

Los Angeles  Department of Water & Power

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June 1, 2015

The Honorable City Council
c/o Office of the City Clerk
Room 395, City Hall
Mail Stop 160

Attention: Councilmember Felipe Fuentes
Chairperson, Energy & Environment Committee

Councilmember Jose Huizar
Chairperson, Planning and Land Use Management

Honorable Members:

Subject: Council File No. 14-1291 (Motion) – Graywater

This report was prepared in response to the Motion made by Councilmember Paul Koretz on September 23, 2014, requesting the Los Angeles Department of Water and Power (LADWP) report on existing Graywater studies and incentive programs, and recommendations to promote Graywater in the City of Los Angeles (City). The Motion further instructs the Los Angeles Department of Building and Safety (LADBS), with the assistance of the Los Angeles Department's City Planning, and Public Works Bureau of Sanitation, to evaluate amending the Low Impact Development (LID) Ordinance (Ordinance No. 181899) to require new single-family and low-density multi-family buildings to include Graywater stub outs.

Background

Graywater means untreated wastewater that has not been contaminated by any toilet waste or unhealthy bodily waste. Graywater includes, but is not limited to wastewater from bathtubs, showers, bathroom washbasins, clothes washing machines, and laundry tubs, and does not include wastewater from kitchen sinks or dishwashers.

Los Angeles Aqueduct Centennial Celebrating 100 Years of Water 1913-2013

111 N. Hope Street, Los Angeles, California 90012-2607 Mailing address: Box 51111, Los Angeles, CA 90051-5700
Telephone: (213) 367-4211 www.LADWP.com

Graywater systems that measurably offset potable uses of water can play a role in achieving the City's goal of increasing water use efficiency and improving the City's sustainability and resilience to dry conditions as well as statewide and regional water shortages. The City encourages water conservation and promotes water efficiency through numerous incentive and rebate programs. Through its Technical Assistance Program, the City provides up to \$250,000 for Graywater systems with verifiable water savings to commercial businesses. To promote residential customer adoption of Laundry-to-Landscape Graywater systems, the City has eliminated plan and permit requirements for Graywater systems installed in a one or two-family dwelling, provided the Laundry-to-Landscape system is installed in accordance with the requirements of the California Plumbing Code.

The installation of Graywater systems, other than a Laundry-to-Landscape system, requires plan approval from the Los Angeles County Department of Public Health (LACDPH) and approved plans and a plumbing permit from LADBS. The California Plumbing Code (Code) allows the collection and reuse of Graywater in residential and non-residential buildings that is generated on-site for various uses. The Code allows treated Graywater to be used for additional beneficial uses including toilet and urinal flushing. The Code includes adopted standards for treatment, and defines varying requirements depending on the size, capacity, and complexity of a Graywater system.

Actively managed Graywater systems that are used properly can save water, but they can just as easily be turned off and save no water. Similar to other plumbing systems, Graywater systems represent a potential health risk if installed improperly and/or are not maintained. Graywater systems that have potable water connection also have the potential of creating a cross-connection that could contaminate the drinking water system. However, if installed properly this issue is addressed in the Code requirements, LADWP Backflow Prevention Guidelines, and the approval process by LADBS and LACDPH.

Amending the City's LID Ordinance to require new single-family and low-density multi-family buildings to include Graywater stub outs is not deemed as the appropriate section of the Code to amend and is not recommended. The Green Building Code requirements under the purview of LADBS is deemed a more appropriate section of the code to amend and is recommended for incorporation of proposed Graywater requirements as part of new private developments, similar to those of the solar energy requirements. The City's LID Ordinance is part of Chapter VI Article 4.4 of the Los Angeles Municipal Code, titled "Stormwater and Urban Runoff Pollution Control," and applies to all dischargers located within the City that discharge stormwater or non-stormwater into any storm drain system or receiving waters.

Existing Graywater Studies

A number of studies have been conducted to assess the feasibility of Graywater systems. Following is a list of studies from various cities as well as a white paper and technical memorandum on Graywater regulations. Findings from these studies suggest that Graywater systems are costly, have strict maintenance requirements, and require a relatively complicated permitting process. Additionally, the findings indicate that the potential for Graywater use is not fully achievable because not all available sources of Graywater are typically used by homeowners. The studies suggest that the demonstrated water savings can be contradictory, one study found a decrease in water consumption while another actually saw an increase in water usage. Finally, the studies do not fully investigate whether water savings are only attributed to the use of Graywater systems or also include water savings from other conservation measures. Therefore water savings related to Graywater systems, according to the studies, was inconclusive.

Graywater Pilot Project – City of Los Angeles, 1992

<http://agwaterstewards.org/images/uploads/docs/LA%20Graywater%20Pilot%20Project.pdf>

Description: The City of Los Angeles Office of Water Reclamation conducted a pilot project on Graywater with objectives to gain quantitative data on the practical use of Graywater systems, and to make recommendations to the City Council for the safe use of Graywater in the City based on the results. The pilot project consisted of eight Graywater systems installed at residences in the City, sampled monthly, and monitored over a year-long period for safety and water savings.

Findings: Results showed the maximized water savings potential of a Graywater system to an individual home can be up to 50 percent of water use. However, due to maintenance requirements, complications with permitting, and costs associated with Graywater systems, it is highly unlikely that a large enough number of people will actually install these systems. Therefore, it was concluded that Graywater cannot be expected to play a significant role in the community's water supply reliability.

“Laundry to Landscape” Graywater Pilot Program Report – City of Long Beach, 2012

<https://drive.google.com/file/d/0B7oxNOGXk8x3YWR1ejBIREJybm8/view?usp=sharing>

Description: The City of Long Beach implemented a pilot program for 33 households to conserve resources by installing Graywater systems to irrigate trees, shrubs, and gardens from their washing machines. The intended benefits included reduced consumption of potable water, reduced load on sewage infrastructure, and replenishment of natural groundwater resources. The Office of Sustainability conducted follow-up evaluations for each pilot study participant by visiting the installation site, performing a test of the system, interviewing the participant, and examining the state of the landscape irrigated by the Graywater.

Findings: Participants were highly satisfied with their Graywater systems and an overwhelming majority of the systems were in perfect working order. Nevertheless, the water usage for households with Graywater systems does not appear to have decreased. On average, the 33 households used 0.94 more billing units of water per month than they did before installation. This finding runs counter to the expected result of water savings due to Graywater system installations.

Residential Graywater Irrigation Systems in California: An Evaluation of Soil and Water Quality, User Satisfaction, and Installation Costs – City of Santa Rosa, 2012

<http://Graywateraction.org/content/Graywater-study-0>

Description: Graywater Action, in collaboration with the City of Santa Rosa and Ecology Action of Santa Cruz, conducted a study on 83 Graywater systems in 66 Central California households. The study included interviews of Graywater system users, water quality tests, soil and plant health assessments, as well as cost surveys with professional Graywater installers.

Findings: Some of the key findings identified in the study include: 1) a decrease of per capita water consumption by an average of 17 gallons per day, at least half of which is directly attributable to water savings from Graywater reuse; 2) low pH levels in soils irrigated by systems that were over four years old and not properly maintained; and 3) sufficient water quality effluent for long-term irrigation of plants (as long as Graywater-friendly laundry detergents that contained no sodium or boron compounds were used). It was further determined that more user education and design improvements were necessary to improve the performance of Graywater systems and avoid potential problems.

“White Paper on Graywater” – WaterReuse Association, 2010

[http://www.watereuse.org/files/s/docs/Graywater White Paper.pdf](http://www.watereuse.org/files/s/docs/Graywater%20White%20Paper.pdf)

Description: Discusses the history and motivation for reusing Graywater, future trends in Graywater systems and reuse, and key legislative models, regulations, standards and guidelines from states (including California, Arizona, and Florida) that have safely and effectively implemented Graywater reuse.

Findings: The study concludes that the quantitative and water quality impacts of Graywater reuse on the water reuse industry are expected to be modest. It recommends additional research support on the scientific aspects of Graywater, risk assessment, and risk comparisons under a variety of Graywater reuse conditions.

“Technical Memorandum on Graywater” – Southern Nevada Water Authority, 2009

<http://www.nwri-usa.org/pdfs/CrookTechnicalMemorandumonGraywater.pdf>

Description: Discusses the applications of untreated Graywater, as well as regulations set by various states, including California and Arizona.

Findings: Some of the findings and conclusions are 1) actual quantities of Graywater used are considerably less than the amount of Graywater produced by a home because not all of the available sources of Graywater are typically used by homeowners; 2) Graywater standards and policies from regulatory agencies and communities generally state that Graywater is potentially hazardous to human health due to the likelihood of the presence of pathogenic organisms; and 3) the cost to construct and operate a Graywater system for untreated Graywater ranges from a few hundred dollars to more than one thousand dollars, not including irrigation system costs.

Existing Graywater Incentive Programs for Single-Family Homes by Other Agencies

Currently, there are few cities in the state that offer Graywater incentive programs. LADWP has reached out to four utilities in Northern California that provide incentives for Graywater systems to evaluate the success of these programs. The utilities were surveyed about their rebate program. Each agency responded to multiple questions regarding the different types of incentives offered, number of participants, attributed water savings as well as cost effectiveness of their program.

The surveys indicated that rebates for simple Graywater systems for subsurface outdoor irrigation generally range from \$75 to \$150. Most rebates are one time and only cover the cost of materials. In addition, the San Francisco Public Utilities Commission

offers a \$225 rebate to waive permit fees for more complex systems; however, there have been no participants for this particular rebate to date.

Customers have only participated in the Laundry-to-Landscape programs. In addition, the programs have had low customer participation. Surveys also indicate the Graywater programs were uncertain of any sustained water savings. Surveyed agencies reported difficulty in quantifying water savings and assumed the values to be low compared to other conservation programs. Furthermore, the surveys are inconclusive of the cost effectiveness of the incentive programs.

Below is a list of agencies that currently provide incentives for Graywater systems:

City of Santa Rosa provides \$75 per qualifying Graywater fixture installed and a “sustained reduction rebate” of \$200 for every 1,000 gallons reduction in monthly water consumption. The rebate amount cannot exceed the cost of the Graywater system (excludes labor). <http://ci.santa-rosa.ca.us/doclib/Documents/Graywater.pdf>

San Francisco Public Utility Commission provides up to \$225 rebate per permit issued for the installation of a Graywater system for subsurface outdoor irrigation in a residential unit through the *Graywater Permit Rebate Program*. In addition, the *Laundry-to-Landscape Graywater Program* offers a \$112 subsidy towards the cost of a \$117 laundry-to-landscape Graywater kit for residential units with proper installation of an outdoor irrigation system supplied by a clothes washing machine. <http://sfwater.org/index.aspx?page=100>

City of Palo Alto provides rebates of up to \$200 for residents who properly connect a clothes washer to a Graywater irrigation system. In a “Laundry to Landscape” Graywater system, there is no alteration to the plumbing or sewer system. The rebate program is offered through the Santa Clara Valley Water District.
<http://www.cityofpaloalto.org/gov/depts/utl/residents/resrebate/resiwater.asp>
<http://www.valleywater.org/GraywaterRebate.aspx>

City of Santa Cruz provides rebates of up to \$150 for customers who attend a Graywater system design and installation workshop, and install a Laundry to Landscape system.
<http://www.cityofsantacruz.com/departments/water/conservation/Graywater>
<http://centralcoastGraywater.org>

Current Incentive Programs in Los Angeles

LADWP's Technical Assistance Program (TAP) offers commercial, industrial, institutional, and multi-family residential customers up to \$250,000 for the installation of pre-approved equipment and products that demonstrate water savings, including Graywater systems.

Simplified Permitting for Graywater Systems in One- and Two- Family Dwellings

LADBS developed simplified standard plans for simple gravity type Graywater systems without potable water connection in one and two family dwellings. When using these standard plans, the permitting can be processed over the counter. Further, when using the Standard Plans, approval from the Department of Public Health will not be required.

Recommendations for New Programs

The researched studies provide conflicting findings on the benefits, while the surveyed utilities with existing residential Graywater rebate programs indicate low participation from customers, and difficulty in quantifying actual and permanent water savings. Consequently, supporting information is not available to help provide the necessary justification for creating a budget and allocating staffing resources to the development of a residential Graywater rebate incentive program.

In order to justify the development of a residential Graywater rebate incentive program, water savings must be quantifiable and permanent. LADWP does not recommend at this time the development of a residential Graywater incentive program.

LADWP will continue to promote the installation of Graywater systems through its current TAP incentive program for commercial, industrial, institutional, and multi-family residential customers. LADWP will also continue to support customer interest in residential Graywater systems through its education and information campaign.


The Conservation group will work to expand its outreach program to include information about Graywater systems and effective use by developing an informational campaign on residential Graywater systems. In the meantime, customers can find general information about Graywater systems at LADWP's Website www.ladwp.com/Graywater.

The Honorable City Council
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If you have any questions or require additional information, please contact me at (213) 367-1338, or have a member of your staff contact Ms. Winifred J. Yancy, Director of Intergovernmental Affairs and Community Relations, at (213) 367-0025.

Sincerely,



 Marcie L. Edwards
General Manager

JL:yrq

c: Councilmember Bob Blumenfield, Vice Chair, Energy & Environment Committee
Councilmember Tom LaBonge, Member
Councilmember Jose Huizar, Member
Councilmember Paul Koretz, Member
Mr. Adam Lid, Legislative Assistant

Councilmember Gilbert A. Cedillo, Vice Chair, Planning and Land Use Management
Councilmember Mitchell Englander, Member
Ms. Sharon Gin, Legislative Assistant

Ms. Winifred J. Yancy

14-1291

MOTION

California is facing drought and climate disruptions that will require significant alterations to the water habits established over the past century. Increasing water conservation, efficiency, and reuse are key to improving the City's sustainability and resilience to dry conditions and statewide and regional water shortages.

The City continues to encourage water conservation and promote water efficiency through incentives and rebate programs. However, increased use of graywater could provide additional conservation opportunities. Graywater reuse for irrigation is a water conservation and reuse strategy that is being actively promoted by a few California water agencies. One recent study by the City of Santa Rosa, found that of 66 households that installed graywater systems, there was an average water savings of 17 gallons per person per day.

Graywater systems in residential buildings in the City are permitted by the Los Angeles Department of Building and Safety (LADBS), subject to approval by the Los Angeles County Department of Public Health. The Los Angeles Department of Water and Power (LADWP) does not currently provide financial incentives to promote graywater systems.

I THEREFORE MOVE that the Council request the Department of Water and Power to prepare a report within 60 days on existing graywater studies, existing graywater incentive programs being implemented by water agencies, and recommendations for programs and incentives to promote graywater use in the City.

I FURTHER MOVE that the Council instruct the Department of Building and Safety, with the assistance of the Planning Department, and the Bureau of Sanitation, to evaluate amending the Low Impact Development Ordinance (Ordinance No. 181899) to require new single-family and low-density multi-family buildings to include graywater stub outs.

PRESENTED BY:

Paul Koretz

PAUL KORETZ
Councilmember, 5th District

SECONDED BY:

Paul Kerkorian

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