Washington Department of Ecology
Sinclair & Dyes Inlets Fecal Coliform TMDL

1. Proposed Schedule

September-Oct 2008	TMDL technical report (45 day external review)
September 25	Implementation Meeting #1
December 4	Implementation Meeting #2
February-March 2009	Implementation Meeting #3
May	Public review draft TMDL (combined technical report & implementation plan)
June	Public meeting
September 2009	Submittal to EPA

2. Implementation Plan Meetings

Sept. 25th meeting

- Review marine locations and streams requiring fecal coliform reductions
- Review Ecology proposal for Waste Load Allocations and Load Allocations
- Ecology request for information about Phase II programs – due Dec 4th
- Speaker or panel discussion

Dec. 4th meeting

- Discussion: Priority actions or programs for areas assigned fecal coliform reductions
- Gap analysis: What programs are in place vs. what is needed?
- Speaker or panel discussion

Feb-March 2009 meeting

- Monitoring plan
- Resources and funding
- Speaker or panel discussion

3. Topics for speakers or panel discussion – what are your information needs?

- Highway stormwater treatment –WSDOT research
- Update on stormwater public outreach (Kitsap area and King County-led consortium)
- IDDE programs, IDDE training (Kitsap County Health Department?)
- Planning and public works departments – why they work differently, ways to work together
- Marinas?
- Nonpoint sources – is there enough oversight?
- Your suggestions

4. Additional Resources

From Curtis Hinman, WSU

Rain Garden Handbook for Western Washington Homeowners, a companion rain garden flyer, and a technical paper examining the flow control benefits of rain gardens are available at: www.pierce.wsu.edu (go to the Water Quality and then the LID page)

While much attention over the past few years has been given to developing low impact development guidelines for public projects, relatively little effort has been directed to homeowners guidelines.

Over the past 18 months we have been working with experts in the Puget Sound region, conducting computer modeling to better understand the flow control benefits from rain gardens, and researching rain garden soil mixes. The handbook attempts to distill that information into a guide that is easy to read and explains the concepts for designing and installing rain gardens on residential lots using, to a large degree, graphics.

The flow control modeling paper for rain gardens is included to provide stormwater designers, managers and educators with: 1) the necessary technical background to make informed decisions concerning the use of the handbook; and 2) the latest flow control modeling and sizing guidelines for rain gardens.

Stormwater (journal), Clary et al., May 2008, "Can stormwater BMPs remove bacteria?"

Informal Comment on this article by Ed O'Brien, Washington Dept of Ecology Stormwater Engineer:

Most of our end-of-pipe treatment facilities will not solve the problem of frequent elevated bacterial counts. For the most part, they are not capable of playing even a significant role in reducing bacteria. The article seems to indicate that "retention ponds and media filters remove some bacteria. But we would have to investigate that to see how they define retention and media filters. To us, a retention pond is one that does not have a surface discharge. Obviously that is not what the article authors mean. The category of media filters is way too broad. Undoubtedly, some media can do a better job than others.

Based on my experience in domestic wastewater management and stormwater management, the best media for bacteria removal is high organic content natural soils. The bacteria are physically strained and often adsorbed by organic soils. Then they either die off of their own accord because they are not in an environment that they need, or they are preyed upon by various organisms in healthy soils.

So, how do you reduce bacteria in existing stormwater discharges? You try to retrofit LID approaches that force stormwater to flow through a healthy soil profile. That profile can either be naturally preserved areas (e.g., the 65/10 option), or human-created areas such as rain gardens. Note that this is not just letting stormwater flow through a vegetated swale where the water merely is strained by the vegetation. The water has to pass through some length of soil profile. If the water ultimately infiltrates further into the underlying soil so much the better. That will help reduce the gross levels of hydrologic disruption caused by the urbanization too. Also, the more water that is infiltrated means that the bacteria loading to surface water would be reduced proportionately even if there was no bacteria removal. Fortunately, there is removal. If the water must be recollected in under drains below rain gardens, it should at least be greatly reduced in almost all pollutant concentrations except nutrients. Phosphorus and nitrogen leaching from the soil can be a problem. Phosphorus is a problem in fresh waters. Nitrogen is a problem in marine waters.

In new developments and redevelopments, aggressive use of man-made LID techniques, use of natural areas for stormwater infiltration, and preservation of a high percentage (no one really has a feel for how much, but the more, the better) of natural areas are presently, the only answers to this problem. Just as they are the most effective answer to minimizing natural hydrologic disruptions that affect the biology of surface waters.