

## 1 Long term MS4 planning to protect and recover receiving waters

### 2 I. Background discussion

3 The Municipal Separate Storm Sewer System (MS4) permits issued by Ecology require local jurisdictions to  
4 implement a wide range of programmatic stormwater management actions. The permits have made some  
5 progress toward illustrating the connection between stormwater management, MS4 outfalls, and receiving  
6 water conditions, but there are few requirements that are tied directly to receiving waters. Mapping is required,  
7 but only a TMDL or an S4 response causes permittees to focus on what specifically the receiving water needs to  
8 comply with State water quality standards.

9 While stormwater management has made great strides since the first permits were issued in 1995, the science is  
10 clear that a site and subdivision approach to controlling stormwater runoff from developed and developing  
11 areas still falls short of protecting receiving water quality conditions. Further, requirements based on new and  
12 redevelopment will have little impact on runoff from existing development without innovative program overlays  
13 (such as regional facilities or a flow control transfer program).

14 Early studies indicated that natural land cover and soils need to be preserved in a watershed to prevent channel  
15 degradation, and to maintain base flows and functional habitat conditions for salmonids. The Phase I  
16 Watershed-scale stormwater planning studies from the 2013 permit reinforce that applying all of our  
17 conventional flow control, runoff treatment, and low impact development best management practices will not  
18 be enough to fully attain standards protective of designated beneficial uses or to counteract the challenges  
19 posed by urbanization.

20 More work is needed, but funding for additional strategies and capital projects is limited. Local jurisdictions  
21 need to prioritize spending and direct strategic investments or effort to those basins and catchment areas where  
22 improvements can be most readily achieved and the benefits can be seen on a fairly near-term timeline.

23 The 2013 permit launched Stormwater Action Monitoring (SAM; formerly known as the Regional Stormwater  
24 Monitoring Program) – and planned for a corresponding receiving water monitoring program for the Lower  
25 Columbia – which will tell us broadly if conditions are getting better or worse, what BMPs are effective, and how  
26 we incorporate the latest science and the most effective approaches. The first round of SAM data collection in  
27 Puget Sound small streams and marine nearshore areas clearly showed a decrease in receiving water conditions  
28 with increased urbanization, and a significant difference inside and outside Urban Growth Areas. (Final reports  
29 are expected soon.)

30 The objective of the watershed-scale stormwater planning requirement in the 2013 permit was for each Phase I  
31 county to create a model to evaluate stormwater management strategies that would accommodate planned  
32 growth in a developing watershed and still maintain hydrologic and water quality conditions that fully support  
33 “existing uses” and “designated uses” (as those terms are defined in WAC 173-201A-020) throughout a stream  
34 system. The permit requirements focused on the scale and detail of modeling and planning to bring into focus  
35 the needs of the stream system – the receiving water body.

### 36 *What we learned from the Phase I counties’ watershed plans*

37 Each of the four counties selected a medium sized (10-50 square miles) watershed located in an urban growth  
38 area designated pursuant to the Growth Management Act, and therefore known to be under pressure for  
39 development in the near future. The watersheds had unique characteristics, but all are already partially  
40 urbanized. The counties created models to test a suite of strategies in various scenarios to see if water quality  
41 standards were, or could be, met. The modeling reports for the three plans submitted so far (King County will

1 submit their plan next spring) showed that current and future conditions in these watersheds do not meet water  
2 quality standards, and that actions beyond site and subdivision scale of stormwater management will be needed  
3 to prevent degradation of the receiving waters. The models in all of the watersheds projected that riparian  
4 restoration (for temperature) and large amounts of additional stormwater detention and infiltration (for flow  
5 control, for Benthic Index of Biotic Integrity (B-IBI) scores, and for bacteria) are needed to improve receiving  
6 water conditions. Other in-stream projects (not associated with managing municipal stormwater discharges)  
7 were also modeled as having near-term and cost-effective positive outcomes on receiving water bodies.

8 The anticipated costs to recover from these impairments is tens of thousands of dollars per acre of watershed in  
9 Snohomish and Clark Counties. The costs per acre for these typical Puget lowland and lower Columbia  
10 developing watersheds are significantly lower than for more developed basins (the Kirkland Juanita Creek Study  
11 estimated costs were approximately \$300,000 per acre). While this demonstrates that current permit  
12 requirements are having a significant impact, the modeled additional effort to recover the beneficial uses are  
13 still well beyond current funding programs and approaches.

14 One important strategy that the counties did not highlight in their scenarios was changing the land use  
15 designation or zoning codes established as part of the land use comprehensive planning process under the  
16 Growth Management Act. Comprehensive planning, and stormwater management are regulated under different  
17 laws and overseen by different state and local departments with separate administrative and public processes.  
18 Despite knowing that such changes could help protect water quality without the high capital project costs  
19 identified by the models, these non-structural strategies are difficult to project into the future given perceptions  
20 of conflict between growth management and stormwater management. It is difficult for stormwater managers  
21 to cross this boundary of authority and responsibility as part of an exercise required by the MS4 permit.

### 22 *What to do in the next permit*

23 Ecology received early recommendations on the approach for future stormwater planning requirements.  
24 Ecology agrees with many of these recommendations, including developing a planning requirement that applies  
25 to both Phase I and Phase II cities and counties. Ecology also agrees with the recommendation against including  
26 a jurisdiction-specific modeling exercise similar to the 2013 requirement for the Phase I counties.

27 The recommended objectives include identification of prioritized sub-watershed (basins or catchments) based  
28 on scientific information related to receiving water and other watershed characteristics. Since the 2013 permit  
29 was issued, new guidance associated with stormwater planning was published:

- 30 • [Building Cities in the Rain](#), (Department of Commerce 2016),
- 31 • [Watershed Characterization](#) (Ecology 2016), and
- 32 • [Development of a Stormwater Control Transfer Program](#) (Ecology 2016).

33 These guidance documents provide technical frameworks upon which to prioritize sub-basins or catchments and  
34 potentially direct stormwater improvements. For the 2019 permit, Ecology proposes a stormwater planning  
35 effort by both Phase I and Phase II permittees that is focused on the needs of local receiving waters. Knowledge  
36 of receiving waters is the first step in helping to guide stormwater program decision-making and  
37 implementation planning based on what the receiving water needs in order to restore/maintain beneficial uses.

### 38 *Connection to other areas of the permit*

39 Many jurisdictions already have various types of stormwater or watershed plans based partly on stormwater  
40 infrastructure and/or receiving water needs. A long-term MS4 planning requirement can enhance these plans  
41 and create tailored stormwater management implementation strategies based on local receiving water needs.  
42 Beyond stormwater facility retrofits and land conservation planning, jurisdictions' Stormwater Management

1 Programs (SWMPs) can include tailored strategies such as focused source control, education and outreach, or  
2 maintenance efforts (*e.g.*, whole system cleaning, or enhanced street sweeping in targeted areas).

### 3 II. Purpose and intent

4 The purpose of long-term MS4 planning is the protection and restoration of the beneficial uses of receiving  
5 waters. To meet this purpose, the permit intends to support a prioritization and planning process that results in  
6 targeted investments in BMPs and capital actions that contribute to preventing and reducing impacts to  
7 receiving waters. Ecology recognizes that many receiving water impairments are tied to a broader set of  
8 pressures/sources than just stormwater. This planning should put stormwater in a broader context with other  
9 actions needed to protect and restore beneficial uses.

### 10 *Objective*

11 The proposed initiation of a long-term MS4 planning requirement will help permittees make informed decisions  
12 about how and when to address existing and anticipated flow and water quality problems by:

- 13 1. Developing an inventory of basins all or partially inside your jurisdictional boundaries,
- 14 2. Using existing information to complete a prioritization of your basins, and assessing data gaps,
- 15 3. Identifying catchment areas for planning within priority basins, and
- 16 4. Identifying specific approaches to apply within the catchment areas.

### 17 III. Approach

18 Permittees will use local information related to receiving waters and contributing area conditions to prioritize  
19 basins (approximately 1-10 square miles in area) for planning. Next, each permittee will identify catchment  
20 areas (up to approximately 600 acres in area) for planning a tailored set of strategies or actions to protect and  
21 improve water quality for the Permittee's highest priority basins. The plan developed for the catchment areas  
22 will include consideration of the following MS4 and complementary strategies at a minimum: capital projects  
23 including regional facilities; land acquisition and/or conservation easements; land use or zoning code  
24 adjustments; new critical area designations; protected, enhanced, or restored riparian buffers; enhanced MS4  
25 maintenance; education and outreach.

### 26 *Methods/procedure for identifying and characterizing basins*

- 27 1. Convene an interdisciplinary team to conduct and coordinate this effort. Team make-up should include  
28 representatives from the jurisdiction's stormwater program, long-term planning, transportation, parks and  
29 recreation, and scientific and technical experts.
  - 30 a. This team will be used to coordinate the planning effort across various departments, compile  
31 existing information, refine initial prioritization results, prepare plan, and evaluate the process  
32 and implementation of the plan as an ongoing task.
- 33 2. Delineate basin boundaries for all receiving waters in your jurisdiction with approximately between 1-10  
34 square mile total watershed areas (including contributing areas that lie outside your jurisdiction). Phase I  
35 counties will limit this exercise to the Puget Lowland areas of their jurisdictions.
  - 36 a. Jurisdictions in Puget Sound may use the Watershed Characterization project basin delineation  
37 boundaries as a starting point. If needed, correct the existing basin delineation.
  - 38 b. Assign a name and unique identification number to each basin (or use the name and unique  
39 identification number assigned by the Watershed Characterization project). The name should  
40 reflect the receiving water.
- 41 3. Provide an interim report with the following information for each basin:
  - 42 a. The percentage of the basin that lies inside your jurisdiction's boundaries.
  - 43 b. The other jurisdictions that share the basin.

- 1 c. The total percent impervious area in the basin.
- 2 i. You may calculate the effective impervious surface if you have the information readily
- 3 available to do so.
- 4 d. Any existing planning documents upon which you might consider building a long-term MS4 plan.
- 5 4. For basins in which you have at least 10% of the total watershed area, or in which you are partnering with
- 6 another jurisdiction on an existing plan for the receiving water body:
- 7 a. Compile existing information to inform understanding of receiving water condition and/or any
- 8 impairments to beneficial uses. Include all of the information needed for the prioritization
- 9 process spelled out in the [Building Cities in the Rain guidance document \(2016\)](#).
- 10 b. Conduct a qualitative (or quantitative) assessment of each receiving water. Identify any data
- 11 gaps and develop a strategy to address data needs.
- 12 5. Deliverable in year TBD (to be determined) of permit: watershed inventory with key characteristics of each
- 13 basin and, if applicable, GIS coverage with your refined basin delineation(s)

#### 14 *Methods/procedure for prioritizing basins*

15 Use a prioritization process equivalent to that found in the *Building Cities in the Rain* guidance document and/or

16 in the Stormwater Control Transfer guidance to generate a prioritized ranking for each of the basins. The highest

17 priority basins are expected to benefit more quickly as a result of stormwater improvements (including those

18 where habitat improvements are also needed). This prioritization will be based on the following principles:

- 19 1. For each of these basins, identify whether the receiving water or habitat is impacted (needs recovery or
- 20 restoration) or is high quality (needs protection).
- 21 2. Give highest priority to watersheds in need of protection.
- 22 a. Give priority to receiving waters that show low to moderate levels of impairment (e.g., as
- 23 assessed via water quality data, B-IBI scores, habitat surveys).
- 24 b. Give a higher priority to watersheds where your municipality can exert a greater influence (e.g.,
- 25 the majority of the watershed is within the jurisdiction, interlocal agreements are in place or
- 26 possible).
- 27 c. Give higher priority to where regional efforts are also focused.
- 28 3. Deliverable in year TBD of permit: watershed inventory with prioritization and ranking

#### 29 *Approach/methods for catchment area planning*

30 Permittees will develop a long-term MS4 plan for the catchment areas (receiving water body subbasins

31 approximately 400-600 acres in size) which they identify in their priority basins. The plans must consider

32 including an appropriate combination of: capital projects; regional facilities; land acquisition and/or

33 conservation easements; land use or zoning code adjustments; new critical area designations; protected,

34 enhanced, or restored riparian buffers; enhanced maintenance; and education and outreach that the permittee

35 either has capacity to implement or can acquire the capacity to implement.

36 Ecology acknowledges that many permittees have already done this, or something similar. Permittees are

37 encouraged to use and/or build on prior plans to accomplish these goals and fulfill this permit requirement.

- 38 1. Share the results of your prioritization process and engage your interdisciplinary team in identifying which
- 39 catchment areas will be your focus for long-term MS4 planning.
- 40 a. Include public/citizen representation and involvement in this process.
- 41 2. For TBD of your top priority basins, identify TBD catchment areas for planning.
- 42 3. Focus primarily on identifying actions that are most likely to improve hydrologic and water quality
- 43 conditions.

- 1 a. As noted above, consider the following MS4 and complementary strategies at a minimum:  
2 capital projects including regional facilities; land acquisition and/or conservation easements;  
3 land use or zoning code adjustments; new critical area designations; protected, enhanced, or  
4 restored riparian buffers; enhanced MS4 maintenance; education and outreach.
- 5 b. Habitat improvements such as fish barrier removal, increased hydraulic complexity may also be  
6 recommended as appropriate but are not a required element of a long-term MS4 plan intended  
7 to develop basin-specific stormwater strategies.
- 8 c. For recovery/restoration, identify strategies to decrease stormwater inputs and impacts to  
9 receiving waters. For protection, develop a strategy with projects and actions to maintain  
10 beneficial uses and habitat conditions in the receiving waters. Identify both short-term and long-  
11 term actions by conducting a guided assessment of BMPs based on what the receiving water  
12 needs: is your SWMP in this catchment adequate as-is, do some BMPs need to be focused,  
13 targeted, and/or added to provide what the receiving water needs to meet or recover beneficial  
14 uses?
- 15 d. As is the case for TMDLs, the BMPs chosen for long-term MS4 planning must be effective,  
16 defensible, and specific. This planning process can take place at a variety of levels of technical  
17 certainty. An alternative scenarios analysis or even best professional judgment based on  
18 applying lessons learned elsewhere to your MS4 and local receiving waters may be both  
19 adequate and appropriate for this exercise. More rigorous exercises such as the [Development of](#)  
20 [a Stormwater Control Transfer Program](#) (Ecology 2016) might be needed in other situations and  
21 would be required to get credit for other changes to your SWMP.
- 22 e. Consider all types of permit-required actions in a more targeted or focused manner: catch basin  
23 cleaning, stormwater facility maintenance, IDDE screening, education and outreach, new and  
24 redevelopment, mapping, source control inspections, structural stormwater controls.
- 25 f. Consider additional actions to achieve the goal of protecting or recovering the receiving water:  
26 enhanced system maintenance and cleaning, regional facilities, designating additional critical  
27 areas and/or riparian buffers. Identify where build-out at current or proposed zoning will not be  
28 adequately mitigated by stormwater facilities or other structural improvements. Integrate  
29 stormwater planning with Growth Management Act planning and other related/associated  
30 planning efforts. Address additional permit objectives for stormwater management where  
31 appropriate and practicable.
- 32 4. Conduct a public review process and have discussions with planning officials throughout the process.
- 33 5. Develop an effectiveness assessment to provide feedback on the implementation efforts.
- 34 6. Deliverable in year TBD of permit: proposed plan (including rationale for selected BMPs/actions) and  
35 estimated budget/funding approach.