

Stormwater BMPs Maintenance Conditions Evaluation





Prepared for Ecology on behalf of the Stormwater Workgroup by **City of Bellevue**, Herrera Environmental Consultants, Inc., and Aspect Consulting, LLC

Study Highlights

- Most common maintenance needs in pond, trench, and tank BMPs include managing sediment, debris, and trash accumulation.
- BMP maintenance recordkeeping is not standardized across jurisdictions

Goal & Background

The goal of this study was to evaluate maintenance standards for selected stormwater BMPs in the Stormwater Management Manual for Western Washington (SWMMWW). The evaluation sought to answer questions about pond, trench, and tank BMPs regarding:

- How maintenance standards benefit water quality
- Alternative effective maintenance frequencies compared to municipal NPDES stormwater permit requirements
- Identification of SWMMWW maintenance standards that may need updating

Maintenance standards for municipal stormwater BMPs are codified in stormwater manuals, of which the Ecology SWMMWW is the most commonly used in western Washington. The SWMMWW is also the basis for individual permittee stormwater manuals. However, the origins of maintenance standards for many BMPs are not well documented, especially for conventional BMPs like ponds and trenches. Municipal stormwater permits require specific maintenance activity frequencies but allow permittees to adjust based on their own data and experience. However, there is limited guidance on how to evaluate data or conduct analyses to justify changes in maintenance frequency.



Figure 1 Debris accumulates on a storm drain grate

Project Findings

Key findings from the study include insights into stormwater BMP maintenance standards, variations in maintenance requirements across municipalities, and the role of recordkeeping in evaluating maintenance needs.

- The current BMP maintenance standards are derived from the 2001 SWMMWW and are based on the 1992 Ecology Stormwater Manual for the Puget Sound Basin and the 1990 King County Surface Water Design Manual.
- While the maintenance standards are extensive and a bibliography is present in the SWMMWW, many standards lack specific references, making it difficult for permittees to gauge their effectiveness.
- The most common maintenance need across the BMPs evaluated was managing sediment, debris, and trash accumulation in various components such as inlet and outlet pipes and trash racks. This was consistently identified in municipal O&M programs and the Study pilot data analysis.

Collectively improving stormwater management

Stormwater Action Monitoring (SAM) is a collaborative, regional stormwater monitoring program that is funded by more than 90 Western Washington cities and counties, the ports of Seattle and Tacoma, and the Washington State Department of Transportation. SAM's goal is to improve stormwater management to reduce pollution, improve water quality, and reduce flooding. We do this by measuring stormwater impacts on the environment and evaluating the effectiveness of stormwater management actions.

- Other frequent maintenance needs included pipe blockage, noxious weeds, and access issues.
- BMP maintenance recordkeeping is not standardized across jurisdictions, as data collection methods must align with permit requirements, local needs, and data management methods (e.g., asset management software).

Recommendations

- Perform field testing to verify or update some BMP maintenance standards, especially those based on old references or local studies. Four elements of the maintenance standards were highlighted in the Study for field testing: 1. sediment accumulation in pipes, vaults, ponds; 2. vegetation growth, especially grass height; 3. blockage in pipes, inlets, and outlets; and, 4. water ponding as it relates to the desired range of water storage
- 2. Consider a preventative approach for common BMP maintenance issues. This extra labor cost for things like routine cleaning of sediment or trash will likely be recovered with the lower risk of BMP failure events (e.g., clogging leading to flooding).
- 3. Permittees should consider an assessment (i.e., analysis) of their maintenance frequencies once per permit cycle. BMPs visited more frequently than expected can highlight BMP performance issues and trends in maintenance cost.
- 4. For altering BMP maintenance frequencies from those specified in the municipal stormwater permits, data on BMP performance can be used along with the experience of the permittee. The maintenance data, however, would need to be tied to the maintenance standards, and some permittees would need to collect more details on maintenance outcomes.

Why does this study matter?

This Study is important for understanding the origins and uses of stormwater BMP maintenance standards in western Washington. The Study outcomes deepen the understanding of how maintenance activities relate to the standards and to the minimum BMP performance requirements for O&M. The findings from the Study will help permittees better understand common BMP maintenance issues for different types of BMPs and how they can change BMP maintenance frequencies using their own data and experience. The findings will help Ecology when considering what maintenance standards could be updated and the range of standards in use by permittees.

What should stormwater managers do with this information?

- Review their jurisdiction's BMP maintenance data to identify opportunities for revising maintenance frequencies, especially those different than frequencies indicated in the municipal stormwater permits.
- Explore which BMP needs motivate maintenance and how often specific needs occur.
- Consider collecting BMP maintenance data that aligns directly with the standards. For example, supplementing a pass/fail approach with a checklist of maintenance elements and key measurements (e.g. sediment depth estimates). This can help answer questions like "does the BMP condition exceed the maintenance standard?"

What will Ecology do with this information?

Ecology will evaluate opportunities to refine BMP maintenance standards, focusing on long-established BMPs such as ponds, which have historically shaped standards for many other BMP types. This could include reviewing and integrating relevant references to enhance the scientific basis for specific maintenance standards, ensuring they reflect current research and best practices.

For more information, including the final report, see the website at

ecology.wa.gov/sam

To request an ADA accommodation, contact Ecology by phone at 360-407-6600 or email at chelsea.morris@ecy.wa.gov, or visit https://ecology.wa.gov/accessibility. For Relay Service or TTY call 711 or 877-833-6341.