Letter of Intent to
Submit an NPDES Effectiveness Study Proposal

All fields must be completed

1. Proposed Study Title: Effectiveness of Oyster Shell Amendments for Stormwater

2. Short Description of Proposed Study:
The City of Mercer Island is planning to retrofit one of their more developed stormwater basins. Water quality monitoring data indicate that stormwater copper concentrations frequently exceed water quality standards (WQS) in this basin. The Port of Seattle recently implemented the addition of oyster shell amendments in some of their catch basins. Limited data suggest that this amendment may be effective for reducing metal concentrations in stormwater.

As a pilot effort, oyster shell amendments will be added to several catch basins in Mercer Island to reduce copper concentrations and the potential for toxicity. The proposed study will evaluate the effectiveness of oyster shell amendments for 1) metals removal and toxicity reduction (by increasing hardness), 2) reducing other stormwater chemicals of interest, and 3) potential improvements in water quality in the receiving stream.

If other permitees are interested, the study could be designed to address additional study questions including 4) Does sediment accumulation in catch basins impact water quality (as it relates to maintenance frequency)?, and 5) Is oyster shell treatment effective for reducing copper toxicity (by increasing hardness) in a more rural basin in Mercer Island with lower copper concentrations.

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: NPDES W WA Minimum Requirement #6

Phase II Permit: NPDES W WA Minimum Requirement #6

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?

In stormwater with low hardness levels, even relatively low dissolved copper concentrations can exceed WQS. However, copper can be difficult to reduce with current treatment techniques. The Port of Seattle has found oyster shell amendments reduce copper concentrations and toxicity potential in stormwater. The Port's monitoring also suggests this treatment requires minimal construction and maintenance effort.

Available data suggest that oyster shell amendments could be a viable treatment option for runoff with potentially toxic copper concentrations; however, field testing is extremely limited to date. If the proposed study demonstrates this is an effective treatment, TAPE approval could be pursued as a separate effort, and oyster shell amendments could serve as an approved option for runoff treatment in the future.

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

A final report will examine the dataset of influent and effluent concentrations (chemical, nutrient, and suspended solids) in untreated (control) and oyster shell-treated catch basins. Previous monitoring data will be leveraged for the assessment. The report will outline findings on removal efficiency, variability of performance, and maintenance requirements for catch basins with oyster shell amendments. This will inform permitees as to whether oyster shell amendments should be pursued further as a runoff treatment option.

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

Since stormwater treatment needs can vary greatly by location, it is important to have a wide variety of retrofit options from which to choose. Some of the current treatment technologies do not sufficiently remove copper and/or require large capital improvement expenditures. The proposed study would be a novel approach to stormwater treatment within an existing system, which could effectively reduce copper and lower toxicity potential. The treatment is fairly low cost, using local recycled materials, and could be implemented in a variety of situations across the region.

6. Applicant(s) Contact Information:

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

Patrick Yamashita, City of Mercer Island, 206-275-7722, patrick.yamashita@mercergov.org

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

☐ Source Control	☑ Retrofits	☐ Education & Outreach
☐ LID	☐ O&M	☐ Other:

Submit LOI to Brandi Lubliner (WA Department of Ecology) via email at Brandi.Lubliner@ecy.wa.gov