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**Public Works**  
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Snohomish County Surface Water Management appreciates the opportunity to comment on Water Quality Policy 1-11. This guiding set of policies for conducting the Water Quality Assessment for Washington is critical for determining the County's responsibilities under many sections of the National Pollution Discharge Elimination System permit.

We are concerned that Policy 1-11 does not appear to contain adequate procedures for the assessment of parameters to determine whether standards have been attained. It is unclear what volume, age, or quality of data are necessary for listing, de-listing or for a change of categories. We are specifically concerned about criteria for listing and de-listing of waters for fecal coliform bacteria, since many of the surface waters in Snohomish County are listed as not meeting those standards. In addition, current policy for listing waterbodies as impaired for fecal coliform bacteria, based upon the "10% not to exceed" criteria, is not based on statistically rigorous methods resulting in high rates of false positive and negative listings (Ecology 2002).

EPA (2006) indicates that states' assessment methodologies should: 1) explain how the state identifies, considers or evaluates all existing and readily available data and information; 2) articulate the basics of the quality assurance and quality control (QA/QC) criteria used to evaluate data submitted by outside entities to determine what weight, if any, should be assigned to said data and information; and 3) explain the analytical approaches, including statistical analyses, used to infer true segment conditions from all valid existing and readily available information. The decision processes should provide all stakeholders with the opportunity to understand exactly how assessment decisions are made.

Currently, Ecology lists waterbodies as impaired for fecal coliform bacteria using as few as five sample results gained during a critical period, with a minimum of two samples exceeding the recreational criteria for a given waterbody. This method gives no consideration to the probability of falsely listing a waterbody; particularly when dealing with highly variable parameters such as fecal coliform bacteria.

Within Snohomish County's jurisdiction alone, there are currently 46 river segments of various lengths which are designated by Ecology as impaired for fecal coliform bacteria. Once a waterbody segment is

determined to be impaired and EPA approves an associated TMDL, NPDES permit holders are required by federal law to implement costly actions to reduce pollutants. From 2007 through 2012, Snohomish County actions included implementation of water quality monitoring, education and outreach, and business inspection programs aimed at tracking and reducing levels of fecal coliform bacteria. Since 2007, Ecology estimates providing over \$16 million dollars statewide through Centennial Grants for programs aimed at reducing fecal coliform bacteria (Jeff Nejedly Personal Communication March 10, 2011). Failing to implement statistically valid methods for listing and de-listing to improve confidence in the assessment of waterbodies costs the state and local governments millions of dollars on an annual basis. Without de-listing criteria, stakeholders lack the ability to determine if their actions are resulting in changes to the 303(d) list.

In the following section, we reference assessment programs in Florida and Oregon which provide clear guidance to stakeholders on listing and de-listing criteria. These programs can be used as examples for changes in Washington policy. We also include a list of specific issues and recommendations for revisions to policy 1-11 and TMDL development processes.

#### **State Assessment Programs and Methods**

The State of Florida's Department of Environmental Quality established Administrative Code 62-303 for the identification of impaired waters. Ecology (2002) references the statistical analysis method utilized by the State of Florida as a valid approach to minimizing false positive and false negative listings. The code sets forth a minimum number of samples not meeting an applicable water quality criterion needed to put a water body on the planning list with at least 80% confidence. The code allows a wide range of sample sizes from a minimum of 10 to a maximum of 500. This same code sets forth clear procedures for de-listing previously impaired waters, where the criteria require additional samples to be obtained such that 90% confidence is gained prior to de-listing.

Oregon has a well established 303(d) and 305(b) assessment methodology (Oregon Department of Environmental Quality 2006). Oregon lists a waterbody as impaired for E.coli when a 30-day log mean or more than 10% of samples exceed 406 colonies per 100ml, with a minimum of 2 exceedences. Attainment of the 406 colony criteria is found when a 30 day log mean is less than 126 colonies per 100ml and, if data from 10 or more sample are available, 90% of samples are below 406 E.coli organisms per 100ml. If data are insufficient to calculate a 30-day log mean, then, for 10 or more samples, 90% of the samples must be below 406 E.coli organisms per 100ml; or for 5 to 9 samples, no exceedences of 406 E.coli organisms per 100ml. While the assessment's analytical methods are not clearly articulated, Oregon has set attainment criteria which not only allows for a higher count of bacteria than Washington, but also attempts to set the standard for attainment higher than that for impairment.

## Issues and Recommendations – Water Quality Policy 1-11

- 1) The water quality assessment policy 1-11, Chapter 1, includes a process for listing waterbodies based upon fresh water fecal coliform data. This policy is not sufficient to allow stakeholders to determine whether a waterbody meets or exceeds state water quality standards. Program managers need a clear and transparent policy to determine compliance with standards to determine annual budgets and corresponding resource allocations.

We recommend the following revisions to policy 1-11 for fecal coliform bacteria listings:

- a) Clearly state that data evaluated for any listing do not span multiple years or seasons. Currently, a segment may be placed in category 4 when EPA has approved a TMDL. These TMDL studies analyze data across years and seasons, which is in direct conflict with policy 1-11.
  - b) Define the “critical period” as the period of highest use for water contact recreation for bacteria.
  - c) Define the “local circumstances” which Ecology may use to change ranges of data used for analysis. Stakeholders need to know how additional data are used to determine compliance with standards.
  - d) Data more than 5 years of age should not be used during the assessment.
  - e) Document and reference the equations used to analyze data for compliance with the geometric mean and 10% not to exceed criteria.
  - f) Describe how non-detects are treated and provide a reference to support decisions.
  - g) When data used for listing purposes are taken from the Ecology database, Environmental Information Management (EIM), state that quality control data are not evaluated by Ecology.
  - h) For those data used for listing purposes and not taken from EIM, indicate the requirements for submittal of quality control data and describe how it will be evaluated. We recommend consistency with EIM protocols.
  - i) Clarify how field duplicate data, as extracted from EIM, are used during the assessment process.
  - j) Describe the scientific rationale and probability of committing false positive or false negative listings based upon the 10% not to exceed “raw scores” approach used to evaluate an exceedence of water quality standards.
- 2) Water quality policy 1-11, Chapter 1, lacks procedures for de-listings from category 5 or 4a to category 1. We recommend the following revisions to policy 1-11 for fecal coliform bacteria de-listings:
    - a) Identify the number of samples required for analysis of the geometric mean and comparison to standards.
    - b) Identify which program in Ecology will receive the data during calls for data.

- c) Document and reference the methods used to analyze data for compliance with the geometric mean and 10% not to exceed criterion.
  - d) Identify the temporal regime of sampling required.
  - e) Define the critical period.
  - f) Identify the maximum age of data allowed for submittal.
  - g) Identify the data quality control requirements and how Ecology will use those in an assessment.
  - h) Describe Ecology's rationale for requiring stakeholders to provide additional anecdotal information to support a change of listing. Identify the methods Ecology will use to rank and evaluate anecdotal information to support a change of listing category.
- 3) We encourage Ecology to consistently indicate the source of data used to support listings. Many listings and the associated citations do not clearly indicate the data used to support listings. In many cases the 2008 citations carry forward from 2004 and a complete listing of all data collected and reported for the sample location follows, making a determination of data used nearly impossible. This occurs for the following listing ID's: 7280, 7254, 7437, 7440, 7274, 7190, 6641, 7200, 9780, 21977, 7245, 7298, 7307, 7450, 9789, 21991, 7262, 7258, 7204, 43041, 21973, 21974, 21984, 21982, and 21983. We recommend that Ecology review these listings and others to provide clear citations of data used to support the listing.
- 4) Ecology's TMDL studies for fresh water fecal coliform bacteria analyze data in a manner inconsistent with water quality policy 1-11. Not only are data analyzed across years, for calculation of a geometric mean, but analysis of a 90<sup>th</sup> percentile is conducted and referred to as the water quality standard. However, the Environmental Assessment group refers to the 90<sup>th</sup> percentile as the 10% not to exceed standard and uses a "raw scores" approach for analysis. The TMDLs often refer to the 90<sup>th</sup> percentile as the water quality standard. An example can be found in table 2 of the Little Bear Fecal Coliform TMDL submittal report <http://www.ecy.wa.gov/pubs/0510034.pdf>, where the 90<sup>th</sup> percentile is referred to as the standard and the result has been obtained either using Microsoft Excel's 90<sup>th</sup> percentile function or the National Shellfish Programs Model Ordinance Method in Excel.

A similar reference to the 90<sup>th</sup> percentile and the resulting numeric value as a standard is found throughout the Stillaguamish Multi-Parameter TMDL (<http://www.ecy.wa.gov/pubs/0403017.pdf>). Examples are found in the last paragraph on page 33, where the author uses the 90<sup>th</sup> percentile calculation for comparison to fecal coliform criteria. While the author refers to the results as estimated targets distinguished from the actual water quality criteria, ambiguity in language throughout the document is found where the authors suggest methods such as the statistical rollback are used to determine if fecal coliform distributions are in compliance with standards.

Differences in methods and reference to the standard used by the Environmental Assessment Program (EAP) and TMDL groups within Ecology introduce ambiguity into analysis and confusion

among stakeholders. We recommend that Ecology Environmental Assessment and TMDL programs determine a consistent application of analytical methods and reference to standards. The result should be a standardized protocol for analysis of data to support development of fecal coliform bacteria TMDLs.

- 5) TMDL studies have used the analysis of stream flow inconsistently for determination of seasons upon which analysis is conducted to meet the geometric mean criterion. Neither WAC 173-201A nor policy 1-11 define the critical period or provide stakeholders with methods used to identify the critical period upon which to conduct seasonal analysis. The ambiguity introduces confusion and the use of variable month ranges upon which to conduct seasonal geometric mean analysis. We recommend that Ecology clearly define the critical period used for seasonal analysis.

Thank you for the opportunity to comment on the policy. If you have questions about our comments, please call Steve Britsch at 425-388-3464 ext.4668.

Sincerely,



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#### References Cited

Ecology. 2002. Overview of the Water Quality Assessment Process. Water Quality Policy 1-11 (revised September 2002). Additional clarifications of the binomial distribution method.

EPA. 2006. EPA's Guidance for 2006 Assessment, Listing, and Reporting Requirements Pursuant to Sections 303(d), 305(b), and 314 of the Clean Water Act [2006 Integrated Report Guidance (IRG)]. Signed July 29, 2005.

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