

26 July 2016

Letter of Intent to Submit an NPDES Effectiveness Study Proposal

Dear RSMP Effectiveness Program,

We are pleased to submit this Letter of Interest to extend our monitoring research on the effectiveness of a built innovative stormwater treatment system located on the Manchester Beach waterfront in Kitsap County.

1. Proposed Study Title:

Monitoring the Effectiveness of Sustainable Waterfront Stormwater Solution Prototypes on Treating Runoff at Manchester Beach, Puget Sound

2. Short Description of Proposed Study:

This sustainable waterfront stormwater prototype monitoring project assesses the effectiveness of waterfront-located green stormwater infrastructure, or low impact development (LID), in reducing the harmful effects of stormwater immediately prior to discharge into receiving waters. The treatment facility in this study is a small park that has been designed to treat stormwater from the contributing basin of approximately 80 acres. The system includes two treatment systems: 1) an array of bioretention cells composed of an innovative bioretention media (Filterra) that surrounds the park and 2) traditional bioretention rain garden soil media in a spiral water feature. Contaminants frequently detected in stormwater, including heavy metals, petroleum hydrocarbons, and fecal coliform have shown significant reduction (e.g., 42% to 99% of *E. Coli* bacteria reduction) after treatment in both types of the bioretention treatment cells, according to laboratory measurement and statistical analysis.

The monitoring program has been successfully running for over 8 months, with 9 events covering a range of storms captured. However, the monitoring program was stopped by further construction upstream of the stormwater park during this summer and will resume in the fall. The proposed study is needed to extend the current monitoring period (required to end on January 31st, 2017), for two major reasons: a) to assess the long-term performance of the two treatment systems; as the composite/soil matures the assessment can be more representative of long-term performance, and b) the treatment system after summer storms can be measured during the extended monitoring period. As contaminants accumulate in the dry summer periods, data collected will be reflective of worst-case scenarios of high pollutant loadings.

Because water flow and sampling equipment has already been purchased and installed at both the inlets and outlets of the stormwater park and initial monitoring conducted through a one-time Washington SeaGrant funding, additional stormwater research funding for a second year of project monitoring will be an especially efficient use of funds.

With conclusive data indicating positive performance, this waterfront-based prototype could be broadly applied to assist coastal communities in addressing local and regional stormwater issues, and inform environmental planning decisions. Further, the prototype also captures the economic and recreational benefits of multi-functional green stormwater solutions, and can provide design guidelines and specifications for wider application in Puget Sound and other coastal areas.

In addition, we will continue to partner with Kitsap County on their outreach and education programs, increasing citizen understanding of water quality issues and solutions as well as awareness of environmental responsibility. Continued monitoring will further inform professional presenta-

tions and publications that will communicate the applicability of waterfront stormwater prototypes to planners, designers, decision-makers and the public.

2. What specific Stormwater Management Program condition(s) or other permit condition(s) in the NPDES W. WA. Phase I and/or Phase II Municipal Stormwater Permit does your study address?

Phase I Permit: Not directly applicable since Kitsap County is a Phase II jurisdiction. However, findings from the project will also be useful to Phase I cities and counties.

Phase II Permit: The project involves monitoring bioretention devices retrofitting the old stormwater discharge outfall, providing a stormwater treatment facility along with multifunctional public green space (e.g., pedestrian trail, public park, community center, etc.). It pertains to Phase II Minimum Requirement #5 (On-site Stormwater Management), Minimum Requirement #6 (Run-off Treatment), and Minimum Requirement #7 (Flow Control).

3. How will this study inform, assess effectiveness and/or support implementation of the specified NPDES permit conditions (e.g., project goal) and future permit conditions?

This study will inform questions regarding the effectiveness of innovative stormwater treatment and outfall design alternatives for Puget Sound that will facilitate community and political decision-making. The prototype monitoring, along with other green infrastructure solutions accomplished by our lab, will contribute to our research on other green stormwater prototypes that can be applied to the NPDES permits of municipalities in Kitsap County and other Puget Sound communities (e.g. Olympia and Bellingham are currently undergoing substantial waterfront redevelopment projects) as they develop alternatives to typical outfall construction to better address contamination at the end of the pipe.

4. What are the anticipated measurable outcomes or deliverables of this proposed study?

Solid data sets and statistical analysis of the long-term performance of green solution infrastructure, include the evaluation of removal efficiency of a suite of contaminants frequently detected in stormwater: persistent organic pollutants, removal efficiency in response to a range of different scales of storm events, and comparison of traditional and new filtration media. In addition, for evaluation of the outreach and education program, surveys will be conducted partnering with Kitsap public works to measure attitudes, behavior change and awareness of stormwater pollution and support for stormwater treatment projects.

5. How does this study advance regional understanding for stormwater management?

The prototype provides insights into guidelines for the design, long-term performance, and long-term sustainability of green infrastructure approaches and technical considerations. Monitoring of the prototype answers questions of how bioretention cells correspond to major factors such as the relational size of green stormwater facilities to the contributing basin, scale of storms, specific pollutants, and filtration media. It also will inform questions about the frequency of maintenance needed to ensure the longevity and long-term performance of bioretention facilities and how maintenance may affect that function. Also, long-term infiltration rates and adsorption capacity will be monitored for better improving understanding of long-term stormwater management.

6. Applicant(s) Contact Information:

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7. Permittees you are coordinating with (Provide contact information):

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8. Select Stormwater Work Group study category (select all that apply):

Source Control

LID ✓

Retrofits ✓

O&M

Education & Outreach ✓

Thank you for considering our LOI request to submit a full application for “Monitoring the Effectiveness of Sustainable Waterfront Stormwater Solution Prototypes on Treating Water Quality Runoff at Manchester Beach, Puget Sound.”

Sincerely,

Nancy D. Rottle

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