

## **Attachment 1: Compiled King County Comments on Phase I Municipal Stormwater Permit, Preliminary Draft Language, May 16th, 2011**

The application of Low Impact Development (LID) and the use of Green Stormwater Infrastructure (GSI) require a complex process of planning, development, operations, maintenance and enforcement. Stepping through the process, these permit requirements create more difficult application and design requirements and will apply to more projects than the previous regulations. This level of complexity will require many more small-project applicants to hire engineers or other professionals to comply and will increase the cost of compliance. It will also require the jurisdictions to develop pools of skilled plan reviewers and site inspectors to ensure that the LID structures are properly designed, installed and protected during construction. It will also require jurisdictions to expand their inspection program and have well trained inspectors to ensure proper operations and maintenance are done on these private facilities and have in place a robust enforcement program to ensure compliance. These new requirements are troubling since many of the long term operational and maintenance needs for effective functioning of LID BMPs are poorly developed or, in some instances, poorly tested for reliability and cost-effective application.

The proposed LID requirements are very aggressive in that Best Management Practices (BMPs) are applied in a redundant fashion without any apparent consideration of what it is going to take to inspect, maintain, and keep the BMPs functioning in perpetuity. They may be feasible to construct and put into operation but are they really feasible to keep operating in the long term given that they will eventually number in the thousands across the landscape? This creates a new body of work for the jurisdictions to ensure the property owners are properly maintaining LID structures and using appropriate source controls that will prevent damage to the structures. The County advocates that Ecology give consideration given to the expectations of programs that jurisdictions will be required to implement such as determining the frequency these BMPs will be inspected; to what standards they will be maintained and at what cost for the homeowners; and, what type and to what level of enforcement jurisdictions will take for non-compliance by private property owners. We recommend that Ecology temper these requirements until these issues are more fully addressed. The permit emphasis should be on moving closer to the desired outcome, i.e., expansion of LID BMPs on the landscape and not on the process which is still in development.

We recommend that Ecology consider a simpler and less aggressive approach of applying one rather than multiple LID BMPs to each developed surface and focusing its strategy for pavement more on rain gardens and bioretention systems that can be inspected and maintained more feasibly and less expensively than permeable pavement. King County has seen from initial results of the Juanita Creek Basin Retrofitting Analysis, that the use of rain gardens/bioretention systems can provide a good level of protection when coupled with conventional duration control and treatment facilities. Inspection and maintenance of permeable pavement and its underlying treatment layer to protect water quality will be difficult if not infeasible from a cost perspective. We recommend that this LID feature only be considered if a rain garden or bioretention system is not feasible; and vegetated

roofs only be considered if roof downspout controls or rain gardens/bio-retention systems are not feasible and, in any event, should not be redundant with these systems.

The apparent goal of these stormwater regulations is for LID to become the default strategy for managing stormwater, with traditional methods/infrastructure used only when LID is unfeasible. Effectively, this model is to move away from large, regional stormwater treatment/storage facilities to many small, distributed facilities (manage the stormwater as close to the source as possible). Where feasible, the emphasis is on infiltrating as much water as possible to minimize runoff and attempt to mimic pre-developed forest conditions. This poses a huge challenge to the region's jurisdictions with questions about LID applicability, function, maintenance, still remaining unresolved.

LID should be considered a critical tool in stormwater management but not the only tool; large storms still need to be controlled with regional facilities, particularly where the underlying soil is glacial till and in highly urbanized older development areas where levels of imperviousness may reach more than 50 percent and landscape level redevelopment options may be completely infeasible. King County would prefer that the upcoming permit include more options for studies and pilot projects to provide both Ecology and the jurisdictions real-world information on how to blend broadly applied LID technology with other stormwater management programs and approaches. We recommend this approach so that some assurance can be developed that jurisdictions know how properly integrate LID concepts into the current Municipal Separate Storm Sewer System (MS4) and that the GSI technology will work on this landscape scale.

There are still significant concerns about various aspects of broad application of LID on the landscape. Issues of major concern are the long-term fate of infiltrated pollutants; source control, operations, maintenance, and inspections in single family residence settings; spill containment and cleanup; the effects of interflow on neighboring structures; and, where these waters daylight. There is also a lack of the use of Cost Benefit Analysis and no Social Equity Analysis. King County strongly supports the effective and appropriate use of LID as part of a comprehensive stormwater management programs and wants to ensure the success of the application of LID in the Puget Sound region.

## **General Comments**

There are numerous references to external documents in both the text of the permit and in Appendix 1. It is difficult to determine what effect the content of these external documents will have on the implementation of the permit as these documents are not yet available for review. Among these documents are the 2012 Stormwater Management Manual for Western Washington; the 2012 Puget Sound Partnership (PSP) code development guidebook; and, the 2007 WSU rain garden handbook, which is currently being updated. In addition, the PSP code development guidebook makes multiple references to the PSP LID technical guidance manual that is also being updated. These manuals, guidebooks, and handbooks presumably contain technical guidance and standards for design, construction, inspection, maintenance, and enforcement. Without

having these available, we cannot determine the cost and effectiveness of this program. The use of yet-to-be-developed external documents to drive permit requirements is an ongoing concern that permittees have faced in past issuances of permits and have encountered the same problems.

The county recommends that terms be used consistently and with complete definitions. The difference between BMPs and facilities is significant; facilities are structures with designed features that can be modeled, and have maintenance standards. BMPs include a much broader range of uses that may or may not have design standards. Another set of terms is Maximum Extent Practicable (MEP) and Maximum Extent Feasible (MEF) that seem to be used interchangeably in this permit. MEP has regulatory standing and is contained within Section 402(p) of the Clean Water Act where MEF is a construct in response to the Pollution Control Hearings Board (PCHB) ruling. We recommend that the permit use MEF when referring to LID requirements.

### **LID – Codes:**

The schedule cited in the draft permit is conditional on an issuance in July of 2012. This means that King County must submit draft enforceable requirements in 18 months. This includes, at a minimum, mandating the inclusion of LID requirements in engineering and street standards; clearing and grading ordinances and standards; parking requirements; individual zoning district bulk and dimension regulations; subdivision standards; landscape and tree standards; building and maintenance standards; and, inspection standards. King County must then achieve equivalency for the King County Surface Water Design Manual, Stormwater Codes and Ordinances and add LID to the above mentioned codes and ordinances within another six months. This is to be done in cooperation with multiple agencies within and outside of King County government and then processed through the County's rule adoption process. As a consequence of the schedule disruption, and uncertainty created due to passage of House Bill 1478 and the probability of appeals; the achievement of the schedule listed in the permit is problematic and unlikely. The time frames are based on the premise that there will be no challenges, appeals, or other legal actions that will slow the process or alter the regulatory requirements for the stormwater LID requirements. As experienced by the Phase I permittees when establishing equivalency for the design manuals, the process and effort is much more than the past and proposed timelines anticipated.

King County recommends that the requirement of including the "parties involved" as part of the annual reporting of this LID requirement be deleted. It adds no value and creates additional paperwork and effort to track who has attended what meeting. The main issue is the end result not the process.

Finally the proposed language requires local jurisdictions to allow Ecology review and approval of local ordinances covering a wide range of topics including engineering and street standards; clearing and grading ordinances; parking requirements; subdivision standards; landscape and tree standards; and, individual zoning district bulk and dimension regulations. This effectively delegates the responsibility of determining the

priority of, and standards for, local jurisdictional authorities such as such as road safety and land use, to Ecology. King County welcomes comments and input but consider the requirement of approval an unacceptable delegation of municipal authority.

There are alternative models for integrating the relationship between land use and stormwater that do not put jurisdictional authorities under the Clean Water Act's municipal NPDES stormwater permit. For example, a regional system of landscape prioritization, and funding of retrofits in identified areas, including urban and rural areas and transportation corridors, based on informed watershed-scale analysis, could, in partnership with local permits and incentive-based land use controls such as re-vegetation, improve current stormwater problems. However, delegation of land use authority to NPDES permits will likely result in appeals and delays in improvements.

### **LID – Site and Subdivision Proposal**

In general, the county finds this approach achievable but not fully supportable as currently proposed. King County does not agree that LID requirements would supersede the Growth Management Act requirements. This statement places stormwater programs in an untenable position.

Implementation of the LID requirements will create a significant increase in cost for public and private owners to determine the feasibility of a site for LID. Several feasibility criteria pertain to exclusion zones from structures such as underground storage tanks, drinking water wells, and septic systems. Complete, accurate, and accessible databases do not exist for all of the features listed, leaving developers and permittees unable to confidently apply these criteria to proposed LID projects. Not only will the county incur additional cost in the permitting and inspection but will probably be called upon to develop accurate databases related to feasibility criteria.

Protection of LID on private property during construction will require more county oversight making construction process more costly – the construction industry already challenges the cost of permitting and the cost of increased oversight will be difficult to attain. The King County Council already has a proviso in effect regarding the cost of permit inspections and making developers meet development requirements.

The county strongly supports Ecology for coming up with the 8% duration control standard as an alternative to the mandatory list to allow flexibility in selection of LID BMPs. Our understanding of this standard from using it in the Juanita Creek Basin Retrofitting Project is that it cannot be met with a conventional flow control facility only. Such a facility would be larger than the site it is mitigating. Therefore, it does force the use of LID BMPs in addition to a standard duration control facility. If Ecology refines its strategy to be more feasible from a maintenance standpoint through the use of rain gardens and bioretention, we would recommend that the 8% duration control standard be revised accordingly.

King County opposes use of the term “hard surface” in place of “impervious surface.” We understand why Ecology is proposing it (i.e., to recognize the use of permeable pavement), but permeable pavement is only permeable as long as it is maintained like a facility. If not maintained, it can be just as impervious as non-permeable pavement. The term “hard surface” is also inconsistent with a vegetated roof, which is actually a soft surface underlain by an impervious surface. We believe the term “hard surface” creates confusion not only for these reasons but because of what most people associate as impervious surface. For example, most people associate roofs and pavement with impervious surface regardless of permeability. They do not recognize the difference between a permeable pavement and non-permeable pavement when they see it on the landscape. Our zoning code uses the term “impervious surface” to limit the maximum coverage of a parcel with impervious-like surfaces for aesthetic reasons. Our (and most municipal) surface water management fee structure uses impervious surface coverage to determine the amount of the fee, which is often measured from aerial photos where permeable pavement looks the same as regular pavement. Although we give discounts in the fee for permeable pavement, we still call it impervious surface because it has to be inspected and maintained to stay permeable. Please do not force us to change “impervious surface” to “hard surface” every where it is mentioned in the county’s codes. This would be an onerous and costly effort for no value added in clarity.

It appears that if no item on the mandatory list is feasible, then the LID requirement is achieved. If this is not true, then Ecology is encouraged to clarify the language to state what is intended. If it is intended that the project must default to the performance standard and utilize other non-listed LID or traditional facilities to meet the standard, then this needs to be stated.

The requirements are unclear as to whether a development’s impervious surface is to be sited to maximize use of LID BMPs or the LID BMPs are maximized around where the impervious surface is sited. King County recommends that the intent be clarified and Ecology use caution not to overstep its authority to regulate land use through the NPDES permit.

An overriding concern has been the long-term cost and effectiveness of the LID BMPs. King County recommends that consideration to be given to what the typical design life of LID BMP’s that are proposed both maintained and not-maintained. King County encourages Ecology to consider phasing in the LID BMP requirements in the next permit so that these and other technical and feasibility standards can be more fully developed.

It is not clear whether Ecology is proposing/encouraging any type of credit for LID BMPs above and beyond the low end of the performance standard (8% of 2-year to 50% of the 2-year) that would impact sizing of facilities to control 50% of 2-year and up. King County does not recommend that significant credits or reliance be given for homeowner-maintained BMPs because of the significant challenges associated with inspecting and compelling maintenance of such BMPs. King County has already encountered such challenges with its Flow Control Best Management Practices (FCBMP) inspection program.

With regard to Section 4.5 as it pertains to public roadways, we recommend permeable pavement not be in the list of required on-site management BMPs that apply to projects subject only to requirements #1-#5. Also, it is recommended that Ecology allow local governments to accept LID performance standard compliance as an option to the specific BMP requirements for all projects required to meet minimum requirements #1-#9.

King County has a general concern about compost standards for bioretention BMP's. Although, much commercially available compost may fall below state standards for metals and other pollutants, the standards themselves may not be protective of aquatic life. We recommend reviewing the compost standards for the purpose of determining if a second set of standards is appropriate and is to be developed for compost used directly in the water courses or in stormwater facilities or BMPs to ensure that the material is protective of aquatic life.

## **Section 8: Feasibility Criteria**

With regard to the feasibility for bioretention and rain gardens based upon native soil saturated hydraulic conductivity less than 0.15 inches/hour, the testing protocols and number of tests are not defined. The determination of Saturated Hydraulic Conductivity is critical to determine the feasibility of LID and a number of issues are unresolved around methodology and application. Soil maps and assumptions about soil characteristics are not sufficient for site assessment. What methodology provides the accuracy needed: pit, infiltrometer, permeameter, or grain size analysis; all give different results? How many tests, where on the property; the lack of details in the methodology can easily lead to improper and inappropriate application and installation. Are these tests conducted under truly saturated soil conditions (wet period) or during other periods? When are these tests conducted: with native infiltration (before any clearing); after clearing; after grading; after compaction? Only final condition of soil prior to application of LID is meaningful and consequently predictive. Native soils are quite heterogeneous; the standards ensure functionality of the structures, over both short and long term. If the majority of the flow laterals from the BMPs, then provisions need to be made for downstream structures to ensure capacity and protection of the receiving environment.

The provision that 'in these instances bioretention/rain gardens can be built with an under drain' is confusing. It is not clear whether an under drain makes a site with a nominal percolation rate feasible. The county recommends that Ecology either specify that percolation rates are not a feasibility criteria given that under drains are an option or delete the provision regarding under drains.

Another competing concern is based on the premise of protecting local resources. Due to a legitimate concern that localized infiltration of stormwater, without stringent source control, would place shallow aquifers at risk, some local jurisdictions are urging businesses and landowners to connect to a regional facility. Failure to do so will result in the businesses/landowners being required to implement operational and structural changes at their sites. This would drive the property owners into a regional system. The

jurisdictions want to protect shallow drinking water aquifers from potentially- polluted, infiltrating stormwater. This is becoming more common in well head protection areas and critical aquifer recharge areas (CARAs) where municipalities want to have more control over water quality.

The feasibility criteria for permeable pavement states that it is considered infeasible when within 100 feet of a known contaminated site or abandoned landfill; within 100 feet of a drinking water well, or a spring used for drinking water supply; and within 10 feet of a small on-site sewage disposal drainfield. This is problematic because in many cases, the databases/data sets containing this information are incomplete, inaccurate, or difficult to use. The costs to develop or complete and verify these data sets; and make them easily available for use are significant and beyond most current revenue streams of the responsible state and local agencies.

The feasibility criteria for permeable pavement states that it is considered infeasible where seasonal high groundwater creates prolonged saturated conditions at the ground surface, within the wearing course, or within one foot of the bottom of the lowest gravel base course. It is not clear what level of groundwater level monitoring will be considered sufficient to understand the hydrogeology at a site. Groundwater fluctuations may be significant in higher than average precipitation years. If monitoring is only conducted in a low to moderate precipitation year, future wet winters could result in groundwater tables high enough to breach the surface or cause other problems related to the permeable pavement. With regard to permeable pavement feasibility associated with slope, the phrase, 'cannot reasonably be designed' is unclear and difficult to implement.

## **Permeable Pavement**

The permeable pavement BMP is particularly problematic and of questionable feasibility from the standpoint of performance, durability, longevity, inspection, maintenance, compliance, and water quality protection. The following is a collection of concerns and questions regarding the proposed broad and aggressive use of permeable pavement. Until these concerns and questions are addressed, the county recommends Ecology not push permeable pavement as aggressively as it is in the draft requirements.

There are still many concerns and unanswered questions related to the broad use of permeable paving techniques in public roads and high travel areas, including, but not limited to:

- 1) Long term durability, especially at intersections longevity/performance of porous/permeable pavements considering the heavy traffic seen on many county roads.
- 2) Spill containment and clean up and resulting traffic impacts. One major concern is how to clean up spills of harmful substances that occur routinely on roads. Spilled substances are relatively easy to clean up from an enclosed drainage system or gravel shoulder. It is entirely unclear how agencies could respond if a spilled substance is allowed to percolate through the wear course and into the road

- substrate. It is not feasible to tear up the road every time there is a vehicle accident or lost load that results in a spill.
- 3) Maintenance, repair, and tracking of multiple sections of pervious paved roads. A requirement to use pervious pavement for every qualifying development and redevelopment will create a patchwork of pervious and impervious pavement with different maintenance standards and repair methods. The tracking of this inventory will soon become complex and costly. Operations such as grinding and resurfacing of roadways would require substantial planning to ensure previous pavement is protected.
  - 4) Durability and maintenance when subjected to snow and ice treatments (i.e. sand, gravel, salt brine etc.). (Appendix 1 Revisions, Pg. 36 item B)

Permeable pavement is not suitable for any road with heavy truck traffic, high ADTs, slopes, propensity for spills, and abundance of underground utilities. Determining appropriate surfacing materials/designs requires analysis of site specific factors such as soil properties, drainage, and traffic loading. The calculations for this analysis require inputs including the life cycle, which, at present, is poorly understood for permeable pavements. Current road standards may not allow deviations from traditional road surfacing materials and traditional roadway design seeks to divert water away from the road structure, not infiltrate or convey water into the substrate beneath roads.

With regard to native soils below permeable pavement not meeting the soil suitability criteria for providing treatment, King County is very concerned that applying the suggestion of a 6-inch layer of treatment media for water quality is not maintainable under a permeable pavement. How can its function be restored once clogged? How can it be evaluated for performance? Secondly, it is unclear as to whether the option of a 6-inch layer makes the feasibility criterion invalid. It is also unclear whether the option to say that un-suitable in situ treatment soil underneath PGIS makes the permeable pavement BMP infeasible. Water quality treatment and maintenance of the water quality function will be nearly impossible underneath permeable pavement.

Heavily compacted sub-base (95% compaction standard) as part of roadway design and function makes the road prism less than ideal location for infiltration for either till or outwash soil areas. The use of the right-of-way outside the road prism is much more effective approach from an infiltration standpoint (not compacted); from a maintenance accessibility standpoint; and an overall cost standpoint. Additionally, presettling technology/facilities and water quality treatment could be effectively addressed outside of the road prism which is not the case for permeable pavements.

An under drain is mentioned with regard to placement in areas of till soils. Does the availability of using an under drain make permeable pavement “feasible” on impermeable/till soils? If an under drain is required, is this the place for attempting infiltration? This approach creates potential conflicts with other utilities in roadway limits under drain use and also drives outlet and subsequent drainage systems to a lower elevation, which affects feasibility of tying into downstream conveyance features.

In addition, municipalities will need a way to track where the permeable pavement has been placed to prevent from overlaying it with impervious pavement as it wears out over time. Minor repairs of pervious asphalt pavement will be problematic until asphalt plants begin producing it on a regular basis. The State of Washington would need to set a standard in the "Standard Specifications" to reduce the number of mixes available and ensure quality and availability. Cuts and patches will, or necessity be made with impervious asphalt until plants are regularly producing the material and making small amounts available for such repairs.

Permitting agencies will need to require geotechnical engineering for any pervious pavement roadway which may make small projects expensive or likely to fail if this requirement is not made. Groundwater wells will need to be installed to determine depth to groundwater and when the peak groundwater elevation is observed. This will not allow for fluctuations due to higher than normal rainfall events and so some systems may fail during wet years, which may result in removal of smaller systems on private properties, particularly with rain gardens and roof downspout systems where permits may not be required.

Permeable pavement used for private driveways and roads will be particularly challenging to keep functioning because they require regular care and vacuuming on the part of the homeowner. Tracking and compelling this regular care will be problematic for jurisdictions, particularly if a homeowner does not have the financial means or equipment to implement this care. Special care will be needed to ensure that new homeowners are aware that they have a pervious driveway and understand the maintenance requirements. Also, if the pavement has a life span of 20 to 25 years as some studies suggest, the homeowner may be faced with more frequent than historical replacement of the driveway or road in order to ensure performance. This will be even more difficult to enforce as it will be expensive for the homeowner and unclear as to when the pavement has to be replaced. Currently, there is not a widely accepted standard for when the performance has degraded to the point that replacement is needed. Until such standards are developed and the many other concerns and questions about permeable pavement are addressed, we recommend Ecology reconsider requiring permeable pavement so broadly.

If permeable pavement is to be required, we believe that its use should be limited to such places as residential areas, parking areas outside of travel paths, sidewalks, and separated bike lanes. We recommend that permeable pavements not be used in the traveled way for motor vehicles until more information becomes available on life cycle and maintenance costs. There is very little peer reviewed literature which documents what the lifecycle and maintenance costs are for permeable pavements and for the road lens under the pavement. Cost/benefit analysis be performed on permeable pavement technology for use in ROW with regard to install, inventory, inspection, and maintenance versus effectiveness and compared to other alternative approaches. At minimum, the performance standard alternative should be available for all public roadway projects. We do advocate that permeable pavements be used in low risk areas such as sidewalks, parking lots, bike paths and non-motorized trails. We propose Ecology provide

permittees the flexibility to limit the use of permeable paving as described in the following sample language:

“Pervious paving is considered infeasible in the following areas until further studies and pilot programs have resolved questions of durability, maintenance, spill containment and cleanup:

- within travel ways of roads identified as arterials and collectors;
- within intersections and within 50 foot approaches of said intersections;
- within areas with documented history of recurring spills;
- within sport/play courts where it would be unsafe, or the quality of play would be affected, or a standard of development for that type of court set by a recognized organization would not be met
- within areas where attaining structural load requirements make the project cost prohibitive”

## **Maintenance, Inspections and Enforcement**

Maintenance, inspection, and enforcement requirements are of special interest to the jurisdictions. These issues include inspection standards and frequencies; maintenance standards and schedules; performance measures; and access and enforcement issues. It is assumed that some of these issues will be addressed in Ecology’s Western Washington Stormwater Manual draft due out in October of this year and in the Low Impact Development Guidance Manual for Puget Sound expected to be updated and issued later this year by the Puget Sound Partnership and Washington State University. Since these documents are unavailable, King County cannot provide comment. It is presumed that these will establish minimum standards that will to be reviewed, revised based on comments and adopted; therefore, comments will be supplied when these are made available.

Since 2005, King County has implemented a program titled the FCBMP Program. This approach is comparable to the LID approach proposed in this draft language. King County’s experience suggests inspection, maintenance, and enforcement of FCBMPs is difficult and sometimes impossible due to barriers such as: lack of access to the facility because it is underground; denial of access by private property owners; lack of public knowledge; or lack of public interest. If a jurisdiction is denied access to inspect facilities on a private property or fails to maintain a public system on private property then the functionality of the jurisdiction’s MS4 is at risk.

King County has recently instituted an inspection program to inspect the FCBMPs in place since 2005. Only a small sampling of sites have been visited, but of those, 47% either needed maintenance, could not be inspected (including not being allowed on the property), or, did not provide required treatment. Of the total inspected, 37% were not built per plan. King County has developed a checklist for their inspectors, which is based on the Maintenance Instructions found the 2009 King County Surface Water Design Manual, Appendix C (Small Project Drainage Designs). It has not been made clear to

what extent and type of enforcement action the jurisdictions are going to be required to take on non-functioning or missing LID structures.

The application of this approach will be done as properties are developed and redeveloped. Most of this development is on single lots or plats scattered across the county. This will create a patchwork of traditional and LID features, which will require highly detailed tracking systems. An example of the complication would be, if a particular stretch of sidewalk is porous concrete and a homeowner applies for a road/sidewalk cut permit to run a gas line to their home from the main. The permit reviewer will need to know that the sidewalk must be repaired with porous concrete so it can be written into the permit.

Since maintenance standards and program requirements have not yet been proposed by Ecology, many questions remain about the feasibility of keeping LID BMPs functioning in the long term. Will the jurisdictions be required to track and enforce maintenance of LID BMPs with the same rigor used to enforce maintenance of facilities? If the answer is yes, as a reasonable person would expect, then the question becomes, how does cost affect feasibility? An inventory of numerous, disparate FCBMPs on private properties will be costly to inspect and maintain on the assumption that there will eventually be thousands of these BMPs across the county and probably thousands of noncompliance issues. Will the benefit of correcting a LID BMP problem for a 1,000 square-foot patch of impervious surface on a single family lot be worth the cost of enforcement? One might say that the solution would be to make the maintenance and functioning of the LID BMP a title requirement or covenant but King County's experience with this approach shows it to be problematic and enforcement is difficult and not cost effective.

One suggestion has been to ensure that facilities are accessible, such as being placed on a common track or adjacent to the ROW. But if the lot or development has the wrong slope or contour, then does that create infeasibility? There are real concerns about long term effectiveness of these BMPs on private properties especially if the property owners will be expected to maintain the facilities/BMPs. The approach outlined in the draft language is very prescriptive and omits some approaches that could be equally effective at stormwater management.

## **Watershed-Scale Stormwater Planning**

King County recognizes and supports the need for long-range planning and the need to develop basin plans and watershed plans that are able to identify the needs and strategies required to manage stormwater and reduce or eliminate the impacts of runoff to receiving waters. King County has developed numerous basin plans and is currently developing modeling tools that can provide additional information to aid basin planning. King County also supports including basin and watershed planning as a requirement within the permit. We view the watershed-scale stormwater planning proposal as a modeling requirement in addition to basin planning. This approach requires the jurisdictions to conduct modeling to determine the impact of land altering activities on receiving waters due to stormwater runoff and then develop programs which will minimize the impacts.

Several issues are raised using the modeling approach proposed by this draft permit language.

A significant level of effort will need to occur in anticipation of this requirement. All drainages between 2 and 40 square miles will need to be established and inventoried. A process to track, by basin, all land use actions, as described, will need to be developed. Once the trigger has been identified, then data sets, such as the following, will need to be reviewed and completed: stormwater drainage and treatment facility maps and inventories; land use cover; soils infiltration rates, capacity and saturation rates; seasonal water tables; and pollutant loading based on land use. Many of the datasets for effective modeling are incomplete and will need to be created before modeling can even occur. If LID is mandated to be the primary component then additional datasets will need to be developed such as locations of contaminated sites or abandoned landfills; drinking water wells, springs used for drinking water supply; on-site septic systems, etc. We recognize the challenges of requiring that multiple jurisdictions collaborate in the development of basin or watershed plans as a requirement within the permit. But we strongly recommend that Ecology include permit language that encourages jurisdictions to cooperate in the development of basin plans.

The cost of the modeling will vary significantly based on scale and on the accuracy of these data sets and the other data needs for the models. This will be driven by the level of certainty needed to achieve a reasonable level of accuracy. This level of accuracy will drive the level of effort and the quality of data. The need to determine the level of accuracy can be seen by the use of literature review, nearby data, and the use of locally collected data for the three iterations of Ecology's Toxics Loading Study.

Regardless of the level of accuracy used, this is an expensive requirement and will require external (state and federal) funding not currently available to many permittees. The need for operational funding support from state and federal sources should be considered a pre-requisite for this program. King County requests that Ecology account for the level of effort it will take to meet this requirement, and the variability in the level of effort. The modeling is a significant cost, other modeling requirements such drainage mapping; field sampling; and, the development of inventories and data layers will significantly increased the cost.

The next issue is the availability and effectiveness of the modeling tools to conduct the proposed modeling and the leveling of modeling required. King County encourages Ecology to further define the details of the analysis being proposed proposing. King County is currently testing modeling tools in both the Juanita Creek Basin and in WRIA 9 (using the SUSTAIN Model in WRIA 9). Some level of modeling can be done with tools currently available but will this provide any additional information than the default rigorous site-by-site approach? The cost difference between modeling flow and modeling potential pollutant loading is significant. King County recommends, that if Ecology does require the modeling, that the analysis focus on flow initially and delete pollutant loading requirements until a future permit. In addition King County

recommends that the requirement be phased in and considered pilot in this next permit round.

King County recognizes the significant role that land use management has in the protection of the environment and agrees that land use is a significant factor in stormwater management. Stormwater management needs a strong role in the Growth Management Act (GMA) mandated comprehensive plans to be effective and protective. King County recognizes the difficult role that Ecology has in promulgating the Water Pollution Control Act (WPCA) while respecting the authority and role of the GMA. This draft permit section brings the issue of the boundary between, and the harmony called for, concerning the GMA and WPCA. Ecology even stated at the PCHB hearing that its concerns related to basin or watershed planning may be moving the agency too far into land use planning and that this effort needed to be harmonized with a parallel GMA land use process, elevating water quality as a growth management planning priority (page 37). This effort must proceed carefully to ensure that the proper actions, for environmental protection, occur in the appropriate venues.

Regional stormwater management rests on four elements: jurisdictions implementing their Stormwater Management Plans (SWMPs) recognized as maximum extent practicable (MEP) actions; retention of stormwater on site to the maximum extent feasible (implementation of LID), conveyance systems and flow control and water quality facilities; and, land use regulations (through the growth management act). All the elements need to be recognized as critical to the management of stormwater runoff and fully implemented. But King County's position is that not all stormwater management is mandated or implemented through the Municipal NPDES permit. A multi-jurisdictional regional system of stormwater retrofits and prioritization that includes urban and rural areas, and transportation corridors across whole watersheds and the region needs to be coupled with increased state and federal funding for both retrofits and incentive based land use controls such as re-forestation and retention of open space.

King County proposes that the city's annexations trigger be removed. These annexations usually occur after the area has been built out and this action does not represent a change in land use. Additionally, King County advocates that a minimum land area benchmark be established for the "change in impervious area" trigger. As currently written, a two-square-mile drainage with a one percent TIA would trigger a watershed-scale planning effort for a 0.64 acre conversion.

The Pollution Control Hearings Board (PCHB) ruling on the Phase I permit – Summary of Decision states *"The Board concludes that permittees must provide information in their annual report to Ecology on the extent to which basin planning is being undertaken or should be considered in their jurisdiction in order to assist with future phases of the permit."* And in the Conclusions of Law, section 17 the PCHB states ... *"Given there several factors, the Board concludes that a permit condition requiring municipalities to implement LID at a basin or watershed scale is not, at this time, reasonable or practicable"* and further states that *"The Board concludes that city and county permittees should identify such areas where potential basin planning would assist in reducing*

*harmful impacts of stormwater discharges upon aquatic resource.” We request that Ecology take these statements into consideration when developing this permit section.*

## **Stormwater Monitoring**

King County has been and is a strong advocate for the regional approach determining the effectiveness of permit requirements and the impacts of stormwater programs on the long term quality of the Puget Sound Basin. The approach developed by the Stormwater Monitoring Workgroup and adopted by the Puget Sound Partnership provides the region the best opportunity to determine the most effective stormwater management approaches to protect the health of the Puget Sound Basin. King County strongly supports the creation of the pooled resources and the implementation of a regional monitoring program containing status and trends, effectiveness, and source identification monitoring components. King County wishes to thank Ecology for supporting the Stormwater Work Group during the development of the recommendations to establish this program, and hopes that Ecology will continue this support.

King County supports having Ecology serve, at this time, as the administrator of the pooled resources for the regional monitoring program. We recommend that a thorough review of Ecology’s performance be conducted at the end of the permit cycle, and that a search be conducted for an administrative entity for the next permit cycle prior to issuing draft permits in 2016 or 2017 or beyond.

Understanding that the payment schedule date may be adjusted to allow Ecology to address HSB1478, King County recommends that the cost for the monitoring be evenly distributed between 2013 and 2017. This distribution allows for greater cost consistency and avoids large cost variations during the permit term. King County recommends that costs be allocated using a minimum base amount per jurisdiction, with population adjustment for the remainder. King County recommends that a method be established for ensuring that costs per jurisdiction can be modified to account for any annexations and incorporations that might occur during the permit cycle. The simplest approach is to provide boilerplate language for annexation agreements to address this issue.

King County supports the level of effort of \$1.5M/year for effectiveness studies from Puget Sound jurisdictions. We believe this level of effort is sufficient to initiate the program, but not so large as to be unaffordable by the jurisdictions or unmanageable by Ecology. While each jurisdiction should provide a minimum level of funding for the region’s effectiveness program, including an allowance and credit for jurisdictions wishing to pursue other effectiveness studies should be considered. King County recommends that a “Local Needs” provision, as proposed by the City of Seattle, be included in the permit.

King County anticipates and requests further discussion regarding final formula related to cost shares, and a discussion on credit for past expenditures.

We propose that the Preliminary Draft Funding Agreement, Attachment A, include an expanded list of deliverables including but not limited to interim and final reports. King County recommends that the scope of work attached to the interagency agreement specify deliverables and timing of the deliverables. It is expected that deliverables will include data sets, reports, and data management systems. The county also recommends that the scope of work attached to the interagency agreement specify data management activities and deliverables and timing of the activities and deliverables

King County recommends that stream monitoring sites be selected in streams based on catchment area instead of stream order. The definition of stream order is the relative position, or rank, of a stream channel segment in a drainage network and does not relate to the size or characteristics. The monitoring has now expanded to include 1st, 2nd, 3rd order streams. The program is focused on small, wadable, stormwater dominated streams and the text use that term.

King County recommends that sediment toxicity testing not be conducted as part of the streams status and trends monitoring, and that this monitoring focus on sediment chemistry. It was the intent of the original SWG recommendations and it also parallels the marine nearshore sediment chemistry monitoring.

King County strongly advocates for the removal of text requiring the continuation of S8.D, the outfall characterization monitoring required in the current Phase I permit. We recommend that this monitoring end after two years of monitoring, not three years. King County also recommends that the results of the Phase 1 BMP effectiveness monitoring, programmatic effectiveness monitoring, and flow control effectiveness monitoring programs be evaluated to determine whether changes are warranted in the Western Washington Stormwater Design Manual or in the permit conditions.

### **Attachment 1: Minimum Technical Requirements for New Development and Redevelopment:**

This attachment would be more effective if it included a "Purpose" section. As written, the benefit of the regulations is unclear, particularly without the availability of the 2012 Stormwater Management Manual for Western Washington 2012. The implementation and exception processes appear to leave a lot of discretionary decision-making to the reviewer of the project. It would be helpful to the reader if more supporting information, such as examples, be provided to give guidance to both the reviewer and the designer.

A general concern that is not addressed in the permit is the impact to groundwater on the infiltration of stormwater that is greater than pre-developed forested conditions. The development of a site will result in the loss of evapo-transpiration functionality and that difference is being infiltrated to ground. The region's geo-hydrology is complex and localized tills layers and aquatards that can easily escape local studies. There is no requirement to determine if this infiltration is causing lateral flow that will surface nearby; or, entering a shallow or deep aquifer. There are no current studies on the wide scale application to local aquifers, balancing withdrawal for use against recharge through

these structures. Additional comments for this section are contained in the edited version of Attachment 1 which is included as a separate attachment.