LOW IMPACT DEVELOPMENT IN THE TWIN CITIES, MINNESOTA

Jay Riggs, District Manager
Washington Conservation District
Oakdale, Minnesota
Minnesota

Land of 10,000 Lakes and . . .
Land of 3,638 Impaired Waters

Inventory of All Impaired Streams for which assessments have been done
January 6, 2009

Inventory of All Impaired Lakes and Wetlands for which assessments have been done
January 6, 2009

Legend:
- TMDL needed for one or more pollutants
- Basin
- All required TMDLs have been approved or impairment is caused by natural sources
- County
- All required TMDLs have been approved or impairment is caused by natural sources
- At least one approved TMDL, still needs additional TMDL approval(s)
- TMDL needed for one or more pollutants
Twin Cities: Confluence of Three Major Rivers

Mississippi River
Minnesota River
St. Croix River
Minneapolis

Noteworthy MN LID Efforts:
- MIDS and LID Standards
- Prioritization
- Retrofits
- New Technologies

Note: WCD is much further away from Canada than Snohomish CD!
Low-impact development

From Wikipedia, the free encyclopedia
(Redirected from Low impact development)

Low-impact development (LID) may refer to:

- **Low-impact development (Canada/US)**, the term is used in Canada and the United States to describe a land planning and engineering design approach to managing stormwater runoff.
- **Low-impact development (UK)**, the term is used in the UK for a type of development which through its low negative environmental impact either enhances or does not significantly diminish environmental quality.

This disambiguation page lists articles associated with the same title.
If an internal link led you here, you may wish to change the link to point directly to the intended article.

Categories: Disambiguation pages
lid  (lid)

1. A removable or hinged cover for a hollow receptacle or box.
2. An eyelid.
3. **Biology.** A flaplike covering, such as an operculum.
4. A curb, restraint, or limit: approved a new lid on corporate spending.
5. **Informal.** An act of concealment; a cover: “Put a lid on it!”
6. **Slang.** A hat.
7. **Slang.** An ounce of a certain noxious weed.
Low-Impact Development: An Integrated Environmental Design Approach

“Match Predevelopment Curve Number”

This requirement is identical to the State of Maryland’s definition of the predevelopment condition. The CN for the predevelopment condition is to be determined based on the land cover being woods in good condition and the existing HSG. The design storm is to be the greater of the rainfall at which direct runoff begins from a woods in good condition, with a modifying factor, or the 1-year 24-hour storm event. The rainfall at which direct runoff begins is determined using Equation A.9. The initial rainfall amount at which direct runoff begins from a woodland is modified by multiplying this amount by a factor of 1.5 to account for the slower runoff release rate under the wooded predevelopment condition.

\[
P = 0.2 \times \left( \frac{1000}{CN_c} - 10 \right)
\]

Eq. A.9

where P is rainfall at which direct runoff begins.
New State Legislation

(c) The agency shall develop performance standards, design standards, or other tools to enable and promote the implementation of low-impact development and other stormwater management techniques. For the purposes of this section, "low-impact development" means an approach to storm water management that mimics a site's natural hydrology as the landscape is developed. Using the low-impact development approach, storm water is managed on-site and the rate and volume of predevelopment storm water reaching receiving waters is unchanged. The calculation of predevelopment hydrology is based on native soil and vegetation.

•Minnesota Statutes 2009, section 115.03, subdivision 5c
Minimal Impact Design Standards

Ordinance Package

Performance Goal

Calculation Methodologies for a Menu of Techniques
Minimal Impact Design Standards

- New development
- Redevelopment
- Linear Projects
- Flexible Treatment options — when a site just cannot meet the goal.

Performance Goal
New development
For new, nonlinear developments that create more than one acre of new impervious surface on sites without restrictions, stormwater runoff volumes will be controlled and the post-construction runoff volume shall be retained on site for 1.1 inches of runoff from impervious surfaces statewide.
Minimal Impact Design Standards

Redevelopment
Nonlinear redevelopment projects on sites without restrictions that create one or more acres of new and/or fully reconstructed impervious surfaces shall capture and retain on site 1.1 inches of runoff from the new and/or fully reconstructed impervious surfaces.

Definition: Any development that is not considered new development.
**Minimal Impact Design Standards**

**Linear Projects**
Linear projects on sites without restrictions that create one acre or greater of new and/or fully reconstructed impervious surface, shall capture and retain the larger of the following:

- 0.55 inches of runoff from the new and fully reconstructed impervious surfaces
- 1.1 inches of runoff from the net increase in impervious area

Mill and overlay and other resurfacing activities are not considered fully reconstructed.

*Definition:* Construction or reconstruction of roads, trails, sidewalks, and rail lines that are not part of a common plan of development or sale.
When site restrictions exist: Tight clay soils, shallow bedrock, or Karst topography, soil contamination, existing building or utility conflicts, or other site constraints such as zoning requirements.

Option #1 = 0.55” Volume control + 75% annual TP + evidence

Option #2 = Maximum possible volume control + 60% annual TP + evidence

Option #3 = Off-site mitigation through banking or another project
Minimal Impact Design Standards

Calculation Methodologies for a Menu of Techniques
Minimal Impact Design Standards

The Community Assistance Package (CAP) provides ordinances and policies that integrate the MIDS performance goal, calculator, and overall LID principles.

Help cities comply with federal regulations and requirements under Total Maximum Daily Load (TMDL), Municipal Separate Storm Sewer System (MS4), Anti-Degradation, and Outstanding Resource Value Waters (ORVW) programs.
Subwatershed Stormwater Retrofit Analysis
Prioritization Approaches

Subwatershed Assessments

Water Quality Model, Field Work, and Cost-Benefit Analysis
COMPLETED URBAN SWAs

Plus Carver Initiated
<table>
<thead>
<tr>
<th>Catchment</th>
<th>Retrofit Description (refer to catchment profiles for additional detail)</th>
<th>Projects Identified</th>
<th>TP Reduction (lb/yr)</th>
<th>TS Reduction (lb/yr)</th>
<th>Volume Reduction (ac-ft/yr)</th>
<th>Estimated Installation Cost</th>
<th>Estimated Life Cycle Cost (30-yr)*</th>
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<tbody>
<tr>
<td>DEM-1-3</td>
<td>Impervious Area Disconnect</td>
<td>1</td>
<td>3.6</td>
<td>1310</td>
<td>2.13</td>
<td>$5,000</td>
<td>$100</td>
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<td>DEM-1-4</td>
<td>Boulevard Bioretention</td>
<td>2</td>
<td>1.7</td>
<td>595</td>
<td>0.83</td>
<td>$12,100</td>
<td>$468</td>
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<tr>
<td>DEM-2</td>
<td>Bioswale (WQ)</td>
<td>1-2</td>
<td>4.4</td>
<td>1450</td>
<td>0.32</td>
<td>$24,350</td>
<td>$523</td>
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<td>DEM-3</td>
<td>Boulevard Raingardens</td>
<td>5</td>
<td>1.9</td>
<td>850</td>
<td>1.17</td>
<td>$18,830</td>
<td>$824</td>
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<tr>
<td>DEM-3**</td>
<td>Boulevard Raingardens</td>
<td>7</td>
<td>2.5</td>
<td>1130</td>
<td>2.27</td>
<td>$25,180</td>
<td>$861</td>
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<td>3.4</td>
<td>1490</td>
<td>2.99</td>
<td>$34,580</td>
<td>$904</td>
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<td>270</td>
<td>0.56</td>
<td>$9,100</td>
<td>$980</td>
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*The first projects that need to be addressed, that will likely return highly-competitive value, are two projects not quantified within this table: an extensive stream bank restoration repair and a gulley stabilization. Please see the Catchment Profile for DEM-1, North for guidance on this.

**These options can’t be summed with other options within the same catchment; doing so would cause double-counting of treatment estimates.
PROJECT LOCATION MAP
Residents within the red shaded area on the map below, are eligible to get a FREE raingarden!
Not sure if you qualify? Call us!

FREE RAINGARDENS
For select LILY LAKE residents
— Fall 2012 GROUND-BREAKING

What Happens When It Rains?
In your neighborhood, rain that runs off of rooftops, driveways and streets goes into storm sewers that flow directly into Lily Lake without getting cleaned. Water from Lily Lake eventually goes to the St. Croix River.

Rain runoff can wash oils, fertilizers, pesticides, and dirt straight into Lily Lake.

A raingarden in your yard will soak runoff into the ground before the water can carry these pollutants down the road and into Lily Lake.

FOR MORE INFORMATION
or to SIGN UP FOR A FREE RAINGARDEN:

Contact: Amy Carolan
MSCWMO Administrator
amy.carolan@mnwcd.org
651-275-1136 x 22

Contact: Angie Hong
Water Resource Education Specialist
angie.hong@mnwcd.org
651-275-1136 x 35

Washington Conservation District
1380 W. Frontage Road, Hwy 36
Stillwater, MN 55082
651-275-1136
About the Funds

Legacy Funds
In 2008, Minnesota’s voters passed the Clean Water, Land and Legacy Amendment (Legacy Amendment) to the Minnesota Constitution to: protect drinking water sources; to protect, enhance, and restore wetlands, prairies, forests, and fish, game, and wildlife habitat; to preserve arts and cultural heritage; to support parks and trails; and to protect, enhance, and restore lakes, rivers, streams, and groundwater.

The Legacy Amendment increases the state sales tax by three-eighths of one percent beginning on July 1, 2009 and continuing until 2034. The additional sales tax revenue is distributed into four funds as follows: 33 percent to the clean water fund; 33 percent to the outdoor heritage fund; 19.75 percent to the arts and cultural heritage fund; and 14.25 percent to the parks and trails fund.

Environment and Natural Resources Trust Fund
In 1988, Minnesota’s voters approved a constitutional amendment establishing the Environment and Natural Resources Trust Fund.
LID Installation Funding

2013 Clean Water Fund
Clean Water Assistance
Total Metro Funding: $4,109,109
Total Statewide Funding: $10,700,007

2013 Clean Water Fund
Community Partners
Total Funding: $1,400,000
LID Installation Funding

Lily Lake Stormwater Retrofit

Project Narrative

Lily Lake, in Stillwater, is a popular recreational spot for residents with its swimming beach, fishing pier, and canoe/boat access. Lily Lake is impaired by excess nutrients, and restoring its water quality is a priority for the community. A recent assessment of the 22 catchments, or 590 acres, that drain to Lily Lake identified multiple locations where stormwater management features could be installed to help achieve the 145-pound phosphorus load reduction that is needed to help improve water quality.

The purpose of this project was to work with residents in two of the 22 catchments, located on the northeast side of Lily Lake. The MSCWMO kicked off the project by sending colorful flyers to all residents living within the two priority catchments. The flyer invited residents to an open house where they were educated about the current state of Lily Lake and what could and was being done to improve water quality. Of the forty residents who signed up to work with the MSCWMO to install stormwater treatment features on their property, the top 15 locations were selected based on the sites ability to capture pollutants prior to reaching Lily Lake. The 15 selected residents worked with the MSCWMO to design their stormwater treatment feature and agreed to maintain the feature for up to ten years.

Actual Outcomes

A total of 15 raingardens resulting in 3000 square feet of treatment facilities were installed in the two target catchments as part of this project. According to as-built modeling information, the project resulted in the expected 9.5 lb/yr TP reduction.
LI D Installation Funding

Lily Lake Phase I
LI D Installation Funding

Lily Lake Phase I
LID Installation Funding

Green Churches
191 Practices Installed in 2012
Research: Constructed Filter Systems
“Minnesota Filter” (sand with 5% iron filings, Maplewood, MN)
Filter Trenches around wet detention ponds (Prior Lake, MN)
Filter Trenches around wet detention ponds (Prior Lake, MN)

- Volume Treated by Trenches (Filter Volume)
- Normal Water Surface Elevation
- Minnesota Filter
- Overflow Grate
- Water Level Control Weir
- Drain tile

St. Anthony Falls Laboratory
UNIVERSITY OF MINNESOTA

http://stormwater.safl.umn.edu/
http://www.cityofpriorlake.com/WaterResources.shtml
2013 INTERNATIONAL LOW IMPACT DEVELOPMENT SYMPOSIUM

August 18-21, 2013
Saint Paul RiverCentre, Saint Paul Minnesota

• Online registration is now available.

~ Update ~

View a PDF copy of the Program at a Glance. (updated 6-28-13)

View a PDF copy of the Draft Program. (updated 5-23-13)

The 2013 International Low Impact Development (LID) Symposium is being hosted in the Midwestern United States through a collaborative effort between many states, universities, and organizations. From the Great Lakes to the Mississippi Watershed, every state in the Midwestern United States is addressing urban water quality issues from combined sewer overflows to stormwater runoff. The 2013 International LID Symposium will bring together over 1,000 professionals to share their research, implementation, policy, financing, and education strategies to build and restore cities while protecting our environment.

Featured Plenary and Luncheon Speakers

Welcome to Minnesota
John Linc Stine, Commissioner, Minnesota Pollution Control Agency

Low Impact Development: Retooling Communities for the 21st Century
Avi Friedman, Ph.D., Professor of Architecture and Director, Affordable Homes Lab, University of Michigan Planning Program

REGISTRATION & CONFERENCE QUESTIONS
Heather Dorr or Nicole Freese
College of Continuing Education, University of Minnesota
612-624-3708
cceconf5@umn.edu

IMPORTANT DEADLINES
6/15/13 - Presenter Registration Deadline (to be added)
6/28/13 - Early Registration Deadline (to be added)
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