



June 1, 2011

Mr. Phil Argiroff
Michigan Department of Environmental Quality
Southeast Michigan District Office
27700 Donald Court
Warren, Michigan 48092-2793

Dear Mr. Argiroff:

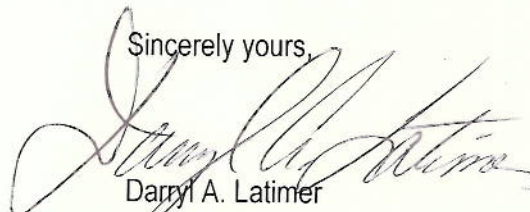
Regarding: Green Infrastructure Program Progress Report

This letter transmits the first annual Progress Report on the Green Infrastructure activities, being undertaken by the Detroit Water and Sewerage Department (DWSD) pursuant to the proposed new requirement in the National Pollutant Discharge Elimination System (NPDES) permit. An annual report on the status of Green Infrastructure Program implementation is expected to be included as a new requirement in Part I.A.14.d.9) of the NPDES permit, when the pending permit modification is issued. Although this requirement has not yet been officially placed into effect, DWSD is providing the attached report to keep MDEQ apprised as to the Green Infrastructure improvements which are being undertaken in conjunction with conventional CSO control projects.

DWSD is being assisted by SEMCOG on the planning effort for the Green Infrastructure Program, with funding assistance being provided from the grant issued pursuant to Section 205j. The attached report was prepared for DWSD by SEMCOG to describe the status of Detroit's ongoing Green Infrastructure Program planning and implementation. We look forward to working with you on the Green Infrastructure Program, including the upcoming visit by MDEQ and EPA personnel as part of EPA's Green Infrastructure Local Partnership Initiative.

If you have questions, or need further information on the Green Infrastructure Program, please feel free to contact Mirza Rabbaig at (313) 964-9880.

Sincerely yours,



Darryl A. Latimer
Deputy Director

cc: Mr. W. Creal, MDEQ, Water Resources Division
Mr. M. Bray, MDEQ, WRD Permits Section
Mr. M. Rabbaig, DWSD
Mr. C. Hersey, SEMCOG
Mr. R. Hinshon, Hinshon Environmental Consulting

GREEN INFRASTRUCTURE PROGRAM PROGRESS REPORT

DETROIT WATER AND SEWERAGE DEPARTMENT

**PURSUANT TO REQUIREMENTS UNDER
DRAFT MODIFICATION
NPDES PERMIT NO.
MI0022802**

Prepared for:

Michigan Department of Environmental Quality

Prepared by:

Southeast Michigan Council of Governments (SEMCOG)

535 Griswold, Suite 300

Detroit, MI 48226

313-961-4266

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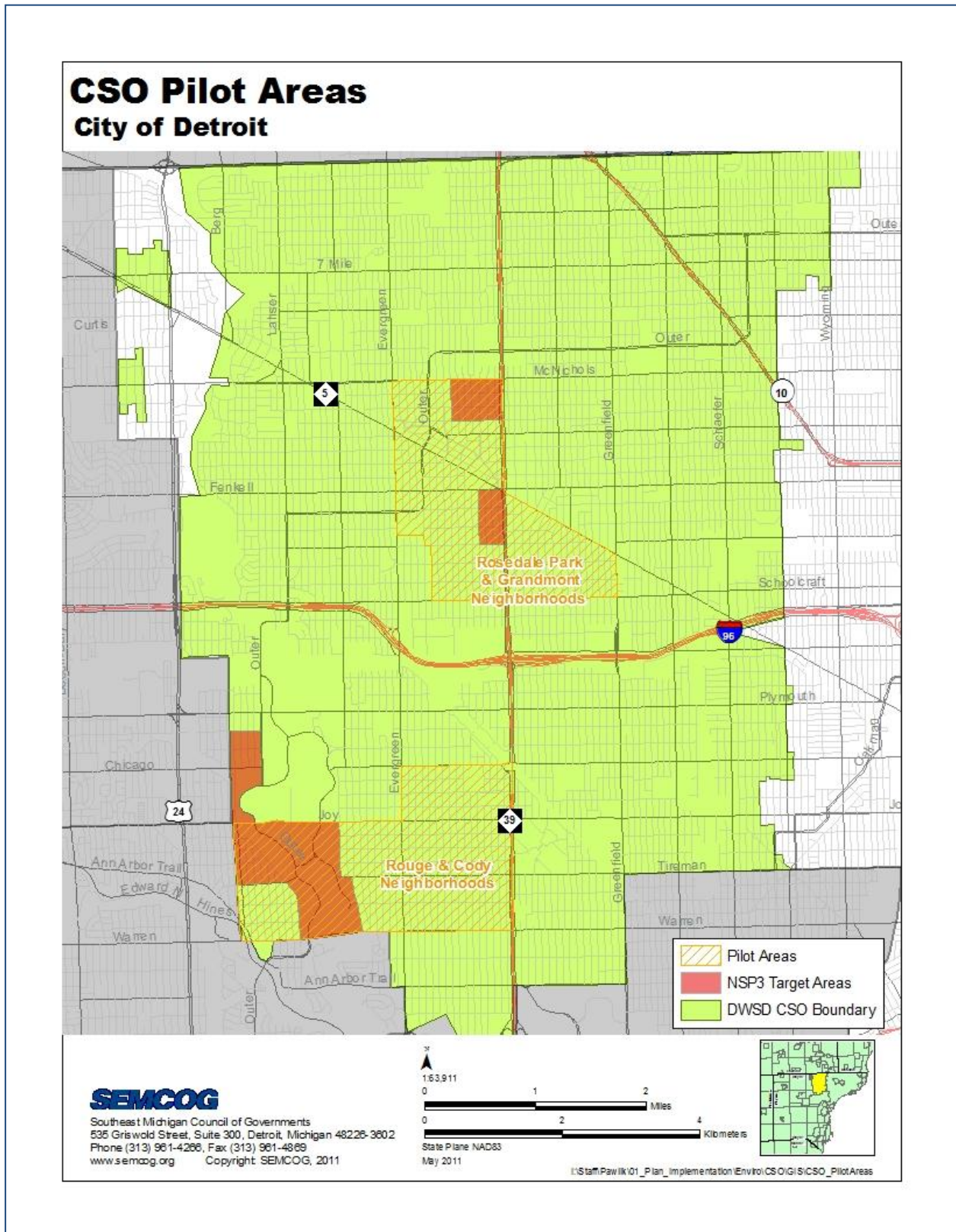
I. Green Infrastructure Program Overview.

DWSD's Alternative Rouge River CSO Control Program is designed to restore water quality and protect public health while staying within its financial means by controlling rate increases that will be needed to pay for new projects. The program encompasses a 25-year phased plan that focuses on Green Infrastructure solutions along with "right-sized" conventional CSO control facilities. The purpose of this report is to outline progress achieved on the Green Infrastructure Program.

Progress on the Green Infrastructure Program has included extensive discussions with City Departments responsible for either the identified techniques and/or the jurisdictional property areas. SEMCOG's 205j grant funding from the MDEQ is supporting these efforts by working to integrate and set up strategies with these departments that will support design and implementation of green infrastructure in the long-term, while identifying short-term implementation opportunities. Concurrent with these activities, the City of Detroit is also undertaking the city-wide Detroit Works Project, which is a process to create a collective vision for Detroit's future at the neighborhood, city and metropolitan scale. Results from this project are expected in late 2011 and will impact long-term decision making for green infrastructure implementation.

As planning efforts have progressed and have included meetings and coordination with City departments, not-for-profit organizations, potential developers and neighborhood groups, specific areas within the CSO drainage area were clearly identified for early implementation of the Green Infrastructure program during fiscal years 2010 – 2011 and 2011 – 2012. These primary pilot areas are commonly referred to as the Rosedale Park/Grandmont and the Rouge/Cody neighborhood areas. Together they encompass approximately 3,500 acres. See **Figure 1. Green Infrastructure Pilot Areas**. The detailed descriptions provide a summary of the ongoing efforts within each of the identified permit categories as well as an estimate of runoff reduction for those techniques implemented in the 2010-2011 fiscal year.

Figure 1. Green Infrastructure Pilot Areas.



II. Tree Planting.

Coordination with tree planting efforts across the CSO area includes the City of Detroit General Services Department and Greening of Detroit (<http://www.greeningofdetroit.com/>). City of Detroit General Services Department oversees tree planting across the city and Greening of Detroit implements tree planting activities. While initial green infrastructure implementation activities will occur within the two primary focus areas, two distinct categories of tree planting activities have been identified, including Street Trees and Urban Stormwater Forests. Street tree planting is implemented within the road right-of-way between the sidewalk and curb along city and county roads. Urban stormwater forests consist of more densely planting trees within a city park. Benefits of both types of planting activities are realized across many attributes for a city, including environmental (air & water), economic, safety & social.

Since early 2010, over 1,000 trees have been planted within the CSO tributary area. The following list identifies the types of trees that have already been planted within the CSO area:

- Red Maple;
- Swamp White Oak;
- London Planetree;
- American Elm;
- Hackberry;
- Red Oak;
- River Birch;
- Serviceberry;
- Sweet Gum;
- Kentucky Coffee Tree; and
- Winter King Hawthorn.

Trees were selected based on species biodiversity, appropriateness for Southeast Michigan urban areas and interception/infiltration/evapotranspiration potential. These trees were planted by Greening of Detroit who will also ensure two years of after planting care. Table 1. Tree Planting Stormwater Volume Reduction Benefits summarizes the stormwater-related benefits attributed to these trees as planted. On average the typical size as planted is 1.5 inches. These benefits were estimated using i-Tree (<http://www.itreetools.org/>) a program developed in conjunction with the US Forest Service. Its capabilities are unique in that it provides direct estimates of tree benefits by type, size and region.

Table 1. Tree Planting Stormwater Volume Reduction Benefits

	Total Number of Trees Planted	Interception (gallons per year)	Canopy Cover (square feet)
Street Trees	476	7,000	6,845
Stormwater Forest (Stoepel Park)	550	7,800	6,900
Total Benefits	1,026	14,800	13,745

Interception alone is a conservative estimate of stormwater benefits, but represents the degree to which canopy coverage positively impacts the environment. In addition, demonstrations have estimated that tree canopy typically intercepts the first 20 – 30% of rainfall. With an estimate of 25% interception for a typical 2-year; 24-hour event (2.25 inches) these trees, as planted, intercept approximately 5,800 gallons of rainfall from the 2.25 inch rain event. This rain event is consistent with that utilized in SEMCOG’s land cover analysis performed in 2009. Historic stormwater runoff calculation methodologies do not represent the benefits of specific trees by their respective size and species. It is for this reason that this alternative methodology employed by the US Forest Service is utilized to provide an indicator as to the amount of rainfall not reaching the CSO system. SEMCOG is currently research growth predictions for trees that estimate future environmental benefits of specific tree species given their annual growth rate. Obviously, as the tree canopy coverage increases, the stormwater runoff reduction and rainfall interception rates will increase.

III. Demolition and Greening Vacant Properties.

Working in conjunction with the Detroit’s Planning Department and Buildings and Safety, Engineering and Environment Department (B&SEED), demolitions will start with the City-owned residential units located outside of the Neighborhood Stabilization Area Number 1. This is approximately 6 homes located throughout the CSO tributary area.

After demolishing these initial city-owned structures, DWSD will work with B&SEED to include additional privately-owned residential units on the approved demolition list. We estimate 50-75 residential units in the 2011-2012 fiscal year beginning with those located in the pilot areas.

Greening of Detroit will be contracted to implement greening activities on vacant property following demolition activities. This will start with the 6-9 city-owned structures and move to city-owned vacant parcels (approximately 250 in the 2011 – 2012 Fiscal Year).

The importance of coordination across departments with demolitions is reflected in the fact that 655 demolitions have already taken place within the CSO tributary area. These demolitions were possible through the Neighborhood Stabilization Area funding from the US Department of Housing and Urban Development (HUD). Since funding was available for these areas, DWSD is focusing on areas where funding did not exist. Table 2. 2010 Demolitions Stormwater Runoff Estimated Benefits describes the estimated reduction of stormwater entering the CSO system. Similar to the analyses conducted in 2009 using the CITYgreen© methodology which follows the TR-55 curve number approach, an 18% reduction of stormwater runoff volume is initially anticipated during a typical 2-year, 24-hour event equivalent to approximately 2.25 inches of rainfall.

Table 2. 2010 Demolitions: Stormwater Runoff Estimated Benefits

	Pre-Demolition	Post-Demolition
Total Acreage of the 655 Demolitions (Acres)	74	74
Impervious Cover Estimate (Acres)	12	1
Composite Curve Number Across Parcels Encompassing the Demolitions	81	78
Stormwater Runoff Volume (Million Gallons)	1.54	1.27

As vegetation becomes denser following greening activities mentioned above, the corresponding curve number will decrease which will increase the long-term stormwater runoff reduction benefits.

IV. Downspout Disconnection

The program is currently under discussion with DWSD, Detroit Law Department, and B&SEED. It still being developed, but current plans call for this to be implemented as a homeowner disconnect program. Homeowners would be required to disconnect from the system (as required by state law). DWSD would host workshops on “how to” disconnect and offer free materials (e.g., downspout elbow, extender, and plug) to those in attendance. DWSD Public Affairs would also develop various “how to” educational pieces (e.g., web site, video, brochure). As currently envisioned, DWSD will work with B&SEED inspectors to clarify the acceptable methods for residential downspout disconnection, and to begin inspections in the pilot areas of the CSO tributary area.

V. Roadways and Parking Lots

Meetings are ongoing to discuss incorporating green infrastructure designs into future roadway projects and to identify short-term opportunities for green infrastructure implementation. The City of Detroit Department of Public Works has an annual process of selecting roads for resurfacing projects. After these projects are approved, the City develops standard specifications for the resurfacing projects. These specifications are submitted to MDOT who then contracts the work for completion. Integrating green infrastructure into this process in a manner in which DWSD may contract greening activities in coordination with road resurfacing projects is the focus for the coming year. In addition, coordinating design of green infrastructure into the reconstruction of any roads under the jurisdiction of Wayne County is also a focus.

VI. Municipal Properties

Municipal properties typically include DWSD-owned properties, fire stations, police stations and DPW facilities. The initial focus includes the two pilot areas previously mentioned and meetings are ongoing to identify potential green infrastructure opportunities at the DPW West Yard located at I-96 and Southfield Freeways. This DPW Yard covers approximately 25-acres of land area within the CSO tributary area and implementing greening opportunities can provide numerous short- and long-term benefits.

VII. Conclusions

Green infrastructure is typically designed to manage smaller rain events up to the 2-year; 24-hour event. The initial analysis conducted for the green infrastructure program utilized the CITYgreen© TR-55 Curve Number Methodology with the 2-year; 24-hour event (2.25 inches)¹. Given the basis of that analysis, the combined 2010 activities consisting of 655 demolitions and 1,026 trees a combined reduction of stormwater entering the CSO system is estimated at 276,000 gallons. As previously mentioned, as the vegetation is modified through greening techniques on the demolition properties and as the trees increase in size, the stormwater runoff reduction benefit will increase.

¹ As DWSD advances its green infrastructure program, every effort will be made to refine such predicted benefits through emerging, yet tested, hydrologic and hydraulic modeling tools and methodologies to better correlate with emerging upgrades of DWSD's Greater Detroit Regional Sewer System (GDRSS) Hydraulic Model.