

# Letter of intent (LOI)

Interested parties should submit a Letter of Intent (LOI) on or before February 28, 2020 for each individual proposal. Letter of intent should include applicant contact information and seven questions about proposed study. More details about SAM study selection process, eligibility and funding availability can be found in SAM REF guidelines in SAM Effectiveness webpage.

Email address \*

jsaltonstall@aesgeo.com

Applicant contact information

Applicant Full Name \*

Jennifer H. Saltonstall, L.Hg.

Organization \*

Associated Earth Sciences, Inc.

Phone number \*

425-827-7701

Proposed Study Information

### 1. Proposed Study Title \*

Evaluation of the influence of bioretention soil infiltration performance rate and safety factors on facility sizing and maintenance.

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### 2. Which topic(s) from the SWG's priority list do you propose to address? \*

The proposed study topic should be in the SWG's priority list

# 11. Gather data about eligible SSC project types to inform future requirements and/or implementation. # 16. Informed by a white paper, do a controlled field study to evaluate maintenance thresholds required in the SWMMWW.

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### 3. Select type of project being proposed \*

- Survey
- Literature Review & Synthesis
- Environmental Sampling Study
- Other

#### 4. Short Description of the Proposed Study \*

250 word limit: describe how results will assess effectiveness and advance regional understanding and permittees' implementation of specific stormwater management approaches

Bioretention facilities are not getting the "credits" they deserve. Older bioretention facilities have been hypothesized to have reduced infiltration rates. Field data of installed facilities (SAM Bioretention Hydrologic Performance Studies, WSU-Puyallup column studies, and SPU monitoring data) indicate significantly higher bioretention soil infiltration rates than assigned model infiltration rates. Per SWMMWW, the WWHM model bioretention soil is assigned a short-term infiltration rate of 12 inches per hour, which is then reduced by a factor of either 2 or 4 depending on drainage basin size. The resultant design infiltration rate is 3 or 6 inches per hour. For retrofit applications where area for bioretention is limited, engineered bioretention facility size could be effectively reduced while providing the same water quality benefits. For new development, smaller facilities will cut initial installation cost and reduce long-term O&M cost and burden. Information on vegetation conditions and maintenance practices combined with field-tested infiltration rates can provide baseline information for a broader perspective on bioretention life spans and credits for benefit ratio and equivalent area when assessing stormwater impacts to our receiving waters.

We propose that field data be collected on installed facilities to provide data on: (1) BSM infiltration rate, (2) composition and density of the vegetation community, and (3) O&M procedures. The data can be used to provide confidence that facilities are long-lived, adequately sized and allow for a refinement of the SWMMWW assigned short-term infiltration rate and default safety factors.

#### 5. What type information will be collected or analyzed for this proposed study? \*

If existing permittees' data are needed, specify the type, and the expected timing of a request for existing information from Permittees

We will leverage the contacts and database of facilities from the SAM Bioretention Hydrologic Performance Studies. We have more than 50 facilities currently reviewed covering a range of ages. Permittee can also suggest bioretention facilities for inclusion in the study.

The following field data will be measured or collected:

- Facility field infiltration rate using controlled flood tests or large-scale infiltration testing
- Vegetation community composition and cover by woody and herbaceous vegetation
- Operations and maintenance practices (via phone or onsite interview)
- Facility age

We will also review facility design information if available including model inputs (sizing factors, total and impervious drainage areas), bioretention soil thickness and qualitative compaction, base area and inlet/outlet structures.

6. What are the anticipated measurable outcomes and key deliverables that will be produced by the proposed study, and how will they be used by Permittees and the Washington State Department of Ecology? \*

The credits for area treated and controlled by bioretention as part of program requirement for Structural Stormwater Controls (SSC) should reflect the treatment capacity. The credits for area treated are based on modeled infiltration rates. The information collected from this study can be used to refine the SWMMWW assigned short-term infiltration rate and default safety factors to allow for more credit where appropriate, or to provide confidence that facilities are adequately sized with a substantial safety factor. This study will also provide data on actual vegetation condition and corresponding operations and maintenance practices to provide information to owners/jurisdictions when allocating maintenance budgets.

7. Permittees or agencies you are proposing to coordinate with (provide staff names and contact information, if known) \*

Enter "NA" if not applicable.

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