THE ROUGE RIVER PROJECT
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Rouge River National Wet Weather Demonstration Project

Wayne County, Michigan

TASK PRODUCT MEMORANDUM
Conclusions and Recommendations of the Groundwater Study Group
Nonpoint Work Plan No. URBSW18, Task No. 2

RPO-NPS-TPM39.00

November 1996

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ACKNOWLEDGMENTS

We would like to thank Noel Mullett, Wayne County Department of Environment for his assistance in the preparation and completion of this document.

The Rouge River National Wet Weather Demonstration Project is funded, in part, by the United States Environmental Protection Agency (EPA) Grant #X995743-01, #X995743-02, #X995743-03 and #C995743-01. The views expressed by individual authors are their own and do not necessarily reflect those of EPA. Mention of trade names, products, or services does not convey, and should not be interpreted as conveying, official EPA approval, endorsement, or recommendation.

Rouge River National Wet Weather Demonstration 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 will address 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 ensure compliance with federal, state and local environmental laws which protect human health and the environment.

This will be accomplish 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 municipalities across the nation facing similar problems with guidance and potentially effective solutions.

PREFACE

The Rouge River and its watershed are a primary source of pollution to the Great Lakes. The Clean Water Act of 1972 intended to make waterways "fishable and swimmable" by 1972. Although that goal has not been reached, great progress has been made in improving water quality in most waterways. The Rouge River Remedial Action Plan (RAP) provided a basis for which The Rouge River National Wet Weather Demonstration Project (Rouge Project) efforts were created: it identified the major sources of pollution and measured the relative contributions of each. The RAP is the continuing foundation for the Rouge Project and presents a framework for addressing the problems within the Rouge River by looking beyond treatment and focusing instead on prevention methods.

The Rouge Project was established under the initial Rouge Grant 1 from the United States Environment Protection Agency, Region 5, and enabled Wayne County to initiate a comprehensive watershed-wide pollution-control approach that addresses combined sewer overflow (CSO), stormwater management, and other nonpoint source controls through the application of innovative technologies, progressive financial and institutional arrangements, and creative public involvement and education programs.

Rouge Grant 2 provides the framework for the progression and implementation of Project goals as Wayne County continues its mission to develop potential solutions and implement projects which will lead to the restoration of water quality in the Rouge River. The Project will address 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 ensure compliance with federal, state, and local environmental laws which protect human health and environment.

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

Under Rouge Grant 2, the Rouge Project will build on lessons learned from Grant 1 efforts and focus on further integration of the goals of the overall Mission. To this end, Rouge Grant 2 concentrates on the following key Project areas:

- **Watershed Management** will continue under Rouge Grant 2 with the development and evaluation of wet weather and stormwater alternatives, the planning of long-term

monitoring programs, and the ongoing efforts to enhance instream water quality, monitor rain and flow levels, interpret data analysis, and present recommendations.

- **Nonpoint Source Pollution Control** will provide for the stormwater management, permit applications, and development of financial and institutional alternatives for wet-weather watershed management in concert with enhanced efforts to establish institutional partnerships. Toward the goal of institutional partnering, several community projects will be undertaken with watershed communities. Additional efforts include the inventory of wetlands and measurement of pollutant loads from abandoned dumps and air deposition with possible remediation of some sites.

- **CSO Construction Coordination** will continue to monitor the construction of CSO demonstration projects established under Grant 1. Additional planning and assistance will allow project coordinators to make additional recommendations on the design criteria of future CSO abatement facilities.

- **Public Involvement and Information** will reach and interact with more stakeholders, institutions, and regulatory agencies, thus fostering a renewed understanding and continued commitment to reducing pollution, and continuing the transfer of watershed management approaches way beyond the project. It will be the central mechanism for transmittal of the Project's Decision Support System tools, processes, and information necessary for sustaining a watershed management support system directly to varied audiences both within and outside the Rouge watershed.

Additional information on the Rouge River Project is available from many sources, including the Wayne County Department of Environment (WCDOE) and the Rouge Program Office (RPO).

ABSTRACT

Work Plan URBSW18 - *Groundwater Investigations/Recharge* investigated the availability of data and information to define groundwater quality and its presence within the Rouge Watershed. This work plan also investigated the role of groundwater studies in demonstration remediation efforts at abandoned dump sites within the watershed. A group of local engineers and scientists with strong backgrounds in groundwater and soil evaluations was assembled to evaluate the issues mentioned above. The group formulated several conclusions and recommendations based on their review.

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1.0 INTRODUCTION.

Work Plan URBSW18 - *Groundwater Investigations/Recharge* investigated the availability of data and information to define groundwater quality and its presence within the Rouge Watershed. This work plan also investigated the role of groundwater studies in demonstration remediation efforts at abandoned dump sites within the watershed. The information compiled during this work plan will be used to define how the existing groundwater data will be used to support a presumptive approach to remediation, subwatershed management planning, and identifying long-term monitoring needs. This memo presents the conclusions and recommendations of these investigations.

2.0 APPROACH.

A group of local engineers and scientists with strong backgrounds in groundwater and soil evaluations were assembled. This "RPO groundwater" group met three times. The first two meetings were used to discuss the investigative program that has been proposed by the University of Michigan-Dearborn (UM-D) and Clayton Environmental Consultants (Clayton). The third meeting focused on developing conclusions and recommendations based on results of the discussions held during the first two meetings.

3.0 FINDINGS.

3.1 PROPOSED PROGRAM BY UM-D AND CLAYTON.

The purpose of the investigative program proposed by UM-D and Clayton is to "facilitate the development of a generic process for the investigation and closure of sites (abandoned dump sites) for recreational land use." The goals of this program are to: (1) develop a generic model to evaluate the subsurface geology, hydrogeology and geochemistry on a regional basis within a watershed; and (2) test the premise that contaminated groundwater represents a significant source of pollution to surface waterbodies such as the Rouge River. The proposed program entails: (1) a literature search and compilation of existing data; (2) a watershed-wide monitoring study at approximately 60 existing wells to field verify results of the literature search; (3) additional monitoring at 66 new wells at 22 sites to determine if a correlation exists between groundwater quality and surface water quality; and (4) data interpretation which will include developing maps of the watershed showing various geologic and hydrogeologic formations. It is a two year program with an estimated budget of $461,000.

3.2 RELATED RPO PROGRAMS.

Several RPO work plans are providing data that can be used to quantify the impact groundwater has on the Rouge River. Other work plans will need geologic and hydrogeologic information to complete certain tasks. Each of these work plans were reviewed by the group.

The Baseline monitoring program conducted under work plans SAM1-SAM5 (Analytical Sample, Continuous Water Quality and Flow Data Collection) and WOMG2 (Ongoing Water Quality Monitoring: Instream/Continuous) has been and will continue to collect instream water quality data throughout the watershed. Monitoring conducted under dry-weather conditions should indicate whether or not a source of pollution is impacting instream water quality under this flow condition. If elevated levels of either nutrients or metals (total and dissolved) in the water column are found to impact designated uses or aquatic life, an investigation to identify the source(s) needs to be conducted. This source identification may include groundwater.

The toxics monitoring program being implemented under WMD8 (Toxic Contaminants) will characterize toxic impacts on human health and aquatic life at select locations throughout the watershed. This monitoring effort is the first phase in a toxics assessment program. If toxics are found to be impacting certain sections of the Rouge, a more rigorous investigation into locating the source(s) will be performed under a later phase, and could include monitoring the groundwater as a possible source.

The sediment reconnaissance survey conducted in 1994 under MOD5 (Toxics/Sediment Survey) analyzed sediment samples from 182 locations along the major branches of the Rouge River. These samples were analyzed for metals, PCBs, PAHs, and total organic carbon. Locations with elevated levels were noted and entered into RPO's GIS system. This information is useful in locating portions of the Rouge where sediment contamination has occurred and the possible source(s) of this contamination.

The abandoned dumps investigation being conducted under DMP1 (Quantify Loads/Abandoned Dumps) is developing a generic process for the investigation and closure of abandoned dump sites. Groundwater contamination and the impact this contamination may pose on the surrounding environment is a major focus of this investigation. Site specific geologic and hydrogeologic information will be required as part of the closure process.

In addition, an area-wide approach to closing these abandoned sites will be investigated as an option for facilitating the overall process throughout the watershed. The development of an area-wide closure plan will require geologic and hydrogeologic information on a watershed-wide basis, not just site specific data.

3.3 EXISTING DATA. The existing data on geology, hydrogeology, groundwater, and contaminated sites is extensive for southeastern Michigan. Clayton has all ready reviewed a significant portion of this data and compiled it into a single summary

document. The State of Michigan, University of Michigan, and several private firms also maintain appropriate databases that are available to the RPO.

4.0 CONCLUSIONS.

4.1 Surface Water Impacts.

- Groundwater and its impacts on the surface waters should be investigated as part of a pollutant source identification program that targets both specific sections of the river and individual pollutants.

- Groundwater should only be a concern if the loads are degrading the water quality to a point that a designated use is impaired.

- The results of the instream, biological, sediment reconnaissance, and toxics monitoring programs can be used to establish the location of problem areas and the parameters of concern for the Rouge River Watershed.

- The available data on the geology, hydrogeology, groundwater, and contaminated sites may provide sufficient information to assist with: (1) estimating groundwater quality and loading; (2) identifying whether or not groundwater may be a possible source of pollutant loading at specific locations; and (3) estimating the correlation between groundwater quality and instream quality.

- The field monitoring program, such as proposed by UM-D and Clayton, should only proceed once the available data has been compiled and site-specific coverage for source identification at particular sites of interest are prioritized.

4.2 ABANDONED DUMPS PROGRAM.

- The data transfer proposed by UM-D and Clayton will be useful to the abandoned dumps program as well as other programs, such as toxics. This data will be useful for identifying the relative sensitivity of the hydro geologic units in the transport of contaminants to sensitive receptors. The transport parameters of the hydrogeologic units can be defined and used to calculate worst case loadings to the river under a variety of hydrologic conditions.

- At this time, the field monitoring program proposed by UM-D and Clayton with its watershed-wide approach is inconsistent with the phased approach that is recommended for the abandoned dumps program. The data provided by such a sampling program may prove to be useful, but not until sites of interest are identified.

5.0RECOMMENDATIONS

- Future groundwater investigations should only be conducted in support of specific work plans, such as the abandoned dumps program and toxics. Any groundwater investigation needs to be developed and coordinated through the work plan it will be supporting.

- The groundwater monitoring program at the approximately 60 existing wells and the 66 new wells in the UM-D and Clayton proposal will cost approximately $250,000 - $300,000 and should not be funded by the RPO at this time. The groundwater data that would be collected as part of the UM-D and Clayton proposal are likely to be of limited use for identifying specific sites of groundwater contamination or impacts of contaminated groundwater on surface water because the monitoring is on a watershed-wide scale.

- An additional task to the abandoned dumps work plan should be developed for compiling a database of the available geologic and hydrogeologic information for the Rouge River Watershed. This data can be used to identify geologic units with greater or lesser hydrogeologic sensitivity to the transport of contaminates to the river. Using Clayton's data, worst-case loading to the river can be estimated. The predicted contaminant level can then be compared to applicable water quality standards. This information will also be useful to several other current work plans, and subwatershed managers. Clayton is a solid choice for conducting this activity under the guidance of an RPO work plan manager.

- Data from the instream, biological, sediment reconnaissance, and toxics monitoring programs needs to be evaluated to establish the location of problem areas and the parameters of concern for the Rouge River Watershed. This data can then be correlated with the hydrogeologic information in a particular geologic unit and the location of contaminated sites and abandoned dumps to identify the potential impact of groundwater loading from these sites on water and sediment quality. This information should then be entered into the GIS and displayed on a map of the watershed.