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Water Quality Governance in the Rouge River Watershed

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The goal of this review is to outline and synthesize the actors and decision-making venues that govern water quality outcomes in the Rouge River Watershed. We find that water quality in the Rouge River Watershed is governed at multiple levels, from federal agencies to regional organizations and nonprofits to county and municipal governments. We find that these governance activities fall into four categories: (1) ensuring compliance with the federal Clean Water Act and NPDES permit program for managing point source water pollution; (2) implementation of the Environmental Protection Agency and Great Lakes Water Quality Agreement (GLWQA) Area of Concern (AOC) designation; (3) enactment of local zoning and land use regulations; and (4) broader and largely non-governmental watershed protection activities (e.g., on-site management of nonpoint source pollution, green infrastructure, and education).

Summary of roles in managing water quality in the Rouge River Watershed:
Overall, we find the **federal government** plays an important role in water quality regulation through establishing NPDES permit requirements, AOC designation and Remedial Action Plans (RAPs), and providing grant funding through the Clean Water State Revolving Fund and Great Lakes Restoration Initiative. The **state government** plays an important role in issuing NPDES permits (including Soil Erosion and Construction Stormwater (SECS) permits, industrial stormwater permits, and MS4 permits), distributing resources through various mechanisms, like the Clean Water State Revolving Fund and Michigan Great Lakes Protection Fund, managing conveyance systems, and developing Stormwater Management Plans for state-led projects. There are three **county governments** in the Rouge River Watershed and they are responsible for NPDES permit implementation (including creating and implementing their own Stormwater Management Plans), operating and maintaining sewer and drain operations, and issuing permits of their own to ensure compliance with construction and non-NPDES regulated zoning. There are forty-eight **municipal governments** in the Rouge River Watershed and they are responsible for NPDES compliance and implementation, wastewater and stormwater infrastructure construction and maintenance, and land use planning and zoning. **Local interest groups and community organizations**, like neighborhood associations and communities of faith, play important roles in local policy formulation and implementation. **Regional bodies**, such as GLWA, SEMCOG, and the Alliance of Rouge Communities, play coordination, capacity-building, education, and advisory roles for the Watershed while maintaining some infrastructure, implementing restoration activities, and monitoring water quality. All governing actors work to inform and educate the public on actions they can take to protect water quality.

In the Rouge River Watershed, stormwater management has largely focused on centralized conveyance and retention (e.g., drains, sewers, tanks, basins, and treatment facilities) as strategies for managing point source pollution under the NPDES program. Management of

nonpoint source pollution, as well as the planning, funding, and implementation of green infrastructure, is occurring more unevenly throughout the Watershed, seemingly at the discretion of the governance body on hand. Some NPDES permits have green infrastructure requirements. For example, the Detroit Water and Sewage Department (DWSD) is required to implement its Green Stormwater Infrastructure Plan in accordance with its NPDES permit. However green infrastructure requirements vary between counties and municipalities.

Water quality governance in the Rouge River Watershed is ultimately a complex combination of decision-making scales and actors. The NPDES permit program is largely top-down regulation by the federal government. Local zoning and land use regulations represent more bottom-up governance driven by municipalities and counties. Watershed restoration activities and broader watershed management include decision making at multiple scales, both in the implementation of the Remedial Action Plans and the coordination of regional activities. For example, while funding for AOC restoration often flows down from the EPA, the implementation of restoration projects is often highly localized, relying on the input and expertise of local actors.

The NPDES permit program

The EPA, under the authority of the 1972 Clean Water Act (CWA), regulates point source discharges of water from state, municipal, or private systems into public waters to ensure that established water quality standards are met. These standards are regulated through the National Pollutant Discharge Elimination System (NPDES), which is administered by state governments. The NPDES permit program regulates point source pollution from three potential sources: municipal separate storm sewer systems (MS4s), construction activities, and industrial activities. Though retaining oversight responsibilities, the EPA has authorized the state of Michigan to implement the NPDES program within the state via permitting, administration, and enforcement duties. While green infrastructure is not consistently incorporated into NPDES permits, the EPA released a compendium of MS4 permitting approaches in June 2022 that encourage the use of green infrastructure to manage stormwater discharges.

In Michigan, the Department of Environment, Great Lakes, and Energy (EGLE) is authorized by the EPA to manage the state's stormwater discharge permit program. EGLE is therefore the state agency responsible for issuing NPDES permits, including SECS, industrial, and MS4 permits. These permits are issued to departments, counties, municipalities, and private entities throughout the state. As of July 5, 2022 there are over 160 active NPDES permits in the Rouge River Watershed. Those issued an NPDES permit are responsible for compliance and reporting activities. For example, even as a peer organization to EGLE, the Michigan Department of Transportation develops and implements a Stormwater Management Plan and maintains roads and drainage systems in compliance with their EGLE-issued NPDES permit.

The Rouge River Watershed includes Wayne, Oakland, and Washtenaw counties. In Washtenaw and Oakland counties, stormwater management duties are shared between the Water Resources Commissioner and Road Commission. In contrast, Wayne County concentrates stormwater management duties within their Environmental Services Division. Under both models, there are similar responsibilities, including administering the NPDES permits of the county, issuing stormwater and drain use permits, maintaining sewer and drain operations, collaborating on stormwater design standards and regional projects, handling illicit discharge complaints, and engaging in public outreach about stormwater and wastewater best practices. County Road Commissioners also ensure road development is in compliance with water quality requirements, regulate post construction water management, conduct site plan approvals and inspections, and implement pollution prevention measures (e.g., street sweeping, cleaning catch basins).

Municipalities often hold NPDES permits, particularly MS4 permits, and may be involved in ensuring that private NPDES permit holders stay in compliance. Municipalities also receive reports of illicit discharges from the public and, often in coordination with county and state officials along with nongovernmental organizations, can investigate non-compliance with permit requirements or notify the state of violations. Municipalities are charged with maintaining drains and water systems including water mains, sewers, drainage, catch basins, and storm water lines under their jurisdiction, as well as water system pump stations, sanitary sewage lift stations, and water meters. In addition to stormwater and wastewater infrastructure and drainage systems, municipalities maintain roads within their jurisdiction, issue building, construction, and plumbing permits, and conduct inspections.

Regional organizations like Friends of the Rouge also receive reports from the public regarding illicit discharges and pass concerns on to appropriate authorities. The Alliance of Rouge Communities (ARC) assists its members, consisting of all three counties and the majority of municipalities in the watershed, with meeting MS4 permit requirements.

AOC restoration activities

The 1978 Great Lakes Water Quality Agreement (GLWQA), between the United States and Canada was signed to protect Great Lakes water quality. The GLWQA authorizes the EPA, in cooperation with the Canadian government, to designate Areas of Concern within the Great Lakes, manage and monitor AOC restoration activities, and administer federal funding for the Great Lakes granted through the Great Lakes Restoration Initiative (GLRI). The Rouge River was designated an AOC in 1985 because it was deemed to have significant impairment from human activity. The GLWQA requires Remedial Action Plans (RAPs), or required clean ups, for AOCs. These RAPs are developed collaboratively by the EPA, the state (EGLE), county and

municipal governments, and nongovernmental organizations (e.g., Friends of the Rouge). An AOC does not exist on a federal, state, or local level exclusively. Therefore, the protocols for AOC implementation are outlined by the GLWQA. In Michigan, all AOCs have a Public Advisory Council (PAC), a group of local community members who provide input on RAP development and participate in restoration activities. PACs are often the primary means by which local communities are engaged in RAPs. There is a Statewide Public Advisory Council composed of PAC members from all of Michigan's AOCs.

Since 1993, the Rouge River Advisory Council (RRAC) has been the PAC for the Rouge River AOC. The RRAC consists of residents with direct knowledge of the Rouge ecosystem and is tasked with overseeing the development of the RAP. The RRAC considers future use and maintenance of RAP projects and serves as a bridge to Rouge communities to ensure long term success of RAP projects.

The RRAC is responsible for advising and updating EGLE on the implementation of the Rouge RAP and over the years has formed a number of subcommittees to deal with more specific issues such as habitat destruction, nonpoint source pollution (such as stormwater runoff), on-site sewage disposal, public education, contaminated sites, and headwater land use. The RRAC also acts as liaison with the public at large and with interest groups to ensure that there is adequate public participation in the RAP process. The RRAC executes large-scale habitat restoration projects as well.

Local interest groups and community organizations such as housing associations, block clubs, and places of worship also play an important role in restoration project formulation and implementation, particularly when it comes to the maintenance of restored habitats over time.

Local zoning and land use planning

Michigan grants autonomy and authority to local governments for local zoning and land use planning. Within the Rouge River Watershed, some zoning legislation includes municipal land use and construction requirements related to storm drainage and zoning ordinances for green infrastructure. While local zoning is regulated by state water pollution oversight for both point and nonpoint sources of pollution, local decisions about the placement of certain kinds of businesses, impervious surfaces, and green infrastructure can have an impact on local water quality.

Broader watershed protection efforts

At the state level, EGLE manages a nonpoint source pollution program which provides technical assistance to local stakeholders in developing and implementing watershed management plans to

mitigate nonpoint source pollution and restore affected waters. The agency also provides grant funding to local stakeholders to support nonpoint source pollution mitigation and restoration, land use planning, and education and outreach. For example, EGLE issues low interest loans through the Clean Water State Revolving Fund (primarily funded by the EPA) that supports investment in new wastewater and stormwater projects and infrastructure upgrades. EGLE also issues section 319 Nonpoint Source Pollution Grants to implement nonpoint source activities in approved watershed management plans. Finally, EGLE assists directly with nonpoint source pollution monitoring and field investigations.

To varying degrees, the three counties in the Rouge River Watershed help secure funding for water quality projects, offer training and technical assistance to the public, direct residents to volunteer opportunities, and either track or implement green infrastructure projects. Washtenaw County helps municipalities and individuals incorporate green infrastructure into their stormwater management plans and properties through training and financial assistance. Wayne County has implemented "grow zones" to increase groundwater infiltration and oversaw the Rouge River National Wet Weather Demonstration Project, an EPA-sponsored project to manage pollution using a watershed approach. Oakland County is leading a multi-community effort funded by Southeast Michigan Council of Governments (SEMCOG) to expand green infrastructure.

Municipalities in the Rouge River Watershed direct residents to resources for implementing water quality protection practices into their daily lives. Some municipalities have developed land use requirements around natural features related to storm drainage and zoning ordinances for green infrastructure. Many municipalities are involved in the Alliance of Rouge Communities, which helps coordinate activity and policy across the Watershed. Detroit is somewhat unique, as green infrastructure is included as a requirement in their NPDES permit. The Detroit Water and Sewerage Department (DWSD) investments in green infrastructure specifically target combined sewer overflows (CSOs), and DWSD has created an online stormwater hub in collaboration with nonprofits, community-based organizations, and local institutions to track city-wide progress and impact of green stormwater infrastructure. DWSD also issues Drainage Charge Green Credits to non-residential customers who reduce peak flow and volume and stormwater runoff.

Regional bodies play coordination, education, and advisory roles for government and non-governmental organizations and residents within the watershed while maintaining some infrastructure, executing restoration activities, and monitoring water quality. This includes organizations such as SEMCOG, Great Lakes Water Authority (GLWA), ARC, RRAC, and Friends of the Rouge River. For example, SEMCOG has a Green Infrastructure Vision for

Southeast Michigan from 2014 and a Low Impact Development Manual for Michigan from 2008 and is currently convening a Water Infrastructure Task Force to improve water infrastructure systems in Southeast Michigan. GLWA, apart from water provision and wastewater services, convenes regional stakeholder meetings, and conducts water quality monitoring. The Alliance of Rouge Communities assists with grant funding and supports green infrastructure with a land cover mapping tool and grow zone campaign. One of the RRAC subcommittees is dedicated to nonpoint source pollution such as stormwater runoff. Friends of the Rouge conducts restoration activities and biological monitoring, educates the public, and influences policy through advocacy and lobbying.