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## WREN WINTER 2013 WATER POLICY NEWS FEATURE

### Are Rain Gardens Mini Toxic Cleanup Sites?

By Lisa Stiffler, [Sightline Institute](#)

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*Here's what happens to the pollutants swept up in stormwater runoff.*



*Students in Columbia County dig a rain garden at their middle school. The project was part of the 2010-2011 Columbia County WREN Grant Project, "Community Raingarden Model."*

If you're concerned about water pollution, you've likely heard this message: The runoff that gushes from our roofs, driveways, streets, and landscaped yards is fouling rivers, lakes, and bays nationwide.

You probably also know about the most popular stormwater solutions, including rain gardens and other green infrastructure that soak up the filthy water, cleaning it before it reaches sensitive waterways that are home to beloved wildlife and where people like to play and fish.

But those two ideas taken together are making some people anxious. If stormwater is the source of such devastating amounts of petroleum and heavy metals, won't the rain garden in my front yard become a mini toxic waste site that could harm children and pets?

Not according to the research that's available. Here's the score on pollutants in rain gardens:

**Petroleum pollutants/Polycyclic aromatic hydrocarbons:** Studies from the field and laboratory find that rain gardens do a great job of capturing petroleum pollution, and that the chemicals are largely eliminated when they're destroyed by bacteria in the soil.

**Heavy metals:** Soil and mulch in rain gardens contain particles that will adsorb and hold metals including copper, cadmium, lead, and zinc. A small fraction of the metals are sucked into plant roots and vegetation.

While metals are not degraded in rain gardens, they're present at very low levels. When local governments test for metals in the sediment that's scooped from the bottom of stormwater ponds or rain gardens that drain parking lots and other city surfaces — material that would likely have higher



*Students water the rain garden they designed and installed in Columbia County to control and treat polluted runoff on school property.*

levels of metals than your average residential rain garden — they found that the contamination levels were still below soil and compost standards meant to protect human health.

**Bacteria and viruses:** While some research has found bacteria and viruses that can cause disease in humans in stormwater, sunlight as well as other micro organisms in the runoff and soil of rain gardens can destroy the pathogens. Also, most of the microorganisms present come from animal waste and are less likely to cause illness in people.

The bottom line is that the soil in rain gardens is safe for kids and animals. That said, people are advised to wash their hands after working or playing in any soil, which can contain naturally occurring metals, fecal waste from the neighbor's dog, or any number of compounds one wouldn't want to ingest. Over time, the top few inches of soil in a rain garden can be replaced to limit

the accumulation of metals. And while rain gardens are attractive landscape features, the plants and soil are also doing an important job and will likely work better if children and dogs aren't spending a lot of time digging and playing in them.

**For more information:**

1. Lisa's full article: <http://daily.sightline.org/2013/01/22/are-rain-gardens-mini-toxic-cleanup-sites/>
2. EPA NPDES webpage - Bioretention (Rain gardens):  
[http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=factsheet\\_results&view=specific&bmp=72](http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=factsheet_results&view=specific&bmp=72) and <http://www.epa.gov/nrmrl/wswrd/wq/>
3. Pennsylvania Stormwater Best Management Practices Manual, BMP: Rain Garden/Bioretention  
<http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-67993/6.4.5%20BMP%20Rain%20Garden%20Bioretention.pdf>
4. Water Environmental Research Foundation's Livable Communities website:  
[http://www.werf.org/liveablecommunities/info\\_sources.htm](http://www.werf.org/liveablecommunities/info_sources.htm)
5. ["Development and Evaluation of a Biphasic Rain Garden for Stormwater Runoff Management"](#)



*Lisa Stiffler: Journalism fellow, writes about pressing issues in the Northwest, like polluted stormwater that runs into Puget Sound, or harmful BPA in baby products. Before joining the Sightline team, Stiffler was a reporter at the Seattle Post-Intelligencer for ten years, most of them spent covering environmental issues. Email: [lisa@sightline.org](mailto:lisa@sightline.org).*