadmium, beryllium) is significantly lower than the corresponding ambient concentrations. For metals (e.g. iron) associated with larger particles, the flux is greater than the ambient concentration. The historical trends are upward for iron, lead, chromium, and beryllium, and upward for zinc, nickel, and mercury.

Development of Recreational Risk-Based Clean Up Criteria

Technical Memorandum, December 2000, 37 pages, Order Number: RPO-NPS-TM19 **

This document presents the generic recreational cleanup criteria for direct contact (i.e. dermal contact and incidental ingestion) with soil. These criteria are useful in determining acceptable concentrations of hazardous substances in soil that are protective of human health through exposure pathways characterized by standard assumptions.

View this document now: RPO-NPS-TM19 (676 KB - PDF file)

Field Reconnaissance Plan for Abandoned Fill Survey

Joseph O'Brien and Dennis Prevo

Field Sampling Plan, November 1993, 5 pages, Order Number: NPS-FRP-01.02 ***

A detailed plan is presented for conducting field inspections of up to 20 abandoned landfills and/or dumps along the Rouge River. Fill areas suitable for leachate sampling and monitoring is determined. Each fill area is inspected for the following characteristics: type of hydraulic connection; slope, surface area, and other drainage features; depth of fill; waste types; surrounding land use and land cover; potential pollutant source locations; visible signs of erosion; and potential for future leachate sampling. Locations of fill areas will be mapped on United States Geological Survey (USGS) 7.5 minute quadrangle maps, and entered into the Rouge River Geographic Information System (GIS) database. Samples of field log sheets are included.

View this document now: RPO-NPS-FRP-01.02 (55 KB - PDF file)

Guidelines for Closure of Abandoned Dump Sites

Zachare Ball, Rhonda Berger, Tom Cok, Rose Ellison, Beth Gotthelf, Jon Hansen, Steve Hoin, Joan Lintelman, Mark Mikesell, Dan Rogers, Mary Vanderlaan, & Brad Venman

Technical Report, November 2004, 311 pages, Order Number: RPO-NPS-TR11 **

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Abandoned dump sites have been revealed at numerous locations in the Rouge River Watershed. Many are located in the flood plain of the Rouge River. Therefore, one aspect of the Rouge River National Wet Weather Demonstration Project has been to evaluate the expected loads to the Rouge River from abandoned dump sites located in the watershed and assess potential load reduction from nonpoint source control efforts. This document has been developed to describe a generic process to provide guidance for the investigation and closure of abandoned dump sites with recreational land use. Limited recreational risk-based closures for abandoned dump sites will focus on eliminating or minimizing the pathways for exposure to the public and the environment.

View this document now: RPO-NPS-TR11 (2.8 MB PDF file)

Guidelines for Conducting an Outfall Inventory

Robert Gignac, Bryan Alexander & Ashraf Ibrahim

Technical Memorandum, June 1997, 25 pages, Order Number: NPS-TM21.00 **

Outfall inventory techniques have been performed from August 1996-December 1996 within the Bell Branch/Tarabusi Creek tributaries of the Rouge River Watershed. These techniques have been evaluated to help communities more accurately define outfall information for future use in the preparation of stormwater discharge permits, and industrial discharges, as well as conducting river model calculations.

View this document now: NPS-TM21.00 (103 KB - PDF file)

Middle 1 Subwatershed Management Study

Karen Gallagher, Douglas Denison, & Don Tilton

Technical Memorandum, November 1997, 67 pages, Order Number: NPS-TM23.00 **

The Middle 1 Subwatershed Management Study, prepared by the RPO and funded by the Rouge Project, describes and illustrates issues associated with the Subwatershed, including: state of the Subwatershed; vision and goals for the future; current 1997 stormwater management activities within the Subwatershed; alternative actions to preserve and protect the Subwatershed water quality and character; anticipated benefits of the actions; institutional and financing options; and progress assessment and monitoring opportunities.

View this document now: NPS-TM23.00 (192 KB - PDF file)

Middle Rouge Detention Basin Inventory

Dennis Prevo

Technical Memorandum, August 1994, 25 pages, Order Number: NPS-TM27.00 ***

Locations and specifications of the 259 detention basins in the Middle Rouge River Subwatershed are documented. Each detention basin was studied to determine specific characteristics: tributary drainage area, surface area of basin, total volume, inches of storage over the tributary area, permanent pool volume, permanent pool depth, inlet/outlet pipe diameter, and tributary land use. A short summary of urban watershed BMPs for controlling storm water pollution is included. Tables are also included.

Newburgh Lake Basis of Design

John O'Meara, Michael Tomlinson, Jim Poppleton, Mark Mikesell, & John Michalski

Technical Report, April 1996, 89 pages, Order Number: NPS-TR09.01 **

Newburgh Lake is an impoundment in the Rouge River Watershed. The lake is located on the Middle Rouge River in the City of Livonia, and is part of the Wayne County Park System's Edward Hines Parkway. Newburgh Lake was created in the early 1900s and sediments have accumulated. Some of these sediments contain toxic pollutants that can result in a human health hazard. The Newburgh Lake Restoration Project has set out to restore the Lake's recreational uses, and address the needs and desires of the public by eliminating these contaminated sediments.

View this document now: RPO-NPS-TR09.01 (5 MB - PDF file)

Newburgh Lake Restoration

Project Profile, April 1999, 2 pages, Order Number: NL-00 **

Newburgh Lake had offered recreational opportunities, but this resource suffered from various problems. Since Newburgh Lake was created in the early 1900s, sediments have accumulated. These sediments, some contaminated with pollutants, have significantly degraded the recreational quality of Newburgh Lake. Shallow water depths resulting from the sediment accumulation and nutrient-rich water have led to excessive growth of aquatic plants. Moreover, some of these sediments contain toxic contaminants such as polychlorinated biphenyl's (PCBs) that have entered the food chain and are currently present in the fish. These contaminated fish result in a potential human health hazard associated with fish consumption. To eliminate this possible hazard, it was necessary to remove the contaminated sediments.

View this document now: NL-00 (32 KB - PDF file)

Nonpoint Source Data Assessment and Field Investigation

Thomas F. Quasebarth, Kelly A. Cave, Richard A. Wagner, Douglas Denison, Mark D. Mikesell, & Amarjit Sidhu

Technical Report, August 1994, 85 pages, Order Number: NPS-TR03.00 ***

This report reviews available existing data developed under local and national NPS programs and identifies data gaps that will be addressed under the Rouge Project. Available data sources include 208 Programs, the Rouge River Remedial Action Plan (RAP), the Nationwide Urban Runoff Program (NURP) and other ongoing nonpoint studies. Data derived from these sources as well as the proposed Rouge Project field investigations will serve as the basis for developing a cost-effective nonpoint source control program that can be implemented watershed-wide. The field investigations will include monitoring programs performed at pilot sites to quantify nonpoint sources of pollution, and water quality improvements that can be achieved by structural and nonstructural BMPs. The field investigations will also serve to establish the relative costs associated with construction and O&M of various prototype BMPs. Literature reviews were conducted of urban storm water sources and controls, and air deposition sources. The report also summarizes significant local and national programs. Contaminated sediments and abandoned dumps affecting the

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river are presented along with pilot study, field investigation and data analysis plans. Tables and figures are included; an 80 page appendix is also included.

View this document now: NPS-TR03.00 (3.3 MB - PDF file)

Pebble Creek Erosion and Sedimentation Control Study

City of Farmington Hills

Community Project, October 1998, 36 pages, Order Number: CP-SP10-02.00 **

The objective of the Pebble Creek Erosion and Sedimentation Control Study was to improve the effectiveness of Erosion and Sedimentation Control (ESC) on residential construction sites. Controlling construction site erosion and sedimentation is critical to maintaining water quality in the Rouge Watershed. This study not only pilot tested methods and products that may be used to enhance erosion and sedimentation control programs, but also compiled resource information. The report includes sections on currently utilized and implemented ESC measures, field investigation results on the effectiveness of the ESC products/methods studies, improvement opportunities including structural and non-structural ESC methods to minimize the impacts of residential construction, conclusion and recommendations for improving the local ESC process for residential construction projects, and others. Volume II of the report is a resource guide that summarizes information compiled during the project on current erosion and sedimentation control practices on the market today. It is intended as a field application resource.

View this document now: CP-SP10-02.00 (238 KB - PDF file)

Pilot Best Management Practice Projects (319 Grant)

Kelly A. Cave, Razik Alsaigh, Christine Pomeroy, & Douglas Denison

Technical Report, January 1996, 235 pages, Order Number: NPS01A-TR02.01 **

This report describes the development of the pilot best management practice (BMP) pollution control projects, their implementation, and information gained through the pilot studies. Best management practices chosen for pilot study include structural, wetland and source control activities.

View this document now: NPS01A-TR02.01 (2.8 MB - PDF file)

Pilot Source Control Assessment and Prioritization

Kelly A. Cave, Karen G. Reaume, John Aldrich, & Christine Pomeroy

Technical Report, January 1996, 264 pages, Order Number: NPS-TR08.00 **

This report summarizes pilot source control programs that will define and evaluate the effectiveness of the maximum extent practicable program of source control best management practices. First, the report summarizes current knowledge about pollutants that impair the uses of the Rouge River and significant, controllable sources of these pollutants. Then, five pilot source control areas are selected and a demonstration program of source control BMPs is defined for each site. Data derived from the pilot source control programs will serve as the basis for a cost effective program that can be implemented watershed wide.

View this document now: NPS-TR08.00 (5.3 MB - PDF file)

Preliminary Pollution Loading Projections for Rouge River Watershed and Interim Nonpoint Source Pollution Control Plan

Kelly Cave, Eric Harold, & Tom Quasebarth

Technical Report, February 1996, 177 pages, Order Number: NPS-TR07.00 **

This report details the preliminary pollution loading projections obtained from collected data which is used to assess the load reductions that can be achieved under various control strategies within the Rouge River Watershed. The report compares land use based pollutant loadings with projected base flow, point source, and combined sewer overflow (CSO) loadings, summarizes current source and treatment pollution control strategies for use in the Rouge River Watershed, assesses the expected impact of selected storm water and CSO pollution control scenarios on reducing loadings to the Rouge River, and presents an interim NPS control plan for the Rouge River Watershed.

View this document now: NPS-TR07.00 (4.2 MB - PDF file)

Process for Abandoned Dumps in the Rouge River Watershed

J. Bokovoy, J. O'Meara, E. Anderson, & M. Droze

Miscellaneous Memorandum, January 1996, 20 pages, Order Number: NPS01D-MM01.00

This document looks at how areas within the Rouge River Watershed were filled in under past practices with solid and/or industrial waste. The process document was developed by a joint effort of EPA, MDEQ, and Wayne County, to provide a basic mechanism by which the Rouge River Watershed can be addressed, and provided for an initial attempt at a systematic approach. The document provides a flow chart of steps, some of which include identification record review, site visit/site screening, sampling and standard clean ups. The Process for Evaluating Abandoned Dump Sites document was developed prior to the enactment of Part 201 of the Natural Resources and Environmental Protection Act, 1994, PA451. Based on the changes in Michigan's environmental regulations, the actual process will be revisited and future versions may include several key elements of this original document.

Process for Evaluating Abandoned Dump Sites Field Sampling Plan

Jennifer Bokovoy

Field Sampling Plan, January 1996, 40 pages, Order Number: NPS01D-FSP01.00 **

This Field Sampling Plan (FSP) specifically addresses the quality assurance requirements of the abandoned dump site sampling program to be conducted under the Rouge Project. The sampling program is part of the "Process for Evaluating Abandoned Dump Sites in the Rouge River Watershed." The purpose of the sampling component is to identify probable pollutants existing at the abandoned dump sites and to identify if further investigation at the individual site is needed. Sampling

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activities to be performed at the individual dump sites may include seepage, groundwater, sediment, instream water or soil sampling. Specific on-site conditions are examined to determine the extent and type of sampling frequency, sampling methods for the various possible media, field documentation requirements, sample designation, and sample handling and shipping.

Sediment Remediation Techniques: Review of Existing References with Application to Newburgh Lake

John M. O'Meara

Task Product Memorandum, December 1994, 7 pages, Order Number: NPS-TPM19.00 ***

The Rouge Project NPS Pollution Control work effort has been exploring different options for remediating Newburgh Lake sediments and restoring the lake's water quality to allow recreational use (e.g., boating, swimming, fishing). Identification of the contaminated sediments and an accurate bathymetric survey were the first two steps taken to develop this program. The next steps require the development of a mechanism for the removal and ultimate disposal of both contaminated and "clean" sediments. This task product memorandum presents a summary of the investigative work performed on Newburgh Lake followed by a brief review of the three main contaminated sediment remediation handbooks published by the United States Army Corps of Engineers (USACOE) and the United States Environmental Protection Agency (EPA). The proposed remediation options for the demonstration activities at Newburgh Lake are also presented. Appendices contain a total of 18 pages.

View this document now: RPO-NPS-TPM19 (52 KB - PDF file)

Significant Components of Urban Pollutant Loads--Crossing the Final Hurdles for Achieving Water Quality Standards

Flora M. McCormack, & James W. Ridgway

Paper, October 1994, 10 pages, Order Number: WEFTEC94-05 **

NPS pollution control has failed to realize the same reductions as point source pollution because a number of impediments remain in the implementation of an effective NPS program. This paper provides a brief summary of past nonpoint studies in southeast Michigan, the impediments which have prevented implementation, and some alternatives for overcoming these obstacles. The impediments identified by the Rouge Project are not technical, but rather institutional. The Rouge Project recognizes that implementation of NPS controls are best handled at the local level but the motivation to local governments, industries, and residents is not sufficient to initiate controls. The Rouge Project will therefore attempt to forge a consensus between the regulators and the public in general to develop a holistic or consensus-based approach to NPS control and pollution prevention.

View this document now: WEFTEC94-05 (30 KB - PDF file)

Soil Erosion: A Study of Current Practices (video)

City of Farmington Hills

Community Project, October 1998, Order Number: CP-SP10-01.00 **

The objective of the Pebble Creek Erosion and Sedimentation Control Study was to improve the effectiveness of Erosion and Sedimentation Control (ESC) on residential construction sites. Controlling construction site erosion and sedimentation is critical to maintaining water quality in the Rouge Watershed. A project video that presents the highlights of the project and specific recommendations for ESC on residential construction sites was developed. This video is available as a teaching tool to introduce different types of ESC methods and practices to others.

Strategies to Address On-Site Sewage System Problems

Barry Johnson

Task Product Memorandum, October 1998, 60 pages, Order Number: NPS-TPM54.00 **

Surveys performed by Oakland County and Wayne County Health Departments found failure rates of onsite sewage disposal systems (OSDS) between 21 percent and 52 percent in communities in their counties. The failures of OSDS contributes to nonpoint pollution and has contributed to the failure to meet surface water quality standards. A review of other efforts to address the regular evaluation and maintenance of OSDS was performed. This search revealed five different ways that communities, utilities and private groups had developed approaches to assure that OSDS were reviewed on a regular basis. This material was shared with local health department personnel, and the Rouge Remedial Action Committee, subcommittee on OSDS. These groups developed a model ordinance and a guidance document to address the regular evaluation and maintenance of OSDS. This material has been made available to communities and has been supported for use to comply with the general storm water permit issued by the Michigan Department of Natural Resources. That permit requires that communities minimize seepage of septic systems into the communities storm water drainage system. The model and supporting information provide a method to minimize the seepage of septic systems into storm drains and surface water.

View this document now: NPS-TPM54.00 (284 KB - PDF file)

Summary of Waste Disposal Sites

John O'Meara & Dennis Prevo

Technical Memorandum, July 1994, 8 pages, Order Number: NPS-TM11.00 ***

A summary of the initial efforts to collect existing data on waste disposal sites along the Rouge River is presented. Preliminary field investigations were conducted, and a literature and/or file search was performed at WCEHD, Oakland County Health and Planning Divisions, and both the Waste Management and Environmental Response divisions at the MDNR. A total of 112 regulated active and inactive landfills or unregulated dumps were located in Wayne and Oakland counties. The field investigations revealed evidence of exposed waste along the river and its tributaries, leachate seepages, and cuts into the fills by meandering of the river bed. Literature and file searches focused on information for abandoned sites which might indicate potential sources of pollution to the Rouge River. The searches identified data relating ground water quality, monitoring results, flow direction, soil types, drilling activities, site maps, and photographs. It should be noted that information was not available for many of the abandoned sites. Individual site summaries and photographs are included.

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Wayne County Newburgh Lake Restoration Project Final Construction Report

Technical Report, January 1999, 37 pages, Order Number: RPO-NPS-TR38.00 **

Selected sections from the Newburgh Lake Restoration Project Final Construction Summary Report are included in the file below. The construction phase of the Newburgh Lake Restoration Project began in April 1997 and continued through October 1998. The most challenging phase of the project was the excavation and removal of 558,000 tons of sediments, much of which was contaminated with PCBs. Beyond sediment removal, 7 acres of fish spawning beds and habitat structures were built throughout the lake bottom; 10 acres of beneficial aquatic vegetation were planted in a constructed shoal area; 28,000 pounds of PCB contaminated fish were eradicated and removed from the lake and its adjacent waterways; over 30,000 fish of various species were restocked; and numerous shoreline and infrastructure upgrades were made to enhance the recreational use of the surrounding park area.

View this document now: RPO-NPS-TR38.00 (5.1 MB - PDF file)

Computer Modeling

Approach to Simulating the Water Quantity and Quality in the Rouge River
Determination of Impervious Area and Directly Connected Impervious Area
Development and Preliminary Simulations of the Rouge River Water Quality Models
Main Rouge Dissolved Oxygen Modeling Status/Observations
Middle 1 Subwatershed SWMM Modeling for Subwatershed Management Plan Development
Middle 3 Subwatershed SWMM Modeling for Subwatershed Management Plan Development
Model Review and Assessment
Modeling Subwatershed/Subarea Delineations
Pebble Creek Storm Water Modeling and Priority Improvements
Percent Treated Analysis of Demonstration Combined Sewer Overflow Control Facilities
Preliminary Pollution Loading Projections for Rouge River Watershed and Interim Nonpoint Source Pollution Control Plan
Selection of Stormwater Pollutant Loading Factors
Upper 2 Subwatershed SWMM Modeling for Subwatershed Management Plan Development
User's Manual: Watershed Management Model (WMM) for Windows
WMM for Windows Information and Install Files

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Watershed Management

The early focus of the Rouge Project was on the control of Combined Sewer Overflows (CSOs). The CSOs in the Rouge watershed are primarily located in the older urban core, downstream portion of the Rouge Watershed. Within two years of the first sampling conducted under the Rouge Project, it became evident that sources of pollution upstream of the CSOs were a major contributor to the impaired uses observed in the river. Storm water runoff and illicit discharges to separate storm water systems were identified as a major source of pollutants entering the river. Without efforts to address these issues, the major capital investments to control CSOs in downstream areas would not result in significant improvements in water quality or beneficial uses of the river. Later studies revealed the need to control storm water runoff to reduce the frequency, volume and velocity of flood flows in the river. These excessive flows, following wet weather events, were shown to be responsible for significant impairments to aquatic habitat and riparian properties. As a result of these findings efforts under the Rouge Project expanded and shifted to take a more holistic and complete watershed approach.

At the heart of the watershed management approach developed under the Rouge Project was the Michigan Voluntary Watershed- Based General Storm Water Permit. This voluntary permit established the process for developing watershed management plans to address the control of storm water and other sources of pollution and beneficial use impairments. Implementation of this voluntary permit, by the Rouge communities, began five years in advance of the 2003 Michigan General Storm Water Permit that made storm water management permits mandatory for the urbanized communities across the State of Michigan.

Another major accomplishment of the Watershed Management Approach within the Rouge watershed was the formation of the Alliance of Rouge Communities (ARC). This entity was formed under the provisions of Part 312 Watershed Alliances, Natural Resources and Environmental Protection Act as amended by Public Act 517, 2004. The ARC is now coordinating collaboration efforts within the Rouge watershed to assist its members in complying with the storm water permit requirements and restoring the beneficial uses of the River.

Overview Materials

Overview of Watershed Management for the Rouge River
Institutional and Financial Arrangements
Other Watershed Management Information

Demonstration Projects

Ordinances, Management Plans, and Institutional Projects

Downspout Disconnection Program - Main 3/4 (RIIA-20)

City of Dearborn

Project Profile/Report, January 2005, 4 pages, Order Number: RIIA-20

The purpose of this project is to aid and encourage city residents to disconnect roof downspouts that presently connect to combined sewers. The objectives of this start-up program are: 1) study relevant community ordinances to develop a draft ordinance covering downspout disconnection; 2) survey homes to determine downspout connection status; and 3) start a program encouraging residents to voluntarily disconnect their downspouts by reimbursing them $20 per downspout, with a maximum of $60 per household. The goal is to disconnect 400 households in the first year of this program

View this document now: RIIA-20 (120 KB, PDF file)

Garden City Stormwater Ordinances, Storm Sewer System Base Map, Initial Implementation of Illicit Discharge Elimination & Public Education Plans Project (SW-05)

Garden City

Project Profile/Report, May 2001, 81 pages, Order Number: SW-05

The project implemented storm water management activities associated with coverage under the Michigan Department of Environmental Quality General Storm Water NPDES Permit. Project activities created better storm water management and the concurrent reduction of storm water pollution loading into the Rouge River.

View this document now: SW-05 (2.3 MB, PDF file)

Headwater Protection & Stormwater Management Program for Salem Township (M1-06)

Washtenaw County Drain Commissioner

Project Profile/Report, December 2008, 65 pages, Order Number: M1-06

GIS and modeling were used to establish stormwater management standards, runoff rates, and assist with determining ordinance language.

View this document now: M1-06 (1.2 MB, PDF file)

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Inkster Stormwater Ordinances, Implementation of Illicit Discharge Elimination & Public Education Plans Project (SW-06)

City of Inkster

Project Profile/Report, March 2002, 2 pages, Order Number: SW-06

The project implemented stormwater management activities that are associated with coverage under the Michigan Department of Environmental Quality General Stormwater NPDES Permit.

View this document now: SW-06 (KB, PDF file)

Lower 1 Wetland Resource Protection Plan (WET-01)

Canton Township

Project Profile/Report, February 2001, 89 pages, Order Number: WET-01

The Lower 1 Wetland Resource Protection Plan Project developed a subwatershed-wide wetland resource protection plan for the Lower 1 subwatershed. This wetland inventory was used as a basis for evaluating wetland value and assigning a relative value to the wetlands in the subwatershed.

View this document now: WET-01 (901 KB, PDF file)

Municipal Stormwater Planning & Renovation (SP-05)

City of Southfield

Project Profile/Report, December 2001, 11 pages, Order Number: SP-05

The municipal stormwater control program was renovated through the implementation of innovative structural and F & I controls. A stormwater utility for ongoing management of stormwater control issues was established.

View this document now: SP-05 (401 KB, PDF file)

Pebble Creek Subwatershed Stormwater Drainage Master Plan (SW-11, URBSW7.8)

Charter Township of West Bloomfield & City of Farmington Hills

Project Profile/Report, December 2001, 69 pages, Order Number: SW-11

The Charter Township of West Bloomfield and the City of Farmington Hills developed a Stormwater Drainage Master Plan for a pilot area, the Pebble Creek subwatershed. The project addressed flow, water quality, ordinance review, public education and illicit discharge elimination throughout the communities. The project resulted in a plan that focuses on flow control and best management practices that incorporate water quality improvements.

View this document now: SW-11 (10.1 MB, PDF file)

Sustainable Water Resources Management & Public Education Plan (SN2-06)

Cranbrook Educational Community

Project Profile/Report, November 2002, 23 pages, Order Number: SN2-06 |

This project provided an environmental characterization report of the area around Cranbrook, established a baseline monitoring program for the hydrologic ecosystem, developed a master plan for restoration of the hydrologic system, developed comprehensive sustainable site plan guidelines for the campus, prepared a plan for a new wetland to receive storm water, prepared plans so Grotto Lake can become a treatment wetland for stormwater, and provided for additional stormwater storage.

View this document now: SN2-06 (635 KB, PDF file)

Pollution Prevention

Abatement of Agricultural Runoff (M1-15)

Wayne/Washtenaw County Conservation Districts

Project Profile/Report, October 1998, 13 pages, Order Number: M1-15

The project conducted soil testing and developed and published conservation plans. Informative meetings were held with farmers to discuss farming practices. Woodlot management practices were also examined.

View this document now: M1-15 (219 KB, PDF file)

Business Waste Audit Program (RV-16)

Resource Recovery and Recycling Authority of Southwest Oakland County (RRRASOC)

Project Profile/Report, August 2007, 18 pages, Order Number: RV-16

This project consisted of performing waste audits of local businesses located in the Rouge River Watershed. Businesses were informed of proper ways to recycle

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

and/or dispose of hazardous wastes.

View this document now: RV-16 (648 KB, PDF file)

Commercial Lawn Maintenance Workshop (RIIA-25)

City of Wixom

Project Profile/Report, October 2001, 4 pages, Order Number: RIIA-25

The City of Wixom hosted a workshop, open to the public, in Spring of 2001. All materials used for the workshop were compiled into a "print-ready" package that was distributed to all Middle One SWAG members to use in their own communities after the completion of the workshop. The materials encourage subwatershed-wide action towards River-friendly "commercial" lawn care.

View this document now: RIIA-25 (117 KB, PDF file)

East Lincolnshire Subdivision SSO Elimination Phase 1 (RIIA-08)

City of Farmington Hills

Project Profile/Report, Project Number: RIIA-08

This project will eliminate Sanitary Sewer Overflows (SSOs) to the Rouge River from the Lincolnshire Skye Pump Station in Farmington Hills.

Golf Course Maintenance Program (U2-02)

Redford Township
Project Profile/Report, Project Number: U2-02

Problems associated with the use of river water for golf course irrigation were evaluated. A model program for golf course maintenance was developed to minimize impacts of receiving waters.

Instream Dissolved Oxygen Augmentation (RIIB-22)

City of Dearborn

Project Profile/Report, February 2005, 60 pages, Order Number: RIIB-22

This project administered dissolved oxygen to portions of the Rouge River. By administering large quantities of dissolved oxygen, dissolved oxygen deficiencies associated with combined sewer overflow episodes could be mitigated, thus improving habitat.

View this document now: RIIB-22 (2.6 MB, PDF file)

Livonia Regional Waste Transfer Facility (M3-10)

City of Livonia

Project Profile/Report, February 2003, 6 pages, Order Number: M3-10

This report describe the process for the closing of a landfill in Livonia.

View this document now: M3-10 (309 KB, PDF file)

Rouge River Gateway Partnership Master Plan Implementation 2004-2005 (RV-11)

University of Michigan - Dearborn

Project Profile/Report, 2005, 15 pages, Order Number: RV-11

This project commented on the success of the Rouge River Gateway Partnership Master Plan Project. Highlights included ecosystem rehabilitation, restoration projects, and storm water management projects in Rouge River communities.

View this document now: RV-11 (2.2 MB, PDF file)

Site Conservation Easements (SP-12)

Superior Township

Project Profile/Report, October 1998, 58 pages, Order Number: SP-12

This project identified potential conservation easements adjacent to the Rouge River and its tributaries.

View this document now: SP-12 (196 KB, PDF file)

Recreation and Habitat

Carpenter Lake Fisheries Management (RVIIB-13)

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

City of Southfield

Project Profile/Report, November 2007, 27 pages, Order Number: RVIIB-13

This project included a treatment program (methods, field setup, draw down, fish removal, fish sorting) and the results of the fish removal program.

View this document now: RVIIB-13 (5.2 MB, PDF file)

Carpenter Lake Restoration Project (RV-28)

City of Southfield

Project Profile/Report, January 2008, 25 pages, Order Number: RV-28

This project rehabilitated Carpenter Lake for purposes of storm water management, public recreation, and wildlife habitat. Activities included the removal and replacement of a dam, sediment removal, improved aesthetics, and establishment of wildlife features in the lake.

View this document now: RV-28 (2.3 MB, PDF file)

Detroit Parkland Improvement Project (SP-88, part of URBSW7.4)

City of Detroit

Project Profile/Report, June 2003, 30 pages, Order Number: SP-88

This project combines the three previously awarded projects: Rogell Drain Stabilization, Eliza Howell Park Maintenance, and a Rouge Park project for creation of a native/wildflower area interspersed with wetlands. The Rogell Drain uses bioengineering techniques for streambank stabilization. The Eliza Howell project developed and implemented a Rouge River friendly park maintenance program. The Rouge Park project established a native prairie and wildflower area interspersed with wetland areas.

View this document now: SP-88 (1.2 MB, PDF file)

Ford Park Passive Recreation Project (M1-14)

City of Northville

Project Profile/Report, February 1999, 10 pages, Order Number: M1-14

The project restored recreational activities in a park, focusing on ecology, integration of water, education program, pedestrian river walk, and native plantings.

View this document now: M1-14 (378 KB, PDF file)

Gateway Corridor Greenway - Outer Drive to Evergreen Road (RIIB-12)

Wayne County Parks

Project Profile/Report, December 2003, 5 pages, Order Number: RIIB-12

Wayne County Parks intends to extend the public greenway and path associated with Edward Hines Park. Design and engineering services were provided for a trail from Outer Drive to Evergreen Road. The project included the collection of existing data, design development, survey/geotechnical work, a Phase I environmental site assessment, and the preparation of construction documents.

View this document now: RIIB-12 (139 KB, PDF file)

Habitat Evaluation (M1-12)

Friends of the Rouge

Project Profile/Report, March 1999, 4 pages, Order Number: M1-12

An inventory of critical habitat was conducted and public awareness and involvement was increased.

View this document now: M1-12 (159 KB, PDF file)

Interpretation and Educational System along Tonquish Creek (RH-03)

Plymouth Township

Project Profile/Report, January 2001, 13 pages, Order Number: RH-03

A barrier-free walkway trail system that provides access along the creek to an existing pond and a proposed fishing platform was installed. Habitat plantings define and enhance wildlife use areas adjoining the creek. Interpretive stations were installed along the walkway, incorporating the creek, wetlands and upland areas to show elements in stormwater and river ecology.

View this document now: RH-03 (556 KB, PDF file)

Interpretive Wetland Recreational Trail at Visteon Village (RIII-21)

Van Buren Township

Project Profile/Report, December 2004, 14 pages, Order Number: RIII-21

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

This project constructed a state-of-the-art passive recreational and interpretive area within a historically important wooded wetland complex. The recreational trail winds thrgouhg feature ecosystems as determined by an ecological inventory, and showcases native forest communities, amphibian and avian species habitat, profiles of native soils, and other aspects of the unique woodland. Portions of this trail include raised boardwalk over wet areas, as well as overlooks and outdoor classroom areas where trail users can sit, rest, observe and work. Educational and interpretive structures include progressive signage that tells the story of the forested wetland ecosystem and how it uniquely relates to the larger watershed.

View this document now: RIII-21 (806 KB, PDF file)

Lower Rouge River Log Jam Inventory and Maintenance Project (RXB-05)

Canton Township

Project Profile/Report, December 2010, 5 pages, Order Number: RXB-05

The goals of this project included both passive and active recreational opportunities, along with development of an inventory for log jam removal and maintenance. While there are many documented benefits of log jams such as flow reduction, there are also many harmful effects. In many cases, log jams were causing severe erosion and property damage to riparian areas. This grant provided the resources to ensure the proper maintenance of obstructions in the river adjacent to the Lower Rouge Trail and helped to enhance the recreational opportunities of this area.

View this document now: RXB-05 (87 KB, PDF file)

Lower Rouge River Recreation Trail and Bridges Project (RIXB-03)

Canton Township

Project Profile/Report, December 2010, 13 pages, Order Number: RIXB-03

The goal of this project is for pedestrian trail construction and the purchase and installation of two footbridges over the Lower Rouge River in Canton. The trail section and two bridges would connect directly to the Canton Lower Rouge River Trail, which was built in part with a recent National Wet Weather Demonstration Project grant. Ultimately, the Canton Lower Rouge River Regional Trail will connect to the I-275 bicycle path and the Lower Rouge River Regional Trail segment to be constructed in the City of Wayne.

View this document now: RIXB-03 (908 KB, PDF file)

Outdoor Lab & Interactive Trail Systems for BMP (M1-13)

Salem-South Lyon Schools

Project Profile/Report, June 1999, 41 pages, Order Number: M1-13

An outdoor lab and interpretive trail system for viewing best management practices (BMPs) was developed. These activities compliment the science curriculum and recreational use at the schools.

View this document now: M1-13 (151 KB, PDF file)

Oxbow Restoration Project Design & Preparation (SW-16)

Henry Ford Museum and Greenfield Village

Project Profile/Report, July 2001, 4 pages, Order Number: SW-16

The storm water collection system was rehabilitated using best management practices. A major storm drain was redirected from direct discharge for the river into a wetland habitat in the area of the former Oxbow area. This creates a healthy habitat for fish and wildlife. Preliminary designs for the restoration were prepared and the costs for each design component was developed.

View this document now: SW-16 (140 KB, PDF file)

Northville Bennett Arboretum Pathway Project (RXB-01)

Northville Township

Project Profile/Report, January 2012, 10 pages, Order Number: RXB-01

The Bennett Arboretum Pathway is compiled of at-grade asphalt path, elevated boardwalk, a pedestrian bridge, and porous concrete path. It connects Northville Township to the City of Northville, providing access into the Bennett Arboretum and Hines Parkway. The pathway is along the east side of Sheldon Road, between Six Mile Road and Seven Mile Road. The project includes participation from Northville Township, the City of Northville, and Wayne County.

View this document now: RXB-01 (1 MB, PDF file)

Quarton Lake and Springdale Park Restoration Project (SW-17)

City of Birmingham

Project Profile/Report, October 2002, 41 pages, Order Number: SW-17

This 2002 report identifies steps taken by the City of Birmingham to improve stream bank stabilization at the Springdale golf course. The project deliverable for Springdale Park included design and construction. In addition, this project used public involvement activities to educate area residents and upstream communities on how to protect Quarton Lake and the Rouge River.

View this document now: SW-17 (4.3 MB, PDF file)

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Quarton Lake Restoration Project (RIIB-25)

City of Birmingham

Project Profile/Report, December 2003, 8 pages, Order Number: RIIB-25

The project provided for construction and oversight for the Quarton Lake Restoration Project. This project restored the integrity of the Quarton Lake ecosystem and recreational uses of the lake. These goals were accomplished primarily by removing accumulated sediment from the lake, and lessening the impact of streambank erosion through bioengineering techniques. Public involvement activities also occurred.

View this document now: RIIB-25 (354 KB, PDF file)

Recreation, Habitat Restoration, Environmental Education and Rouge River National Automotive Heritage Site Project (RH-12)

University of Michigan - Dearborn

Project Profile/Report, May 2000, 18 pages, Order Number: RH-12

The University of Michigan Dearborn received funding to prepare preliminary planning documents for the Rouge River Gateway Corridor. The plan set the framework for the development of: a river based educational and recreational site for visitors; an area to educate the public about the river, its heritage and the environment; and improved the fish and wildlife habitat of the Rouge River.

View this document now: RH-12 (900 KB, PDF file)

Recreational Trails in the Lower Rouge River Watershed (RIIB-05)

Canton Township

Project Profile/Report, December 2003, 10 pages, Order Number: RIIB-05

A plan to construct non-motorized trails through the Lower 2 Rouge River Parkway and the community was developed. The plan includes enhancements of active and passive recreational opportunities, design of a non-motorized trail system, and design of educational signage about the Rouge River, trees and vegetation.

View this document now: RIIB-05 (416 KB, PDF file)

Rouge Green Corridor Identity Demonstration Project (RVIB-06)

Oakland County Planning

Project Profile/Report, September 2006, 12 pages, Order Number: RV1B-06

The purpose of this project was to demonstrate now a brand identity concept for a riparian corridor can be used to maximize that resource as a community asset.

View this document now: RV1B-06 (841 KB, PDF file)

Rouge Green Corridor Urban Habitat Implementation Plan (RXB-16)

Alliance of Rouge Communities

Project Profile/Report, September 2006, 12 pages, Order Number: RXB-16

This project is a part of the Alliance of Rouge Communities continued effort to promote the restoration and stewardship of the Rouge River ecosystem. The purpose of this project is to implement recommendations of the Rouge Green Corridor Urban Habitat Conservation & Stewardship Plan to develop urban habitat and riparian buffers. The project seeks to raise public awareness and stewardship of the critical urban wildlife habitat and recreation feature provided by the Rouge River as it flows through Birmingham, Beverly Hills and Southfield in southeast Oakland County.

View this document now: RXB-16 (3.1 MB, PDF file)

Study and Concept Plan for Bell Creek Park Area Project (RH-01)

Redford Township

Project Profile/Report, September 2007, 15 pages, Order Number: RH-01

The project modified an existing publicly owned floodplain area to incorporate recreational, water quality, habitat and regional detention capabilities in combination with educational opportunities. The Township conducted initial studies of the site to determine current conditions, and develop a concept plan for modifications which will further the goals outlined.

View this document now: RH-01 (646 KB, PDF file)

Valley Woods Trail Head and Storm Water Improvement Project (RIXB-12)

City of Southfield

Project Profile/Report, September 2011, 8 pages, Order Number: RIXB-12

This project created an attractive and functional storm water structure as a component of a new park entrance for the Valley Woods Nature Preserve at Civic Center Drive east of Telegraph Road. The project eliminated an exisitng erosion problem and improved conveyance from surface streets. In addition, it provided a safe and aesthetic access point to the Valley Woods Nature Preserve.

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

View this document now: RIXB-12 (1.4 MB, PDF file)

Wayne Road Dam Removal and Habitat Restoration Project (RXB-20)

Alliance of Rouge Communities (ARC)

Project Profile/Report, August 2013, 97 pages, Order Number: RXB-20

The Wayne Dam Removal and Habitat Restoration Project is located within the City of Wayne on the Lower Branch of the Rouge River. The project was funded by a NOAA GLRI Grant to the Alliance of Rouge Communities (ARC), in partnership with Wayne County. This project consisted of the removal of the Wayne Dam and stream and habitat restoration. The implementation of the project has improved the riparian corridor and hydrologically reconnected approximately 123 miles of river and tributaries to the Great Lakes system for the first time in over a century. The river hosts a variety of fish species in the vicinity of the dam, including variety of warm water species (smallmouth bass, northern pike, walleye, suckers, darters, minnow, and sunfishes). All of these species have benefitted as a result of this project.

View this document now: RXB-20 (10.9 MB, PDF file)

Wildlife Habitat Survey (1998-1999) RiverWatch (1999-2000) (RH-14)

Friends of the Rouge

Project Profile/Report, February 2001, 12 pages, Order Number: RH-14

The Wildlife Habitat Survey and River Watch 2001 final report describes the objectives, tasks, and activities completed by Friends of the Rouge. It discusses the frog and toad survey performed by community volunteers and the river watch activities, which include storm drain stenciling, stream surveys, water quality monitoring, and benthic monitoring.

View this document now: RH-14 (490 KB, PDF file)

Streambank Stabilization

Application of Soil Bioengineering Techniques for the Restoration of Johnson Creek (M1-05)

Washtenaw County Drain Commissioner

Project Profile/Report, May 2000, 59 pages, Order Number: M1-05

Streambanks were stabilized using bioengineering techniques targeted towards protection of high quality habitats.

View this document now: M1-05 (4.7 MB, PDF file)

Beech Woods Naturalized Streambank and Soil Erosion Control Project (RVIIIB-09)

City of Southfield

Project Profile/Report, December 2008, 10 pages, Order Number: RVIIIB-09

This project was part of City of Southfield's continued effort to promote the restoration and stewardship of the Rouge River ecosystem. The purpose of this project was to mitigate damage caused by streambank erosion along the Main Branch of the Rouge River at Beech Woods Golf Course, a municipal golf course owned by the City of Southfield. The site is located in a floodplain and was identified as one of 12 top priority sites in the 2004 Main 1-2 streambank erosion inventory.

View this document now: RVIIIB-09 (2.3 MB, PDF file)

Bell Branch Streambank Stabilization (RXB-14)

City of Livonia

Project Profile/Report, June 2013, 44 pages, Order Number: RXB-14

The Rennold's Ravine streambank stabilization project is located on the Bell Branch in the City of Livonia. The project includes bank stabilization for erosion control and to minimize the potential for bank failure, which will be implemented approximately 650 feet along the length of the stream. The project will not only reduce erosion by stabilizing the banks of the river, but a native vegetation buffer along the stream will help to enhance the water quality by filtering pollutants.

View this document now: RXB-14 (7.8 MB, PDF file)

Booth Park Streambank Restoration (RVIB-20)

City of Birmingham

Project Profile/Report, September 2005, 16 pages, Order Number: RVIB-20

This project consisted of streambank improvement activities in Booth Park. Bioengineered techniques, including the use of native vegetatation, were to be used for restoring and improving streambanks within the park.

View this document now: RVIB-20 (1.2 MB, PDF file)

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

City of Wayne Stormwater Project (SW-14)

City of Wayne

Project Profile/Report, Project Number: SW-14

The project included a public education program, inventory and maintenance of the existing system, and design and construction of a storm water retrofit to existing storm water system.

Danvers Pond Dam Removal and Stream Restoration Design Project (RVIIIB-15)

City of Farmington Hills

Project Profile/Report, November 2008, 6 pages, Order Number: RVIIIB-15

This project is a part of City of Farmington Hills continued effort to investigate two alternative solutions to the sedimentation issue at Danvers Pond that would restore the aquatic ecology of Pebble Creek by removing the existing dam and restoring the natural creek. The pond is in need of corrective measures to eliminate the potential dam failure that could cause adverse impacts to downstream properties and ecosystems. It is important to the community to address this problem and protect the water quality within its borders and beyond.

View this document now: RVIIIB-15 (1 MB, PDF file)

Edwards Relief Drain Streambank Stabilization Construction Project (RVIB-19)

Oakland County Drain Commissioner (OCDC)

Project Profile/Report, November 2004, 22 pages, Order Number: RVIB-19

This project consisted of stabilizing the streambanks of the Edwards Relief Drain. Bioengineered streambank stabilization techniques were to be used for this project.

View this document now: RVIB-19 (729 KB, PDF file)

Edwards Relief Drain Streambank Stabilization (RIIA-11)

Oakland County Drain Commissioner

Project Profile/Report, November 2004, 58 pages, Order Number: RIIA-11

The project consists of approximately 800 feet of open ditch restoration in the existing drainage easement. The stabilization project will include the use of traditional means of stream bank restoration including erosion control blankets, fractured limestone rock, and/or natural boulders. Bio-engineering aspects of stabilization will be utilized whenever feasible.

View this document now: RIIA-11 (4.6 MB, PDF file)

Fellows Creek Naturalization and Flow Reduction (RIII-23)

Canton Township

Project Profile/Report, November 2004, 58 pages, Order Number: RIII-23

This project includes designing and constructing a regional storm water wetland adjacent to the south side of the Fellows Creek and Green Drain in Flodin Park. Streambank and in-stream habitat enhancements will be designed and constructed to improve approximately 1000 feet of stream corridor. A complete stream corridor assessment will be conducted through Flodin Park to design the most appropriate types of streambank stabilization measures and in-stream habitat structures. This project will evaluate the flow issues, quantify the need to reduce peak flows and recommend other areas for constructing flow attenuation wetlands in order to further reduce overall flow variability. Canton will also conduct cable updates and press releases on this project in order to engage further public involvement and understanding of how this project relates to watershed issues and the improvement of water quality and habitat.

View this document now: RIII-23 (1.5 MB, PDF file)

Firefighters Park Streambank Stabilization (RIIB-04)

City of Troy

Project Profile/Report, December 2003, 33 pages, Order Number: RIIB-04

This project stabilized the stream banks of the Sprague Drain approximately 400 feet to 100 feet upstream of the confluence with the Rouge River. The project was designed to re grade the stream banks and then to install bioengineered stream bank stabilization measures to prevent future erosion.

View this document now: RIIB-04 (3.2 MB, PDF file)

Ford Field Bridge Retrofit and Stream Valley Improvements (SW-02)

City of Dearborn

Project Profile/Report, February 2004, 28 pages, Order Number: SW-02

The project will correct an engineered choke point in the Lower Rouge River and restore eroded streambanks. This will be achieved by designing and implementing a stream valley restoration project. This stream valley restoration project will reduce the sediment load generated through Dearborn and allow the Rouge River to naturally flush itself thereby restoring critical habitat.

View this document now: SW-02 (1.5 MB, PDF file)

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Main 1-2 Streambank Inventory Project (RIIA-12)

Oakland County Drain Commissioner (OCDC)

Project Profile/Report, December 2004, 124 pages, Order Number: RIIA-12

This 2004 report summarizes the activities of the Rouge Main 1-2 Streambank Erosion Inventory and Site Prioritization project. The purpose of the project was to identify stream bank erosion sites and to develop conceptual designs to address erosion at priority sites.

View this document now: RIIA-12 (23 MB, PDF file)

Main Rouge River Restoration and Hill Slope Stabilization (RXB-08)

City of Birmingham

Project Profile/Report, October 2012, 7 pages, Order Number: RXB-08

The project purpose was to address one of the most severe hillslope erosion sites in the City. The hillslope failure was located downstream of Booth Park – between Willits and Baldwin Roads, north of Maple Road, along the south side of the river. The Project goals included stabilizing the streambank, re-establishing the aesthetics of the streambank along the river stretch and providing habitat by installing native vegetation along the bank.

View this document now: RXB-08 (326 KB, PDF file)

Nankin Mills Bank Stabilization (M3-07)

Wayne County Parks

Project Profile/Report, January 2005, 12 pages, Order Number: M3-07

The project utilized a variety of streambank stabilization methods to improve the aesthetics, recreational desirability, and water quality of the Nankin Mill race. Plantings of native materials, trees, and wild flowers will be included to demonstrate natural erosion control measures.

View this document now: M3-07 (271 KB, PDF file)

Oakland County Upper Rouge River Stream Bank Erosion Inventory Project (RVIB-22)

Oakland County

Project Profile/Report, May 2006, 45 pages, Order Number: RVIB-22

This project identified areas of the Rouge River Watershed in Farmington Hills that suffered from streambank erosion. Further, conceptual streambank remediation designs were created to address these problem areas.

View this document now: RVIB-22 (6.6 MB, PDF file)

Quail Ridge Drain Improvements (RIIA-09)

Northville Township

Project Profile/Report, Project Number: RIIA-09

Increased imperviousness within the Rouge River watershed has resulted in an increase in runoff and bank full events within the stream, causing channel incision and channel bank failure. Proposed improvements include measures to reduce peak velocities and reinforce existing stream banks using vegetative bioengineering and geo-bioengineering techniques.

Randolph Street Drain Project (SW-08)

Randolph Street Inter-County Drain Drainage District

Project Profile/Report, March 2004, 20 pages, Order Number: SW-08

The project will provide analysis and recommendations to address flooding and erosion problems in the Randolph Street Inter-County Drainage District located in the Middle I Rouge Subwatershed and encompass portions of Oakland and Wayne Counties.

View this document now: SW-08 (984 KB, PDF file)

Randolph Street Drain Streambank Restoration Project (RIXB-13)

Oakland County Drain Commissioner

Project Profile/Report, June 2010, 7 pages, Order Number: RIXB-13

The channel and eroded banks of the Randolph Street Drain were in need of stabilization. This project used new design methods that helped address development and corresponding increases in impervious surfaces that have resulted in increased volumes of surface runoff, increased stream rates, sedimentation, stream bank erosion and stream channel widening.

View this document now: RIXB-13 (840 KB, PDF file)

Rouge River Streambank Stabilization at Booth Park (RIXB-02)

City of Birmingham

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Project Profile/Report, June 2010, 7 pages, Order Number: RIXB-02

This project addressed a severe stream bank erosion site and installed a floodplain enhancement area within Booth Park. The plan improved the stream bank with a combination of native vegetation and ledge rock walls. The intent of the city was to maximize bio-stabilization techniques (greening) and minimize the hard stabilization of the bank. The reduction of sediment pollution in the river will allow the river to re-establish its habitat and flow characteristics.

View this document now: RIXB-02 (350 KB, PDF file)

Rouge River Streamwood Stream Bank Erosion Mitigation Project (RVIIB-08)

City of Southfield

Project Profile/Report, May 2008, 10 pages, Order Number: RVIIB-08

In the Rouge River Streamwood Stream Bank Erosion Mitigation Project approximately 300 feet of stream bank were stabilized at the project site.

View this document now: RVIIB-08 (1.4 MB, PDF file)

Rummell Drain Improvement (RIII-18)

Rummell Relief Drainage District

Project Profile/Report, December 2003, 12 pages, Order Number: RIII-18

This project consisted of improving the Rummell Drain. Activities included stream bank stabilization, reducing area flooding by widening stream channels, and restoring open water aesthetics and water quality.

View this document now: RIII-18 (457 KB, PDF file)

Storm Water Master Plan (RIIA-04)

City of Westland

Project Profile/Report, September 2004, 13 pages, Order Number: RIIA-04

This project created a tool for the City of Westland to use in order to reach watershed management goals and objectives. In particular, issues such as streambank erosion, culverts, removal of debris, and best management practices are all discussed.

View this document now: RIIA-04 (760 KB, PDF file)

Stormwater Conveyance & Wetland Treatment Facilities (M1-07)

Washtenaw County Drain Commissioner

Project Profile/Report, May 2000, 17 pages, Order Number: M1-07

A feasibility study was conducted to replace piped stormwater systems with open swales and treatment using constructed wetlands.

View this document now: M1-07 (543 KB, PDF file)

Streambank Stabilization Project (M1-11)

City of Novi

Project Profile/Report, April 2002, 69 pages, Order Number: M1-11

The project used multiple bioengineered streambank stabilization systems to mitigate and reduce the amount of eroding sediments generated from existing natural streambanks of the Rouge River while maintaining the natural aesthetics and character of the Rouge River.

View this document now: M1-11 (2.5 MB, PDF file)

Wetlands Projects

Bloomfield Wetland Inventory (RVIIB-18)

Bloomfield Township

Project Profile/Report, December 2007, 18 pages, Order Number: RVIIB-18

In 2007 a comprehensive Wetland Inventory of Bloomfield Township in Oakland County, Michigan was completed. The Wetland Inventory is intended to serve as an update to the existing Bloomfield Township Wetland Inventory Map that is utilized to administer the Township's local wetland ordinance. The Wetland Inventory Report describes the methods used to complete the Wetland Inventory and includes a discussion of the results and recommendations.

View this document now: RVIIB-18 (1 MB, PDF file)

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Van Buren Lake Fringe Wetlands (RIII-22)

Van Buren Township

Project Profile/Report, December 2004, 13 pages, Order Number: RIII-22

This project is located south of Ecorse Road and east of Highway I-275. This property, is currently owned by the Visteon Corporation, and includes a 36-acre former gravel pit lake. This project will support design and construction of a wetland fringe in the lake in order to protect water quality, mitigate the impact of storm water pollutants on the lake, and provide fish and wildlife habitat for the lake.

View this document now: RIII-22 (734 KB, PDF file)

Wayne County Wetland Revolving Fund Project (WET-07)

Wayne County Department of Public Services

Project Profile/Report, December 2002, 102 pages, Order Number: WET-07

The Wayne County Wetland Preservation Fund planned, designed, constructed, and maintained wetland sites within Wayne County in fulfillment of the goals of the Rouge River National Wet Weather Demonstration Project.

View this document now: WET-07 (4.4 MB, PDF file)

Wetlands Education Project (RH-02)

Garden City Public Schools

Project Profile/Report, October 2000, 30 pages, Order Number: RH-02

The project assisted in the development of an environmental education/recreation site. The project activities were tied to the Michigan Curriculum Framework and MEGOSE for students in grades 9-12. A recommendation for a design and installation a learning station which could serve as the head of an educational/recreational trail system for use by teachers and their students was developed.

View this document now: RH-02 (1 MB, PDF file)

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Public Involvement & Education

The Rouge Project's strategy for a comprehensive public involvement and education program was a success. Since the Rouge Project's inception in 1992, it was clear that public education and involvement programs would be the cornerstone of the restoration of the Rouge River.

The actions taken during the Project were based on a **1993 survey of area residents** which 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.

A **1999 survey of the Rouge River residents** confirmed that the actions taken by the Rouge Project were resulting in an increasingly informed and supportive public. A paper titled "**Measuring the Soft Stuff - Evaluating Public Involvement in Urban Watershed Restoration**" compared the results of the 1993 and 1999 surveys of Rouge River residents.

A strong consensus building public involvement program was developed 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 created in the fall of 1994 based upon the 1993 survey.

The goal of the Action Plan was to engage numerous stakeholders, inform them, and hopefully gain their support and encourage them to change their behavior 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 always two-way. In addition, since many of those surveyed thought the causes of pollution to the Rouge River was from industrial sources, a public education campaign had to explain the impact of storm water and non-point source pollution on the river. Finally, the campaign stressed personal responsibility in Rouge River restoration efforts.

Rouge River restoration messages included:
- Use your head, you live in a watershed;
- Storm drains aren't garbage cans;
- When it comes to pollution, every home is waterfront property;
- Everyone is part of the problem and needs to be part of the solution, and,
- Simple changes can make big differences.

In the years that followed public involvement strategies were developed, educational materials were produced, and outreach activities were created to engage the general public.

Informational materials were developed incorporating messages for a variety of audiences, such as businesses, students, citizens, etc. In addition, stewardship programs were successfully implemented including: the Friends of the Rouge programs, such as, the **Frog and Toad Survey**, the **Rouge Education Project**, the **Rouge Rescue**, **Benthic Macroinvertebrate Sampling** and **River Restoration**. Other ongoing

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public education pollution prevention initiatives, funded in-part by, or initiated during the Rouge Project include the **Alliance of Rouge Communities** (ARC) education activities, the **Southeast Oakland Communities Water Authority** (SOCWA), **Healthy Lawns and Gardens** programs, and the **Southeast Michigan Council of Governments** (SEMCOG) **Ours To Protect** materials.

Wayne County's Department of Public Services, Water Quality Management Division has **Pollution Prevention** services available and established the **Rouge River Publications Clearinghouse** that offers a variety of education materials available for purchase. Materials include publications, brochures, CDs, and much more. **Rouge River Signage** is also available for purchase. For further information, call the Rouge Information Line at 1-888-223-2363.

Overview Materials

- **Overview of the Public Involvement and Education Programs**

Green Schools

The Rouge Project funding was instrumental in assisting Wayne County with the establishment andimplementation of the County's Green School Program in 2008. Under Wayne County's Green School program, a school is eligible to receive a green, emerald or evergreen school environmental stewardship designation if the school or students complete activities in a combination of four categories: Recycling, Energy Savings, Environmental Protection and Miscellaneous. A school will receive a Green School designation by successfully completing 10 activities. The Emerald School designation is achieved by successfully participating in 15 activities and the Evergreen School designation is achieved by successfully participating in 20 activities. Activities range from establishing a paper recycling program, to implementing an energy savings program, to holding an environmental education event promoting the health of Great Lakes watersheds.

Wayne County's Department of Public Services has been working with Wayne RESA for seven years to promote and grow the County's Green Schools Program. In the first year (2008), Wayne County recognized 12 schools, in 2014 (the last year of the Rouge Project) over 130 schools were recognized. In 2014, 35 schools earned the Green School designation, 50 schools earned the Emerald School designation, and 47 schools participated in 20 or more activities to earn an Evergreen School designation.

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Demonstration Projects

2004 Illicit Discharge Elimination and Public Education Activities (RIII-12)

2004 Illicit Discharge Elimination and Public Education Activities (RIII-12)

2004 Illicit Discharge Elimination and Public Education Activities (RIII-12)

2004 Illicit Discharge Elimination and Public Education Activities (RIII-12) City of Inkster

Project Profile/Report, December 2004, 15 pages, Order Number: RIII-12

Dye testing and smoke testing were administered to the City of Inkster's storm water systm to identify illicit discharge sources. This testing was successful in identifying several illicit discharge sources.

View this document now: RIII-12 (337 KB - PDF file)

2004 Rouge River Water Festival at Cranbrook (RV-10)

Cranbrook Institute of Science

Project Profile/Report, 2004, 5 pages, Order Number: RV-10

The Cranbrook Educational Community hosted approximately 1,670 students for the Rouge River Water Festival. During this 4-day event, students were introduced to many topics regarding the Rouge River Watershed.

View this document now: RV-10 (193 KB - PDF file)

2006-2007 Newspaper Articles (RVII-04)

Friends of the Rouge

Project Profile/Report, 2007, 17 pages, Order Number: RVII-04-news

This Rouge Education Project 2006 – 2007 data summary report was coordinated by the non-profit organization Friends of the Rouge, which promotes restoration and stewardship of the Rouge River watershed through school-based water quality monitoring, investigation and problem solving.

View this document now: RVII-04-news (2.6 MB - PDF file)

2006-2007 REP Photo Album (RVII-04)

Friends of the Rouge

Project Profile/Report, 2007, 15 pages, Order Number: RVII-04-photos

This Rouge Education Project 2006 – 2007 photo album was coordinated by the non-profit organization Friends of the Rouge, which promotes restoration and stewardship of the Rouge River watershed through school-based water quality monitoring, investigation and problem solving.

View this document now: RVII-04-photos (2.9 MB - PDF file)

Bloomfield Township Public Education Initiative (RV-05)

Bloomfield Township
Project Profile/Report, November 2004, 4 pages, Order Number: RV-05

This project serves to inform the public of best management practices (BMPs) regarding lawncare. A mailer was created that explains proper lawncare techniques, including the use of native vegetation and mowing tips.

View this document now: RV-05 (157 KB - PDF file)

Carpenter Lake Restoration Project (RV-28)

City of Southfield

Project Profile/Report, February 2008, 25 pages, Order Number: RV-28

This project rehabilitated Carpenter Lake for purposes of storm water management, public recreation, and wildlife habitat. Activities included the removal and replacement of a dam, sediment removal, improved aesthetics, and establishment of wilidlife features in the lake.

View this document now: RV-28 (2.3 MB - PDF file)

City of Wayne Stormwater Project (SW-14)

City of Wayne

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Project Profile/Report, Project Number: SW-14

The project included a public education program, inventory and maintenance of the existing system, and design and construction of a storm water retrofit to existing storm water system.

Commercial Lawn Maintenance Workshop (RIIA-25)

City of Wixom

Project Profile/Report, October 2001, 4 pages, Order Number: RIIA-25

The City of Wixom hosted a workshop, open to the public, in Spring of 2001. All materials used for the workshop were compiled into a "print-ready" package that was distributed to all Middle One SWAG members to use in their own communities after the completion of the workshop. The materials encourage subwatershed-wide action towards River-friendly "commercial" lawn care.

View this document now: RIIA-25 (117 KB - PDF file)

Continuation of IDEP, PEP and Watershed Planning Activities (RIIB-23)

City of Livonia

Project Profile/Report, December 2002, 11 pages, Order Number: RIIB-23

This project further implemented Livonia's illicit discharge elimination and public education programs, as well as continued subwatershed plan implementation activities. The project included outfall inspection and tracking of questionable outfalls, public education, and continuation of subwatershed planning activities.

View this document now: RIIB-23 (472 KB - PDF file)

Continuation of Public Education Programs 2001-2002 (RIIA-23)

Friends of the Rouge

Project Profile/Report, Project Number: RIIA-23

This project helped subwatersheds and communities fulfill stormwater permit requirements for public education. Friends of the Rouge (FOTR) supported 69 schools and 16 new schools in using the Rouge Education Project material. Training workshops were conducted. Rouge Rescue/River Day activities were conducted at 30 sites. Storm Drain stenciling projects were carried out for 23 projects. Seven frog and toad survey workshops were held. Sixteen information outreach workshops were held on a variety of topics. A benthic macroinvertebrate sampling project was conducted.

Continue IDEP, Public Education, Subwatershed Planning and Central Waste Oil Collection Facility Planning (RIIB-27)

City of Wayne

Project Profile/Report, May 2003, 29 pages, Order Number: RIIB-27

The City of Wayne is committed to improving the water quality of the Rouge River in the Lower 2 Subwatershed by continuing development and implementation of its Subwatershed Planning, Public Education Plan and Illicit Discharge Elimination Plan, as well as research for a potential central waste oil collection facility for the City. This project continues programs that have recently been implemented or provided for development and implementation of activities, which were outlined in the City's Storm Water Pollution Prevention Initiative (SWPPI).

View this document now: RIIB-27 (3.2 MB - PDF file)

Continue IDEP, Public Education, Subwatershed Planning and Johnson Creek Protection Group Support (RIIB-28)

Northville Township

Project Profile/Report, Project Number: RIIB-28

Northville Township is committed to improving the water quality of the Rouge River in the Middle 1 and Upper Subwatersheds by continuing development and implementation of its Subwatershed Planning, Illicit Discharge Elimination Plan and Public Education Plan as well as the coordination of activities associated with the Johnson Creek Protection Group. The activities in this project continued programs that have been recently implemented or provided for development and implementation for activities outlined in Northville Township's Storm Water Pollution Prevention Initiative.

Demonstration Home Lawn Care (SP-04)

Southeastern Oakland County Resource Recovery Authority (SOCRRA)

Project Profile/Report, February 2000, 2 pages, Order Number: SP-04

This project sponsored demonstrations of environmentally friendly lawn care programs. Soil testing (especially for phosphorus) was conducted. People who tend to over-fertilize their lawns were shown the study results.

View this document now: SP-04 (221 KB - PDF file)

E. L. Johnson Nature Center Visitor Center Improvements (RIII-07)

Bloomfield Township

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Project Profile/Report,September 2006, 5 pages, Order Number: RIII-07

The project constructed a 5000 square foot building to house a Visitor Center at the E.L. Johnson Nature Center to replace two existing “temporary” buildings. The new structure is a barrier-free Visitor Center that supports year-round recreational and school-based environmental education activities.

View this document now: RIII-07 (133 KB - PDF file)

Friends of Rouge 2002-2003 Public Education and Involvement in the Rouge River Watershed (RIII-19)

Friends of the Rouge

Project Profile/Report, Project Number: RIII-19

Friends of Rouge Schoolyard Habitats Project (RIII-24)

Friends of the Rouge

Project Profile/Report, November 2003, 31 pages, Order Number: RIII-24

This project consisted of involving 5 Plymouth Canton Community Schools in Rouge River awareness activities. Students were introduced to the use of native vegetation, pollution reduction, and stormwater impacts on the Rouge River.

View this document now: RIII-24 (2.8 MB - PDF file)

Friends of the Rouge Public Education & Involvement Project 2013 - 2014 (RXIB-10)

Friends of the Rouge

Project Profile/Report, January 2015, Order Number: RXIB-10

This project is a part of the Friends of the Rouge continued effort to promote the restoration and stewardship of the Rouge River ecosystem through education, citizen involvement, and other collaborative efforts for the purpose of improving the quality of life ot the people, plants, and animals of the watershed. This project was accomplished through several programs: the Rouge Education Project; Rouge Rescue and Planting projects; and the Frog and Toad Survey.

View this document now: RXIB-10 (2.8 MB)

Garden City Stormwater Ordinances, Storm Sewer System Base Map, Initial Implementation of Illicit Discharge Elimination & Public Education Plans Project (SW-05)

Garden City

Project Profile/Report, May 2001, 81 pages, Order Number: SW-05

The project implemented storm water management activities associated with coverage under the Michigan Department of Environmental Quality General Storm Water NPDES Permit. Project activities created better storm water management and the concurrent reduction of storm water pollution loading into the Rouge River.

View this document now: SW-05 (2.2 MB - PDF file)

GIS/Public Awareness Educational Programs (M1-10)

City of Novi

Project Profile/Report, August 2000, 40 pages, Order Number: M1-10

A limited Geographic Information System (GIS) was developed that contains the geographical information pertaining to the physical features that may impact stormwater runoff. The following layers of the GIS system were created: topography, soils, land use, and watershed/subwatershed boundaries. The GIS information was displayed to residents through an interactive display located at the City Hall. The GIS information was also disseminated to audiences through a local cable TV channel. In addition, this project developed a Community Emergency Action Plan to be used in case of hazardous material spills into the storm drain system.

View this document now: M1-10 (1.4 MB - PDF file)

Healthy Lawn & Garden Education (RIII-20)

South Oakland County Water Authority (SOCWA)

Project Profile/Report, September 2004, 16 pages, Order Number: RIII-20

This project provided public education services to support specific permit requirements of municipalities within the Rouge River Main 1-2 Subwatershed for a two year period: 2002-2004. Education initiatives focused on home practices for lawn and garden management, citizen training to promote stewardship and grassroots outreach, demonstration rain gardens and other environmentally-sound practices, facilitation of public participation in landscape restoration, and public awareness of recreation and restoration opportunities on public lands adjacent to the Rouge River.

View this document now: RIII-20 (1.4 MB - PDF file)

Healthy Garden Tours (SP-03)

Southeastern Oakland County Resource Recovery Authority (SOCRRA)

Project Profile/Report, Project Number: SP-03

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

This project sponsored healthy garden tour programs in various communities. The project included volunteer involvement, public outreach, and development of educational materials.

Healthy Lawn & Garden Education for Storm Water Pollutant Reduction (RIIB-10)

Southeastern Oakland County Resource Recovery Authority (SOCRRA)

Project Profile/Report, October 2002, 13 pages, Order Number: RIIB-10

This project provided public education services to support specific permit requirements of municipalities within the Rouge River Main 1-2 Subwatershed. Education initiatives focused on home practices for lawn and garden management, citizen training to promote stewardship and grassroots outreach, and public awareness of recreation and restoration opportunities on public lands adjacent to the Rouge River.

View this document now: RIIB-10 (2.8 MB - PDF file)

Homeowners OSDS Public Education Material (OSS-05)

Wayne County Environmental Health

Project Profile/Report, October 2002, 2 pages, Order Number: OSS-05

This project included the development of public education materials that will be used to educate homeowners in the Middle 3 Subwatershed in OSDS operation and maintenance. The materials included a video and other forms to facilitate documentation of homeowner OSS maintenance activities.

View this document now: OSS-05 (152 KB - PDF file)

Implement Manhole Rehabilitation and Continue Public Education (RIIB-13)

City of Westland

Project Profile/Report, March 2004, 36 pages, Order Number: RIIB-13

Public education activities consistent with the Public Education Plan submitted as part of the General Permit application were conducted. The City implemented recommendations of the manhole rehabilitation program where the City conducted manhole inspections of 480 sanitary manhole structures to identify repairs necessary for eliminating inflow and infiltration of storm water into the sanitary system.

View this document now: RIIB-13 (2 MB - PDF file)

Inkster Stormwater Ordinances, Implementation of Illicit Discharge Elimination & Public Education Plans Project (SW-06)

City of Inkster

Project Profile/Report, March 2002, 2 pages, Order Number: SW-06

The project implemented stormwater management activities that are associated with coverage under the Michigan Department of Environmental Quality General Stormwater NPDES Permit.

View this document now: SW-06 (164 KB - PDF file)

Lower Rouge River Recreational Trail Head and Associated Trails Project (RVIIB-02)

Canton Township

Friends of the Rouge Public Education & Involvement Project 2012 - 2014 (RXIB-10)

This project is a part of Friends of the Rouge continued effort to promote the restoration and stewardship of the Rouge River ecosystem through education, citizen involvement and other collaborative efforts for the purpose of improving the quality of life of the people, plants and animals of the watershed. This project will be accomplished through several programs: the Rouge Education Project; Rouge Rescue and Planting projects; and the Frog and Toad Survey.

Friends of the Rouge Public Education & Involvement Project 2012 - 2014 (RXIB-10)

This project is a part of Friends of the Rouge continued effort to promote the restoration and stewardship of the Rouge River ecosystem through education, citizen involvement and other collaborative efforts for the purpose of improving the quality of life of the people, plants and animals of the watershed. This project will be accomplished through several programs: the Rouge Education Project; Rouge Rescue and Planting projects; and the Frog and Toad Survey.

Friends of the Rouge
Project Profile/Report, 2007, 39 pages, Order Number: RVIIB-02

In this project the construction of the Lower Rouge River Recreation Trail System was completed.

View this document now: RVIIB-02 (4.7 MB - PDF file)

Nankin Mills Rouge Interactive Display (M3-05-06)

Wayne County Parks

Project Profile/Report, February 2003, 2 pages, Order Number: M3-05

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

This project reopened the Nankin Mills Interpretive Center. This Center serves to educate the public on the natural and cultural resources of the Rouge River through the uses of exhibits and programming.

View this document now: M3-05 (289 KB - PDF file)

Nankin Mills Rouge Interactive Display (M3-05)

Wayne County Parks

Project Profile/Report, September 2002, 4 pages, Order Number: M3-0506

A display was developed to provide the public with an interesting, exciting way to find out what the river was like before the impact of man. The display motivates visitors to become involved in caring for and restoring the Rouge River. Pamphlets are available that explain activities each visitor can do around their home and neighborhood to clean up the Rouge River.

View this document now: M3-0506 (159 KB - PDF file)

Nankin Mills Rouge Interactive Kiosk (M3-06)

Wayne County Parks

Project Profile/Report, September 2002, 4 pages, Order Number: M3-0506

The project created a fun, exciting, hands-on kiosk for the learning center that can be used by people of all ages. The kiosk helped people explore the dynamics of an urban watershed. Pamphlets will be available with suggestions for activities that will help in the restoration of the river.

View this document now: M3-0506 (159 KB - PDF file)

Oakland County Rouge Water Festival and Rouge Watershed Display (RIII-04)

Cranbrook Institute of Science

Project Profile/Report, December 2003, 9 pages, Order Number: RIII-04

The first Rouge Water Festival in Oakland County was completed in the fall of 2003. The Cranbrook Educational Community hosted a smaller version of the Rouge River Water Festival to complement the Rouge Water Festival currently held at the University of Michigan - Dearborn campus every May. Cranbrook also constructed a permanent interactive Rouge River Watershed display in the Cranbrook Institute of Science. The subject matter of the display was determined with the input of the Main 1-2 Subwatershed Education Group Public Education Group and other partners.

View this document now: RIII-04 (35 KB - PDF file)

Otter Reintroduction and Watershed Education Project (RV-08)

Oakland Plus

Project Profile/Report, December 2005, 76 pages, Order Number: RV-08

This project assessed the feasibility of introducing the northern river otter into the Rouge River Watershed. However, the feasiblity study concluded that due to a lack of riparian habitat, the northern river otter should not be introduced into the watershed.

Outdoor Lab & Interactive Trail Systems for BMP (M1-13)

Salem-South Lyon Schools

Project Profile/Report, June 1999, 41 pages, Order Number: M1-13

An outdoor lab and interpretive trail system for viewing best management practices (BMPs) was developed. These activities compliment the science curriculum and recreational use at the schools.

View this document now: M1-13 (1.3 MB - PDF file)

Plymouth Township Presentations to Associations and Tributary Signage (RIII-14)

Plymouth Township

Project Profile/Report, December 2004, 10 pages, Order Number: RIII-14

This project will disseminate information to educate Plymouth Township residents about specific ways they can help improve water quality in natural waterways by changing domestic maintenance habits and activities, and will explain the concept of a watershed and the relationship between water quality issues, individual neighborhoods, housing values and health.

View this document now: RIII-14 (468 KB - PDF file)

Public Awareness (M1-04)

Salem Township
Project Profile/Report, December 1999, Project Number: M1-04

Educational materials were developed and public meetings were held to inform the public on ways to reduce stormwater pollution.

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Public Education for Healthy Lawns, Landscapes, Rain Gardens & Rainwater Harvesting Project (RIXB-01)

South Oakland County Water Authority (SOCWA)

Project Profile/Report, February 2010, 8 pages, Order Number: RIXB-01

This project is a part of the South Oakland County Water Authority's (SOCWA) public education project and is directed to the long-term management goals of the Main 1-2 Rouge Subwatershed Management Plan. The focus of this environmental education project is to restore/maintain aesthetically appealing conditions and to minimize flow variability and associated negative impacts.

View this document now: RIXB-01 (331 KB - PDF file)

Public Education and Involvement Projects 2005-2006 (RVIB-04)

Friends of the Rouge

Project Profile/Report, September 2006, 48 pages, Order Number: RVIB-04

This project consisted of public education and involvement efforts performed by the Friends of the Rouge on behalf of the communities in the Rouge Watershed under the Storm Water General Permit. Activities included the Rouge Education Project (REP); Riparian Corridor Management (RCM); Frog and Toad surveys; Benthic Macroinvertebrate Sampling and Data Collection;Storm Drain Stenciling and Decaling; and Public Outreach Workshops and Bus Tours.

View this document now: RVIB-04 (693 KB - PDF file)

Public Education and Involvement Projects 2006-2007 (RVIIB-04-01)

Friends of the Rouge

Project Profile/Report, 2007, 28 pages, Order Number: RVIIB-040

In 2006 – 2007, the Friends of the Rouge Education Project (REP) involved over 5,000 students, 130 teachers, and many volunteers in sampling efforts in the Rouge watershed. Results are organized by the seven subwatersheds that comprise the Rouge watershed: Lower 1 and Lower 2 (encompassing the Lower Branch of the river), Main 1-2 and Main 3-4 (encompassing the Main Branch of the river and the Main Stem downstream of where all the branches join together), Middle 1 and Middle 3 (encompassing the Middle Branch of the river), and Upper (encompassing the Upper Branch of the river).

View this document now: RVIIB-04 (598 KB - PDF file)

Public Education and Involvement Projects, General Permit Activities (RVIIIB-02)

Friends of the Rouge

Project Profile/Report, November 2008, 35 pages, Order Number: RVIIIB-02

This project is a part of Friends of the Rouge continued effort to promote the restoration and stewardship of the Rouge River ecosystem through education, citizen involvement and other collaborative efforts for the purpose of improving the quality of life of the people, plants and animals of the watershed. This project will be accomplished through five programs: the Rouge Education Project, Riparian Corridor Management Project, the Rouge Rescue, Volunteer Monitoring, and Partnership Building.

View this document now: RVIIIB-02 (106 KB - PDF file)

Public Education and Involvement Projects (RVIIB-04-02)

Friends of the Rouge

Project Profile/Report, December 2007, 32 pages, Order Number: RVII-04

This Rouge Education Project 2006 – 2007 data summary report was coordinated by the non-profit organization Friends of the Rouge, which promotes restoration and stewardship of the Rouge River watershed through school-based water quality monitoring, investigation and problem solving.

View this document now: RVIIB-04 (1.1 MB - PDF file)

Public Education, Pilot Commercial IDEP and IDEP Training (RIIB-15)

City of Dearborn Heights

Project Profile/Report, OCtober 2003, 29 pages, Order Number: RIIB-15

This project implemented goals in the Subwatershed Management Plans (SWMP) developed for the Middle 3 and Lower 2 Rouge River subwatersheds and goals in the Dearborn Heights Storm Water Pollution Prevention Initiative (SWPPI). As part of this project public education activities were completed including watershed displays. Commercial businesses were inspected as part of a pilot program for IDEP. Inspectors completed IDEP training.

View this document now: RIIB-15 (1.1 MB - PDF file)

Public Involvement Wetlands Steward (WatchFrogs) Program (RVIB-02)

Friends of the Rouge

Project Profile/Report, October 2006, 10 pages, Order Number: RVIB-02

The long term goal of the Wetland Stewards Program is to slow wetland loss by protecting existing wetlands from destruction. A short term goal is to create a citizen group called WatchFrogs that will learn the function, value, and identification of wetlands. The group will be provided the tools necessary to enable them to become

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actively involved in protecting wetlands in their communities.

View this document now: RVIB-02 (293 KB - PDF file)

Public Participation, Illicit Discharge and Public Education Continuation Programs (RIIB-20-21)

City of Garden City

Project Profile/Report, November 2002, 11 pages, Order Number: RIIB-20-21

This report summarizes Illicit Discharge Elimination Plan (IDEP) and Public Education Plan (PEP) activities by Garden City to help reduce storm water pollution to the Lower 2 and Middle 3 branches of the Rouge River.

View this document now: RIIB-20-21 (80 KB - PDF file)

Rain Garden Educational and Demonstration Project (RVIIB-03)

Lawrence Technological University

Project Profile/Report, December 2008, 56 pages, Order Number: RVIIB-03

In this project a bioretention cell (i.e. rain garden) on Lawrence Tech's campus was designed and constructed to serve both as a retrofit structural storm water BMP as well as an educational tool.

View this document now: RVIIB-03 (3.2 MB - PDF file)

Recreational Trails in the Lower Rouge River Watershed (RIIB-05)

Canton Township

Project Profile/Report, Januaru 2004, 10 pages, Order Number: RIIB-05

A plan to construct non-motorized trails through the Lower 2 Rouge River Parkway and the community was developed. The plan includes enhancements of active and passive recreational opportunities, design of a non-motorized trail system, and design of educational signage about the Rouge River, trees and vegetation.

View this document now: RIIB-05 (416 MB - PDF file)

Riparian Corridor Master Plan for Bennett Arboretum (RV-03)

Wayne County Parks

Project Profile/Report, 2005, 20 pages, Order Number: RV-03

This project consisted of remediating Bennett Arboretum in such a way as to benefit the Rouge River Watershed, as well as improve upon the aesthetics of the Arboretum itself. Activities included the removal of dead trees and the removal of invasive species.

View this document now: RV-03 (594 KB - PDF file)

River Watch Program (SP-11)

Friends of the Rouge

Project Profile/Report, February 2000, 8 pages, Order Number: SP-11

The project conducted Adopt-A-Stream programs in the Upper 2 and Middle 1 subwatersheds.

View this document now: SP-11 (388 KB - PDF file)

Rouge Educational Project 1998-1999 (SW-03)

Friends of the Rouge

Project Profile/Report, July 2000, 2 pages, Order Number: SW-03

This project sponsored healthy garden tour programs in various communities. The project included volunteer involvement, public outreach, and development of educational materials.

View this document now: SW-03 (3.5 MB - PDF file)

Rouge Friendly Lawn and Landscape Public Education 2005-2006 Project (RVIB-01)

Southeastern Oakland County Water Authority (SOCWA)

Project Profile/Report, May 2006, 9 pages, Order Number: RVIB-01

This project educated the public about proper landscaping techniques. The techniques introduced helped to reduce the amount of fertilizers entering the watershed system. Print materials, website information, and volunteers were used spread the message of proper gardening.

View this document now: RVIB-01 (379 KB - PDF file)

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Rouge Friendly Lawns & Landscapes: Demonstration Projects & Public Education (RVIIB-01)

Southeastern Oakland County Water Authority (SOCWA)

Project Profile/Report, September 2007, 11 pages, Order Number: RVIIB-01

This project promoted earh-friendly lawn and landscapes through retailer partnerships, public information materials, public seminars, and updates to the Healthylandscapes.com website.

View this document now: RVIIB-01 (445 KB - PDF file)

Rouge Friendly Lawns and Landscape 2010 - 2012 (RXB-09)

Southeastern Oakland County Water Authority (SOCWA)

Project Profile/Report, December 2012, 12 pages, Order Number: RXB-09

This project promoted earh-friendly lawn and landscapes through retailer partnerships, public information materials, public seminars, and updates to the Healthylandscapes.com website.

View this document now: RXB-09 (485 KB - PDF file)

Rouge Friendly Lawns and Landscapes 2013 - 2014 (RXIB-06)

Southeastern Oakland County Water Authority (SOCWA)

Project Profile/Report, January 2015, 10 pages, Order Number: RXIB-06

This project is a part of SOCWA's public education project and is directed to the long-term management goals of the Main 1-2 Rouge Subwatershed Management Plan. The focus of this environmental education project is to restore/maintain aesthetically appealing conditions; and to minimize flow variability and associated negative impacts.

View this document now: RXIB-06 (450 KB - PDF file)

Rouge Green Corridor Public Involvement and Presentation & Rain Garden Community Sites and Public Education (RV-07)

Southeastern Oakland County Water Authority (SOCWA)

Project Profile/Report, August 2005, 22 pages, Order Number: RV-07

This project served to inform the public of the assests attributed to the Rouge Green Corridor. Further, this project raised the public's awareness regarding invasive species as well as gathering their insight into future Rouge Green Corridor improvements.

View this document now: RV-07 (884 KB - PDF file)

Rouge Oakland Communities Public Education Efforts (RVIIB-05)

Oakland County

Project Profile/Report, July 2008, 9 pages, Order Number: RVIIB-05-01, RVIIB-05-02

This project consisted of educating the public on practices that benefit the Rouge River Watershed. In particular, public service announcements informed of proper gardening techniques, disposing of household wastes properly, storm drain awareness, and water conservation techniques.

View this document now: RVIIB-05-01 (298 KB - PDF file); RVIIB-05-02 pamphlets (5.5 MB - PDF file)

Rouge Oakland County Public Education Activities #2 (RV-26)

Oakland County

Project Profile/Report, January 2006, 7 pages, Order Number: RV-26

This projects served to raise public awareness about the importance of watersheds. This was accomplished through the use of cable airtime, radio airtime, newsletters, municipal education, and grant education.

View this document now: RV-26 (67 KB - PDF file)

Rouge Oakland Public Service Announcements (RIXB-15)

Oakland County

Project Profile/Report, February 2010, 13 pages, Order Number: RIXB-15

This project is a part of the Oakland County's ongoing public education programs under storm water general permit activities. The products of this project were made available to communities throughout the Rouge River watershed and other watersheds. This storm water public education project consisted of cable television and radio public services announcements and print advertisement.

View this document now: RIXB-15 (452 KB - PDF file)

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Rouge Oakland County Public Education Activities 2003-2004 (RIII-17)

Oakland County

Project Profile/Report, June 2004, 9 pages, Order Number: RIII-17

This project provides for the production of a commercial and airtime to broadcast two new videos focused on improving water quality. The Rouge River Main 1-2 Subwatershed Public Education worked with the Wayne County Department of the Environment and the Huron River Watershed Council to combine efforts into a regional advertising campaign to educate homeowners and residents on various watershed issues, including water conservation, water quality, riparian responsibility, yard care, pet care, stormwater and recreation.

View this document now: RIII-17 (306 KB - PDF file)

Rouge Oakland Public Service Announcements - 2011 (RXB-07)

Oakland County Water Resources Commissioner

Project Profile/Report, November 2011, 9 pages, Order Number: RXB-07

The purpose of this project was to continue public education efforts in the Rouge River watershed. This project included continuing existing educational efforts with consistent messages regarding personal actions that can impact the watershed and ultimate storm water discharge location. This project addressed the Public Education elements of the Oakland County Storm Water Pollution Prevention Initiative (SWPPI), Goal 7 – Educate the Public About their Role in Protecting Water Quality.

View this document now: RXB-07 (56 KB - PDF file)

Rouge Public Education & Public Involvement Project 2003-2005 (RV-27)

Friend of The Rouge

Project Profile/Report, August 2006, 43 pages, Order Number: RV-27

The Rouge Education Project (REP) conducted public education activities through area schools. Students and teachers learned about the Rouge River, pollution prevention, and hands-on water quality monitoring tasks.

Rouge River Gateway Partnership Master Plan Implementation 2004-2005 (RV-11)

University of Michigan - Dearborn

Project Profile/Report, 2005, 15 pages, Order Number: RV-11

This project commented on the success of the Rouge River Gateway Partnership Master Plan Project. Highlights included ecosystem rehabilitation, restoration projects, and storm water management projects in Rouge River communities.

View this document now: RV-11 (2.2 MB - PDF file)

Rouge River Water Festival at Cranbrook 2006 (RVIIB-12A)

Cranbrook Institue of Science

Project Profile/Report, 2007, 166 pages, Order Number: RVIIB-12A

This project involved the ongoing planning and presentation of the Rouge River Water Festival at Cranbrook Institute of Science and it also included funding to create an interactive display at Cranbrook.

View this document now: RVIIB-12A (3.3 MB - PDF file)

Rouge River Water Festival @ Cranbrook 2007 (RVIIB-12B)

Cranbrook Institue of Science

Project Profile/Report, 2007, 6 pages, Order Number: RVIIB-12B

This project included the following activities: Planning and Presenting the Cranbrook Water Festival, Teacher Training and Follow-up, and Project Administration.

View this document now: RVIIB-12B (83 KB - PDF file)

Rouge River Water Festival at University of Michigan - Dearborn 2004 (RV-21A)

University of Michigan - Dearborn

Project Profile/Report, Project Number: RV-21A

This project described the Rouge River Water Festival, which is hosted by the Wayne County Department of the Environment and the University of Michigan - Dearborn. This Event hosted over 3.000 students, and introduced them to water resources, pollution prevention, and habitat conservation.

Rouge River Water Festival at University of Michigan - Dearborn 2005 (RV-21B)

University of Michigan - Dearborn

Project Profile/Report, July 2005, 54 pages, Order Number: RV-21B

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

This project commented on the Rouge River Water Festival. This event hosted students from neighboring Rouge River Watershed communities and served to teach them about pollution prevention and habitat conservation.

View this document now: RV-21B (1.9 MB - PDF file)

Rouge River Water Festival at Cranbrook 2005 (RVIB-17)

Cranbrook Institue of Science

Project Profile/Report, 2005, 7 pages, Order Number: RVIB-17

The Rouge River Water Festival hosted approximately 1,100 students over a three-day period. Festival activities included teaching students about the Rouge River ecosystem, as well as pollution prevention.

View this document now: RVIB-17 (241 KB - PDF file)

Rouge River Water Festival at Cranbrook 2008 (RVIIIB-16)

Cranbrook Institue of Science

Project Profile/Report, Project Number: RVIIIB-16

This project consists mainly the planning and implementation of the 2008 Rouge Water Festival at Cranbrook, which is a public education program. This effort includes planning and presentation of the three-day Rouge River Water Festival for fourth and fifth grade classes, a pre-training workshop for participating teachers prior to the water festival, and distance learning via videoconferencing for those classes that cannot attend the Rouge River Water Festival at Cranbrook.

Schools Program and Rouge River Calendar Contest (RV-09)

Oakland Plus

Project Profile/Report, 2005, 6 pages, Order Number: RV-09

This project extended itself to area schools to inform students about the Rouge River Watershed. Festivals and other outreach activities were conducted to educate students on things such as erosion control and pollution prevention.

View this document now: RV-09 (218 KB - PDF file)

SOCWA Earth Friendly Landscapes, Rain Gardens, and Public Education (RVIIB-01)

South Oakland County Water Authority (SOCWA)

Project Profile/Report, October 2007, 11 pages, Order Number: RVIIB-01

This public education project focused on two long-term management goals of the Main 1-2 Rouge Subwatershed Management Plan. The first goal is to restore/maintain aesthetically appealing conditions. The second goal is to minimize flow variability and associated negative impacts. These goals will be met through a multi-faceted public education program implemented by SOCWA in cooperation with retailers, agency partners, and volunteers.

View this document now: RVIIB-01 (445 KB - PDF file)

SOCWA Healthy Lawn and Garden Education Project (SW-12)

South Oakland County Water Authority (SOCWA)

Project Profile/Report, March 2000, 6 pages, Order Number: SW-12

The Healthy Lawn and Garden Education Project educated and motivated residents of southeastern Oakland County communities in the Rouge Watershed. The program developed and creatively communicated gardening and landscape approaches, building upon the Healthy Landscape Principles. The project also documented the attitudes and practices of citizens relating to healthy lawn and garden practices and other home practices relating to storm water quality.

View this document now: SW-12 (213 KB - PDF file)

Storm Water Education (RVIIIB-04)

University of Michigan - Dearborn

Project Profile/Report, December 2008, 105 pages, Order Number: RVIIIB-04

This project enhanced the understanding of the Rouge River Watershed by developing and implementing three storm water education projects at the University of Michigan - Dearborn - Environmental Interpretive Center. The Center developed two sharply focused, multi-screen, multi-media, audio-visual presentations on the Rouge River Watershed for the general public and school groups for showing in the auditorium of the Center. The Center also developed a series of interactive web pages on five kiosks to teach the importance and implementation of Best Management Practices in the Rouge River Watershed. The center also planned, organized, and hosted the 11th Annual Rouge River Water Festivals on its campus in 2008.

View this document now: RVIIIB-04 (1.4 MB - PDF file)

Storm Water Education: 2009 Rouge River Water Festival & Real Time Monitoring Exhibit (RIXB-05)

University of Michigan - Dearborn

Project Profile/Report, October 2009, 73 pages, Order Number: RIXB-05

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

This project enhanced the understanding of the Rouge River Watershed by developing and implementing three storm water education projects at the University of Michigan - Dearborn - Environmental Interpretive Center. The Center developed two sharply focused, multi-screen, multi-media, audio-visual presentations on the Rouge River Watershed for the general public and school groups for showing in the auditorium of the Center. The Center also developed a series of interactive web pages on five kiosks to teach the importance and implementation of Best Management Practices in the Rouge River Watershed. The center also planned, organized, and hosted the 11th Annual Rouge River Water Festivals on its campus in 2008.

View this document now: RIXB-05 (2.1 MB - PDF file)

Storm Water Education Project (RVIB-10)

University of Michigan - Dearborn

Project Profile/Report, June 2007, 148 pages, Order Number: RVIB-10

This project enhanced the understanding of the Rouge River Watershed by utilizing the Environmental Interpretive Center as a "Welcoming Center" for visitors to the University's Natural Area and providing access to the Rouge River located in Wayne County. The center also planned, organized, and hosted the Annual Rouge River Water Festivals on its campus in 2006 and 2007.

View this document now: RVIB-10 (1.9 MB - PDF file)

University of Michigan-Dearborn Education Exhibits on Storm Water Management (RIIB-09)

University of Michigan-Dearborn

Project Profile/Report, June 2007, 148 pages, Order Number: RIIB-09

This project will provide a series of educational experiences about storm water runoff and management for visitors to the Rouge River Watershed Environmental Interpretive Center at the University of Michigan Dearborn campus. This will be accomplished using interactive models, multimedia presentations, touch screen computers, lighted matching boards, large puzzles, large mobiles and colorful posters.

View this document now: RIIB-09 (412 K - PDF file)

Storm Water Education and Erosion Control Projects (RV-17)

Northville Township

Project Profile/Report, December 2004, 29 pages, Order Number: RV-17

This project consisted of several ways to improve upon watershed management. Public education and streambank stabilization activities were just a couple of avenues in which communities could improve their watershed quality.

View this document now: RV-17 (2.5 MB - PDF file)

Water Quality Monitoring and SWPPI Activities (RVIIIB-08)

Northville Township

Project Profile/Report, November 2008, 110 pages, Order Number: RVIIIB-08

In this project Northville Township worked towards improving the water quality of the Rouge River in the Middle 1 and Upper Subwatersheds by performing the following activities: additional water quality monitoring, commercial good housekeeping practice education, and a storm drain inlet marking program.

View this document now: RVIIIB-08 (11.5 MB - PDF file)

Wildlife Habitat Survey (1998-1999) RiverWatch (1999-2000) (RH-14)

Friends of the Rouge

Project Profile/Report, February 2001, 12 pages, Order Number: RH-14

The Wildlife Habitat Survey and River Watch 2001 final report describes the objectives, tasks, and activities completed by Friends of the Rouge. It discusses the frog and toad survey performed by community volunteers and the river watch activities, which include storm drain stenciling, stream surveys, water quality monitoring, and benthic monitoring.

View this document now: RH-14 (490 KB - PDF file)

Workman Elementary Schoolyard Habitat (RVIIB-20)

Canton Township

Project Profile/Report, 2007, 17 pages, Order Number: RVIIB-20

This project served to educate the community as well as improve watershed management with the creation of a habitat pond. Activities included the creation of a habitat pond, complete with native vegetation, a foot path, and a walking bridge.

View this document now: RVIIB-20 (1.3 MB - PDF file)

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Technical Papers & Reports

Key for Document Reading Level
* No scientific background required for understanding
** Some scientific and/or technical background helpful
*** Scientific and/or technical background suggested

1999 Public Opinion Survey

Public Sector Consultants

Technical Report, March 1999, 30 pages, Order Number: RPO-PI-TR12 **

The primary purpose of this survey, were to (1) measure the effectiveness of various public information and education programs conducted since the project began, in 1993, and (2) help guide public-involvement activities in the development of watershed management plans now being prepared.

View this document now: RPO-PI-TR12 (692 KB - PDF file)

A Strategy for Public Involvement

Wayne County Department of Environment (Michigan)

Supplemental Report, January 1994, 62 pages, Order Number: RPO-PI-SR02 *

Community interviews, focus groups and telephone queries were conducted to identify public opinion and perception of needs of the Rouge River Watershed communities. Four consistent themes emerged from the research: stakeholders and community leaders must be actively involved; the K-12 schools are critical to long-term success; there are very effective communication tools and organization entities already in place throughout the watershed; and most people obtain a significant amount of information from, and form opinions, based on what they read, hear, and see in the major media. Specific ideas and approaches are included.

View this document now: RPO-PI-SR02 (899 KB - PDF file)

Are These Products in Your Home?

Rouge Project Public Involvement Work Element

Brochure, February 1997, Order Number: PI-BR-05 *

This brochure describes the potentially hazardous products in homes that people may have in their homes. Disposal tips for the hazardous materials are given in addition to non-toxic alternatives. A list of community household hazardous waste collection telephone numbers for the Rouge River Watershed is also included.

Business Clean Water Guide: Doing Your Part To Keep Our Streams Clean

Canton Township

Community Project, July 1998, Order Number: CP-SP02-01.00 **

This guide is one of the task products of the Canton Township - "Fellows Creek Regional Detention and Public Education Programs" project that was completed as part of the original round of community stormwater projects. This guide contains the Detention Basin Maintenance Fact Sheet and the following 10 fact sheets: Protecting Water Quality; Catch Basin Care; Oil/Water Separators; Maintaining Building Exteriors; Maintaining Paved Areas; Maintaining Healthy Lawns, Shrubs and Trees; Maintaining Vehicles and Equipment; Using and Storing Deicing Chemicals; Storing Materials and Wastes; and Recycling. This guide may be easily adopted and modified for individual communities.

Canton Township Business Fact Sheets

Rouge Project Public Involvement Work Element

Fact Sheet, October 1997, 16 pages, Order Number: PI-CTBFACT *

These one-page fact sheets, developed by Canton and Plymouth Townships, are intended to inform local residents and business owners of the role they can play in pollution prevention.

View this document now: PI-CTBFACT (1.6 MB - PDF file)

Canton Township Household Fact Sheets

Rouge Project Public Involvement Work Element

Fact Sheet, October 1997, 23 pages, Order Number: PI-CTHFACT *

These one-page fact sheets, developed by Canton and Plymouth Townships, are intended to inform local residents and business owners of the role they can play in pollution prevention.

View this document now: PI-CTHFACT (1.3 MB - PDF file)

Changing Currents: The Rouge River Watershed Poster

Observer & Eccentric Newspapers

Poster, August 1996, Order Number: PI-POSTER-02 *

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

This four-color poster depicts the Rouge River Watershed and marks historical sites, CSO treatment facilities and sewer separation projects. The legend identifies degraded water quality areas, known sites of environmental contamination, CSO locations and major park land areas. A brief overview of the Rouge Watershed is also included.

Community Grants Program - 1998

Johnson, Carl

Brochure, March 1998, Order Number: PI-BR-09 **

The Wayne County Rouge Project community grants program began in 1993 with the award of grants for Phase I CSO basins and sewer separation projects. In 1995, the program evolved to include demonstration grants for stormwater and watershed management projects. In 1998, the program was further expanded to include new community support features, including: a) a streamlined process for executing IAAs with the County; b) a handbook on grant requirements to assist communities; and c) the appointment of an RPO representative to provide more "personal service" to communities in the development and implementation of projects. There are six categories for the community grants projects: GIS, recreation and habitat, watershed management, wetlands, stormwater and CSO.

Consensus Building and Grass Roots Efforts in a Comprehensive Urban Watershed Management Program

Zachare Ball, Josephine Powell, & Jack Bails

Paper, June 1996, 3 pages, Order Number: Watershed96-05.00 **

A Public Involvement Action Plan for the Rouge Project was devised based on a survey of stakeholders living and working in the Rouge River Watershed. The goal of the plan is to inform stakeholders, educate them, change their behavior, and gain their support for achieving and maintaining a healthy river basin.

DemoBulletin - Combined Sewer Overflows-Second Series

Rouge Project Public Involvement Work Element

Bulletin, 8 pages, Order Number: PI-BUL-02 **

This overview describes the types of Combined Sewer Overflows (CSO) solutions being implemented in the Rouge Watershed, as well as a map of the Rouge River Watershed CSO control projects.

DemoBulletin - Storm Water Management

Rouge Project Public Involvement Work Element

Bulletin, 8 pages, Order Number: PI-BUL-01 **

Rouge River DemoBulletins are multi-page fact sheets that describe the types of technology used to manage water quality in the Rouge River Watershed. This overview of storm water management defines the storm water runoff pollution problem and discusses management options. It is written especially for public officials, watershed managers and the general public.

DemoInfo - Computer Modeling

Rouge Project Public Involvement Work Element

Fact Sheet, 2 pages, Order Number: PI-INFO-99 *

Computer models are used to develop mathematical representations of real life situations. In the Rouge, computer models are being used to help answer questions about the impacts on water quality resulting from implementation of watershed pollution control strategies. This fact sheet illustrates the computer modeling process and reviews what models are being used by the Rouge Project.

View this document now: PI-INFO-99 (123 KB - PDF file)

DemoInfo - An Introduction to the Rouge Geographic Information System

Rouge Project Public Involvement Work Element

Fact Sheet, Order Number: PI-INFO-03 *

The Rouge Project Geographic Information System (GIS) is a computerized database that organizes and displays spatial information and maps, and is used for solving complex research, planning and management problems. This fact sheet describes how GIS is used, what type of information is stored in the database, and what types of questions can be answered using this computer technology.

View this document now: PI-INFO-03 (98 KB - PDF file)

DemoInfo - Combined Sewer Overflows

Rouge Project Public Involvement Work Element

Fact Sheet, Order Number: PI-INFO-05 *

A definition of CSOs is presented in this fact sheet. Descriptions of the types of CSO solutions being implemented in the Rouge Watershed are included, as well as a map of the Rouge River Watershed CSO control projects.

View this document now: PI-INFO-05 (145 KB - PDF file)

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

DemoInfo - Household Hazardous Waste

Rouge Project Public Involvement Work Element

Fact Sheet, Order Number: PI-INFO-08 *

Some household products require special attention in their use, storage and disposal. These products we use everyday are considered "hazardous". This brochure defines differing levels of hazardous materials; provides household hazardous waste tips and non-toxic alternatives; lists many household items and their proper disposal method; and lists contacts and phone numbers for Rouge River Watershed household hazardous waste collection information.

View this document now: PI-INFO-08 (110 KB - PDF file)

DemoInfo - Rouge Education Project

Rouge Project Public Involvement Work Element

Fact Sheet, Order Number: PI-INFO-04 *

The Rouge Education Project is coordinated by Friends of the Rouge, and funded, in part, by the Rouge Project. It provides elementary through high school students the opportunity to study the scientific and social ramifications of the Rouge River. This interdisciplinary focus centers around the components of research/data collection and problem solving/action taking.

View this document now: PI-INFO-04 (87 KB - PDF file)

DemoInfo - Rouge River National Wet Weather Demonstration Project

Rouge Project Public Involvement Work Element

Fact Sheet, Order Number: PI-INFO-02 **

This fact sheet, written for the public, is a general overview of the Rouge River National Wet Weather Demonstration Project (Rouge Project). The mission statement and funding sources are presented along with descriptions of each of the 10 project elements that will be used to manage and implement the project.

DemoInfo - Septic Systems

Rouge Project Public Involvement Work Element

Fact Sheet, Order Number: PI-INFO-11 *

This fact sheet discusses the operation and maintenance of septic systems and includes a planning diagram and maintenance record. Septic systems are wastewater treatment systems in areas where sewers are not available. Proper siting, installation and maintenance are key to ensuring good performance from a septic system.

View this document now: PI-INFO-11 (137 KB - PDF file)

DemoInfo - Storm Water Management: Best Management Practices (BMPs)

Rouge Project Public Involvement Work Element

Fact Sheet, Order Number: PI-INFO-06 *

BMPs are used to manage storm water pollution problems in the Rouge Watershed. This fact sheet defines storm water runoff pollution, land use impact on runoff, and explains the different types of BMPs including structural, vegetative, and managerial.

View this document now: PI-INFO-06 (78 KB - PDF file)

DemoInfo - The Watershed

Rouge Project Public Involvement Work Element

Fact Sheet, Order Number: PI-INFO-01 *

Rouge River DemoInfos are fact sheets written for the general public, describing specific water quality issues within the Rouge River Watershed. This issue contains current and historic demographic statistics, along with information on the watershed's geology and ography.

View this document now: PI-INFO-01 (162 KB - PDF file)

DemoInfo – Wetlands

Rouge Project Public Involvement Work Element

Fact Sheet, Order Number: PI-INFO-09 *

Wetlands are one of the most biologically diverse systems in the world and support a host of plant and animal species. The fact sheet describes wetlands and many of their benefits including; water quality improvements; food and habitat for fish and wildlife, flood control and shoreline erosion control, and recreation.

View this document now: PI-INFO-09 (172 KB - PDF file)

Designing the Right Hook: Public Participation in the Watershed Planning Process

Josephine Powell & Zachare Ball

Paper, May 2004, 7 pages, Order Number: NONPOINT2001-01 **

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Second National Conference - Nonpoint Source Pollution Information and Education Programs. Chicago

View this document now: NONPOINT2001-01 (77 KB - PDF file)

Detention Basin Maintenance

Rouge Project Public Involvement Work Element

Fact Sheet, 4 pages, Order Number: PI-INFO-100 *

Homeowners' Associations and business owners are responsible for maintaining their detention basins. Detention basins require maintenance to ensure that they function properly. This educational brochure, prepared by Canton Township Engineering Services, explains the different types of detention basins; what type of maintenance is required; and includes a schedule for maintenance tasks.

View this document now: PI-INFO-100 (346 KB - PDF file)

Detention Pond Maintenance Manual

Assembly of Rouge Communities

Miscellaneous Report, October 2005, 14 pages, Order Number: PDMM *

Your detention basin is a storm water Best Management Practice (BMP) designed to reduce the impacts of pollutants and increased storm water on local streams caused by development. They are an essential part of southeastern Michigan's efforts to improve the quality of our streams, rivers, and lakes; however detention basins will fail prematurely if not properly maintained. Once a detention basin fails, it will no longer perform its intended function and it is often very Whether you are an individual property owner, a home owners association representative, or a residential/commercial property manager, this Guidebook will answer all of these questions and provide you with stepby-step instructions for maintenance activities. Routine maintenance will prolong the life of your detention pond, improve its appearance, prevent flooding and property damage and enhance local streams and lakes. This Guidebook is not a set of rules and regulations on how to design or build a detention basin.

View this document now: PDMM (1.5 MB - PDF file)

Downspout Disconnection Brochure

Rouge Project Public Involvement Work Element

Fact Sheet, 6 pages, Order Number: PI-INFO-101 *

Rain water that lands on your roof is collected in gutters and is discharged to the ground by downspouts. Redirection of storm water coming from downspouts to vegetated areas can reduce storm water entering the sewer system, preventing pollution and helping to reduce flooding. This brochure provides information on the environmental benefits of disconnecting downspouts from the sewer system. It also provides a step-by-step process on how to disconnect them.

View this document now: PI-INFO-101 (891 KB - PDF file)

Friends of the Rouge River Watch Program, Wayne County, Michigan

Project Profile, July 2000, 2 pages, Order Number: SP-11 *

This project profile is a summary of the results of a grant funded effort performed with local community funding or in kind services. The summary focuses on the demonstration aspects of the project.

View this document now: SP-11 (97 KB - PDF file)

GIS User Needs Survey of Southeast Michigan

Michael N. Beaulac

Supplemental Report, August 1997, 9 pages, Order Number: PI-SR20.00 **

This report, published in August 1997, provided representatives of the Southeast Michigan District Office staff a first phase of MDNR In-House GIS Support Services. This effort seeks to increase management capabilities and integration of key model components of the Rouge Project GIS and similar initiatives at the Livonia District Office.

Healthy Lawn and Garden Principles Brochure

Rouge Project Public Involvement Work Element

Brochure, 2 pages, Order Number: PI-INFO-102 *

When soil and plants are healthy, plants naturally resist disease and pests - allowing gardeners to reduce their use of pesticides and quick-release fertilizers. The healthy garden principles and practices presented in this brochure help gardeners reduce yard waste and protect water quality.

View this document now: PI-INFO-102 (140 KB - PDF file)

Healthy Lawn Care Demonstration Project and Healthy Garden Tours, Southeastern and Southwestern Oakland County, Michigan

Charlotte Nichols

Project Profile, February 2000, 2 pages, Order Number: SP-04 *

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

This project profile is a summary of the results of a grant funded effort performed with local community funding or in kind services. The summary focuses on the demonstration aspects of the project.

View this document now: SP-04 (154 KB - PDF file)

Household Clean Water Guide: Doing Your Part To Keep Our Streams Clean

Canton Township

Community Project, July 1998, Order Number: CP-SP02-02.00 **

This guide is one of the task products of the Canton Township "Fellows Creek Regional Detention and Public Education Programs" project that was completed as part of the original round of community stormwater projects. This guide contains the Detention Basin Maintenance Fact Sheet and the following 10 fact sheets: Protecting Water Quality; Catch Basin Care; Maintaining Septic Systems; Landscaping Near the Water's Edge; Maintaining Healthy Lawns, Shrubs and Trees; Controlling Garden Pests; Home Composting: Natural Mulches; Wetlands; Car Care; Reducing Household Waste; Recycling; and Household Hazardous Waste. This guide may be easily adopted and modified for individual communities.

Keeping Our Shop In Tune - Customer Awareness Poster

Rouge Project Public Involvement Work Element

Poster, January 1997, 14 pages, Order Number: PI-POSTER-04 *

Vehicle service shops can help protect water quality in important ways by keeping pollutants out of storm drains and sanitary sewers. This poster is given to a Rouge Friendly Business and proclaims "We are doing our part to protect the Rouge River and help our community comply with the Clean Water Act." This poster is meant to be displayed in a customer service area and identifies 15 ways that the business is preventing pollution.

View this document now: PI-POSTER-04 (1.4 MB - PDF file)

Keeping Your Shop In Tune - Employee Education Poster

Rouge Project Public Involvement Work Element

Poster, January 1997, 14 pages, Order Number: PI-POSTER-03 *

Vehicle service shops can help protect water quality in important ways by keeping pollutants out of storm drains and sanitary sewers. This poster identifies 15 common activities that, if not done in an environmentally-friendly way, can lead to stormwater pollution. Under each activity are BMPs, or tips to follow that will minimize or s pollutants from reaching a water body. This poster is meant to be placed in the work area and can be used in the training and education of employees.

View this document now: PI-POSTER-03 (1.4 MB - PDF file)

Making Your Yard, Car and Home 'Rouge River Friendly' - A Fall Primer

Rouge Project Public Involvement Work Element

Brochure, August 1993, Order Number: PI-BR-02 *

Fall is the time of year when many people fertilize and care for their lawns, take care of basic car maintenance, and do their semi-annual cleaning which often includes disposal of leftover paint and various chemicals. If these activities are not done in an environmentally friendly way, they can lead to many pollution and environmental problems within the watershed. Do's and dont's, a list of household hazardous wastes, and helpful hints are included, educating the public on how they can live responsibly in the fragile Rouge River Watershed.

Making Your Yard, Car and Home 'Rouge River Friendly' - A Spring Primer

Rouge Project Public Involvement Work Element

Brochure, April 1994, Order Number: PI-BR-01 *

Spring is the time of year when many people fertilize and care for their lawns, take care of basic car maintenance, and do their semi-annual cleaning. If these activities are not done in an environmentally friendly way, they can lead to many pollution and environmental problems within the watershed. Do's and dont's, a list of household hazardous wastes, and helpful hints are included, educating the public on how they can live responsibly in the fragile Rouge River Watershed.

Measuring the Soft Stuff - Evaluating Public Involvement in Urban Watershed Restoration

Josephine Powell & Jack D. Bails

Project Profile, June 2000, 15 pages, Order Number: Watershed2000-05 **

This paper presents a case study for measuring and evaluating the effectiveness of a public involvement and education strategy for the Rouge River Watershed in metropolitan Detroit. It focuses on the public opinion telephone survey results from 1999. This paper compares the 1999 survey responses to those obtained from a similar baseline watershed-wide survey conducted in 1993 and an intensive mail survey also conducted in 1999 in a smaller area of the watershed.

View this document now: Watershed2000-05 (360 KB - PDF file)

Nankin Mills Interpretive Center Exhibits

Barry Johnson

Project Profile, February 2003, 2 pages, Order Number: M3-05 *

The objective of the Nankin Mills Interpretive Center grant was to foster awareness and appreciation of the natural and culture resources of the Rouge River watershed

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

through exhibits and interpretive programming and to promote stewardship of these resources.

View this document now: M3-05 (289 KB - PDF file)

Our Actions Can Affect The Rouge River

Rouge Project Public Involvement Work Element

Flyer, January 1997, Order Number: PI-FLYER-01 *

This simple one page flyer lists the 12 most frequent actions that people may do and how these actions can affect the Rouge River. If these common everyday things are not done in an environmentally friendly way, they can lead to stormwater pollution that affects the Rouge River. Listed next to each action are some tips to prevent pollution.

View this document now: PI-FLYER-01 (70 KB - PDF file)

Our Business Practices Can Affect the Rouge River

Rouge Project Public Involvement Work Element

Flyer, January 1997, Order Number: PI-FLYER-02 *

This one page flyer lists the most frequent actions that a business owner/operator may do and how these actions affect the Rouge River.

View this document now: PI-FLYER-02 (32 KB - PDF file)

Proposed Rouge River Public Involvement Action Plan

Wayne County Department of Environment (Michigan)

Supplemental Report, September 1994, 84 pages, Order Number: RPO-PI-SR03 *

This action plan is designed to seek public input from people within the Rouge River Watershed in order to design programs to meet community needs and allay concerns. The public has limited knowledge about the current status of the watershed, pollutants affecting it, and activities that can be undertaken to alleviate pollutant loadings. Therefore, by including all segments of the community in the public information and involvement process, knowledge and public involvement will increase, and support for project programs will grow as people begin to call the programs their own. Target audiences include the general public; media; local government officials; educational community; industry and business; environmental and community groups; and technical community and environmental managers. The action plan identifies initial messages, key themes and delivery mechanisms for each audience. Appended to this plan is the research report: "A Strategy for Public Involvement," January 1994, 60 pages, which documents results from community interviews, focus groups and telephone queries that were conducted to identify the public involvement views and needs of the Rouge River Watershed communities.

View this document now: RPO-PI-SR03 (1.3 MB - PDF file)

Protecting the Riparian Corridor

Southeast Michigan Council of Governments (SEMCOG)

Brochure, February 2007, 4 pages, Order Number: RIPARIAN-CORRIDOR

This SEMCOG brochure provides useful information for local communities and citizens on riparian corridor protection including streambank stabilization methods and things to consider during construction projects.

View this document now: RIPARIAN-CORRIDOR (1.7 MB - PDF file)

Public Involvement Programs that Support Water Quality Management

Josephine Powell, Zachare Ball, & Karen Reaume

Project Profile, 10 pages, Order Number: Watershed 2000-03 **

This paper discusses the programs used by the Public Involvement team of Wayne County's Rouge River National Wet Weather Demonstration Project (Rouge Project) to first increase watershed awareness in Rouge River Watershed residents and business owners; educate them about pollution sources to the Rouge River and involve them in restoration of the Rouge River by showing them that small changes in their daily activities can help improve water quality and restore the river.

The Rouge Friendly Neighborhood Program was piloted over a two-year period in watershed neighborhoods in three distinctly different areas of the watershed. All neighborhoods were surveyed to determine level of knowledge existing about water quality issues, lawn care maintenance and pollution prevention practices. The results were used to fashion a neighborhood program for each area. All three neighborhoods received Rouge Friendly brochures, newsletter articles and other materials.

The Rouge Friendly Business Program, a companion program to the neighborhood effort, sought to educate small-to-mid-sized businesses that they can positively impact the Rouge River by making small changes to daily business practices. Since auto-related businesses are very common in the Rouge River Watershed, an automotive services roundtable was convened. The partners included representatives of automotive service associations, the local chamber of commerce and businessmen who met for a year to review draft materials, make suggestions about the program's promotion and help mold the program before it was implemented. Once implemented, the industry representatives promoted the program in their publications and recruited businesses to participate in the program.

View this document now: Watershed 2000-03 (60 KB - PDF file)

Rouge Education Project, Wayne County, Michigan 1998-1999

Charlotte Nichols

Project Profile, July 2000, 3 pages, Order Number: SW-03 *

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

This project profile is a summary of the results of a grant funded effort performed with local community funding or in kind services. The summary focuses on the demonstration aspects of the project.

View this document now: SW-03 (74 KB - PDF file)

Rouge Friendly Business Brochure

Rouge Project Public Involvement Work Element

Brochure, May 1996, Order Number: PI-BR-06 *

This brochure describes the Rouge Friendly Business Program, which is sponsoring this program and the steps that a business needs to take to become "Rouge Friendly." This program is the first water quality education program in the watershed to focus entirely on helping businesses help the Rouge River.

Rouge Friendly Business Program for Businesses

Rouge Project Public Involvement Work Element

Activity Book, November 1997, 26 pages, Order Number: PI-BMP-03 **

The BMPs described in this booklet are focused on activities common to any business, i.e., cleaning paved surfaces, cleaning up spills and leaks, properly disposing of your floor wash water. These BMPs can show you how you can operate your business to reduce the amounts of substances that may enter storm drains and sanitary sewers. This booklet is a resource guide for the publication. In addition to this booklet, there is a questionnaire in the form of an assessment form and an action plan in one packet. The questions are activity based and are focused on common things that any business may do.

View this document now: PI-BMP-03 (332 KB - PDF file)

Rouge Friendly Business Program for Construction Related Businesses: General Contractors, Home Builders and Subcontractors Working on Construction Sites

Lynn M. Lefebvre & Karen G. Reaume

Activity Book, January 1998, 47 pages, Order Number: PI-BMP-06 **

The Best Management Practices (BMPs) described in this booklet are focused on activities common to construction related businesses, specifically general contractors, home builders and subcontractors working on construction sites. These BMPs can show you how you can operate your business and include pollution prevention practices such as: cleaning up spills and leaks, cleaning equipment, stabilizing disturbed soils, and fueling and servicing equipment. In addition to this booklet, there is a questionnaire in the form of an assessment form and an action plan in one packet.

View this document now: PI-BMP-06 (1.1 MB - PDF file)

Rouge Friendly Business Program for Construction Related Businesses: Home Repair and Maintenance Contractor

Lynn M. Lefebvre & Karen G. Reaume

Activity Book, January 1998, 31 pages, Order Number: PI-BMP-05 **

The Best Management Practices (BMPs) described in this booklet are focused on activities common to construction related businesses, specifically home repair and maintenance contractors. These BMPs can show you how you can operate your business and include pollution prevention practices such as: cleaning up spills and leaks, cleaning equipment, cleaning paved areas, and repairing vehicles and equipment. In addition to this booklet, there is a questionnaire in the form of an assessment form and an action plan in one packet.

View this document now: PI-BMP-05 (433 KB - PDF file)

Rouge Friendly Business Program for Food Related Businesses

Rouge Project Public Involvement Work Element

Activity Book, December 1996, 20 pages, Order Number: PI-BMP-02 **

The BMPs described in this booklet are focused on activities common to food related businesses. These BMPs can show you how you can operate your business to reduce the amounts of oil, grease, and other substances. This booklet is a resource guide for the publication. In addition to this booklet, there is a questionnaire in the form of an assessment form and an action plan in one packet. The questions are activity based and are focused on the food service industry.

View this document now: PI-BMP-02 (486 KB - PDF file)

Rouge Friendly Business Program for Metal Machining Businesses

Rouge Project Public Involvement Work Element

Activity Book, December 1996, 29 pages, Order Number: PI-BMP-04 **

The BMPs described in this booklet are focused on activities common to metal machining businesses. These BMPs can show you how you can operate your business to reduce the amounts of metal wastes, oily wastes, and other substances that may enter storm drains and sanitary sewers. This booklet is a resource guide for the publication. In addition to this booklet, there is a questionnaire in the form of an assessment form and an action plan in one packet. The questions are activity based and are focused on the metal machining industry.

View this document now: PI-BMP-04 (318 KB - PDF file)

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Rouge Friendly Business Program for Vehicle Service Businesses

Rouge Project Public Involvement Work Element

Activity Book, December 1996, 36 pages, Order Number: PI-BMP-01 **

The Best Management Practices (BMPs) described in this booklet are focused on activities common to vehicle service shop and other vehicle related businesses. These BMPs can show you how you can operate your business to reduce the amounts of antifreeze, oily wastes and other substances. This booklet is a resource guide for the publication. In addition to this booklet, there is a questionnaire in the form of an assessment form and an action plan in one packet. The questions are activity based and are focused on the vehicle service industry.

View this document now: PI-BMP-01 (509 KB - PDF file)

Rouge Friendly Neighborhood Brochure

Rouge Project Public Involvement Work Element

Brochure, January 1997, Order Number: PI-BR-07 *

This brochure educates and involves individuals and neighborhoods in protecting the Rouge Watershed. The Rouge Friendly Neighborhood Program is the first water quality education program in the watershed to focus entirely on the needs of neighborhoods.

Rouge News and Views- September 1993

Rouge Project Public Involvement Work Element

Newsletter, 4 pages, Order Number: PI-NEWS-02 *

Articles in Volume II include: Festivities on the Rouge; Nonpoint Source Pollution Control; Wildlife Returns to the Rouge River; Volunteers, Pros Befriend Rouge; Rouge Demonstration Project Hosts Russian Visitors; Rouge River Remedial Action Plan Mapped Rouge Restoration; Wet Weather Project Brightens Future.

Rouge News and Views - Winter 1995

Rouge Project Public Involvement Work Element

Newsletter, 4 pages, Order Number: PI-NEWS-06 *

Articles in Volume VI include: Demonstration Project Receives Additional Funding for CSO Projects; Rouge River: The Nation's Research Laboratory; Introducing SnoopAsaurus; Tom Anderson: 1919-1994.

Rouge News and Views - April 1994

Rouge Project Public Involvement Work Element

Newsletter, 4 pages, Order Number: PI-NEWS-04 *
Articles in Volume IV include: Team Rouge Counts Rain Drops; The Technological Heart of the Project: Computer Models; Rouge Rescue '94.

Rouge News and Views - Fall/Winter 1996

Rouge Project Public Involvement Work Element
Newsletter, 4 pages, Order Number: PI-NEWS-10 *

Articles in volume X include: EPA Administrator Carol Browner Visits; A 'New Birth' for Newburgh Lake; A 'Rouge Friendly' Business is Everybody's Business; Redford Retention Treatment Basin Dedicated; Friends of the Rouge a Winner With Some Old Favorites.

Rouge News and Views - January 1994

Rouge Project Public Involvement Work Element

Newsletter, 4 pages, Order Number: PI-NEWS-03 *

Articles in Volume III include: November 12th Leadership Breakfast Shares River's Stormy Past, Future Dream; Newburgh Lake; A Sampling of the Rouge; Rouge Partnership.

Rouge News and Views - July 1993

Rouge Project Public Involvement Work Element

Newsletter, 4 pages, Order Number: PI-NEWS-01 *

"Rouge River News and Views" is a newsletter that informs the general public and government officials of the activities of the Rouge Project, FOTR, Rouge River Action Council, and other Rouge River initiatives. Articles in Volume I include: Bringing Our River Back to Life; Rouge Rescue '93; Wet Weather Project Keys to River Restoration; Communities Taking Action; Students Play Important Role; Wet Weather Dimensions of Pollution.

Rouge News and Views - September 1994

Rouge Project Public Involvement Work Element

Newsletter, 4 pages, Order Number: PI-NEWS-05 *

Articles in Volume V include: Working Together to Save the Rouge; Controlling Combined Sewer Overflow to the Rouge; Detroit Water and Sewerage Department's

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Household Hazardous Waste Program; Rouge Remedial Action Plan Advisory Council's (RRAC) Successful First Year.
Rouge News and Views - Summer 1995

Rouge Project Public Involvement Work Element

Newsletter, 4 pages, Order Number: PI-NEWS-07 *

Articles in Volume VII include: Complex River Problems Need Multi-step Solutions; Rouge Rescue Celebrates its Tenth

Anniversary; Rouge Project Documents Available; Let's Go Fishing!

Rouge News and Views - Summer 1996

Rouge Project Public Involvement Work Element

Newsletter, 4 pages, Order Number: PI-NEWS-08 *

Articles in VIII include: Rouge Project Hosts Technical Workshop; Canoeing on the Rouge River; Rouge Species: Great Blue Heron; People are the River's Best Friends.

Rouge News and Views - Winter 1996

Rouge Project Public Involvement Work Element

Newsletter, 4 pages, Order Number: PI-NEWS-09 *

Articles in Volume IX include: First Rouge Retention Treatment Basin is Dedicated; Media Tour Generates Interest; Getting the Word Out; Rouge Species; Redside Dace; The Rouge Project is on the Internet and the Rouge River; Celebrating Its Worth.

Rouge River Activity Book

Rouge Project Public Involvement Work Element

Activity Book, June 1996, 12 pages, Order Number: PI-ACTIVITY-01 *

This booklet contains a variety of activities to inform elementary students about water quality problems in the Rouge River Watershed and how they can be part of the solution. Activities include: Where Do You Live, Wetlands, Nature Wonder, Household Wastes, Our Lawns Pollute the Rouge River Wildlife, Rouge River Fish, Where's the Fish and Storm Drains.

View this document now: PI-ACTIVITY-01 (427 KB - PDF file)

Rouge River Interpretive Recreation Opportunities Plan

Tilton Don & Karen Gallagher

Task Product Memorandum, February 1998, 30 pages, Order Number: NPS-TPM-49.00 **

Under the Rouge Project, the Wayne County RPO staff developed a plan to illustrate how existing and future recreational opportunities along the Rouge River could be enhanced with interpretive messages to improve public understanding of ongoing improvements to the river's water quality. The Rouge River Interpretive Recreation Opportunities Plan has been designed as a colorful brochure and poster which will be provided to park planners and other interested community leaders within the Rouge River Watershed.

View this document now: NPS-TPM-49.00 (1.3 MB - PDF file)

Rouge River Newsletter Articles

Newsletter, Order Number: PI-ARTICLES *

A series of newsletters articles have been written on the ics found in the Rouge Repair Kit.

View this document now: PI-ARTICLES (67 kb - PDF file)

Rouge River Repair Kit

Rouge Project Public Involvement Work Element

Booklet, July 1997, 42 pages, Order Number: PI-REPAIR-KIT **

This booklet provides citizens with information on what they can do to restore and protect the Rouge River. The following topics are included in this booklet: healthy lawn and garden; landscaping design and maintenance; problem of erosion; pet care and animal waste; household hazardous waste; car care; home improvement activities; downspout disconnection; and water conservation. Also included is information on organizations to join and actions that can be taken in your community.

View this document now: PI-REPAIR-KIT (1.4 MB - PDF file)

Salem Elementary School/South Lyon Community Schools Outdoor Environmental Education Lab Project, Salem Township, Michigan

Charlotte Nichols

Project Profile, July 2000, 2 pages, Order Number: M1-13 *

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This project profile is a summary of the results of a grant funded effort performed with local community funding or in kind services. The summary focuses on the demonstration aspects of the project.

View this document now: M1-13 (151 KB - PDF file)

SOCRRA - Healthy Garden Posters

Rouge Project Public Involvement Work Element

Poster, 4 pages, Order Number: PI-INFO-103 *

These one-page educational fliers, prepared by the Southeastern Oakland County Resource Recovery Authority, can easily be made into posters. They include: Healthy Landscape Principles; Waste-Wise Tips for a Healthy Lawn; Planting Trees for a Healthy City; and Water Wisely.

View this document now: PI-INFO-103 (225 KB - PDF file)

SOCRRA - Home Composting

Rouge Project Public Involvement Work Element

Fact Sheet, 2 pages, Order Number: PI-INFO-104 *

Through the natural process of composting, leaves and grass clippings from your yard can be transformed into a soil-enriching substance called compost. This educational fact sheet outlines the steps for making compost at home, reflecting the experience of Southeastern Oakland County Resource Recovery Authority (SOCCRA) Master Composters working in an urban setting.

View this document now: PI-INFO-104 (191 KB - PDF file)

SOCRRA - Natural Mulches

Rouge Project Public Involvement Work Element

Fact Sheet, 2 pages, Order Number: PI-INFO-105 *

Fallen leaves carry 50-80 percent of the nutrients a tree extracts from the soil and air. These nutrients and elements are essential for plant growth.This fact sheet, prepared by the Southeastern Oakland County Resource Recovery Authority, describes the many earth-friendly options available for using fallen leaves around the home.

View this document now: PI-INFO-105 (175 KB - PDF file)

SOCRRA - New American Yard

Rouge Project Public Involvement Work Element

Fact Sheet, 3 pages, Order Number: PI-INFO-106 *

This fact sheet, prepared by the Southeastern Oakland County Resource Recovery Authority, describes how to make your own compost; how to use that compost and other mulches in your yard; explains how plants grow and use nutrients; and has a layout of a home landscape with tips on planning your landscape in harmony with nature.

View this document now: PI-INFO-106 (330 KB - PDF file)

SOCRRA - Waste-Wise Tips for a Healthy Lawn

Rouge Project Public Involvement Work Element

Fact Sheet, 2 pages, Order Number: PI-INFO-107 *

This fact sheet, prepared by the Southeastern Oakland County Resource Recovery Authority, demonstrates different steps you can take when working with your lawn that reduce the need for lawn chemicals. These tips include feeding your lawn with grass clippings, different mowing options, grass recycling tips, lawn watering, lawn fertilization, and reducing pesticide use.

View this document now: PI-INFO-107 (150 KB - PDF file)

Storm Drains Aren't Garbage Cans

Rouge Project Public Involvement Work Element

Brochure, July 1997, Order Number: PI-BR-08 **

This brochure was written to reinforce the messages from the visual display. It explains the problem of storm drain pollution and provides tips on how to prevent this type of pollution. Also included in this brochure is a map of the major watersheds in Southeast Michigan.

View this document now: PI-BR-08 (721 KB - PDF file)

Storm Drains Aren't Garbage Cans (Magnet)

Rouge Project Public Involvement Work Element

Magnet, 1 pages, Order Number: PI-INFO-108 *

This popular graphic, which shows an unhappy fish sticking it's head out of a storm drain that has been littered with debris, illustrates the fact that anything that goes

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into a storm drain can end up in the Rouge River. This can be used to produce magnets or other educational material.

View this document now: PI-INFO-108 (52 KB - PDF file)

Taking Root: Sowing and Harvesting the Seeds of Public Involvement and Education

Josephine Powell, Noel Mullett, & Zachare Ball

Paper, February 1998, 4 pages, Order Number: Urbretro-98-02 **

The Rouge River, a tributary to the Detroit River, in Southeast Michigan, has been documented as a significant source of pollution to the Great Lake System. The Rouge River Watershed spans approximately 467 square miles in three countries and is home to over 1.5 million residents. This paper discusses the products, programs and partnerships used by the Public Involvement team of the Rouge Project Public Involvement Team to first increase watershed awareness in Rouge River Watershed residents; educate them about the pollution sources to the Rouge River and then involve them in restoration of the Rouge River by showing them that small changes in their daily activities can help restore the river. Even before the inception of the Rouge Project four years ago, it was clear that a comprehensive public involvement and education program was necessary to support Rouge River restoration activities. A survey of watershed residents in 1994, 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. The survey determined that a grassroots approach coupled with a down strategy was needed. A public outreach strategy based on the survey used the philosophy that communication with Rouge River watershed stakeholders must be continual, consistent, truthful and always two-way.

View this document now: Urbretro-98-02 (665 KB - PDF file)

The Rouge

Rouge Project Public Involvement Work Element

Poster, September 1994, Order Number: PI-POSTER-01 *

This four-color poster illustration of a river bank scene depicts man and nature coexisting along the banks of the Rouge River. Twenty-one features are identified including types of flora, fauna, wildlife, combined sewers, log jams, bank erosion and concrete channels. There is a key identifying each item. A map of the Rouge Watershed showing sewer drains, industrial and municipal discharge is also illustrated.

The Watershed Restoration News, Local Townships Share Lessons in Environmental Protection and SOCRRA Provides Healthy Lawn Tips in a Rouge - Friendly Way, Vol. 3 - July 1998

Sandra R. Kiser

Restoration Newsletter, July 1998, 4 pages, Order Number: PI-News-13 **

The July 1998 edition of The Watershed Restoration News featured articles on Canton & Plymouth Township's Fellows Creek Regional Detention and Public Education Programs projects as well as SOCRRA's Healthy Lawn and Garden program. The Fellows Creek Project resulted in the completion of a detention facility inventory, development of a storm water ordinance, and the development of public education materials. Several publications were produced under the Public Education Program including, water quality guides and pamphlets on catch basin care. Lastly, the Southeastern Oakland County Resource Recovery Authority article outlines tips on safe lawn care practices.

The Watershed Restoration News, Rouge Communities and Agencies Implement a Variety of Watershed Projects, Vol. 2 - March 1998

Sandra R. Kiser

Restoration Newsletter, March 1998, 4 pages, Order Number: PI-News-11 **

This edition focused on three watershed management pilot projects: Redford Township GIS, Southfield's Stormwater Management Plan and Wayne/Washtenaw County Healthy Farming Practices. This edition also listed stormwater management projects that are currently underway.

The Watershed Restoration News, Stormwater BMPs - What's Practical? Vol. 1 - January 1998

Sandra R. Kiser

Restoration Newsletter, January 1998, 2 pages, Order Number: PI-News-12 **

The Rouge Project is testing the effectiveness of various solutions for reducing the volume of Stormwater generated in the watershed and removing pollutants found in the Stormwater. This version of the newsletter discusses structural BMPs being implemented in the watershed, namely, vegetated swales and wetlands.

Watershed Education and Watershed Management: Using the River as an Interdisciplinary Teaching Tool

Mark Mitchell & James L. Graham

Paper, June 1996, 4 pages, Order Number: Watershed96-04.00 **

The Friends of the Rouge Education Project (REP) began in 1987 with 16 Detroit area high schools and has expanded to include 75 elementary, middle and high schools. The project's interdisciplinary curriculum incorporates chemistry, biology, computer science, mathematics, reading and writing skills, art and music.

Watershed Poster

Rouge Project Public Involvement Work Element

Poster, 1 pages, Order Number: PI-INFO-109 *

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

This poster builds awareness about where individuals live within the watershed. This multi-color poster includes the major watersheds in Southeast Michigan with the text, "use your head, you live in a watershed". It also provides a simple definition of the word "Watershed".

View this document now: PI-INFO-109 (226 KB - PDF file)

What Does Southeast Michigan Have... That No One Else In The Country Has?

Rouge Project Public Involvement Work Element

Brochure, February 1995, Order Number: PI-BR-03 *

This colorful brochure describes the team effort being coordinated in order to clean up the Rouge River. Team Rouge comprises key government organizations at the federal, state and local levels; residents; Friends of the Rouge (FOTR); universities; and neighborhood, community and business groups. Sections in the brochure include: What is Team Rouge Doing? Participate in a Program! Where Do You Live in the Watershed? Tips on Being "Rouge-Friendly," and Organizations Dedicated to Cleaning up the Rouge.

When it Rains Would You Rather...

Rouge Project Public Involvement Work Element

Brochure, June 1995, Order Number: PI-BR-04 *

This brochure focuses on retention treatment basins construction projects and explains how they will work.

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Sampling & Monitoring

The Rouge Project recognized that sampling and monitoring were critical to implementing a holistic watershed management approach for restoring the Rouge River. To this end, the Rouge Project established a comprehensive sampling and monitoring program to satisfied three criteria:

- monitor the health of the watershed,
- respond to community and management needs, and
- provide for cost-effective implementation of restoration activities.

Objectives developed for the monitoring program were:

- characterize river and ecosystem health trends,
- identify and prioritize problem areas,
- assess progress towards achieving watershed goals,
- document compliance with municipal watershed based storm water permits, and
- encourage public stewardship.

The Rouge Project developed numerous technical reports concerning the sampling and monitoring program. These include field sampling plans as well as summaries of various sampling efforts such as sediment reconnaissance, aesthetics, habitat, erosion, toxicity, water quality assessments, river hydrology, and desirable fish community targets.

For additional information and reports about ecosystem health monitoring in the Rouge River watershed, please visit the Friends of the Rouge website at **www.therouge.org**.

Volunteer Monitoring

Throughout the Rouge Project, volunteers have provided a valuable resource that has assisted watershed managers with support in clean-up and monitoring efforts. Volunteer monitoring can*:

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- Help people make the connection between watershed health and individual behavior,
- Increase the number of waterways assessed,
- Promote personal and community stewardship and cooperation,
- Illustrate the differences between natural and degraded habitats,
- Build bridges between stakeholder groups,
- Create a constituency for local waters, and
- Help inform the general public and policy makers about the status of specific waterways.

To realize the above as well as to support development of a comprehensive watershed sampling and monitoring program and encourage public stewardship of the water resources throughout the Rouge River watershed, the Rouge Project provided technical assistance and financial support to Friends of the Rouge and Wayne County to establish volunteer monitoring programs throughout the watershed. These programs include: **Frog and Toad Survey**, **Rouge Education Project**, and **Benthic Macroinvertebrate Sampling**.

* A.Markowitz, Volunteer Monitoring in Maryland, Assessing Cumulative Impacts of Watershed Development: EPA National Symposium, Chicago, IL, March 1996.

Technical Papers & Reports

Key for Document Reading Level
* No scientific background required for understanding
** Some scientific and/or technical background helpful
***Scientific and/or technical background suggested

1993-1994 Baseline Data Summary for the Rouge River

Richard A. Wagner & Thomas F. Quasebarth

Technical Memorandum, May 1996, 112 pages, Order Number: RPO-WMD1A-TM03-01 **

This report summarizes streamflow and water quality conditions in the Rouge River Watershed. The foundation of this report is based on data collected from the years 1993 and 1994 by the Wayne County Rouge Program Office (RPO) and on historical data collected by others. Rainfall, streamflow, dry and wet weather ambient instream water quality, biological and sediment data are analyzed. Data collected during both dry and wet weather includes data for constituent categories such as oxygen demand, nutrients, solids and bacteria. Biological studies included aquatic toxicity tests, fish surveys, macroinvertebrate surveys, habitat assessments, and phytoplankton studies. The sediment data included parameters that were used as indicators for the potential of sediment toxicity, realizing that the actual toxicity of the sediments is dependent upon factors other that individual contaminant concentrations. Results of all data surveys indicate that all of the Rouge River branches are degraded to some extent. Of the four branches, the Upper Rouge and the Middle Rouge appear to have the highest overall quality. In all branches, the upstream reaches have a higher quality than the downstream reaches.

View this document now: RPO-WMD1A-TM03-01 (2.6 MB - PDF file)

1993-1994 Baseline Water Quality Field Sampling Plan

Field Sampling Plan, April 1994, 50 pages, Order Number: SAM-FSP01.07 ***

The FSP provides a detailed description of the sampling and monitoring efforts of the Rouge Project baseline monitoring program. It details the wet weather sampling program which monitored the baseline water quality of a CSO impacted urban river system. Methods, sites, duration, magnitude and sample handling of the sampling effort from Fall 1993 to Fall 1994 are described. SOPs presented in this document ensure that the sampling is of acceptable quality and will yield information and data that is useable and technically defensible. The document is used for both staff training and reference. Appendices contain over 200 pages. Charts, forms and diagrams are included.

1993-1994 Sampling Program Overview

Carol Hufangel

Technical Memorandum, May 1996, 58 pages, Order Number: RPO-SAM-TM43 **

This document summarizes monitoring and sampling activities durning 1993 and 1994 which were performed as a part of the Rouge Project. A basic overview of the

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

sampling programs is described in the memorandum, along with a description of the purpose of each project.

View this document now: RPO-SAM-TM43 (2.3 MB - PDF file)

1995 Baseline Data Summary for the Rouge River

Christine H. Catalfio

Technical Memorandum, December 1996, 177 pages, Order Number: RPO-WMOG-TM12 **

This memorandum summarizes the results of the streamflow and water quality conditions throughout the Rouge River Watershed in 1995. Data collected for this memorandum was obtained through the efforts of the RPO and from historical data presented by other agencies and organizations.

View this document now: RPO-WMOG-TM12 (3.4 MB - PDF file)

1995 Baseline Water Quality Sampling Field Sampling Plan

Hufnagel, Carol

Field Sampling Plan, March 1996, 60 pages, Order Number: WMOG2B-FSP03.00 **

The FSP provides a detailed description of the sampling and monitoring efforts of the Rouge Project 1995 baseline monitoring program. It details the wet weather sampling program which monitored the baseline water quality of a combined sewer overflow impacted urban river system.

View this document now: RPO-WMOG2B-FSP03.00 (159 KB - PDF file)

1995 Sediment Oxygen Demand Studies

Joseph Rathbun, Gary Mercer, & Sarina Aryan

Technical Memorandum, July 1996, 41 pages, Order Number: MOD-TM08.00 **

In situ sediment oxygen demand (SOD) measurements were made at 14 stations on all four branches of the Rouge River between June and September 1995. Sediments at most of the stations were sandy, and exhibited low SOD (<1.5 g O2/m2/day). Silty sediments were usually restricted to small local deposits, except in the Middle Branch impoundments and some areas of the lower Main Branch.

View this document now: MOD-TM08.00 (964 KB - PDF file)

1995 Streambank Erosion Reconnaissance Survey

Joseph Rathbun, Gary Mercer, & Thomas Johnson

Technical Memorandum, August 1996, 36 pages, Order Number: WM-TM09.00 **

A reconnaissance survey of the magnitude and extent of streambank erosion on the four major branches of the Rouge River and selected tributaries was conducted in December 1995. A procedure is described for a more quantitative evaluation of the contribution of streambank erosion to the total suspened solids load of the river.

View this document now: WM-TM09.00 (176 KB - PDF file)

1996 Baseline Data Summary for the Rouge River

Christine H. Catalfio, Edward Kluitenberg, & Louis Regenmorter

Technical Memorandum, December 1997, 215 pages, Order Number: RPO-WMGT-TM26 **

This report summarizes the results of the streamflow and water quality conditions throughout the Rouge River Watershed in 1996. Data collected for this report was obtained through the efforts of the Wayne County RPO and from historical data presented by other agencies and organizations. Rainfall, streamflow, dry and wet weather ambient instream water quality and special bacteriological and dissolved oxygen data are included. Data collected during both dry and wet weather includes data for constituent categories such as oxygen demand, nutrients, solids and bacteria. Results of all data surveys indicated that all of the Rouge River branches are degraded to some extent.

View this document now: RPO-WMGT-TM26 (1.2 MB - PDF file)

1996 Baseline Water Quality Sampling Field Sampling Plan

Carol L. Hufnagel

Field Sampling Plan, October 1996, 55 pages, Order Number: WMOG2B-FSP17.00 **

The field sampling plan provides a detailed description of the ongoing sampling and monitoring efforts of the Rouge Project 1996 baseline monitoring program. Monitoring efforts to support targeted subwatersheds are included in the 1996 sampling program. It details the wet weather sampling program which will monitor sampling in the Main 1 Watershed prior to implementation of CSO control projects in this area.

View this document now: WMOG2B-FSP17.00 (1.7 MB - PDF file)

1996 Sediment Oxygen Demand Studies

Joseph E. Rathbun, Sarina G. Aryan & Gary W. Mercer

Technical Memorandum, February 1997, 12 pages, Order Number: MOD-TM16.00 **

This report summarizes in situ sediment oxygen demand (SOD) measurements made at eight stations on the Main Branch of the Rouge River between August and

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

October 1996.

View this document now: MOD-TM16.00 (140 KB - PDF file)

1997 Baseline Data Summary for the Rouge River Watershed

Christine H. Catalfio, Kristen L. Chaffin, Edward H. Kluitenberg, & Louis C. Regenmorter

Technical Memorandum, September 1998, 172 pages, Order Number: WMGT-TM30.00 **

This report summarizes the results of the streamflow and water quality conditions throughout the Rouge River Watershed in 1997. Data collected for this report was obtained through the efforts of the Wayne County Rouge Program Office (RPO) and from historical data presented by other agencies and organizations. Rainfall, streamflow dry and wet weather ambient instream water quality and wet weather includes data for constituent categories such as oxygen demand, nutrients, solids and bacteria. Results of all data surveys indicate that all of the Rouge River branches are degraded to some extent. Of the four branches, the Upper Rouge and the Middle Rouge River Watershed have better water quality than the downstream reaches. Data were also compared to monitoring results from 1994 through 1996 to define if water quality has changed at individual sites over the last four years. This comparison has shown a variety of changes with pollutant levels and water quality improving and decreasing.

View this document now: WMGT-TM30.00 (1.6 MB - PDF file)

1997 Baseline Water Quality Sampling Field Sampling Plan

Carol L. Hufnagel

Field Sampling Plan, August 1997, 72 pages, Order Number: WMOG2B-FSP18.00 **

This field sampling plan provides a detailed description of the ongoing sampling and monitoring efforts of the Rouge Project 1997 Basline Monitoring Program. The 1997 sampling program has two major goals: maintaining the historical database; and monitoring the Combined Sewer Overflows (CSO) basins that were recently put on line or that will be going on-line later this year, and to assess their impact(s). It details the wet weather sampling program which will support the seven CSO basins that will be on-line in 1997 in Oakland County (Main 1), Inkster (Lower 2), Dearborn Heights (Middle 3), Redford (Upper 1) and Puritan-Fenkell (Main 3). Sampling programs will include efforts to monitor the instream impacts of these basins. Methods, sites, duration, magnitude and sampling handling of the monitoring effort for the 1997 season (April-October) are described.

1998 Baseline Data Summary for the Rouge River Watershed

Chris Catalfio, Joseph Rathbun, Edward Kluitenberg, and Sarina Aryan

Technical Memorandum, October 1999, 267 pages, Order Number: RPO-WMGT-TM34 **

This report summarizes the baseline environmental conditions in the Rouge River Watershed observed in 1998. The 1998 program was a continuation of the 1997 program which focused on the collection of water quality data at selected monitoring sites to support the Phase 1 Combined Sewer Overflow basin performance monitoring and reporting. The program in 1998 involved continuous monitoring of water quality, flow, level, rainfall, and the collection of water quality samples at selected locations in the Rouge River and within the watershed. A network of 21 instream sites was used to monitor levels of flow, dissolved oxygen, and water chemistry during wet weather events. These sites were located both upstream and downstream of selected Phase 1 basins. The site located downstream of the basins included continuous monitoring for flow and dissolved oxygen levels. The instream water quality monitoring for CSO basin evaluation has been designed to contribute to the historical data set for the Rouge River Watershed.

View this document now: RPO-WMGT-TM34 (4.2 MB - PDF file)

1998 Baseline Water Quality Sampling Field Sampling Plan

Carol L. Hufnagel

Field Sampling Plan, July 1998, 63 pages, Order Number: WMGT-FSP19.00 **

This field sampling plan provides a detailed description of the ongoing sampling and monitoring efforts of the Rouge Project 1998 Baseline Monitoring Program. Methods, sites, duration, magnitude and sample handling of the monitoring effort for the 1998 season (April-October) are described. Standard operating procedures (SOPs) ensure that the sampling is of acceptable quality and will yield information and data that are useable and technically defensible. The document is used for both staff training and reference.

View this document now: WMGT-FSP19.00 (1.6 MB - PDF file)

1999 Baseline Data Summary for the Rouge River Watershed

Christine Catalfio, V. Elliott Smith & Christine Rohrer

Technical Memorandum, August 2004, 129 pages, Order Number: RPO-WMGT-TM35.00 **
This report summarizes the baseline environmental conditions in the Rouge River Watershed observed in 1999. The 1999 program was in part a continuation of the 1998 program, which focused on the collection of data at selected monitoring sites to continue documenting water quality status and trends, and to support the Phase 1 Combined Sewer Overflow (CSO) basin performance monitoring and reporting. However, wet weather data were collected at only one CSO site, as well as other selected river stations. The program in 1999 involved continuous monitoring of water quality, river flow and level at 15 stations, rainfall monitoring at 18 stations, and the collection of dry weather grab samples at up to 67 river stations throughout the watershed. Sections of the 1999 Baseline Data Summary contain the following: (1) Introduction; (2) Hydrologic Data; (3) Water Quality Data; (4) Bacteriological Surveys; (5) Special Studies; (6) Summary and Conclusions; (7) References. Six appendices provide further information.

View this document now:RPO-WMGT-TM35.00 (3.4 MB - PDF file)

1999 Baseline Water Quality Sampling Field Sampling Plan

Carol L. Hufnagel

Field Sampling Plan, August 1999, 73 pages, Order Number: WMGT-FSP20.00 ***

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

This field sampling plan provides a detailed description of the ongoing sampling and monitoring efforts of the Rouge Project 1999 Baseline Monitoring Program. The 1999 sampling program has two major goals: (1) maintaining the historical database, to track trends in the River; track progress on Rouge restoration efforts; and provide data to assist in implementing other Rouge restoration efforts (i.e., "hot spots" for illicit discharge elimination) (2) monitoring the Combined Sewer Overflow (CSO) control basins that were recently put online or that will be going online later this year, and to assess their impact(s).

This FSP details the wet weather sampling program which will support the ten CSO basins that will be online in 1999 in Oakland County (Main 1), Inkster (Lower 2), Dearborn Heights (Middle 3), Redford (Upper 1), Detroit (Main 2 and 3) and River Rouge (Main 4). Sampling programs will include efforts to monitor the instream impacts of these basins.

Methods, sites, duration, magnitude and sample handling of the monitoring effort for the 1999 season (May-October) are described. Standard operating procedures (SOPs) ensure that the sampling is of acceptable quality and will yield information and data that are useable and technically defensible. This Field Sampling Plan (FSP) is used for both staff training and reference.

View this document now: WMGT-FSP20.00 (1 MB - PDF file)

2000 Baseline Data Summary for the Rouge River Watershed

Elliott Smith, Ed Kluitenberg, Colleen Hughes, & Chris Catalfio

Technical Memorandum, June 2004, 201 pages, Order Number: RPO-WMGT-TM45 **

This report summarizes the baseline environmental conditions in the Rouge River Watershed observed in 2000. The 2000 program was in part a continuation of the 1999 and earlier programs, which focused on the collection of data at selected monitoring sites, in order to continue documenting water quality status and trends and to support the Phase 1 Combined Sewer Overflow (CSO) basin performance monitoring and reporting. The field program in 2000 involved continuous monitoring of water quality, river level and flow at 5 stations, precipitation monitoring at 22 stations, and the collection of dry weather grab samples at 45 river stations throughout the watershed. Although no specific wet weather sampling was conducted in 2000, partial results of a 1999 Middle Rouge wet weather special study are reported based on phosphorus monitoring at nine stations. A second special study involved water quality sampling at 13 stations in Newburgh Lake, Middle Rouge.

View this document now: RPO-WMGT-TM45 (4.6 MB - PDF file)

2000 Baseline Water Quality Sampling Field Sampling Plan

Carol Hufnagel

Field Sampling Plan, December 2000, 57 pages, Order Number: RPO-WMGT-FSP21.00 **

This field sampling plan provides a detailed description of the ongoing sampling and monitoring efforts of the Rouge Project 2000 Baseline Monitoring Program. The goals of the 2000 sampling program include: maintaining the historical database, tracking trends in the River; tracking progress on Rouge restoration efforts; and providing data to assist in implementing other Rouge restoration efforts (i.e., ?hot spots? for illicit discharge elimination). Methods, sites, duration, magnitude and sample handling of the monitoring effort for the 2000 season (May-October) are described. Standard operating procedures (SOPs) ensure that the sampling is of acceptable quality and will yield information and data that are useable and technically defensible. This Field Sampling Plan (FSP) is used for both staff training and reference.

View this document now: RPO-WMGT-FSP21.00 (433 KB - PDF file)

2001 Baseline Data Summary for the Rouge River Watershed

Chris Catalfio, Colleen Hughes, Ed Kluitenberg, & Elliott Smith

Technical Memorandum, June 2004, 214 pages, Order Number: RPO-WMGT-TM47 **

This report summarizes the baseline environmental conditions in the Rouge River Watershed observed in 2001. The 2001 program was in part a continuation of earlier programs, which focused on the collection of data at selected monitoring sites, in order to continue documenting water quality status and trends and to support the Phase 1 Combined Sewer Overflow (CSO) basin performance monitoring and reporting. In addition, the continued monitoring at selected sites in each Storm Water Management Area (SWMA) should help evaluate possible changes in water quality due to other stormwater management practices in each SWMA. The field sampling and monitoring program in 2001 involved continuous monitoring of water quality at seven stations, river level and flow monitoring at 12 stations, precipitation monitoring at 22 stations, and the collection of dry weather grab samples at 41 river stations throughout the watershed. As part of a special survey, during four of the biweekly dry weather surveys, additional grab samples were collected at 15 additional locations in the Middle 1 and Lower 1 Rouge SWMAs. Another special study involved ammonia sampling at 3 locations in the lower Main Rouge River concrete channel. No wet weather sampling was conducted in 2001.

View this document now: RPO-WMGT-TM47 (3.2 MB - PDF file)

2001 Baseline Water Quality Sampling Field Sampling Plan

Elliott Smith

Field Sampling Plan, May 2001, 57 pages, Order Number: RPO-WMGT-FSP22.00 **

This field sampling plan provides a detailed description of the ongoing sampling and monitoring efforts of the Rouge Project 2001 Baseline Monitoring Program. The goals of the 2001 sampling program include: maintaining the historical database, tracking trends in the River; tracking progress on Rouge restoration efforts; and providing data to assist in implementing other Rouge restoration efforts (i.e., ?hot spots? for illicit discharge elimination). Methods, sites, duration, magnitude and sample handling of the monitoring effort for the 2001 season (May-October) are described. Standard operating procedures (SOPs) ensure that the sampling is of acceptable quality and will yield information and data that are useable andtechnically defensible. This Field Sampling Plan (FSP) is used for both staff training and reference.

View this document now: RPO-WMGT-FSP22.00 (1.5 MB - PDF file)

2002 Baseline Data Summary for the Rouge River Watershed

Chris Catalfio, Colleen Hughes, & Joe Rathbun

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Technical Report, December 2004, 250 pages, Order Number: RPO-WMGT-TR59 **

This report summarizes the baseline environmental conditions in the Rouge River Watershed observed in 2002 by the Rouge River National Demonstration Project (Rouge Project). The 2002 program was in part a continuation of earlier programs, which focused on the collection of data at selected monitoring sites, in order to continue documenting water quality status and trends. The 2002 program also supported the Phase 1 Combined Sewer Overflow (CSO) basin performance monitoring and reporting. In addition, the continued monitoring at selected sites in each Storm Water Management Area (SWMA) should help evaluate possible changes in water quality due to stormwater management practices in each SWMA. The monitoring program in 2002 involved continuous monitoring of water quality (dissolved oxygen and temperature) at eight stations, river level and flow monitoring at 13 stations, and precipitation monitoring at 21 stations. During 2002, no dry or wet weather intermittent sampling was performed in the Rouge River Watershed. Intermittent sampling is planned to resume in 2003 and a plan has been developed to rotate intermittent sampling activities through the seven SWMAs over a five-year period. Additionally in 2002, staff from the Rouge Project and the Michigan Department of Environmental Quality (MDEQ)/Water Division collaborated on several "special studies" during the 2002 season. These studies were performed to determine the impact of watershed development and urbanization on the stream and stream channel.

Sections of the 2002 Baseline Data Summary contain the following: (1) Introduction; (2) Hydrologic Data; (3) Water Quality Data (including an analysis of trends); (4) Special Studies Data; (5) Summary and Conclusions; and (6) References. Five appendices provide additional supporting information. A Rouge Project Data CD can also be ordered from the project web site that includes the data summarized in this report as well as a stand-alone data viewer application, DataView.

View this document now: RPO-WMGT-TR59 (7.9 MB - PDF file)

2002 Baseline Water Quality Sampling Field Sampling Plan

Elliott Smith, Ed Kluitenberg, & Colleen Hughes

Field Sampling Plan, June 2002, 38 pages, Order Number: RPO-WMGT-FSP24 **

This field sampling plan provides a detailed description of the ongoing sampling and monitoring efforts of the Rouge Project 2002 Baseline Monitoring Program. The goals of the 2002 sampling program include: maintaining the historical database; tracking trends in the River; tracking progress on Rouge restoration efforts; and providing data to assist in implementing other Rouge restoration efforts (i.e., “hot spots” for illicit discharge elimination). Methods, sites, duration, magnitude of the monitoring effort for the 2002 season (May-October) are described. Standard operating procedures (SOPs) ensure that the sampling is of acceptable quality and will yield information and data that are useable and technically defensible. This Field Sampling Plan (FSP) is used for both staff training and field reference.

View this document now: RPO-WMGT-FSP24 (587 KB - PDF file)

2003 Baseline Water Quality Field Sampling Plan

Chris Catalfio

Field Sampling Plan, April 2003, 47 pages, Order Number: RPO-WMGT-FSP25 *

This field sampling plan provides a detailed description of the ongoing sampling and monitoring efforts of the Rouge Project 2003 Baseline Monitoring Program. The goals of the 2003 sampling program include: implementing monitoring required in individual community storm water permits, maintaining the historical database, tracking trends in the River; tracking progress on Rouge restoration efforts; and providing data to assist in implementing other Rouge restoration efforts (i.e., "hot spots" for illicit discharge elimination).

Monitoring and sampling scope, methods, sites, duration, and sample handling for the 2003 season (May-October) are described. Standard operating procedures (SOPs) ensure that the sampling is of acceptable quality and will yield information and data that are useable and technically defensible. This Field Sampling Plan (FSP) is used for both staff training and reference.

View this document now: RPO-WMGT-FSP25 (1.2 MB - PDF file)

2003 Rouge River Ecosystem Monitoring and Assessment Report

Chris Catalfio, Colleen Hughes, Joe Rathbun, & Steve Rood

Technical Report, January 2005, 36 pages, Order Number: RPO-WMGT-TR61 **

The Baseline Data Summary Report as presented in previous years has been changed to reflect the organization of the Rouge River Watershed into seven Storm Water Management Areas (SWMAs). Each SWMA represents one or two subwatersheds; Main 1-2, Main 3-4, Upper, Middle 1, Middle 3, Lower 1, and Lower 2. Data are presented in this report that summarize physical, chemical, and biological monitoring that has been performed in the Rouge River Watershed. To reflect the inclusion of these additional data and the presentation of data by SWMA the document has been renamed to, The Rouge River Ecosystem Monitoring and Assessment Report (RREMAR). These additional data now found within in this report include the Index of Biotic Integrity (IBI-Fish community), Stream Habitat (GLEAS 51), Macro invertebrate, and Frog and Toad Survey data.

The Rouge River Ecosystem Monitoring and Assessment Report summarizes the environmental conditions in the Rouge River Watershed observed in 2003 by the Rouge River Wet Weather National Demonstration Project (Rouge Project) and other agencies. The 2003 program was in part a continuation of earlier programs, which focused on the characterizing water quality status and trends. The monitoring program in 2003 involved continuous monitoring of water quality (dissolved oxygen and temperature) at eight stations, river level and flow monitoring at 13 stations, and precipitation monitoring at 21 stations. These activities are a part of a Five-Year Monitoring Plan that was started in 2003 and includes a rotational schedule of intermittent water quality sampling through the seven SWMAs over a five-year period. Dry weather intermittent sampling began in the Main 1-2 SWMA in the fall of 2003 with completion in 2004. Additionally in 2003, staff from the Rouge Project and the Michigan Department of Environmental Quality (MDEQ)/Water Division collaborated on several "special studies". These studies were performed to determine the impact of watershed development and urbanization on the stream and stream channel and are summarized in this report.

View this document now: RPO-WMGT-TR61 (9.1 MB - PDF file)

2004 Baseline Water Quality Field Sampling Plan

Chris Catalfio

Field Sampling Plan, April 2004, 48 pages, Order Number: RPO-WMGT-FSP26 **

This field sampling plan provides a detailed description of the ongoing sampling and monitoring efforts of the Rouge Project 2004 Baseline Monitoring Program. The

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

goals of the 2004 sampling program include: implementing monitoring required in individual community storm water permits, maintaining the historical database, tracking trends in the River; tracking progress on Rouge restoration efforts; and providing data to assist in implementing other Rouge Watershed restoration efforts (i.e., "hot spots" for illicit discharge elimination).

Monitoring and sampling scope, methods, sites, duration, and sample handling for the 2004 season (May-October) are described. Standard operating procedures (SOPs) ensure that the sampling is of acceptable quality and will yield information and data that are useable and technically defensible. This Field Sampling Plan (FSP) is used for both staff training and reference.

View this document now: RPO-WMGT-FSP26 (1.4 MB - PDF file)

2004 Five Year Plan Dry Weather Survey Standard Operating Procedure

Rouge Project Office

Field Sampling Plan, March 2004, 46 pages, Order Number: 2004-SOP-DRY *

This document covers the field procedures that will be performed during the 15 dry weather surveys planned per year in the 2003 through 2007 sampling seasons. It is updated yearly to include the final selection of sampling locations in the SWMA(s) sampled in a particular year and any other applicable changes in the monitoring program.

View this document now: 2004-SOP-DRY (1.1 MB - PDF file)

2004 Five Year Plan Wet Weather Survey Standard Operating Procedure

Rouge Project Office

Field Sampling Plan, April 2004, 50 pages, Order Number: 2004-SOP-WET *

This document covers the field procedures that will be performed during the five planned wet weather surveys per year in the 2004 through 2007 May through October sampling seasons. It is updated yearly to include the final selection of sampling locations in the SWMA(s) sampled in a particular year and any other applicable changes in the monitoring program.

View this document now: 2004-SOP-WET (1.1 MB - PDF file)

2004 Rouge River Ecosystem Monitoring and Assessment Report

Chris Catalfio, Colleen Hughes & Steve Rood

Technical Report, December 2005, 302 pages, Order Number: RPO-WMGT-TR63 **

The Rouge River Watershed is organized into seven Storm Water Management Areas (SWMAs). Each SWMA represents one or two subwatersheds: Main1-2, Main 3-4, Upper, Middle 1, Middle 3, Lower 1, and Lower 2. Data are presented in this report that summarize physical, chemical, and biological monitoring that has been performed in the Rouge River Watershed. Funding for the hydrologic and water quality data collected during the 2004 Rouge monitoring program was provided by the Assembly of Rouge Communities and the federal grants for the Rouge River National Wet Weather Demonstration Project (Rouge Project). This report also considers sampling/monitoring data for the Rouge River collected and reported by others for fish community, stream habitat, benthic macroinvertebrates, frog and toad populations, and other indicators of ecosystem health.

The Rouge River Ecosystem Monitoring and Assessment Report summarizes the environmental conditions in the Rouge River Watershed observed in 2004 by the Rouge Project and other agencies. The 2004 program was in part a continuation of earlier programs, which focused on the characterizing water quality status and trends. The monitoring program in 2004 involved continuous monitoring of dissolved oxygen and temperature at eight stations, river level and flow monitoring at 13 stations, and precipitation monitoring at 21 stations. These activities are a part of a Five-Year Monitoring Plan that was started in 2003 and includes a rotational schedule of intermittent water quality sampling through the seven SWMAs over a five-year period. Dry weather intermittent sampling was performed in the Main 1-2 and Upper SWMAs in 2004.

View this document now: RPO-WMGT-TR63 (9.5 MB - PDF file)

2005 Baseline Water Quality Field Sampling Plan

Chris Catalfio

Field Sampling Plan, April 2005, 50 pages, Order Number: RPO-WMGT-FSP27 **

This field sampling plan provides a detailed description of the ongoing sampling and monitoring efforts of the Rouge Project 2005 Baseline Monitoring Program. The goals of the 2005 sampling program include: implementing monitoring required in individual community storm water permits, maintaining the historical database, tracking trends in the River; tracking progress on Rouge restoration efforts; and providing data to assist in implementing other Rouge Watershed restoration efforts (i.e., “hot spots” for illicit discharge elimination).

View this document now: RPO-WMGT-FSP27 (1 MB - PDF file)

2005 Five Year Plan Dry Weather Survey Standard Operating Procedure

Rouge Project Office

Field Sampling Plan, March 2005, 46 pages, Order Number: 2005-SOP-DRY *

This document covers the field procedures that will be performed during the 15 dry weather surveys planned per year in the 2003 through 2007 sampling seasons. It is updated yearly to include the final selection of sampling locations in the SWMA(s) sampled in a particular year and any other applicable changes in the monitoring program.

View this document now: 2005-SOP-DRY (889 KB - PDF file)

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

2005 Five Year Plan Wet Weather Survey Standard Operating Procedure

Rouge Project Office

Field Sampling Plan, March 2005, 50 pages, Order Number: 2005-SOP-WET *

This document covers the field procedures that will be performed during the five planned wet weather surveys per year in the 2004 through 2007 May through October sampling seasons. It is updated yearly to include the final selection of sampling locations in the SWMA(s) sampled in a particular year and any other applicable changes in the monitoring program.

View this document now: 2005-SOP-WET (1 MB - PDF file)

2005 Rouge River Ecosystem Monitoring and Assessment Report

Chris Catalfio, Colleen Hughes & Steve Rood

Technical Report, June 2007, 359 pages, Order Number: RPO-WMGT-TR65 **

The Rouge River Watershed is organized into seven Storm Water Management Areas (SWMAs). Each SWMA represents one or two subwatersheds: Main1-2, Main 3-4, Upper, Middle 1, Middle 3, Lower 1, and Lower 2. Data are presented in this report that summarize physical, chemical, and biological monitoring that has been performed in the Rouge River Watershed. Funding for the hydrologic and water quality data collected during the 2005 monitoring program was provided by the Alliance of Rouge Communities and the federal grants for the Rouge River National Wet Weather Demonstration Project (Rouge Project). This report also includes sampling and monitoring data for the Rouge River collected and reported by others for bacteria, fish community, stream habitat, benthic macroinvertebrates, frog and toad populations, and other indicators of ecosystem health. The Rouge River Ecosystem Monitoring and Assessment Report summarizes the environmental conditions in the Rouge River Watershed observed in 2005 by the Rouge Project and other agencies. The 2005 program was in part a continuation of earlier programs, which focused on characterizing water quality status and trends. The monitoring program in 2005 involved continuous monitoring of dissolved oxygen and temperature at eight stations, river level and flow monitoring at 13 stations, and precipitation monitoring at 16 stations. These activities are a part of a "Five-Year Monitoring Plan" that was started in 2003 and includes a rotational schedule of intermittent water quality sampling through the seven SWMAs over a five-year period. Dry and wet weather intermittent sampling was performed in the Main 1-2 and Upper SWMAs in 2004 and in the Middle 1 and Middle 3 SWMAs in 2005. Rouge River Watershed monitoring and survey data are summarized in this report by SWMA. The report summary, conclusions, and references are also included.

View this document now: RPO-WMGT-TR65 (9.7 MB - PDF file)

2006 Baseline Water Quality Field Sampling Plan

Chris Catalfio

Field Sampling Plan, April 2006, 49 pages, Order Number: RPO-WMGT-FSP28 **

This field sampling plan provides a detailed description of the ongoing sampling and monitoring efforts for the 2006 Baseline Monitoring Program being conducted on behalf of the Rouge Project and the Alliance of Rouge Communities. The goals of the 2006 sampling program include: implementing monitoring required in individual community storm water permits, maintaining the historical database, tracking trends in the River; tracking progress on Rouge restoration efforts; and providing data to assist in implementing other Rouge Watershed restoration efforts (i.e., hot spots for illicit discharge elimination).

View this document now: RPO-WMGT-FSP28 (1.1 MB - PDF file)

2006 Five Year Plan Dry Weather Survey Standard Operating Procedure

Rouge Project Office

Field Sampling Plan, April 2006, 42 pages, Order Number: 2006-SOP-DRY *

This document covers the field procedures that will be performed during the 15 dry weather surveys planned per year in the 2003 through 2007 sampling seasons. It is updated yearly to include the final selection of sampling locations in the SWMA(s) sampled in a particular year and any other applicable changes in the monitoring program.

View this document now: 2006-SOP-DRY (1.6 MB - PDF file)

2006 Five Year Plan Wet Weather Survey Standard Operating Procedure

Rouge Project Office

Field Sampling Plan, April 2006, 44 pages, Order Number: 2006-SOP-WET *

This document covers the field procedures that will be performed during the five planned wet weather surveys per year in the 2004 through 2007 May through October sampling seasons. It is updated yearly to include the final selection of sampling locations in the SWMA(s) sampled in a particular year and any other applicable changes in the monitoring program.

View this document now: 2006-SOP-WET (1.4 MB - PDF file)

2006 Rouge River Ecosystem Monitoring and Assessment Report

Chris Catalfio, Colleen Hughes, Jennifer Sackrison & Nancy Gregor

Technical Report, March 2008, 423 pages, Order Number: RPO-WMGT-TR67 **

The Rouge River Watershed is organized into seven Storm Water Management Areas (SWMAs). Each SWMA represents one or two subwatersheds: Main1-2, Main 3-4, Upper, Middle 1, Middle 3, Lower 1, and Lower 2. Data are presented in this report that summarize physical, chemical, and biological monitoring that has been performed in the Rouge River Watershed. Funding for the hydrologic and water quality data collected during the 2006 monitoring program was provided by the Alliance of Rouge Communities and the federal grants for the Rouge River National Wet Weather Demonstration Project (Rouge Project). This report also includes sampling and monitoring data for the Rouge River collected and reported by others for bacteria, fish community, stream habitat, benthic macroinvertebrates, frog and toad populations, and other indicators of ecosystem health. The Rouge River Ecosystem Monitoring and Assessment Report summarizes the environmental conditions in the

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Rouge River Watershed observed in 2006 by the Rouge Project and other agencies. The 2006 program was in part a continuation of earlier programs, which focused on characterizing water quality status and trends. The monitoring program in 2006 involved continuous monitoring of dissolved oxygen and temperature at two stations, river level and flow monitoring at nine stations, and precipitation monitoring at 20 stations. These activities are a part of a "Five-Year Monitoring Plan" that was started in 2003 and includes a rotational schedule of intermittent water quality sampling through the seven SWMAs over a five-year period. Dry and wet weather intermittent sampling was performed in the Main 1-2 and Upper SWMAs in 2004, in the Middle 1 and Middle 3 SWMAs in 2005, and in the Lower 1 and Lower 2 SWMA in 2006. Rouge River Watershed monitoring and survey data are summarized in this report by SWMA. The report summary, conclusions, and references are also included.

View this document now: RPO-WMGT-TR67 (14.3 MB - PDF file)

2007 Baseline Water Quality Field Sampling Plan

Chris Catalfio

Field Sampling Plan, March 2007, 48 pages, Order Number: RPO-WMGT-FSP29 *

This Field Sampling Plan (FSP) provides a detailed description of the ongoing sampling and monitoring efforts for the 2007 Baseline Monitoring Program being conducted on behalf of the Rouge River National Wet Weather Demonstration Project and the Alliance of Rouge Communities. The goals of the 2007 sampling program include: implementing monitoring required in individual community storm water permits; maintaining the historical database and tracking trends in the Rouge River; tracking progress on Rouge restoration efforts; and providing data to assist in implementing other Rouge Watershed restoration efforts (i.e., “hot spots for illicit discharge elimination).

View this document now: RPO-WMGT-FSP29 (616 KB - PDF file)

2007 Five Year Plan Dry Weather Survey Standard Operating Procedure

Rouge Project Staff

Field Sampling Plan, March 2007, 25 pages, Order Number: 2007-SOP-DRY *

This document covers the field procedures that will be performed during the 15 dry weather surveys planned per year in the 2003 through 2007 sampling seasons. It is updated yearly to include the final selection of sampling locations in the SWMA(s) sampled in a particular year and any other applicable changes in the monitoring program.

View this document now: 2007-SOP-DRY (913 KB - PDF file)

2007 Five Year Plan Wet Weather Survey Standard Operating Procedure

Rouge Project Staff

Field Sampling Plan, March 2007, 46 pages, Order Number: 2007-SOP-WET *

This document covers the field procedures that will be performed during the five planned wet weather surveys per year in the 2004 through 2007 May through October sampling seasons. It is updated yearly to include the final selection of sampling locations in the SWMA(s) sampled in a particular year and any other applicable changes in the monitoring program.

View this document now: 2007-SOP-WET (1.2 MB - PDF file)

2007 Rouge River Ecosystem Monitoring and Assessment Report

Chris Catalfio, Colleen Hughes, Jennifer Sackrison & Nancy Gregor

Technical Report, March 2009, 465 pages, Order Number: RPO-WMGT-TR68 **

The Rouge River Ecosystem Monitoring and Assessment Report summarizes the environmental conditions in the Rouge River Watershed observed in 2007 by the Rouge Project and other agencies. The monitoring program in 2007 involved continuous monitoring of dissolved oxygen and temperature at two stations, river level and flow monitoring at eight stations, and precipitation monitoring at 21 stations. These activities are a part of a "Five-Year Monitoring Plan" that was started in 2003 and includes a rotational schedule of intermittent water quality sampling through the seven SWMAs over a five-year period. Dry and wet weather intermittent sampling was performed in the Main 1-2 and Upper SWMAs in 2004, in the Middle 1 and Middle 3 SWMAs in 2005, in the Lower 1 and Lower 2 SWMA in 2006, and in the Main 3-4 SWMA in 2007. The report also presents results of an intensive study undertaken in 2006 to determine the sources of E coli bacteria, an indicator of the presence of sewage, throughout the watershed. Rouge River Watershed monitoring and survey data are summarized in this report for all seven SWMAs.

View this document now: RPO-WMGT-TR68 (10.5 MB - PDF file)

2008 Rouge River Ecosystem Monitoring and Assessment Report

Christine H. Catalfio

Technical Report, June 2009, 23 pages, Order Number: RPO-WMGT-TR71 **

The 2008 Rouge River Ecosystem Monitoring and Assessment Report is a summary of the continuous monitoring level and flow, precipitation, and dissolved oxygen (DO) and water temperature data collected during the year. Although the ARC was not monitoring in 2008, continuous monitoring of level and flow was performed by the United States Geological Survey (USGS) at seven locations throughout the watershed in cooperation with Oakland County and the Michigan Department of Environmental Quality (MDEQ). Additionally, Wayne County Department of Environment (WCDOE) supported monitoring of continuous level and flow at three additional locations. An on-line database is available which allows users to query sampling data collected since 1994 by site, date, and parameter. It allows for online data viewing or download and includes on-line help.

View this document now: RPO-WMGT-TR71 (907 KB - PDF file)

2009 Rouge River Ecosystem Monitoring and Assessment Report

Christine H. Catalfio

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Technical Report,, September 2010, 26 pages, Order Number: RPO-WMGT-TR72 **

The 2009 Rouge River Ecosystem Monitoring and Assessment Report is a discussion of the monitoring data collected during the year. Precipitation data (15-minute totals) were collected in 2009 at 20 rain gage locations throughout the watershed. Six of the rain gages were operated by the Wayne County Department of the Environment (WCDOE), 11 rain gages were operated by the Oakland County Drain Commissioner's (OCDC) Office, and the Detroit Water and Sewerage Department (DWSD) operated three rain gages. Continuous monitoring of level and flow was performed by the United States Geological Survey (USGS) at seven locations throughout the watershed in cooperation with Oakland County and the Michigan Department of Environmental Quality (MDEQ). An on-line database is available which allows users to query sampling data collected since 1994 by site, date, and parameter. It allows for online data viewing or download and includes on-line help.

View this document now: RPO-WMGT-TR72 (729 KB - PDF file)

2010 Rouge River Ecosystem Monitoring and Assessment Report

Christine H. Catalfio

Technical Report, November 2011, 27 pages, Order Number: RPO-WMGT-TR74 **

The 2010 Rouge River Ecosystem Monitoring and Assessment Report is a discussion of the monitoring data collected during the year. Precipitation data (15-minute totals) were collected in 2010 at 21 rain gage locations throughout the watershed. Seven of the rain gages were operated by the Wayne County Department of the Environment (WCDOE), 11 rain gages were operated by the Oakland County Drain Commissioner's (OCDC) Office, and the Detroit Water and Sewerage Department (DWSD) operated three rain gages. Additional precipitation data were also collected for the Detroit and Pontiac area by NOAA's National Weather Service Forecast Office. Continuous monitoring of level and flow was performed by the United States Geological Survey (USGS) at seven locations throughout the watershed in cooperation with Oakland County and the Michigan Department of Environmental Quality (MDEQ). Continuous monitoring of dissolved oxygen (DO) and temperature was performed by the USGS at one location in the Upper Branch of the Rouge River. An on-line database is available which allows users to query sampling data collected since 1994 by site, date, and parameter. It allows for online data viewing or download and includes on-line help.

View this document now: RPO-WMGT-TR74 (1.2 MB - PDF file)

2011 Rouge River Ecosystem Monitoring and Assessment Report

Christine H. Catalfio

Technical Report, September 2012, 35 pages, Order Number: RPO-WMGT-TR75 **

The 2011 Rouge River Ecosystem Monitoring and Assessment Report is a discussion of the monitoring data collected during the year. Precipitation data (15-minute totals) were collected in 2011 at 21 rain gage locations throughout the watershed. Seven of the rain gages were operated by the Wayne County Department of Public Services (WCDPS), 11 rain gages were operated by the Oakland County Water Resources Commissioner's (OCWRC) Office, and the Detroit Water and Sewerage Department (DWSD) operated three rain gages. Continuous monitoring of level and flow was performed by the United States Geological Survey (USGS) at eight locations throughout the watershed in cooperation with Oakland County and the Michigan Department of Environmental Quality (MDEQ). Continuous monitoring of dissolved oxygen (DO) and water temperature was performed by the USGS at one location in the Middle Branch of the Rouge River. An on-line database is available which allows users to query sampling data collected since 1994 by site, date, and parameter. It allows for online data viewing or download and includes on-line help.

View this document now: RPO-WMGT-TR75 (1 MB - PDF file)

2012 Rouge River Ecosystem Monitoring and Assessment Report

Christine H. Catalfio

Technical Report, August 2013, 31 pages, 35 pages, Order Number: RPO-WMGT-TR76 **

The 2012 Rouge River Ecosystem Monitoring and Assessment Report is a discussion of the monitoring data collected during the year. Precipitation data (15-minute totals) were collected in 2012 at 21 rain gage locations throughout the watershed. Seven of the rain gages were operated by the Wayne County Department of Public Services (WCDPS), 11 rain gages were operated by the Oakland County Water Resources Commissioner's (OCWRC) Office, and the Detroit Water and Sewerage Department (DWSD) operated three rain gages. Continuous monitoring of level and flow was performed by the United States Geological Survey (USGS) at six locations (US1-US5, US7) throughout the watershed in cooperation with Oakland County and the MDEQ. Continuous monitoring of dissolved oxygen (DO) and water temperature was performed by the USGS at one location in the Main Branch at Plymouth Road (US7). An on-line database www.rougeriver.com/database is available which allows users to query sampling data collected since 1994 by site, date, and parameter. It allows for online data viewing or download and includes on-line help.

View this document now: RPO-WMGT-TR76 (752 KB - PDF file)

2013 Rouge River Ecosystem Monitoring and Assessment Report

Meghan Price

Technical Report, June 2014, 31 pages, 32 pages, Order Number: 2013 RREMAR **

The 2013 Rouge River Ecosystem Monitoring and Assessment Report is a discussion of the monitoring data collected during the year. Precipitation data (15-minute totals) were collected in 2013 at 21 rain gage locations throughout the watershed. Seven of the rain gages were operated by the Wayne County Department of Public Services (WCDPS), 11 rain gages were operated by the Oakland County Water Resources Commissioner's (OCWRC) Office, and the Detroit Water and Sewerage Department (DWSD) operated three rain gages. Continuous monitoring of level and flow was performed by the United States Geological Survey (USGS) at six locations (US1-US5, US7) throughout the watershed in cooperation with Oakland County and the MDEQ. Additional level and flow monitoring was performed by the USGS at 2 locations (US9 and L05D) from May-October 2013. Continuous monitoring of dissolved oxygen (DO) and water temperature was performed by the USGS at one on the Main Branch at Plymouth Road (US7) and one location on the Lower Branch at Military Road (L05D). Frog and toad surveys, benthic macroinvertebrate surveys, and winter stonefly searches were performed by Friends of the Rouge (FOTR) and Wayne County. Complete reports on these surveys can be accessed at http://www.therouge.org. A subset of the data collected through 2011 can be accessed through the Rouge's Web View database at www.rougeriver.com/database. This online database allows users to query the Rouge Project sampling data from 1994 through 2011 by site, date, and parameter.

View this document now: 2013 RREMAR (1.7 MB - PDF file)

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Abandoned Dump Site Leachate Sampling Field Sampling Plan

Jennifer Bokovoy

Field Sampling Plan, August 1994, 16 pages, Order Number: NPS-FSP09.00 ***

This FSP specifically addresses the quality assurance requirements of the abandoned dump site leachate sampling program. The program is part of the investigation of abandoned dump sites in the Rouge River Watershed and entails reconnaissance, sampling and analysis of leachate and storm water runoff, and estimation of pollutant discharges to the Rouge River from abandoned dump sites. Field sketches, maps and log sheets are included. Appendices contain 120 pages.

View this document now: RPO-NPS-FSP09.00 (113 KB - PDF file)

Aesthetic Descriptors of Water Quality: Rouge River and Main Tributaries

Thomas M. Heidtke

Technical Memorandum, June 1996, 30 pages, Order Number: WM-TM06.00 **

Descriptive water quality information collected from March 1994-November 1994 within the Rouge River Watershed has been reviewed and analyzed using a simple index approach. In response to a need for quantifying and intergrating such descriptive information together with conventional water quality data collected under the Rouge River Water Quality Sampling Program, a numerical indicator of general aesthetic conditions has been proposed and tested on a preliminary basis.

View this document now: WM-TM06.00 (581 KB - PDF file)

Aesthetic Quality Index For The Rouge River

Thomas M. Heidtke & Eric Tauriainen

Paper, October 1996, 12 pages, Order Number: WEF96-03.00 **

As part of the Rouge Project, information pertaining to the aesthetic state of the Rouge River has been collected along with more conventional data representing water and sediment chemistry, as well as biological and habitat conditions.

View this document now: WEF96-03.00 (1.2 MB - PDF file)

Aquatic Habitat Field Sampling Plan

Ron French

Field Sampling Plan, February 1998, 47 pages, Order Number: WMOG7.1-FSP16.00 **

This Field Sampling Plan (FSP) provided the framework for conducting the Aquatic Habitat Survey. The FSP identifies sampling/survey locations and the sampling/survey methodology that will be followed during implementation of the Aquatic Habitat Survey. The FSP also provides for coordination of sampling activities and analysis with other biological monitoring program efforts.

View this document now: WMOG7.1-FSP16.00 (583 KB - PDF file)

Aquatic Habitat Survey

Nicole Adaniya & Joe Rathbun

Technical Report, February 1998, 100 pages, Order Number: WMGT-TR10.00 **

An investigation of fish habitat quality was performed in the Rouge River Watershed during the summer of 1996. Observations of instream and streambank conditions were made at 83 locations throughout the watershed, and were used to calculate habitat quality scores using the GLEAS Procedure #51 habitat assessment protocol, and to assess habitat suitability for 14 species of fish using Habitat Suitability Index (HSI) models.

View this document now: WMGT-TR10.00 (4.2 MB - PDF file)

Assessment of Toxic Contaminants: 1996 Dry Weather Toxics Assessment Survey Results

Sarina G. Aryan, Joseph E. Rathbun, & Mark D. Mikesell

Technical Memorandum, July 1998, 48 pages, Order Number: RPO-WMGT-TM46 ***

Water and sediment samples were collected from ten locations throughout the Rouge River Watershed under dry weather conditions in the Fall of 1996, and analyzed for organic and metal contaminants, and toxicity. In addition, sediment cores were collected from Phoenix Lake, Wilcox Lake, and Nankin Lake, and analyzed for metal and organic contaminants. The majority of the chemicals measured were below their method detection limits. Moderate contamination and toxicity was found to be widespread in the watershed, however; water and sediment from all ten river stations plus surficial sediment from all three impoundments contained concentrations of a few chemicals which exceeded established MDEQ, U.S. EPA, or NOAA criteria, or exhibited significant toxic effects, or both. The most common contaminants observed in potentially toxic amounts were PCBs, individual PAHs, and zinc in water, and individual PAHs, lead, arsenic, and zinc in sediments. On the whole, the sediment samples were more contaminated and more toxic than the water samples. Contaminant distributions in sediment cores from the three impoundments suggested recent or on-going inputs of metals and PAHs. Causal relationships between the chemical and toxicity test data sets were not always apparent, illustrating the necessity of performing testing both water and sediment for both chemistry and toxicity when conducting ecological health studies.

View this document now: RPO-WMGT-TM46 (155 KB - PDF file)

Bathymetric Surveys Field Sampling Plan

Michael Tomlinson

Field Sampling Plan, April 1994, 20 pages, Order Number: NPS-FSP03.00 ***

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

A detailed plan is presented for conducting bathymetric surveys on four lakes within the Rouge River Watershed in order to define water depth. Phoenix, Wilcox, Newburgh and Nankin Lakes were surveyed for location. Survey methods are described. Position is measured using a global positioning system; depth is measured continuously using a fathometer operating at 200-kiloHertz frequency, and water level is determined by staff gauges. Samples of data logs are included.

View this document now: RPO-NPS-FSP03.00 (59 KB - PDF file)

Bathymetric Surveys of the Middle Rouge Impoundments

Mike S. Tomlinson & Dennis B. Prevo

Technical Memorandum, April 1995, 31 pages, Order Number: NPS-TM41.00 ***

Bathymetric surveys were conducted during April 1994 by the RPO on four of the Middle Rouge River impoundments (Newburgh, Phoenix, Wilcox, and Nankin Lakes). Water depth was measured with a survey-grade fathometer or sounding rod equipped with a photoelectric sensor to detect the soft muck sediment-water interface. Sample location was measured using a differential global positioning system with an accuracy of +/- 12 feet. Position data were checked and imported into a contouring program (WINSURF) in order to contour the corrected depth data. The original fathometer strip charts were used to interpolate between grid points in areas of steep bottom or rapidly changing gradients to enhance the quality of the final bathymetric maps. The final contours and lake shorelines were transferred to AutoCAD in order to produce the final bathymetric maps for the study and to calculate the surface areas within each isobath. These surface areas were used to produce depth versus area (hypsographic) curves and depth versus volume curves. The four lakes result from the damming of the Rouge River in the early 1900s and there is little or no evidence of the Rouge River channel after 80+ years. All of the lakes were deeper at the end closest to the dam. Notable features in the lakes include islands and peninsulas, some are natural and others may be artificial. Maps, charts and a bathymetric data printout are included. Appendices include 62 pages.

Branch Report: Lower Rouge River

Vyto Kaunelis, Noel Mullett, Carl Johnson, & Joseph O'Brien

Technical Memorandum, September 1997, 51 pages, Order Number: NPS-TM32.00 **

The Lower Rouge Branch Report summarizes the conditions of the Lower Rouge River and suggests actions that communities, citizens, local agencies and organizations can take to improve the recreational uses and natural value of the river. Additionally, the report offers adequate background information that will enable communities and invidividuals to develop plans for restoring the river. Three sources of information were used to gather data for this report: (1) a four-year monitoring program implemented by the RPO, (2) interviews with active individuals, agencies and volunteer groups within the subwatershed, and (3) MDEQ's Rouge Remedial Action Plan (RAP) and 1994 RAP Update. Extreme bacteria levels have almost depleted the river's natural resource and recreational use. The accumulation of litter, oxygen depletion and sedimentation have damaged its aesthetic value and severely impacted the river's ability to support a healthy aquatic and wildlife environment. Through Rouge Project efforts suggested actions have been given to restore the river. Those include: continued efforts to complete CSO programs currently underway and coordinate with other pertinent programs for water quality improvement; community participation in pilot projects to demonstrate storm water control BMPs; implementation of watershed management plans, in conjunction with the General Permit, to control storm water runoff; organization of a subwatershed-wide approach for creating and implementing a recreational plan for the parkland along the river; and creation of outreach programs to educate the public. Implementation of these actions will eliminate some impairments, reduce others and increase the overall quality of life for citizens in the Lower Rouge subwatershed.

View this document now: NPS-TM32.00 (1.5 MB - PDF file)

Communicating Rouge Project Findings: Use of Quality Indicators to Report on Rouge River Status and Trends

Elliott Smith

Task Product Memorandum, June 1997, 37 pages, Order Number: WMGT-TPM42.00 **

This memorandum describes and demonstrates an indicator approach developed by Rouge River National Wet Weather Demonstration Project (RPO) staff for conveying technical information on watershed quality to the public. The information consists of measurement data and observations of chemical, biological and physical indicators of river quality collected over two years (1994-95) in the Rouge River Watershed located in Wayne County, Michigan near Detroit.

View this document now: WMGT-TPM42.00 (1.2 MB - PDF file)

Data Screening, Validation, Reduction, and Reporting

Thomas F. Quasebarth

Technical Memorandum, February 1996, 32 pages, Order Number: RPO-WM03A-TM05.02 *

This technical memorandum summarizes procedures required to screen, validate, reduce and report environmental measurements and laboratory analytical data collected under the Rouge Project. These procedures are designed to maximize the usability of the data and to establish standard criteria that should be consistently applied to review the environmental data collected under long-term watershed monitoring programs. The procedures pertaining to screening, validation, reduction and reporting are collectively referred to as data screening procedures, and are organized according by data type including precipitation data, streamflow data, continuous water quality data and laboratory data. The precipitation data screening objective is to identify and correct or reject unreliable or spurious data resulting from instrument problems such as power outages, obstruction of gage by debris, and clock synchronization problems. The data are collected from a network of tipping bucket rain gages at selected locations throughout the watershed. Stage/flow data screening seeks to: identify unreliable or spurious data resulting from instrument problems (i.e., power outages, displacement of probes during storm events, incorrect level setting during calibration and timing clock problems), and to ensure that rating curves are properly developed, updated, and applied to estimate stream discharge at various stage levels. These data are collected from a network of flowmeters at selected locations throughout the watershed. The continuous in-situ water quality data screening objective is to identify and correct or reject unreliable or spurious data resulting from instrument problems such as sensor damage, power outages, displacement of probes during storm events, incorrect calibration and timing clock problems. These data are collected from a network of multi-parameter water quality sondes at selected locations throughout the watershed. Lastly, laboratory data screening will identify preliminary laboratory data that were not generated in accordance with referenced procedures and methods, and to qualify those data in terms of "useable", "useable with qualifiers", or "rejected" (unusable). This is a two-stage process consisting of a data handling check and a data usability review. Careful application of these procedures will facilitate data analyses and prepare the precipitation, stage/flow, continuous in-situ water quality and laboratory data for distribution.

View this document now: RPO-WM03A-TM05.02 (283 KB - PDF file)

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Development of a Monitoring Program to Support the Rouge River Watershed

Louis C. Regenmorter, Vyto P. Kaunelis, & Noel Mullett

Paper, May 1998, 8 pages, Order Number: WEFSPEC98-01 **

The watershed management approach being applied to the Rouge River in southeast Michigan under the Rouge Project includes an integrated monitoring program. The monitoring program will be applied during the implementation phase of the management plan. The development of the monitoring plan involves three sets of criteria: (1) capable of monitoring the health of the Rouge River Watershed; (2) responsive to community/watershed management needs; and (3) cost-effective to implement. This development process includes defining: (1) monitoring objectives; (2) indicators; (3) data needs: (4) individual sampling programs; and (5) estimated costs. The monitoring program will be based on water chemistry sampling results as well as the use of environmental indicators that focus on field conditions and performance indicators that document progress on implementation of selected controls and management activities. The field programs will be comprised of monitoring at numerous locations throughout the 467 square mile watershed, and documentation to show compliance with a new general permit for the watershed will be used to compiled information for the performance indicators.

View this document now: WEFSPEC98-01 (126 KB - PDF file)

Ecological Targets for Rehabilitation of the Rouge River

Michael J. Wiley, Paul W. Seelbach, & Stephen P. Bowler
Supplemental Report, April 1998, 19 pages, Order Number: NPS-SR21.00 **

This report summarizes an analysis of potential Rouge River fish communities and the ecological characteristics (temperature and river flow regimes) required to maintain them. The analysis is based on measurements and modeling for the structure of fish communities in rivers throughout southern Michigan. In essence, a regional biological hydrological criteria for rivers ecologically similar to the Rouge was developed. The goal was to develop ecological targets that are realistic and achievable by recognizing the human presence in the Rouge watershed. The results are organized into three main sections. The first examines the geographical and ecological context of the Rouge River. The second presents the main results of this study: target fish communities for key river segments and associated thermal and hydrologic regime targets. The final presents an evaluation of the potential for biases in the target criteria due to the Rouge River's highly incised channel form.

View this document now: NPS-SR21.00 (1.2 MB - PDF file)

Ecological Targets for Rehabilitation of the Rouge River: Part I - Interim Report on Fish Communities and Summer Temperatures: Part II - Interim Report on Discharge Regimes

Michael J. Wiley & Paul W. Seelbach
Supplemental Report, September 1996, 55 pages, Order Number: PI-SR08.00 *

Heavy urbanization of the Rouge River Watershed has destroyed or degraded many of the natural functions of this river ecoystem. "Bringing this river back to life" will require restoration of clean oxygenated waters; natural flow regimes; diverse channel habitats; diverse, productive fish communities; and connectivity to the Great Lakes for migratory fishes (Beam and Braunscheidel 1996). As great investments of money and time, and great patience are applied to the Rouge River system, clearly-defined goals are needed--how might a rehabilitated Rouge River look and function? Part I of this three part report provides a vision of potential fish communities for specific reaches of the Rouge River as well as target temperature regimes. Part II of the report provides target flow regimes and Part III will provide target channel hydraulics adequate for sustaining the target fish communities.

View this document now:PI-SR08.00 (154 KB - PDF file)

Environmental Monitoring Program to Support the Rouge River National Wet Weather Demonstration Project

Louis C. Regenmorter & Vyto P. Kaunelis

Paper, July 1998, 8 pages, Order Number: MonCon98-02.00 **

The watershed-based approach being applied to the Rouge River in Southeast Michigan under the Rouge Project has included an extensive environmental monitoring program. Monitoring is considered a critical element to the Rouge Project because it is used to: 1) established baseline conditions; 2) support the development of watershed models; 3) identify problems and their sources; and 4) evaluate control programs. The environmental monitoring conducted by the RPO has involved the collection, management, and analysis of data on rainfall, stream flow, instream water quality, CSOs and storm water discharges, biological communities and habitats, sediments, toxics, aesthetics, and the performance of various control programs. Over 500 monitoring stations have been established throughout the 438 square mile watershed. The RPO has collaborated with the EPA, state, and local agencies in the development and execution of the monitoring program.

View this document now: MonCon98-02.00 (49 KB - PDF file)

Evaluation of Aesthetic Conditions Within the Rouge River: Results for the 1996 Monitoring Season

Thomas Heidtke

Technical Memorandum, July 1998, 21 pages, Order Number: WMGT-TM28.00 **

Descriptive water quality information pertaining to the aesthetic condition of the Rouge River has been collected since 1994 as part of the Rouge Project. In response to a need for quantifying and intergrating such qualitative information together with more conventional water quality data collected under the Project, a numerical index approach was proposed and initially tested using the 1994 database. The Rouge River Aesthetics Index (RRAI) reflects the status of four descriptive parameters: water clarity, water color, odor and visible debris. The RRAI to the 1994 database resulted in set of revisions/modifications to parameter descriptors and parameter weights used in calculating the index. These revisions were incorporated into the set of aesthetic information collected in subsequent years, including 1996. The current study provides a statistical analysis and summary of the available aesthetic information for 1996, and also provides a brief comparison of results for the 1994 and 1996 monitoring seasons.

View this document now: WMGT-TM28.00 (81 KB - PDF file)

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Facility Illicit Connection Inspection Program

Dean Tuomari & Susan Thompson

Standara Operating Procedure (SOP), December 2011, 30 Pages, Order Number: SM-IDEP-SOP **

This standard operating procedure (SOP) addresses the tasks performed by the field crews during the on-site inspection portion of the Illicit Discharge and Elimination Program (IDEP). It includes the field procedures for conducting: (1) dye testing of the plumbing fixtures; and (2) evaluating the general housekeeping and chemical storage practices on the premises.

View this document now: IDEP-SOP-2011 (818 KB - PDF file)

Frog and Toad Survey of the Middle 1 Subwatershed

Project Profile, October 1999, 2 pages, Order Number: M1-12 **

This project profile is a summary of the results of a grant funded effort performed with local community funding or in kind services. The summary focuses on the demonstration aspects of the project.

View this document now: M1-12 (146 KB - PDF file)

Impoundment Limnological Studies Field Sampling Plan

Joseph Rathbun

Field Sampling Plan, May 1995, 24 pages, Order Number: MOD-FSP06.00 ***

The FSP provides a detailed description of the schedule (Fall 1994 through Summer 1995) and procedures of the impoundment limnological studies. Methods, sampling sites (Newburgh, Walled, Meadowbrook, and Phoenix Lakes), and data handling processes are described. SOPs are included. Samples for nutrients (nitrate, nitrite, ammonia, total phosphorous, and orthophosphorous), chlorophyll, plankton, total suspended solids are collected, and in situ water transparency, dissolved oxygen and temperature measurements are made once a month at each impoundment. This includes diurnal dissolved oxygen profiles taken at sunrise and after midday. Macrophyte biomass was measured once in the summer of 1995. This information is used as input data for the water quality models, and the field sampling plan is used both for staff training and for reference.

View this document now: MOD-FSP06.00 (301 KB - PDF file)

Johnson Creek Reconnaissance Survey

Gary Crawford & Douglas Denison

Task Product Memorandum, April 1997, 22 pages, Order Number: WMGT-TPM44.00 **

This memorandum summarizes the assessment of the baseline condition of the mainstream of Johnson Creek. The foundation is based on data collected during an August 1996 field recognizance survey conducted by the Wayne County Rouge Program Office (RPO).

View this document now: WMGT-TPM44.00 (1.3 MB - PDF file)

Newburgh Lake Geotechnical Investigation

Phil Spalding, Fritz Klingler & Jerome Neyer

Technical Memorandum, October 1997, 118 pages, Order Number: NPS-TM13.00 **

This document presents the results of a geotechnical investigation performed in conjunction with the proposed Newburgh Lake Restoration Project in Livonia, Michigan. The purpose of the investigation was to evaluate the general subsurface conditions within the lake and provide geotechnical recommendations for design and implementation of the restoration project. Specifically, the areas of geotechnical concern included: draining of the lake, earthwork operations, temporary haul road analysis, material handling, and protection of existing infrastructure in and around the lake.

View this document now: NPS-TM13.00 (93 KB - PDF file)

Newburgh Lake Sediment Core Sampling and Analysis

John M. O'Meara, V. Elliott Smith, Joseph E. Rathbun, Laura L. Huellmantel, & Dennis B. Prevo

Technical Report, September 1994, 33 pages, Order Number: NPS-TR04.00 ***

A sediment survey of Newburgh Lake in Wayne County, Michigan was completed during the period of November 8, 1993 through November 12, 1993. The sediment survey involved the collection, subsampling, and analysis of sediment from a total of 21 locations. A total of 101 samples were analyzed for metals using X-ray fluorescence spectroscopy and polychlorinated biphenyls (PCBs) and polycyclic aromatic hydrocarbons (PAHs) using modified enzyme immunoassay test kits. The 21 stations were also sampled by vibrocoring. Coring stations were located utilizing global positioning system (GPS) technology. The most contaminated region of Newburgh Lake for PCBs, PAHs, and the metals quantified is the West-Northwest part of the lake. Contaminants are most concentrated in the upper 0-30 inches of sediment, which are mainly black oily silt. The average depth of this oily silt layer, where it was present, was 19 inches. PCBs, lead, nickel, and zinc were the contaminants present in Newburgh Lake sediments that most often exceeded their respective Effects Range-Median (ERM) values, suggesting the potential for toxic effects in aquatic organisms. The sand and/or gravel that usually composed the lower end of the cores contained very low concentrations of all of the contaminants quantified. Correlations between the field (screening) results and the laboratory results for metals and total PCBs were very strong (r^2>0.80), and the relationships were linear. Most of the field data for the metals were highly biased compared to the laboratory data, while there were no apparent biases in the total PCB field data. There was a weaker correlation between the field and lab data for total PAHs. Field logs and data are included, along with a 140 page appendix.

View this document now: NPS-TR04.00 (1.3 MB - HTML file)

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Nonpoint Source Storm Event Monitoring Program Field Sampling Plan

Louis C. Regenmorter

Field Sampling Plan, October 1994, 56 pages, Order Number: NPS-FSP11.00 ***

This FSP addresses the quality assurance requirements of the Nonpoint Source (NPS) storm event monitoring program for the Rouge Project. Flow monitoring and water quality sampling is conducted at subareas with single land use characteristics and at selected pilot Best Management Practices (BMPs) that are designed to control nonpoint pollution source loadings discharged into the Rouge River. The primary objectives of this program are to: 1) assess the relative magnitude of nonpoint pollution sources discharged to the Rouge River; 2) provide quantitative information regarding the pollutant removal efficiencies that are achieved by various types of BMPs under actual field conditions; and 3) collect sufficient monitoring data so that the results may be applied to assess NPS impacts and BMP controls on similar unmonitored areas and BMP types within the Rouge River Watershed. The FSP provides an overview of the Nonpoint Storm Event Monitoring Program, including water quality parameters to be analyzed; roles and responsibilities of the staff involved with the program; Data Quality Objectives and the overall quality assurance objectives; sampling locations and proposed sampling frequency; required sampling equipment; sampling methods; required field documentation; sample identification protocols; and sample handling and shipping procedures. Detailed step-by-step procedures that must be followed by members of the sampling team are presented in SOPs appended to the FSP. Appendices contain 180+ pages of diagrams, forms, charts.

View this document now: RPO-NPS-FSP11.00 (149K - PDF file)

Rouge River Reconnaissance Survey

Louis C. Regenmorter

Technical Report, October 1994, 40 pages, Order Number: MOD-TR01.00 **

A reconnaissance survey was conducted along 90 miles of the Rouge River. Its purpose was to record the locations of sewer outfalls, characterize sediments, and provide a general description of the river's flow hydraulics, water quality, and environment. The findings of the survey conducted on the Main Rouge River, Lower Rouge, Middle Rouge, and Upper Rouge are presented in the report. A map that identifies the locations of many of the described features is also included. The report includes the locations and sources (combined, storm, sanitary, unknown) of the 630 outfalls found. The general makeup of the sediments (sand, silt, clay, cobblestones) are described, and identified on the field maps. Locations where the sediments contain high organic contents are specifically identified for future sampling activities. Additional characteristics that are reported include: flow rates, hydraulics, and stream geometry at selected locations; visual observations of water clarity, impacted water quality, and aesthetic appearance; and general descriptions of land use and the flora and fauna. A black and white 44" x 36" River Reconnaissance Survey map is included.

View this document now: MOD-TR01.00 (396 KB - PDF file)

Rouge River Watershed Sediment Reconnaissance Survey

V. Elliott Smith, Laura Lang Huellmantel, Joseph E. Rathbun, Colleen Hughes, Paul M. Zimmerman, & John Michalski

Technical Memorandum, July 1995, 21 pages, Order Number: MOD-TM38.00 ***

A reconnaissance survey was conducted throughout most of the Rouge River to characterize sediment quality from October 15 to November 11, 1993. Sediment grab samples were collected from 182 locations at approximately one kilometer (0.6 mile) intervals. Priority locations for sampling were instream deposits of soft, oily silt where contaminants were more likely to accumulate. All samples were analyzed for contaminants by quantitative screening methods: metals and other elements by x-ray fluorescence spectroscopy (XRF); total polychlorinated biphenyls (PCBs) and total polycyclic aromatic hydrocarbons (PAHs) by enzyme immunoassays. Total organic carbon (TOC) by ignition and all results were corrected to sediment dry weight. Elements quantified by XRF analysis were determined for antimony, arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, selenium, silver, titanium and zinc. Results indicated that metals concentrations were usually low, although six metals (antimony, chromium, copper, lead, nickel and zinc) occurred at concentrations which exceeded the toxicity-based guidelines of Long and Morgan (1990). This indicates only potential metals toxicity, which is not yet confirmed. Generally, higher concentration metals were found in the downstream reaches of each branch, and especially in the Main Rouge. Total PCB concentrations in Rouge sediments were generally low. However, a concentration of 12 mg/kg was found upstream of Newburgh Lake on the Middle Rouge, where PCB levels exceeding 50 mg/kg have been found in an earlier survey. Elevated PCB levels also occurred near two groups of landfills along the Lower Rouge, and near groups of CSO and stormwater outfalls on the Main Rouge. Total PAH concentrations were also generally low but measurable in most samples at levels of 1 to 27 mg/kg. About half exceeded the low-toxicity guideline (4 mg/kg). The more elevated PAH levels occurred near certain outfall groups and landfill sites, especially along the Main and Lower Rouge Branches. Charts, maps. Appendices contain 124 pages.

View this document now:RPO-MOD-TM38.00 (2.6 MB - PDF file)

Rouge River Watershed Sediment Reconnaissance Survey QAPP

Joseph Rathbun

Supplemental Report, September 1993, 45 pages, Order Number: RPO-MOD-QAPP-03.03 **

This addendum to the Main Quality Assurance Project Plan (QAPP) specifically addresses the quality assurance requirements of the Rouge River watershed sediment quality survey.

View this document now: RPO-MOD-QAPP-03.03 (401 KB - PDF file)

Sampling Site Selection

Glenn Hummel

Technical Memorandum, May 1996, 60 pages, Order Number: SAM-TM16.01 **

This document provides information on the sampling site selection criteria and selection process used for the 1993-1995 baseline sampling program of the Rouge Project.

View this document now: RPO-SAM-TM16.01 (93 KB - PDF file)

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Sediment Oxygen Demand Studies Field Sampling Plan

Joseph Rathbun

Field Sampling Plan, May 1995, 22 pages, Order Number: MOD-FSP07.00 ***

The FSP provides a detailed description of the schedule (Fall 1994 through Fall 1995) and procedures of the sediment oxygen demand (SOD) studies. Methods, sampling sites, and data handling processes are described, and SOPs are included. SOD is thought to be a major source of oxygen depletion in the river. It is measured using EPA-designed SOD chambers, which enclose a known volume of water and area of sediment, in which oxygen depletion is monitored over time. SOD coefficients are calculated from the data. This information is used as input data for the water quality models; the FSP is also used for staff training and reference.

View this document now: MOD-FSP07.00 (140 KB - PDF file)

State of the Rouge Reports

Supplemental Report, Order Number: SAM-STATE_REPORTS *

The Rouge River Watershed is a hydraulic unit consisting of 48 communities and three counties. It has four main river courses and many tributaries, which eventually drain into the Detroit River and then to Lake Erie. These booklets were developed to provide the people who live, work, or recreate in the watershed with information about the habitat and water quality of the tributaries and branches of the Rouge River. As mentioned in the Rouge River Remedial Action Plan (RAP), one reason such information is important is that it determines how the river and watershed environment can be used for recreation and aesthetic enjoyment. The Middle 1 Subwatershed covers primarily the Cities of Northville and Novi, and the Townships of Northville, Salem, Plymouth and Novi. The Middle 3 Subwatershed is located in portions of the Cities of Dearborn Heights, Livonia, Garden City, and Westland, as well as a small portion of Redford. The Upper 2 Subwatershed is located in portions of the Cities of Livonia, Farmington Hills, Farmington, and Novi, as well as Redford and Northville Townships.

These reports were published in 1996 and based on 1995 data. These reports represented the State of the Rouge at that point in time and may no longer represent the current condition of the Rouge River. However, their value is in showing a way to present information in a manner that was very effective and illustrative to the general public on the current conditions and what needs to be done to restore the Rouge River.

View this document now:SAM-STATE_REPORTS (1.4 MB - PDF file)

Stream and Dam Reaeration Studies Field Sampling Plan

Joseph E. Rathbun

Field Sampling Plan, May 1995, 18 pages, Order Number: MOD-FSP05.00 ***

The FSP provides a detailed description of the schedule (Fall 1994 through Fall 1995) and procedures of the stream and dam reaeration studies. Methods, sampling sites, and data handling processes are described, and standard operating procedures (SOPs) are included. Stream reaeration is estimated by the United States Environmental Protection Agency (EPA) propane injection/fluorometric dye study technique, and dam reaeration is determined by measuring the dissolved oxygen concentration above and below the dams on four impoundments. Data is used for the Rouge Project water transport and quality models.

View this document now: MOD-FSP05.00 (177 KB - PDF file)

Stream Time of Travel Studies

Kurt T. Spieles & Edward H. Kluitenberg

Technical Report, April 2004, 31 pages, Order Number: RPO-WMGT-TR55 **

This report provides a detailed description of four wet weather time-of-travel studies performed in the Rouge River. The goals of this study were to determine time-of-travel during wet weather events for two selected reaches of the Rouge River. One reach consisted of the Main Rouge River downstream of the Acacia Park CSO basin. The other reach consisted of the Upper and Main Rouge River downstream of the Redford CSO basin. The time-of-travel results were used to assess the validity of time-of-travel assumptions previously made in analyzing dissolved oxygen impacts from CSO basin overflow events.

Methods, data collection, results, and analysis of the time-of-travel study are described. Dye tracer tests were performed on each test reach for two separate rain events. The field effort was conducted according to the Stream Time-of-Travel Field Sampling Plan (RPO-WMGT-FSP23) that was created for this study. Dye was injected at predetermined locations and dye concentration was measured at selected downstream monitoring sites on each test reach. The results were used to determine the time-of-travel for each test reach during each rain event. The results from this dye study confirmed the validity of time-of-travel assumptions made in analyzing DO impacts from Oakland County and Redford CSO basin overflow events.

View this document now: RPO-WMGT-TR55 (576 KB - PDF file)

Stream Time-of-Travel Studies Field Sampling Plan

Kurt Spieles

Field Sampling Plan, August 2001, 38 pages, Order Number: RPO-WMGT-FSP23.00 **

This field sampling plan provides a detailed description of field sampling efforts for wet weather time-of-travel studies. The goals of the time-of-travel studies include: determining time-of-travel during wet weather events for two selected reaches of the Rouge River; and assessing the validity of time-of-travel in the Main Rouge River DO Model during CSO basin overflow events. Methods, sites, duration, magnitude and sample handling of the monitoring effort for the proposed time-of-travel studies are described. Standard operating procedures (SOPs) ensure that the sampling is of acceptable quality and will yield information and data that are useable and technically defensible. This Field Sampling Plan (FSP) is used for both staff training and reference.

View this document now: RPO-WMGT-FSP23.00 (729 KB - PDF file)

Summary of Bell Branch/Tarabusi Creek Outfall Inventory

Timothy Ferguson & Ashraf Ibrahim

Technical Memorandum, November 1997, 24 pages, Order Number: NPS-TM22.00 **

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Utilizing Global Positioning System (GPS) techniques, a pilot outfall inventory was performed from August 1996 through December 1996 on the Bell Branch and Tarabusi Creek tributaries to the Upper Branch of the Rouge River. These tributaries are included in the Upper 2 Subwatershed. The techniques and methods utilized were evaluated to develop a Standard Operating Procedure (SOP) for future outfall information for future use in the preparation of stormwater discharge permits, and industrial discharges, as well as conducting river model calculations. These models will assist in correcting erosion, pollution and flooding problems. The information collected durning the inventory was added to Geographic Information System (GIS) database developed by the RPO.

View this document now: NPS-TM22.00 (443 KB - PDF file)

What We Have Learned: 1994 Status Report

Rouge Project Public Involvement Work Element

Bulletin, March 1995, 8 pages, Order Number: PI-BUL-03 **

This report describes the data results from the Rouge Project's CSO water quality sampling data collection efforts in 1994. Pollutant data results of bacteria, nutrients, total suspended solids, biochemical oxygen demand and dissolved oxygen are discussed individually for both wet weather and dry weather conditions. Graphs and maps of the data analysis are included. Future sampling plans are presented for other pollutant sources such as storm water, illicit connections, failing septic systems and leaching dumps.

What We Have Learned: 1995 Status Report

Rouge Project Public Involvement Work Element

Bulletin, May 1996, 8 pages, Order Number: PI-BUL-04 **

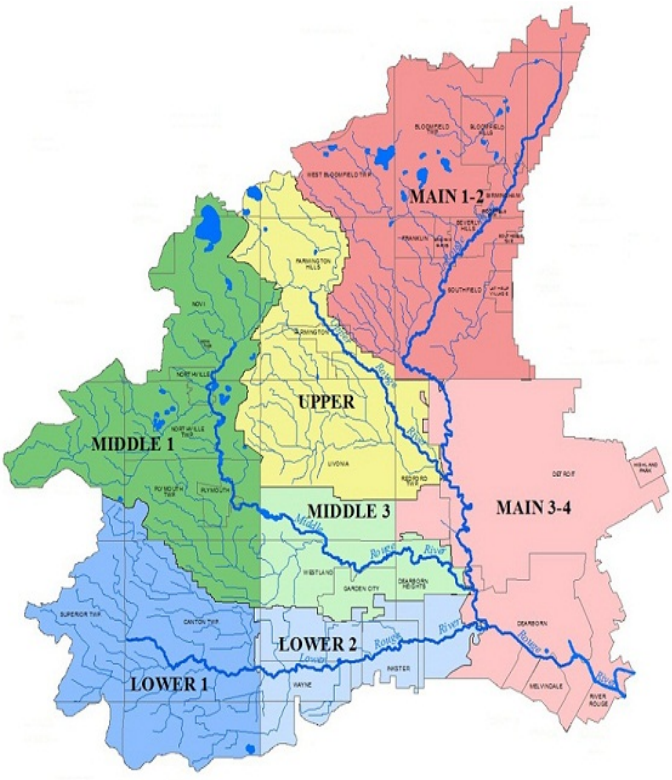
This update is the second water quality status report of the Rouge River and is based primarily on water chemistry analysis. Overall, the results from the 1995 sampling season are similar to those found in 1994. Results of bacteria, nutrients, total suspended solids, biochemical oxygen demand and dissolved oxygen are described for wet and dry weather conditions.

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Geographic Information Systems (GIS)

An extensive GIS was developed for the Rouge Project by Wayne County and Rouge Project staff for managing and utilizing Rouge Watershed information. The GIS and data management system is important to ongoing river restoration efforts. For example, maps of various areas of the watershed are routinely produced to convey information to watershed stakeholders. A variety of GIS services are provided including planning and decision support spatial analysis, the production of thematic maps to help illustrate different aspects of the watershed restoration and monitoring efforts, and technical assistance to others to enable users to more easily utilize GIS tools to access and utilize the information within the system.

The Rouge Project GIS contains over 50 different data themes from various sources including transportation (highways, county roads, two-tracks, local streets, railroads and airports), hydrography (lakes, perennial streams, and intermittent streams/drains), political boundaries (city and township boundaries) and section lines from the public land survey system. Rouge GIS staff developed various GIS data themes including watershed drainage area boundaries, outfalls, and monitoring locations. Additional data sets were obtained from other GIS data providers such as the United States Environmental Protection Agency (USEPA), the United States Geological Survey (USGS), the Southeast Michigan Council of Governments (SEMCOG), the State of Michigan Center for Geographic Information, and Wayne County GIS.



Rouge Storm Water Management Areas

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Demonstration Projects

Building GIS Capacity to Protect the Rouge River (GIS-39)

Mohammad Tariq

Project Profile/Report, March 2001, 4 pages, Order Number: GIS-39

This 2001 report briefly discusses a GIS project in the City of Birmingham that will be used to better manage the storm infrastructure and ensure the protection of public health. GIS shapefiles of the storm sewer system components were derived using various City maps and documents. It explains how the data developed will be used as a tool to assist in pollution prevention and allow for improvements to the water quality of the Rouge River. Through the mapping of the storm sewers and related data the city will be able to more efficiently identify locations of potential illicit connections and staff will be able to track upstream source(s). Additionally, staff should be able to more quickly contain pollutant source spills if they occur.

View this document now: GIS-39 (129 KB - PDF file)

Canton Township Utility Coverage Project (GIS-02)

Kelly C. Kelly

Project Profile/Report, May 2001, 9 pages, Order Number: GIS-02

The final status of a Canton Township Community Utility Coverage Project is summarized in this 2001 report. The purpose of the project was to upgrade and enhance the Geographic Information System (GIS) to accommodate watershed management activity including planning and implementing elements of the Michigan Department of Environmental Quality (MDEQ) General Permit. Activities included attending GIS meetings and coordinating GIS initiatives, updating the data depicting the water, storm, and sanitary sewer infrastructure, developing a GIS application that would track the watershed management public education activities, conducting ArcView training, and purchasing hardware for data managers. The activities included in this project are complete. For additional information contact Canton Township.

View this document now: GIS-02 (337 KB - PDF file)

City of Wayne General GIS Development Project (GIS-04)

Ayres, Lewis, Norris, and May, Inc.

Project Profile/Report, May 2001, 9 pages, Order Number: GIS-04

This 2001 Geographic Information System (GIS) Development and GPS Survey Report summarizes the development of the City of Wayne GIS system which included the following themes: storm sewer system, sanitary sewer system, soil erosion along the Rouge River, soil types, flood zones, land use, and environmental contamination sites. An overview of each task is included as well as a discussion of the benefits from the project to improvement of water quality in the Rouge River. For additional information contact the City of Wayne.

View this document now: GIS-04 (506 KB - PDF file)

Data Management / GIS Inventory (U2-06)

Barry Johnson

Project Profile/Report, December 2001, 2 pages, Order Number: U2-06

This project was one of the first project commissioned by the Rouge Program Office to utilize GIS technologies in support of storm water management activities. The project conducted a pilot study in an area covering about 25 percent of Redford Township. The pilot study was designed to establish the protocols and procedures for the rest of the Township.

View this document now: U2-06 (1.2 MB - PDF file)

Dearborn Storm Sewer Data Development Project (GIS-13)

NTH Consultants, Ltd.

Project Profile/Report, December 2001, 67 pages, Order Number: GIS-13

The project included creating a GIS-based storm water infrastructure and land use database to aid in storm water quality source area identification and illicit connection/illegal discharge investigations. A database useful in the evaluation of structural and non-structural Best Management Practices was also provided as part of a Storm Water Pollution Prevention Initiative. The project provided a graphical display of water quality management maps and data sets to assist in public education programs.

View this document now: GIS-13 (2.2 MB - PDF file)

Farmington Fundamental GIS Project (GIS-43)

Charlotte Nichols

Project Profile/Report, July 2000, 2 pages, Order Number: GIS-43

The fundamental GIS capabilities necessary for planning and implementing programs required under the MDEQ General Permit for Storm Water Discharge were developed. The objectives of the project were to develop required data, and to procure the necessary hardware, software, training, and professional services to participate in watershed management planning and implementation. The system helps to identify and monitor on-site septic disposal conditions in the City. As a component to the detection process, education materials were created and mailed out as part of the public education activity.

View this document now: GIS-43 (94 KB - PDF file)

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Farmington Hills Storm Sewers & Septic Data Development (GIS-01)

Charlie Bristol

Project Profile/Report, September 2002, 80 pages, Order Number: GIS-01

This 2002 report summarizes a project administered by Oakland County with the assistance of the City of Farmington Hills. The purpose of the project was to develop citywide digital layers of the storm sewer and septic system infrastructure for use in a parcel based GIS. The City will use the layers to quantify and locate the existing storm sewer infrastructure and septic systems within the community and in the development of a storm water management plan.

View this document now: GIS-01 (4 MB - PDF file)

Geo-Spatial Metadata Application (GIS-38)

Orchard, Hiltz & McCliment, Inc.

Project Profile, May 2001, 43 pages, Order Number: GIS-38

This report, completed in 2001, commented on the use of metadata as well as an evaluation of Spatial Metadata Management System (SMMS). Metadata serves three main purposes: 1) it serves as a practical means for data management, 2) federal agencies are required to use metadata standards for data management, and 3) it allows for easy data transfer with external sources. Further, an evaluation on the SMMS was conducted and summarized in this report. Overall, the report concluded that the SMMS met current needs along with being flexible enough to meet future needs.

View this document now: GIS-38 (575 KB - PDF file)

GIS Data for Water Quality Indices and Wetlands Assessment (GIS-41)

West Bloomfield Township Planning

Project Profile, May 2001, 43 pages, Order Number: GIS-41

The purpose of the project was to expand two GIS capabilities necessary for planning and implementing programs to support the Michigan Department of Environmental Quality General Permit for Storm Water Discharge which supports the Rouge River restoration activities.

View this document now: GIS-41 (549 KB - PDF file)

GIS Development Supporting Watershed Management (GIS-40)

Charlotte Nichols

Project Profile, May 2001, 2 pages, Order Number: GIS-40

This 2001 report illustrates the steps taken by both West Bloomfield and Farmington Hills in implementing and expanding their GIS capabilities. These GIS capabilities, in turn, would be used for MDEQ permitting purposes, as well as managing storm sewer flow and pollution control measures.

View this document now: GIS-40 (33 KB - PDF file)

GIS Septic Field Data and Soil Erosion (GIS-44)

James Miller

Project Profile, December 2000, 2 pages, Order Number: GIS-44

This report, completed in 2000, summarizes the steps taken by Westland to complete a GIS dataset that is comprised of the entire city storm pipe system. Further, this report illustrates steps taken to rectify errors that occurred in an earlier version of the deliverable. Field verification activities were conducted to gather correct information on storm system features.

View this document now: GIS-44 (52 KB - PDF file)

GIS/Public Awareness Educational Programs (M1-10)

Barry Johnson

Project Profile, August 2000, 3 pages, Order Number: M1-10

This 2000 report summarizes a City of Novi GIS/Public awareness project. Geographic Information Systems (GIS) and related technology can be used to increase public awareness of the water quality issues related to the Rouge River. By combining GIS technology and storm water modeling, users can access and analyze multiple chemical spill scenarios to improve their understanding of pollutant transport through the City of Novi (CON) storm sewer system. This information will help emergency managers determine the appropriate emergency action to provide enhanced response and reduced environmental degradation to the Rouge River and its tributaries.

View this document now: M1-10 (261 KB - PDF file)

Inkster Storm Sewer Data Development Project (GIS-05)

Muzaffar Lakhani

Project Profile, May 2001, 16 pages, Order Number: GIS-05

The purpose of a City of Inkster Storm Water Geographic Information System (GIS) Project was to develop the separated storm sewer portions of a City-wide GIS layer and this 2001 report.

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

View this document now: GIS-05 (399 KB - PDF file)

Livonia Enhancement of Current GIS Public Storm Sewer Layer Project (GIS-11)

Christine Rohrer

Project Profile, November 2001, 45 pages, Order Number: GIS-11

This report summarizes the enhancements to the storm water collection system and how it assisted the City of Livonia in meeting the watershed objectives of monitoring illicit connections, assisting in drainage system management, and in erosion management. The project also served as a model for other communities.

View this document now: GIS-11 (1.4 MB - PDF file)

Livonia GIS to Support Illicit Discharge Elimination Plan (GIS-42)

Christine Rohrer

Project Profile, November 2001, 4 pages, Order Number: GIS-42

This report from 2000 documents steps taken by Livonia to identify illicit discharges and septic systems using GIS. Water billing information was studied to indentify parcels receiving but not paying for sewer service. Further city records were studied to identify septic sewer systems and 205 parcels out of 37,191 were identified as having septic sewer systems. The report notes that the Rouge River watershed would benefit from this project, as illicit discharge points and septic sewer systems would be identified.

View this document now: GIS-42 (157 KB - PDF file)

Melvindale GIS Development (GIS-35)

City of Melvindale

Project Profile, November 2001, 4 pages, Order Number: GIS-35

This project demonstrated the use of GIS for storm water sewer system mapping and provided Melvindale with access to data from others and will support watershed management efforts.

View this document now: GIS-35 (62 KB - PDF file)

On-Site Sewage Disposal Data Management System Project (GIS-31)

Steve Tackett & Raj Sinha

Project Profile, November 2001, 4 pages, Order Number: GIS-31

This report from 2001 summarizes steps taken to compile On-Site Disposal Systems (OSDS) in a computerized format in pilot communities located in Wayne County. Relevant information gathered included address, date of septic permit, city or township, septic tank capacity, and size of absorption field. Upon completion, this pilot program was to be used as a model for inputting all septic permits in Wayne County. While there was some difficulty in finding address information, data from the previous 43 years was compiled and inventoried in a computerized database using ACCESS software.

View this document now: GIS-31 (201 KB - PDF file)

Plymouth Township GIS Development Project (GIS-07)

John Foley

Project Profile, August 2001, 7 pages, Order Number: GIS-07

This report (2000) summarizes the Charter Township of Plymouth efforts to acquire or develop the fundamental components of a GIS to be used in support of plan preparation and subsequent implementation as required by the MDEQ General Permit for Storm Water Discharge and included strategies to resolve issues of GIS development (automation, conversion techniques, accuracy, and data base design) which typically emerge in the pursuit of data compatibility within other watershed communities.

View this document now: GIS-07 (257 KB - PDF file)

Romulus Environmental Data Development Project (GIS-12)

City of Romulus

Project Profile, August 2001, 44 pages, Order Number: GIS-12

A City of Romulus GIS project was established to develop preliminary GIS based mapping information, which would have impacts on water quality in the watershed. The project summary report (2002) includes a discussion or the inventories of the storm system, dumpsites, septic tanks, and businesses storing hazardous wastes. Also included in this report are copies of newspaper articles used for public information and education.

View this document now: GIS-12 (2.5 MB - PDF file)

Septic System and Illicit Discharge Data Development Project (GIS-36)

City of Novi

Project Profile, August 2001, 44 pages, Order Number: GIS-36

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

The purpose of the project awas to develop data themes related to the storm drain network, stoe the attribute data for these themes in teh City of Novi GIS, anaylze the data, and produce mapping output and a final report. Data themes based on the issues of illicit discharge connections and failed septic systems were developed. These data themes were integrated with the Illicit Discharge Connection application in an attempt to reduce and/or possibly eliminate their occurrence in the pilot areas.

View this document now: GIS-36 (1.2 MB - PDF file)

Septic System and Storm Sewer Data Development (GIS-37)

City of Dearborn Heights

Project Profile, 2000, 6 pages, Order Number: GIS-37

This 2000 report summarizes steps taken to identify and inventory septic and storm systems in Dearborn Heights. GIS was implemented to collect, store, display, and analyze storm sewer and septic system information. Further, attempts were made to identify illicit discharges using GIS technology (none were found). City personnel training and community outreach were other aspects of this project.

View this document now: GIS-37 (112 KB - PDF file)

Southfield Storm System Data Development Project (GIS-34)

City of Southfield

Project Profile, OCtober 2001, 5 pages, Order Number: GIS-34

This report summarizes a project by the City of Southfield that resulted in an accurate depiction of the storm sewer infrastructure within the City. The development of GIS maps enabled the City to accurately identify the existing system, to easily update maps, to help ensure compliance with federal, state, and local laws to protect the environment, and to perform various engineering system analyses.

View this document now: GIS-34 (40 KB - PDF file)

Superior Township Utility and Parcel Development Project (GIS-03)

Superior Township

Project Profile, October 1999, 1 page, Order Number: GIS-03

A parcel based GIS was implemented to enhance the collection, storage, control and dissemination of community information. A parcel base map with the associated ownership database was compiled with the cooperation of Washtenaw County. This 1999 report summarizes steps taken to introduce GIS capabilities to Superior Township for use in watershed management programs.

View this document now: GIS-03 (92 KB - PDF file)

Van Buren Township GIS Development Project (GIS-10)

Van Buren Township

Project Profile, September 2001, 20 pages, Order Number: GIS-10

This 2001 report summarizes Van Buren Townships efforts to acquire or develop the fundamental components of a GIS of the storm and sanitary infrastructure to be used in support of plan preparation and subsequent implementation as required by the MDEQ General Permit for Storm Water Discharge and included strategies to resolve issues of GIS development (automation, conversion techniques, accuracy, and data base design) which typically emerge in the pursuit of data compatibility within other watershed communities.

View this document now: GIS-10 (809 KB - PDF file)

Westland GIS Data Development Project (GIS-06)

Charlotte Nichols

Project Profile, September 2001, 1 page, Order Number: GIS-06

Existing and future land use data layers were developed. The existing storm sewer layer was updated and enhanced to include direction of flow and drainage district boundaries were developed. The enhancements to the Westland's GIS provide data necessary for implementation of an Illicit Discharge Elimination initiative and were used in monitoring the effectiveness of BMP programs. Enhancement of the storm sewer layer assisted the City in monitoring the effectiveness of BMPs. The effectiveness of BMPs for reducing solid and liquid contaminants entering the River can be determined by sampling and the results can be provided to the public and other communities involved in the management of the watershed.

View this document now: GIS-06 (63 KB - PDF file)

Ypsilanti Township GIS Conversion Project (GIS-08)

Charlotte Nichols

Project Profile, October 1999, 1 page, Order Number: GIS-08

An existing geographic data layer was converted to formats compatible with the systems at Wayne County and Washtenaw County. The database design was modified and additional system requirements were assessed. This 1999 memorandum presents the final status and task description of the GIS development within the Charter Township of Ypsilanti and the Ypsilanti Community Utility Authorities for Watershed Management.

View this document now: **GIS-08** (273 KB - PDF file)

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Technical Papers & Reports

* No scientific background
** Some scientific and/or technical background helpful
*** Scientific and/or technical background suggested

Data Management / GIS Project

Barry Johnson

Project Profile, December 2001, 2 pages, Order Number: U2-06 *

This project profile is a summary of the results of a grant funded effort performed with local community funding or in kind services. The summary focuses on the demonstration aspects of the project.

View this document now: U2-06 (1.2 MB - PDF file)

Drain Information System Pilot Project

Richard Wilhelm & Ken Koleda

Task Product Memorandum, March 1999, 38 pages, Order Number: RPO-WMGT-TPM60 **

The Wayne County Department of Environment, Division of Public Works (DPW) is improving and modernizing its information systems for County Drains. This work includes the conversion of information from paper maps and legal descriptions to a computer-based geographic in formation system (GIS). Ultimately, the GIS will provide three benefits for the County: improved record-keeping for maintenance and engineering staff responsible for County Drains; improved service to residents and businesses served by the County Drains; and improved ability to perform environmental management and reporting under the Michigan Storm Water General Permit (MIG610000) and future federal storm water regulations. This task product memorandum describes the inventory of information available for developing the Wayne County Drain GIS. The inventoryi ncludes a County-wide review of available digital data, paper maps and drainage districts and a more detailed review of parcel boundary data within one community: Westland. This memorandum also describes the end products of this project such as the preliminary Drain Information System (DIS) pilot project file developed in ArcVIEW TM that includes the location and extent of approximately 375 unique County Drains. Within the detailed pilot area of Westland, more complete information is presented for the drain network and for parcels within the drainage districts. The DIS pilot was developed using the State of Michigan MIRIS base map currently used by the Rouge project. All data necessary to view the DIS pilot were provided to DPW. Recommendations were developed for implementing a full-scale DIS based on the pilot results. These recommendations include: 1) perform quality control steps and reconcile discrepancies within existing information; 2) establish the full-scale DIS on the new Wayne County digital ortho-photo base map currently under development; and 3) incorporate new digitized data with parcels that the County is developing under another project.

View this document now: RPO-WMGT-TPM60 (125 KB - PDF file)

Fundamental GIS Development Project, GIS Round II, City of Farmington, Michigan

Charlotte Nichols

Project Profile, July 2000, 2 pages, Order Number: GIS-43 *

This project profile is a summary of the results of a grant funded effort performed with local community funding or in kind services. The summary focuses on the demonstration aspects of the project.

View this document now: GIS-43 (94 KB - PDF file)

GIS Data for Water Quality Indices and Wetlands Assessment, West Bloomfield, Michigan

Project Profile, September 2000, 2 pages, Order Number: GIS-41 **

The purpose of the project was to expand two GIS capabilities necessary for planning and implementing programs to support the Michigan Department of Environmental Quality General Permit for Storm Water Discharge which supports the Rouge River restoration activities.

View this document now: GIS-41 (86 KB - PDF file)

GIS Development Project, Westland, Michigan

Charlotte Nichols

Project Profile, February 2000, 2 pages, Order Number: GIS-06 *

This project profile is a summary of the results of a grant funded effort performed with local community funding or in kind services. The summary focuses on the demonstration aspects of the project.

View this document now: GIS-06 (63 KB - PDF file)

GIS Pilot Project Report

Project Profile, June 1998, 154 pages, Order Number: RPO-PI-TM99 **

This document describes the Upper 2 GIS Pilot project that was conducted to identify and define a select number of GIS applications for watershed management; identify and acquire available GIS data necessary for prototype development of the applications; and conduct integration of the data to illustrate issues of data compatibility. This document summarizes the primary issues found to be significant in the transfer and integration of data. The topics addressed by the pilot project include:
- the utility of GIS in watershed management - the pilot found as many as eight separate applications over and above the obvious mapping and data management capabilities of GIS;

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- the importance of data transfer - given the costs of developing GIS data, it is in the interest of watershed mangers, and GIS users in general, to obtain available data rather than to digitize and develop data redundantly. For the Pilot Project, base map data was available, or was soon to be available, from the local communities, which would facilitate the study if transferring and integrating data from numerous sources; and
- the issue of data integration - Issues that influence the potential for successful integration of data include: the type of data to be integrated, technological advances / hindrances, and technical specifications of the data.

View this document now: RPO-PI-TM99 (1.8 MB - PDF file)

GIS/Public Awareness Project

Barry Johnson

Project Profile, December 2001, 3 pages, Order Number: M1-10 *

This project profile is a summary of the results of a grant funded effort performed with local community funding or in kind services. The summary focuses on the demonstration aspects of the project.

View this document now: M1-10 (261 KB - PDF file)

Township GIS Conversion Project, Ypsilanti, Michigan

Charlotte Nichols

Project Profile, October 1999, 1 pages, Order Number: GIS-08 *

This project profile is a summary of the results of a grant funded effort performed with local community funding or in kind services. The summary focuses on the demonstration aspects of the project.

View this document now: GIS-08 (38 KB - PDF file)

Using GIS Tools to Implement an Illicit Discharge Elimination Program in Livonia, Michigan

Christine Rohrer

Project Profile, 7 pages, Order Number: Watershed 2000-04 **

The City of Livonia, Michigan is using Geographic Information Systems (GIS) technology to enhance the implementation of its illicit discharge elimination program. The illicit discharge elimination program currently underway within the City of Livonia is required by the Michigan Department of Environmental Quality (MDEQ) Voluntary General Stormwater Permit (MIG610000), which was issued in 1997. This permit offers an innovative approach to the National Pollutant Discharge Elimination System (NPDES) permit program by focusing on the concept of watershed management. In August 1999, the City of Livonia received coverage under the MDEQ Voluntary General Stormwater Permit in lieu of requirements of the Environmental Protection Agencies (EPA) Phase I stormwater program.

Within the City of Livonia, GIS has been used in direct support of General Stormwater Permit activities that focus on identifying illicit connections, points of infiltration and likely sources of future contamination to the storm sewer system. Activities currently underway include the mapping of the stormwater conveyance system, the location and mapping of storm sewer outfalls, and the location of on-site sewage disposal systems (OSDS). As a result of the GIS integration, record keeping is improved, problem areas are identified earlier, and joint efforts with surrounding communities and other agencies with storm drainage jurisdictions in Livonia are simplified. These GIS tools are also part of an overall municipal GIS program for improving the delivery of public works services to businesses and residents.

View this document now: Watershed 2000-04 (404 KB - PDF file)

Wayne County Drain Information System Phase II - Develop Standard Map Format and Generate Township Map Sets

Ken Koleda

Technical Report, April 2002, 25 pages, Order Number: RPO-GIS-TR45 **

This task memorandum describes the work completed for Task #3 of the Drain Information System Phase II project. The goal of this task was to create a community drain map for the prototype area and to define the necessary procedures and map layout template to facilitate further community map production.

View this document now: RPO-GIS-TR45 (638 KB - PDF file)

Wayne County Drain Information System Phase II - Drain Assessment Application Prototype

Ken Koleda

Technical Report, April 2002, 17 pages, Order Number: RPO-GIS-TR46 **

This document describes the work completed for Task #4 of the Drain Information System Phase II project. The goal of this task was to create a prototype of a drain assessment application that could be implemented when the Wayne County parcel data becomes available. This document details the steps necessary to create this prototype.

View this document now: RPO-GIS-TR46 (415 KB - PDF file)

Wayne County Drain Information System Phase II - Update Drain Data and Attribute Drains with Unique Subwatershed Identifier

Ken Koleda

Technical Report, April 2002, 43 pages, Order Number: RPO-GIS-TR44 **

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

This report for the Wayne County Drain Information Phase II project summarizes the procedures necessary to update the Wayne County drain data as generated for the Drain Information System (DIS) Phase I work.

View this document now: RPO-GIS-TR44 (889 KB - PDF file)

Maps

Report Maps (8.5 by 11 inches unless noted)

- Rouge Watershed Base Map
- Rouge Watershed Base Map (black & white)
- Rouge Storm Water Management Areas
- Rouge Detroit River Areas of Concern
- Rouge Green Corridors
- Rouge CSO Area Status - December 2006
- Rouge Watershed Base Map (17 by 11 inches)
- Rouge Storm Water Management Areas (17 by 11 inches)

Display Maps (36 by 28 inches)

- Rouge CSO Area Status - December 2006
- Rouge Storm Water Management Areas
- Rouge Storm Water Management Areas and Drainage Subareas
- Rouge Topography

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grants #XP995743-01, -02, -03, -04, -05, -06, -08, -09, and C-264000-01.

Accomplishments

The Rouge River National Wet Weather Demonstration Project (Rouge Project) is a working example of how a systematic watershed approach to pollution management can result in cost-effective and ultimately greater and faster achievement of designated uses in a water body. The Rouge Project was initiated in 1992 by Wayne County, Michigan. This cooperative effort between federal, state and local agencies was supported through June 2014 by over $350,000,000 in multi-year federal grants from the United States Environmental Protection Agency with additional funding from local communities and other stakeholders.

To download and view a pdf of the Rouge River Restoration Summary that highlights the Rouge Project's many accomplishments over the period of October 1992 through June 2014, please **click here**.

Links

Environmental Agencies & Organizations

Alliance of Rouge Communities (ARC)
Friends of the Rouge
Southeast Michigan Council of Governments (SEMCOG)
SEMCOG Ours to Protect
United State Environmental Protection Agency (USEPA)
USEPA Water Science
USEPA Watersheds
State of Michigan
Michigan Department of Environmental Quality (MDEQ)
Michigan Department of Natural Resources (MDNR)
Michigan Department of Transportation (MDOT) Storm Water Management

Local Governments

Rouge Communities
Oakland County
Oakland County Water Resources Commissioner
Washtenaw County
Washtenaw County Water Resources Commissioner
Wayne County
Wayne County Department of Public Services - Environmental Services Group

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