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February 6, 2015

EXHIBIT C

Nancy Ahern, Director
Utility System Management Branch
Seattle Public Utilities
PO Box 34018
Seattle, WA 98124-4018

RE: Phase I Municipal Stormwater Permit (WAR04-4503)
Ecology Comments on Draft (4/23/14) Ordinance and Technical Standards for Runoff Controls for New and Redevelopment

Dear Ms. Ahern:

The Department of Ecology (Ecology) has completed its review of the City of Seattle's draft Ordinance and Technical Standards, dated April 23, 2014, under the Phase I Municipal Stormwater Permit (Permit). Detailed comments are attached to this letter and constitute Ecology's "written response" per the Permit's Special Condition S5.C.5.a.iii, paragraph 3.

Also in accordance with Special Condition S5.C.5.a.iii, Ecology has calculated Seattle's deadline for adoption of the programs required under S5.C.5.a and S5.C.5.b to be January 15, 2016. This date adds 199 calendar days to the permit-specified deadline for adoption to accommodate the fact that Ecology's written response was provided 289 calendar days following April 23, 2014 (the date Ecology received your submittal).

We look forward to discussing the comments and questions regarding your submittal in order to resolve issues and arrive at an approvable ordinance and director's rule package. Please contact me at (425) 649-7223 or by email at rmcc461@ecy.wa.gov if you have questions.

Sincerely,

Rachel McCrea

Rachel McCrea
Municipal Stormwater Specialist & Lead Water Quality Planner for the Lower Duwamish

cc: Kate Rhoads, Municipal Stormwater Specialist, Seattle Public Utilities (electronic)
Sherell Ehlers, Stormwater Policy Advisory, Seattle Public Utilities (electronic)
Doug Howie, Stormwater Engineer, Ecology HQ
Permit file

CONTENTS

SEATTLE MUNICIPAL CODE CHAPTER 22.800

GENERAL COMMENTS

APPLICABILITY TO GRADING/LAND DISTURBING ACTIVITIES

Changes at 22.800.030.A; also page 69, lines 38-39; minor edits throughout regarding grading – Confirm applicability of stormwater code to land disturbing activities (i.e., grading). SMC 22.170 contains grading permit thresholds; please provide for verification.

DISTINGUISHING BETWEEN THE MS4 AND RECEIVING WATERS

Drainage system vs. stormwater system (edit at 22.800.040.A.6.c, pg 5, line 16 and throughout definitions). Ecology is concerned how numerous terms are used when you need to distinguish between the MS4, a private stormwater system and the receiving waters. See below.

- "Drainage system" includes MS4 and receiving waters.
- "Drainage water" is what is allowed in a stormwater system (stormwater and allowed discharges)
- "public drainage system" is the drainage system owned or used by Seattle (but includes receiving waters)
- "informal drainage system" is undefined (presumably includes receiving waters)
- "private drainage system" is undefined (presumably includes receiving waters)
- "Public storm drain" is wholly or partially piped, owned or operated by city, designed to carry only drainage water. Unclear if this includes receiving waters.
- Use in 22.802.020 B&C (IDDE) suggests receiving waters and drainage system are distinct. However the definitions do not clearly separate the two.
- "Watercourse" is the route surface waters flow not including "designated receiving waters." Surface waters are not defined. Do they include drainage water as well as receiving water, as the definition implies (i.e., ditches)?

CONSIDERATIONS FOR DUWAMISH SOURCE CONTROL

22.800.040.A.4 & 5 present opportunities for LDW source control. Consider how they factor into the Seattle source control strategy.

22.800.050 Potentially Hazardous Locations – Consider whether B would include sites/buildings where TSCA level PCBs are present.

CHANGES TO FINAL PROJECT DURING CONSTRUCTION

22.800.040.B.3 – Ensure a documented process is in place for filing such changes with the Director and incorporating into GIS? Refer to a related EPA Audit finding.

ROADWAY PROJECT EXCEPTION FOR "SEVERE CONSTRUCTION FEASIBILITY HARDSHIP"

22.800.040.C.1.d (pages 6 & 7) introduce a proposal for a jurisdiction-wide exception associated with roadway project construction conditions. Ecology does not approve this jurisdiction-wide exception.

However we acknowledge that you are trying to solve specific problems that may be better solved in other provisions. Detailed concerns, questions, and clarifications are provided below.

- "severe construction feasibility hardship" is not defined. The City has verbally explained that this is intended for technical feasibility issues, not economics.
- It is not clear how one would "weigh" a severe construction feasibility hardship against the "requirement's benefits."
- The proposed exceptions would be subject to public notice and review at C.6.
- The City has explained verbally that "infrastructure limitations" refers to situations where facilities would interfere with or be located in proximity to existing major utility lines; and that "hydraulic limitations" refers to a lack of hydraulic head for discharges from underground vaults (and thus the installation of a pump in the roadway).
- The cited WSDOT HRM Appendix 2-A describes a process to be followed. It is written in a guidance "consider" format and refers to processes that are only established in the WSDOT program. Such guidance is not relevant or appropriate for a city or county MS4 permittee.
- The City verbally explained that other existing flexibilities (for Integrated Drainage Plan, fee-in-lieu, and off-site mitigation (22.800.080.E, F and G.)) would be pursued first, prior to use of the proposed exception.
- Regarding the location in proximity to existing major utility lines in rights-of-way: Ecology has approved an approach in the Highway Runoff Manual to allow for the mitigation/management of this surface area and type in an alternative location as close to the project location as possible. This is similar to Seattle's off-site mitigation provision (22.800.080.G).

APPLICABILITY OF REQUIREMENTS TO OLDER PROJECTS

22.800.070.A.2 – Explain why this section waives the new MR5 only when the funded public project complies with the old GSI requirement.

22.800.100.C – Confirm definition of "permit application" is consistent with the Phase I Permit's S5.C.5a.iii, footnote 1.

DEFINITIONS: 22.801

Aquatic life use – This is being introduced due to the enhanced treatment requirement language associated with fresh water discharges. It is a much more limited definition than that in WAC 173-201A, which defines fresh and marine waters, and surface waters of the state. Because Seattle's definition is not consistent with WAC 173-201A, and to avoid future confusion, suggest including a caveat clause, such as "for the purposes of this section" in this definition.

Arterial – Definition references Section 11.18.010. Please provide this reference.

Capacity constrained system – Confirm this definition works properly. What is the "informal drainage system" (term not defined)?

Compaction – is out of alphabetical order.

Discharge point – This definition makes sense in this code. Use of the modified Phase I Permit definition is not required.

Green Stormwater Infrastructure = While this term and definition parallel "LID BMPs", infiltration trenches, dry wells, and perforated stub-out connections are not LID BMPs.

Illicit connection – Uses the term "public drainage system" in lieu of MS4. This is an example of the potential problem with Seattle's definition for "drainage system".

Impervious surface, **pervious surface**, and **pollution generating pervious and impervious surfaces** – Seattle has proposed to not use Ecology's "hard surface" term for project threshold evaluation requirements. However, Seattle's proposal is internally inconsistent and confusing. Ecology recommends following the "hard surface" approach per Appendix 1 of the Permit.

- Seattle's "Impervious surface" definition adds some pervious surfaces: permeable paving, vegetated roofs and areas with underdrains (i.e., playfields).
- However, it is the definition of "pollution generating pervious surfaces" that include permeable pavement subject to vehicle use and sports fields (natural and artificial turf).
- Related note re: "areas with underdrains (i.e., playfields") – consider clarification that this is not the same as infiltrating bioretention with underdrains.

Large Project – Confirm how this term is used. Per 2008/2009 code work, this term is used to support regulation of piecemealing, and dewatering controls for capacity in downgradient system. Confirm this term is not used for stormwater code thresholds. Same for **small project**.

Maximum extent feasible – Is this term now used in very specific ways that are retained from the previous "GSI to the MEF" approach? It would seem the phrase should be unused now that we have explicit infeasibility criteria.

Nutrient-critical receiving water – Explain what "as prescribed in rules promulgated by the director of SPU" means. Ecology suggests referring to CWA 305(b) list. The previously approved definition was acceptable. What problem is this change trying to solve?

Receiving water – Consider a partial update of this definition per the modified Phase I Permit (excluding "to which an MS4 discharges.")

Sidewalk project - The word "cannot" in the sidewalk project definition should be "can."

Missing definitions: rainwater harvesting, detention cisterns, infiltrating bioretention, permeable pavement surfaces, permeable pavement facilities

Clarifying receiving water types: Ecology is concerned that the City's approach to categorizing receiving waters is not clear and is further confused by the City's "drainage system"-related terms (see General Comment). Suggest reducing the complexity and/or the sheer number of different terms where possible.

- Designated receiving water (not subject to flow control)
- Flow critical receiving water (not a designated receiving water)
- Listed Creek Basins (defined page 24, lines 8-13) – Are these also flow critical receiving waters?
- Non listed creek basins (undefined creeks otherwise not listed) – Are these also flow critical receiving waters?
- Perhaps the definitions of Listed and NonListed creek basins should explain the purpose of calling them out (i.e., identifies the flow control target to be met in these flow critical receiving waters)?
- Non-flow control basin (used in MR5 list; not included in definitions) discharges to a designated receiving water.
- Projects discharging to a wetland, creek, public combined sewer, small lake or capacity constrained system basins (used in MR5 list).

22.802.030 Permissible Discharges

Page 34, line 28 adds "washing or rinsing of potable water storage reservoirs." BMPs are necessary to ensure nothing but water is used and you remove settled solids and chlorine prior to discharge to the MS4.

Page 34, lines 34-42: Add prohibition for swimming pool cleaning wastewater and filter backwash.

Page 35, line 11 – Refers to a "stormwater pollution prevention plan" but the permit does not use the word "stormwater" here in order to accommodate that some potentially allowable discharges are not stormwater.

Page 35, lines 36 & 37: As a reminder, discharges from lawn watering and other irrigation runoff must be minimized through public education activities and water conservation efforts.

Minimum Requirement Thresholds

22.805.020 – MRs for All Projects

Page 42, line 24 – Odd comma after "and all trees, and drainage courses…" Delete comma?

Page 45, line 6 – Refer to the Permit Appendix 1 for a clarification that the on-site treatment system must prevent a discharge to surface water (such as a closed loop recirc system or upland application). As written, SMC appears to allow discharge of treated wheel wash water. Not approvable.

Page 46, lines 38-43 – Install Permanent Flow Control and Water Quality Facilities. What is the purpose of this section? Should it also include the new citation to MR5 onsite requirements? How does one know if they are required to comply? Note that E (soil quality and depth BMP) and F (GSI to the MEF) were deleted (page 47). Both referred to old MR5 requirements. Neither were replaced in this section. Soil quality and depth requirement now located in 22.805.070.B2.

22.805.030 Threshold Summary for Single Family Residential Projects

Applies MR5 to SFR projects; SFR projects defined to not trigger MRs 6 & 7. OK.

22.805.040 Threshold Summary for Trail & Sidewalk Projects

Applies MR5 to trail and sidewalk projects. Seattle proposes that a trail/sidewalk project would not have to do MR 6, 7 or 8. Ecology considers this a jurisdiction-wide exception under Section 6 of Appendix 1 of the Permit. This is generally approvable, pending resolution of related comments. Rationale considered by Ecology includes:

- Trail and sidewalk projects are linear and Ecology expects they would have multiple threshold discharge areas (TDA) over the length of the project. Seattle does not use the TDA concept in threshold evaluations for constructing drainage facilities.
- Trails are not classified as streets, and a trail project does not contain PGIS.
- Sidewalk Projects are defined to result in less than 5,000 sf of new + replaced impervious surface in the roadway. Sidewalks themselves are not "in the roadway" but associated structures such as ADA ramps do require some roadway replacement.
- Sidewalks are not pollution generating.
- The definition of Roadway includes the parking strip (PGIS) and gutter where there is a curb, but not the shoulder where there is no curb.
- Increasing nonmotorized transportation in this dense urban environment by improving or providing trail and sidewalk infrastructure should have a net environmental benefit, reducing stormwater pollutants as vehicle trips and car habitat are reduced.

22.805.050 Threshold Summary for Parcel Projects:

- A. Applies MR5 to parcel based projects. Confirm the application of BMP T5.13 to all projects.
- B.1 Applies MR8 (wetlands) thresholds. Error at 22.805.050.B.1.c: Ecology does not delete the word "native" from the 2.5 acre conversion threshold.
- B.2 Applies MR7 in Listed Creek Basins (forested flow control standard)
    - B.2.a New Development (forested flow control standard):
        - *Effective* impervious surface threshold of 10,000 sf not used; City uses 10,000 new plus replaced impervious surface threshold. Unclear whether "effective" is intentionally left out. See below.
        - Error at 22.805.050.B.2.a.3: Ecology does not delete the word "native" from the 2.5 acre conversion threshold.
        - Update 22.805.050.B.2.a.4 per Appendix 1 of the Permit (or explain why different requirement is needed). Include 15 minute timestep details and other specificity provided in Appendix 1 of the Permit. It is also inconsistent to see use of *effective* impervious surface here but not elsewhere. Clarify City's intent regarding use of "effective" surfaces.
    - B.2.b Redevelopment (pasture flow control standard) at 2,000 sf new + replaced (no additional thresholds). Ecology has previously approved this provision based on the following rationale:
        - Seattle is requiring a flow control standard based on pasture conditions, rather than existing conditions, for all areas that would, under the Permit's requirements, only have to meet a standard based on existing conditions.

Additionally, Seattle's MS4 area is predominantly in non-listed creek basins, or those areas that were at least 40% impervious in 1985. Therefore, flow controls in total are expected to be equivalent.

- B.3 Applies MR7 in NonListed Creek Basins (pasture flow control standard).
    - B.3.a if the existing land cover is forest, use forested flow control standard:
        - *Effective* impervious surface threshold of 10,000 sf not used; City uses 10,000 new plus replaced impervious surface threshold. Unclear whether "effective" is intentionally left out. See below.
        - Ecology does not delete the word "native" from the 2.5 acre conversion threshold.
        - Update 22.805.050.B.3.a.4 per Appendix 1 of the Permit (or explain why different requirement is needed). Include 15 minute timestep details and other specificity provided in Appendix 1 of the Permit. It is also inconsistent to see use of *effective* impervious surface here but not elsewhere. Clarify City's intent regarding use of "effective" surfaces.
    - B.3.b use pasture flow control standard at 2,000 sf new + replaced (no additional thresholds). Note that use of a pasture-based standard in this requirement is a necessary component of Seattle's program equivalency.

22.805.060 THRESHOLD SUMMARY FOR ROADWAY PROJECTS:

- A. Applies MR5 to roadway projects. Confirm the application of BMP T5.13 to all projects.
- B.1 Applies MR8 (wetlands) thresholds. Error at 22.805.060.B.1.c: Ecology does not delete the word "native" from the 2.5 acre conversion threshold.
- B.2 Applies MR7 in Listed Creek Basins (forested flow control standard)
    - B.2.a New Development (forested flow control standard):
        - *Effective* impervious surface threshold of 10,000 sf not used; City uses 10,000 new plus replaced impervious surface threshold. Unclear why desire to be different here.
        - Ecology does not delete the word "native" from the 2.5 acre conversion threshold.
        - Update 22.805.060.B.2.a.4 per Appendix 1 of the Permit (or explain why different requirement is needed). Include 15 minute timestep details and other specificity provided in Appendix 1 of the Permit. It is also inconsistent to see use of *effective* impervious surface here but not elsewhere. Clarify City's intent regarding use of "effective" surfaces.
    - B.2.b Redevelopment (pasture flow control standard) at 10,000 sf new + replaced impervious surfaces (not using effective impervious surfaces).
        - Seattle is requiring a flow control standard based on pasture conditions, rather than existing conditions, for all areas that would, under the Permit's requirements, only have to meet a standard based on existing conditions. Additionally, Seattle's MS4 area is predominantly in non-listed creek basins, or

those areas that were at least 40% impervious in 1985. Therefore, flow controls in total are expected to be equivalent.

- B.3 Applies MR7 in NonListed Creek Basins (pasture flow control standard)
    - B.3.a if the existing land cover is forest, use forested flow control standard:
        - *Effective* impervious surface threshold of 10,000 sf not used; City uses 10,000 new plus replaced impervious surface threshold. Unclear why desire to be different here.
        - Ecology does not delete the word "native" from the 2.5 acre conversion threshold.
        - Update 22.805.060.B.3.a.4 per Appendix 1 of the Permit (or explain why different requirement is needed). Include 15 minute timestep details and other specificity provided in Appendix 1 of the Permit. It is also inconsistent to see use of *effective* impervious surface here but not elsewhere. Clarify City's intent regarding use of "effective" surfaces.
    - B.3.b use pasture flow control standard at 10,000 sf new + replaced (no additional thresholds). Note that use of a pasture-based standard in this requirement is a necessary component of Seattle's program equivalency. This results in flow control to a higher standard based on a simple threshold evaluation (with no additional 0.1 cfs calculation or initial roadway project cost and size threshold considerations).
- C Applies MR6 as follows:
    - C.1 New Development at 5,000 sf new + replaced PGIS, or
    - C.2 new PGIS at 5,000 and result is 50% or more expansion within project site, or
    - C.3 new + replaced PGPS at ¾ acre or more
    - Note that the HRM contains language about project credits for existing surfaces that receive treatment to standards because runoff is commingled with the new and/or replaced surfaces in the project site that are required to be treated.

22.805.070 On-Site Stormwater Management Requirements

- B. A statement is included ("…installed…to receive flows from that portion of the site being developed…") that implies facility sizing only looks at the new/replaced project area, not any existing surfaces that may run onto the new/replaced project area. Like for treatment, an on-site BMP must be sized to accommodate all surface area draining to the BMP (including existing if it cannot be separated from the flows from the new or replaced surfaces.)
- B.1 requires tree retention (4" diameter) to the MEF. The 2014 SWMMWW indicates a 6" minimum diameter in order to receive modeling credit.
- B.2 requires soil quality and depth BMP.
- C provides for use of the LID Performance standard in lieu of the on-site lists as an option for projects. Because all of Seattle is within a UGA, the Permit does not require use of the LID Performance Standard; it is acceptable as an option.
    - C.1.a New development in Listed Creek Basins (forested flow control standard).

- C.2.a For all other projects, the LID Performance Standard is expressed as a pasture-based standard, consistent with the approvable application of flow control standards under MR#7. This ("pre-developed pasture condition for the range of pre-developed discharge rates between the 1 percent and 10 percent exceedance values") is a technically appropriate standard to express as the LID performance standard for basins where it is allowable to match existing conditions.

D.1.a includes a phrase: "A BMP is considered infeasible…if the minimum design criteria for the BMP cannot be met for the project in the space remaining on the project site." This is generally not acceptable. The only explicit allowance in the SWWMM for "insufficient space" is for bioretention on redevelopment sites (see infeasibility criteria for BMP T7.30). There is also some relevance for dispersion. This proposed "space remaining" criterion, as well as the Director's Rule allowance for as much as 50% reduction in size of pre-sized bioretention facilities if area isn't available (page 5-87), is allowable only for redevelopment projects.

D.1.b refers to competing needs. Subsection 2 includes a reference to the Permit's response to comments document. Rather than this reference, specify how Seattle will implement this reference with references instead to Seattle-specific special zoning district criteria. At Subsection 5, clarify the SMP reference.

ONSITE BMP LISTS

Ecology is reviewing Seattle's proposed on-site list structure under the jurisdiction-wide exception provision in the Permit's Appendix 1, Section 6. Pending resolution of all related comments, Ecology is considering the following lines of evidence and/or conditions in our review:

- Whether or not modeling using Seattle's design criteria and project types shows equivalent performance within each on-site list category. For BMPs in Category 2, Seattle needs to show equivalent performance, which can be done by showing how each GSI BMP meets the LID Performance Standard.
  - For parcel and road projects, conduct permeable pavement 2-5% slope modeling according to SWMMWW guidance. The standard detail needs a check dam, or other underground flow impediment, to slow flows on a slope. Using 50% impervious/50% lawn is not the current modeling approach.
- All BMPs required for evaluation in any given category must be evaluated (and selected where feasible) before moving on to the next category. This must be clearly described. The single sentence in D.1 ("Consider all GSI BMPs in a category for feasibility before moving on to each successive category as necessary.") should be emphasized in the Director's Rule and list footnotes.
- Sizing criteria, including the pre-sized BMPs, should take into account both impervious and pervious surfaces which drain to it. This is not directly addressed in Seattle's proposal.
- Broad conditional note: Application of Seattle's modified on-site lists are generally for redevelopment projects only, such as is typical of Seattle lot sizes and density; not new development projects.

GSI BMPs Category 1

- Infiltration trenches and dry wells – The SWMMWW allows infiltration trenches for roof runoff and not other surfaces. To qualify for Category 1, their evaluation is required for R (roof runoff) only. Change the right hand column to R only and remove the S.

GSI BMPs Category 2

- Rainwater Harvesting – Ecology evaluated SPU's claims that the design criteria for rainwater harvesting ensures that this BMP can meet the LID performance standard. Ecology does not believe that it is representative to use 10-years of rainfall as if there is no overflow from the cistern during this time. Uses for the water in the cistern are "irrigation, outdoor cleaning, and indoor plumbing". The amounts for irrigation and outdoor washing are not limited in any way. In order to retain this GSI BMP in Category 2, wet season (Oct to May) uses must be limited to indoor plumbing, and dry-season irrigation, should water be available, should be rate limited by gallons per acre per day.
- Rain Gardens – Ecology does not approve Seattle's proposal to restrict the use of rain gardens at .6 minimum infiltration rate. Rain gardens, if between .3 and .6 infiltration rate, could be designed similar to the standard section for infiltrating bioretention with an underdrain, but without the engineered soil.
- Infiltrating bioretention – Ecology does not generally agree that bioretention and permeable pavement perform equally well, thus Appendix 1 of the Phase I Permit lists permeable pavement before bioretention in On-site List #2. Permeable pavement surfaces should perform better than bioretention. Even 15% better is sufficient to warrant priority consideration. Provide updated modeling for evaluation. Specify minimum sizing criteria for bioretention facilities so that the facility (if used for the list approach) meets the LID performance criteria.
- Permeable Pavement Facilities – The SWMMWW allows for a 2:1 ratio of drainage area to permeable pavement surface. Seattle's proposal accepts up to 5:1 for NPGIS and 3:1 for PGIS. Provide updated modeling for evaluation showing how the increased drainage area will still meet the LID performance standard.

GSI BMPs Category 3

- Noninfiltrating Bioretention and Vegetated Roofs – Ecology would prefer these in category 4, but will approve them in category 3 as they are generally similar to dispersion.
- Single Family Residential Cisterns – Given limited hydrologic performance, single family residential cisterns should be in category 4.

Table 805.1 SFR list

- Application is the same in all basins. This results in greater application of on-site BMPs since flow control exempt projects (discharging to designated receiving water) are not excluded. This is a necessary component of Seattle's program equivalency.
- Footnote 'a' re: 5,000 sf infiltrating on site is acceptable for SFR project rain gardens.

Table 805.2 Trail list

- List distinguishes between projects that discharge to flow control exempt/designated receiving water bodies, which is allowed under the Permit's Appendix 1.
- Footnote 'c' sets a minimum permeable pavement size in the ROW at 2,000 sf contiguous. Ecology is concerned that this limits the application of permeable pavement for sidewalks.
- Footnote 'b' restricts the use of bioretention if the contributing area is smaller than what would result in a 500 sf cell top area. Ecology does not approve this limitation on the use of bioretention. Instead, Ecology suggests setting a minimum size for a bioretention facility, resulting in the installation of BMPs that are potentially oversized for the area draining to it. Additionally, since Seattle is using pre-sized BMPs based solely on impervious surfaces, Ecology believes it is appropriate to potentially oversize a facility in part to accommodate the runoff from pervious surfaces as well.

Table 805.3 Parcel list

- Footnotes a and b do not appear to be used in the table.
- The term "non-flow control basin" is not in the definitions. Suggest fixing the terms and definitions in that section, not footnotes in a table. Also looks like should be relevant to table 805.2. Isn't a "non-flow control basin" the same as a basin discharging to a designated receiving water?

Table 805.4 Roadway list

- Footnote a should refer to infiltrating on the "project site."
- Footnote 'b' restricts the use of bioretention if the contributing area is smaller than what would result in a 500 sf cell top area. Ecology does not approve this limitation on the use of bioretention. Instead, Ecology suggests setting a minimum size for a bioretention facility, resulting in the installation of BMPs that are potentially oversized for the area draining to it. Additionally, since Seattle is using pre-sized BMPs based solely on impervious surfaces, Ecology believes it is appropriate to potentially oversize a facility in part to accommodate the runoff from pervious surfaces as well.

Historic Preservation and Archaeology laws – This list may be better located in the Director's Rule. The "g" and "h" appear to be incomplete citations.

22.805.080 FLOW CONTROL

B. includes the old GSI to the MEF language. The last sentence may also no longer be appropriate, as GSI is used to meet MR5, not MR7. GSI BMPs may be designed to provide credit to flow control facility sizing, but it is no longer acceptable to rely solely on GSI BMPs to meet flow control requirements.

B.2 & B.3 – The forested and pasture standards written description has changed. Is it appropriate to still refer to the "recurrence interval flow" instead of "peak flow" (now that it uses "discharge durations"

instead of "peak flow rates and flow durations")? Ecology text is "2-year peak flow up to the full 50 year peak flow."

22.805.090 TREATMENT

B. Is it still appropriate to require all projects to use GSI to the MEF to meet treatment requirements? There are no additional thresholds in this section, as there were in 080.B.

B.1.b.2 – Is "2-year recurrence interval" the same as "full 2-year release rate"?

B.5 (lines 27-28) This "or" clause has an odd sentence structure. Should it say "for projects…which use infiltration…"? Also line 30 "or have" is odd; perhaps should be "or with"?

22.807 DRAINAGE REVIEW AND APPLICATION REQUIREMENTS

- Page 70, Line 39; page 72, line 33 – retain "native" here for consistency with Appendix 1 and previous comments. Note too that use of ¾ acre conversion threshold here (line 31) is inconsistent with the definition of Large Project.

VOLUME 1: PROJECT MINIMUM REQUIREMENTS

1. Ensure all final language from code is updated accurately in Volume 1.

2. Page 1-1: Update your references section to the modified 2014 SWMMWW.

3. Page 2-4: Project types 6 (utility) and 7 (road maintenance) are exempt Per SMC 22.800.030. What is the purpose of including these in Vol 1, Chapter 2? None of the Chapter 2 "steps" clearly kick out exempt project types. It is not clear how this Chapter works together with Chapter 4 when the project is exempt.

4. Chapter 3 contains "other minimum requirements" and Chapter 4 contains "project minimum requirements." This language is potentially confusing and may result in a project that fails to consider Chapter 3 requirements. Flow charts in Chapter 4 do not include the Chapter 3 requirements. Suggest improved phrasing/clarity to explain that both Chapters are relevant.

5. The Soil Quality and Depth BMP requirement should be included in Chapter 3 and/or Chapter 4. This is required of all projects over the initial threshold size of 2,000 sf new + replaced or 7,000 sf LDA.

6. Page 4-2, Table in Section 4.3: The table does not distinguish when you can use "Pre-developed Pasture" for a listed basin and/or a non-listed creek basin. Since this is not an optional selection, we suggest the table provide a more thorough explanation.

7. Chapter 4 uses shorthand "FC#1," "FC#2 or Forest," etc. Where are these shorthand abbreviations defined?

8. Chapter 4 updated flow charts will need detailed review and discussion with Ecology to ensure they clearly and accurately reflect the necessary and required thresholds. These draft versions are not entirely accurate. For example:

    - Page 4-3, Figure 4.1B: This diagram does not appear to be consistent with roadway project thresholds. Clarify the 10,000 sf thresholds relative to the Permit's Appendix 1 Figure 3.3 flow chart. For example, you have an "and" in the question so if you have a project with >5,000 sq ft and <10,000 of new plus replaced, the answer is no and it should be yes for >5,000 sq ft. You also have a question about >10,000 new plus replaced later.

9. Page 4-18, Section 4.8: Is it a "close*d*-contour" basin, not "close-contour" basin?

10. Page 5-9, Second bullet above Section 5.2.1: Is there a maximum storm that an engineer should evaluate for discharge from the site? Discharge from the site could occur during a very large storm.

11. Page 8-3: Do you have any Cultural Resources approvals? If you do, you should note it here.

VOLUME 2: CONSTRUCTION STORMWATER CONTROL

1. Page 1: Page 3-2, Table 1a:

    - For Element 1 you need to add Fencing (Ecology BMP C103).
    - We prefer "Ecology" over "DOE"

2. Page 3-4, Table 1a, Element 9: the second BMP E3.25 should be BMP E3.70 (also on Table 1b).

3. Page 3-8, Table 1b, Element 5:

    - BMP C231 is called "Brush Barrier"
    - Why did you not include BMP C251 Construction Stormwater Filtration?

4. Page 4-13: Section 4.1.5, bullets: Consider adding Ecology BMP T5.13 Soil Quality and Depth here

5. Page 4-32, Section 4.2.3.6: In the second bullet, you reference Upland land application of wheel wash water. Note that Ecology plans to remove this from the SWMMWW due to lack of specification and applicability. Consider providing additional guidance.

6. Page 4-44, Section 4.2.10.5: In the fourth bullet add "and/or treatment" between "detention" and "may".

7. Page 4-45, Fourth bullet: If you direct intercepted subsurface water to receiving water, you need to consider it in the flow regime off-site and may limit the runoff flow rate off the site.

8. Page 4-49, Tables 6 and 7: Aren't swale side slopes typically described as H:V and not percent slope?

9. Page 4-50: There should be a maximum Turbidity limit to pass before removing the turbidity curtain in addition to the 6 to 12 hour time.

10. Page 4-64: Table 9 lists "Maximum Average Downslope" as high as 33-percent while the text limits slope to 14-percent. Which is correct?

11. Page 4-76: Use of a Chitosan Enhanced Stormwater Filter system requires approval from Ecology (https://fortress.wa.gov/ecy/publications/summarypages/ecy070258.html).

12. Page 5-3, Section 5.1.1.3: You state, "If the rating is high" in this sentence. What is a "high" rating?

13. Page 5-5: In step 2, you use "ECA". Where do you define "ECA"?

14. Page 5-29: Note at the top of page. We are working on revised text here with the construction permit. We need to confirm this before the final approval of the manual.

15. Page5-36, Last paragraph before Section 5.1.12.4: I think the word "instantaneous" is more appropriate than "simultaneous".

VOLUME 3: PROJECT STORMWATER CONTROL

1. Page 2-8: TAPE also has systems with GULDs for Preliminary Treatment (50% removal of TSS). Would you consider those as part of a treatment train? You identify Proprietary and Emerging Tech. in Figure 3.1.

2. Page 3-7, Step 4: You should reference Step 4b not 4a.

3. Page 3-9, Section 3.3.1, Step 2: You should reference figure 3.1, there is no Figure 3.2 in our copy of the text.

4. Page 3-10: Figure 3.1:

    - You have a box for pre-treatment, but don't discuss this in the text is Section 2.
    - It would be helpful if you put in "Yes" or "No" with the arrows to show what direction you move with an answer.

5. Page 3-11, Section 3.3.1, Step 5: You should reference figure 3.1, there is no Figure 3.2 in our copy of the text.2

6. Page 3-13: You list the Media Filter Drain in the text, but you don't show it as approved in Figure 3.1.

7. Page 3-14:

    - You don't list "Infiltrating Bioretention" in the text, but you identify ii in Figure 3.1.
    - The note on Bioretention seems out of place.

8. Page 4-1: Ecology has reviewed the SPU calculations behind the pre-sized approach for BMPs and has the following concerns:

- The pre-sized on-site tables use the impervious area times the factor to get the size of the BMP. This ignores runoff from pervious surfaces. Ecology believes that pervious surfaces should be included in this calculation in order to properly size the BMP. There may be different ways to accomplish this. The SPU factors are used to calculate the bottom area of a bioretention facility and/or permeable pavement. Ecology's 5% requirement is for the top surface area (area at top of Ponding). This makes it difficult to determine how to deal with the pervious area draining to the BMP. One possibility is to designate a certain percentage of the drainage area as pervious and still use the impervious total to size the BMP, until the pervious surfaces exceed the given percentage, at which time the BMP must be sized specifically for its impervious and pervious drainage areas.

- There are a number of empty cells remaining in the tables in the SPU Director's Rule.

9. Page 4-2, Section 4.1.2.2: Do the BMP sizing factors work for MR #5 as well as #6 and #7? Alternatively, does a designer need to follow the List approach or LID Performance standard in addition?

10. Page 4-3, second full paragraph: We don't understand the text where you use pre-sizing calculations to size a BMP and then you say that you can have an area twice the size of the area used for pre-sizing flow to the facility.

11. Page 4-5, Section 4.2.1: In the on-line BMP text, you should also add text saying velocities must not be high enough to resuspend sediments in the BMP.

12. Page 4-5, Section 4.2.1: Ecology requirement for water quality treatment flow rate for BMPs downstream of detention is the full 2-year release rate. How does this compare with your criteria?

13. Page 5-12, Section 5.2.5.1: Retained trees must have a minimum diameter of 6-inches to receive credit (SWMMWW Vol. V, BMP T5.16, Tree Retention Design Criteria).

14. Page 5-12, Section 5.2.5.2: Ecology does not give credit for trees planted in planter boxes (SWMMWW Vol. V, BMP T5.16, Newly Planted Tree Flow Control Credit).

15. Page 5-42: You have excluded "Permeable Pavement Surfaces" from infiltration facilities and don't require testing for existing soils. Please describe your thinking on this and why Ecology we should accept your decision. Ecology assumes all permeable pavement is an infiltration BMP in some manner. See Table 5.23 as well.

16. Page 5-45, Table 5.7: Change the number to 0.3 in/hr in the table and discuss the ability to use the elevated underdrain system for the 0.3 to 0.6 in/hr condition in the design criteria for bioretention used to meet the list option.

17. Page 15-49, Vertical Setbacks: You are using the vertical separation criteria that Ecology set for Bioretention facilities for all infiltration facilities. Ecology has vertical separation requirements that are larger than these for other infiltration facilities. (See SWMMWW SSC-5 in Vol. III, Section 3.3.7).

18. Page 5-55, last paragraph: You need to include the requirements of (See SWMMWW SSC-7 from Vol. III, Section 3.3.7).

19. Page 5-56, Section 5.4.1.7: We believe the correction factor is not a minimum but a maximum. Correction factors are multiplied times the field infiltration rate and could be lower than 0.5.

20. Page 5-61, Section 5.4.2.3: In the footnote to the table, you use 0.5 in/hr as a threshold for infiltration rate. This is greater than the Ecology number and less than your number listed earlier.

21. Page 5-64, Table 5.12: You appear to base this table on a 0.5 in/hr infiltration rate. Additionally, what is the minimum width of the ditch?

22. Page 5-71, Table 5.15: There is a gap between 5 in/hr and 8 in/hr in this table.

23. Page 5-79, bottom two bullets: You are referencing the wrong Tables, should be 5.17 and 5.18.

24. Page 5-84, Plant Material: Do you have any requirements for plant height and bushiness in R-O-Ws?

25. Page 5-86, Table 5-19: You need to complete the table. There are several other incomplete tables in this volume.

26. Page 5-87: If a designer uses the pre-sized approach, does (s)he also meet MR #5 requirements?

27. Page 5-89, Table 5.21: You use a 6-in/hr infiltration rate for bioretention soil. Ecology uses 6 in/hr or 3 in/hr depending on the size of the area draining to the facility. Ecology has evaluated this and changed the criteria in the SWMMWW. Ecology accepts Seattle's proposal as it is effectively an initial infiltration rate of 12-in/hr and a safety factor of 2.

28. Page 5-93, Figure 5.12 is missing (along with several others in this portion of Volume 3.

29. Page 5-101, Table 5.23: What is the difference between "High" and "Low" slopes?

30. Page 5-101 second paragraph after the table: You mention an "aggregate treatment course" in this place and on page 5-102, you mention a "water quality treatment course". Are these referring to two different things or is there an edit required?

31. Page 5-105:

    - Ecology recommends that you limit the run-on area to no greater than the permeable pavement area i.e. 2:1 ratio of drainage area to permeable pavement area. On page 5-106, you use a 5:1 ratio for NPGIS and 3:1 for PGIS.
    - Complete Figure 5.14 and submit it to Ecology for review.

32. Page 5-110, Water Quality Treatment Course: Do you want to reference Ecology BMP T8-10?

33. Page 5-111, Pre-Sized Approach: Storage volume is greater when the pavement is nearly flat, than when it is sloped. Do you need an adjustment factor for the reduction in storage capacity for a sloped permeable pavement facility?

34. Page 5-112: Your modeling approach does not include use of the permeable pavement element in WWHM 2014.

35. Page 5-119: You reference BMP T7.10. This BMP is in Vol. V and there are no design criteria in this section. The text immediately directs readers to Section 3.3 in Vol. III.

36. Page 5-130: Ecology needs to see how you developed your sizing equation in Table 5.27.

37. Page 5-139: Ecology needs to see references for Table 5.28.

38. Page 5-141, Section 5.6.2: We don't fully understand the reasoning behind Permeable Pavement Surfaces and how you will apply them. You will infiltrate through the material, but they are not infiltration facilities. You describe them as not allowing any run-on, yet you allow 10% run-on. You give credits, but if they don't infiltrate, where does the water go?

39. Page 5-159, Table 5.35: You need to create a special stage-storage curve for detention pipe. You do not mention this in the table.

VOLUME 4: SOURCE CONTROL

1. Page 1-6, Table 1: It is hard to answer the questions in Section 2.1 with a yes or no. Since these are always required, does an applicant need to answer these questions?

2. Page 2-6, Section 2.1.5.2: You should reference the Source Control BMP for berming around potential liquid spill areas.

3. Page 3-11, Section 3.2.1.3: You should indent the last two bullets on the page since they apply to the bullet above them and are not stand-alone.

4. Page 3-47, Section 3.4.3.1: Ecology no longer uses the web reference of "biblio" for our documents. You need to review the references to Ecology document and insert the correct URL. For this document, reference https://fortress.wa.gov/ecy/publications/summarypages/94146.html.

5. Page 3-62, Section 3.6.2: FYI Ecology is revising the document identified in this section (Publication 04-10-031).