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### **“Rain Barrel: A Low Impact Improvement”**

Low Impact Development is defined as, “a new, comprehensive land planning and engineering design approach with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds.”<sup>i</sup> Low impact development is important because as we continue to grow our suburbs and urban environments, the amount of storm water runoff increases and leads to more pronounced and frequent flooding as well as water quality issues, erosion, and potential property damage as well as other issues. In a natural, undisturbed environment, there is about 10% runoff. In an urban environment that can increase up to around 55%. That means less water is being infiltrated back into the ground to recharge the ground water supply. Low impact development applies to urban settings, transportation, as well as a residential environment. Some suggestions include using bioretention cells or a rain garden for landscaping or using permeable pavements. The focus of this paper is going to be on one type of low impact design that can be used in a residential setting. There are a number of low impact designs that can go into a home, one of which is using a rain barrel.

Rain barrels are a low impact improvement that can be made to any home, including an existing home with existing landscaping. Rain barrels store rooftop runoff and are the simplest in design of the low impact practices that can be done on lot. A rain barrel is a barrel that is put on the side of a house with a hose out the top connecting to the storm gutters on the roof or the side of the house so that the barrel catches the storm water runoff instead of it running down the driveway and into the sewers. A regular gardening hose can be connected to the bottom of the barrel so that the water can then be used to water plants, gardens, and lawns. A lid or mesh cover can also be used to discourage mosquitoes. In some jurisdictions it is illegal to disconnect downspouts from storm sewers so check first.



In the United States, 30-60% of all water used is for irrigation, mostly lawns.<sup>ii</sup> Rain barrels provide us with a water catchment system that can help alleviate some of that need and reduce the demand for ground water. Additionally, “rain barrels can provide a source of chemically untreated 'soft water' for gardens and compost, free of most sediment and dissolved salts. Rain barrels and cisterns are low-cost water conservation devices that can be used to reduce runoff volume and, for smaller storm events, delay and reduce the peak runoff flow rates. By storing and diverting runoff from impervious areas such as roofs, these devices reduce the undesirable impacts of runoff that would otherwise flow swiftly into receiving waters and contribute to flooding and erosion problems.”<sup>iii</sup> Furthermore, “this reduced storage can help alleviate the cost of these larger practices, and also reduce the possible impacts to wetlands and natural areas commonly associated with larger practices. Another benefit of many on-lot practices is that it generally promotes groundwater recharge through infiltration or indirectly by applying or directing runoff to pervious areas.”<sup>ii</sup>

A rain barrel can be constructed with very simple materials and instructions or the entire unit can be purchased. The retail cost for either way is generally between \$150 and \$250. There are do it yourself instructions on building your own rain barrel online at:

<http://www.composters.com/docs/rainbarrels.html#rct>

The maintenance required for a having a rain barrel are minimal. Once or twice a year it should be visually checked to make sure the gutters, hoses, and barrel are all clean of debris and build up. Additionally, the homeowner needs to ensure that the hose remains elevated during the winter to prevent freezing and cracking. Here is a list of things the Low Impact Development Center advises to inspect:

- *Roof catchment*, to ensure that no particulate matter or other parts of the roof are entering the gutter and downspout to the rain barrel.

- *Gutters*, to ensure that no leaks or obstructions are occurring.
- *Downspouts*, also to assure that no leaks or obstructions are occurring.
- *Entrance at rain barrel*, to ensure that there are no obstructions and/or leaks occurring.
- *Rain barrel*, to check for potential leaks, including barrel top and seal.
- *Runoff / overflow pipe*, to check that overflow is draining in non-erosive manner.
- *Spigot*, to ensure that it is functioning correctly.
- *Any accessories*, such as rain diverter, soaker hose, linking kit, and additional guttering.

The main limitation of using a rain barrel is that some homeowners don't like landscaping and may have a challenge using the stored water. In this case, some other form of low impact design, such as planting native plants, would be a better option.

Because of its simple design, low maintenance, and minimal cost, I think a rain barrel is practical option that individual homeowners could do to help conserve and restore a natural resource.

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<sup>i</sup> <http://www.lowimpactdevelopment.org/>

<sup>ii</sup> <http://www.epa.gov/reg3esd1/garden/stormwater.htm>

<sup>iii</sup> [http://www.lid-stormwater.net/raincist/raincist\\_cost.htm](http://www.lid-stormwater.net/raincist/raincist_cost.htm)

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References:

- [http://www.lid-stormwater.net/raincist/raincist\\_home.htm](http://www.lid-stormwater.net/raincist/raincist_home.htm)
- <http://www.lowimpactdevelopment.org/>
- <http://www.composters.com/docs/rainbarrels.html#rct>
- <http://www.epa.gov/reg3esd1/garden/stormwater.htm>
- <http://www.stormwatercenter.net/>