# Pre-Final Draft:

# Project Ideas for Round 5

Note to SWG: The following ideas are the SAM Study Solicitation Subgroup’s (S4’s) recommended project ideas for this round. We received several new study ideas on stormwater BMP effectiveness and source identification through a public survey. S4 reviewed the proposed ideas and presented the initial list to SWG on July 16. SWG input was received and integrated into this revised list. Some S4 comments were kept in this document where they provide context for the recommendation.

## Permit:

1. Identify correct BMPs and locate geographic priorities for stormwater retrofits necessary to intercept road-derived toxics (6ppd, PAHs, etc.) to protect water quality and salmonid populations (i.e., coho and chinook)? Supplement existing research on this topic.
2. Use existing GIS data and aerial imagery to identify priority locations to target the implementation of stormwater related BMPs.
3. Based on evaluation of current trainings (Illicit Discharge Detection and Elimination, Operations & Maintenance, Controlling Runoff, etc.) implemented by individual MS4 jurisdictions, identify three to five effective trainings from each category and make recommendations to standardize and improve those trainings. Develop trainings for future use across all jurisdictions in Washington.
4. Evaluate stormwater treatment infrastructure (bioswales, detention/retention ponds, etc.) and their impacts on wildlife where they coexist within the MS4. Identify design and maintenance recommendations to minimize such wildlife impacts. Consider using a Before-After-Control-Impact (BACI) study design and evaluate the potential for MS4 flows inadvertently creating ecological traps where habitat-like features may attract wildlife to stormwater infrastructure.

## Source Control:

1. Conduct a stormwater runoff study to characterize stormwater pollutants at different traffic volumes (e.g., low, medium, high traffic areas). Consider building on previously collected data under the 2013 WSDOT highway characterization study and the on-going [SAM stormwater characterization study.](https://ecology.wa.gov/regulations-permits/reporting-requirements/stormwater-monitoring/stormwater-action-monitoring/sam-effectiveness-studies/stormwater-characterization)
2. Develop guidance and methods for capturing and containing PCBs from suspected or confirmed sources, such as exterior buildings materials. Which BMPs are the most effective (cost included) at minimizing PCBs entering the MS4? What onsite or small and inexpensive treatment devices could be used to remove PCBs from pressure washing wastewater? What can be done to prevent the PCBs from entering the MS4 passively (i.e., when the building is just sitting in place and not being washed or demolished)?
3. What are the best test methods for detecting bacteria sources (wildlife, livestock, humans, etc.) to support Illicit Discharge Detection and Elimination work? What are the most effective practices, including education & outreach and operations & maintenance of BMPs for reducing bacteria loading in stormwater? How are those BMPs monitored for effectiveness?
4. How effective are public outreach and behavior change campaigns at reducing actions that contribute to stormwater pollution to MS4s? Which specific strategies yield the greatest impact? Make recommendations for outreach programs that apply to all jurisdictions.
5. How well does gray or traditional stormwater infrastructure capture contaminants like 6PPD, 6PPDQ, PAHs, PFAS, PCBs? What can be done to make gray infrastructure more effective at capturing persistent and emerging contaminants (through maintenance, retrofit, etc.)?
6. What are the ways that we can retrofit existing traditional or older pond structures for more stormwater quality treatment? Most were designed for flow control, but can we determine what methods could be used to update them to remove other pollutants (including 6PPDQ, PAHs, metals etc.)?

## Maintenance/Manual:

1. A white paper on how jurisdictions approach stormwater management on properties that do not drain to MS4s.  Are there local codes for stormwater management that apply? What non-stormwater regulations apply (e.g. TMDL)?
2. Adapt TAPE’s definition of qualifying storm conditions to Eastern Washington climatic conditions so that more treatment devices could be considered for approved use in drier climates.

##  BMP Effectiveness:

1. Assess effectiveness, in terms of both cost and pollution reduction, of street waste disposal procedures in [Appendix 6](https://fortress.wa.gov/ecy/ezshare/wq/permits/MS4_2024_App6_Final.pdf). In particular, assess effectiveness of discharging liquids removed from the street to stormwater collection systems while sweeping during rain events.
2. Synthesize current understanding of how contaminants of emerging concern (CECs) behave within existing runoff treatment BMPs, focusing on mechanisms like sorption, degradation, transformation, and plant uptake. Include evaluating the implications for BMP design and soil or media longevity and reuse. Identify opportunities or challenges for longevity and reuse and disposal of spent media. Consider consulting contaminants listed in the [PSEMP CEC Prioritization Table](https://pspwa.app.box.com/s/0luxyi979sz3d9cx90ovlr4ot6axqwk8/file/1105331028089) published by the Puget Sound Ecosystem Monitoring Program (PSEMP) Toxics Work Group.
3. Determine a biochar specification that produces the best pollutant removal treatment. Consider that feedstock type, pyrolysis temperature, particle size, and post-processing treatments can influence biochar's physical and chemical properties and thus, its effectiveness in removing pollutants contaminants such as nutrients, metals, hydrocarbons, PFAS and 6PPDQ.
4. Collect data and evaluate the potential for PFAS migration to groundwater via infiltration BMPs, particularly in areas with vulnerable aquifers or drinking water sources.
5. Determine the pollutant load reduction rate of TSS for a few typical Eastern and Western Washington catch basin designs to identify and demonstrate which catch basin designs qualify as "pre-treatment" BMPs. The study results should be applicable across the state, Also, consider building on previous SAM study on catch basin maintenance ([SAM Fact Sheet #15](https://www.ezview.wa.gov/Portals/_1962/Documents/SAM/FS%23015%20WesternWA_CatchBasinInspection_MaintenanceReview.pdf)).
6. Evaluate the WQ benefits of using drought tolerant trees and shrubs in vegetated BMPs in arid climates. Provide a list of drought tolerant trees and shrubs along with installation and maintenance guidance for design engineers. Demonstrate & distinguish usefulness of trees and shrubs-species with low water needs.
7. Study existing gray or green BMPs to verify capture or treatment of 6PPDQ. Consider both solids and dissolved forms of the pollutant.
8. Quantify the habitat value and other benefits including potentially reduced O&M provided by mature vegetation in stormwater ponds. Are we still achieving the designed the pollutant removal and/or flow attenuation? What are the trade-offs?
9. Identify appropriate BMPs for managing polluted pressure washing runoff and how to use them effectively in the various situations that you find at different sites to better establish regional compliance consistency for both regulators and contractors.

# Low Priority Project Ideas

Note to SWG: These ideas lack clarity and permit purpose, S4 and Ecology staff believe these ideas to be considered as a low priority for Round 5. However, if SWG and SAM participants have past history and are interested in these ideas, we need clarification and direction to move forward.

1. Fill gaps on benefits of retrofitting, restoration of riparian buffer, property acquisition, removal of impervious surfaces, floodplain reconnection or other actions used to address stormwater runoff discharging to or from MS4s not otherwise required in S.5.C (from Structural Stormwater Controls, Science Review and Synthesis Project)
2. Research and compile examples of effective stormwater management tools in a white paper. For example, public private partnerships, watershed planning, use of technology tools, Strategic Asset Management.
3. Conduct a study reviewing redevelopment projects (large to small) to quantify the improvements in flow and water quality control that resulted. Demonstrate how this information could be used to scale up expected benefits from redevelopment across the region.
4. What is the minimum maintenance frequency for bioretention required to achieve optimum or design runoff treatment benefits of the facilities? Build on the previous SAM work on hydrologic performance of bioretention facilities ([SAM Fact Sheet #33](https://apps.ecology.wa.gov/publications/documents/2510030.pdf)).
5. What is the range of options to address spills on permeable pavement, and what are the most effective and lower cost methods?
6. Develop or modify a model to predict catch basin accumulation for predicting maintenance frequencies.
7. Create a matrix comparing the effectiveness, costs, constructability, and maintainability of BMPs. This could be a white paper.

# **Consider in Round 6**

Note to SWG: These ideas are likely to support better in Round 6 (2027-28) when related SAM & other projects are completed.

1. Investigate other MS4 permit thresholds to see if they are appropriate for 6PPDQ; also review reporting data from other permits for information pertinent to treating 6PPDQ –Possibly a Round 6 idea with modifications to meet the new permit needs/requirements?
2. Identify other issues or sources of Tire Wear Particles (TWPs) that are not mitigated through street sweeping.