



GAIL FARBER, Director

COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

"To Enrich Lives Through Effective and Caring Service"

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February 2, 2011

IN REPLY PLEASE

REFER TO FILE:

**B-0
A3533**

TO: Each Supervisor

FROM: Gail Farber *Gail Farber*
Director of Public Works

BOARD MOTION OF JANUARY 11, 2011, AGENDA ITEM NO. 31-A USE OF ROOFTOP CATCHMENT SYSTEMS

On January 11, 2011, your Board approved a motion by Mayor Michael D. Antonovich, copy attached, instructing the Directors of Regional Planning and Public Works to report back on the use of rooftop catchment systems as a method of collecting stormwater for reuse and reducing potential pollutants from entering the storm drain systems (items 1-4).

The motion was amended by Supervisor Zev Yaroslavsky to also instruct the Director of Public Works to report back on the progress made in incorporating Low Impact Development (LID) principles into the Department's Road and Flood Design and Maintenance Manuals as well as how these standards compare to those private property LID standards adopted by your Board in November 2008 (item 5). Public Works' response to Supervisor Yaroslavsky's amendment will be provided in a separate report.

1. Findings on the current regulations and incentives for the installation of rooftop runoff catchment systems for residential and commercial buildings in the unincorporated areas of Los Angeles County.

Rooftop catchment systems utilize storage devices such as cisterns or rain barrels to harvest rainwater runoff from residential and commercial buildings in an effort to supplement water supplies and reduce pollutants from entering the storm drain system.

On November 18, 2008, your Board approved the LID ordinance which took effect on January 1, 2009. LID is an approach to stormwater management that strives to protect water quality and mimic preconstruction runoff by reducing impervious area and infiltrating or capturing rainwater whenever possible. LID builds on conventional design strategies using landscape and hardscape areas in a development to perform beneficial hydrologic functions such as retaining, detaining, storing, or filtering stormwater.

LID standards are applicable to new developments and projects which result in the alteration of 50 percent or more of the impervious surfaces of an existing developed site within the unincorporated areas of the County. Developers and homeowners can select from a variety of LID strategies that best suit their project scope and specific site conditions. LID features to promote infiltration include porous pavement, dry wells, and rain gardens while methods of rainwater harvesting utilize cisterns or rain barrels to capture rainwater for later use as outdoor irrigation.

Site specific variables such as groundwater elevation and soil permeability may make infiltration difficult. In these instances, compliance with the LID regulations requires a developer or homeowner to install a system of rainwater harvesting. Although there are no direct financial incentives for the installation of such a system in the unincorporated County, compliance with the County's LID regulations is a prerequisite to issuance of a building permit. However, a property owner using such a system for part of their irrigation needs in lieu of potable water may realize some savings on their water bill during the rainy season.

Our research indicates some other local jurisdictions in Los Angeles County offer limited rebate programs. For example, the City of Los Angeles offers complimentary installation of a rain barrel for residents within designated watersheds. The pilot program, which is funded by the Safe Neighborhood Parks, Clean Water, Clean Air and Coastal Protection Bond Act of 2000, began in July 2009 and has a maximum of 600 available spots and over 3,000 applications. They are no longer accepting applications. The City of Los Angeles anticipates capturing approximately 600,000 gallons (2 acre-feet) annually. The City of Santa Monica offers a tiered rebate program funded by Measure V, a property tax for watershed management projects. The City of Santa Monica's rebate program ends June 30, 2011. Residents installing rain barrels (up to 199 gallon capacity) may be eligible for \$100 per rain barrel with a limit of eight rebates per property. Small cisterns (200 to 499 gallons) are eligible for \$250 per cistern with a limit of four rebates per property. Large cisterns (500 gallons or more) are eligible for \$500 per cistern with a limit of two rebates per property.

2. How rooftop runoff catchment systems can supplement LEED project certification.

Rooftop runoff catchment systems can be used to achieve points in the LEED scoring system. A properly designed and constructed rooftop catchment system can be used to control stormwater runoff rate and quality. Projects can also earn points by reducing potable water usage for outdoor irrigation. Rainwater captured from roof runoff can be used to supplement landscape irrigation needs thereby reducing potable water usage.

3. Progress of the County's Low Impact Development (LID) plan and success stories.

The County began requiring LID on new construction projects applied for after January 1, 2009. Initially, there were concerns that the LID requirements were cost prohibitive and incompatible with proposed development projects. However, these concerns have reduced as developers and design professionals have increased their understanding and experience with LID Best Management Practices (BMPs).

Small residential projects have successfully incorporated the required prescriptive LID features into the site design. One of the most popular choices is the use of rain gardens and landscaped areas where runoff from roofs, driveways, and other impervious surfaces are directed and infiltrated into the ground. This helps to sustain a wide variety of landscaping and promotes groundwater recharge.

Commercial and residential tract developments are required to mitigate the increased stormwater runoff generated by development. Residential tract developments typically use a combination of small site LID BMPs such as rain gardens and down spout routing in conjunction with large scale subregional LID BMPs such as retention basins and bio-swales. Commercial properties typically achieve compliance using underground infiltration systems designed and located under parking areas.

The County's recently completed Acton Library is an example of a successful approach to LID compliance. All stormwater runoff (including the roof) is directed to the pervious parking area. Beneath the parking area a detention basin is used to store and infiltrate the stormwater. This design reduces stormwater runoff, improves water quality, and replenishes groundwater.

There are also several examples of successful LID design on private development. The first example is a small subdivision able to infiltrate stormwater on the project site using a combination of porous pavement (parking lot), landscaping, and a retention basin that collects the flow from the driveway. A second larger subdivision incorporates LID features at both the lot and subregional level. The developer uses bioretention (local depressions in traffic calming roundabouts), bio-swales (running alongside private driveways), and rain gardens and pervious pavement (at the lot level) to satisfy the LID requirements and mitigate hydromodification impacts. Finally, a large scale commercial solar facility in Antelope Valley is able to design a series of retention basins to capture and infiltrate stormwater.

4. What percentage of the Los Angeles River's stormwater runoff is recycled and how can it be increased.

Over the past 10 years, the Los Angeles River Watershed has received an average of 280,000 acre-feet of stormwater runoff. On average, approximately 30,000 acre-feet of stormwater is conserved annually, which is approximately 12 percent. This percentage will be increased as the Los Angeles County Flood Control District (LACFCD) collaborates with other agencies to increase stormwater capture for groundwater recharge in Los Angeles. As more and more properties implement LID practices primarily for water quality benefits, there will also be a secondary groundwater recharge benefit. There are a number of projects and groundwater recharge studies that the LACFCD has completed or is in the process of developing that will increase stormwater capture within the Los Angeles River Watershed. Collectively, these projects (shown in Attachment 1) could increase stormwater capture by an additional 30,000 acre-feet annually, bringing total conservation to 24 percent.

If you have any questions, please contact Raj Patel of our Building & Safety Division at (626) 458-6385.

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Attach.

cc: Chief Executive Officer (Rita Robinson)
Executive Office
Department of Regional Planning (Richard J. Bruckner)

ATTACHMENT 1 GROUNDWATER RECHARGE PROJECTS AND STUDIES

In the Los Angeles River Watershed, the LACFCD joined forces with the City of Los Angeles Department of Water and Power (DWP) to develop the Tujunga Wash Watershed Groundwater Recharge Master Plan. The study identifies potential projects, environmental concerns, costs, and benefits. The study is expected to be complete in spring 2011. The LACFCD and the DWP are currently seeking appropriations from Congress for the update of the 1999 U.S. Army Corps of Engineers (Corps) Los Angeles County Drainage Area (LACDA) Water Conservation and Supply Hansen Dam Feasibility Study. The study identifies projects at Hansen Dam that could increase water conservation by 1,700 to 3,400 acre-feet annually.

The LACFCD and the Water Replenishment District of Southern California (WRD) are continuing to seek appropriations from Congress for the update of the Corps' LACDA Water Conservation and Supply Whittier Narrows Feasibility Study. The study identifies projects that will increase water conservation at Whittier Narrows Dam and Reservoir an additional 2,900 to 5,500 acre-feet.

The current project underway to retrofit Big Tujunga Dam to address the seismic stability of the dam will also increase the amount of stormwater that can be held for groundwater recharge. Once the project is complete (summer 2011), the Big Tujunga Dam Seismic Retrofit Project will provide on average an additional 4,500 acre-foot annual water conservation benefit.

A major expansion at Hansen Spreading Grounds was recently completed. The storage capacity of the facility increased from 300 acre-feet to 1,200 acre-feet and the average annual water conservation will be increased by 1,400 acre-feet.

The Tujunga Spreading Grounds are owned by DWP, but operated by the LACFCD. DWP entered into an agreement with LACFCD to retrofit the Tujunga Spreading Grounds. The project will increase the average annual water conservation of the facility by 4,200 acre-feet. Construction is scheduled to start in summer 2012.

The Pacoima Spreading Grounds improvement concept to increase storage capacity will be complete in early 2011. Construction would be scheduled for 2013. The average annual water conservation benefit is estimated to be 1,200 acre-feet. A water conservation concept for Lopez Spreading Basin has also been identified, which will conserve an additional 500 acre-feet annually. This concept should be done in 2012.

The Pacoima Reservoir postfire sediment removal is scheduled to start in January 2012 to remove 3 million cubic yards of sediment behind the dam due to the Station Fire and subsequent storms. Removing the material will restore over 1,500 acre-feet of water conservation benefit annually. Big Tujunga Dam is scheduled to have the sediment removed in 2012 and will also restore over 1,500 acre-feet of water conservation benefit due to lost storage from debris deposition from the Station Fire.

The Devil's Gate Dam Water Conservation Project is being developed to reestablish the ability to store stormwater for groundwater recharge at the facility. The project relies on Devil's Gate Reservoir to maintain its storage capacity, which currently is compromised by debris deposition during rain events as a result of the Station Fire. Restoring the capacity of the reservoir will allow the recharge of an additional 4,500 acre-feet of stormwater on average annually. The Devil's Gate Dam postfire sediment removal project is scheduled to start in fall 2011.

The Eaton Wash Spreading Grounds Improvement Project will be complete in early 2011 and will on average add an additional 300 acre-feet of water conservation benefit annually. Santa Anita Spreading Grounds Headworks Project is in development and expected to save an additional 120 acre-feet annually. The Peck Spreading Basin Pump Station Project is also currently in development and expected to save 1,000 acre-feet on average annually.

A pump station and pipeline is currently under construction to deliver recycled water from San Gabriel Coastal Basin Spreading Grounds to Rio Hondo Coastal Basin Spreading Grounds. The pipeline will also have the ability to deliver stormwater from the Rio Hondo Channel to be recharged at the San Gabriel Coastal Basin Spreading Grounds. The project will conserve on average an additional 5,600 acre-feet of storm and recycled water annually and will be complete in March 2011.

The Sun Valley Park Drain and Infiltration System was constructed in 2006. The project relieves flooding by capturing stormwater runoff and recharging groundwater. In the 2010-11 storm season, the project collected and recharged 162 acre-feet of stormwater.

The Strathern Wetlands Park Project is currently under design for construction on a 46 acre property, which was recently acquired by the LACFCD. The site is situated in the Sun Valley Watershed, which has been prone to major flooding. The project will relieve flooding by capturing stormwater in detention ponds, treating it through constructed wetlands, and recharging groundwater. It is estimated that the project will recharge approximately 900 acre-feet of stormwater on an annual basis.

The LACFCD and the WRD are also working together to remove sediments in the Dominguez Gap Spreading Grounds. The project will expose more favorable soils for groundwater recharge and is expected to triple the percolation rate of the facility. The project should be complete in 2012.



GAIL FARBER, Director

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February 2, 2011

IN REPLY PLEASE
REFER TO FILE: **WM-7**
A3537

TO: Each Supervisor

FROM: Gail Farber *Gail Farber*
Director of Public Works

BOARD MOTION OF JANUARY 11, 2011, AGENDA ITEM NO. 31-A INCORPORATING LOW-IMPACT DEVELOPMENT PRINCIPLES INTO THE ROAD AND FLOOD DESIGN AND MAINTENANCE MANUALS

On January 11, 2011, your Board approved a motion by Mayor Michael D. Antonovich, copy attached, instructing the Directors of Regional Planning and Public Works to report back on the use of rooftop catchment systems as a method of collecting stormwater for reuse and reducing potential pollutants from entering the storm drain systems (Items 1-4).

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5. Progress made in incorporating LID principles into the Department's Road and Flood Design and Maintenance Manuals as well as how these standards compare to those private property LID standards adopted by your Board in November 2008.

I am pleased to report that the Department of Public Works (Public Works) has drafted the Green Infrastructure Guidelines (Guidelines), which establish a goal of mitigating 30 percent of the runoff generated from a 3/4-inch storm event. These Guidelines apply to new construction and reconstruction of road and flood projects. The Guidelines identify design parameters and maintenance considerations for several potential LID applications, such as porous pavements, vegetated swales, bioretention areas, filter strips, and stormwater storage areas. In addition, the Guidelines provide examples of desirable sustainable practices that can be

considered for Public Works projects, such as pavement recycling, composting, and drought-tolerant landscaping.

The Guidelines are to be used in planning or designing road and flood infrastructure projects. Department approval of the Guidelines is expected by March 2011. However, Public Works has already proactively begun to integrate LID features in projects. Some examples are:

- Stormwater infiltration basins as part of the Sun Valley Park Project (completed);
- LID adaptation of Tujunga Wash (some completed and additional construction to begin 2011);
- Bioswales along Los Angeles River Headwater in Canoga Park (scheduled for construction in 2012);
- Stormwater infiltration at Strathern Pit in Sun Valley (scheduled for construction in 2014);
- Bioswales along Rosemead Boulevard and Avocado Heights (scheduled for completion in November 2011 and early 2013, respectively);
- Bioretention basins along Paramount Boulevard (completed);
- Median infiltration in Tyler Avenue (completed);
- Permeable shoulders along Covina Hills Road and Sacramento Street (completed); and
- Several other landscaping projects that include bioswales and other LID features alongside road projects.

The County LID Ordinance requires that developers of commercial properties and residential properties of five or more units infiltrate or store 100 percent of the excess runoff that would normally be treated for water-quality purposes resulting from the development. Residential developments consisting of four or fewer units were required to implement two LID Best Management Practice alternatives found in Public Works LID Standards Manual.

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The Guidelines seek to reduce runoff from road and flood infrastructure projects similarly to the County LID Ordinance for commercial and residential properties of five or more units. However, options for implementing LID features on development projects are greater than those for infrastructure projects alone primarily because County road and flood projects typically have limited right of way to use for the purposes of infiltration or storage. Therefore, in some cases County projects capture less runoff than private development. Road projects, in particular, often have only the median and parkway to utilize for LID purposes. County projects and private developments alike may encounter other technically infeasible situations, such as high groundwater and clay soils, in which case infiltration is not desirable.

If you have any questions, please contact me or your staff may contact Gary Hildebrand at (626) 458-4300 or ghildeb@dpw.lacounty.gov.

BH:sw

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Attach.

cc: Chief Executive Office (Rita Robinson)
County Counsel
Executive Office
Regional Planning