Chapter 3
Existing Impairments, Pollution Sources, Obstacles and Progress-to-Date

3.1 EXISTING IMPAIRMENTS AND POLLUTION SOURCES

The Rouge Remedial Action Plan Advisory Council (RRAC) summarized the impaired uses of the Lower 2 as impaired or severely impaired for water contact, warm water fisheries, habitat degradation, aesthetics degradation, aquatic life and wildlife degradation and navigation. Table 3-1 lists the watershed impairments, known pollutants and sources of the pollutants.

Table 3-1: Watershed Impairments, Known Pollutants and Sources

IMPAIRMENTS	KNOWN POLLUTANTS	SOURCES
Warm water recreation (Restrictions on swimming and other activities)	E.coli, fecal coliform	CSOs, SSOs, illicit connections, animal waste runoff from impervious surfaces
Loss of fish and wildlife habitat	Channelization	Enclosure or relocation of streambed
	Phosphorus	Improper application of fertilizer Sanitary sewage Runoff from impervious surfaces such as parking lots and roads
	Sediment	Stream bank erosion Upstream runoff
	Increased Temperature	Low flow in river, not enough trees and vegetation along the banks
	Hydrologic flow and velocities	Impervious surfaces with insufficient or no storm water controls
Degradation of fish populations and benthos	Sediment	Soil erosion Upstream runoff
	Phosphorus	Residential fertilizer use Sanitary sewage Runoff from impervious surfaces
	Hazardous Materials	Illegal discharges Point source discharges

IMPAIRMENTS	KNOWN POLLUTANTS	SOURCES
Degradation of fish population and benthos (cont.)	Increased Temperature	Atmospheric deposition of pollutants including mercury
	Hydrologic flow and velocities	Low flow, not enough vegetation Impervious surfaces with insufficient or no storm water controls
Degradation of aesthetics	Phosphorus & Nitrogen	Residential fertilizer use Sanitary sewage Runoff from impervious surfaces
	Sewage	SSOs, CSOs, Illicit Discharges
	Garbage & oils	Impervious surfaces such as parking lots Improper disposal of household products
	Sediment	Upstream runoff
Restrictions on fish consumption	PCBs and mercury	Contaminated sediments Industrial and point source discharges Air Deposition
Fish tumors or other deformities	Organic & inorganic chemicals Viruses	Contaminated sediments Point source discharges Illegal discharges
Restrictions to navigation	Log jams	Stream flow variation
	Sediments	Stream bank erosion Upstream runoff
	Low flow	

This is an urban subwatershed with an estimated 32% of the land covered by impervious surfaces. Impervious surfaces such as roofs, parking lots, roadways and sidewalks allow the rainfall and snow melt to rapidly reach the river through street runoff and enclosed storm drains. This amount of impervious surface has contributed to the excessive peak flows in the river. A challenge in the Lower 2 will be to include methods to reduce the amount of directly connected impervious surfaces when areas are redeveloped and to use other methods to retain and treat storm water before it enters the River.

3.2 PART 201 (OF ACT 451 OF 1994, AS AMENDED) SITES OF ENVIRONMENTAL CONTAMINATION AND ABANDONED LANDFILLS

Waste disposal sites were identified in the Technical Memorandum, Summary of Waste Disposal Sites, RPO NPS-TM 11.00, July 1994 and Sites of Environmental Contaminations were identified in the Rouge RAP Progress Report of 1998. These Part 201 sites are a potential source of contaminants/impairments for the Lower 2.

- By-Rite Gas Station, Westland
- Chem Central, Romulus
- Dearborn Refining Co., Dearborn
- Feister Oil Company, Westland
- Henry's Service Center, Wayne
- Kelsey Hayes Romulus Facility, Romulus
- Marquette and Hanlon Rd., NE Corner, Westland
- Michigan Recovery Systems, Romulus
- National Airport Site, Westland
- Servco, Inkster
- Unistrut Corporation, Wayne
- Van Dresser Corp., Westland
- Victory Auto Sales, Wayne
- Wolverine Gasket Company, Inkster
- Woodland Meadows North

3.3 OBSTACLES

All of the stakeholders serving on the Lower 2 SWAG have embraced the goals of the RAP. Because of the staggering costs associated with eliminating the impairments, the stakeholders have prioritized the identified pollutant sources to assure that the limited financial resources are directed to the worst problem. All have agreed that all sources of untreated sewage entering the water course must be eliminated. Thus, CSO control, SSO control, and illicit connection detection and elimination are the highest priority.

The tremendous costs associated with CSO and SSO control must be staggered to assure the solvency of many communities. This does not diminish the stakeholder's commitment to achieve water quality standards, only the timeframe of compliance.

At the same time, other impairments preclude full use of the river. For example, extreme peak flows and the sediments associated with these flows destroys habitat and thereby impact fish and wildlife communities. The Lower 2 SWAG members have committed to addressing these impairments within the context of the subwatershed plan. These commitments are limited, however, by the ability to pay for the recommended control alternatives. The Lower 2 communities will continue to pursue control of all SSOs and CSOs. As these issues are addressed, other goals, such as flow control, will become a priority.

Lastly, a great number of pollutant sources can best be addressed through public education. Through source controls a wide variety of chemical constituents can be reduced. These efforts have been initiated and will continue into the future.

3.4 PROGRESS TO DATE

All of the completed basins are controlling CSOs at a rate of about 4 billion gallons per year and 130 miles of stream are now free of CSO discharges. In addition, 12.5 million gallons per day of dry weather discharges have been eliminated in results from the illicit discharge teams. Environmental improvements include the restoration of wetlands, habitat improvement, installation of BMPs, improved aesthetics, etc. For the first time in years, the river is meeting the dissolved oxygen water quality standard (5 mg/l). Also, fish species are being found in greater and more diverse numbers. The recreational use of the River is also expanding and this success can be attributed to CSO controls, illicit connection elimination, a multitude of other Rouge Project programs including developing better community, industry and public awareness of pollution control and prevention.

3.4.1 CSO Control Efforts

Combined sewer overflows (CSOs) are discharges from collection system that carry both sanitary and storm water. In dry weather, combined sewers usually carry wastewater directly to the wastewater treatment plant, but during heavy rains, storm water overwhelms the capacity of the collection system and wastewater is allowed to discharge to surface waters untreated. For the most part communities are aware of the location of their CSO systems, so identifying them can be timely accomplished by record review. Elimination of untreated CSOs can be accomplished through sewer separation (complete separation), and/or through construction of detention basins or detention basin tunnels and/or in-system storage coupled with appropriate treatment and disinfection of remaining overflows. All options, however, are very expensive and environmentally disruptive.

Inkster CSO basin under construction

Sewer separation is usually the most expensive alternative and may not be effective unless complete separation (i.e. removal of all foundation and footing drains previously connected to the combined system) is achieved. Complete separation is often very costly and disruptive. Less costly and disruptive partial separation may result in residual wet sanitary flows still in excess of the available separated sanitary sewer capacity, thus still requiring additional corrective actions. Basins and tunnels require the availability and disruption of large areas of land which often are not available in older established communities. In-system storage utilizes excess capacity within the collection system itself, if available in conjunction with a system of gates, dams and other structures to control the flow of wastewater. The installation and maintenance costs associate with in-system storage can be very high. Ongoing operation and maintenance of a CSO Basin is at least $500,000 per year.

In 1992, The U.S. Environmental Protection Agency (EPA) provided $46 million to Wayne County to fund the Rouge Project with a primary goal of establishing a watershed-wide approach to addressing the problems of a urban river. This meant looking beyond the obvious impacts (i.e., CSOs) to matters of recreational use and habitat restoration. While final design decisions for the major civil structures remained with the local

communities, the Rouge Project provided overall coordination to encourage substantial differences among the designs commensurate with the intent of the demonstration project.

Sewer separation projects in various areas of the Lower 2 Subwatershed have proven to be a benefit to the Rouge River. These projects have taken place in Wayne, Westland, Garden City and Inkster. Overall, the projects took place in areas that included both combined and separate sewer systems. CSO areas in Wayne and Westland were controlled by sewer separation projects (1996-97) where 288 acres and 409 acres respectively, were separated. Four miles of new sewers and storm drains were used for Wayne and 8 miles for Westland. The City of Wayne's project also included a 2.3MG basin. A project highlight was the complete separation of sewer systems in the Wayne, Westland and Garden City areas.

Inkster CSO basin complete

In the summer of 1997 a CSO basin in Inkster became operational. This basin controls about half of the CSO area in the Lower Rouge. This design includes a million gallon first flush tank as well as a 2 million gallon 2 compartment main storage basin. When the flush tank becomes full, the flow is then diverted to the basin. The treated effluent from the basin enters the Lower Rouge River just east of Inkster Road.

3.4.2 SSO Control Efforts

Sanitary sewer overflow (SSO) systems are similar to CSO systems, except that SSO systems were not intended to carry storm water or to overflow untreated sanitary sewage to surface waters. Untreated discharges backing up into residences creates an immediate public health hazard, and is the primary public health and safety concern of this SWAG.

Two categories of sanitary sewers exist within the Rouge watershed. Those that originally were constructed as separated sanitary sewers, and those that originally were part of a combined sanitary-storm water sewer system that have undergone sewer separation, resulting in either partial separation or full separation. In the originally separate sanitary sewers (OS3) and the fully separated (previously combined) sanitary sewers (FS3), some non-sanitary wet weather water still enters the sewer through cracks, points, etc.) and inflow (i.e. – entrance of rainwater from the surface – such as through manhole cover holes, poorly sealed manhole rings, etc.) In partially separated (previously combined) sanitary sewers (PS3) building foundation and footer drains often are still connected. Thus, in addition to the types of inflow and infiltration (I/I) mentioned above, the foundation and footing drain can result in a presignificant inflow component impact on the sewer flows during wet weather event. In the case of these PS3 sewers, the flows resulting from the wet weather inflow may be several times the normal base sanitary flow.

To avoid back-up of wastewater into the streets and/or basements, some of the older separated sewers and overflow weirs on the high-level overflow connections to adjacent storm sewers allowing untreated discharges to surface waters. Identification and elimination of untreated SSO discharges from these types of systems requires the detection and elimination of all physical sanitary connections (illicit discharges) to the separate

storm water drainage system and removal of the excess storm water inflow and infiltration from the sanitary system.

Even in sanitary systems where these types of storm water – sanitary cross connections do not exist, the sanitary sewers occasionally may receive more flow (either base sanitary flow, or sanitary flow diluted by infiltration/inflow) than they can convey to the wastewater treatment plant. In these cases, the excess flow results in a discharge to the ground surface or surface water or results in backup of sewage into basements. Overflows also may occur due to equipment breakdown and/or power failure (i.e. pump or power failure at a lift station).

The detection of SSO cross connection-based discharges into separate storm sewers can be accomplished through an illicit discharge elimination program. If a hydraulic connection is determined to exist, wet weather flow studies have to be performed to located the specific connection, and to determine corrections necessary to eliminate the storm water I&I causing the excess flow in the sanitary sewer that is causing the SSO to the storm system. This identification process is time consuming and can be expensive to undertake.

The potential solutions to eliminate untreated SSOs are complex due to the nature of the causes and the inter-relationships of the local and regional sewerage systems that serve the communities. Additionally, the potential additional local and/or regional system SSOs that occur as a result of wet weather, exceeding the system(s) design capacity(ies), also need to be considered.

The solutions will be very expensive and will take time to implement. This subwatershed plan provides the opportunity to look at the impairments to the Rouge River and set economic and public health priorities based on the impact this will have on the water quality of the Rouge River and in the reduction of basement flooding.

The Lower 2 SWAG communities believe that commitment of resources to control the pollutants to the river must be made on the basis of the degree of protection achieved, regardless of whether the source is CSO, SSO, or storm water. Accordingly, they are proposing a water quality based approach to controlling untreated SSOs, such that the solution implemented provide water quality benefits commensurate with the costs incurred, while reducing the risks of basement flooding.

A watershed approach to correcting SSOs is supported by the EPA in their draft rules on SSOs and in a recent report by the Southeast Michigan Council of Governments titled, “Implementing Sanitary Sewer Overflow Corrections: An Action Strategy, August 2000”.