

The Spokane Stormwater Bio-infiltration Swale and Water Wise Landscape Demonstration Project

WSU Spokane County Extension and Spokane County Stormwater Utility are conducting a demonstration project involving bio-infiltration swales (also known as 208 swales). The goals of the demonstration project are:

1. to acknowledge public demand for alternatives to turfgrass in swales
2. to identify the plants most likely to survive swale conditions in Spokane's climate
3. to determine whether alternative plant materials can perform as well as turfgrass in swales, from aesthetic and water quality viewpoints
4. to field-test a soil mix that has previously been lab-tested and designed to filter contaminants from the stormwater entering swales
5. to educate homeowners, contractors, and design professionals about swales

Twelve swales in Spokane County were selected for the demonstration project. All of the swales are located in residential front yards, and all property owners agreed to participate in the project by allowing their swale to be excavated, refilled with an engineered soil mix, and then planted with either turfgrass or alternative plants. The homeowners will be responsible for maintenance of the swales. Click **here** [[swaledrivingmap.jpg](#)] for a map of the swale locations and types.

Reconstruction of the swales took place in September and October of 2007. Each swale floor was excavated to a depth of one foot below finished grade, and the soil mix was placed and graded. Swale side slopes received minimal work except to strip the sod on the alternative plant swales. Six of the swales were planted with alternative plants, five were re-sodded, and one "hybrid" swale was partially sodded and partially planted with alternatives. Click **here** [<http://web.mac.com/barblien/>] for photos of the reconstruction process.

The soil placed in the swales was a batch mix of five parts of a local topsoil (the Garrison gravelly loam) with one part "clean green" compost. This recipe was based on lab testing

that had been previously conducted for other local studies on swales. Spokane County Stormwater Utility will be testing the soil in these 12 swales for several years to track changes in soil chemistry that would indicate whether contaminants are being adequately removed from the stormwater runoff as it infiltrates, and whether the turfgrass and alternative plant swales function differently.

Members of the project team, with input from the advisory committee and local plant retailers, compiled a list of plants that could survive the conditions typically found in Spokane's swales. In general, these conditions would include a wet winter and spring with periodic flooding, but a relatively dry summer; other factors considered were cold hardiness, aesthetic appeal, and local availability. Click [here \[swaleplantlist.pdf\]](#) for a PDF file of the list of recommended plants (including trees, shrubs, perennials, and ground covers). Some of these plants can be viewed in the "Green Zone" exhibits of sustainable landscaping practices, just south of the WSU Extension office at 222 N. Havana in Spokane.

Although it was not possible to test every plant on the list, quite a few of them were planted in the alternative swales. The plant palette for each swale was based on the personal preferences of the homeowners, sun exposure, and factors such as deer resistance in some cases. Click [here \[altswaledescriptions.pdf\]](#) for a PDF file of the planting plans and plant lists of the six alternative swales and the "hybrid" swale.

Although this demonstration project only affords us a limited look into the process of bio-infiltration, the data resulting from it may help to answer the following questions:

- Should turfgrass be the only plant allowed by local ordinances governing stormwater bio-infiltration swales?
- Is the stormwater contaminant removal that takes place in swales largely a result of filtration and chemical activity in the soil, in the plant roots, or by uptake through the vegetation itself?
- What is the recipe for the ideal soil mix for Spokane swales, and should it be specified in local ordinances?

This demonstration project is a joint effort between Spokane County Stormwater Utility and WSU Spokane County Extension. It was partially funded by a grant from the Washington Department of Ecology, which allocates EPA funds under Section 319 of the Clean Water Act. Although most of the work on this demonstration project was carried out in 2007, soil testing will continue for several years, and it will be difficult to draw any conclusions until those tests are completed.

The project team hopes that this demonstration project contributes to our technical understanding of swales, raises awareness of their value in protecting our water quality, and tests the viability and effectiveness of alternative plants versus turfgrass in swales. Click **here** [[team-thanks.htm](#)] for a list of the project team and other contributors. For further information, contact the following:

Spokane County Stormwater Utility, 477-3604

WSU Spokane County Extension, 477-2048

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