DEPARTMENT OF
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State of Washington

Water Quality Program

Policy 1-11, Chapter 1

October 2018 Public Review

Response to Comments

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For more information contact:

Chad Brown
P.O. Box 47600
Olympia, WA 98504-7600

Phone: 360-407-6600

Washington State Department of Ecology - www.ecology.wa.gov

o Headquarters, Olympia	360-407-6000
o Northwest Regional Office, Bellevue	425-649-7000
o Southwest Regional Office, Olympia	360-407-6300
o Central Regional Office, Yakima	509-575-2490
o Eastern Regional Office, Spokane	509-329-3400

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Water Quality Program Policy 1-11, Chapter 1

October 2018 Public Review Draft Response to Comments

By

Water Quality Program

Environmental Assessment Program

Toxics Cleanup Program

Washington State Department of Ecology
Olympia, Washington

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Summary

Background

The Ecology Water Quality Program periodically gathers and uses readily available water quality data to produce waterbody listings for different categories of water quality (from good to polluted) called "Washington's Water Quality Assessment." The listing methodology for conducting the Water Quality Assessment (WQA) is found in Water Quality Policy 1-11, Chapter 1: *Assessment of Water Quality for the Clean Water Act Sections 303(d) and 305(b) Integrated Repor*t. This agency policy guides how Ecology assesses water quality data for Washington's waterbodies and makes listing decisions on the water quality status.

Ecology held a public review on revisions to Policy 1-11, Chapter 1 in February – April 2018. We received comments from 24 entities. The public comments, and Ecology's responses, are contained in this document. An index of public commenters is included below to assist the commenter in finding responses to their comments.

Comments are categorized in the order of the sections in Policy 1-11. Within each section, comments are organized in alphabetical order by commenter. We provided subject areas under some sections to further delineate similar comments where appropriate. To view the full set of comments received, go to Ecology's website where all correspondence is publically available in the order they were received. (http://ws.ecology.commentinput.com/comment/extra?id=ph6ZP)

Index of Public Commenters

The following entities provided comments regarding the draft documents. In the comment table, each commenter is referenced by the name in brackets.

Commenter	Affiliation	Page # of response to specific comments
[AWB]	Association of Washington Business (Chandler)	8, 11, 12, 26, 41, 45, 48, 52, 78, 85, 93, 94, 115, 123, 130
[Boeing]	The Boeing Company (Akiyama & Shestag)	6, 8, 12, 16, 17, 22, 24, 27, 29, 39, 49, 57, 86, 99, 109, 110, 112, 113, 115, 116, 126, 127, 128, 131, 135
[EPA Region 10]	EPA Region 10 (Fullagar)	12, 62, 63, 64, 79, 100, 104, 133
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[Jamestown S'Klallam Tribe]	Jamestown S'Klallam Tribe (Hals)	13
[Kalispel Tribe]	Kalispel (Merrill)	13, 46, 106, 117, 119, 123
[King County DNR]	King County Dept Natural Resources & Parks (True)	6, 9, 23, 31, 37, 49, 53, 55, 57, 58, 67, 70, 72, 81, 96, 101, 119, 120, 124, 128, 131, 132, 133, 135, 136
[NWEA]	Northwest Environmental Advocates (Bell)	9, 15, 18, 27, 33, 34, 35, 36, 38, 40, 42, 44, 51, 53, 59, 61, 65, 71, 81, 84, 87, 89, 90, 91, 96, 97, 102, 121, 124, 129
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[Snoqualmie Tribe]	Snoqualmie Indian Tribe (Baerwalde)	32, 36, 47, 103, 108, 109, 122

Commenter	Affiliation	Page # of response to specific comments
[Streamkeepers]	Clallam County Streamkeepers Program (Chadd)	133
[Suquamish Tribe]	Suquamish Tribe (Taylor)	10, 36, 109, 114, 116, 118, 139
[Upper Skagit Tribe]	Upper Skagit Indian Tribe (Maloney)	47, 114, 119
[Vancouver]	City of Vancouver (Sutton)	10, 14, 15, 19, 20, 23, 26, 27, 29, 32, 41, 47, 50, 52, 89, 92, 99
[WASWA]	Washington Association of Sewer & Water Agencies (Kuntz)	20, 26, 44, 51, 56, 75, 86
[WSDOT]	Washington State Dept of Transportation (Stone)	6, 8, 11, 12, 13, 17, 21, 22, 30, 35, 47, 50, 73, 75, 76, 77
[WSPA]	Western States Petroleum Association NW Region (Villegas)	33, 48, 126, 130

Abbreviations Acronyms and Definitions

Comment from [Boeing]: Definitions. Page vii - Definition: "Call for Data" In order to ensure that data submitted is of acceptable quality, the definition of "Call for Data" should include a reference to time limitation of "most recent ten years of data".

Ecology Response: *The definition of 'call-for-data' has been edited.*

Comment from [Interagency Team] [WSDOT] [Snohomish County]: Improve the list of defined terms to foster consistent interpretation of the Policy. For example, the term "data validation" conflicts with usage in other parts of the Policy and with Environmental Information Management System (EIM) specified Quality Assurance levels. Several definitions for commonly used terms are absent in the draft Policy. Recommendation: Evaluate the use of terminology throughout the Policy to eliminate vague, inconsistent, or incorrect descriptions. Ensure terminology aligns with legal and scientifically accepted definitions in conformance with QMP requirements and associated glossary for inclusion in the Policy's definitions. Search the document for commonly used terms for inclusion in the definitions section of the Policy.

Ecology Response: *The "Definitions" section of the policy has been revised. Definitions for the terms "data verification" and "data validation" in Policy 1-11 were supplied by Ecology's QA program. Data collected and managed in accordance with a quality assurance project plan meet data credibility requirements for consideration in water quality status evaluations. We encourage the commenter to bring to our attention any specific listings for which it is believed that poor quality data has resulted in an incorrect water quality category determination so that we can work with you to review such listings and make any appropriate changes.*

Comment from [King County DNR]: Page vii: The definition of "Call-for-data" should just specify the most recent 10 years of data with any exceptions.

Ecology Response: *The definition has been revised.*

Comment from [King County DNR]: Page viii: The definition of "Data validation" conflicts with usage in other parts of the document and with Environmental Information Management (EIM) specified Quality Assurance (QA) levels. To remedy this we recommend: a) The definition of data validation be removed from Policy 1-11 since it is not used again in the document; b) Add a definition of a "data usability review" that includes all the elements necessary under the Credible Data Act; c) Develop a standardized set of questions about each dataset loaded into EIM which address the four main points of the Credible Data Act; and d) Provide a means for sampling plans, QA plans and water quality reports generated by other researchers and agencies to be uploaded and stored in EIM alongside their associated data, similar to how Ecology documents are linked to EIM records.

Ecology Response: *The definition of data validation is included in the policy in order to make a distinction between the verification and validation of data. It is correct that data validation is not a prerequisite for uploading data to EIM or for a dataset to be used in the WQA. We appreciate the suggestion for developing a data credibility checklist and*

will continue to explore this idea. We will also explore the idea of allowing QA plans, sampling plans, and associated reports to be uploaded and linked to their associated EIM datasets. These suggestions will require a separate focused effort and are thus outside the scope of the current Policy 1-11 revisions.

Comment from [Seattle]: Definitions, pages vi-ix: Suggest (1) revising the definitions so that they do not include rules for calculation, which will appear elsewhere in the Policy if needed, and (2) deleting definitions that are not drawn from the law and therefore could cause confusion or later be used out of context; for example: "data validation" (used once in the Policy and explained there – p. 9), "impairment" and "water quality standards."

Ecology Response: *Other commenters have asked for specificity in certain words and terms in relation to the WQA. Revisions and clarifications to the definitions section have been made to indicate that the definitions are for the purposes of applying to Policy 1-11.*

Part 1: General Assessment Considerations

Section 1A: Introduction and Background

Comment from [AWB]: Ecology should clearly express its intention that any Category 5 listing be grounded on substantial and unequivocal water quality data exceeding numeric criterion and evidence of designated use impairment.

> **Ecology Response**: *This paragraph has been revised to indicate that the parameter specific sections of the policy describe the amount of evidence required to determine whether or not numeric criteria are being persistently attained and that Section 1E describes the requirements for narrative criteria evaluations.*

Comment from [Boeing]: Request for extension.

> **Ecology Response**: *Based on a request by Boeing and others for additional review time, Ecology extended the public comment period for proposed revisions to Water Quality Policy 1-11 until close of business on April 6, 2018.*

Comment from [Interagency Team] [Snohomish County] [WSDOT]: Page 2. Fourth paragraph. As written, the paragraph could be interpreted to suggest that data submitters are responsible for ensuring the credibility of data used in the WQA. The credibility of data collected for an intended purpose may be sound, yet that does not necessarily mean the data should be assigned a Level 3 or higher in EIM for use in the WQA. Recommendation: Re-word the sentence to clarify that data submitters are responsible for ensuring data credibility relative to their QAPPs intended purpose. Per the WQDA, Ecology is tasked with ensuring use of credible data in the WQA.

> **Ecology Response**: *Language has been moved and clarified in Chapter 1E. Ecology ensures that credible data are used in the WQA in part by using data from EIM that has both a QA Planning and a QA Assessment Level of 3 or above that has been assigned by the data submitter. A QA Assessment Level of 3 or above means that at minimum, the data, sampling methods, and analysis methods have at a minimum been evaluated for precision, bias, representativeness, comparability, and completeness as specified in the QAPP or SAP.*
>
> *The comment seems to suggest that Ecology must ensure that all data used in the WQA is free of any errors; such an expectation would be unrealistic. Determining that a dataset is credible does not require that it is entirely without errors. When Ecology becomes aware of errors in data or information, appropriate actions are taken to ensure the associated data or information do not contribute to errors in the WQA. Whereas systematic errors can be detected through properly administered QA /QC procedures, random errors are often much more difficult to detect and may be common to any dataset. That said, sporadic random errors in individual data values have a low likelihood of being the determining factor in WQA category determinations in the assessment. For example, a transcription error resulting in a dissolved oxygen value that is 0.5mg/L lower than the actual measured value would be irrelevant if the actual*

measured value was already 2mg/L below a dissolved oxygen criterion of 9.5mg/L. When one also considers that most listings consist of multiple data points, the significance of an error in any single value is further diminished.

Finally, while the concern about poor quality data resulting in erroneous 303(d) listings is understood and appreciated, there is little evidence that waterbodies are systematically being placed on the 303(d) list in error. Ecology's experience is that it is a rare occurrence for a waterbody to have been placed on the 303(d) list for a given pollutant, but then have further investigation during TMDL development reveal that the waterbody is actually meeting water quality standards for that pollutant; some of these occurrences may be due to improvements in water quality rather than errors. These conclusions suggest that errors, because they are inevitable, need to be considered in the appropriate context in terms of their type, their rate of occurrence within associated datasets, and the degree to which any given errors will actually influence the end result of a water quality status determination for a specific parameter.

Comment from [King County DNR]: Page viii and page 2: The definition of impairment includes a qualifier that impairments occur when water quality standards are not "persistently" met. The water quality standards are intended to protect designated uses over as little as an hour (acute aquatic life toxicity) up to a maximum of a lifetime exposure (drinking water designated uses for carcinogens). Because of the wide variety of potential uses of the word persistent, we recommend persistence be defined and only used as part of the individual parameter subsections.

Ecology Response: *Persistence is in fact defined, for purposes of the WQA, in the individual sections in Part 2. We recognize the variation in how the standards are designed to protect designated uses over different spatial and temporal time scales. This is the reason that the methodology for determining whether or not standards are persistently met varies by parameter. When considering if a designated use is impaired, Ecology must evaluate how often a standard needs to be met in order to fully support a use. Is it always? If so, this would means that a single exceedance of a parameter in a ten year period confers impairment. However, would it be reasonable to designate a use as impaired if, for example, pH was known to have exceeded a criterion by 0.1 units during a single minute within a 10 year period? Given limited data, we have to make decisions about how many instances of standards exceedances indicate impairment. Ecology has determined that although a single exceedance may indicate that data point does not comply with the numeric criterion, it is not enough evidence, in most cases, to designate an entire waterbody segment as impaired for a given use. These decisions must be parameter specific and based on how variation in a given parameter affects the support of a designated use.*

Comment from [NWEA]: In addition to these comments, we incorporate by attachment as comments on this proposed listing methodology the following additional comments: (1) Letter from Nina Bell, NWEA, to Patrick Lizon, Ecology Re: Washington's Draft Integrated Report and Section 303(d)(1) List of Impaired Waters (May 15, 2015); and (2) Letter from Nina Bell, NWEA, to Patrick Lizon, Ecology Re: Call-for-Data for Next Water Quality Assessment (April 6, 2018).

Ecology Response: *Comment noted. The NWEA letter from May 15, 2015 was responded to during the public review process for the Water Quality Assessment that was approved by EPA in July 2016. Correspondence from NWEA on the call-for-data from April 6, 2018 was reviewed and it was determined that issues raised regarding Policy 1-11 revisions were also raised in the comments that are being addressed in this response to comments.*

Comment from [Seattle]: Several typos noted in the document.

Ecology Response: *Typos have been corrected as noted in the comments. We appreciate the assistance with proofreading the policy.*

Comment from [Snohomish County]: Page 2. Awkward last sentence of the first paragraph "Development of this document was largely in accordance with directed in part by EPA's Integrated Reporting Guidance". Consider re-wording to ""Development of this document was largely in accordance with, and directed in part by, EPA's Integrated Reporting Guidance".

Ecology Response: *The sentence has been revised.*

Comment from [Snohomish County]: Clarify the roles and responsibilities for the production and use of credible data during the WQA. Recommendation: Include a sentence or two in the executive summary summarizing the roles that submitters and Ecology play in producing and utilizing credible data for the WQA.

Ecology Response: *Clarifying sentences have been added to the Executive Summary section.*

Comment from [Suquamish Tribe]: The Tribe also supports comments submitted by the NWIFC related to the proposed policy revisions and incorporates those comments by this reference.

Ecology Response: *Comment noted.*

Comment from [Vancouver]: We recommend that Ecology implement data verification, as required by the WQDA, to assess data sets submitted to EIM and applied in the WQA - and in particular those data sets submitted and applied in Category 5 listings. We also recommend that Ecology provide stakeholders full access to detailed sampling documentation that data submitters should provide to Ecology, to allow stakeholders to support Ecology in the review process.

Ecology Response: *We disagree that data verification requires Ecology to fully review and house all supporting sampling documentation related to data submitted into EIM and for use in the assessment. Policy 1-11 has a new section that has been added under "1D. ensuring Data Credibility in the Assessment" that details how data is evaluated and verified. Each environmental study conducted by or for Ecology must have an approve Quality Assurance Project plan, or QAPP. It is the responsibility of the data submitter to follow a QAPP when collecting data, and to identify the QA level when data is being submitted into EIM and subsequently used in the Assessment. It is the responsibility of the*

data submitter to ensure that the data they submit has been collected under the data quality level they identify. We do not believe it was the intent of the WQDA to require Ecology to second guess each data point submitted to EIM. This would be an inefficient and ineffective use of state resources. Instead, policy 1-11 includes guidance on how Ecology will manage errors discovered by the agency or others.

Comment from [WSDOT]: The title of Part 2 creates ambiguity, specifically the word choices of "specific," "considerations" and "criteria" when used together. Recommendation: Edit the title of Part 2 and/or the pollutant specific sub-sections to clarify what information is considered specific criteria used to make category determinations versus considerations where exceptions or best professional judgment may be applied.

Ecology Response: *The title of Part 2 was edited to be clear that the policy is describing assessment considerations for specific water quality criteria found in the standards.*

Section 1B: Process to Develop Water Quality Assessment

Comment from [AWB]: Ecology should be credited for conducting a thorough and well documented public involvement process over the past two years. The agency was open to hearing perspectives on the deficiencies of the current Policy, improvement ideas presented by various stakeholder groups, and providing full discussion opportunities. The administrative process leading to the proposed Policy modifications represents a "well-done." That said, Ecology needs to set an expectation that groups with meaningful/influential interests participate in advisory committee meetings. There is a perception that some veto-wielding viewpoints were not heard. A more transparent involvement would be respectful of other participants and facilitate a pathway to (hoped for) consensus outcomes.

Ecology Response: *Comment noted.*

Comment from [AWB]: The revised Policy 1-11 continues with minimal data and generous decision thresholds to justify Category 5 determinations. But this choice by Water Quality Program management team will likely perpetuate and aggravate what is already an unmanageable section 303(d) listing outcome. State water quality agencies have ample authority and discretion to shape a listing policy to fit with down-stream Clean Water Act program priorities and implementation constraints.

Ecology Response: *While we appreciate your concerns, we have an obligation to identify waters that are not persistently meeting water quality standards regardless of the difficulty in achieving clean water within a specified time frame. Our goal is to provide a listing methodology that determines the status of water quality in Washington based on an evaluation of available monitoring data. To evaluate whether or not standards are persistently being met, Ecology considers magnitude, frequency, and/or duration of the exceedance. We do not factor in economics, difficulty in achieving standards, or timing considerations when making listing decisions.*

Comment from [AWB]: Page 5, Coordination with Tribes and Other States – Does Policy 1-11 have any relevance or effect for waterbodies on reservation lands for tribes who have chosen not to develop and promulgate water quality standards? Most Washington tribes have not promulgated water quality standards. What government/tribal entity has authority or responsibility to implement Clean Water Act section 303 on those reservation lands? Does Policy 1-11 have any relevance for reservation waterbodies?

> **Ecology Response**: *Policy 1-11 applies only to waters in Washington, it does not apply to waters that are within tribal reservation lands or within an adjacent state. EPA has oversight authority for tribal lands where a tribe has not adopted water quality standards.*

Comment from [Boeing]: Boeing thanks Ecology for its efforts to solicit input on potential revisions to the Policy. These efforts resulted in significant benefits to the February 2018 Draft Policy.

> **Ecology Response**: *Comment noted. We appreciate the support for Policy 1-11 revisions.*

Comment from [Boeing]:
Boeing notes that the February 2018 Draft Policy includes a number of new provisions that rely on listing methodologies that are not scientifically defensible or otherwise do not comply with RCW 90.48570 through RCW 9048.590 and other requirements for Assessment Unit ("AU") impairment listings. Boeing therefore requests that Ecology revise the Draft Policy based on Boeing's comments, and those of the Northwest Pulp and Paper Association and Association of Washington Business (which Boeing joins and incorporates by reference), and recirculate a revised draft for further public review.

> **Ecology Response**: *Comment noted. Ecology received comments from many different entities representing a wide variety of backgrounds and perspectives, including Boeing, NWPPA, and AWB. We have responded to those comments and made changes to Policy 1-11 as appropriate. Policy 1-11 has been finalized based on comments received during the public comment period.*

Comment from [EPA Region 10]: We appreciate the extensive public process Ecology has undertaken to improve transparency, as well as to document the decision making process which guides assessment determinations.

> **Ecology Response**: *We appreciate EPA's support and participation in the public process to scope and revise Policy 1-11.*

Comment from [Interagency Team] [Snohomish County] [WSDOT]: Better describe the process, including roles and responsibilities of the involved parties and the laws governing the process. As written, this section does not provide stakeholders a clear picture of the process. Recommendation: The section would benefit from outlining the WQA development process in a simple flow chart, assigning roles and responsibilities to involved parties, and taking care to ensure consistent and appropriate word usage when describing the distinct steps of the WQA process.

Ecology Response: *We have added a flow chart to this section as suggested.*

Comment from [Interagency Team] [WSDOT]: Unfortunately, neither the stakeholder meetings, nor this draft Policy revision include proposed updates to Chapter 2. We continue to urge Ecology to update Chapter 2 and provide an opportunity for public review and comment. The Team welcomes opportunities to work in partnership with Ecology and other stakeholders to accomplish this.

Ecology Response: *Comment noted. Ecology was clear from the beginning of the process that the scoping and public dialogue efforts were limited to Policy 1-11, chapter 1. We will pass this request on to managers in the Water Quality Program for future consideration.*

Comment from [Kalispel Tribe]: The draft policy places an excessive amount of emphasis on making sure there is no chance of an erroneous listing of a waterbody where some uncertainty exists. Where there is uncertainty and a chance for error in deciding if an impairment of a waterbody exists, the listing decisions should be conservatively based on protecting the natural resource and people's health, not protecting the pollution.

Ecology Response: *Erroneous listings can be those that determine impairment where designated uses are fully met or may determine uses are fully attained where an impairment exists. Ecology's goals are meet the federal requirement to use all readily available data and to develop a list of Category 5 waters (often with few data points) in a defensible manner. This policy is written to minimize errors in impairment and attainment determinations.*

Comment from [Jamestown S'Klallam Tribe]: The Primary purpose of Policy 1-11 is to ensure that we correctly identify and list all Washington waters that do not meet the Clean Water Act. The proposed changes compromise this fundamental activity by increasing the proof of burden to demonstrate impairment and changing definitions to provide loopholes. Increasing the required sample exceedances at a time when monitoring capacity is especially diminished is counterproductive and may abet worsened conditions before listing actually happens.

Ecology Response: *Comment noted. Ecology is committed to accurately identifying impaired waters in order to minimize over- or under-listing waters. The burden of proof is a balance of limited data and reasonable assumptions on the status of the water based on credible water quality data. Ecology has a responsibility to ensure that our decisions regarding the 303(d) list and 305(b) report are credible; we do not have any intention of making 'loopholes' in this policy.*

Comment from [NWIFC]: A water quality assessment policy should focus on diagnosis: whether the state's waters are meeting the applicable water quality standards. This should be an objective assessment. Other policy considerations - including the challenges of addressing those problems that are identified - should not color the assessment process. Importantly, water quality assessment should not be used to mitigate the state's water quality standards.

Ecology Response: *Comment noted. Ecology has made every effort to develop a listing methodology that determines whether a waterbody is not persistently meeting a water*

quality standard. We have spent significant time going over comments received that question whether we are achieving our main goals, which is to place waters in Category 5 that are truly impaired, and to minimize errors that lead to over- or under-listing impaired waters.

Comment from [NWIFC]: NWIFC and its member tribes remain committed to working alongside Ecology to address those impairments that are identified. NWIFC encourages Ecology to keep in mind that there are now ample implementation tools available to ensure that sources' reasonable concerns with compliance can be addressed. NWIFC appreciates the difficulty of this work, but we continue to be steadfast in our desire to help tackle even our most vexing pollution problems so that we can ensure clean waters and healthy fish for all those who depend on Washington waters.

Ecology Response: *Comment noted. We appreciate the support and commitment to clean water offered by NWIFC and tribal members.*

Comment from [Pierce County]: As we have expressed in previous comment periods, Pierce County maintains the position that the State should codify the contents of Policy 1-11, and not adopt any new language as standing guidance. The County wants Ecology to formally adopt all new language as regulation, which preserves the public's right to due process and legal appeal.

Ecology Response: *Policy 1-11 functions similar to other state policies, which are statements by the agency that describe the procedures and process that are generally followed in conducting an activity or determination. Implementation of policy or guidance needs to be flexible in order to account for evolving science and unusual circumstances or unanticipated situations.*

Comment from [Snohomish County]: Recommendation: Include language in the finalized Policy to reflect Ecology's ongoing commitment to reviewing listings which were based upon pre 2001 data that no longer meet the requirements of Policy updates. During each assessment, move listings supported by "old" and/or non-representative data into a new category established for determining conformance to Policy conditions and consideration for new study. This recommendation aligns with opportunities under Goal 2A of the Water Quality Programs 2015-2020 strategic plan4 to improve internal WQA process and maintain progress on Standards.

Ecology Response: *We do not see the need to include language in Policy 1-11 that is time specific based on 2001 data. We have committed to review listings based on old data where no new data exists to determine if the listing is still accurate. However, we need to emphasize that listings based on data older than ten years will not be dropped simply because no new data exists to reevaluate the status. This would discourage monitoring and be counterproductive to the intent of the Assessment to identify problem waterbodies.*

Comment from [Vancouver]: We commend Ecology's development of the Water Quality Atlas. This is an excellent GIS tool to understand and track the Water Quality Assessment information.

Ecology Response: *We appreciate your support of the Water Quality Atlas.*

Comment from [Vancouver]: We recommend that Ecology establish coordination procedures for waters that flow across state lines, such as the Columbia River. We recommend that Ecology add a new section into the Water Quality Policy that defines processes and procedure for evaluations of Washington rivers that share boundaries with Oregon and Idaho. These procedures need to identify methods in the WQA to address water quality impairments that may be due to mixing of waters across state boundaries and possibly due to point sources in adjoining states flowing into a common river.

> **Ecology Response**: *This comment is more appropriately addressed through the state water quality standards, which requires that downstream uses of another state or tribal water must be protected. Plainly stated, the more stringent criteria would be applicable in a resulting TMDL or cleanup plan. For purposes of the WQA, we apply Washington standards to make initial impairment determinations, and then will confer with other states and tribes on listing decisions of mutual interest. It would not be appropriate to include detail in Policy 1-11 on how impairments are handled in shared waters, since TMDLs that result from shared state and tribal waters are typically led by EPA, who has procedures for addressing water quality impairments across state and tribal boundaries.*

Section 1C: Waterbody Segments and GIS Layers

Comment from [NWEA]: Ecology continues to use a gridded system for open waters with units of 2,460 by 3,660 feet with assessments of contaminated segments one quarter of that size. The Methodology does not explain the benefits and detriments of this entirely random system. Of the many reasons why this gridded system does not work, is the fact that using it does not serve the 303(d) program well. By restricting the geographic coverage of unsafe levels of pollution, Ecology assures that it will continue to issue the vast majority of permits without water quality-based effluent limits on the only sources of pollution that it regulates, thereby perpetuating pollution of the Sound. In proceeding without either TMDLs or effluent limits, Ecology is subverting the goals of the Clean Water Act and specific objectives of the applicable water quality standards.

> **Ecology Response**: *The gridded system used by Ecology for open waters has been in place and used as a basis for listings in marine waters since 1996. We do not consider the listed grids to be fully representative of where a TMDL or clean-up plan may be implemented to control sources. Rather, the listings provide an indicator that a problem is occurring at a given time and location. The next step is to perform a TMDL analysis or alternative study to fully define the extent of the problem and where the sources are coming from. The paucity of data usually available for a given waterbody segment does not provide enough information to determine the geographic extent or temporal duration of a problem. We recognize the limitations that are presented when a fixed segment system is used to represent sample data results taken from one location and are planning to have future internal discussions around the appropriateness of the segment system for open waters. However, we do not believe that our current segmentation structure has in any way inhibited cleanup programs that address polluted waters.*

Comment from [Pierce County]: Where applicable, explicitly define and list "critical period" for each major watershed or WRIA.

> **Ecology Response**: *The definition of critical period is provided in Policy 1-11. Any parameter may have a critical period assigned for a given watershed based on specific information, such as a TMDL study. Therefore it is not possible to define critical periods for major watersheds without additional study to define the critical period for the parameter of concern.*

Comment from [Seattle]: Part 1.C (Waterbody Segments and GIS Layers), page 4, first paragraph. Like the current Policy, the scope should be identified as "surface waters" within state jurisdiction. Suggest: "Waterbodies covered by this policy include all surface waters of the state.

> **Ecology Response**: *Revision was made as suggested.*

Comment from [Seattle]: Part 1.C (Waterbody Segments and GIS Layers), page 6, last paragraph. The description of the Water Quality Atlas appears incomplete. The Atlas also includes, for example, surface water, tissue, and sediment testing data and documents category determinations. The atlas is a very broad tool and it would be helpful to make that clear to the reader.

> **Ecology Response**: *Clarifying language was added on what the Water Quality Atlas provides.*

Comment from [Snohomish County]: Data available through the Water Quality Atlas is not "representative" of Standards. The disclaimer on data available through the Water Quality Atlas indicates that Ecology does not certify the information is an accurate representation of Standards. Recommendation: Indicate that data available through the Water Quality Atlas is useful, but that stakeholders should reference WAC 173-201A, Table 2 for the definitive set of water quality standards to apply to water bodies of interest.

> **Ecology Response**: *Clarifying language has been added to this section.*

Section 1D: Ensuring Data Credibility in the Assessment

Comments on meeting credible data requirements

Comment from [Boeing]: This section provides a general list that describes data types that will be considered credible. As a general matter, the assessment protocols for some of the pollutants have become overly complicated and data quality intensive. In order to ensure consistent adherence to the requirements for data acceptability, Boeing recommends that Ecology develop a standard checklist that must be completed by the party submitting data at the point when data is uploaded to the Environmental Information Management System ("EIW)_ The checklist would support evaluation of whether the data is, in fact, credible as that term is used in RCW 9048.575. In the absence of a mechanism such as the recommended checklist, there would be insufficient

transparency and consistency, likely leading to inclusion of data that is not of acceptable quality and is not credible. Data that is not credible should be considered unusable and not used for assessment purposes, per "Data Unusable for the Assessment" (page 10). In addition, Ecology should provide the ability to upload all QAQC data, such as sampling plans and protocols quality assurance plans and water quality reports, so that supporting documentation is available to the public.

> **Ecology Response**: *We agree that the assessment protocols for some pollutants has become more complex and data quality intensive. This additional information has come as a result of the public dialogue sessions that were held in 2016-2017 where this additional information was requested for the sake of transparency and to ensure credibility. Ecology has worked hard to find a balance of how much information to provide and/or require from a data submitter to meet credible data requirements. While a checklist is an idea we can suggest to the agency EIM program, we do not believe it is essential to have one in Policy 1-11 because there are numerous checks and balances built into the EIM data submittal process before the data is uploaded into EIM.*

Comment from [Boeing]: The proposed changes to the Policy include several new data requirements, as noted in comments on section 21 Toxics-Human Health Criteria below. Ecology has noted that Policy 1-11, Chapter 2 Ensuring Credible Data for Water Quality Management is not part of the current public comment opportunity. However, all of the new data requirements should be incorporated into Chapter 2 at the next update. In addition, data that does not comply with data validation requirements should be considered unusable and not used for the water quality assessment, per "Data Unusable for the Assessment".

> **Ecology Response**: *Comment noted.*

Comment from [Interagency Team] [WSDOT]: The Water Quality Data Act requires Ecology to develop policy describing the specific criteria that determine data credibility. The draft Policy Chapter 1 nor current Chapter 2 contain baseline parameter specific criteria describing data credibility requirements, such as method and data quality objectives (which could be used to define QA or Planning Level 3 or higher in EIM). Recommendation: Include method and data quality objectives in the existing QAPP template linked on page 8 of the draft Policy or the Guidelines for Preparing a QAPP8 (Publication No. 04-03-030). Additionally, require use of the QAPP template(s) on: Water Quality Program grant funded projects, NPDES permit-related QAPPs, and Ecology's internal monitoring projects in support of the federal clean water programs. Achievement of QAPP required method and data quality objectives should define data that can be assigned a QA or Planning Level 3 or higher in EIM. Develop a programmatic QAPP for the WQA process that includes specific criteria used to evaluate credibility, such as method and data quality objectives. Include the internal procedures followed by Ecology during the WQA, which is a recurring data usability assessment project.

> **Ecology Response**: *We will explore the concept of a programmatic QAPP for the WQA that could be used when an entity is going out specifically to gather data for the WQA. However, it is important to note that Ecology has an obligation in the Clean Water Act to use all "readily available" ambient water quality data. Many studies and monitoring projects produce water quality data that can be used for the WQA even if the intent of the study was for another purpose. To meet credible data requirements, Ecology requires*

that the data is collected under a QAPP. The data submitter to EIM is responsible for noting the QA level when submitting the data to EIM. The Water Quality Data Act puts the onus on the data submitter to not knowingly falsify data that is submitted to Ecology.

Comment from [Interagency Team] [Snohomish County]: Improve the QAPP template requiring its use for: WQP grant funded projects, NPDES permit-related QAPPs, and Ecology's internal monitoring projects in support of the federal clean water programs. Achievement of QAPP required MQOs and DQOs would define data that can be assigned a QA or Planning Level 3 or higher in EIM.

Ecology Response: *Comment noted. Ecology was clear from the beginning of the process that the scoping and public dialogue efforts were limited to Policy 1-11, Chapter 1. We will pass this request on to managers in the Water Quality Program for future consideration.*

Comment from [NWEA]: In this section, Ecology explains Washington's Water Quality Data Act. What Ecology omits from this section is an explanation of how Washington's statute conflicts with federal regulations and guidance pertaining to the 303(d) listing process. For example, Ecology's discussion of the Act pertains to ambient water quality samples yet data and information required to be evaluated for the 303(d) list goes well beyond such ambient data. 40 C.F.R. § 130.7(b)(3), (5). We are not suggesting that Ecology should use data that are not credible but, rather, that Washington's law is improperly constraining in determining what data and information are credible and therefore is inconsistent with federal law.

Ecology Response: *The Water Quality Data Act has been in place for well over ten years and has been implemented by Ecology when assessing data for the WQA. At no time has EPA or others indicated that the state statute conflicts with federal regulations and guidance pertaining to the 303(d) listing process.*

Comment from [Pierce County]: Ecology did not open Chapter 2 of Policy 1-11 to public comment and revision. Recommendation: Open policy 1-11 Chapter 2 to public comment and revision, thereby increasing transparency of the decision-making process, understanding among stakeholders of what qualifies as credible data, and rigor of the criteria used to assess data credibility in the Polio'. Additionally, Ecology should collaborate with external stakeholders to ensure that approved external QAPPs produce data that meet the data credibility requirements in policy 1. 11 Chapter 2.

Ecology Response: *Comment noted. Ecology was clear from the beginning of the process that the scoping and public dialogue efforts were limited to Policy 1-11, chapter 1. We will pass this request on to managers in the Water Quality Program for future consideration.*

Comment from [Snohomish County]: The draft Policy does not adequately describe the specific criteria used to determine credibility of water quality data in alignment with the Water Quality Data Act (WQDA) RCW 90.48.570-585. The County requests Ecology develop, document, and utilize a list of parameter-specific methods for reference and use in determining data credibility. (b) Neither the Policy, any quality assurance/quality control (QA/QC) document,

nor SOP provides definitive guidance on how organizations should treat/qualify their bacteria samples that exceed method-specific hold temperatures or where field duplicates fail a relative standard deviation or percent difference data quality objective. Without these parameter specific criteria, stakeholders are treating data differently and Ecology likely accepts data for use in the WQA that it should reject. (c) Neither the Policy, any QA/QC document, nor SOP provides definitive guidance on how organizations should treat/qualify their temperature data if a thermistor fails calibration criteria. Without these parameter specific criteria, stakeholders are treating data differently and Ecology likely accepts data for use in the WQA that it should reject.

> **Ecology Response**: *The issues raised in the comment would all be covered under a QAPP. Data submitters that monitor and collect data under a QAPP (EIM Planning and assessment Level 3 or higher) follow the specifics in the QAPP that address how samples are handled if the holding times are not met or a thermistor fails calibration criteria in accordance with the QAPP. It was never intended in the WQDA that Ecology second guess all individual data values gathered under a QAPP; this would require an inordinate amount of time and resources. Entities that are collecting data under a QAPP are expending resources to ensure that the data they collect meet quality assurance objectives. As noted in previous responses, the data submitter is responsible for ensuring their data meets quality objectives outlined in the QAPP, not Ecology. We have many QA/QC checks and balances built into the EIM system, as well as the automation system when we pull data from EIM for use in the Assessment. If we do find data that was erroneous or should not have been used, we take immediate action to correct the data or information and will remove it if it fails to meet quality assurance requirements.*

Comment from [Snohomish County]: Create a new QAPP template or improving upon (publication 04-03-030) by including MQOs and DQOs.

> **Ecology Response**: *The request is outside of the scope of Policy 1-11. We will pass this suggestion on to the appropriate staff for consideration.*

Comment from [Vancouver]: We recommend further amendments to the Water Quality Policy document to ensure full implementation of this Washington State law (WQDA). These amendments need to include, at a minimum, providing public access to field measurements and laboratory analytical data files as well as: 1) the Sampling and Analysis Plans (SAP) and Quality Assurance Project Plans {QAPP) for field sampling programs {original and updated versions), 2) site sampling documentation (map, photos, coordinates, distance from shore, and proximity to storm-water or other outfalls), 3) field measurement records (including date, time, water depth, instrument used, sampler name), and 4) field calibration records (including instrument type and serial numbers) and chain-of-custody forms for laboratory analyses. We request that Chapter 1 of Ecology's Water Quality Policy 1-11 include a new section specifying a process for the public to gain access to these sources of information and to also require data credibility reviews by Ecology. Public reviews of the entire basis for 303(d) listings of waterbodies is very important to allow confirmation of data applied and reviewed in the Water Quality Assessment process, which would follow Ecology's Data Credibility Policy and Washington State law.

> **Ecology Response**: *We agree that it is the obligation of Ecology to fully implement the Water Quality Data Act (RCW 90.48.570-590) and ensure that credible data is used in agency decisions involving water quality. While we fully support public accessibility so*

that the decisions the department makes are transparent, the WQDA does not require that all data and information associated with making decisions is immediately available to the public. This would be an unreasonable demand given the breadth of decisions made and the amount of background information associated with agency decisions. The law at RCW 90.48.580(3) requires that the department respond to questions regarding the data, literature, and other information is uses for specific actions within a reasonable timeframe. While we do strive to make as much information as we can instantly available by the public (such as through EIM or through the Water Quality Atlas that allows one to access permitting information, water quality standards, and other information on a specific waterbody), we deal with specific requests for additional information on a case-by-case basis when a public inquiry is questioning a decision made by the department. We are continually look for improvements we can make to increase the availability of data to the public.

Comment from [Vancouver]: We recommend that Ecology specify in this Policy that all data submitters need to provide the following documentation for use in the Water Quality Assessment: 1) proof that a QAPP or SOP was completed (and submitted to Ecology) prior to sampling, 2) sampling documentation (map, photos, coordinates, distance to shore, and proximity to outfalls), 3) field measurement records (including date, time, water depth, instrument used, sampler name), and 4) field calibration records (including instrument type and serial numbers). In addition, these supporting documents need to be accessible for public review as downloadable electronic files.

Ecology Response: *We do not agree that the documentation cited in the comment needs to all be submitted to Ecology in order to meet credible data requirements. As described in Policy 1-11, Section 1D on ensuring credible data, Ecology utilizes several checks and balances through its agency programs to verify that credible data is used in the assessment. These are described in further detail in this new section.*

It is significant to note that the WQDA did not intend that Ecology take sole responsibility for the credibility of data from outside data submitters. While we have many checks and balances in place to determine and verify data credibility, it was also intended by the WQDA that a data submitter take responsibility for the data that is collects and submits to Ecology. RCW 90.48.590 states that "Any person who knowingly falsifies data is guilty of a gross misdemeanor." While we all recognize that mistakes do occur with data and it is important to continually be on the lookout for data errors, this part of the law puts the responsibility on the data submitter to not knowingly designate data as having a higher quality than its actual quality.

Comment from [WASWA]: Section 1D Ensuring Data Credibility in the Assessment, starting page 22 This section has improved over the previous draft in that it indicates Ecology will check all data being entered into the EIM, instead of just spot checks. It also reinforces strict measures of QA/QC for data gathered and submitted in support of the Water Quality Assessment. However, it still indicates that data deemed unusable will still be retained in the EIM, with appropriate notation. We would suggest that data considered unusable for the WQA be removed from the EIM. We fail to see what other use the data would have if it fails QA/QC rigor. It is also still not clear if QA/QC information submitted for the WQA will be available for public

inspection, which we insist is necessary. In a scientific context, if you wish to scrutinize the results of an experiment, the first thing you examine is methodology and QA/QC. This should apply as well for methods and QA/QC for data submitted for the WQA.

> **Ecology Response**: *The comment seems to suggest that the agency EIM database is intended only for application to the WQA, which is not true. In fact, the agency EIM database was established to house a variety of different types of environmental data with different levels of quality that can be used for many different purposes. A data submitter must indicate the QA Level of the data, and WQA staff only use water quality data that is QA Level 3 or higher (indicating that the data were gathered under a QAPP) to determine whether the data is usable for the WQA. While we fully support public accessibility so that the decisions the department makes are transparent, it is not required that all data and information associated with making decisions is immediately available to the public. This would be an unreasonable demand given the breadth of decisions made and the amount of background information associated with agency decisions. While we do strive to make as much information as we can instantly available by the public (such as through EIM or through the Water Quality Atlas that allows one to access permitting information, water quality standards, and other information on a specific waterbody), we deal with specific requests for additional information on a case-by-case basis when a public inquiry is questioning a decision made by the department. We are continually look for improvements we can make to increase the availability of data to the public.*

Comment from [WSDOT]: Additional clarity around who is doing what to ensure data credibility will improve both consistency and transparency. Recommendation: Use an active voice to clarify the various roles and responsibilities for the various parties involved in the WQA process.

> **Ecology Response**: *We have added clarity around data credibility and included a process flow chart as suggested by other comments. Where appropriate throughout the document, narrative was changed to the active voice.*

Comment from [WSDOT]: It is unclear as to whether and how Ecology relies on SOPs to describe specific criteria for determining data credibility as required by the Water Quality Data Act. As written, the SOPs are simply guidance. If adherence to SOPs is how data credibility is being evaluated, that must be made clear. It should be clear to stakeholders how to plan for and design a project that will result in data that will meet QA Planning and Assessment Levels 3 or higher. Recommendation: Clarify how SOPs are utilized by Ecology to describe specific criteria and evaluate data credibility as required by the Water Quality Data Act.

> **Ecology Response**: *It is already stated in "1D. Ensuring Data Credibility in the Assessment" that SOPs are developed by Ecology for field sampling and field analytical activities undertaken at Ecology. They provide useful information to data submitters for the Assessment. Unless specified that an SOP must be followed under the assessment considerations for specific water quality criteria, there is not a requirement that an SOP be followed, although a data submitter must at a minimum operate under a QAPP and it would likely include SOPs within the QAPP.*

Comment from [Boeing]: Page 9 — Data Verification. This section states: "Data validation is not typically necessary for the purpose of the WQA_' Although this statement may have been accurate in the past, it is no longer correct, and it is essential that data be verified. As an example, water quality standards for many pollutants are below the detection limit of the approved test methods for the pollutant in these cases, it is necessary to validate data for any sample data result that is between a test method reporting limit and method detection limit and/or marked with a "J" flag. Therefore, the Draft Policy should be revised to include provisions for data verification.

> **Ecology Response**: *We have explained both in this section and in the definitions section the difference between data validation and data verification. For the WQA, data verification is used to determine data credibility. Data validation is not required of all data, but is a specific term that describes a process used for datasets whose usage requires a maximal level of QA/QC.*

Comment from [Boeing]: Data Verification. The February' 2018 Draft Policy does not provide mechanism to ensure adequate transparency of data review and verification In order to ensure adequate transparency, the Draft Policy should be revised to include a standard data verification report that would be available to the public on the EIM system.

> **Ecology Response**: *The request for a standard data verification report in EIM is outside the scope of this listing policy and would not serve a useful purpose since one can access any data submittal in EIM and look at details of the submitted data. While we fully support public accessibility so that the decisions the department makes are transparent, it is not required that all data and information associated with making decisions is immediately available to the public. This would be an unreasonable demand given the breadth of decisions made and the amount of background information associated with agency decisions. The law at RCW 90.48.580(3) requires that the department respond to questions regarding the data, literature, and other information is uses for specific actions within a reasonable timeframe. While we do strive to make as much information as we can instantly available by the public (such as through EIM or through the Water Quality Atlas that allows one to access permitting information, water quality standards, and other information on a specific waterbody), we deal with specific requests for additional information on a case-by-case basis when a public inquiry is questioning a decision made by the department. We are continually look for improvements we can make to increase the availability of data to the public.*

Comment from [Boeing]: Given the complexity of the proposed assessment policy for human health toxics, the Policy needs to include a standard operating procedure (SOP) on sampling and test methods with detection limits for fish tissue collection and analysis.

> **Ecology Response**: *This kind of information would be included in a QAPP, but we will pass the suggestion on to the appropriate staff for consideration.*

Comment from [Interagency Team] [Snohomish County] [WSDOT]: Proposed changes to Chapter 1 removes language allowing waivers to the requirement for lab accreditation, but the allowances remain in Chapter 2 creating uncertainty regarding Ecology's granting of waivers. Definitions for Quality Assurance Levels do not account for instances where Ecology provides

waivers from producing a new QAPP when Ecology deems an existing QAPP equivalent. Recommendation: Clarify whether Ecology will still allow waivers for lab accreditation. Include language in applicable sections of the Policy to reflect Ecology decisions to provide waivers to QAPPs and describe how data submitters should assign Quality Assurance levels to that corresponding data in EIM.

> **Ecology Response**: *This comment brings up waivers for two different topics – lab accreditation and QAPPs. Ecology's Executive Policy 22-02 provides information on the use of accredited laboratories, including the process for obtaining a waiver from the requirement to use an accredited laboratory. A waiver for a QAPP is allowed under certain circumstances. QAPP waivers are generally approved only if the study does not generate new environmental data, analyze existing environmental data, model environmental conditions, or evaluate environmental technology. Studies that meet these criteria must be described in detail in an approved QAPP, must be conducted under the umbrella of a programmatic QAPP, or be described in an addendum to an already-approved QAPP.*

Comment from [King County DNR]: King County would prefer that Ecology's EIM data submittal process include a standardized series of questions and answers that document: a) That appropriate QA procedures were actually followed, b) The samples and measurements are representative of the Assessment Unit (AU) under investigation and that the sampled locations are Waters of the State, c) That the authors of the study, in cooperation with Ecology scientists, both concur the data are usable for making decisions about water quality conditions and potential impairments. In the interest of consistency and transparency, King County recommends a standardized set of data usability questions be utilized for all EIM submittals and the answers to these questions be part of the public records associated with each data package.

> **Ecology Response**: *Comment noted. We will pass this suggestion on to the agency EIM program for consideration.*

Comments on data verification

Comment from [Vancouver]: Data Verification:The actual verification of data submitted for the Water Quality Assessment (WQA) are dependent on the data submitter and not Ecology, as defined in this section of the policy document. This approach to data verification for use in the WQA is inadequate to protect Ecology from using invalid, incomplete, or even false data. In addition, critical analytical data sources that are used in the WQA to trigger Category 5 listings should be required to include data validation as well as detailed data verification. We recommend that Ecology allow stakeholders full access to detailed sampling documentation that data submitters must provide to Ecology (not just data files). We also recommend that Ecology set up a standardized and detailed data verification procedure spreadsheet for all reviewers (inside and outside of Ecology) to fill out and sign. This will engage resources outside of Ecology and enhance data verification for these very important data sources. Ecology's new section addressing Data Unusable for the Assessment does identify specific examples of unusable data, but it does not define routine procedures and document requirements to allow Ecology to identify problem or unusable data sources. This brief section of Chapter 1of the Water Quality Program Policy is too general and only states that "Ecology reserves the right to

request further quality assurance documentation from any entity that has submitted data for use in the WQA."

> **Ecology Response**: *Ecology has had a program in place for several years to ensure that credible data is stored in the Agency's EIM database. Ecology staff with data management expertise work with individual data submitters to input data. The process of uploading each batch of data into EIM is time intensive and often involves several iterations of QC review between the data submitter and Ecology before the data is acceptable. Ecology staff ultimately load the final reviewed dataset into EIM. While the commenter may not agree that the programs outlined in Policy 1-11 serve to verify data quality, we have found them to be effective and to minimize the possibility of data errors.*

Section 1E: Data and Information Submittals

Comments on how data are analyzed

Comment from [Boeing]: Page 12 — The Policy must include a clear method to address data from boundaries AL's for rivers with definitive boundaries (i.e., culverts or dams). On page 12, the Draft Policy states: "only one parameter value per day per AU will be used in the WQA' However, segmented rivers/streams may have monitoring locations associated with these definitive boundaries. Such rivers/streams should be assessed as multiple AUS.

> **Ecology Response**: *The 1:24,000 scale National Hydrography Dataset (NHD) is used to delineate AUs for fresh water rivers, streams and lakes less than 1500 acres. This establishes AUs based on a confluence-to-confluence type hydrologic system. Unless a request has been received by Ecology to reconsider how an AU is currently delineated, we have no basis to determine that an AU is inappropriately divided. Any given monitoring location resides in one AU or another.*

Comment from [Pierce County]: We recommend that data be analyzed over the water year instead of the calendar year wherever possible.

> **Ecology Response**: *We have considered this alternative, but are not in a position to implement it during this assessment cycle.*

Comment from [Pierce County]: Ecology should be careful when averaging data that displays discontinuous or clustered patterns, and may not represent typical circumstances. Data distribution should be considered when applying the hypergeometric test, particularly when few samples are involved.

> **Ecology Response**: *Comment noted. The hypergeometric distribution, unlike the binomial distribution, does not assume that samples are independent.*

Comment from [Pierce County]: It is inappropriate to assume instantaneous measurements represent anything other than one point- and time-specific measurement. WAC 173-201A WQ criteria clearly separates instantaneous concentration from average concentration, and it is inappropriate to use one type of measurement to substitute for another. Also, WQ criteria contain

separate standards for acute and chronic thresholds, with chronic thresholds generally much lower. This difference could be unrepresented or misrepresented by use of instantaneous measurements. Hourly averaging periods should be based on continuous data that meets data quality standards.

> **Ecology Response**: *EPA requires Ecology to utilize the data that is readily available. For the toxic substances, it is rare to have sufficient data to properly calculate an average for a criterion. It is not practicable to require continuous monitoring or the collection multiple samples within a short timeframe (day or hour) to assess toxic substance data. As an analogy, we note that in Discharge Monitoring Reports EPA allows an instantaneous sample result to be reported as representative of an average concentration when multiple results are unavailable for the reporting period.*

Comment from [Pierce County]: Numeric Data Submitted to EIM. "Only one value per day per AU will be used in the WQA. The highest measurement per day will be used unless otherwise specified, except for dissolved oxygen for which the lowest measurement will be used, and pH for which the highest or lowest measurement will be used as applicable." Recommendation: In the case of temperature, pH, and dissolved oxygen, an average of measurements collected over multiple days would help confirm whether adverse conditions are persistent, and would better represent the magnitude and duration of conditions to which the aquatic life is exposed. This is a much more representative and useful approach than only looking at the most "extreme" (and potentially short-lived) condition.

> **Ecology Response**: *We do not agree that averaging measurements for temperature, pH, and dissolved oxygen would better represent the magnitude and duration of conditions to which the aquatic life are exposed. Averaging would, in fact, likely mask extreme conditions that could cause harm to aquatic life. The water quality criteria are based on setting pollutant parameter magnitudes that are protective of the use. Unless the criteria allow averaging as a basis for determining compliance, those protective levels (such as daily - or instantaneous - maxima or minima) must be used as a basis for determining impairment of the use.*

Comment from [Pierce County]: Please include "third party data submittals" in the glossary. page 24. Category 5. The 303(d) List— " An AU may also be placed in Category 5 if it is currently meeting standards, but credible data and information indicate that the waterbody is not expected to meet applicable water quality standards by the next WQS cycle. Recommendation: There appears to be an underlying assumption that a listing can be based on a trends analysis that suggests water quality standards will not be met in the near future. The use of trends analyses to support listing decisions lacks the specificity needed to provide assurances of consistent, credible, and transparent analyses. We recommend that before this listing decision is made, Ecology describe the minimum number of samples needed to support a trends analysis, the test statistic proposed, and the confidence interval and listing decisions made based upon the results.

> **Ecology Response**: *Language has been added to the section on third part submittals to define what is meant by "third party" and to emphasize the basis for Ecology's discretion in allowing data submitted by third parties to be used. Language has also been added requiring data to be collected through a valid statistical methodology in order to analyze trends. To date, Ecology has not listed any waterbodies on Category 5 due to trends data.*

Comment from [Pierce County]: Pierce County continues to request Ecology revise its procedure to demonstrate the same level of rigor and burden of proof for delisting waterbodies as for listing waterbodies.

> **Ecology Response**: *Understanding why there is a greater burden of proof for delisting water bodies than for listing was discussed in detail during the public dialogue meeting held on Policy 1-11. Ecology conducted an error analysis that more clearly explains why more data is needed to move from Category 5 than to get listed in Category 5. Please see Ecology's paper at: https://ecology.wa.gov/DOE/files/44/441bf7ac-7f34-499f-8b14-5e21c39eb1b9.pdf starting on page 5.*

Comment from [Vancouver]: We also recommend that Ecology modify the current limitation of one parameter value per day per AU to allow for at least hourly continuous water quality monitoring data sets to document diurnal monitoring of pH and DO.

> **Ecology Response**: *Water quality standards for pH and DO need to be met at all times. For example, with dissolved oxygen, the single lowest value recorded for a given day is the value used to represent that day in determining whether or not the assessment unit meets water quality criteria. If we were to average continuous monitoring over a period, it could mask noncompliance with standards that are not to be exceeded at any time.*

Comment from [WASWA]: There is now no specific mention of Ecology's unwillingness to accept continuous data sets. Does this mean such data falls under the section indicating that a data submitter may make special arrangements with Ecology to submit data? This needs to be further clarified. The statement that only one data point per parameter per day per assessment unit seems to preclude the use and acceptance of continuous data. It also seems to conflict with the statement that EPA requires that all data in a data set be submitted, not just selected portions. Again, Ecology must develop guidelines for acceptance and use of continuous data. Starting on page 29 is the discussion of the age of data. Data older than 10 years, collected under less stringent QA/QC protocols, before the implementation of appropriate SOPs, should not be used for any aspect of the WQA. This information may still have value for determination of historical natural conditions.

> **Ecology Response**: *Clarifying language was added to the beginning of this section to confirm that Ecology will accept both individual and continuous monitoring datasets. Ecology does in fact accept continuous monitoring data and encourages its collection. Policy 1-11 cites the use of continuous monitoring data in the specific parameter sections for dissolved oxygen pH, temperature, and total dissolved gas. When assessment of continuous data is conducted, only one data value is used per day. For example, with dissolved oxygen, the single lowest value recorded for a given day is the value used to represent that day in determining whether or not the assessment unit meets water quality criteria.*

Comment from [AWB]: Applying the Category 5 listing criteria from prior versions of Policy 1-11 has produced an unmanageable backlog of Category 5/TMDL obligations. This situation is partly caused by Ecology's policy choice to rely on >10-year old water quality data as representative of current conditions and still a valid basis for Category 5 placement and then

TMDL development. Policy 1-11 should create a mechanism to reassign Category 5 waters to Category 2 or Category 3 for the reasons just presented, where those waterbodies can become priorities for Ecology monitoring efforts.

> **Ecology Response**: *Ecology does not agree that all data older than ten years should be arbitrarily removed. As long as the data met quality assurance requirements at the time the data was submitted, we would not discount the data quality simply because of age. We emphasize that when available, newer data within the last ten years is always used for the assessment, and can result in a category change if enough data is available. However, we do not remove impairment determinations with data older than ten years where no new data is available to assess because without newer data we cannot assume that the condition of the waterbody has improved. To begin an Assessment, Ecology conducts a call-for-data. Data collected within ten years of the published call-for-data end date for each Assessment is then consolidated and assessed with other data of the same waterbody segment and parameter. Ecology is making a effort to review old listings that no longer meet current Policy 1-11 requirements, but because of the large number of listings in the database, all listings from previous assessment cycles will not necessarily be reassessed according to the most recent policy unless more recent information associated with the parameter and waterbody segment is made available, or a request is made to reassess a listing under the new policy.*

Comment from [Boeing]: Page 15 — By allowing for the continued listing of AUS based on data more than ten (10) years old, the February 2018 Draft Policy fails to meet the intent of the requirement that a listing be based on "an adequate number of samples" (as described under Data Evaluation on Page 7). AUS with no data within the last ten years should be moved to Category 3, Lacks Sufficient Data

> **Ecology Response**: *See above response to AWB.*

Comment from [Pierce County]: In the stakeholder meetings, Ecology stated their willingness to review data Older than 10 years old using the new guidance in an updated Policy 1-11. Recommendation: Upon completion Of an updated Policy 1-11, review listing determinations made using data Older than 10 years according to the updated criteria.

> **Ecology Response**: *See above response to AWB.*

Comment from [Vancouver]: Age of Data Considered in the WQA (Page 15): Ecology's Policy document needs to clearly define that data older than 10 years will be excluded from use in the WQA, since these data more than one decade old would not represent current water quality conditions. Sediment data would be the exception to this rule. We recommend modifying the policy to remove the use of all data older than 10 years, especially in the context of limited data sets that cannot be reasonably understood to represent actual water quality conditions. Furthermore, we recommend that the policy needs to emphasize that water quality data collected within recent years should be considered most representative and should supplant older data.

> **Ecology Response**: *See above response to AWB.*

Comment from [NWEA]: Ecology proposes that it will not use data older than ten years except when it seeks to delist segments based on determining purported natural conditions. There is no rationale presented to explain why there are two sets of rules, one for listing which is more

restrictive and one for delisting that is less restrictive. Ecology also states that it will evaluate newly submitted data by adding it to previously assessed data only if those are less than ten years old. In doing so, Ecology also needs to look for trends to see if waters are threatened. In addition, there is nothing particularly scientific about combining data based on an arbitrary cutoff point that ends in a zero. If the more recent data demonstrate a clear impairment, say in the last three years, and averaging those data with data from the previous seven years results in a finding that there is no impairment, clearly the more recent data should be used without combining them. Given the infrequency of Ecology's 303(d) lists, it would be irresponsible to ignore such a trend, one that would only likely worsen before Ecology got around to a new list. Is Ecology stating that it intends to review all existing listings based on this new method of assessment or just when polluters concerned about how listed segments may affect their discharges request this re-assessment? Ecology needs to not throw in a vague sentence about something that is potentially of such significance. In addition, if Ecology intends to do this, it must state its rationale and provide an explanation of how it will determine what "quality assurance requirements" were in place at the time of the data collection, and why it was able to use the data in the first place.

> **Ecology Response**: *We are not sure we understand the comment regarding two sets of rules for listing and delisting. In fact, delisting from Category 5 to Category 1 requires much more data and has more stringent requirements than what is required to be placed in Category 5. This is explained in more detail in an Error Analysis that was conducted by Ecology's Environmental Assessment program statistics staff to demonstrate why it is easier to get onto Category 5 (requires less data) than to get delisted to Category 1. We do agree that if more recent data demonstrates a clear impairment, then that impairment should not be masked by averaging it with the earlier years of data within the 10 year period. We have built requirements into the parameter-specific sections that address this issue. The assessment methodologies do not rely on averaging data over a 10 year period.*
>
> *Finally, regarding the comment about reassessing old listings (that have no new data within the ten year window for that cycle), Ecology maintains that listings must have met the quality assurance requirements in place at the time of its collection. If a listing is called into question because of quality assurance concerns (regardless of its age), Ecology will research the listing, and the data and information that led to the listing in the first place. If the quality concerns are substantiated and it appears that the listing did not meet minimum quality assurance levels at the time it was listed, Ecology will propose to remove the waterbody from the list and will report the finding to EPA during the next listing cycle. This is important because we cannot maintain the integrity of the Assessment results if we knowingly leave a waterbody segment on the list that we know did not meet minimum quality assurance levels. If we are not able to make a determination, the waterbody will be left on the list until new data is collected to substantiate or refute the earlier listing.*

Comment from [Snohomish County]: Page 15. Use of non-detect samples. Choosing a random value for calculation of a geometric mean seems inconsistent with EIM requirements for assigning values to non-detect data. EIM requires that the method detection or reporting limit be assigned to a non-detect result, particularly for bacteria data where geometric means are generated for comparison to Standards. An associated qualifier is used, indicating the non-detect value. Recommendation: Review EIM requirements for assigning values to non-detect data and

update the Policy accordingly. This may include indicating that non-detect values are assigned a value equal to the method detection or reporting limit.

> **Ecology Response**: *A document is available on the EIM Help Center that can assist with using non-detect data for bacteria: https://fortress.wa.gov/ecy/eimhelp/*

Comment from [Vancouver]: Use of Non-detect Samples (Page 15): We recommend that values of no more than one-half method detection limits should be used in calculating statistics for data sets, which is consistent with EPA and Ecology's policy for RPAs and risk assessments.

> **Ecology Response**: *The use of non-detect samples in the water quality assessment process will vary by parameter and how close the detection limit is to a criterion or threshold. For bacteria, a value of one-half the detection limit will be used to calculate a geometric mean. The criteria for bacteria is much greater than the detection limit, and the geometric mean will not be greatly influenced by using one-half the detection limit. For the toxic contaminants used to evaluate the human health uses, a non-detect that is greater than a threshold will not be used, as it is unknown if the non-detect value shows compliance. Non-detects that are less than a threshold will be included in the assessment for human health uses, however numeric values will not be substituted for non-detects in the determination of a median value.*

Comments on quality of data submitted

Comment from [Boeing]: Page 15, final paragraph, and Pages 58-59. In order to ensure that higher quality data is given greater weight than lower quality data, the Policy should explicitly state that data from time-weighted or volume-weighted water samples takes precedence over grab sample data.

> **Ecology Response**: *The Water Quality Data Act requires that data used in the WQA meet minimum credible data requirements and does not differentiate between "higher quality" and "lower quality" data. Therefore, we do not see the point in having one set of credible data be given greater weight to take precedence over another set.*

Comment from [Boeing]: The section titled "Additional Information on Data Submittals' identifies and discusses several factors that limit the type of data that will or will not be used for a WQA. In order to ensure that higher quality data is given greater weight than lower quality data, the Policy should explicitly state that randomly collected data representative of the water body as a whole takes precedence over, and supersedes to the extent inconsistent, targeted samples designed to characterize a localized condition.

> **Ecology Response**: *Targeted samples that are designed to characterize a localized condition would not be considered representative of ambient water conditions and would not be used. If for some reason you believe a listing was based on localized data that is not representative of ambient conditions, please notify us and we will look into whether data was inappropriately used. The Water Quality Data Act requires that data used in the WQA meet minimum credible data requirements and does not differentiate between "higher quality" and "lower quality" data. Therefore, we do not see the purpose in having one set of credible data be given greater weight to take precedence over another set.*

Comment from [Interagency Team] [Snohomish County] [WSDOT]: Page's 12 – 13. Clarify the roles and responsibilities for the production and use of credible data during the WQA. Better describe the information leading up to the EIM Quality Assurance table to clarify the difference between QA Planning Levels and QA Assessment Levels. Additionally, improve the EIM Quality Assurance table to clarify roles and responsibilities for data collectors, labs, and data submitters. Recommendation: Edit language, using active voice, leading up to and within the table to clarify roles and responsibilities of the various actors involved in the EIM submittal and QA/QC level assigning process. Define important terminology such as QA/QC Planning Level and QA/QC Assessment Level.

> **Ecology Response**: *We have added clarity around data credibility and included a process flow chart as suggested by other comments. Where appropriate throughout the document, narrative was changed to the active voice. It is not necessary to add information to Policy 1-11 that can be found on Ecology's website for EIM. More detail on the QA Planning and QA Assessment Levels can be found on Ecology's EIM Help Center page, specifically the Study Help document, found at https://fortress.wa.gov/ecy/eimhelp/HelpDocuments. There is also additional information on the page where the data submitter enters their studies into EIM. On that page, when they are entering in their study info, they can click on the name of any field and a pop-up will appear that tells them detailed information about that field. Definitions for QA Planning and Assessment Levels have been added to the policy. Clarification language has also been added to the policy to be clear that the data submitter is responsible for assigning the QA Planning and Assessment Levels for EIM. The role of determining and examining the quality control of the data falls entirely to the data submitter, or whoever is in charge of their monitoring program. The same person is in charge of all field operations and using current/approved standard operating procedures. The same person verifies and assesses the data for usability. The same person assigns the QA levels when they create their EIM study.*

Comment from [Interagency Team] [Snohomish County]: Recommendation: Clarify that the assignment of quality assurance levels of 3 or higher include the conditions placed on levels below them.

> **Ecology Response**: *The policy has been updated to clarify that the descriptions of QA Assessment Levels 3-5 represent requirements in addition to the ones described in the lower QA Levels.*

Comment from [Interagency Team] [Snohomish County] [WSDOT]: EIM does not currently provide the capability for data submitters to upload their approved QAPP, Sampling and Analysis Plan (SAP), equivalent document, modeling information, or narrative documentation to support natural condition or Category 5 determinations for B-IBI and ensure that data meet QA Planning and Assessment levels of 3 or higher. Recommendation: Provide EIM the capability to house attached documents and require data submitters to upload their QAPP, SAP, equivalent document, information obtained from a modeling effort, or narrative documentation to EIM such that natural condition and Category 5 determinations for B-IBI occur and ensure that data achieve QA Planning and Assessment Levels of 3 or higher.

Ecology Response: *This is a utility that the EIM team is researching, but changes to EIM are outside of the scope of the Policy 1-11 update as EIM is an agency database whose structure and function is beyond the sole discretion of the Water Quality Program. While we fully support public accessibility so that the decisions the department makes are transparent, the WQDA does not require that all data and information associated with making decisions is immediately available to the public. This would be an unreasonable demand given the breadth of decisions made and the amount of background information associated with agency decisions. The law at RCW90.48.580(3) requires that the department respond to questions regarding the data, literature, and other information is uses for specific actions within a reasonable timeframe. While we do strive to make as much information as we can instantly available by the public (such as through EIM or through the Water Quality Atlas that allows one to access permitting information, water quality standards, and other information on a specific waterbody), we deal with specific requests for additional information on a case-by-case basis when a public inquiry is questioning a decision made by the department. We continually look for improvements we can make to increase the availability of data to the public*

Comment from [King County DNR]: Page 11: Thank you for recognizing that some water quality monitoring projects are not intended to capture the overall water quality within an AU. King County recommends that EIM staff specifically address the usability of data for listing purposes at the time of each upload and ensure that the decision is documented (i.e., identify or flag spill and/or swimming beach monitoring program data sets).

Ecology Response: *It is not the responsibility of the EIM data loader to determine the usability of data for WQA listing purposes. The EIM data loader verifies the accuracy, correctness and completeness of the data before it is uploaded into EIM, but the data comes from a variety of entities and can be used for any number of purposes, including the Assessment. When data are pulled from EIM for assessment purposes, we rely on the data location and type to help ensure that we are not using non-representative data, and will do further checks as needed to determine that the data is representative.*

Comment from [Pierce County]: Quality Assurance Levels for Data Submittals to EIM. Quality assurance levels are vaguely described and difficult to understand. Recommendation: Provide further guidance on how to determine Quality Assurance Level when submitting data to EIM. Develop and conduct regular training for data submitters and QAPP writers. Explicitly state who can determine Quality Assurance level.

Ecology Response: *More detail on the QA Planning and QA Assessment Levels can be found on Ecology's EIM Help Center page, specifically the Study Help document, found at https://fortress.wa.gov/ecy/eimhelp/HelpDocuments. We have also added definitions into Policy 1-11 for these terms. There is also additional information on the page where the data submitter enters their studies into EIM. On that page, when they are entering in their study info, they can click on the name of any field and a pop-up will appear that tells them detailed information about that field. Clarification language has been added to the policy to be clear that the data submitter is responsible for assigning the QA Planning and Assessment Levels for EIM.*

Comment from [Snoqualmie Tribe]: Ecology should introduce language that prevents clustering or spreading out data to hide periods of noncompliance for all parameters. ECY must ensure that water quality assessments reflect water conditions at critical time periods and prevent the erroneous delisting of Category 5 waters.

> **Ecology Response**: *Policy 1-11 cannot dictate when or how external stakeholders collect data, it can only determine what data can or cannot be used in developing the 303(d) list and to set appropriate measures to ensure data are assessed in a manner to avoid masking periods of noncompliance. The assessment methodology does include provisions to address critical periods where appropriate and when it would not complicate the methodology while having little to no effect upon a category outcome. Section 1E Data and Information Submittals includes language about not submitting partial datasets. Language has been added to Section 1E under "Data Unusable for the Assessment" indicating that if it comes to Ecology's attention that a monitoring design was manipulated to obscure or avoid periods of non-compliance, then data for the entire study will be discarded from the assessment. Section 1F has language stating that data showing compliance during "critical condition" periods must be available in order to qualify for Category 1.*

Comment from [Vancouver]: Data and Information Submittals (Page 11): We recommend that Ecology revise the text in this section so it is clear that Ecology will perform data verification and assessment for usability to assign the appropriate QA/QC Level for data sets submitted in the WQA - and in particular those data sets applied in Category 5 listings. We also recommend that Ecology allow stakeholders full access to detailed sampling documentation that data submitters should provide to Ecology (not just data files), to allow stakeholders to support Ecology in the review process.

> **Ecology Response**: *Language has been added to this section to direct the reader to Section 1D which describes data verification. It is not the responsibility of Ecology to assign the appropriate QA/QC level for data sets submitted to EIM for use in the WQA. This is the responsibility of the data submitter. By assigning the QA/QC level, the data submitter accepts responsibility that the data was collected with the level of QA indicated. Ecology only uses ambient water quality data that has been assigned a QA Assessment level of 3 or above, indicating that the data was collected in accordance with a QAPP.*

Comment from [Vancouver]: Third Party Data Submittals (Page 16): We agree that all data submittals should include the documentation specified plus details of instrument calibrations, sampling sites, and field records. However, Ecology does not define the term "third party" in this Policy document. We recommend that Ecology provide a definition of the term "third parties" within the document and provide a logical basis or framework for the exercise of Ecology's discretion, which is based on emphasizing the use of the highest quality data providing the most representative characterization of actual water quality conditions in a segment.

> **Ecology Response**: *Language has been added to this section to define what is meant by "third party" and to emphasize the basis for Ecology's discretion in allowing data submitted by third parties to be used.*

Comment from [WSPA]: WSPA recommends that Ecology rely on more robust data sets rather than discrete measurements (i.e. single day and single grab samples). Listing a waterbody based on data from a single day and/or single grab sample is unreasonable and does not follow good scientific method. Reliance on these types of discrete measurements can ignore many variables that result in an irregular value and often creates unnecessary work. Due to the significance of a Category 5 listing, WSPA believes that the determination should be based on substantial, multi-year evidence of water quality standards exceedances.

> **Ecology Response**: *It is not feasible to omit discrete data from the assessment. Ecology is required to use all credible readily available data. Discrete measurements can provide highly credible information about the water quality status of a waterbody. Ecology has standardized SOPs for collecting discrete data. We agree that in most cases Category 5 determinations should be based on multiple years of data. This is why we have added a statistical test to the assessment methodology for discrete dissolved oxygen, pH, and temperature measurements which tightly control Type I error (concluding that a waterbody is impaired when in actuality it is not) and requires two years failing the test for a Category 5 determination. The exception is that two extreme discrete data exceedances in a single year will lead to a Category 5 determination for these parameters.*

Comments on narrative and other types of data and information submitted

Comment from [NWEA]: Ecology incorrectly limits the use of modeled data to those situations where "when the status of water quality is being determined in relation to natural conditions." Modeled data are also information upon which Ecology can determine, for example, that waters are threatened and therefore require listing. Modeled data can also be used to determine that waters are impaired where sampling data are lacking. Ecology is also not free to eliminate all data because the objective of the sampling was not for the purpose of determining "the overall quality of the water." Projects that have objectives of characterizing a localized condition, such as dilution calculations for regulatory mixing zones, are not per se data and information that should and cannot be used. In fact, the opposite is true. It is a conclusion without basis for Ecology to determine that all such data are unusable because they "may not be representative of ambient water quality." In fact, Ecology must evaluate them to see if they are, or are not, sufficiently representative and its Methodology must explain why and when it will not use such data. Very few studies are intended specifically for the purpose of determining the overall quality of the water within a specified segment or assessment unit; Ecology is not free to disregard all other data and information.

> **Ecology Response**: *The Credible Data Act requires that we use actual observations of water quality data on the waterbody in question. Ecology uses models to evaluate observed data relative to natural or reference conditions. Ecology would not use nonattainment of dilution calculations to assess a waterbody's ambient condition because that is a permit compliance issue that would be regulated through the NPDES permit program and corrected. The purpose of Section 303(d) is to identify waters that are currently meeting permit limits but the waterbody is showing impairment, and thus a TMDL or cleanup plan is need to set wasteload and load allocations to bring the water back into compliance.*

Comment from [NWEA]: We are pleased to see that Ecology is finally acknowledging the role of narrative criteria and standards. Unfortunately, Ecology misconstrues the law by stating that, "Narrative criteria may be used in conjunction with numeric criteria as described in the parameter sections... The linkage between source, cause, and effects needs to be clearly documented in order to meet credible data requirements in Washington." This overly narrow approach to interpreting and applying Washington's narrative standards is simply incorrect. To require double the documentation is to negate the independent value of the designated uses that must be supported and the narrative criteria that must be met, thus violating EPA's rule of independent applicability and rendering much of Washington's water quality standards of no value.

> **Ecology Response**: *Ecology has an obligation to ensure that we adhere to the Water Quality Data Act (RCW 90.48.585-590). We therefore stand by the requirement that in order to use information to make a narrative listing, the study or information must show documentation of environmental alteration in the waterbody segment, as well as documentation that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. Those two pieces of evidence must be tied together in order to reach a reasonable determination that the waterbody is impaired for the existing or designated use. A comparison of numeric data to numeric criteria already inherently makes that linkage.*

Comment from [Pierce County]: Part IE: Assessment of Studies to Determine Impairment based on Narrative Standards. "For water quality studies that are submitted to Ecology for consideration in the WQA. the study must show a link between the environmental alteration in the waterbody and the impairment of a beneficial use" and "The linkage between source, cause, and effects needs to be clearly documented in order to meet credible data requirements in Washington" Comment: These strong statements directly conflict with the proposed process for making Category 5 Bioassessment listing determinations. Ecology proposes to list AUS prior to establishing any linkages between alterations, impairments, sources, causes, or effects. Recommendation: For bio-assessments, conduct a stressor analysis study prior to making a Category 5 determination and make any subsequent listings for the identified stressor(s), when appropriate.

> **Ecology Response**: *The bioassessment listing methodology is described in Part 2B. As noted in this section, listings that are placed in Category 5 will be labeled as "benthic biodiversity-cause unknown" until a stressor analysis study identifies a pollutant, in which case the listing will change to identify the pollutant causing the impairment.*

Comment from [Snohomish County]: Page 11. The allowed use of modeled data to determine natural conditions is of concern where credible field validation of modeled results is not conducted. Recommendation: Clarify that credible field validation of modeled results is necessary for use in determining natural conditions.

> **Ecology Response**: *Language has been edited based on the comment. Any modeled outputs would need to meet credible data requirements outlined in RCW 90.48.585. Making a natural conditions determination is further described in section 1G. Other*

Assessment Considerations. Please see that section for details on what is needed to determine natural conditions for purposes of the WQA.

Comment from [WSDOT]: Page 11, first paragraph, last sentence, "Modeled data that meet credible data requirements will be allowed when the status of water quality is being determined in relation to natural conditions:" The intent and scientific defensibility of this sentence are unclear. Recommendation: Replace "modeled data" with "modeled output" and describe the specific criteria used to ensure modeled output will meet the credible data requirements.

Ecology Response: *Language has been edited based on the comment. Any modeled outputs would need to meet credible data requirements outlined in RCW 90.48.585.*

Comments on application of water quality standards

Comment from [NWEA]: We agree that where information is not available to determine which criteria, as between fresh and marine waters, are not available, the more stringent of the two (or more) should apply. Ecology should also state here that where upstream waters are governed by downstream criteria and uses, those upstream data must be measured against the downstream criteria. For example, fresh waters immediately upstream of shellfish beds for which a more stringent bacteria criterion applies, must be evaluated as to their potential to impair the downstream criteria and uses. See WAC 173-201A-260(3)(b).

Ecology Response: *Protection of downstream uses is appropriately considered when setting the designated uses and associated water quality criteria as required by 40 CFR 131.10(b*), "*In designating uses of a water body and the appropriate criteria for those uses, the State shall take into consideration the water quality standards of downstream waters and shall ensure that its water quality standards provide for the attainment and maintenance of the water quality standards of downstream waters*". *Therefore, the applicable WQ criteria Washington's water quality standards already incorporate upstream numeric criteria for the protection of downstream uses. As cited, WAC 173-201A-260(3)(b) provides the regulatory path to regulate actions, such as issuing permits and setting TMDL load allocation to meet downstream uses. This does not allow the state to supplant the numeric criteria associated with designated use in a particular waterbody for the criteria associated with a use in the downstream waterbody. The water quality assessment can, however, apply an upstream load allocation that has been determined though an action (such as an approved site specific study like a TMDL) demonstrating that the concentration of a pollutant must be lower than the existing numeric criteria to meet a downstream use. Without a study that determines a more stringent criteria is necessary, the use of a downstream numeric criteria in upstream waters would be an arbitrary and indefensible application.*

Comment from [NWEA]: PART 2: Specific Assessment Considerations for Water Quality Criteria. We urge Ecology to add to this list so that there are clear methods of using all required parts of its water quality standards), and all of its criteria, including narrative criteria.

Ecology Response: *The pollutant parameter assessment methodology described in Part 2 is based on specific parameters that are in the water quality standards, as well as*

narrative criteria for aquatic life, fish/shellfish harvest, and drinking water uses. We have a general description of the use of narrative criteria in Part 1 that can be applied to other types of narrative criteria where we have sufficient information to make a listing decision.

Comment from [NWEA]: As we explain in the cover letter to submissions of publications with data and information pertaining to violations of narrative criteria, beneficial use support, and antidegradation, Ecology needs to add a substantial section to its listing methodology on how it assembles the data.

Ecology Response: *We have included a section on the use of narrative criteria in Part 1 that would cover the examples provided in the comment. Because each situation will be site and case specific, it is not possible to provide details on how Ecology would assemble the data because it could be quite different depending on the study and location.*

Section 1F: Category Descriptions

Comments on Category 1

Comment from [Snoqualmie Tribe]: Downlisting from Cat 4A/4B is only appropriate when a TMDL or pollution control program has been completed for all parameters and has been approved by EPA.

Ecology Response: *We agree and would only move a listing to Category 4A if a TMDL were approved by EPA, or to Category 4B if EPA approves of a pollution control program being implemented to meet water quality standards. The designated use will be considered impaired as long as any of the relevant parameters are still demonstrating non-compliance. However, Ecology will continue to assess each parameter independently.*

Comment from [Suquamish Tribe]: It is recommended that the policy be clarified to state that, for toxics, waters placed in Category 1 should meet criteria for all potential contaminants and support designated uses. Waterbodies should not be listed in or moved to Category 1 if listed in other categories.

Ecology Response: *Waterbody listings that go into the 5 categories are parameter specific. A waterbody can be in Category 1 (meeting standards) for one pollutant and Category 5 (not meeting standards) for another pollutant. A fish and shellfish harvest use is impaired if one (or more) toxic does not meet water quality standards. The designated use will be considered impaired as long as any of the relevant parameters are still demonstrating non-compliance.*

Comments on Category 2

Comment from [Everett]: Add a bullet number 3 on page 18 as follows: "Data show some exceedances of numeric criteria, but natural conditions allowed in the water quality criteria may account for it, and the agency is unsure whether human causes are exceeding the changes allowed in the standards beyond the natural conditions. (pertains to dissolved oxygen and temperature listings)"

> **Ecology Response**: *The suggested language is not appropriate and was not added. If information is presented that demonstrates that the human allowance has not been exceeded, then Ecology could consider this information as part of a natural conditions evaluations. However, EPA has been clear in guidance to states that where uncertainty exists for natural conditions because of a lack of information, the waterbody should be placed in Category 5 until enough information is available to make a natural conditions call, including the human allowances that are part of the temperature and dissolved oxygen standards.*

Comment from [King County DNR]: Because the definition of persistent varies by parameter and the designated use intended for protection, King County recommends that discussions of persistence be limited to the parameter specific sections of Policy 1-11. There are also other legitimate reasons for use of "Waters of Concern, Category 2". In addition to data failing to demonstrate a persistent water quality problem, variable results may fail to show a statistically relevant change from natural conditions, or the timing of exceedances may occur outside of critical conditions. Overall, there are many potential reasons to categorize a waterbody of concern other than pollutant persistence.

> **Ecology Response**: *We agree with King County's view on waters of concern, which is why for most parameters, when a parameter has any exceedances, but does not qualify for Category 5 or 1, it goes into Category 2. Some clarification is in order regarding the definition of impairment. The concept of when a designated use is considered to be impaired remains the same although there is variability among parameters in how it is determined that a standard is not persistently being attained. There is a nuance to the definition of impairment that is very important. An AU is expected to persistently attain water quality standards. When an AU does not persistently attain standards for a given designated use, the designated use is impaired. In this regard, determining that an AU is* ***not persistently attaining*** *standards, is different than determining that water quality standards are* ***persistently not attained*** *in an AU or that exceedances are persistent. These two thresholds are not necessarily coincident. The former sets an expectation that the available data and information show that the standards are almost always attained; when the frequency, magnitude, and/or duration of exceedances is negligible, the use is not impaired. The latter shifts the burden of proof to showing a pattern of standards non-attainment. In the context of a Category 5 decision, showing a pattern of non-attainment requires more evidence than showing a pattern of attainment- all that is need to stay out of Category 5 is a lack of observed exceedances, not proving that the listing belongs in Category 1. This is why not placing a listing in Category 5 does not default to a listing being placed in Category 1, which does requires a high burden of proof that a criterion is* ***persistently met****.*

Comment from [NWEA]: Ecology appears to be ignoring EPA's guidance with regard to categories 2 and 3. EPA describes the use of category 3 as for identifying those segments that are higher and lower priority for follow-up monitoring, and may do so using predicative tools such as probability surveys or landscape models. Category 3 provides states with the flexibility to monitor these segments in a manner consistent with their overall monitoring strategy and schedule. In contrast, Ecology states that "Category 2 applies when credible data create concerns of possible impact to designated uses, but fall short of demonstrating that there is a persistent problem. Ecology, however, states that it's simply a dumping ground for "insufficient data," in fact the "default" for all waters without any data at all. There is no discussion of using category 3 placement as a source of monitoring priorities. EPA describes category 2 as a location for the state to identify those pollutant parameters for which a segment is attaining uses/criteria if the segment is also not attaining other uses/criteria. Ecology describes its category 2 more as EPA's category 3, a source of future monitoring priorities.

> **Ecology Response**: *Ecology has not ignored EPA guidance regarding categories 2 and 3. We agree that based on EPA 2006 guidance descriptions, Washington is using categories 2 and 3 differently than other states and if we were to reverse the descriptions it would be more in line with 2006 EPA guidance. Unfortunately, by the time the 2006 guidance came out, Ecology had already established category descriptions in 2002 based on how they are now described, and we made the decision to stay with those descriptions because the Washington public had become accustomed to Category 2 listings being a "water of concern" rather than a water meeting some uses but not all. Ecology uses the multi-category approach based on a listing being parameter and location specific. Thus, you can have several listings in different categories for the same location, based on parameter-specific information. Category 5 listings would then be prioritized for TMDLs on a single parameter or multi-parameter basis. As we are working with EPA to load Washington's assessment information into the national ATTAINS database we will be adding an AU use-based category to the assessment of each water. This will likely align better with EPA's 2006 recommended Category descriptions.*

Comment from [Pierce County]: Pierce County continues to recommend that waterbody segments assessed with data older than five years be placed in Category 2 instead of Category 5.

> **Ecology Response**: *Ecology has used a ten year window of data for each Assessment cycle for many years and believes it is appropriate to continue to do so. However, it is important to note that for each parameter specific assessment methodology, the category determination is based on the most recent data when such data is sufficient to justify a change in category. Moving waterbodies from Category 5 to Category 2 simply because the data is older than 5 years would give a disincentive to monitor the site for the most current conditions. We do note that the use of older data in the assessment is becoming less frequent due to an increase in regular data reporting and submittals to Ecology's EIM database.*

Comment from [Seattle]: Part 1.F (Category Descriptions), page 19, Category 4A. Suggested edits.

> **Ecology Response**: *Language was revised based on suggested revisions.*

Comments on Category 4A

Comment from [Boeing]: In some cases, data indicate that subdivisions or other discrete areas within an existing AU have demonstratively distinct conditions. In order to ensure that AU listings are based on data that is applicable to the A1-I, the Policy should provide for splitting the AU into multiple AUS where the data indicate it is appropriate This concept is illustrated in the following situation discussed on page 20: In the discussion of moving an existing Category' 4A listing to a Category 1: If a stream consists of an upstream (or headwaters) section, separated from the downstream section by a culvert, and the data indicate that these segments have demonstrably distinct conditions, the AU should be divided into two AUs.

> **Ecology Response**: *Splitting up an AU would require a demonstration that there was a distinct hydrologic change in a reach since the AUs are derived from the NHD. The presence of a culvert would not justify splitting an AU as this does not necessarily result in differing water conditions above or below the culvert. If you have waterbody AUs in your area of interest that you believe need to be represented as two different AUs because of distinctly different conditions, we suggest that you identify those to Ecology and provide rationale and backup information to justify the request.*

Comment from [Interagency Team] [Snohomish County]: The steps described for moving a Category 4a listing to Category 1 within a TMDL area often do not consistently meet Ecology TMDL lead or EPA expectations or align with Standards such that stakeholders understand data requirements, enabling Ecology to report to EPA on CWA section 319 success as partial basis for continued 319 funding eligibility. Examples of discrepancies between Ecology and EPA expectations and Policy: Experience with de-listing segments impaired for bacteria indicates that Ecology TMDL lead and EPA expectations for data volumes and analysis methods did not conform to Policy or Standards. Ecology TMDL leads do not consistently evaluate TMDL load or waste load allocations when making de-listing decisions. The age of data allowed or required to support de-listing has differed from Policy. Recommendation: Ecology's Water Quality Program Policy staff should work with TMDL leads and EPA to develop transparent, predictable, and credible parameter-specific de-listing methods protective of designated uses and consistent with Standards.

> **Ecology Response**: *It is not clear from the comment what steps for moving a Category 4a to Category 1 are inconsistent with meeting Ecology or EPA expectations, or do not align with standards. The examples that are given for delisting were brought up in the public dialogue meetings and Ecology has addressed consistency issues within the policy where a TMDL is in place, both in the general section as well as in several of the parameter-specific sections under Category 1. It is not possible to develop one set of methods that are predictable and transparent for delisting because each TMDL is unique, from a geographic perspective as well as what sources and parameters are identified. Ultimately, when a TMDL is in place, much more information exists to determine the sources, the loading capacity of the waterbody and load allocations need to bring the water back into compliance with standards. The policy now includes several process steps that will occur when data on a waterbody segment in Category 4A shows that it is meeting standards. Before moving any listing based on data alone, WQA staff will consult with the appropriate regional TMDL staff to determine if the TMDL has been successfully implemented and if it is appropriate to move the listing to Category 1. This*

may require best professional judgement on the part of the Ecology TMDL staff but it is an important step so that the WQA listing decisions do not undermine the success of a TMDL.

Comment from [NWEA]: Category 4A: Has a TMDL Approved by EPA. Ecology is correct to state that "[w]hen Ecology determines that a TMDL is not being successfully implemented, the AUs within the TMDL will be placed back in Category 5." But Ecology incorrectly concludes that, data generated during the development of a TMDL should not be used for the WQA until the dataset is complete for the TMDL. Monitoring data submitted independent of the TMDL study that is within a TMDL boundary needs to also be considered within the context of the TMDL. Ecology's inability to complete 303(d) lists on a timely basis, consistent with federal regulations, militates against putting aside data because it and others are in the middle of collecting data.

Ecology Response: *We agree that this may appear to be suppressing data, which is not our intent. In fact, in the most recent listing cycle, data was pulled from EIM and used for the assessment regardless of whether the data was within a TMDL boundary. We have removed this paragraph from the policy to be clear that this is not a practice Ecology is doing.*

Comment from [NWIFC]: Ecology's draft describes the bases for Category 4 determinations in a manner that would inappropriately permit downlisting for all parameters when a TMDL or pollution control program has only been completed for one or some of the toxic substances for which an AU is listed. NWIFC requests that Ecology clarify that downlisting to Category 4 is only appropriate where a TMDL (in the case of Category 4A) or a qualifying pollution control program (in the case of Category 4B) has been approved by EPA /or the listed contaminant or parameter. For parameters or toxic contaminants that are not covered by an EPA-approved TMDL or pollution control program, Category 5 remains the appropriate designation.

Ecology Response: *Language was clarified that a waterbody listing for a given toxic contaminant would only move to Category 4A or 4B from Category 5 if a TMDL was approved by EPA or a pollution control program was approved by EPA. Otherwise the listing would remain in Category 5.*

Comment from [NWIFC]: In earlier communications, NWIFC had emphasized that Ecology should not enlist Category 4 designations (whether via a new Category 4P or a lenient interpretation of Category 4B) as a means to avoid the legal and other protections afforded by a Category 5 determination for AUs impaired due to PCBs. While not limited to PCBs, Ecology's current draft describes the various Category 4 designations in a manner that appears to soften the requirements and enforceability of such designations. Ecology's draft also omits the requirement in the current Policy 1-11 for "enforceable pollution controls or actions stringent enough to attain compliance with the water quality standards." NWIFC urges Ecology to revise the draft language to make clear that Category 4 serve as a means for AUs to attain water quality standards and that pollution controls and actions specified under Category 4B programs be enforceable.

Ecology Response: *The intent of revisions to Category 4B was not to soften the requirements but to go into more detail on what information would be required for Ecology to consider before submitting Category 4B listings to EPA for their*

consideration and potential approval. We have added in language to emphasize that authorities used to implement the pollution control actions must be enforceable.

Comment from [Vancouver]: Category Descriptions/ Moving a proposed Category 1,2, 3, or 5 listing to Category 4A (Page 19-20): We agree that Ecology's data review and assessment process is key to correct categorization of water bodies. Tracking changes to listings or challenges to listing data is important to stakeholders as well as Ecology to comply with the WQDA. We recommend that Ecology provide a method to add remarks or flags on the listing records so that public reviewers can identify data changes in the WQA, listing changes, and if a Category 5 listing is currently under review due to data challenges.

Ecology Response: *We do not see a practical way to provide the detailed flags that the commenter is requesting, and do not see how this would improve the utility for the reviewer. The online search tool can provide information on listings that have moved in and out of the 5 categories. The reviewer can use the online search tool to query the most current WQA listings in comparison with previous approved assessments to come up with lists of what has changed. We also note that when Ecology submits a WQA to EPA for review and approval of Category 5, we are required to justify all listings that come off Category 5. If you have a specific request for information that you are not able to glean out of the Search or map tool, please contact us and we will help out to the degree our tools will allow.*

Comments on Category 4B

Comment from [AWB]: Ecology's prescription for gaining approval of a Category 4b "Other Pollution Control Program" is simply too demanding. Ecology should reconsider the opportunity presented by Category 4b and re-write this section of Policy 1-11 to be much more pragmatic and accessible. Consider this perspective: a Category 4b plan should credit responsible, good faith activities to understand and reduce pollutant loading. Ecology's re-write should solicit and sanction 4b approaches as an alternative to Category 5/TMDL. This re-drafted Policy 1-11 should include commentary on the availability of "Straight-to-Implementation" (STI) and the relationship of that approach to Category 4b.

Ecology Response: *It is important to note that EPA must take an approval action on Assessment results for Category 5, including delisting off of Category 5 to another category. EPA has specific requirements that must be met in order to place a waterbody into Category 4B. If Ecology does not provide EPA with a justification that those requirements are met, EPA will not approve moving a waterbody from Category 5 to 4B. Thus, Ecology does not see any benefit in creating different requirements for Category 4B that EPA will not in the end approve. Straight to implementation (STI) is another alternative to conducting a TMDL and we agree is a viable option where sources have already been identified and there is interest in working to get to clean water in lieu of a TMDL. However, while the STI project is in progress, the waterbody remains in Category 5 until such time that water quality data shows that the effort has been successful and the waterbody is now meeting Category 1 requirements. Therefore, we do not believe it is appropriate to include a description of what it would take to use an STI approach as an option to a TMDL, since it will not change category determinations until the water is*

meeting standards. We will pass this suggestion on to the TMDL Program for consideration of adding more description of the STI approach to its program.

Comment from [Interagency Team]: Page 23. Second bullet. It is difficult for stakeholders to prepare for an assessment of progress on Category 4B listings for placement in Category 1 when the expectations on data "sufficiency" are not identified. Recommendation: Define what constitutes "sufficient" data in determining that specific assessment unit meets Standards.

Ecology Response: *Category 4B listings are based on pollution control programs that are in place and being actively implemented. It is not possible to give a general definition of what would be sufficient information because each program will be site and parameter specific. Entities working on pollution control programs that have Category 4B listings will work with Ecology to demonstrate that progress is being made, so that those results can be written up and shared with EPA for continued approval as a 4B listing.*

Comment from [Interagency Team]: Page 23. Third bullet. Stakeholders commit significant resources to attain 4b status and implement programs to improve water quality. Failure to define what constitutes "making sufficient progress," jeopardizes ongoing commitment of local resources for efforts required to retain 4b status. Recommendation: Define what constitutes "making sufficient progress."

Ecology Response: *Category 4B listings are based on pollution control programs that are in place and being actively implemented. It is not possible to give a general definition of what would be sufficient information because each program will be site and parameter specific. Entities working on pollution control programs that have Category 4B listings will work with Ecology to demonstrate that progress is being made, so that those results can be written up and shared with EPA for continued approval as a 4B listing.*

Comment from [Interagency Team]: Reviewing 4b pollution control plan progress every listing cycle is unreasonable considering the timeframe for plan implementation and water quality response. Recommendation: Expand the timeframe for review of pollution control plans allowing the waterbody to remain in Category 4b during the process. Consider aligning with typical TMDL effectiveness determinations.

Ecology Response: *We do not have the latitude to expand the review timeline of Category 4B progress beyond each listing cycle because that is what EPA requires in order to remain in 4B. Waterbodies that qualify for Category 4B have a higher scrutiny than TMDLs during each listing cycle because a TMDL is not in place. Therefore, it is incumbent on the pollution control program to continue to be actively implemented and showing that some progress is being made towards meeting water quality standards. EPA would not condone allowing a Category 4B listing where there was no active implementation that was showing some progress.*

Comment from [NWEA]: Ecology describes the category 4B as: "The waterbody does not require a TMDL because the pollution control program is designed to meet water quality standards in a reasonable amount of time and is being actively implemented." EPA's guidance addresses what constitutes a "reasonable period of time". Ecology's draft methodology does not

shed further light on how Ecology will determine these time periods, despite the fact that the category 4B listing is a method of avoiding category 5 listings and TMDLs. Ecology just muddies the waters when it states that it considers a timeframe reasonable if "it is similar to the timeframe that would likely be developed under a TMDL." On what basis does Ecology assess timeframes for TMDL implementation, if at all? The methodology is not helpful if it remains this vague. Moreover, in this methodology, Ecology should commit to posting 4B determinations and EPA findings on its website for public review and accountability.

> **Ecology Response**: *Category 4B determinations are waterbody specific, so it is not possible to have specific guidance that stipulates how to determine the time period that it will take to bring the water back into compliance. The positive aspect of a Category 4B, where it qualifies, is that actions to bring the waterbody back into compliance with the standards can happen much more quickly than waiting for a TMDL to be established. Successful Category 4Bs in Washington have resulted in meeting standards because a stipulation is that cleanup efforts are being actively implemented because the likely source of the impairment is already known. Candidate Category 4Bs are judiciously reviewed and assessed by Ecology's TMDL manager before being proposed to EPA, who must agree that the 4B listing is appropriate. Furthermore at each listing cycle, a Category 4B report for all listings must be provided to EPA to show that water quality continues to improve. If this can't be demonstrated, the water moves back into Category 5. In the last Assessment we made Category 4B write-ups available on our website and will continue to do that for the public to review.*

Comment from [PSKA & SRK]: The new Draft policy does not include language requiring that 4B programs be designed to improve and attain water quality "in a manner comparable to a TMDL." (Draft p. 20). It also does not have a requirement, as does the current Policy 1-11, for "enforceable pollution controls or actions stringent enough to attain compliance with the water quality standards." (Draft p. 20). It is essential that a 4B program be designed in a manner comparable to a TMDL and that pollution controls are enforceable. Policy 1-11 requires that a 4B program "show progress on water quality improvements in accordance with the plan." Where is this requirement to improve water quality in the Draft? Indeed, the word "improvement" does not appear in the Draft at all.

> **Ecology Response**: *Language was added to address concerns that enforceability had been removed from 4B requirements.*

Comment from [Seattle]: For accuracy and to match Category 4B description (p. 20 of the policy), identify as "pollution control program" at the following location: "A. EPA has approved the respective TMDL for a given pollutant (Category 4A). B. A pollution control program clean-up program other than a TMDL is already in place (Category 4B). C. The impairment is not known to be caused by a pollutant, and therefore a TMDL is not appropriate to address the impairment (Category 4c)."

> **Ecology Response**: *Language to describe 4B on this page has been revised to be consistent with the 4B description later in the section.*

Comment from [Seattle]: Requirements for an Eligible Category 4B Program. This section focuses on necessary components of a Category 4B placement for water column impairment and

does not mention the pathway to Category 4B related specifically to sediment quality. SPU suggests a footnote on page 20 or 21 making clear that the pathway to Category 4B for sediment quality is described in Part 3 (Page 80).

Ecology Response: *A footnote was added as suggested in the comment.*

Comment from [Seattle]: Part 1.F (Category 4B), Several suggested edits to language.

Ecology response: *Revisions were made as suggested.*

Comment from [Seattle]: Part 1.F (Category 4B), pages 22-23. Suggest reviewing the use of terms "determination" and "demonstration," which appear to be used interchangeably.

Ecology Response: *Language was revised to be consistent with using "determination."*

Comment from [WASWA]: On page 23, number 3, Estimate or projection of time when water quality standards will be met This section describes what is needed to gain placement in Category 4B in terms of proposed controls and the timeframe needed to attain WQS. Does this language mean that timeframes in excess of the standard maximum of 10 years are now possible?

Ecology Response: *The estimation of time to meet standards required for Category 4B is outside of the assessment framework of ten years that is used to assess data for an assessment cycle. It is recognized that meeting water quality standards for some parameters will take multiple years to meet, depending on the parameter. For example, growing trees to produce riparian cover to bring temperatures into compliance with the standards could take 30-40 years.*

Comments on Category 4C

Comment from [NWEA]: Ecology claims that category 4C is where "[t]he impairment is not known to be caused by a pollutant, and therefore a TMDL is not appropriate to address the impairment (Category 4c)." EPA guidance states that where an impairment exists and the state has demonstrated that it is not caused by a pollutant, the state may place the segment into Category 4C. Ecology, in contrast, states that the burden is for someone to demonstrate the impairment is caused by a pollutant, not that a pollutant is the assumed cause of the impairment.

Ecology Response: *We disagree with the interpretation that the cited language states that the burden is for someone to demonstrate an impairment is caused by a pollutant. It means that if a use is identified as impaired and an identified cause is a non-pollutant, then that cause is given a 4C listing. Available pollutant data for that location would also be used to create listings in other categories. Ecology has used the same description of Category 4C since the categories were established in 2002 and EPA reviews these decisions.*

Comment from [NWEA]: Ecology incorrectly includes as "non-pollutants" "invasive exotic species." Invasive species are legally pollutants. Ecology should make clear here that a finding of

"degraded biological integrity, when a pollutant does not contribute to the impairment" is not a default but a finding that, in fact, one or more pollutants or water quality parameters have not contributed to the impairment.

> **Ecology Response**: *Listings based on information showing presence of invasive exotic species have been placed in Category 4C since the 2004 Assessment and have subsequently received EPA approval on our candidate 303(d) lists submitted, so we believe we are operating within federal law. AUs are placed in this category when the impairment of a designated use is not appropriately addressed by assigning pollutant load limits through the TMDL process. There are other programs in place at Ecology and elsewhere that deal directly with prevention and eradication of invasive exotic species. A 4C listing does not mean that an aquatic life impairment is only caused by a non-pollutant. If an impairment is caused by both pollutants and non-pollutants, then separate listings are made.*

Comments on Category 5

Comment from [AWB]: Ecology should offer commentary on the significance of a Category 5 listing in Washington State. A Category 5 listing is a significant regulatory determination that should only be based on substantial evidence of persistent (multi-year) exceedances of numeric criteria and demonstrable non-achievement of the designated use(s). Ecology should endeavor to explain the regulatory, legal, and economic significance of a Category 5 listing decision.

> **Ecology Response**: *Comment noted. The request is outside of the scope of Policy 1-11, which is to describe how waters are assessed to determine attainment with water quality standards based on available credible data. The policy does state under the section in Category 5 that actions will be needed to bring the water back into compliance with the water quality standards. It is not practical to provide general commentary on Category 5 listings as it would be case specific.*

Comment from [AWB]: Page 24, Delisting from Category 5 – Ecology should create a path for Category 5 listed waterbodies to be relocated to Category 2 or 3. A Category 5 listing is a significant regulatory determination with lasting consequences. Ecology should be intentional and creative in providing pathways for re-classifying Category 5 waters to other Categories. Several options have been presented in this comment letter.

> **Ecology Response**: *The specific assessment considerations for water quality criteria found in Part 2 include pathways to go from Category 5 to other categories.*

Comment from [AWB]: Numeric water quality criteria are intentionally conservative. As a policy matter, AWB requests the agency to require definitive, persistent and multi-year exceedances of numeric criteria and demonstrable impacts to a designated use before a Category 5 listing will be considered. This intention would be expressed throughout the "Part 2: Specific Assessment Considerations for Water Quality Criteria" section. Marginal, short-duration or infrequent exceedances of water quality numeric criterion could result in placing the waterbody on Category 2 Waters of Concern.

Ecology Response: *Ecology has made a significant effort to strike a balance using magnitude, frequency, and duration for the different pollutant parameters, found in Part 2 of Policy 1-11, in order to minimize type 1 and type 2 errors (placing waters on Category 5 that are not impaired, or not placing waters in Category 5 that are impaired). While we recognize that there still could be errors, we believe that the updated Policy 1-11 reflects our best efforts to minimize such occurrences.*

Comment from [Everett]: Page 24, Delisting from Category 5. This section should acknowledge that a new evaluation can determine that an earlier Category 5 determination may not have been appropriate (for any parameter) and allow a change to Category 2 based either on new data or based on reconsideration of the prior listing.

Ecology Response: *Clarifying language was added to this section.*

Comment from [Interagency Team]: Page 24. Delisting from Category 5. Define what constitutes an "other cleanup method".

Ecology Response: *Language has been clarified in this section.*

Comment from [Kalispel Tribe]: An impaired listing should only be downgraded from a Category 5 if there is a clean-up plan that contains a path to the full restoration of beneficial uses with clear, measurable, and enforceable interim performance milestones.

Ecology Response: *Language was clarified that a waterbody listing for a given toxic contaminant would only move to Category 4A or 4B from Category 5 if a TMDL was approved by EPA or a pollution control program was approved by EPA. Otherwise the listing would remain in Category 5.*

Comment from [PSKA & SRK]: The Policy requires that "Waterbody segments impaired by a pollutant as determined by the methodology described in this policy, or by well-documented narrative evidence of impairment, will be placed in Category 5." Ecology intends to lower the standards to match EPA 2006 Integrated Report Guidance. (Draft p. 24). The existing Policy language is clearer: if a waterbody is impaired, it must be listed. That is the better standard. The proposed revision is confusing and appears to be a higher bar to listing waters.

Ecology Response: *Our intent in adding language from the EPA 2006 guidance was not to change the meaning of Category 5 that we currently apply. To be clearer, we reorganized the language to state up front that Category 5 represents listed waterbodies that are impaired.*

Comment from [PSKA & SRK]: The Draft at page 24 includes a new paragraph about "Delisting from Category 5." It should be clearly articulated that waters can only be delisted from a category 5 to 1 if they now meet water quality standards.

Ecology Response: *Language was added to describe that Category 1 meets tested standards.*

Comment from [Snoqualmie Tribe]: Ecology's current draft policy increases the requirements for listing assessment units (AUs) as impaired for many pollutants while increasing the evidentiary requirements, which will result in fewer Category 5 listings.

> **Ecology Response**: *Ecology's intent in revising the policy is to minimize errors in over- or under-listing waterbodies. The policy increase the data requirements in some cases, and reduces the requirements in other cases. At this point we cannot predict whether the updated policy will result in fewer or more Category 5 listings, as that was not the purpose of revising the policy. A careful review of Category 5 listings will reveal instances where the data is more suggestive that a parameter is not impairing a designated use- these instances indicated a need to improve the accuracy of the assessment methodology. Also, if a waterbody actually has a problem, it is usually readily apparent in the available data, so any increases in data requirements really only affect the edge cases where there is little evidence that a designated use is being impaired.*

Comment from [Upper Skagit Tribe]: The Primary purpose of Policy 1-11 is to ensure that we correctly identify and list all Washington waters that do not meet the Clean Water Act. The proposed changes compromise this fundamental activity by increasing the proof of burden to demonstrate impairment and changing definitions to provide loopholes. Increasing the required sample exceedances at a time when monitoring capacity is especially diminished is counterproductive and may abet worsened conditions before listing actually happens.

> **Ecology Response**: *Comment noted. Ecology is committed to identify waters as impaired on category 5 and to minimize over- or under-listing waters. We believe the burden of proof required is a balance between having limited data and needing to have confidence in the accuracy of the listings. A careful review of Category 5 listings will reveal that the vast majority of the listings will be unaffected by changes in the assessment methodology because even with limited data the observed criteria exceedances are frequent or of high magnitude. The changes will most affect listings where the available data provides weak evidence that a designated use is actually impaired.*

Comment from [Vancouver]: Category Descriptions / Category 5 - The 303(d) List (Page 24): The program policy statement that is underlined is in direct conflict with the data-based selection of the 303(d) listing process in the WQA. The existing Policy text specifies that "data collected through a valid statistical methodology indicates that the waterbody is not expected not to meet applicable water quality standards," and the revised version is simplified to "credible data and information." Recommendation: Remove the underlined sentence or modify it to define the requirements of "credible data and information" to justify a Category 5 listing.

> **Ecology Response**: *Language in this section has been revised to be consistent with language on trend information found earlier in the policy.*

Comment from [WSDOT]: Delisting from Category 5, Page 24, fourth paragraph, last sentence, The use of "exceptions" and "considerations" within the same sentence creates ambiguity. It appears "WQA considerations" could be replaced with "Category Determinations" to improve clarity and align with the applicable delisting sub-sections in Parts 2 and 3.

> **Ecology Response**: *Language revisions have been made as suggested.*

Comment from [WSPA]: Any Category 5 listings not satisfying the 2018 criteria should be reassigned to Category 2 or Category 3. The agency can target those waterbodies for monitoring, and re-list if it becomes appropriate.

> **Ecology Response**: *We will reassess both 'old' and 'new' data that was collected in the data assessment window for this assessment cycle using the updated assessment policy. For 303(d) listings based on credible data collected prior to the current data window: the appropriate thing to do is to keep the waterbody on the 303(d) list pending newer data showing there isn't a problem rather than de-list the waterbody pending newer data that reaffirms there is a problem. This is in alignment with EPA requirements and guidance on 303(d) list development.*

Section 1G: Other Assessment Considerations

Comments on Natural Conditions

Comment from [AWB]: The consideration of Natural Conditions is an integral element of many pollutants and numeric criteria. Ecology has an obligation to define the natural condition of a waterbody. Only then can an assessment of numeric criteria attainment be made and ultimately an evaluation on whether designated uses are achieved. Ecology offers no direction on how to account for the "human actions" component of the dissolved oxygen and pH numeric criteria is deciding on "impairment." AWB disagrees with the statement "If there is insufficient information to determine the level of human influence, then Ecology will assume that human influences have contributed to criteria exceedances and that the contribution is measurable over natural conditions." This statement is inconsistent with WAC 173-201A-260(a). In addition, almost all aquatic life criteria include provisions to adjust the numeric criteria with evidence of natural condition influences. The revised Policy offers no direction on how to apply this component of these water quality criteria. Toxic pollutant numeric criteria for inorganic arsenic and perhaps several other metals could also be adjusted due to natural condition considerations (WAC 173-201A-240(1)). Category 5 must be supported by substantial information demonstrating persistent exceedances of a WAC 173-201A standard, which will include, where appropriate, the "natural conditions" provision and adjustment for the "human actions" increment. While it may be appealing for the agency to "list first" and then rely on the TMDL development process to sort out the natural conditions component, this approach is not what the plain language of WAC 173-201A directs.

> **Ecology Response**: *We disagree that the statement referenced in this section is inconsistent with the natural conditions section in the water quality standards. If information is presented on a Category 5 listing that demonstrates that the human allowance has not been exceeded, then Ecology will consider this information as part of the natural conditions evaluation. However, EPA has been clear in guidance to states that where uncertainty exists for natural conditions because of a lack of information, the waterbody should be placed in Category 5 until enough information is available to make a natural conditions call, including the human allowances that are part of the temperature and dissolved oxygen standards. Determining whether human causes are contributing more than 0.3 degrees C of temperature or 0.2 mg/l of dissolved oxygen in*

excess of the natural condition is a detailed process that involves more in-depth monitoring and data collection, research on what sources exist, and modeling to determine what existing conditions are. Only after this level of detail can you extract whether or not a combination of human sources is greater than the allowed human allowance. This process typically occurs when a TMDL is done on a waterbody identified as exceeding numeric standards. The 303(d) listings based on numeric standards (including a review of whether there are human impacts that could be contributing to the exceedance) trigger the subsequent TMDLs.

Comment from [Boeing]: Page 25- Section IG notes that "states are not required to place waterbody segments into impaired categories when it is determined that the exceedance of standards is due solely to non-anthropogenic sources." In such cases, the waterbody segment can be classified as Category 1. While this language recognizes the potential for non-anthropogenic pollutants, it does not recognize that, in many cases, pollution from widespread sources (and not local to the AU watershed, such as due to atmospheric deposition) can result in impairment of the AIJ_ To avoid listings that are not based on pollution from within the watershed of the AU, the Policy should include 'atmospheric deposition" to the list of "all available data" from the site in question.

Ecology Response: *EPA considers atmospheric deposition from human sources to be a source of impairment to a waterbody regardless of whether it was generated within or outside of a local watershed, and therefore it would not be considered a "natural condition".*

Comment from [Everett]: Page 25, 1G Other Assessment Considerations, Natural Conditions. Recommendation: An additional subsection following Natural Conditions should be added to 1G as follows: Allowances for Human Caused Changes. The standards specifically allow for a decrease of 0.2 mg/L for dissolved oxygen when the natural conditions are lower than the numeric criteria. The standards also specifically allow for an increase of 0.3 degrees C for temperature when the natural conditions are higher than the numeric criteria. If it is not possible to make a quantitative evaluation, then Ecology will make a qualitative evaluation regarding these provisions, where a reasonable confidence that these provisions are exceeded results in a Category 5, and where a reasonable uncertainty results in a Category 2.

Ecology Response: *We do not see the need to add the suggested additional sub-section. If information is presented that demonstrates that the human allowance has not been exceeded, then Ecology could consider this information as part of the natural conditions evaluations. However, EPA has been clear in guidance to states that where uncertainty exists for natural conditions because of a lack of information, the waterbody should be placed in Category 5 until enough information is available to make a natural conditions call, including the human allowances that are part of the temperature and dissolved oxygen standards. Determining whether human causes are contributing more than 0.3 degrees C of temperature or 0.2 mg/l of dissolved oxygen in excess of the natural condition would typically involve more in-depth monitoring and data collection, research on what sources exist, and modeling to quantify human contributions.*

Comment from [King County DNR]: Page 25: "Natural Conditions". Air deposition is increasingly understood as a significant source of pollutants. This is especially true in natural

systems far from any localized human effluents or discharges. We request that Ecology clarify that information indicating "there are no human impacts" should be focused on processes and discharges regulated under the Clean Water Act and RCW 90.48.

> **Ecology Response**: *When exceedances of water quality criteria occur in a waterbody due to human influences, it is not likely that we could determine whether the sources causing the impairment are regulated under the Clean Water Act without further study. This would occur through a TMDL or other alternative clean up action.*

Comment from [Interagency Team] [Snohomish County] [WSDOT]: Page 25. Under Natural Conditions, second paragraph, first sentence. The information and documentation generally necessary to determine natural conditions is not identified. Recommendation: Clarify the information and data required to make a natural conditions determination. Make it clear that such information focus on processes and discharges regulated under the CWA and RCW 90.48. Additionally, refrain from using the term "validate" in the sentence as its use here is not consistent with Ecology's QMP.

> **Ecology Response**: *We have removed the word "validate" from the section. Because different considerations of natural conditions will vary based on location and parameter, it is not practical to try to list data and information that will be needed to make a natural conditions determination. We have listed the types of information that would lead to a determination and would expect to work with any entity wanting to provide information that they believe verifies that that there are no human influences causing the exceedance. If uncertainty exists to make this determination, the listing would remain in Category 5 until such time that a more detailed study was able to verify the extent of human influences. We also note that when exceedances of water quality criteria are found in a waterbody, human influences are not limited just to discharges regulated under the Clean Water Act. EPA would not allow a waterbody to be removed from Category 5 where impairment was caused by other human sources that are not regulated under the Clean Water Act.*

Comment from [Interagency Team] [Snohomish County] [WSDOT]: Page 25. Natural Conditions. Use and documentation of best professional judgment needs clarity. Recommendation: Standardize the process as much as possible to reduce the reliance on subjectivity and facilitate consistent decision making when applying judgment for listing decisions. Clarify how to document professional judgment when applied.

> **Ecology Response**: *Comment noted. When a natural condition determination is made that removes a waterbody from Category 5, we need to provide written justification to EPA that the exceedance is due to a natural condition and no human influences are present. The data and information that was used to make the natural conditional determination is provided when we submit Assessment results to EPA. We don't routinely make natural conditions determinations and they are highly case-specific and parameter specific, so we haven't identified a need to develop a standardized process to make such determinations.*

Comment from [Vancouver]: Other Assessment Considerations / Natural Conditions (Page 25): This policy of listing AUs in Category 5 by default is equivalent to a presumption of "guilty

until proven innocent". Many shallow areas of rivers and lakes show seasonal variations in pH and dissolved oxygen that result from natural conditions of seasonal aquatic plant growth coupled with seasonal temperature ranges and solar effects that lead to diurnal variations that can exceed water quality standards. These natural conditions can occur in rivers and lakes outside of anthropogenic source effects. We recommend that the revised Policy provide interim listing process steps to allow for monitoring to document conditions during a two to three-year data collection period in an AU that shows marginal or space-limited criteria exceedances that may be due to natural conditions -- prior to an AU being placed in Category 5.

> **Ecology Response**: *Ecology is required to periodically assess readily available data to meet federal Clean Water Act requirements in Sections 303(d) and 305(b). We do not see any practical way to try to predetermine where there might be natural conditions causing standards to be exceeded. Therefore, we rely on a comparison of the biologically-based numeric criteria (the acceptable pH range for aquatic species for example) to place waters on Category 5 unless we have enough credible information to make a natural conditions determination at that time. We suggest, conversely, that if an entity believes that a Category 5 listing was assessed in error and it is due to natural conditions, they can conduct monitoring to gather information that they believes shows the listing is due to natural conditions, and it will be considered for the next listing cycle.*

Comment from [WASWA]: Natural conditions, page 49. This section mentions some of the natural conditions occurring in marine waters, such as upwelling, circulation and thermal effects. It would be helpful if some natural conditions for rivers were mentioned as well. Unique to our region is the presence of arsenic in rivers associated with snowmelt from volcanoes. Valuable time, energy and money have been spent chasing anthropogenic sources of arsenic when it was the mountain all along (referring to the Puyallup River Mediation).

> **Ecology Response**: *Language on examples of fresh water natural condition determinations has been added to this section.*

Comments on Requests for Reconsideration

Comment from [NWEA]: Page 26 – Requests for Reconsideration of Listing Decisions. Ecology proposes that it may "reassess" and presumably move waters that have been assessed. It states that these "changes" may not be available until the next public review. It is unclear what this means. Is this a suggestion that Ecology will make the changes but will not make them public or request EPA approval? Will these changes be reflected in the on-line data base? How are these changes valid for purposes of the Clean Water Act if they have not been subject to public review and EPA has not approved them? This section needs to be rewritten for clarity and if it does include the potential for changes between formal listings, Ecology needs to make clear that the agency will add waters just as much as it will move them off the 303(d) list.

> **Ecology Response**: *This section has been clarified to address the comments. If we are asked to reconsider a listing decision before we submit the assessment to EPA we may make a category change during that cycle. However, if we receive a request to reconsider a listing decision after the assessment is submitted to EPA, the results would be available in the next assessment since we only submit updated listings to EPA when the entire 303(d) list is ready to submit to EPA.*

Comment from [Vancouver]: Requests for Reconsideration of Listing Decisions (Page 26): The impact of Category 5 listings on point sources that require NPDES permits is very significant. In the event that a stakeholder challenges a Category 5 listing in accordance with Ecology's policy, and also provides data to enable Ecology to conduct a review, Ecology should have a policy to flag or possibly delay the Category 5 listing until after Ecology's review is completed. We are recommending that Ecology modify the text in this policy section to allow a Category 5 listing to be flagged as under review during a formal listing challenge, in accordance with Ecology's policy, until after Ecology's review is completed.

> **Ecology Response**: *If an entity challenges a newly proposed Category 5 listing and provides supporting data and information prior to submitting the proposed 303(d) list to EPA, we will reconsider the Category 5 determination prior to submitting the list to EPA. Once we make a decision, we do not see a need to flag a proposed listing as under review because our review would be complete. We do not think it is appropriate to ask EPA to hold off on approving the proposed listing pending the collection and submittal of new data and information. We have to make a decision based on the available data and information. If a listing that is already on the approved 303(d) list from a previous cycle is being challenged in a subsequent cycle, this means the listing has gone unchallenged for some period of time. The entity challenging the listing should be working with us to review the listing prior to the submittal of the next proposed 303(d) list to EPA. If new data and information are not available to review the listing, then flagging the listing is not going to have any effect on the waterbody status. We recognize that it may take an entity a full assessment cycle to collect and submit data such that the listing would not be updated with that data until two cycles after a listing is placed in the 303(d) list. This is an artifact of how the 303(d) listing process is conducted, and probably could not be resolved unless we switched to a process that submitted proposed 303(d) listings to EPA on a continual basis rather than the current process of having assessment cycles in which the entire list of impaired waters is submitted to EPA as a package.*

Section 1H: Prioritizing TMDLs

Comments on criteria to prioritize TMDL work

Comment from [AWB]: Ecology lists logical criteria to prioritize TMDL development work. There can be many priorities but "Risks to public health" is certainly important. The late-2016 adoption of extraordinarily stringent human health-based toxic pollutants into WAC 173-201A, and now Ecology's proposed translation of those criteria to evaluate the "harvest" and "domestic water supply" designated uses, has redefined the "risk to public health." As one example, there is evidence that fish and shellfish have PCB tissue concentrations above the Category 5 listing thresholds in many waterbodies and reportedly in salmonids produced at federal, state and tribal hatcheries. It may be appropriate for Ecology to complete a focused review on available data to characterize this risk, and then align listing and TMDL work.

> **Ecology Response**: *Comment noted. This suggestion will be passed on to the TMDL program for consideration.*

Comment from [Interagency Team]: Although the criteria used to prioritize TMDLs meets the intent of Title 33 section 1313(d) of the U.S. Code and Code of Federal Regulations Part 40 section 130.7, the criteria lack the specificity found in a 1997 Memorandum of Agreement (MOA) between Ecology and EPA. The Team understands that the MOA expired on December 31, 2013, but remains in effect because Ecology and EPA have not completed negotiations to finalize an update to the agreement. The MOA contains much more specificity on how to prioritize TMDLs and are therefore important to retain and/or improve upon. Additionally, it may be instructive to review Appendix E of the Water Quality Program Permit Writer's Manual12 Part 1 or other documents as appropriate to consider for inclusion in the Policy. Recommendation: After updating the MOA, align the TMDL prioritization criteria in the Policy with those in the MOA and/or the Permit Writer's Manual.

> **Ecology Response**: *This suggestion will be passed on to the TMDL program for consideration.*

Comment from [King County DNR]: Page 27: "Prioritizing TMDLs". Water quality impairments across Puget Sound continue to grow despite robust wastewater, treatment, stormwater requirements and Growth Management Act focused development. This suggests that site-specific studies examining unexpected or unknown pollution sources and influences will be increasingly important. King County has conducted many such studies in both the Lake Washington and Green/Duwamish watersheds. Development of a robust process to prioritize these water quality issues for actual cleanup plans is paramount among King County's priorities. King County anticipates working together to develop a collaborative process between Ecology (both the Northwest office and headquarters) and other local stakeholders to fulfill our mutual objectives of cleaner water and sediment.

> **Ecology Response**: *Comment noted. We appreciate your commitment to clean water.*

Comment from [NWEA]: Ecology fails to include risks to threatened and endangered species as among the priorities for TMDL development. In fact, it has specifically deleted this from its past guidance. It should go without saying that this fact shows just how committed Ecology is to protecting species on the brink of extinction: not at all.

> **Ecology Response**: *We recognize the importance of protecting threatened and endangered species and considering whether areas are vulnerable to degradation as important criteria to consider when prioritizing TMDLs. In the final policy we included those two factors in addition to the four listed (severity of pollution problem; risks to public health; waterbodies where a new or more stringent permit limit is needed for point sources; local support and interest in a watershed).*

Comment from [PSKA & SRK]: The Draft eliminates criteria from Policy 1-11 that formerly gave a waterbody priority for listing, including: "Risk to threatened and endangered species," and "Vulnerability of water bodies to degradation." (Draft p. 27). Why are these changes proposed? Threatened and endangered species should still be given careful consideration when prioritizing TMDLs - particularly salmonids. Vulnerability to degradation is another important consideration that should not be removed.

Ecology Response: *See above response to NWEA.*

Comment from [PSKA & SRK]: The Draft adds "local support and interest in a watershed" as an additional criterion for prioritizing TMDLs. We object to the addition of this criterion. This is an extremely subjective criterion. This criterion could lend bias in favor of higher socio-economic status areas when prioritizing TMDL's. Similarly, this criterion could have detrimental impacts on communities that may not have the ability to lobby harder for prioritization of their waterbody, including those who might not speak the dominant language, etc.. This could result in a TMDL prioritization structure that further harms communities traditionally left to deal with the social and economic costs of pollution by assigning impaired waterbodies a lower priority due to perceived lack of "interest." Due to these strong environmental and social justice implications, this criterion should be eliminated. As an additional suggestion, please consider adding another criterion which could read: "Ecological risks, especially where Endangered Species Act [ESA]-listed species are present and exposed to an impaired water body".

Ecology Response: *In our experience TMDLs are more successful when there is local support and interest. It is therefore one of the criteria that we believe is important to consider when prioritizing TMDLs. While we recognize that there is some subjectivity involved in weighing this criteria, there are several ways to demonstrate local support and interest, including feedback received from watershed stakeholders, groups and residents, other watershed efforts, and the presence or absence of watershed groups. Our rational will be provided to the public during the annual meeting described in the policy, and stakeholders will have the opportunity to comment and provide feedback on how we apply this criteria to individual cases.*

We recognize the importance of considering environmental and social justice when we make decisions. We added an environmental justice component to our prioritization process found in the policy. As noted in another comment, in the final draft we also included consideration of endangered and threatened species in our prioritization.

Comment from [PSKA & SRK]: The Draft adds a section that implies that the State's forest practices rules are assumed to provide equal protection as that required under a TMDL. (Draft p. 27). How do the State's forest practices account for point sources? How do they mandate and enforce pollution controls on point source dischargers? If a waterbody is impaired in a forest area, clearly the forest practices rules are not sufficient and a TMDL should be implemented.

Ecology Response: *Forest practices in Washington are administered through a set of laws and regulations developed with the intention that they protect water quality, and that incorporate a formal adaptive management program to test and revise the forestry rules as needed should it be determined those rules are not effective in meeting the state surface water quality standards. The potential sources of degradation to a watershed can be complex, and our prioritization statements should not be read as an indication that we would not develop a TMDL in a watershed where point sources are degrading water quality simply because forestry is otherwise a dominant land use. In such a case, the watershed would be prioritized based on the non-forestry sources of pollution, as with any other watershed, but we would continue to rely on the forest practices rules to control any potential water quality degradation that might come from the forest practices activities in that watershed.*

Comment from [Snohomish County]: The criteria used to prioritize TMDLs lack the specificity found in in a 1997 Memorandum of Agreement (MOA) between Ecology and EPA. The County understands that the MOA expired on December 31, 2013, but remains in effect because Ecology and EPA have not completed negotiations to finalize an update to the agreement. The MOA contains much more specificity on how to prioritize TMDLs and are therefore important to retain and/or improve upon. Additionally, it may be useful to review Appendix E of the Water Quality Program Permit Writer's Manual 10 Part 1 or other documents as appropriate to consider for inclusion in the Policy. Recommendation: After updating the MOA, align the TMDL prioritization criteria in the Policy with those in the MOA and/or the Permit Writer's Manual.

> **Ecology Response**: *Comment noted. This suggestion will be passed on to the TMDL program for consideration.*

Comments on annual prioritization meeting

Comment from [Interagency Team]: While we appreciate the added commitment to statewide public meetings, these meetings/webinars are not the best public involvement vehicle for local participation in prioritization of TMDLs. Focused coordination with local partners helps ensure that TMDLs are prioritized to produce meaningful and measureable improvements in water quality. This level of engagement is consistent with the EPA's 2013 Long Term Vision for Assessment, Restoration, and Protection under section 303(d) of the CWA. Recommendation: Commit regional TMDL managers and leads to holding public TMDL engagement and prioritization meetings.

> **Ecology Response**: *Comment noted. This suggestion will be passed on to the TMDL Program for consideration. We do want to emphasize that the commitment that is made in the revised Policy 1-11 to conduct an annual statewide prioritization process should in no way be construed as the only opportunity to work with Ecology staff on local waterbody restoration activities and priorities at the local level. We encourage you to proactively work with Ecology regional contacts to ensure your local water quality priorities are understood and to enhance the collaborative relationship that your comment suggests.*

Comment from [King County DNR]: While Policy 1-11 includes new, helpful text describing prioritization of TMDLs, the section discusses only one statewide, Ecology-hosted TMDL planning meeting per year for this purpose. Given the importance of developing strategic and effective water cleanup plans. King County recommends additional opportunities to work with Ecology's Headquarters and the Northwest Regional Office, such as periodic regional meetings to identify waterbodies where proactive source control, restoration, and/or other actions can serve as a baseline for a TMDL or other cleanup plans (e.g., 4B plan).

> **Ecology Response**: *The commitment that is made in the revised Policy 1-11 to conduct an annual statewide prioritization process should in no way be construed as the only opportunity to work with Ecology staff on local waterbody restoration activities. We will pass this request on to the TMDL program and encourage you to proactively work with*

Ecology regional contacts on a regular basis to improve water quality in your local jurisdiction.

Comment from [Pierce County]: Ecology states a willingness to hold annual public meetings to present and receive feedback regarding the proposed list of TMDLs. Comment: Pierce County is excited by Ecology's new efforts at transparency in the decision- making process and looks forward to fully collaborating with Ecology on prioritizing future TMDLs in our County.

Ecology Response: *Comment noted. We appreciate your commitment to clean water.*

Comment from [Snohomish County]: While we appreciate the added commitment to statewide public meetings, these meetings/webinars are not an appropriate public involvement vehicle for local participation in prioritization of TMDLs. Focused coordination with local partners is necessary to ensure that TMDLs are mutually prioritized to produce meaningful and measureable improvements in water quality. This level of engagement is consistent with the EPA's 2013 Long Term Vision for Assessment, Restoration, and Protection under section 303(d) of the CWA8. Recommendation: Commit regional TMDL managers and leads to holding public TMDL engagement and prioritization meetings to solicit local knowledge to help inform the prioritization process.

Ecology Response: *Comment noted. This suggestion will be passed on to the TMDL Program for consideration. We do want to emphasize that the commitment that is made in the revised Policy 1-11 to conduct an annual statewide prioritization process should in no way be construed as the only opportunity to work with Ecology staff on local waterbody restoration activities and priorities at the local level. We encourage you to proactively work with Ecology regional contacts to ensure your local water quality priorities are understood and to enhance the collaborative relationship that your comment suggests.*

Comment from [WASWA]: Having attended the prioritization workshop for this cycle, we appreciated the opportunity to comment on TMDLs for the upcoming year. This is a useful public forum, and eliminates the surprise element that had sometimes occurred in the past.

Ecology Response: *Comment noted. We appreciate your commitment to clean water.*

Part 2. Specific Assessment Considerations

Section 2A: Bacteria

Comments on bacteria samples and listing methodologies for bacteria

Note: Ecology anticipates that new contact recreational criteria will be adopted into the water quality standards by early 2019. When those criteria and standards are adopted, Ecology will consider amendments to Policy 1-11 to address any needed adjustments to the current methodology for bacteria. Ecology will notify interested stakeholders of any further proposed changes to address the new bacteria criteria and will provide a public review opportunity at that time (expected in 2019).

Comment from [Boeing]: Page 33 - "Use of Beach Environmental Assessment, Communication, and Health (BEACH) Program Enterococcus spp Ecology has announced rulemaking on the recreational use in WA waters (Chapter 173-201A WAC). The current rulemaking timeline indicates that the proposed rule will be available for public comment in July 2018 and the final rule is expected late 2018. As such, Policy 1-11 will require changes as a result of the rulemaking on recreational use bacteria criteria.

> **Ecology Response**: *Ecology anticipates that new contact recreational criteria will be adopted into the water quality standards by early 2019. When those criteria and standards are adopted, Ecology will consider amendments to Policy 1-11 to address any needed adjustments to the current methodology for bacteria. Ecology will notify interested stakeholders of any further proposed changes to address the new bacteria criteria and will provide a public review opportunity at that time (expected in 2019).*

Comment from [King County DNR]: How will Policy 1-11 be updated in the future to address this change, and how will you solicit public input for minor revisions?

> **Ecology Response**: *See above response to Boeing.*

Comment from [Interagency Team] [Snohomish County]: Page 29, third paragraph, first sentence. Assessment Information and Data Requirements. Lacks clarity on whether calculating a geometric for a season or a water year requires a minimum of five data collection events. Recommendation: For consistency with Standards and subsequent areas of the Policy, clarify that a geometric mean calculation for a season requires a minimum of five data collection events or samples.

> **Ecology Response**: *When no critical period has been defined, a geometric mean is typically calculated for the entire water year. When a critical period or season has been identified a geometric mean is calculated for that critical period/season as well as for the water year. The adoption of revised recreational criteria in the near future may necessitate adjustments to averaging periods. Any modification to averaging periods will be addressed in the implementation package for the revised criteria as well as in an amendment to the bacteria assessment method in Policy 1-11.*

Comment from [King County DNR]: Page 30: "Bacteria". We request that Ecology either identify in Policy 1-11, or develop in EIM, the database codes identifying results from sampling programs that intentionally target high bacteria levels, spill events or other conditions deemed not representative of ambient conditions.

> **Ecology Response**: *We will explore the feasibility of developing this recommendation for EIM.*

Comment from [Interagency Team] [Snohomish County]: It remains unclear why Ecology's Error Analysis excluded bacteria which would allow better management of listing decision error rates through the use of advanced test statistics. Recommendation: In alignment an Ecology 2002 overview of the Water Quality Assessment Process, reconsider including bacteria in an error analysis to mitigate for Type 1 and Type 2 listing decision errors.

> **Ecology Response**: *The error analysis excluded bacteria because of how the criteria are expressed. The criteria specifically reference sample numbers, whereas criteria for temperature, dissolved oxygen, and pH do not. For example, the "percent exceedance" component of the criteria state that no more than 10% of "samples" can exceed a given threshold rather than stating that a waterbody (i.e. the population) can exceed at a frequency of no more than 10%. In other words, there is no population level error to evaluate because the standards reference the samples rather than the population. Therefore, when the geometric mean or percent exceedance components of the criteria are exceeded in a sample set then the only Type I or Type II decision error would be random error resulting from the miscalculation of the geometric mean or percent exceedance. Attempting to estimate decision error of this type would not be a useful exercise. Decision error would occur if we were using samples that targeted high (or low) bacteria levels, but we cull such data from the assessment. Another source of error is inaccurate sample values. An analysis of this type of error would then be focused not on a statistical representation of ambient conditions (decision error), but on potential error in reported sample values. To do this for lab analytical error, for example, one would have to estimate "true" sample values in comparison to reported sample values. This type of inquiry is already addressed by lab QA/QC processes for specific monitoring projects through analysis of replicates, duplicates, and blanks. To scale lab analytical error rates up to estimates of general error rates in listing decisions on a statewide basis would likely produce results riddled with error and therefore of very little meaning.*

Comment from [King County DNR]: Page 29: "Bacteria". King County is encouraged by the use of average bacteria values across the entire AU, because multiple sampling events may be conducted in one day within an AU. For instance, multiple samples are often collected during a storm or from different portions of a stream AU. We request that Ecology clarify that all sampling events during each sampling day be averaged to provide a single average bacteria value per AU per day.

> **Ecology Response**: *The policy has been clarified to indicate that multiple samples collected at the same monitoring station on a single day will be averaged, but that samples collected from different stations on a single day for an AU will not be averaged for any waters. If more than one monitoring station has been sampled on a given day, the*

station having the highest average value will be used to represent the daily value for the AU. The reason is that there may be a bacteria source affecting one area of the AU that does not affect another area in the AU. For example, if there is a significant bacteria source between an upstream and downstream monitoring station on a stream AU, averaging the values from the two stations may obscure an exceedance of the criterion at the downstream station.

Comment from [NWEA]: Ecology states that it may define specified critical periods or seasons based on when "bacteria levels are more prone to exceed criteria." It should also define critical periods or seasons, when necessary to protect specific beneficial uses. We do not agree that Ecology can put aside "incomplete" data until its next listing process. Ecology has a terrible track record on issuing timely assessments and, as such, has no basis for ignoring any data if it shows that a waterbody is impaired.

Ecology Response: *Our automated assessment application for bacteria is set-up to analyze partial incomplete water year data sets because we recognize that impairment can often be determined from such data sets; however, we want to retain the flexibility to have an entire water year data set when considering de-listing of a waterbody from Category 5 to another category in order to be sure that samples from later in a water year meet criteria.*

Comment from [NWEA]: It is incorrect policy, as Ecology proposes, to always "remove data from the evaluation whenever it is known to be from monitoring designed to target high bacteria levels. This is not to say that in some instances, Ecology's professional judgment will be that the data do not reflect the waterbody as a whole or reflect specific instances (e.g., spills) that should not be captured in category 5. But this should be spelled out in the methodology and the purpose of such a policy explained. The way that Ecology has approached this issue could preclude any regular testing outside discharge pipes, regular combined sewer overflows, data collection during high flows, data collection near dairy farms, data collection of stormwater discharges at high flows, yet all of these examples are of data that would demonstrate a regular failure to meet the water quality standards and protect the beneficial uses.

Ecology Response: *The policy language has been revised. The intent was to address data sets that exclusively target high bacteria levels while omitting sampling from periods that are believed to have lower bacteria levels. A data set representative of ambient conditions would include samples that span the range of conditions that occur in a critical period, season, and/or water year. Sampling that targets high levels without also targeting low levels would not accurately depict ambient conditions. If only samples targeted for high bacteria levels are considered, it would skew the representation of the geometric mean and percent of samples exceeding the upper threshold of the criteria because it may be excluding a majority of samples that are well below the criteria thresholds. For example, consider a waterbody that has a geomean criterion of 100cfu/100mL with not more than 10% of samples to exceed 200cuf/100mL. Assume that in a two month period (e.g. 61 days) there were 6 days of high flow with bacteria levels of {150, 150, 150, 150, 150, 300} cfu/100mL, and there were 55 days of low flow with bacteria levels of 50cfu/100mL. A sampling regime that only targeted samples from the high flow events would portray the ambient condition as having a geometric mean of*

168cfu/100mL and 17% of samples exceeding 200cfu/100mL. However, six random samples would give results that more accurately represent the true ambient condition (i.e. a geomean of 56cfu/100ml and 2% of samples above 200cfu/100mL for the overall period). In this regard, monitoring that only targets high bacteria levels is much more likely to result in erroneous impairment decisions.

Comment from [Pierce County]: We recommend clarifying the statement 'only one value per day per reach will be used in the WQA'. Furthermore, a sampling 'event' may continue over multiple days. We recommend that the arithmetic mean only be applied to data collected in the same day, and that the geometric mean be used in events sampled over multiple days.

Ecology Response: *The policy has been revised to address this issue.*

Comment from [Pierce County]: Bacteria. "The final category determination for an AU is based on the most recent data available that qualifies for a category (other than Category 3). For example, if an AU qualifies for Category S based on a previous water year dataset, and Category 1 based more recent data, then the AU will be placed in Category 1." Recommendation: This guidance should be consistently applied to all parameters considered in the WQA.

Ecology Response: *The most recent data is used to determine the category determination for all parameters. For most parameters, the assessment of data occurs sequentially by year, starting with the first year of the assessment period. For the most recent data in the assessment period to result in the final category determination, it must be sufficient to override the conclusion of data from previous years. For example, if an AU qualifies for Category 5 based on the first two years of the assessment period and data from the last two years qualifies for Category 1, the AU would be placed in Category 1. The exception is that later data that is insufficient to make a Category 1 or 5 determination (i.e. qualifying for Category 2 or 3) cannot override data earlier in the assessment period that qualifies for Category 5.*

Comment from [Seattle]: Part 2A (Bacteria), top of page 31. Edit to match other references to Category 4B in the Policy.

Ecology Response: *The policy language referenced in the comment has been revised.*

Comment from [Snohomish County]: EIM currently does not contain a clear and easily queried mechanism to identify bacteria samples associated with programs specifically targeting discharges or events not representative of ambient conditions. Recommendation: Modify EIM such that users and Ecology are provided the ability to query representative vs. non-representative data.

Ecology Response: *This is something that we are looking into, but changes to EIM are outside of the scope of the assessment policy update.*

Comment from [Snohomish County]: The Policy fails to specify the maximum number of samples to collect and assess for a water year and critical period. Recommendation: Identify the maximum number of bacteria samples to collect and assess within a critical period or water year

to align with Standards and ensure consistent use of the number of samples the WQA and category 1 determinations.

> **Ecology Response**: *We are not sure what the intent of this comment is. It is unclear what water quality protection benefit would be gained by specifying a maximum number of samples to be assessed for a water year or critical period.*

Comments on Department of Health programs

Comment from [NWEA]: Page 32 – Category Determinations Based on Agency Health Advisories Where there are disparities between the Washington Department of Health and Ecology, the most stringent approach should be used to generate the 303(d) list. That is, if the WDOH concludes that there is an impairment, Ecology should accept that result. This may, or may not, be what Ecology is saying in its obscurely written methodology.

> **Ecology Response**: *Washington State water quality standards (WAC 173-201-210(2)(b)(i)) state that shellfish growing areas approved for unconditional harvest by the state department of health are fully supporting the shellfish harvest goals even when comparison with the criteria suggest otherwise. The implementation of shellfish harvest standards for bacteria has no bearing on whether or not the waterbody may be 303(d) listed for contaminants in fish, as the comment seems to suggest. For example, for the Fish and Shellfish Harvest Use a waterbody can have a Category 1 listing for bacteria, but a Category 5 listing for PCBs in fish tissue; any Category 5 listing for a parameter assessed for a designated use would mean that the use is impaired.*

Comment from [PSKA & SRK]: The Draft indicates that the Department of Ecology will defer to the Department of Health (DOH) regarding its determinations whether to close shellfish beds. (Draft pp. 32- 33). We agree with Ecology's decision to reassign a Category 1 listing as a Category 5 if DOH has determined that a waterbody must be closed for shellfish harvest. However, conversely, the Draft seems to indicate that a Category 5 waterbody might be administratively moved to Category 2 upon consultation with DOH if shellfish beds in the area are closed to harvest. This does not make sense. Just because a shellfish bed is closed in a waterbody does not necessarily mean people will not be otherwise fishing in or consuming fish from that waterbody. If a waterbody is impaired for a designated use it should be listed for the impairment of that use.

> **Ecology Response**: *Washington water quality standards (WAC 173-201A-210(2)(b)(i)) state that shellfish growing areas approved for unconditional harvest by the state department of health are fully supporting the shellfish harvest goals even when comparison with the criteria suggest otherwise. The implementation of shellfish harvest standards for bacteria has no bearing on whether or not the waterbody may be 303(d) listed for contaminants in fish, as the comment seems to suggest. For example, for the Fish and Shellfish Harvest Use a waterbody can have a Category 1 listing for bacteria, but a Category 5 listing for PCBs in fish tissue; any Category 5 listing for a parameter assessed for a designated use would mean that the use is impaired.*

Comment from [Pierce County]: Bacteria. "Agency advisories will also be used to directly assess the protection of designated uses." Comment: Pierce County recognizes and praises Ecology's incorporation of additional data sources into policy 1-11 decisions.

> **Ecology Response**: *Comment noted. Information from Washington Dept. of Health regarding bacteriological conditions at swimming beaches and shellfish beds provides an important line of evidence in the assessment of recreational and shellfish harvest use support.*

Comments on new contact recreation criteria

Comment from [Frymire]: IDEXX strongly encourages Ecology to consider amending the bacteria indicators for contact recreation waters, changing from fecal coliforms to E. coli, for all fresh recreational waters, and enterococci, for all marine recreational waters.

> **Ecology Response**: *This comment is outside the scope and intent of Policy 1-11 and will be passed on to the Water Quality Standards program. As a note, Ecology is in the rule-making process for recreational criteria and will be proposing to adopt E. coli and enterococci as indicators of bacterial contamination, so that should satisfy the commenter's concerns.*

Comment from [Seattle]: Part 2A (Bacteria), page 30, fourth full paragraph. Suggest specifying the time period for using new bacteria criteria, so listings are not changed piecemeal.

> **Ecology Response**: *The language regarding criteria changes has been revised. We anticipate that fecal coliform will be used to assess bacteria during the current assessment cycle but that there will be slight modifications for how the data are assessed. The assessment policy will be updated once the new criteria are adopted. As part of the transition period, entities may request on a case basis that we apply the new bacterial indicators. The standards will contain an expiration date for the current standards after which the new ones will be applied in the assessment.*

Section 2B: Benthic Biological Indicators

Comments on listing specific methodology requirements for B-IBI data

Comment from [EPA Region 10]: Evaluating Bioassessment Data based on B-IBI: The EPA is pleased that Ecology has developed a biological assessment program capable of reliably evaluating benthic community data throughout the entire state. We also appreciate Ecology's consideration of our earlier comments regarding the scoring scale and the adjustment of the scale to a range of 0 to 100, as well as Ecology's decision to raise the B-IBI percentile value for impairment determinations.

> **Ecology Response**: *Comment noted.*

Comment from [EPA Region 10]: The EPA feels Ecology could provide more background documentation regarding the statistical and ecologic analyses that supports certain B-IBI listing details including: 1) Selection of the 10th percentile of conditions as the threshold for aquatic life impairment. More specifically, what level of ecological structure, function, and diversity is associated with the 100 percentile and how does that level compare to the biologic integrity goal of the Clean Water Act? 2.) Selection of a most recent two years of data and how that may adequately represent a site influenced by serial correlation, environmental cycles, or long-term trends. 3.) Comparison of multiple samples to a lower percentile of the reference stream statistical population rather than the central tendency. 4.) Description of pollutant-related metrics and how they will be used to determine if a site is outside of defined tolerance levels. With the goal of increased transparency, the EPA suggests that a flowchart depicting decision nodes would be helpful in understanding how pollutant- related metrics will be used to assess and categorize waters. With this comment the EPA: (a) emphasizes our national policy that waters should be placed in Category 5 even if the specific caused of the impairment has not been identified and, therefore, (b) recommends that B-IBI scores below the 10th percentile are acceptable basis for placement in Category 5.

Ecology Response:

1) Ecology recognizes the need for greater understanding of what constitutes truly healthy biological communities from those that are impaired with regards to ecological structure, function and diversity. The B-IBI is an effective general model for evaluating the biological health of stream communities because the component metrics are diversity measures for various functional groups and ecological guilds. When B-IBI scores are low, it is vital to examine the component metrics to see where there are deficiencies in the community contributing to the observed impairment. Additional biological metrics can also give insight to what might be contributing to the observed impairment. Ecology is also hoping that participation in ongoing work developing a Biological Condition Gradient model for the Puget Lowland/Willamette Valley will help contribute to greater understanding of what constitutes impaired versus healthy biological communities. As such, the 10th percentile of regional targeted reference sites was chosen due to EPA's concern with Ecology's prior use of two numbers, the 5th and 25th percentiles for categories 5 and 1, respectively. The prior use of the 5th percentile was chosen because it indicated clear deviation from targeted reference sites, given that 95% of scores from reference sites were higher than the 5th percentile threshold. Selection of the 10th percentile was is not based on a priori information about what number is truly an indication of impairment, but purely a statistical property of the distribution, one that would be slightly more protective than the 5th percentile of targeted reference sites.

2) The selection of a requirement of the two most recent years that data are available is a means of assessing the most recent conditions. Many sites will not have more than several data collection events, making determination of long-term conditions difficult.

3) Question 3 is a little unclear, but if we understand it correctly, we will be comparing the two most recent years from which we have data to a lower percentile threshold established with targeted reference sites. Essentially, using the 10th percentile as a threshold, a site with an average score below that threshold would be interpreted to be different than 90% of reference sites. Sites meeting this criteria would then be considered for Category 5 listing because they are very different than a majority of reference sites.

4) A flow chart has been added that includes a depiction of the role of the pollutant related metrics.

Comment from [EPA Region 10]: Assessment Information and Data Requirements: The EPA agrees that biological assessment information derived from macroinvertebrate and periphyton community metrics should be considered credible data to be used where defensible to assess waters for aquatic life attainment. We would like to reiterate that as Ecology has indicated, the EPA national guidance directs States to place waters in Category 5 if water quality standards are not being attained, even if the specific pollutant causing the impairment has not yet been identified.

Ecology Response: *Comment noted.*

Comment from [Interagency Team] [Snohomish County][Pierce County]: Page 36. Recommendation: Update the Policy and/or the B-IBI Thresholds Rationale document to include the scientific justification for use of the two most recent years of data to support bioassessment category determinations.

Ecology Response: *The selection of a two-year data window is a means of assessing the most recent conditions. While there is observed inter/intra variability in B-IBI scores, this is usually less than 10%, which is less than many of the other parameters used in the Water Quality Assessment. When data from a stream reach indicate possible impairment, additional scores can be evaluated to see if the data are within the observed variability of the reach or whether there is a trend.*

Comment from [Interagency Team] [Snohomish County][Pierce County]: Describe the minimum number of samples used to support a trends analysis, the test statistic proposed, and the confidence interval and listing decisions made based upon the results. Further, please clarify how Ecology will use results from either improving or declining trends to support category determinations where they do not agree with average scores from the two most recent years.

Ecology Response: *We have removed specific narrative text on trends from the bioassessment section and will rely on how Ecology would use a trend analysis to determine Category 5 listings where we had adequate information. Ecology may place an AU that is currently meeting standards in Category 5, when trend analysis indicates that the AU is not expected to meet applicable water quality standards by the next WQA cycle. A valid statistical design and analysis methodology is required to justify a Category 5 listing based on trend analysis (see USGS publication, Statistical Methods in Water Resources, September 2002).*

Comment from [Interagency Team] [Snohomish County]: Under Assessment Information and Data Requirements. The continued use of RIVPACS model scores for the WQA is not supported without documentation of correlative analysis between reference RIPACS and B-IBI scores. Recommendation: Provide the public with scientific documentation supporting the use of RIVPACS for the WQA in a manner consistent with the APA.

Ecology Response: *The use of RIVPACs in the WQA has not changed from what was originally presented to the public in the 2006 version of Policy 1-11. Because it is*

unlikely that any new RIVPACs data will be used in the foreseeable future, methodology for using it in Category determinations has been removed. However, existing category determinations based on RIVPACs data remain valid pending the availability of newer data and information that warrants a category change.

Comment from [NWEA]: Ecology notes that EPA's "guidance stipulates that states should identify AUs in Category 5 using bioassessment data even if the specific pollutant causing the impairment has not been identified." Nonetheless, Ecology proceeds to propose its own guidance that contradicts EPA. Ecology cannot use this guidance to change its EPA-approved water quality standards. For example, WAC 173-201A-260, cited as the applicable criterion for bioassessment data, states that "[t]oxic, radioactive, or deleterious material concentrations must be below those which have the potential, either singularly or cumulatively, to adversely affect characteristic water uses, cause acute or chronic conditions to the most sensitive biota dependent upon those waters, or adversely affect public health[.]" Nothing in this water quality standard indicates that it is not applicable to permitting actions. In fact, a permit writer is required to ensure that a permit meets this and every other applicable water quality standard and to identify any pollutants causing violations to which a source is causing or contributing.

Ecology Response: *Ecology is not using the guidance in Policy 1-11 to change a water quality standard. EPA guidance for Category 5 listings based on bioassessment data suggests that a stressor identification analysis should be done prior to starting a TMDL in order to identify any pollutants that may be associated with the biological impairment. Prior to that step, it is unclear what a regulated discharger would be expected to do in order to be in compliance with the water quality standards when discharging to a 303(d) listed waterbody that has no pollutant identified. Since 303(d) listings are typically pollutant specific, that is the driver for showing compliance with the standards.*

Comment from [NWEA]: Ecology is requiring additional indices (e.g., Hilsenhoff biotic index, a fine sediment index, metals tolerance index, thermal indicator index) in addition to B-IBI scores in order to find an impairment and list a segment on the 303(d) list. Ecology has not provided a justification for not using B-IBI scores without this additional check. It is clear that Ecology's intent is not to "provide higher confidence" of a pollutant but to circumvent EPA's policy of requiring listing on the basis of bioassessment even if a pollutant has yet to have been identified. Again, Ecology has not demonstrated that bioassessments are not reliable, which is the only basis for requiring an additional measurement. If bioassessments are not, in fact, reliable, then Ecology should refuse to use them (and EPA can add them to the state's 303(d) list).

Ecology Response: *The use of bioassessment data to determine impairment of a waterbody is an evolving program that compares aquatic species diversity at a specific location with reference conditions of sites that are deemed to be in good condition. Thus, it does not have a defined 'limit' that can be used to determine impairment, such as we have with numeric criteria. An important goal with Policy 1-11 is to minimize Type 1 and Type 2 errors (either listing a water as impaired that is fact is not, or not listing a waterbody that is in fact impaired). We received significant comments on this section from stakeholders as well as EPA, and have developed a listing methodology that employs additional indices as another line of evidence to minimize listing errors. We will*

continue to refine the listing methodology as the program evolves and we learn more, but we are confident that the process in the bioassessment section for category determinations is a good balance of using the data that we have with the uncertainties that exist with bioassessment. We agree that if EPA believes we have not appropriately identified impaired waters through the use of bioassessment data, they have the authority to add them to the state's 303(d) list.

Comment from [Pierce County]: We would like to offer a Pierce County example, the Clarks Creek TMDL. The Puget Lowlands B-IBI Reference Sites memo authored by Hayslip (EPA, 2013) cites stream reference sites as representing the State's relatable (comparable) standard for classifying the B-IBI scores generated in the lower alluvial reaches Of Clarks Creek to a Category 5 listing for impairment. The cited reference streams fail to symbolize (represent) a relative homogeneous sampling of the Puget Sound Lowland's streams and rivers based on soils, geology, inclination (slope) and elevation. The County is of the opinion this limited suite of reference streams fails to represent a comprehensibly suitable set of benchmarks or estimates for what one would expect to find (regarding benthic macroinvertebrate scores) if little human impact had occurred (i.e. natural conditions).

Ecology Response: *Ecology is confident that the B-IBI model is a combination of well-tested biological metrics based on sound ecological theory that are used in many more places than the Puget Sound. There is a balance between generality and specificity of models and it is unreasonable to expect that individual models should be developed matching every scenario one might encounter. The B-IBI was originally developed using a range of streams from around the Puget Sound (stream gradients ranging from 0.4-3.2%), so ECY is confident that the B-IBI provides a reasonably good indicator of the biological condition of a site. Additionally, much information about a community can be gleaned from examining the individual metrics of the B-IBI as well as other biological metrics. Additionally, multivariate analyses of data obtained from probabilistic sampling studies from around the Puget Sound (SAM & Watershed Health Monitoring) shows no spatial segregation of Pierce County sites from other sites within the Puget Sound. Reference sites are used for setting expectation under minimal human impacts and while there are no reference sites in Pierce County, this does not mean that they cannot be used for establishing regional expectations.*

Comment from [Pierce County]: Pierce County recognizes the difficulty in finding pristine, undisturbed reference sites in the developed Puget Sound lowlands. The County would like to work with the State to instead find a least impacted set of reference that are geomorphically (and biologically) similar to the majority of streams in our jurisdiction. Other states use separate MMI indices for low and high gradient streams, and RIVPACS and Predator also incorporate watershed slope into their modeling (scoring) algorithms. Furthermore, instead of benchmarking urban streams again pristine (undisturbed) streams, we suggest setting threshold values using data from local streams that are categorized with similar stream characteristics and urbanization levels in their drainage areas. Another alternative is simply using the 10th percentile line constructed with all current Puget Sound Stream Benthos (PSSB) database sites using a method similar with those shown in Fig. 1. The strong inverse correlation of BIBI and percent urbanization in the associated drainage areas indicates that we may not be able to restore an

urban stream BIBI condition back to it nature high BIBI values within reasonable time frame with reasonable inputs of resources.

> **Ecology Response**: *The WQA is intended to meet Clean Water Act requirements for section 303(d), which obligates a state to identify waters for which designated uses are impaired. The suggestion in the comment that we set benchmarks and threshold values based on reference streams that are showing similar stream characteristics and urbanization levels would corrupt the model and render it not useful for its intended purpose.*

Comment from [Pierce County]: Pierce County recommends developing a separate B-IBI protocol for low gradient streams (e.g. glides and runs) specific to the Puget Sound Lowlands region. This approach would be more accurate, less biased, and scientifically defensible.

> **Ecology Response**: *While we recognize that slope can have an influence on stream communities, conditional probability analysis has not shown poor B-IBI scores to be associated with low slope conditions. A statewide Relative Risk/Attributable Risk analysis (in preparation) has demonstrated there is not a significant increase in the probability of poor B-IBI scores with low slope. Poor B-IBI scores are associated with poor substrate conditions, loss of riparian buffers and elevated nutrient concentrations, all of which are exacerbated in highly urban environments. Ecology is involved with current efforts to develop a Biological Condition Gradient model for the Puget Lowlands/Willamette Valley and only nominal alterations are made for low slope sites. Furthermore, while the B-IBI gives an initial indication of the biological condition of a stream segment; additional work is needed to evaluate which component(s) of the associated community are contributing to the impairment. Evaluating the individual metrics of the B-IBI, as well as additional stressor sensitive metrics, can provide information about the likely stressors influencing the biological community of a stream reach. Stressor identification (i.e. CADDIS) will help to determine the most efficient path forward towards improving the biological condition. A TMDL will set the targeted endpoints for pollutants identified at impaired sites that can be measured through time to determine successful rehabilitation.*

Comment from [King County DNR]: Page 34: "Benthic Biological Indicators". Please clarify up front that this section only applies to freshwaters.

> **Ecology Response**: *We have clarified that the B-IBI for aquatic macroinvertebrates is the primary benthic biological indicator for evaluating freshwater aquatic life use support. We note, however, that any credible biological study of fresh or marine waters may be used to evaluate aquatic life use support based on WA State's narrative standards. For example, a credible study using benthic marine community or tolerance metrics to indicate impairment of an aquatic life use can be used to establish a 303(d) listing even though we do not have specific B-IBI methodology for marine waters.*

Comment from [PSKA & SRK]: Why is only freshwater guidance for benthic biological bioassessment shown? We would suggest adding useful guidance for estuarine and marine benthic bioassessment as well.

Ecology Response: *At this time we do not have methodology for conducting marine bioassessments. However, the results of marine studies that meet the requirements as described in Section 1E of this policy for "Information Submittals Based on Narrative Standards" can be used in the WQA.*

Comment from [Seattle]: Part 2B (Benthic Biological), bottom of page 34. For accuracy and to match p. 37 of the Policy, identify as "Benthic Biodiversity-cause unknown."

Ecology Response: *The suggested revision has been made.*

Comment from [Seattle]: Part 2B (Benthic Biological), bottom of page 36. For clarity, consistency and to match p. 37 of the Policy, identify as "benthic assemblage index."

Ecology Response: *The policy language has been revised for consistency.*

Comment from [Seattle]: Part 2B (Benthic Biological), Category 4, page 37, para. 5. Suggested edits.

Ecology Response: *The text has been edited for clarity.*

Comments on B-IBI thresholds

Comment from [Interagency Team] [Pierce County]: It remains unclear how Ecology arrived at the 0.1% threshold. Applying the B-IBI model to reach scale channel gradients as low as 0.1% does not prevent the evaluation of B-IBI scores from low-gradient, depositional, fine-sediment dominated reaches or wetlands. Recommendation: Limit the application Of the B-IBI model to channel gradients no lower than 1%. Utilize additional habitat and morphology data when available, such as pebble counts, embeddedness, habitat unit type, and percent fines to support listing determinations. Provide the scientific rationale for whatever channel gradient threshold is established.

Ecology Response: *The 0.1% has been defined as the upper cut-off for low gradient streams, which have depositional sediment regimes and may have substrates that are naturally dominated by fine sediment (Olivero, A.P. and Anderson, M.G. 2008. Northeast Aquatic Habitat Classification System. The Nature Conservancy. Eastern Regional Office. Boston MA).*

Reference sites used in the B-IBI model have reach scale gradients generally ranging from about 0.1% to about 30%. 0.1% was therefore selected because sites with lesser channel gradients that have sediments naturally dominated by fine sediments are outside of the range of experience for the reference sites used in the development of the B-IBI. Although the habitat classification system by Olivero and Anderson found the greatest difference in biota between channel gradients above or below 0.5%, channel gradients between 0.1% and 0.5% are within the range of experience of the WA state reference sites.

Comment from [Interagency Team] [Pierce County] [Snohomish County]: Page 36. The use of the 10th percentile as a single bioassessment criteria was not disclosed by Ecology as a

preferred bioassessment alternative, and the scientific documentation supporting its use is not available to the public. Ecology's B-IBI Thresholds Rationale does not discuss the use of the 10th percentile as a single criteria and therefore was not available for public dialogue in a manner consistent with the APA. Recommendation: Update the Policy and/or the B-IBI Thresholds Rationale document to include the scientific justification for use of the 10th percentile to support B-IBI category determinations.

> **Ecology Response**: *The 10th percentile was presented in the draft assessment methodology as a subject of public review and comment. The B-IBI threshold was increased to the 10th percentile in order balance the effect of the diagnostic metrics on Type 2 errors. The use of the 10th percentile of the targeted reference distribution has a specific meaning, i.e., that a site below the established threshold is different than 90% of reference data. This indicates the sample data in question is very different than a vast majority of reference data. The use of targeted reference data is common practice and not without precedent. Multiple other states use the 10th percentile as the threshold for indicating degradation when evaluating benthic macroinvertebrate assemblages.*

Comment from [Seattle]: Part 2B (Benthic Biological), Category 5, page 37, para. 1 and 2. In order to provide fair notice to the public of the technical basis for Category 5 listings, delete sentences that allow other benthic assemblage indices to be used and that allow Ecology to consider downward trend in B-IBI scores.

> **Ecology Response**: *We have not made changes to how we will consider benthic assemblage indices. The thermal indicator index is the only one that will be developed in the near future. Ecology will add information on the thermal indicator index to the assessment policy once the index is available. It is anticipated that stakeholders will have the opportunity to provide feedback on the index during public review of policy revisions. We have removed specific narrative from the bioassessment section and will rely on how Ecology would use a trend analysis to determine Category 5 listings where we had adequate information. Ecology may place an AU that is currently meeting standards in Category 5, when trend analysis indicates that the AU is not expected to meet applicable water quality standards by the next WQA cycle. A valid statistical design and analysis methodology is required to justify a Category 5 listing based on trend analysis (see USGS publication, Statistical Methods in Water Resources, September 2002).*

Comment from [Interagency Team] [Pierce County]: Page 36, B-IBI Thresholds. The proposed B-IBI thresholds do not consider the established negative correlation between B-IBI score and urbanization. This could result in requiring jurisdictions expend considerable time, effort, and funds to attempt to recover B-IBI scores in highly urbanized stream reaches with little probability of success. Recommendation: Reflect the extent of reach scale urbanization in the corresponding Eco-region B-IBI threshold, with a modified threshold recognizing that highly urbanized reaches cannot be reasonably expect to obtain the same B-IBI scores as un-urbanized or minimally urbanized reaches. Consider determining thresholds based on a linear regression equation between B-IBI scores and percent urbanization.

> **Ecology Response**: *The comment seems to suggest that impairment of an aquatic life use should not be recognized as impairment when it has been caused by a permanent land use change. Ecology does not support this logic as it could be used, for example, to*

discount any new aquatic life impairments that arise from future increases in urbanization. In other words, if a new area becomes urbanized, one could then make the argument that water quality expectations should be significantly reduced for any waters that become impaired in the area due to the land use impacts. A Use Attainability Analysis is the appropriate means for addressing waters that cannot be expected to support a designated use despite the implementation of all reasonable water quality improvement efforts.

Comment from [King County DNR]: Page 36: "B-IBI Category 5 Determinations". The use of a single 10 percentile "bright-line" BIBI score to designate impairments was not previously recommended or preferred by Ecology to assess these data. As recently as December 2017, Ecology proposed use of dual B-IBI thresholds to establish "clearly impaired" and "meeting designated uses" in a manner similar to the ranking of contaminated sediment below the SQS, between the SQS and the SizMax and above the SizMax. King County generally supports these types of scales as they explicitly acknowledge the uncertainty and variability in the environmental conditions of our waters and sediments. The use of the ecoregion's 10th percentile of the B-IBI scores for reference sites is an acceptable alternative to King County.

Ecology Response: *Comment noted.*

Comment from [King County DNR]: Page 34: "Periphyton Communities". While King County agrees that periphyton communities can potentially be indicative of nutrient or other pollutants, we know of no Puget Sound specific indices or metrics which could be useful to determine if designated uses are being met or impaired. King County suggests that periphyton data are best applied as one of several lines of evidence including nutrients, metals and B-IBI indices to decide if a particular waterbody is impaired and to potentially help focus future stressor identification studies. Please clarify that periphyton data alone are insufficient to make impairment decisions.

Ecology Response: *At this time we do not have a B-IBI for periphyton and any impairment determinations made using periphyton data would likely be rare cases. The text has been revised to indicate more broadly that we may use credible biological data to create 303(d) listings based on our narrative water quality standards.*

Comment from [Interagency Team] [Snohomish County]: The use of periphyton as a bioassessment tool is not understood well enough for use in listing decisions. While the Team agrees that periphyton communities can potentially be indicative of nutrient or other pollutants, we know of no Puget Sound-specific indices or metrics useful in determining designated use(s) impairment. The Team suggests applying periphyton data as one of several lines of evidence to potentially help focus future stressor identification studies. Recommendation: Clarify that periphyton data alone are insufficient to make impairment decisions.

Ecology Response: *See response to King County DNR above.*

Comment from [Pierce County]: Ecology made no reference to using periphyton or other types Of bioassessment data in any of the previous discussions stakeholders participated in, and does not elaborate any further than the above statement in the Proposed Policy 1-11.

Recommendation: Remove any reference to periphyton or other types of bioassessment data from the proposed policy until the body of scientific research establishes a direct link between changes in the periphyton community, or other biologic communities, and anthropogenic water quality impairments. Clarify that periphyton indices may support impairment determinations, but not form the basis of those decisions.

Ecology Response: *See response to King County DNR above.*

Comment from [NWEA]: We believe that Ecology's proposal to average all bioassessment scores in a single year together may be a mistake and that while this could be the default, Ecology should also use its professional judgment where there are indications this would alter the results incorrectly. Ecology's proposal to not list on the basis of one year's data has no basis in science. Likewise, if there are two years of data showing a bioassessment impairment followed by two assessments done at the very end of the season when rains have mitigated some results, Ecology should use its professional judgment about the impairment.

Ecology Response: *The index period for B-IBI results is July through October, which matches the period in which samples from reference sites have been collected. The biological integrity of aquatic communities operates on a multi-year temporal scale rather than a single year. B-IBI scores at reference sites are known to vary year to year by as much as 10%. Averaging scores among years helps to ensure that assessment units are 303(d) listed due to impairment and not due to natural variability in benthic communities and perhaps also due to sampling variability. A stream that truly has a degraded biological community as reflected in low B-IBI scores in one year is likely to have low scores in other years. Basing a category determination on a single year to list or de-list significantly increases the risk of incorrect determinations as well as assessments units flip-flopping on and off the 303(d) list.*

Comment from [Pierce County]: B-IBI scores should not be used as the sole basis or in combination with any other metrics based on benthic macroinvertebrate community structure for determining whether an AU is impaired under any circumstance.

Ecology Response: *EPA 2006 Integrated Report Guidance clearly states that if a designated use is not supported and the segment is impaired, the fact that the specific pollutant is not known does not provide a basis for excluding the segment from Category 5. Bioassessment provides an indication of whether the designated use of that waterbody is being impaired. EPA 2006 Guidance states that if there is a clear indication that the designated use is impaired, the listing should go into Category 5 even if the pollutant is unknown. The guidance then indicates that prior to establishing a TMDL for such segments the pollutant causing the impairment needs to be identified. If the assessment of the new data and information demonstrates that the use impairment is not associated with a pollutant and is attributable only to other types of pollution (e.g., flow or habitat alteration) the segment may be placed into Category 4C.*

Comment from [Pierce County]: We continue to oppose using B-IBI scores alone as a singular justification for assigning a Category 5 listing on Washington's 303(d) list. Pierce County supports using B-IBI as a tool that contributes to a multiple line-of-evidence approach to determining the health of aquatic ecosystems.

Ecology Response: *See above response.*

Comment from [Pierce County]: Within the relatively broad classification scheme used by Ecoregion Level 3, there exists many distinct, smaller habitat units that would influence the benthic macroinvertebrate communities found in streams in those areas. To account for those different habitat units and potentially different biological communities, Ecology should vary B-IBI WQA thresholds by Ecoregion Level 4.

Ecology Response: *At this time we do not have the data necessary to develop B-IBI thresholds that vary by Level 4 EPA Ecoregions.*

Comment from [Pierce County]: Bioassessment data is known to be highly variable between years. Two years of data cannot be sufficient to rigorously determine the impairment of an AU. Provide the scientific rationale for only requiring two scores in a ten-year period; if none exists, require more than two years of data. Additionally, listings that existed in a prior WQA should be re- evaluated according to the data credibility requirements outlined in the Evaluating Bioassessment Data based on B-IBI section of Policy 1-11 to ensure that all listing decisions are fair and consistent.

Ecology Response: *Ecology is not aware of any information that suggests bioassessment data is highly variable. The selection of the most recent two years of data window is a means of assessing the most recent conditions. This helps address the inter-annual variability, which we have found ranges up to ten percent. Data collected prior to 2012, before the SOPs were enacted, must have met data credibility requirements in place at the time the data were collected. We note that all data within the assessment cycle window will be reassessed to determine listings in accordance with the updated methodology.*

Comment from [King County DNR]: We request that Ecology publish the specific reference tolerance levels for the Hilsenhoff Biotic Index and the fine sediment and metals tolerance indices in Policy 1-11. If the intent is to periodically update these reference tolerance levels, please provide information on the frequency and process for these updates. Future application of the temperature index currently in development suggests that additional indices will be added at Ecology's discretion. King County scientists would appreciate the opportunity to participate in the process for determining how these indices will be applied to water quality decisions at Ecology.

Ecology Response: *We appreciate King County's interest in being involved with bioassessment methodology development and we will include King County scientists in the process of developing a thermal tolerance index. The thresholds for the diagnostic metrics have been added to the policy and at minimum will be updated each time the assessment policy is updated.*

Comment from [Snohomish County]: Recommendation: Delay the use of benthic assemblage indices until Ecology provides scientific documentation for and publishes the specific reference tolerance levels for the Hilsenhoff Biotic Index and the fine sediment and metals tolerance indices in Policy 1-11. If the intent is to periodically update these reference tolerance levels, please provide information on the frequency and process for these updates. Future application of

the temperature index currently in development suggests that additional indices will be added at Ecology's discretion. Snohomish County scientists would appreciate the opportunity to participate in the process for determining how these indices will be applied to water quality decisions at Ecology.

> **Ecology Response**: *The Hilsenhoff, metals tolerance, and fine sediment sensitivity indices are currently calculated in the Puget Sound Stream Benthos database. The threshold values have been added to the policy. It is anticipated that interested stakeholders will have the opportunity to provide feedback on the thermal tolerance index during its development.*

Comments on Stressor Identification Analysis

Comment from [Interagency Team] [Snohomish County]: It is unclear how Category 5 bioassessment listing decisions can be made when EIM does not have the capability to accept documentation showing that deleterious, chemical, or physical alternations cause the designated use impairment. Recommendation: In support of recommendation #3 under section 1E; provide EIM the capability to accept stressor identification studies supportive of Category 5 determinations.

> **Ecology Response**: *The ability for EIM to accept stressor identification studies is outside the scope of changes to the listing policy. Bioassessment data indicative of degraded biological integrity provides a sufficient basis for determining that an aquatic life use is impaired. Stressor identification studies are not necessary for Category 5 determinations. EPA asserts that not knowing the cause of a designated use impairment is not a reason for refraining from identifying a use as impaired.*

Comment from [Interagency Team]: Page 37, fourth paragraph. Ecology provided a link to Guidance for stressor identification of biologically impaired aquatic resources. Recommendation: Clarify whether Ecology follows this guidance or the EPA's CADDIS guidance. If the Ecology guidance is used, initiate an effort to update the guidance.

> **Ecology Response**: *Ecology follows EPA's CADDIS guidance for stressor identification and has even produced a guidance document modeled after CADDIS (Ecology publication No. 10-03-036). Additionally, a manuscript outlining this process for the Soos Creek TMDL was recently published: Marshalonis, D. and C.A. Larson. 2018. Flow pulses and fine sediments degrade stream macroinvertebrate communities in King County, Washington, USA. Ecological Indicators 93: 365-378. https://doi.org/10.1016/j.ecolind.2018.04.060*

Comment from [WSDOT]: The draft Policy provides a link to Guidance for stressor identification of biologically impaired aquatic resources. It is unclear if Ecology follows this guidance or the EPA's CADDIS guidance when performing stress identification analysis. Recommendation: Clarify which stressor identification analysis guidance Ecology follows and if the Ecology guidance is used, please initiate an effort to update the guidance.

> **Ecology Response**: *See above response to Interagency Team.*

Comment from [Pierce County]: Bioassessment listings in Category 5 will initially be assigned the parameter name "Benthic Biodiversity — cause unknown." The listing will remain in Category 5 until a stressor identification analysis is done to determine if one or more are contributing to impairment." Recommendation: To remain consistent with credible data requirements in Washington that require a linkage between source, cause, and effects to be clearly documented, conduct a stressor analysis study prior to making a Category 5 determination and make any subsequent listings for the identified stressor(s), when appropriate. A more appropriate category for "benthic Biodiversity — cause unknown" until a stressor analysis is complete would be Category 2 "waters Of concern."

> **Ecology Response**: *EPA 2006 Integrated Report Guidance clearly states that if a designated use is not supported and the segment is impaired, the fact that the specific pollutant or source is not known does not provide a basis for excluding the segment from Category 5. We have revised the parameter name to indicate that a cause or source is unknown so that it is clear that a pollutant has not been identified.*

Comment from [Seattle]: Part 2B (Benthic Biological), General Comment. As part of previous WQA review, the City (SPU) provided comments to Ecology by letter dated May 15, 2015. SPU recommended that bioassessment should not be the basis for Category 5 listings until a pollutant is identified. SPU is still concerned about the use of benthic biological indicators, including the proposed Ecology approach, and reiterates its comments. However, SPU appreciates Ecology's acknowledgment that pollutants associated with low bioassessment scores need to be identified through a stressor identification analysis prior to TMDL development and encourages Ecology to continue to work with stakeholders to further develop the methods and anticipated outcomes of a stressor identification analysis.

> **Ecology Response**: *Comment noted.*

Comment from [Seattle]: Part 2B (Benthic Biological), Category 4, page 37, para. 3. Website link is broken to "Guidance for stressor identification of biologically impaired aquatic resources." In addition, document should be listed in "Helpful Documents" section on page 39.

> **Ecology Response**: *The link has been repaired and the document has been added to the "Helpful Documents" list.*

Comment from [Interagency Team] [Snohomish County]: Page 37, 1st paragraph. The description of the correlative analysis with pollutant levels lacks clarity and raises questions about its relationship to stressor identification analysis. Recommendation: Clarify the correlative analysis and describe its relationship to stressor identification analysis.

> **Ecology Response**: *The diagnostic metrics will be used as an indicator of biological integrity degradation caused by one or more pollutants and thereby increase the confidence of a Category 5 determination. These metrics will not be used in the assessment to identify specific pollutants as causes of impairment. The stressor identification analysis occurs subsequent to 303(d) listing. It is a more rigorous evaluation that may use diagnostic metrics as a line of evidence in addition to a variety of additional chemical, physical, and biological data and information.*

Comment from [WASWA]: It is not clear who will be responsible for stressor identification studies. It seems that this type of study could be very expensive and time consuming, well beyond the expertise and financial capability of some jurisdictions and agencies. This would be particularly unfair if caused by a private party. Could this end up being a permit requirement? Ecology should conduct such studies, perhaps as part of the 5 year assessment of watersheds.

> **Ecology Response**: *A key purpose of the Assessment is to identify impaired waters. When a waterbody is listed in Category 5 for bioassessment where the cause is unknown, EPA guidance indicates that before considering whether to do a TMDL, a stressor identification study be done first to determine if there is a pollutant that is causing or contributing to the impairment. Therefore, we have added this information to the bioassessment section in the policy. Permit requirements associated with Category 5 waterbody listings are driven by the particular pollutant that the waterbody is listed for. A requirement to do a stressor identification study would not be a part of a permit requirement, unless a pollutant had already been identified.*

Comments on the quality of data and use of bioassessment SOPs

Comment from [Interagency Team] [Snohomish County]: Page 35, 3rd major bullet. While use of sample counts as a way to evaluate bioassessment data for use in the assessment represents a step forward, Ecology should use additional field and lab criteria. Recommendation: Consistent with chemical and physical data quality evaluation tools, use the following additional field and laboratory criteria to evaluate the credibility of B-IBI data: Relative percent difference or standard deviations of field replicates; Relative percent difference or standard deviations of lab replicates; Lab sorting efficiency; Lab taxonomic accuracy and precision.

> **Ecology Response**: *The sample count requirement for bioassessment data addresses data usability and comparability rather than data credibility. All bioassessment data used in the assessment must meet data credibility requirements which are described in Chapter 2 of Policy 1-11. Parameter or evaluation specific credibility requirements are not necessary*.

Comment from [Interagency Team] [WSDOT]: Page 35, 1st bullet under Evaluating Bioassessment Data based on B-IBI. Statement (following the cited wording above) that "This applies only to data collected after 2012, when the SOP was enacted". Recommendation: If the reference SOP includes sampling methodology and data quality requirements, which was not developed until 2012, B-IBI listings from prior to 2012 should be removed from Category 5 as they do not meet the minimum requirements for data credibility.

> **Ecology Response**: *Pre-2012 data that was used in the assessment met the data credibility requirements at the time the data were originally collected and assessed. We do not agree that an updated SOP is an intrinsic justification for reclassifying data previously classified as credible as being no longer credible. This recommendation is analogous to a city determining that all existing development is out of compliance with stormwater BMP regulations every time the regulations are updated, rather than applying the new standards only to new development or re-developed properties. If the concern is that waterbodies currently in Category 5 due to bioassessment do not actually*

have impaired aquatic life uses, then the most informative action would be to collect and analyze new data in order to confirm or refute the existing 303(d) listing status.

Comment from [Interagency Team] [Pierce County] [WSDOT]: Page 35, 1st bullet under Evaluating Bioassessment Data based on B-IBI. Statement that "Benthic macroinvertebrate community data needs to be collected and reported in accordance with the SOPs...in order to be used in the WQA" is commended for clearly conveying requirement associated with collecting this information. Recommendation: Include this language for all other parameters where a current SOP exists.

Ecology Response: *Comment noted. It is not feasible/or desirable to require a single specific protocol for all parameters where an Ecology protocol exists. There are often multiple valid methods for collecting data on a given parameter.*

Comment from [Interagency Team] [Snohomish County] [WSDOT]: The credibility of B-IBI data obtained from the Puget Sound Stream Benthos (PSSB) website can't be assessed in a manner consistent with quality assurance planning and assessment levels as defined in the Policy. The PSSB website neither requires nor allows data submitters to conform to data quality requirements outlined in the Policy such that Ecology can deem the data credible for use in the WQA. Recommendation: Refrain from pulling bioassessment data from the PSSB website, or require users of PSSB to conform to the same credible data requirements in Policy, or Require all bioassessment data be loaded to and pulled from EIM only.

Ecology Response: *In general, Ecology will use bioassessment data that has been submitted to the EIM database. Ecology may also use data from other databases that meet the same level of quality required for EIM. If Ecology were to use B-IBI data stored in the Puget Sound Stream Benthos database for the WQAA, we would first verify that it was collected in accordance with a QAPP.*

Comment from [Interagency Team] [Snohomish County]: It remains unclear how Ecology data used to support numeric criteria development conforms with the WQDA when: 1) it includes data gathered prior to Ecology's 2010 Quality Assurance Project Plan for Ambient Biological Monitoring; and 2) Ecology has not demonstrated that these program data have been verified for usability against a QAPP's data quality objectives. Recommendation: Provide the public with scientific documentation demonstrating that Ambient and Sentinel Program B-IBI data, used to support numeric criteria, have been verified for usability against a QAPP's data quality objectives.

Ecology Response: *Ecology conducts macroinvertebrate monitoring to collect data for establishing expectations under minimal human influence. This reference condition information informs a number of different projects, one of which is the thresholds, not numeric criteria, for water quality bioassessment.*

Ecology studies are conducted in accordance with established QAPPs. Specifically related to the macroinvertebrate data, sample collection follows an established SOP (EAP073), with all samples sealed and labelled at the time of collection and passed off with a chain of custody to an established taxonomic laboratory with certified taxonomists. The quality control procedures implemented at the laboratory we use

exceeds industry standards for sample processing and subsampling, including sorting efficiency. During sample identification and enumeration, 10% of samples are recounted by an independent taxonomist and evaluated for accuracy and consistency. Data are loaded by the taxonomic lab into Puget Sound Stream Benthos and subsequently loaded into EIM, where 100% of the data are evaluated for completeness and accuracy.

Comment from [Interagency Team] [WSDOT]: Page 35, 1st bullet under Evaluating Bioassessment Data based on B-IBI. "B-IBI data collected using alternative protocols may be used in the WQA provided that the sampling and analysis methodology is at least as rigorous as the Ecology SOPs and results in data to which the B-IBI model can be applied." Recommendation: Remove this wording as it completely discounts the very clear statement, commended by the Team under item 5 above. If Ecology doesn't remove this wording, provide detail to describe how Ecology will ensure that the sampling and analysis methodology are at least as rigorous as the Ecology SOP before using the data in the WQA.

Ecology Response: *The Ecology protocol serves as the minimum level of data usability for inclusion in the assessment, when considering data collected from 2012 and forward. Data collected using a more detailed protocol, i.e. more surface area sampled or organisms identified to a finer taxonomic resolution than the current Ecology SOP may or may not result in more accurate or precise biological community evaluation. The assessment policy language allows for the potential use of studies that use more detailed methods than the Ecology protocol on a case by case basis, provided that the resulting data is comparable to data collected using the Ecology protocol. We note that any credible biological study can be used to assess aquatic life use support regardless of whether or not the sampling and analysis methods conform to Ecology protocols. For example, a credible study of diatom communities or fish populations that indicates impairment caused by fine sediment could be used to create a 303(d) listing.*

Comment from [Pierce County]: Evaluating Bioassessment Data based B-IBI. "B-IBI data collected using alternative protocols may be used in the WQA provided that the sampling and analysis methodology is at least as rigorous as the Ecology SOPS and results in data to which the B-IBI model can be applied." Recommendation: Elaborate on how Ecology will determine if alterative data collection methods are at least as rigorous as Ecology's bioassessment SOP. Alternatively, consistently apply the data collection requirements outlined in this section to all benthic data considered in (or precluded from) the WQA, regardless of date of collection.

Ecology Response: *See above response to Interagency Team.*

Comment from [Pierce County]: The Puget Sound Stream Benthos (PSSB) program, from which Ecology and others extract data for analyses, captures habitat characteristics and other stream data collected as part of the B-IBI sampling methodology. This information is not captured in EIM, nor are submitters required to include any of the metadata associated with sample collection, Pierce County requests B-IBI data submitted to EIM also be required to include information regarding the description of habitat characteristics. EIM should be amended to be able to accept this type of information from external data submitters. The County recommends these data management refinements as a means for providing more relevant and

valuable information and as a measure to prevent unrepresentative sampling efforts from being included in the Water Quality Assessment process (Type I errors).

> **Ecology Response**: *2006 Integrated Report Guidance clearly states that if a designated use is not supported and the segment is impaired, the fact that the specific pollutant is not known does not provide a basis for excluding the segment from Category 5. Bioassessments provide an indication of whether the designated use of that waterbody is being impaired. Habitat data is not needed to determine that there is an aquatic life impairment, but it can provide key information for the stressor identification analysis. We are not aware of any habitat characteristics currently available in PSSB. The only information needed to create a site in PSSB are geographic coordinates and the name of the county in which the site is located. Samples displayed in PSSB have information about elevation, county and a few geographic details about the site, but that is all. Site creation in EIM requires more information than what is required in PSSB, although this is also largely geographic information as well and does not include habitat characteristics. However, the Watershed Health database in EIM does have the capacity to store physical habitat data and calculate habitat metrics. If the statement is referring to information related to macroinvertebrate sample collection, EIM does require much of the same information as PSSB, i.e., surface area samples, method used, taxonomic resolution, percent of sample sorted, and sample lab.*

Section 2C: Dissolved Oxygen

Comments on using the hypergeometric mean

Comment from [AWB]: Page 41, Evaluating Data using the Hypergeometric Test – "Hypergeometric" is a new term for Policy 1-11 and is used to describe data assessment for several pollutants. It would be useful to provide a definition and some commentary on use of the term.

> **Ecology Response**: *General language has been added to the policy about the hypergeometric test, but detailed information about the statistical properties of the test is beyond the scope of the document. The hypergeometric test is very similar to the binomial test in that both are used to estimate probabilities of occurrence when only two outcomes are possible (e.g. pass or fail). The main differences are that the binomial test assumes that a population is infinite, that samples are independent, and sampling occur with replacement while the hypergeometric test assumes that a population is finite, samples are not independent, and sampling occurs without replacement. In the context of the water quality assessment, we selected the hypergeometric test for use rather than the binomial test because we are interested in the number of days in a year that have exceedances of a criterion. Since only one value per day is used in the assessment, the maximum number of samples assessed in a year is finite at 365. Also, we are interested in sampling without replacement (non-independent samples) since any number of exceedances in a single day equates to that day being designated as a fail, and days are not counted more than once. For example, if there are five samples from a given day with one sample exceeding the criterion and four samples not exceeding, then the day is designated as a fail. By counting the number of days with or without exceedances in a year for a given AU and entering those values into the hypergeometric test, the*

probability that 5% or fewer days in the year had exceedances is calculated. For purposes of the water quality assessment, Ecology decided that DO criteria are not persistently being met in a waterbody if it is unlikely that criterion exceedances are not limited to 5% or fewer days in a year.

Comment from [EPA Region 10]: 2G, D. F. Dissolved Oxygen, pH and Water Temperature. The EPA appreciates the detail that Ecology has provided with respect to implementing the hypergeometric test. In support of transparency goals, EPA offers these sections may benefit from more discussion of Type I and Type 2 errors and error rate objectives associated with: (l) application of the hypothesis tests and (2) evidentiary requirements such as (but not limited to) requiring multiple years of data for discrete data as compared to one year of continuous timeseries data. The EPA is interested in learning more about Ecology's rationale for requiring a hypothesis test to place waters into Category 5 but not to delist. In addition, how does such an approach align with Type I and Type 2 error objectives?

Ecology Response: *This comment addresses not only pH, but also dissolved oxygen and temperature.*

Ecology believes that the assessment of continuous monitoring data typically results in impairment determinations with a much higher level of confidence than determinations relying upon discrete values. From our perspective random discrete measurements of these parameters do not provide the same weight of evidence as does systematically collected time series data. One reason is that the pattern of values in a time series provides credence to the validity of the data. For example, a series of values in a day showing that DO decreased below a criterion and stayed that way for a period of time provides stronger evidence of a problem than a single daily value because it provides a level of 'auto-verification' to the observed exceedance. This auto-verification provides higher confidence that "true" exceedances occurred.

Often, discrete measures of pH, dissolved oxygen, and temperature are collected as ancillary measures in a study. In other words, such data are not collected for the primary purpose of assessing attainment of water quality criteria. There are rarely multiple measurements taken in the same week, and it is often uncommon to have multiple measurements in a single month. In contrast, when continuous data is collected, it is often done because such data is the focus of the study and therefore monitoring components such as site selection, instrument calibration, etc. are typically more rigorously addressed by the data collector. Since continuous datasets provide a more complete representation of ambient conditions and contain a degree of self-verification to the results, we believe that they should be afforded greater weight in determining whether or not criteria are not persistently attained.

We believe that requiring two years of discrete data (instead of one) showing criteria exceedances will generally result in more accurate impairment determinations. The exception is that accurate impairment determinations can be made based on only two discrete values of temperature, DO, or pH when such measures show extreme deviation from a criterion. We believe that large magnitude deviations strongly indicate that the magnitude, frequency, and/or duration of criteria exceedances in an AU are greater than what has been observed in the available measurements alone.

For temperature, the criteria are expressed as a 7DADMax and we typically do not have seven consecutive days of discrete data collected during times of peak temperatures to calculate this statistic. Nevertheless, we are using discrete temperature data to infer whether or not the magnitude component of the 7DADMax is being attained. After reviewing many dataset in which continuous and discrete sample are available for a given location, we believe that we can confidently conclude that an aquatic life use is impaired based on two years of discrete data indicating that it is likely that more than 5% of the days in the evaluation period have peak temperatures exceeding the criteria.

For 303(d) listings based on discrete data for temperature, DO, or pH, we have no requirements for the amount of data needed to assess a parameter besides requiring that at least two exceedances are observed in a year for the year to fail the test. The reason is that when using a statistical test we can only control type I error with the typical datasets we have available for a waterbody (generally 12 or fewer samples per year). From our perspective, Type II error, which is directly related to sample size, cannot be appreciably controlled or be effectively balanced with Type I error until sample sizes reach numbers above 20 or more. If we were to require 20 or more samples in order to control Type II error, we may unintentionally increase actual Type II errors for small datasets because we wouldn't consider datasets with less than the required minimum number of samples even if all of those samples exceeded the criteria.

For 303(d) de-listing for dissolved oxygen and pH using discrete data, we require a different set of logic to make listing decisions. For these waterbodies that we have already determined to be impaired or are included in a TMDL, we generally know the time of year and time of day when criteria exceedances are most likely to be observed. However, a general statistical test seems to be insufficient for addressing situations when we know that the probability of exceedance in a given waterbody varies on multiple temporal scales (daily, seasonal, and annual variability) and we are trying to determine if there is not a problem. According to our calculations, to achieve a statistically significant probability that the criteria are met on 95% or more of days in a year would require hundreds of days in a year to be sampled. This would be impractical and does not incorporate what we know about when we tend to see exceedances of criteria at the given location. This is the problem of trying to "prove a negative". We could probably create an objective statistical method that addressed temporal variability considerations, but it would likely be difficult to construct, cumbersome to apply, and would probably not be much more accurate than a method that substitutes conventional wisdom for some mathematical rigor. Our solution is to require a minimum amount of data (e.g. 21 or more samples) of which the collection is targeted toward the season and time of day when exceedances are most likely to occur. We believe that if no exceedances are observed during this targeted effort in at least two years (in order to address inter-annual variability), that we can reasonably determine that the parameter is persistently meeting criteria. Although possible, it is not practical for most monitoring programs to collect 21 days of discrete measurements during a narrow range of hours in the season in which exceedances are most likely to occur in each of two years. This type of monitoring is clearly more practically executed through continuous monitoring than through discrete monitoring. Note that for temperature we require continuous data to de-list, but dissolved oxygen can be de-listed using either continuous or discrete data. The difference here is not only because the temperature criteria are expressed as a 7DADMax while dissolved

oxygen and pH are expressed as instantaneous minimums. It is also because, due to the cost of current monitoring technology, it is much more practical to collect continuous temperature data for periods of 30 days or more than it is for dissolved oxygen or pH. This is why we have vast amounts of continuous temperature data, but very little continuous monitoring data for pH and dissolved oxygen.

Because Category 1 determinations for dissolved oxygen and pH in the past methodology required continuous monitoring data, we have no Category 1 listings for either parameter. We also have a number of listings in which pH and dissolved oxygen have been monitored approximately on a monthly basis for ten years and show no exceedances of criteria. Although these waters are likely to be meeting the criteria, they did not qualify for Category 1 because the data is discrete rather than continuous. In response to our practical observations that our de-listing procedure was likely too stringent and stakeholder concerns that less data is required to list than de-list, we wanted to open defensible pathway for de-listing based on discrete data. Most probably, de-listing based on discrete data will be infrequent due to the narrow data requirements that are intrinsically necessary for achieving a high level of confidence that a waterbody is persistently meeting criteria.

Comment from [King County DNR]: Pages 40-48: "Dissolved Oxygen and pH Assessments". King County supports the hypergeometric tests and tables presented in these sections. We recommend that all tables and figures in Policy 1-11 be consecutively numbered for future ease of reference.

Ecology Response: *Commented noted. We appreciate the support.*

Comment from [NWEA]: With regard to the hypergeometric test proposed by Ecology, there is no explanation of how this works with seasonality to provide appropriate results. For example, it appears that if data were collected every day of the year, a waterbody could not be listed as failing the test unless 19 or more days exceeded the numeric criteria. But, hypothetically, if 18 days exceeded the numeric criteria all in one season of that year, that should be enough for Ecology to determine with high confidence that violations of the standard are likely to impair aquatic uses such that the waterbody should be listed. We believe that Ecology needs to address this issue of seasonality/critical periods to ensure that the results of what are essentially seasonal standards are not diluted by a sheer abundance of data. Comments pertaining to freshwater are applicable to marine waters.

Ecology Response: *The hypergeometric test is foundationally set up to allow 18 days with exceedances if the other 347 days in the year do not have exceedances. However, it adjusts to the actual number of days sampled. If for example, data is available from every day in a single season (assume 90 days), then the test would be failed far before a 19th exceedance is observed out of 90 days of observations. In this scenario, the test would be failed if 8 or more exceedances were observed out of 90 days of observations (as depicted in the table within the DO assessment method section). In other words, the test is estimating the probability that 19 exceedances would not be observed if sampling were to continue for the full year based and more or less follow the observed pattern of exceedances vs. non-exceedances that had been observed so far.*

Early attempts at developing the test considered grouping data within a year by season (e.g. wet season vs. dry season). However, exploratory analyses on sample datasets suggested that such grouping complicated the analysis but had little effect upon the pattern of exceedances that would fail the test. The main reason is that as the number of days in the period of evaluation is changed, the number of exceedances failing the test can only change step-wise by whole numbers. For example, two exceedances would result in a p-value below 0.05 (failing the test) if the exceedances occurred out of two, three, four, five, six, or seven total samples collected in a single 90 day season or if those total samples were spaced throughout 365 days; only at the 8th sample is there a difference between analyzing by a 90 day season vs. the entire year. In other words, adjusting the period of evaluation only slightly adjusts the sample size breakpoints at which an additional exceedance is needed to fail the test. So, based on how the hypergeometric test is being applied, performing the test by season vs. annually doesn't translate to much of a difference in how the statistics play out in terms how many exceedances are needed to fail the test for a given sample size.

We sought to limit the scope of the text in the policy to describing what method we would use and how we would use it, and omit details regarding why we chose a methodology. The general reason is to increase the accuracy of the 303(d) list, by better controlling error in impairment and attainment determinations. Were we to include a discussion of each detail throughout the entire policy, it would make the document rather unwieldy for the vast majority of stakeholders who want simple and concise explanations about how we will use data to make 303(d) listing decisions for each parameter.

Comment from [Pierce County]: Evaluating Data using the Hypergeometric Test. The policy states that data from each year will be assessed separately. Recommendation: Clarify if data will be assessed by water year or calendar year. Pages 42 & 47. Part 2C: Dissolved Oxygen and Part 20: PH. Large Deviations from Criteria Magnitude. Using single measurement exceedances of criteria magnitude as a basis for listing determinations defeats the purpose and benefits Of using the hypergeometric test to determine if a pattern Of criteria excursions exist. Recommendation: Use only the hypergeometric test as a basis for making listing determinations, except when specific criteria exist in Table Comment: Ecology is to be commended for incorporating discrete monitoring requirements for placement in and movement between WQA Categories.

Ecology Response: *The data will be evaluated by calendar year, but we will consider changing it to water year in the future. A valid observation of a large deviation from a dissolved oxygen criterion is a strong indication that the criterion is not being persistently met. The reason is that daily minima are highly likely to be serially correlated since there is a tendency for dissolved oxygen concentrations in a waterbody to display seasonal stability in the pattern of diel fluctuations. Therefore, it is highly unlikely that exceedances would be limited to a single isolated day that had a very large magnitude exceedance. We have however, increased the requirement for two such observations to be made prior to 303(d) listing in order to ensure that decisions are made with high confidence.*

Comments on dissolved oxygen listing thresholds

Comment from [Everett]: Ecology focuses on comparing the dissolved oxygen data with the numeric criteria. The current dissolved oxygen criteria should recognize a duration of exposure consideration, and recognize that criteria need not apply at all depths. The criteria should be changed to recognize these considerations, and commence a rulemaking that also incorporates relevant duration of exposure considerations, allows for water column differences, and allows for averaging over appropriate time frames. The approach for listing decisions proposed in this policy should focus on the natural conditions and allowances for human caused decreases.

> **Ecology Response**: *For the WQA we have defined "impairment" as a condition occurring when water quality standards are not persistently being attained. In this regard, when we use numeric criteria to determine if an aquatic life use is impaired we need to determine, for example, how many criteria exceedances are indicative of impairment. We have determined that numeric criteria are persistently met if less than 5% of days in an evaluation period show an exceedance of the applicable criterion. Similarly, we have established a general indicator for water column data to account for naturally depressed DO levels that commonly occur near the bottom of the water column. We believe this to be a reasonable approach given that we generally cannot distinguish between natural versus anthropogenic effects for lakes and marine waters during the assessment of ambient data for the WQA. In regards to naturally hypoxic water entering the Strait of Juan de Fuca from the Pacific Ocean, we do not have conclusive data and information that would allow us to determine that anthropogenic activities do not contribute whatsoever to the observed hypoxia.*

Comment from [Everett]: There is no path to change from a Category 5 (impaired) to a Category 2 (water of concern) for dissolved oxygen. Category 2 (water of concern) is a reasonable place for some of these waters when we may not understand enough about the human caused allowance component. Recommendation: Create a decision pathway to change from a Category 5 to a Category 2. Also see the City's comment on "Page 24, Delisting from Category 5" section regarding delisting.

> **Ecology Response**: *Ecology and the City of Everett have a shared interest in a 303(d) list that is as accurate as possible. We therefore understand the City of Everett's desire for 303(d) "de-listing" where the causes of depressed dissolved oxygen levels are not yet characterized. The pathway that the City of Everett is proposing would be based on a consideration of the availability of information about the potential causes and sources of an impairment. We note that for bioassessment and for human health toxics the policy does have a pathway for delisting from Category 5 to Category 2. The difference between these parameters and dissolved oxygen is that the pathways for delisting to Category 2 for bioassessment and human health toxics is driven by a measure of central tendency (mean or median) in the available data which may change through time and become more accurate as additional data is collected.*
>
> *Where the causes of observed hypoxia are not well understood, Ecology's perspective is that it is appropriate to err on the side of resource protection in 303(d) listing decisions. Dissolved oxygen levels are critical for aquatic life and an absence of sufficient dissolved oxygen can have severe effects upon the abundance and diversity of aquatic life. For this reason Ecology is not willing to systematically refrain from 303(d) listing until all causes*

and sources of documented hypoxia are verified through rigorous study. To do so would be to discount the magnitude of the risk of harm to aquatic life. Therefore, Ecology declines to create a new pathway for dissolved oxygen whereby waters could become de-listed into Category 2 when information about causes and sources of potential impairment is lacking. This aligns with EPA's Integrated Reporting guidance which states that not knowing the cause or source of an impairment is not a justification for failing to list waters that do not meet water quality standards.

Comment from [NWEA]: Ecology states that it will not list waters not meeting dissolved oxygen criteria at higher elevations where those waters are meeting temperature criteria. We understand that Ecology is attempting to eliminate those places where physically levels of dissolved oxygen cannot remain in the water. However, there is a misplaced logic here. In order that numeric temperature criteria are met at the lowest (and likely warmest) downstream location to which they apply, the actual temperature of waters upstream must be cooler and sometimes considerably cooler than the numeric temperature criteria themselves. For this reason, it is not sufficient for Ecology to simply apply the numeric criterion high in the watershed as the basis for concluding that under no circumstances could the dissolved oxygen criterion be met. Rather, it must make apply its professional judgment to what the temperature would have to be in order that the downstream temperature criterion would be met at the furthest downstream extent of the use. If it cannot do that, it must use the dissolved oxygen criteria as they are written and save the analysis of its practicality for a time when it begins to contemplate developing a TMDL.

Ecology Response: *The policy language has been clarified, but we note the following. The purpose of the oxygen solubility provision is not to state that if an assessment unit meets temperature criteria, it will not be listed for low DO. The purpose is to recognize that for assessment units at higher altitudes, lower barometric pressure makes it impossible for dissolved oxygen to meet the applicable DO criterion even when the water is 100% saturated with oxygen and even if water temperatures are in the entirely suitable for aquatic life. For example, at 1100m altitude, when the water temperature is 13 degrees Celsius (e.g. in the optimal range for Char Spawning and Rearing), and conductivity is low (e.g. 100 microSiemens/cm), the water can only hold 9.25mg/L at 100% saturation, which is below the Char Spawning and Rearing DO criterion of 9.5mg/L. In this scenario, a 303(d) listing for DO would not be appropriate.*

Ecology uses the national hydrography dataset to delineate streams into assessment units. Therefore, neither DO nor temperature data from the upper reach of a stream is used to assess compliance with criteria in downstream reaches, which are delineated into separate assessment units.

Comment from [Seattle]: Part 2C (Dissolved Oxygen), page 40, last paragraph. Provide clarification on the following new language added to Policy: "An exceedance is indicated in profile data when more than 10% of the water column are below the criterion magnitude." Does the 10% apply to profile data within the stratified layer or increments or to the entire water column? Is it 10% of the data values within the water column? What is the basis for 10%?

Ecology Response: *The previous assessment methodology determined that there was an exceedance if any point in the water column did not meet the applicable criterion. The 10% of the water column refers to 10% of the depth of the entire water column where*

dissolved oxygen is measured along a depth profile. The challenge in evaluating compliance with the dissolved oxygen criteria is that we cannot perform detailed analyses or modelling of site specific conditions for each monitoring location in the assessment to determine more precisely how much of the water column may be naturally hypoxic, although it is well-known that water near the sediment interface are naturally hypoxic in many deep waterbodies at times when vertical mixing of the water column is not occurring. One question we asked ourselves was: is it appropriate to consider an aquatic life use impaired unless 100% of the water column meets the criterion? Based on input from our marine assessment and TMDL staff we determined that if more than 10% of the water column does not meet the criteria, it becomes more likely that there are anthropogenic effects upon DO levels. This guideline is imperfect, but is practicable in determining compliance with criteria in the absence of having a detailed site specific study of dissolved oxygen dynamics. It will prevent some AUs that do not have anthropogenic DO problems from being placed on the 303(d) list. It may still over-list waters for DO, but we are willing to accept this error in order to protect aquatic life and when considering that further study will occur subsequent to 303(d) listing that will confirm or refute the impairment status.

Comment from [Seattle]: Overall, page 30, page 41 (DO) and page 46 (pH) - for example Part 2A (Bacteria, Category Determinations). Delete the following sentence each time it appears in the Policy, because it is inaccurate and unnecessary. (For example, see WDOH-related rule at pp. 32-33.) Part 1.F, Category 5, provides the necessary decision tool.

Ecology Response: *We agree this sentence is unnecessary because the specific methodologies for the different categories are described in the parameter-specific sections. It has been deleted.*

Comment from [Seattle]: After the listing methodology in WQ Policy 1-11 has been revised, does Ecology plan to re-evaluate all existing data based on the new methodology and any new EPA-approved water quality standards? Examples: human health criteria, bioassessment, sediments, bacteria. Would re-evaluation be automatic or otherwise?

Ecology Response: *Ecology will evaluate data back to 2006 using the new methodology and any new EPA-approved water quality standards that are in place when the assessment of data is conducted.*

Comment from [Interagency Team] [Snohomish County]: Under Category 1, Page 43. A TMDL target is not a Standard and therefore should not be used as the basis for listing decisions. Recommendation: Remove the reference to using TMDL targets as the basis for listing decisions.

Ecology Response: *The identified language has been revised.*

Comments on number of exceedances required for dissolved oxygen

Comment from [AWB]: Dissolved oxygen and Page 47, pH – Category 5 determination options – Ecology's proposal to list a waterbody on Category 5 based on data from a single day (and maybe even a single grab sample) is not reasonable. Ecology rationalizes that an egregious

exceedance of numeric criteria can justify a Category 5 listing. For both dissolved oxygen and pH the agency creates a listing path based on a single large magnitude exceedance. A Category 5 listing is a significant regulatory determination which should be based on substantial, multi-year evidence of numeric criteria exceedances and demonstrable indications of designated use impairment.

> **Ecology Response**: *We have increased the requirement to two exceedances. Please see similar responses to comments on the issue of extreme exceedances for pH and temperature.*

Comment from [Boeing]: Dissolved Oxygen (pages 40-44) and 20 pH (pages 45-48) Category 5 determinations for Dissolved Oxygen (page 42) and pH (page 47). These sections provide that, in addition to reliance on a hypergeometric test, a Category' 5 listing may be based on "observations of large deviations from the criterion" The sections go on to explain that "observations of large deviations from the criterion" may be based on sampling results from "a single day.' This pathway to a Category 5 listing does not rely on sufficient data and ignores the potential for single and therefore not representative deviations from ambient conditions To ensure that listings are based on credible data, the provisions for listing based on "observations of large deviations from the criterion must be modified (e.g., provide that AUS that have a single sample with a large deviation be placed in either category 2 or 3 until more data is obtained that demonstrates persistence) or stricken.

> **Ecology Response**: *Ecology declines to remove provisions for basing decisions on extreme exceedances. We have however, increased the requirement for two such observations to be made prior to 303(d) listing. If two random observations happen to coincide with two discrete anthropogenic discharges, statistically speaking, it would be a strong indication that such events happen more frequently than was observed.*

Comment from [WASWA]: For Category determinations for DO, pH and temperature, this draft policy indicates that a single parameter value far beyond the criteria would result in a 303d listing. This is highly presumptive, and not based on good science. It could be the result of a discreet anthropogenic discharge, and therefore not representative of the seasonal average. It also indicates once again the value of continuous data. This should be removed from the policy.

> **Ecology Response**: *See above response to Boeing.*

Comment from [Interagency Team] [Snohomish County]: The allowed and alternative use of single day exceedances or "large deviations" to support Category 5 listings for dissolved oxygen defeats the purpose and utility of the hypergeometric mean test and perpetuates historical errors in decision making resulting in TMDLs and regulatory burden. Recommendation: Use only the hypergeometric mean test as the basis for Category 5 listings, but maintain the exceptions where site specific dissolved oxygen criteria exist in table 602.

> **Ecology Response**: *We have made a revision to require two days with a pronounced criterion deviation for making a Category 5 listing in order to increase the confidence in the determination. The hypergeometric test addresses the frequency of exceedances, but does not incorporate considerations of the magnitude of exceedance. From our perspective, an observation of a large deviation from a criterion provides more*

information about water quality than does a slight deviation from a criterion. Since DO levels in waterbodies do not fluctuate randomly and are serially correlated, a large deviation indicates that additional DO exceedances likely to occurred during the season in which the large exceedance was observed. We think that a consideration of the magnitude of exceedance will allow us to make highly accurate impairment determinations even when the available data is sparse.

Comment from [Interagency Team] [Snohomish County]: Under Category 5 Determinations, Pages 41 – 42. The minimum number of discrete measurements within a year, qualifying as having sufficient data, is not specified. Recommendation: Specify the minimum number of discrete dissolved oxygen measurements needed within one year to qualify as sufficient.

Ecology Response: *Discrete measurement datasets for dissolved oxygen will be evaluated when one or more samples are available. The hypergeometric test is applied separately to each year having data. Note that a minimum of two exceedances is required within a year for the test to fail in that year.*

Comment from [NWEA]: We support the provision that allows for Ecology to list a waterbody for dissolved oxygen violations where large deviations from the least stringent criteria are measured in any single day for the reason Ecology explains, the measurement itself provides confidence. We do not support the need for two years or more data when discrete data are being used. Ecology is already planning on using the hypergeometric test to ensure confidence in the results; that alone provides the "pattern of altered DO" if the data demonstrate an exceedance of the test.

Ecology Response: *The policy has been revised such that a Category 5 listing can be made based on two samples, rather than one sample with a large deviation from the applicable criterion. This is to ensure sufficient confidence in the impairment determination. Due to the robustness of time series datasets, we believe that one year with continuous data can be used to support a Category 5 determination with sufficient confidence. For discrete data, we think it is reasonable that requiring the hypergeometric test to be failed in two years based for a Category 5 determination provides us with a highly credible determination that the standards are not being persistently met. Most waterbodies with DO data have multiple years of data, so this requirement increases the accuracy of our assessment without having a significant inhibitory effect upon the 303(d) listing of impaired waters.*

Comment from [PSKA & SRK]: Ecology should not require two exceedances of D.O. to trigger a Category 5 impairment finding.

Ecology Response: *This is to ensure sufficient confidence in the impairment determination. Due to the robustness of time series datasets, we believe that one year with continuous data can be used to support a Category 5 determination with sufficient confidence. For discrete data, we think it is reasonable that requiring the hypergeometric test to be failed in two years based for a Category 5 determination provides us with a highly credible determination that the standards are not being persistently met. Most waterbodies with DO data have multiple years of data, so this requirement increases the accuracy of our assessment without having a significant inhibitory effect upon the 303(d)*

listing of impaired waters. The policy has also been revised such that a Category 5 listing can be made based on two samples, rather than one sample with a large deviation from the applicable criterion.

Comment from [Seattle]: Part 2C (Dissolved Oxygen), page 41, first paragraph. Category 5 listings should not be based on a one-day exceedance; see similar Comment re: pH. Page 42, last three paragraphs: delete the entire second ground for listing, as there is no basis in the WQ criterion and no precedent for listing based on a one-day exceedance. However, if a one-day exceedance is used as a basis for Category 5 listings, instrument accuracy for discrete samples should be accounted for by applying the 0.2 mg/L margin of error since a single discrete sample could result in a Category 5 listing.

Ecology Response: *We disagree because the criteria actually state that dissolved oxygen levels are not to fall below the applicable criterion at a frequency of more than once every ten years. However, in this assessment policy we are defining the frequency, magnitude, and/or duration at which criterion exceedances confer aquatic life impairment. We have defined "impairment" in the policy as a condition occurring when the criteria are not persistently attained. We note that "not persistently attained" is very different from "persistently not attained" (or exceedances that are persistent) since many comments have misinterpreted the definition to mean the latter. A large deviation from the criterion notably indicates that the depressed dissolved oxygen level is associated with a significant duration (it takes time for a DO level to go from above the criterion to reach the minima and go back up above the criterion again) and also that the frequency of depressed oxygen levels is unlikely to be rare (a depressed oxygen level on one day is highly likely to be preceded by days having similar oxygen concentration minima and followed by days with similar oxygen concentration minima).*

Comments on allowance for instrument accuracy and natural conditions

Comment from [Everett]: Pages 40-44, 2C Dissolved Oxygen Recommendation: Fully describe the components of the dissolved oxygen standards and recognize that the >0.2 mg/L decrease from natural condition is the main basis for listing as impaired (category 5) or if reasonably unsure, water of concern (category 2). Recommendation: add the following into Section 2C. The standards specifically allow for a decrease of 0.2 mg/L for dissolved oxygen when the natural conditions are lower than the numeric criteria. If it is not possible to make a quantitative evaluation, then Ecology will make a qualitative evaluation regarding these provisions. Category 5 (impaired) will be assigned where there is a reasonable confidence that the human caused decrease is more than a 0.2 mg/L decrease from the natural condition. Category 2 (water of concern) will be assigned where there is a reasonable uncertainty that the allowable decrease from human causes is exceeded.

Ecology Response: *If information is presented that demonstrates that the human allowance has not been exceeded, then Ecology could consider this information as part of the natural conditions evaluations. However, EPA has been clear in guidance to states that where uncertainty exists for natural conditions because of a lack of information, the waterbody should be placed in Category 5 until enough information is available to make a natural conditions call, including the human allowances that are part of the dissolved oxygen standards. Determining whether human causes are contributing more than 0.2*

mg/l of dissolved oxygen in excess of the natural condition is a detailed process that involves more in-depth monitoring and data collection, research on what sources exist, and modeling to determine what existing conditions are. Only after this level of detail can you extract whether or not a combination of human sources is greater than the allowed human allowance. This process typically occurs when a TMDL is done on a waterbody identified as exceeding numeric standards. The 303(d) listings based on numeric standards (including a review of whether there are human impacts that could be contributing to the exceedance) trigger the subsequent TMDLs.

Comment from [NWEA]: Ecology has added an increment of impairment to its otherwise applicable water quality standards. Ecology will not count a DO value from a time series dataset as an exceedance when it exceeds the criterion by 0.2mg/L or less. Ecology's proposal to add this increment of lowered protection is, presumably, in addition to the increment that is provided for human contributions under purportedly natural circumstances, resulting in an increment of 0.4 mg/l drop in dissolved oxygen before Ecology will determine that the standard has been violated. In addition, Ecology does not address those situations where 303(d) listings are not based on ambient data but, rather, projections of dissolved oxygen levels, for example through modeling, which are required for listing. The methodology should make clear that Ecology does not intend to double the drop in dissolved oxygen from those predictions in order to make a finding that a waterbody is impaired or threatened.

Ecology Response: *The provision for instrument accuracy is intended to reduce 303(d) listing errors due to measurement error and is permissible under WAC 173-201A-260(3)(g). We note that waterbodies with dissolved oxygen problems tend to exceed criteria frequently, for long durations, and/or by a large margin. In other words, it is rare for an impaired waterbody to only have exceedances of a criteria that are 0.2mg/L or less. The result is that the instrument accuracy provision by and large only affects the category determination outcome in situations where a dataset shows little evidence of actual aquatic life use impairment. If a waterbody only rarely exceeds the DO criterion and when it does it is by an amount that is less than the typical margin of error for DO measurements, then the aquatic life use is unlikely to be impaired.*

The provision will not be used in the water quality assessment cumulatively with the human-caused limitation of a 0.2mg/L decrease when a waterbody's DO is below (or within 0.2mg/L of) the applicable criterion due to natural conditions. Evaluating the human contribution to DO depression typically requires a site specific study that is more rigorous and includes substantially more data than the analysis applied in the water quality assessment.

Comment from [Vancouver]: Dissolved Oxygen (Page 41): Ecology accepts dissolved oxygen instrument accuracy limitations of +/- 0.2 mg/L in the first sentence cited above, and then Ecology negates the acceptance of the same dissolved oxygen instrument accuracy limitations in the last sentence above. Whether dissolved oxygen measurements are recorded by an instrument in continuous monitoring mode or used to measure discrete values, the accuracy limitations of +/- 0.2 mg/L apply equally. We recommend that Ecology revise this section to apply the +/- 0.2 mg/L instrument accuracy limitation to all measurements recorded in the field.

Ecology Response: *Ecology declines to apply the +/- 0.2 mg/L accuracy to discrete dissolved oxygen measurements. Such measurements are likely to overestimate the daily dissolved oxygen minima by more than 0.2mg/L. This means that when there is an exceedance of the criterion by 0.2mg/L or less, the actual magnitude of the exceedance is likely to be more than 0.2mg/L, rendering the instrument accuracy limitation inconsequential. In contrast, dissolved oxygen time series data can be used to verify whether or not the recorded daily minima fell short of the criteria by a maximum of 0.2mg/L.*

Section 2D: pH

Comment from [Interagency Team]: The allowed and alternative use of single day exceedances or "large deviations" to support Category 5 listings for pH defeats the purpose and utility of the hypergeometric mean test and perpetuates historical errors in decision making resulting in TMDLs and regulatory burden. Recommendation: Use only the hypergeometric mean test as the basis for Category 5 listings.

Ecology Response: *We have made a revision to require two days with a pronounced criterion deviation for making a Category 5 listing in order to increase the confidence in the determination. The hypergeometric test addresses the frequency of exceedances, but does not incorporate considerations of the magnitude of exceedance. From our perspective, an observation of a large deviation from a criterion provides more information about water quality than does a slight deviation from a criterion. We think that a consideration of the magnitude of exceedance will allow us to make highly accurate impairment determinations even when the available data is sparse.*

Comment from [NWEA]: With regard to the requirement that the hypergeometric test must be failed over two years minimum if discrete data are used, please see our comments on DO above. The use of the hypergeometric test provides the confidence level that is needed. Please also see comments above pertaining to seasonality. Comments pertaining to freshwater are applicable to marine waters.

Ecology Response: *From our perspective, when relying upon discrete data, the desired level of confidence that a waterbody has an aquatic life use impaired by pH is generally attained when two years of data (to address inter-annual variability) are used to show that the criteria are not being persistently met. The exception is if criteria deviations of large magnitude occur within a single year. Since we look at the last ten years of data, requiring two years to fail the hypergeometric test to qualify for Category 5 doesn't inhibit truly impaired waters from being 303(d) listed. The vast majority of waterbodies with pH data have multiple years of data; however, pH data within any given year is typically sparse (e.g. less than 12 samples/yr.). We also note that not placing a waterbody on the 303(d) list doesn't mean the waterbody is consistently meeting the criteria. Qualifying for Category 1 requires much more data than qualifying for Category 5. Impaired waterbodies tend to show a pronounced magnitude, frequency and/or duration of criteria exceedances. Exceedances that are infrequent, slight, or of transitory duration probably do not appreciably cause physiological harm to aquatic organisms. The primary effect of the proposed methodology is upon the category outcome of edge cases*

where the data is sparse and provides limited evidence of aquatic life impairment. We understand that some stakeholders want us to place waters on the 303(d) list as a precautionary measure when any data suggests an exceedance. However, the 303(d) list is intended to be for waters known to have impaired uses rather than waters that may have impaired uses. We already take a cautionary approach by 303(d) listing when it is unclear if criteria exceedances are actually due to natural conditions, and we think this is an appropriate approach. But populating the 303(d) list with low confidence Category 5 listings causes other problems. For low confidence listings, more data is needed. Until we have additional data to understand if the waterbody actually has an impairment, it remains low on the priority list relative to other waters where impairment is already confirmed. Having the TMDL program perform rigorous studies of waters that may not actually be impaired requires a significant amount resources and therefore decreases the effectiveness of the TMDL program and water quality protection efforts more broadly (it would be like focusing traffic speed enforcement on motorists who rarely go 1mph over the speed limit instead of those who routinely go 10mph over the limit). In summary, we believe that the proposed methodology will reduce Type I error without really affecting Type 2 error while increasing the efficiency of our TMDL program.

Comment from [NWEA]: Ecology has added an impermissible test to its finding exceedances from pH criteria. See discussion above under dissolved oxygen. Here, Ecology makes no reference to the language of its standard, which provides that pH must be within a specified numeric range and, in addition, limits the "human-caused variation" of pH within that range to 0.2 units. . The standard does not allow for an exceedance of the range, either up or down, from the specified numeric criteria; instead, it explicitly states that "pH shall be within the range [.]" Id. In addition, the methodology does not discuss how Ecology applies the variation limitation within the range that is an explicit part of the standards.

Ecology Response: *WA state water quality standards (WAC 173-201A-260 (3)(g)) directs Ecology to give consideration to the precision and accuracy of sampling and analytical methods when applying water quality criteria.*

Comment from [Pierce County]: This section discusses PH. In the paragraph above the table, DO is mentioned twice.

Ecology Response: *The error has been corrected.*

Comment from [PSKA & SRK]: We are very concerned that the acceptable error is 0.2 units for pH. This is a huge amount of error and instruments exist that can cheaply measure pH to 0.02 or 0.03. What is Ecology's rationale for this large unit of error?

Ecology Response: *Errors in the water quality assessment process may be random or systematic. Random error cannot be completely eliminated. Systematic error can be controlled and minimized through quality control measures. In the water quality assessment random errors tend to be implicitly addressed (e.g. allowing up to 5% of pH values to exceed a criterion reduces the influence of random sampling, analysis, and reporting error on the impairment determination). Systematic error in the assessment tends to be explicitly addressed (e.g. if a criterion exceedance is within the known margin of error for the instrument or analysis then it is not counted as a true exceedance). While*

it is true that pH probes measure to hundredth of a standard pH unit, this actually pertains to instrument precision. The instrument measurement accuracy for pH probes is a different descriptor; it is a specification provided by instrument manufacturers (and is separate from any error associated with instrument calibration), and for instruments commonly being used today is generally limited to + or - 0.2 units. Looking at the bigger picture, we note that when a waterbody has a problem with pH, it generally exceeds the criteria frequently, by a large amount, and/or for long durations. Rare exceedances of a pH criterion by slight margin are unlikely to cause impairment to aquatic life. The instrument accuracy provision will therefore only affect the rare edge cases where the question of impairment is more uncertain. When considering that rare observed exceedances by a slight margin may actually not be true exceedances, we believe that the likelihood of the instrument accuracy provision preventing incorrect determinations of aquatic life impairment is much greater than the likelihood of the provision preventing correct determinations of impairment.

Comment from [Seattle]: Part 2D (pH), page 45, second paragraph. Category 5 listings should not be based on a one-day exceedance; see similar Comment re: DO. However, if a one-day exceedance is used as a basis for Category 5 listings, instrument accuracy for discrete samples should be accounted for by applying the 0.2 pH standard units margin of error since a single discrete sample could result in a Category 5 listing.

Ecology Response: *The methodology regarding large deviations from criteria has been revised. It now requires a minimum of two extreme exceedances (for pH, DO, and temperature) to result in a Category 5 listing.*

Comment from [Seattle]: Part 2D (pH), page 47, para. 2. Delete the entire second ground for listing, as there is no basis in the WQ criterion and no precedent for listing based on a one-day exceedance.

Ecology Response: *This provision is being retained, however, it has been revised to require 2 large exceedances in order to result in a Category 5 listing. When an observed pH value exceeds a criterion by a large amount, it indicates that the criteria are exceeded by a larger magnitude, frequency, and/or duration than the single value indicates; it is extremely unlikely that such an observed value would represent a rare or fleeting occurrence. Ambient pH in a given waterbody tends to exhibit a fairly stable diurnal pattern. For this reason, it is extremely unlikely that a random measurement of pH in a stream would be below 5.5 at a certain time of day and then quickly change to a value above 6.5 for the rest of the day. Likewise, it is extremely unlikely that two random daily measurements of pH in a stream just happen to observe the only two days that values are below 5.5, and that the values on nearly every other day are above 6.5 (Note that: a pH of 5.5 represents an acidity ten times greater than a pH of 6.5; the pH of rainwater in WA is approximately 5.3; the occurrence of pH values below 5.5 in streams in WA is rare, due to chemical buffering in a watershed, and is most often observed where acid mine drainage occurs).*

Comment from [Vancouver]: pH (Page 45): Ecology accepts pH instrument accuracy limitations of +/- 0.2 units in the first sentence cited above, and then Ecology negates the

acceptance of the same pH instrument accuracy limitations in the last sentence above. Whether pH measurements are recorded by an instrument in continuous monitoring mode or used to measure discrete values, the accuracy limitations of +/- 0.2 units apply equally. We recommend that Ecology revise this section to apply the +/- 0.2 pH standard units instrument accuracy limitation to all measurements recorded in the field.

> **Ecology Response**: *The +/- 0.2 pH standard units will not be applied to discrete measurement values. Such values are highly likely to underestimate the maximum and overestimate the minimum pH levels that occur during a day. To apply the instrument accuracy limitation to discrete would not increase confidence in determining whether or not the applicable criteria are being attained.*

Section 2E: Phosphorus (Total) in Lakes

Comment from [Interagency Team] [Snohomish County]: The Policy lacks clear guidance or methods to support development of lake-specific studies which establish phosphorus criteria. Recommendation: Develop clear and complete guidance or model-based analyses that local organizations can use to develop lake-specific criterion development evaluations.

> **Ecology Response**: *It is out of scope for the assessment policy to provide guidance on the development of lake specific criteria.*

Comment from [Pierce County]: "The collection of phosphorus data must not be grouped or spread Out over time so as to mask periods Of noncompliance," and "If more than one epilimnion sample value is available for the same AU and day, only the maximum sample value will be used in the mean phosphorus concentration Comment: We applaud that data distribution over the time dimension is considered here. Similarly, data distribution over the spatial dimension needs to be considered. It is inappropriate to use the maximum sample value when multiple values are available for averaging. We recommend time- or area-weighted averages.

> **Ecology Response**: *The policy has been clarified and revised to state that: 1) samples collected from multiple epilimnion depths at a single location on a single day will be averaged together to represent that location; and 2) samples collected from multiple locations within an AU in a single day will be averaged together to derive the total phosphorus value representative of that AU for that day.*

Section 2F: Temperature

Comment from [AWB]: Washington's water quality standards regulation recognizes that natural climatic and landscape attributes; i.e., natural conditions, will affect waterbody temperature. Provisions are built into the regulations to adjust regulatory standards based on natural conditions and cumulative "human actions." There is no indication the proposed Category 5 listing process takes any account of measured water temperatures that may be influenced by natural conditions or human actions. Ecology's proposal to list a waterbody on Category 5 based on data from a single day (and maybe even a single grab sample) is not

reasonable. Natural conditions can have a marked effect on waterbody temperature. Consideration of natural conditions is an integral element of WAC 173-201A temperature criteria and Ecology has an obligation to evaluate that effect. Ecology has side-stepped an assessment of the "natural conditions" and human actions components in favor of the convenience of assuming a human influence contribution. A Category 5 listing should not be based on assumptions. Categories 2 or 3 would be better choices and Policy 1-11 should be amended to set this direction.

> **Ecology Response**: *We would be interested in learning more from AWB about the specific waterbody segments believed to have temperatures that naturally exceed the water quality criteria. We make decisions based on the data and information available at the time the waterbody is assessed. In the absence of data and information indicating that an exceedance of a water quality criterion is due to natural conditions, it is not appropriate to refrain from 303(d) listing until information is available supporting that natural conditions aren't the sole cause of an exceedance of criteria for every potential 303(d) listing for temperature. In fact, EPA has instructed Ecology that not knowing the cause or source of water quality standards non-attainment is insufficient justification for not placing the waterbody on the 303(d) list. A Category 5 status in no way prevents an entity from collecting data and information that would verify that natural conditions are the sole cause of a water quality criteria exceedance. Such information would be used to update the affected listings as appropriate.*

Comment from [AWB]: In addition, Ecology rationalizes that a single egregious exceedance of numeric criteria can justify a Category 5 listing. It is simply unreasonable to draw a Yes/No conclusion about water quality standards/designated use attainment based on a single data value or data from a single day. To do so ignores the many variables that could yield an anomalous value. A Category 5 listing is a significant regulatory determination which should be based on substantial, multi-year evidence of numeric criteria exceedances and demonstrable indications of designated use impairment.

> **Ecology Response**: *We have revised the Category 5 provision regarding extreme criterion exceedances. It now requires two extreme exceedances rather than one. Please see related responses to other comments on the topic of extreme pH, DO, and temperature exceedances for further discussion.*

Comment from [Everett]: The temperature evaluation approach has many of the same problems as the dissolved oxygen. The policy needs to state the natural condition and human allowance components of the temperature criteria. The policy needs to provide direction for how to evaluate those components. Fortunately, Ecology has a history for the marine waters side of recognizing that the temperatures are natural and to not list them for temperature, and the City expects that will continue. The freshwater side, has listed waters as Category 5 based just on the numeric criteria and Ecology needs to make more of an effort to judge the human allowance, and to use Category 2 more often than it has in the past.

> **Ecology Response**: *If information is presented that demonstrates that the human allowance has not been exceeded, then Ecology could consider this information as part of the natural conditions evaluations. However, EPA has been clear in guidance to states that where uncertainty exists for natural conditions because of a lack of information, the*

waterbody should be placed in Category 5 until enough information is available to make a natural conditions call, including the human allowances that are part of the temperature standards. Determining whether human causes are contributing more than 0.3 degrees C in excess of the natural condition usually involves more in-depth monitoring and data collection, research on what sources exist, and modeling to estimate the anthropogenic effects. This process typically occurs when a TMDL study is done in a watershed.

Comment from [Interagency Team] [Snohomish County]: The allowed and alternative use of single day exceedances or "large deviations" to support Category 5 listings for temperature defeats the purpose and utility of the hypergeometric mean test and perpetuates historical errors in decision making resulting in TMDLs and regulatory burden. Recommendation: Use only the hypergeometric mean test as the basis for Category 5 listings, but maintain the exceptions where site specific temperature criteria exist in table 602.

Ecology Response: *We have made a revision to require two days with a pronounced criterion deviation for making a Category 5 listing in order to increase the confidence in the determination. The hypergeometric test addresses the frequency of exceedances, but does not incorporate considerations of the magnitude of exceedance. From our perspective, an observation of a large deviation from a criterion provides more information about water quality than does a slight deviation from a criterion. We think that a consideration of the magnitude of exceedance will allow us to make highly accurate impairment determinations even when the available data is sparse. For example, if the applicable 7DADMax criterion for a waterbody is 16 degrees Celsius, and two random daily measurements of temperature are observed to exceed 23 degrees Celsius, it is extremely unlikely that the criterion is persistently being attained (daily peak water temperatures during summer are serially correlated rather than random distributed) and it is highly likely that the aquatic life in that waterbody experience significant negative effects from such temperatures.*

Comment from [Interagency Team] [Snohomish County]: Pages 53 – 55. Category Determinations. The Policy does not clearly articulate how category determinations are made relative to section 200(B)(iii) of the Standards which indicates that temperatures are not to exceed the criteria at a probability frequency of more than once every ten years on average. Recommendation: Include language in the Policy, clarifying how category determinations are made relative to section 200(B)(iii) of Standards.

Ecology Response: *The water temperature criteria are designed to provide full protection of aquatic life uses. The temperature assessment methodology details the frequency, magnitude, and duration of criteria exceedances that are indicative of aquatic life use impairment.*

Comment from [Interagency Team] [Snohomish County]: Pages 53 – 55. Category Determinations. The terms "warm season", "summer season", and "period between July through August 15" are used interchangeably and introduce confusion with such periods as the Core Summer Salmonid Habitat period (June 15 – September 15) found in Standards.

Recommendation: Improve consistency in use of terminology and critical period ranges to maintain consistency with Standards.

Ecology Response: *The policy language has been clarified.*

Comment from [King County DNR]: Page 55: "Temperature". King County believes both the 7-DADmax and 1-Dmax should meet the thresholds presented in the table on Page 55 to describe a waterbody as unimpaired, regardless of the basis for the original impairment decision.

Ecology Response: *The table for the hypergeometric test was specifically developed to apply 7DADMax criteria to discrete data from which a 7DADMax cannot be derived. In this regard, the table helps address uncertainty involved with determining that discrete data exceedances signal a 7DADmax exceedance. This uncertainty does not exist for data which can be directly compared to criteria- namely, comparing continuous temperature data to a 7DADMax or 1DMax criterion, or comparing discrete data to 1DMax criterion.*

Comment from [NWEA]: We note that here, unlike with dissolved oxygen and pH, Ecology proposes to include a focus on critical seasons such that "exceedances of the criteria on more than 5% of the days in the summer season indicates that the criteria are not persistently met and therefore the aquatic life use is impaired," id. at 52, and "with supplemental spawning period criteria, the hypergeometric test will be adjusted to the number of days associated with the length of a supplemental spawning period that applies to a given AU," id. at 53.

Ecology Response: *We considered performing seasonal evaluations of pH and DO, but after exploring existing datasets we concluded that seasonal analysis would be no more accurate at determining attainment of the criteria, partially because the temporal pattern of observed exceedances for DO and pH was not as clear-cut as with temperature. In other words, the added complexity to the policy seemed unnecessary because it appeared that evaluating the data by season within each year would generally result in the same Category determinations as analyzing the data over the entire year.*

Comment from [NWEA]: As with DO and pH, Ecology has added an impermissible test to its finding exceedances from temperature criteria: When using time series data to evaluate compliance with 7-DADMax and 1-DMax criteria, Ecology will include a value in the count of exceedances when it exceeds the applicable criterion by more than 0.2 degrees C. There is no provision that allows for an additional increment based on instrument accuracy. Ecology is now proposing to alter its numeric temperature criteria by adding an increment of 0.2¬∫ C to all of its numeric criteria, which is not an EPA-approved change to the water quality standards. In addition, this increment is proposed to be added to evaluations of compliance with the 7-DADM metric, which itself is an averaging of the three days before and the three days after each date. Given that these data are averaged, adding an increment to account for instrument error makes no sense.

Ecology Response: *The provision for instrument accuracy is intended to reduce 303(d) listing errors due to measurement error and is permissible under WAC 173-201A-260(3)(g). We note that waterbodies with temperature problems tend to exceed criteria frequently, for long durations, and/or by a large margin. In other words, it is rare for an impaired waterbody to only have exceedances of a criteria that are 0.2mg/L or less. The*

result is that the instrument accuracy provision by and large only affects the category determination outcome in situations where a dataset shows little evidence of actual aquatic life use impairment.

Comment from [NWEA]: Ecology's requirement of two years' data is not consistent with the effect of temperatures on the beneficial uses. For example, hot water in the Columbia River killed far more than half of sockeye in the summer of 2016. See, e.g., The Oregonian, Hot water kills half of Columbia River sockeye salmon (July 27, 2016), available at http://www.oregonlive.com/environment/ index.ssf/2015/07/hot_water_killing_half_of_colu.html (last accessed April 5, 2018). Even if in the next year the river temperatures had dropped, the exceedance had a significant effect on the population that did not need to be replicated a second year in order to count as a violation of water quality standards.

Ecology Response: *The requirement for two years of data applies only to discrete data (i.e. excludes continuous data) with no large magnitude exceedances. Requiring two years of data for discrete data sets that have no large magnitude exceedances is unlikely to be a hindrance to 303(d) listing of waterbodies with temperature problems. Waters with temperature problems tend to have exceedances of criteria with pronounced frequency, magnitude, and/or duration. In this regard, requiring two years of data primarily affects those datasets where evidence of aquatic life use impairment by temperature is scant.*

Lastly, we note that there are 35 assessment units of the Columbia River (including its impoundments) already on the 303(d) list for temperature. Nearly all of these assessment units have multiple years of data with multiple exceedances and/or were listed based on pre-2006 data (which will not be reassessed). Therefore, few, if any, of these assessment units will have a change in 303(d) status due to the revised temperature assessment method.

Comment from [Pierce County]: Where 7-DADMax criterion is applicable and Where 1-DMax criterion is applicable. On page 52, the proposed policy states that "the evaluation of temperature will focus on temperature measurements collected between June 15 and September however, on page 55 the proposed policy references the period between July 15th and August 15th to show compliance with the criteria. Recommendation: Please clarify the dates to be to determine the summer critical period.

Ecology Response: *The distinction is intentional, but we have clarified the language. There are two tests- one test is to determine if a listing should be placed in Category 5 and the second test is to determine if the listing should be placed in Category 1. When screening for problems we will focus on data collected between June 15th and September 15th. There doesn't have to be data from every day during this period to qualify for Category 5. If data is available for two non-overlapping 7DADMax periods and those 7DADMaxes exceed the criterion, the listing qualifies for Category 5. To qualify for Category 1, at a minimum there needs to be data available for every day during the hottest time of the year, which is generally July 15th through August 15th; if there are no exceedances in this period there are not likely to be exceedances during the month prior or after this period. We would still look at data outside this period if available.*

Narrowing the period for Category 1 is intended to reduce the monitoring burden of collecting data that is not needed to answer the question.

Comment from [PSKA & SRK]: The Draft now requires 2 exceedances of the 7-DADMax instead of 1 to list a waterbody as impaired for temperature. (Draft p. 53). The 7-DADMax is already a 7 day average, one exceedance should trigger a finding of impairment for temperature. Temperature is a particularly problematic pollutant in Washington where our salmonids rely on cooler waters for survival. Washington State spends millions each year on salmon recovery. We must take temperature seriously as a pollutant and strive to protect our salmonids. What is the rationale for increasing the number of exceedances necessary to trigger a finding of impairment, and how does this weigh against the urgency to address our declining salmon populations?

Ecology Response: *An aquatic life use is impaired when there is a pattern of not meeting temperature criteria, i.e. when the criteria are not persistently met. Increasing the number of 7DADMax exceedances required to qualify for Category 5 improves the accuracy of the assessment by not listing waters that very rarely exceed temperature criteria (e.g. only during intense drought or extreme weather conditions). Water temperature is the number one cause of impairment to Washington State waters in terms of numbers of 303(d) listings. This change will have no effect on the vast majority of waters with temperature problems since such waters tend to show exceedances that are pronounced in their frequency, magnitude, and/or duration. The greatest effect of this change will be upon the listing status of waters for which evidence of impairment is weak.*

Comment from [Seattle]: Part 2F (Temperature), page 51, last paragraph. If Category 5 listings can be based on a single exceedance, instrument accuracy for discrete samples should be accounted for by applying the 0.2C margin of error since a single discrete sample could result in a Category 5 listing.

Ecology Response: *The policy has been revised such that two, rather than one, large exceedance of the criterion will result in a Category 5 listing.*

Comment from [Snohomish County]: Page 54. Category 5 Determinations. The Policy may err in referencing 1 Day Maximum temperatures as water quality standards. Standards for temperature do not clearly indicate that 1 day maximums of 17.5 °and 23°C are criteria, rather they are referenced as guidelines on acute lethality relative to narrative criteria at the site scale which do not override criteria established in section 200(1)(c) or tables 600 or 602. Neither section 200(1)(c) nor tables 600 or 602 contain 1 day maximum criteria. Recommendation: Justify the use of 1 Day Maximum temperatures when Standards suggests they are guidelines, and when other temperatures related to barriers are established but not referenced as criteria.

Ecology Response: *Whether or not the guidelines are considered criteria is irrelevant. They are part of the water quality standards, which state the department will use the guidelines in determining if an aquatic life use is being supported. We agree that the guidelines to protect against acute lethality do not override the criteria; the guidelines are to be applied in addition to the criteria. If the temperature of a waterbody exceeds a guideline to protect against acute lethality, then the temperature is already fails to meet the applicable criterion. Furthermore, water temperatures don't randomly fluctuate. A large magnitude exceedances cannot be treated as an isolated occurrence. Such an*

observation is evidence that the waterbody likely exceeded the applicable temperature criterion not only on the day that the observation was made, but also on one or more days adjacent to it. Temperatures that are acutely lethal are surely not supporting their cold-water aquatic life designated use and are in violation of WAC 173-201A-310.

Comment from [Vancouver]: Temperature (Page 51): Ecology accepts temperature instrument accuracy limitations of +/- 0.2 °C in the first sentence cited above, and then Ecology negates the acceptance of the same temperature instrument accuracy limitations in the last sentence above. Whether temperature measurements are recorded by an instrument in continuous monitoring mode or used to measure discrete values, the accuracy limitations of +/- 0.2 °C 0.2 units apply equally. We recommend that Ecology revise this section to apply the +/- 0.2 °C temperature instrument accuracy limitation to all measurements recorded in the field.

Ecology Response: *We believe that applying the instrument accuracy provision to discrete data is unnecessary. When a discrete measurement exceeds a criterion magnitude, it is highly likely that the daily maximum exceeds the criterion magnitude by a much more than 0.2 degrees Celsius. Therefore, applying the instrument accuracy provision to discrete data would not produce less rather than more accurate results.*

Section 2H: Toxics – Aquatic Life Criteria

Comment from [Boeing]: Page 60 In order to ensure that higher quality data is given greater weight than lower quality data, the Policy should provide that more recent data will be used to qualify an AU for a given category' and will take precedence over older data.

Ecology Response: *The policy has been revised to clarify that more recent data outweighs older data in qualifying an AU for a given category for the aquatic life criteria.*

Comment from [Boeing]: Page 58 - Averaging Periods. This section states: 'an instantaneous discrete sample will be assumed to represent the averaging periods for the acute criteria and the 24-hour chronic criteria." In order to ensure that higher quality data is given greater weight than lower quality data, the Policy should provide that 24-hour composite samples take precedence over instantaneous discrete samples.

Ecology Response: *Ecology agrees that composite samples provide a better representation of conditions over a time period than one discrete sample. If a day has multiple samples collected and we find that composite samples are included, we'll perform a review to make sure the appropriate data are used for category determinations.*

Comment from [Boeing]: Page 60 - Category Determinations. This section specifies frequency criteria for determination of Category 5 status that are not necessarily indicative of impairment of ambient water quality based on general laboratory error rates, it is possible that exceedances within a three year period would be the result of laboratory error, such as false positives) To ensure that Category 5 listings are based on credible data, the Policy should include a more

robust methodology such as requiring that a percentage of results exceed the criteria over a specified time period.

> **Ecology Response**: *The aquatic life criteria for different parameters have different frequencies of exceedances established in the Water Quality Standards. Several parameters, such as DDT, chlordane, and PCBs have criteria that are not to be exceeded. Other parameters, such as metals, chlorpyrifos, and ammonia, have criteria that are not be exceeded more than once every three years. By setting the Category 5 determination threshold at two observed exceedances within a 3 year period, toxicity issues will be appropriately identified; the observation of two exceedances in a handful of random samples indicates that criteria are likely exceeded more than just twice during a three year period.*

Comment from [EPA Region 10]: The EPA agrees with Ecology that individual daily values should be compared to the 4-day chronic criteria for situations where multiple daily values cannot generate a 4-day average (page 59). With this comment, the EPA notes that language located elsewhere in section 2H may conflict with this approach, such as page 58 under 'Averaging Periods' where policy 1-11 indicates that composites or multi-point data within a 4-day period may be required to assess waters.

> **Ecology Response**: *The policy has been revised to clarify that individual daily values will be compared to the 4-day chronic criteria.*

Comment from [EPA Region 10]: With respect to situations where multiple samples are not available within a 4-day period, the EPA notes that two instances of exceeding a criterion with a '1 in 3' allowable exceedance frequency is adequate basis for placing a water into Category 5.

> **Ecology Response**: *The policy has been revised to allow individual discrete daily values to be compared directly against a 4-day chronic criteria, with two exceedances sufficient for a Category 5 listing.*

Comment from [EPA Region 10]: Metals and Ammonia: Although not a revision, the EPA offers that the existing policy regarding the need for 'same event' sampling for pH and hardness likely results in fewer waters being placed in Category 5 (i.e., structural Type 2 error). With this comment, the EPA notes that other states have developed default regional assumptions for implementation of metals and ammonia criteria.

> **Ecology Response**: *Ecology allows for some flexibility in matching ancillary data (hardness and pH) with assessed parameters. It is preferred to use same sampling event/same time match (within 15 minutes) for parameters and the associated ancillary data. However, if there is a single parameter value and a single ancillary data value on the same day without time information, those will be used together. Additional flexibility is allowed for hardness and metals, as hardness is not expected to greatly vary over a day. For example, the arithmetic average of hardness values collected in one day can be used with metals results that do not have a same event/time pair match for ancillary data. This level of flexibility is not used with pH, as pH fluctuates throughout a 24-hour cycle.*

Comment from [King County DNR]: Page 61: "Toxics - Aquatic Life Criteria". Not all water quality samples analyzed for metals are paired with hardness values. For instance, multiple samples for metals analysis may be collected in a short span of time or over a depth profile, but only one hardness measurement may be associated with the data set. The reverse may also be true in certain circumstances. We request that Ecology allow for use of average hardness values collected closely, but not necessarily precisely paired with samples for metal analysis. This accommodation is particularly relevant for samples collected from lakes or streams during baseflow conditions because hardness results are typically within analytical precision under these conditions. Likewise, we recommend that for multiple discrete metals or other toxics results collected on one day should be averaged to most closely identify the exposure concentration for 24-hour and 4-day chronic criteria

> **Ecology Response**: *Ecology allows for some flexibility in matching ancillary data (hardness and pH) with assessed parameters. It is preferred to use same sampling event/same time match (within 15 minutes) for parameters and the associated ancillary data. However, if there is a single parameter value and a single ancillary data value on the same day without time information, those will be used together. Additional flexibility is allowed for hardness and metals, as hardness is not expected to greatly vary over a day. For example, the arithmetic average of hardness values collected in one day can be used with metals results that do not have a same event/time pair match for ancillary data. This level of flexibility is not used with pH, as pH fluctuates throughout a 24-hour cycle.*

Comment from [King County DNR]: Page 61: "Toxics - Aquatic Life Criteria". King County agrees that modeled hardness data are inappropriate for deciding if metals concentrations are impairing aquatic life. Nevertheless, Ecology should accept average hardness data for lakes or rivers when collected contemporaneously with metals samples. Hardness does not vary in these waterbodies on such short timescales and water quality investigations can use average hardness and average metals concentrations to best estimate exposure concentrations.

> **Ecology Response**: *Ecology allows for some flexibility in matching ancillary data (hardness and pH) with assessed parameters. It is preferred to use same sampling event/same time match (within 15 minutes) for parameters and the associated ancillary data. However, if there is a single parameter value and a single ancillary data value on the same day without time information, those will be used together. Additional flexibility is allowed for hardness and metals, as hardness is not expected to greatly vary over a day. For example, the arithmetic average of hardness values collected in one day can be used with metals results that do not have a same event/time pair match for ancillary data. This level of flexibility is not used with pH, as pH fluctuates throughout a 24-hour cycle.*

Comment from [King County DNR]: Page 61: "Toxics - Aquatic Life Criteria". King County desires Ecology to preferentially evaluate dissolved metals sample concentrations for comparison with criteria. When only total metals values are available, appropriate total to dissolved conversions may serve as a surrogate for dissolved concentrations.

> **Ecology Response**: *Ecology will evaluate metals using the fraction specified in the Water Quality Standards. For most of the metals, this is the dissolved fraction, however, there are a few exceptions where the total fraction is specified.*

Comment from [NWEA]: Despite Ecology's referencing narrative standards at the outset of the guidance on using aquatic life toxics criteria, the text relates solely to comparisons of ambient water quality data to the numeric criteria. The only other measure is the use of bioassay tests. There is no reference to how Ecology will evaluate aquatic life protection where numeric criteria have not been adopted for specific parameters, when Washington's numeric criteria are outdated (e.g., copper), and where contamination is found in media other than the ambient water column (i.e., tissue of the species themselves, their prey, semi-permeable membrane devices). As we have explained previously, as well as in our cover letter on submission of data and information, this is a gross misinterpretation of Washington's water quality standards and EPA regulations pertaining to the 303(d) program.

> **Ecology Response**: *You are correct that Ecology mainly relies on evaluation of data compared to the numeric criteria adopted in the water quality standards to make listing decisions. The use of narrative standards to make listing determinations is described in Policy 1-11 at "1E. Data and Information Submittals." In order to evaluate whether a waterbody was not meeting numeric criteria that are not currently adopted in Washington's water quality standards, Ecology would need to have information submitted that would allow us to evaluate impairment based on narrative criteria, including documentation of a designated use impairment in the waterbody and documentation that the chemical alterations are causing the designated use impairment in the same waterbody.*

Comment from [Pierce County]: Page 58. Part 2H. Averaging Periods. Recommendation: Instantaneous discreet samples should not be assumed to represent the averaging periods for the acute criteria and the 24-hour chronic criteria. Averaging requires at a minimum two points, and data collected over a reasonable time interval to represent water body conditions.

> **Ecology Response**: *EPA has encouraged Ecology to develop a listing methodology that utilizes the data that is readily available. It is rare to have sufficient data to calculate averages for the acute and the 24-hour chronic criteria. It is not practicable to require multiple samples to assess the acute and 24-hour chronic criteria.*

Comment from [PSKA & SRK]: On the discussion concerning hardness-dependent metals and helpful documents to support this discussion, please add reference to the Biotic Ligand Model, which considers dependency on numerous key water quality factors in addition to simple hardness, including dissolved organic carbon, pH, temperature, and numerous other factors. The BLM model is considered by EPA and the scientific community to be more advanced and protective when considering toxicity of these specific metals (e.g. copper, zinc, lead, chromium, and others). See guidance at ttps://www.epa.gov/wqs-tech/copper-bioticligand-model.

> **Ecology Response**: *Ecology is aware of the Biotic Ligand Model (BLM) and is currently conducting a data characterization project for copper. The BLM may be used to establish revised aquatic life criterion in the future, but at this time it is not pertinent to the current assessment methodology policy.*

Comment from [PSKA & SRK]: Overall, Soundkeeper agrees with Ecology's approach to the toxics – aquatic life criteria. However, we are concerned by the amount of caveats in place which may make the Policy confusion to users. We understand that obtaining all of the necessary data

can be difficult; however, we are concerned about how exceptions might be used. The Policy should be clearly written so that listing decisions are not discretionary or left to interpretation.

Ecology Response: *The aquatic life criteria chapter has been revised for clarity.*

Comment from [PSKA & SRK]: In addition, it would be also helpful to add a discussion on using aquatic life criteria for specifically protecting ESA-listed aquatic life, which must be considered individually rather than combined with all other potentially exposed aquatic species.

Ecology Response: *We do not see the need to provide more specific information in this section on ESA-listed aquatic life, since the water quality standards are designed to protect all species and do not delineate different standards for ESA-listed species.*

Comment from [Russell]: In order for surface water quality standards to be protective of aquatic life (salmon) and assure safe beneficial human use there needs to be standards for iron (total iron not to exceed 1 mg/L, soluble iron not to exceed 0.35 mg/L); nitrate-nitrogen (not to exceed 2.0 mg/L since nitrate-nitrogen in excess of this standard adversely impacts fish hemoglobin's ability to transport oxygen and fosters filamentous green algae blooms); soluble reactive phosphorus (not to exceed 10 ug/L since higher concentrations foster harmful Cyanobacteria blooms); and total phosphorus (not to exceed 20 ug/L). There should also be surface water standard for cyanotoxins, i.e., microcystin not to exceed 6 ug/L and anatoxin not to exceed 1 ug/L.

Ecology Response: *This comment is outside the scope and intent of listing Policy 1-11 and will be passed on to the Water Quality Standards program for consideration of new standards. This would require a rule-making and approval by EPA.*

Comment from [Snoqualmie Tribe]: The juvenile salmon in the Snohomish Basin are already carrying toxic loads at levels that can have lethal and sub-lethal deleterious effects. According to James West from the WDFW: "Adult Chinook salmon from all locations in the Puget Sound drainage system, and juveniles from one basin, exceeded PCB thresholds. English sole from four urban locations failed to meet recovery targets (or showed uncertain results) for current conditions for most of the PCBs, PBDEs, PAHs and EDCs. PCBs in herring from urbanized basins were above effects thresholds and not changing."

Ecology Response: *We encourage the Snoqualmie to submit studies to Ecology that may be used to assess waters based on our narrative criteria. The use of narrative standards to make listing determinations is described in Policy 1-11 at "1E. Data and Information Submittals."*

Comment from [Snoqualmie Tribe]: Additionally from the WDFW report Toxic Contaminants in Juvenile Chinook Salmon (Oncorhynchus tshawytscha) Migrating Through Estuary, Nearshore and Offshore Habitats of Puget Sound: "Levels of PCBs and PBDEs in whole body tissue samples from fish collected in the Snohomish, Green/Duwamish and Hylebos/Puyallup river systems, and PCBs in fish from the offshore habitat of the Whidbey Basin and the Central basin were high enough to potentially cause adverse effects, including reductions in growth, disease resistance, and altered hormone and protein levels."

Ecology Response: *We encourage the Snoqualmie to submit studies to Ecology that may be used to assess waters based on our narrative criteria. The use of narrative standards to make listing determinations is described in Policy 1-11 at "1E. Data and Information Submittals."*

Section 2I: Toxics – Human Health Criteria

Comments on using of fish tissue for determining harvest use is impaired

Comment from [EPA Region 10]: The EPA commends and supports Ecology's use of a listing policy based on fish tissue data and would like to acknowledge the state for being a national leader in determining listings using this science-based method. The EPA also recognizes the challenges in developing a listing methodology for appropriately stringent human health criteria supporting reasonable implementation of these criteria.

Ecology Response: *We appreciate EPA's support and the recognition of the challenges in developing listing methodologies for assessing human health criteria using fish tissue.*

Comment from [EPA Region 10]: We feel the methodology could benefit from some additional background information and detail that would increase the transparency and basis of Ecology's listing rationale for human health criteria. These areas include: the comparative protectiveness when considering joint exposure to chemicals in water and tissue versus Ecology's use of water or tissue exposure alone; the protectiveness of not including additional non-water/fish tissue exposures when developing evaluation criteria for non-carcinogens; the use of the median rather than the average for compliance determination, in particular discussing how these statistics characterize exposure; and the adequacy of sample size as a function of the size of waterbodies to be evaluated.

Ecology Response: *Joint exposure to chemicals in water and tissue is addressed by evaluation of the human health criteria while evaluating the support of domestic water supply uses and fish/shellfish harvest uses requires a separate evaluation of exposure to chemicals in water or tissue. We think that when exposure to a chemical is predominantly through the consumption of fish tissue, that evaluating tissue concentrations directly is more accurate than evaluating the concentration of the chemical in water and making additional assumptions about how that water concentration translates into a tissue concentration. The latter requires an assumption that bioaccumulation factors (BAFs) and bio-concentration factors (BCFs) are the same among all waterbodies. However, it is more likely that BAFs and BCFs vary among waterbodies according to waterbody-specific biogeochemical processes. So in this sense we think that a methodology that relies on the analysis of fish tissue results, where available, is much more protective than only analyzing water. The preferred approach for evaluating toxics in the water would be to apply the HHC to water column data. We think that large datasets should be used to directly evaluate attainment of the HHC (many of which are below analytical detection limits) since: 1) water concentrations may be highly variable; and 2) outliers in small datasets may lead to erroneous characterizations of water column concentrations and mistaken conclusions about long-term exposure. Unfortunately, there appears to be few*

large datasets for water column data that could be used to evaluate attainment of the HHC.

When applying narrative criteria to assess potential impairment of a designated use by non-carcinogens, it would not be appropriate to factor in exposures that are not part of the designated use. We do not do this for any designated use - for example, when evaluating recreational use support we do not consider exposure to pathogens from other pathways such as the risk of illness from ingesting contaminated food.

We chose the median tissue value to characterize exposure instead of the average for two main reasons. The first, and most important reason, is that erroneous impairment determinations can result when sample results are forced into an estimate of an average concentration. Specifically, non-detect sample results need to be converted into a numeric result in order to calculate an average concentration. To calculate an average concentration without laborious statistical procedures (which are impractical to employ on a statewide basis for the WQA), some value needs to be substituted for non-detects. The low magnitude of the tissue thresholds for many toxics is such that the choice of the substituted value for non-detects, by itself, can drive the category outcome. For example, if a TEC threshold is less than one-half of the detection limit and one substitutes a value of one-half the detection limit for non-detects, then every AU with three composite samples, including those AUs with only non-detect results would be placed on the 303(d) list. Using the median concentration prevents artificial sample results from being the deciding factor in an impairment determination.

The second reason for using the median is more so conceptual than practical. It has to do with the median being a better descriptor of central tendency than the average for non-normally distributed data since it is not affected by outliers. We do not want outliers to influence our estimate of toxin concentrations that people are typically exposed to on a daily basis. Note that we are interested in the potential amount of a chemical that people are exposed to; we are not able to truly determine the average concentration of the toxic in the overall fish population. There are multiple aspects of fish populations and fish consumption patterns that are not normally distributed. The age and size structures of fish populations are typically right-skewed rather than normally distributed; in fact the distributions could even be bi-modal if fish of a certain age/size class are selectively harvested. Larger fish typically compose a much smaller proportion of the fish population such that they cannot be used to represent what someone would ingest on a daily basis. Although small/young fish compose a much higher proportion of the population, they also are not representative of what is consumed as fish below some size are typically not consumed - either due to size limits in fishing regulations or because fish below are certain size are not kept by fishers due to their lack of consumable tissue. Furthermore, the probability of capture is probably unequal among age and size classes. Also, many toxics appear to have tissue concentration distributions that are right-skewed. Larger/older fish tend to have higher toxic concentrations while smaller younger fish tend to have relatively lower concentrations. In these regards, the presence of a single fish (among multiple composite samples) with an outlier toxic concentration could result in an estimated average concentration that greatly exceeds the tissue threshold (especially if numeric values are substituted for non-detects), even though the vast majority of fish consumed may have values well below the threshold. Using the median of

the composite sample values reduces the risk of outlier values from having a disproportionate influence on our estimate of long-term exposure to humans.

Lastly, from our perspective, placing AUs in Category 5 based on a minimum of three composite samples is highly protective when considering that we are using those samples to represent future long-term exposure. In terms of waterbody size, we do not know the population size of fish in each waterbody and we are not attempting to represent toxic concentrations in the overall fish population.

Comment from [Kalispel Tribe]: We were encouraged by the establishment of the State's new water quality standards to better protect fish and people since it is moving closer to what the Tribe feels is essential to the well-being of its community. However, the changes being proposed within the draft Water Quality Assessment Policy 1- 11 apparently was written with the primary intent to better protect pollution instead of the people by undermining implementation of the State's new water quality standards essential to fully achieving the "fishable" beneficial use of our waters.

Ecology Response: *Ecology disagrees that the primary intent of changes to Policy 1-11 is to better protect pollution instead of the people. One of our key goals is to produce an Assessment that places waters on Category 5 (the 303(d) list) that are impaired, and to minimize Type 1 and Type 2 errors that can occur (either over- or under-listing a water as impaired). We received many comments and suggestions to that effect and have made a conscientious effort to find a balance of making impairment decisions based on limited data and reasonable assumptions that lean towards ensuring that the designated use of the water are protected.*

Comment from [Kalispel Tribe]: Protecting people from eating contaminated fish is fundamental to the "fishable" beneficial use provision of the Clean Water Act. The critical target concentrations of toxins in fish tissue are a major driving factor in the equation for calculating the subsequent water concentration for the human health criteria. If the critical target fish tissue concentration is exceeded in a waterbody, there is no need to have other lines of evidence to show that the beneficial use is impaired. If there was evidence of impairment due to fish contamination in the past, new fish tissue analyses must be included to determine that beneficial uses have been fully restored.

Ecology Response: *We have removed the other lines of evidence that were in previous drafts.*

Comment from [NWIFC]: NWIFC supports a listing policy that is based on fish-tissue data, and strongly backs Ecology's continued embrace of this basis for its listing policy. NWIFC appreciates that Washington is a leader among states/tribes in relying upon this state-of-the science approach to assessment. Fish-tissue data provide a direct measure of whether the harvest use is being supported; as such, they are a tight fit for the question at hand in a listing policy, and thus the most scientifically defensible approach. For this and other reasons elaborated in NWIFC's earlier comments, we are pleased to see that Ecology's current draft continues to rely on fish tissue as the most credible source of data for listing determinations.

Ecology Response: *We appreciate the support for continuing to evaluate chemicals in fish tissue in order to protect fish/shellfish harvest.*

Comment from [NWIFC]: NWIFC has consistently urged that the water quality assessment policy not serve as a vehicle for avoiding or undermining the state's currently effective water quality standards. For human health criteria, these standards are reflected in the consolidated rule. 81 Fed. Reg. 85417 (Nov. 28, 2016). As NWIFC has observed, these standards incorporate a fish consumption rate that does not fully account for tribal fish intake at heritage-based rates; as such, these standards represent a compromise in terms of fully protecting tribal consumption. Yet these are the standards that are currently in effect, and if the tribes must be reconciled to this fact, then so must the state. NWIFC therefore opposes all aspects of Ecology's draft that depart from or work to undermine the current standards applicable to Washington waters.

Ecology Response: *To our knowledge, the harvest use methodology is among the most protective assessment methodologies in the nation.*

Comment from [NWIFC]: It is crucial that Ecology's water quality assessment policy focus on measuring impairment of water quality standards in Washington, including the harvest and other designated uses. An impaired listing triggers development of TMDLs, other pollution control requirements, and/or alternative approaches to identify the causes of and, ultimately, rectify, the impairment. It is important that the assessment policy not erroneously omit assessment units (AUs) from the roster of those that require these additional steps in order to restore them to health - the point of the state's 303(d) list.

Ecology Response: *Our intent is for the 303(d) list to be as accurate as possible.*

Comment from [NWIFC]: It is vital, moreover, that water quality assessment not be conflated with other steps in the larger process, and that considerations germane to other steps (e.g., the challenges or costs of producing a TMDL or reducing contamination) not inappropriately drive the design of an assessment policy. In fact, Ecology devoted considerable effort during the HHC rulemaking process to expand its existing implementation tools and to develop new implementation tools, in order to accommodate industry's concerns with respect to feasibility and costs. An enlarged menu of implementation tools is now available in Washington: regulated sources can avail themselves of variances, compliance schedules, and/or intake credits in order to help them achieve compliance. Ecology's water quality assessment policy should produce an accurate snapshot of impairment - it should not be viewed as an additional opportunity to provide "regulatory relief" to sources. Ultimately, Ecology's water quality assessment policy should not serve as a vehicle for avoiding or undermining the state's current water quality standards. This concern has been urged consistently by NWIFC and is elaborated further below.

Ecology Response: *Ecology's purpose in updating and revising Policy 1-11 is to provide a list of waters in Category 5 that are truly impaired, and to minimize errors that lead to over- or under-listing. It is not Ecology's intent to provide regulatory relief for impaired waters.*

Comment from [Seattle]: Part 2.I(2) (Fish and Shellfish Harvest Use Assessment), page 66, Age of fish. SPU recommends expanding this discussion of the age of fish that are available for

evaluating harvest use impairment. For example, using long-lived fish tissue may not be representative of current conditions.

> **Ecology Response**: *The use of fish tissue in the water quality assessment evaluates the harvest use. We are interested in the concentrations of toxics that are in edible fish and shellfish. Since the assessment includes fish that are harvestable size, a range of ages are captured.*

Comment from [Seattle]: During the scoping process for Policy 1-11, the City provided comments to Ecology (March 31, 2016). Regarding the use of tissue data within the assessment process for toxic substances, SPU recommended that Ecology consider discontinuing the use of tissue data. Our comment on this issue concluded that, if the tissue approach stays in the policy, clear procedures need to be identified for how a water body that is listed related to tissue would be delisted. Although SPU is still concerned about the use of fish tissue including the new proposed Ecology approach, SPU appreciates Ecology's efforts to better frame the use of fish tissue and consider some of its shortcomings. Although not obviously identified in the equations on page 65 of the draft policy, BCFs are still embedded in the calculation and lead to significant uncertainty in the calculated TEC.

> **Ecology Response**: *We have reconsidered the tissue assessment approach and have made modifications to the methodology which we believe will produce evaluations of the support of fish and shellfish harvest use that appropriately consider uncertainty from multiple sources such as tissue concentration variability within and among species and laboratory analytical accuracy and precision.*

Comment from [Snoqualmie Tribe]: These fish and their health are culturally important to the Snoqualmie people and whether consumed or not, they still represent a beneficial use of the water. Calculating contaminant concentrations in terms of water column concentrations fails to demonstrate issues with bio-magnification in the fish population. The presence of fish tissue contaminant concentration above levels of concern at any life stage should directly demonstrate impairment in the fish population and the water. For this reason Ecology must maintain their fish tissue analysis in water quality assessments in order to protect the designated uses for these waters from toxic contamination.

> **Ecology Response**: *We appreciate the support for continuing to evaluate chemicals in fish tissue in order to protect fish/shellfish harvest.*

Comment from [Snoqualmie Tribe]: The purpose of the state's 303(d) list is to restore health to impaired waters through development of TMDLs and other pollution control requirements. TMDLs were established to ensure that the level of contamination is held in control in order to protect the fisheries. If established populations are already carrying these concentrations in their flesh they are already compromised and additional pollution loads will only harm the population further. Tying the regulation of the impairment to the water column only, and excluding evidence of deleterious biological effects, does not necessarily tell the whole story. The water use being protected in these TMDLs are the fish. The concentration that really matter is the pollution load in the fish, not the water column or sediment, and while these may be the tracked sources for the pollution, the biological component of that water still carries the load, is still impaired, and needs to inform the potential listing.

Ecology Response: *We appreciate the support for continuing to evaluate chemicals in fish tissue in order to protect fish/shellfish harvest. We have noted in the policy that attainment of the human health criteria in the water column or sediment does not necessarily signify that the harvest use is supported. Entities would need to work with Ecology to design and implement a study to directly evaluate the attainment of human health criteria in the water column.*

Comment from [Snoqualmie Tribe]: The Snoqualmie Tribe supports the continuation of fish-tissue data as a basis for listing. Fish-tissue data directly measures bio-accumulative contaminants in the aquatic trophic system. Bioaccumulative contaminants are unlikely to reside in significant concentrations in the water column and are more likely to accumulate in sediments and aquatic organisms. The draft revision is focused on toxicity in fish in terms of human consumption rates, which while important, ignores the actual health of the fish population. The draft policy must ensure supportive conditions for fish at every stage in their lifecycles. If there's enough pollution getting into the ecosystem that the water is toxic to the fisheries, then it should be a strong signal to Ecology that the waters are impaired. Ecology should use fish-tissue data where it exists and especially where it indicates that a contamination problem exists, such as in the Snohomish basin.

Ecology Response: *As noted in the comment, the tissue evaluation method is specific to the protection of the harvest use. It does not evaluate tissue concentrations for the purpose of evaluating the health of the fish themselves. We do not have numeric criteria or thresholds in this part of the policy for this purpose. The numeric criteria that we use to protect aquatic life from toxics are water column criteria, and we have many 303(d) listings based on impairment determinations based on the aquatic life toxics methodology. However, we note that we can and have made 303(d) listings based on our narrative standards where a study has shown that contaminant levels in the tissue organisms are harming those organisms. For example, we have a narrative 303(d) listing in Puget Sound based on a study showing harmful levels of dioxin in marine mammals.*

Comment from [Suquamish Tribe]: The Tribe continues to support Ecology's use of fish tissue data as a measure of whether the harvest use is being supported. Fish tissue data provide the most credible information regarding harvest and are particularly relevant for bioaccumulative contaminants as they indicate an integrated measure of uptake from contaminants in water, sediments and diet over time.

Ecology Response: *Comment noted.*

Comments on using a statistically rigorous study

Comment from [Boeing]: Page 63 — Ecology has introduced three new sub-categories under the Toxics — Human Health section. The February 2018 Draft Policy is impermissibly vague as to how these sub-categories inter-relate. The Policy provides that certain types of information will take precedence over other types of information when considering whether to list an AU_ For example, page 64 includes the following statements "A statistically valid study of contaminant levels in fish tissue from a waterbody will take precedence over the harvest use WQA methodology" "A statistically valid study of contaminant levels in the water column of a

waterbody will take precedence over the domestic water supply use methodology However, the discussion is not accompanied by explanatory details. For example, the February 2018 Draft Policy does not include guidelines for performance of a "statistically valid study of contaminant levels in fish tissue." Also, the Draft Policy does not explain the inter-relationship among: "[d]irectly assessing human health criteria attainment"; "statistically valid study of contaminant levels in fish tissue"; and "statistically valid study of contaminant levels in the water column' More explanatory information is necessary if the Policy is to adhere to the requirement that listings be based on credible data. Another example is found on page 65, which includes the following statements: "Attainment of the human health criteria in the water column does not necessarily signify that the harvest use is supported" and "Entities would need to work with Ecology to design and implement a study to design and implement a study to directly evaluate the attainment of human health criteria" The Policy must include additional explanation to support these statements.

> **Ecology Response**: *The harvest use may be determined to be impaired based on either exceedance of TECs (tissue data) or exceedance of human health criteria (water data) . Since listings are for specific AU/designated use/media/parameter combinations, data from one media cannot be used to remove a Category 5 listing based on another media. In other words: to de-list a harvest use Category 5 tissue listing for a specific chemical, fish tissue data showing that the TECs are met would be required; to de-list a harvest use Category 5 water listing for a specific chemical, water data showing that the human health criterion is attained would be needed.*
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> *Statements about statistically valid studies in the policy are intended to recognize that if a study that is more rigorous than the methodology described in the policy is used to show that a harvest or domestic water supply use is or is not impaired, then that more rigorous study can be used in the impairment determination. For example, a study may seek to estimate the average concentration of a chemical in the population of one or more species in a given waterbody, which would require more significantly more samples and a more sophisticated data analysis technique than is outlined in Policy 1-11. This is also why the policy states that a direct evaluation of human health criteria attainment, which must be based on a rigorous waterbody specific study, would take precedence over the domestic water supply evaluation methodology that employs DWECs. We are not able to outline all of the requirements for such a study design because it varies according to the individual characteristics of a waterbody and its watershed as well as the particular contaminants being studied. To be sure, there would have to be a statistical monitoring design in place that incorporates principles of toxicology and risk assessment as opposed to simply collecting a bunch of water and/or tissue samples and then figuring out how to evaluate the sample results.*

Comment from [Boeing**]:** Page 65 — The February 2018 Draft Policy states: "a statistically rigorous study is the only pathway for directly evaluating whether or not human health criteria are being met". However, the Draft Policy does not include criteria that defines a "statistically rigorous study." In order to ensure that listings are based on credible data the Policy must provide for public review of proposed studies that might be relied on to evaluate whether human health criteria are being met

Ecology Response: *A statistically rigorous study would need to be designed in order to answer the question of whether or not a particular human health criterion was being met in water. It would need to explicitly address factors such as the environmental behavior of the target chemical and waterbody specific attributes such as its size, hydrology, and trophic status. Sample numbers, timing of sampling, location of sampling, sampling media, and assumptions underlying the criteria would also need to be addressed in the sampling design. In other words, simply collecting a handful of water samples and then reporting the results would be insufficient. Please refer to study publications (toxic studies and other) completed by Ecology Environmental Assessment Program staff for examples of statistically rigorous studies.*

Comment from [NWIFC]: NWIFC has communicated its concern with a general "off-ramp" that would override a fish-tissue based assessment of impairment by means of a water-column based demonstration that the human health criteria are being met. According to Ecology's earlier drafts (Ecology, June 2017) such water-column data would 'supersede' any of the other methodologies described in this policy," including a fish-tissue based determination of impairment. However, as NWIFC has pointed out, this off-ramp runs counter to the science for many of the contaminants of concern for human health, which are often highly bioaccumulative. Fish-tissue data are particularly relevant for bioaccumulative contaminants, in as much as they provide an integrated measure of uptake from contaminants harbored in sediments, organisms, and the water column over time. Bioaccumulative contaminants are unlikely to reside in significant concentrations in the water column, such that even a robust statistical water-column sample, as Ecology had proposed, won't detect contaminants that are hydrophobic and/or reside instead in the fish tissue. Policy 1-11 should be focused on science-based assessment and not driven by a need "to avoid future problems in establishing a valid TMDL." It is NWIFC's understanding that Ecology's intention in this draft is to alter its earlier approach to address NWIFC's concerns. However, the language of the actual draft policy is ambiguous, and suggests that the water-column data off-ramp may have been preserved.

Ecology Response: *We recognize that it is a complicated issue. Unless there is a statistically rigorous study to show that HHC are being met for the given use, Ecology will determine impairment of the harvest and domestic water supply uses using TECs and DWECs. Listings will be based on parameter and median, therefore it is possible that an AU could be listed in Category 1 based on DWEC water column data but listed in Category 5 for TEC tissue data for a given chemical. A study for directly evaluating human health criteria attainment would require a statistically-based sampling design and data analyses techniques that can be used to test the hypothesis that a given human health criterion is being attained in a specific waterbody for the associated uses. The study would need to be more than just an ad hoc analysis of a random collection of water samples. It would need to explicitly address factors such as the environmental behavior of the target chemical and waterbody specific attributes such as its size, hydrology, and trophic status. Sample numbers, timing of sampling, location of sampling, sampling media, assumptions underlying the criteria, and any other factor that is necessary to appropriately answer the question of HHC attainment would also need to be addressed in the sampling design. Ideally, a comprehensive study would be performed in order to characterize the status of the chemical in water, sediment, and biota in order to evaluate the support of water supply, harvest, and aquatic life uses.*

Comments on methodology for using fish tissue

Comment from [Boeing]: Page 73 Toxic Equivalency Quotient. The Washington Human Health Water Quality standard regulates only 2,3,7,8-TCDD, and not the other dioxin or furan congeners (see WAC 173-201 A, Table 40). In order to ensure clarity with the approved HHWQ standards, Ecology should delete this section.

> **Ecology Response**: *As stated in the comment, Ecology does not have water quality standards for the other dioxin/furan congeners. However, the toxicity of the other dioxin/furan congeners are known and toxicity equivalent factors (TEFs) are well established. The resulting toxic equivalent values (TEQs) will be compared to the 2,3,7,8-TCDD thresholds and any exceedances will result in a Category 2 listing. The policy has been revised to reflect this change.*

Comment from [Boeing]: Page 63 — Three approaches for assessing toxics data for human health protection This section introduces two new terms: tissue exposure concentrations (TEC) and drinking water exposure concentrations (DWEC). The policy needs to include a table listing TEC and DWEC data for each human health water quality criterion.

> **Ecology Response**: *We have added TEC and DWEC tables as an appendix to the policy.*

Comment from [Boeing]: Sections 21 (2) Fish and Shellfish Harvest Use Assessment and on 21 (3) Domestic water supply use assessment These sections use median values for assessments. However, the draft policy does not include enough information to determine if median is the appropriate approach or whether it should be arithmetic mean. The revised draft policy must include sufficient explanation and criteria to justify use of one or the other, perhaps on a case by case basis.

> **Ecology Response**: *The high likelihood of routine non-detect sample observations means that an average cannot be estimated without the use of either: 1) highly laborious statistical procedures; or 2) the substitution of values for non-detects (e.g. 1/2 the detection limit). The first method is impractical to apply statewide within the water quality assessment. The second method would significantly increase the risk of erroneous category determinations (without any evidence that the toxic pollutant is in the waterbody at all); the reason is that since the DWECc thresholds may be near or even below method detection limits, the artificial value substituted for non-detect samples may be the decisive factor in whether an average exceeds or does not exceed a DWECc. The alternative approach, which Ecology has selected, is to compare the median sample to the DWECc. This non-parametric approach appears to be more appropriate since the concentrations of toxics in water are not likely to display normal distributions. Evaluating if the median concentration of a toxic is above the DWECc, in effect, allows us to estimate if the typical amount of a chemical that a person would be exposed to in untreated drinking water is associated with an increased the risk of cancer.*

Comment from [Boeing]: Page 65 — Additional line of evidence — Department of Health Fish Advisories. Ecology lists fish advisories as "other lines of that can be used to make 303(d)

determinations. Fish advisories are linked to the new harvest sub-category. Ecology states: "it is anticipated that most waterbodies that have fish advisories will already be listed as Category 5 for tissue" Given the inherent difficulties with reliance on fish advisories, the Policy must include more specific criteria for when and how fish advisories would be used if they are to be included (e.g., will they be used in AUs that have other, more reliable data, such as fish tissue assessment data?).

> **Ecology Response**: *The policy states that a fish consumption advisory may be used as an additional line of evidence for AUs from which data has actually been collected. Advisories will be evaluated on a case by case basis in order to determine how to appropriately identify an impaired harvest use in the 303(d) list. Each AU covered by a fish consumption advisory must meet or exceed the data requirements described in the harvest use evaluation methodology in order to result in a 303(d) listing (e.g. the AU must have had a minimum of 3 composite samples collected from it). Note however, that we may use a fish advisory to place waters on the 303(d) list when an advisory has been issued due to a contaminant for which there does not yet exist a human health criterion (e.g. PBDEs).*

Comment from [Boeing]: Page 65 - 66 — Data Evaluation for Tissue Samples. This section includes an extensive list of sample requirements to support assessment determinations. Chapter 2, Ensuring Data Credibility in the Assessment, should be updated with requirements for limitations on fish and shellfish for toxics-human health assessments. Data that is not credible should be considered unusable and not used for assessment purposes "Data Unusable for the Assessment (Page 10). Further, the Policy needs to include a mechanism for data providers to document compliance with all of the tissue sample requirements listed in this section and for the public to view the data.

> **Ecology Response**: *The subsection on "Data Evaluation for Tissue Samples" describes what data will be used and how it will be evaluated by Ecology. It addresses data representativeness, usability, and comparability rather than data credibility. Fish tissue data used in the assessment must meet data credibility requirements. It is entirely possible for data to be credible but not usable in the harvest use evaluation. The data credibility requirements described in Chapter 2 of Policy 1-11 are sufficient for determining whether or not tissue data is credible. Parameter or evaluation specific credibility requirements are not necessary. The public can view the tissue sample results in Ecology's EIM database.*

Comment from [Boeing]: Page 71 — Category 5 determinations. The blank sample data quality requirements should be included in the next Policy 1-11 Chapter 2 update. In addition, to support transparency, the EIM system should be modified to allow for inclusion of blank sample data and concise notations if samples are culled based upon blank data.

> **Ecology Response**: *Blank and duplicate samples would be addressed within a study QAPP. Parameter and method specific requirements do not need to be specifically addressed in Chapter 2 of policy 1-11. We will explore the recommendation for including blank sample data in EIM.*

Comment from [Suquamish Tribe]: The Tribe believes that it is crucial that Ecology's Policy 1-11 accurately identify impaired waterbodies, defined as any waterbody which does not attain WQS, including known and designated uses of fishing and fish consumption. The public health issues and response actions that are determined by this policy affect everyone in Washington who eats fish. However, because tribal health and well-being rely on traditional lifeways that include the harvest and consumption of large quantities of fish and shellfish, the failure to adopt adequately protective policies disproportionately and involuntarily harms tribal communities.

> **Ecology Response**: *Ecology takes its responsibilities for meeting Clean Water Act requirements to identify impaired waters very seriously. We have taken a progressive step beyond many states by using fish tissue to evaluate if harvest uses are impaired based on the fish consumption rate of 175 grams/day adopted into the water quality standards. We believe this results in listing methodologies that are protective of Washington tribes and the general public.*

Comment from [Suquamish Tribe]: In response to previous comments regarding TECs, Ecology has stressed that TECs are not water quality standards. The Tribe agrees that this is a technically accurate statement, but notes that TECs cannot be considered to be totally separate from human health criteria (HHC). TECs are derived from HHC promulgated for Washington, which are based on an approved set of exposure parameters and health protective endpoints. As derived, TECs reflect the parameters and endpoints that underlay the HHC and may be used as a way of evaluating fish tissue to determine if the harvest use is supported.

> **Ecology Response**: *We agree with the comment.*

Comment from [Suquamish Tribe]: The Tribe remains concerned that some revisions may serve to undermine elements of existing water quality standards by creating false hierarchies and/or off ramps within the assessment process. For example, numeric criteria should not be designated as the only "direct" measurement of water quality as it implies that this is the preferred or primary assessment tool. Similarly, evaluation of harvest use that considers fish tissue data cannot be considered a "supplemental" or "alternative" approach. Water quality standards include both numeric criteria and protection of designated uses.

> **Ecology Response**: *We agree that if fish tissue data indicates that a harvest use is not supported, then water column data should not alternatively be used to de-list a listing that was originally based on tissue data.*

Comment from [Upper Skagit Tribe]: The upper Skagit Indian Tribe would like to express our support for the Northwest Indian Fisheries Commission (NWIFC) comments submitted to Ecology regarding the draft Policy 1-11, Washington's Water Quality Assessment Listing Methodology to meet Clean Water Act Requirements. We are submitting our comments to especially highlight our concern about the potential for an off-ramp" to de-list or avoid listing impaired water bodies based on the results of water column data in lieu of fish tissue data. Many contaminants are highly bioaccumulative and safe fish harvest is a designated use and a treaty right. As described in the NWIFC comments, since the purpose of the listing policy is to assess water quality and determine if the designated uses are being supported, decisions about de-listing water bodies should be made on the basis of fish tissue data and not solely water column data.

> **Ecology Response**: *See above response to Suquamish Tribe.*

Comments on the use of fish tissue thresholds

Comment from [AWB]: Ecology's formulas for calculating tissue exposure concentrations effectively increase the stringency of WAC 173-201A-240 toxic pollutant criteria and contribute to an over-listing of assessment units as impaired. Local toxic exposure concentrations should be based on fish consumption patterns in the assessment unit (AU). Accounting for the consumption of salmonids should be included. There are several Policy adjustments which would improve this situation. Fish tissue pollutant concentrations will lag actual water column/sediment pollutant cleanup activities and in situ pollutant concentrations. Successful effort to reduce pollutant inputs to an AU could be accomplished, with ambient water column monitoring documenting achievement of WAC 173-201A numeric criterion. Yet the waterbody remains Category 5 listed on the basis of the narrative "harvest" designated use and presumably remain in that status until the contaminated fish die, purge pollutants, or move. Meanwhile, NPDES permittees remain vulnerable to the demands originating from whatever the TMDL product demands. Ecology needs to create a "delisting" or off-ramp process to address this situation. Perhaps a Category 1 or Category 4b relisting and allowing the Washington Department of Health to publish Fish Consumption Advisories, would be a sufficiently protective and reasonable approach.

> **Ecology Response**: *It would not be appropriate for Ecology to refrain from assessing a waterbody unless we have an estimated consumption rate for that specific waterbody. We also note that the presence of a contaminant in an adult anadromous fish caught in a river does not necessarily mean that the fish accumulated the contaminant in the river. The resident species in the river are a more reliable indicator of the pollutant levels associated with land uses in the watershed that can be controlled through a TMDL. This section has been revised to clarify that for Category 5 listing purposes, fish/shellfish tissue data must be representative of chemical contamination in the waterbody from which the fish was collected. We also note that the evaluation of harvest use support based on tissue data is separate from the evaluation of domestic water supply use support based on water column data. A waterbody could support one of the uses, but that does not mean that the other use is also supported. The off-ramp for an assessment unit to be de-listed is for the median concentration of a contaminant to shift below the applicable TEC number. An assessment unit may be delisted to Category 2 in this manner, or, under more rigorous requirements, the assessment unit may be de-listed to Category 1.*

Comment from [Boeing]: Page 65 —The Policy should not allow an AU to be listing based on a Fish and Shellfish Harvest Use Assessment when there is not data for the AU. At minimum, this section should be revised to require additional evidence in the form of a Species Sensitivity Study followed by chronic toxicity testing (over some period of time) to satisfy the requirements for sub-category 21(1) and/or 21(2).

> **Ecology Response**: *The language has been revised to indicate that a listing for an AU will be based on data from that AU, but that it does not necessarily represent the actual spatial extent of the impairment. For example, assume fish tissue is being evaluated in a large lake that is divided into multiple AUs based on grid cells. If fish are only collected from a single grid cell and a contaminant concentration does not meet a TEC, it would be inappropriate to assume that the impairment is spatially limited to only the grid cell from which the fish were collected since fish may travel throughout the waterbody.*

Comment from [Boeing]: Page 67 — Data Analysis. The second paragraph on this page states that, if only a single sample value is available for a species, then that sample value will be designated as the median. Reliance on a single sample for a methodology that requires a composite sample is not a reasonable or defensible interpretation of composite sample (and, in practice, could result in a Category 5 listing based on as few as three fish over a ten year period). The provision allowing a single sample to qualify as a composite sample should be deleted.

> **Ecology Response**: *The language has been edited to clarify that if only a single composite sample is available for a species, then the value from that sample will be designated as the median. As indicated in the policy, Category 5 requires a minimum of three composite samples that exceed the applicable TEC. A new Category 5 listing cannot be based on only three fish.*

Comment from [Suquamish Tribe]: In addition, some of the revised policy language seems to unnecessarily delay a determination of impairment by requiring a demonstration of "persistence". By definition, many of the contaminants of concern are persistent and bioaccumulative. If credible data indicate an exceedance of numeric criteria, or Tissue Exposure Concentrations (TECs) derived from the numeric criteria, the waterbody should be designated as impaired, in most cases. Regulated entities now have an enlarged menu of implementation tools to assist them in achieving compliance over time if a waterbody is listed as impaired. There is no need to further delay listing or action.

> **Ecology Response**: *We agree that the harvest use should be designated as impaired when credible data indicates that either the numeric criteria or the TECs are exceeded. Data showing that the TECs are being met would be needed for de-listing an AU that was originally listed based on tissue data while water column data would be needed to de-list if the AU was listed based on an HHC exceedance.*
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> *Ecology's position is that water quality standards need to be persistently met in order to determine that a designated use is supported. When water quality standards for a given designated use are not persistently met, that use is impaired. Some of the language regarding persistence in the draft policy was directed at the issue of temporal representation in water samples. For example, a random water sample showing an elevated level of copper does not indicate that copper is elevated in the waterbody every day of every year. However, the domestic water supply evaluation is dependent upon long term, rather than infrequent exposures to a chemical in the water supply. This is why the draft method required water samples from multiple years or corroborating tissue data. We have since removed the tissue data requirement, however, we will still require water samples to show exceedances in multiple years in order establish that standards are not persistently met (note that this is a different requirement with a burden of proof which is lower than establishing that standards are persistently met).*

Comment from [PSKA & SRK]: We also object to Ecology raising the bar to a 3-composite sample requirement for carcinogens and non-carcinogens at the TECn. It is not always possible to collect this many samples, which are expensive both to collect and to analyze.

> **Ecology Response**: *Requiring a minimum of three composite samples to support a 303(d) listing will significantly increase the confidence in the impairment determination.*

Ecology is the primary entity collecting fish tissue data in Washington State waters and our protocol is to collect multiple composite samples in each waterbody. Our current sampling efforts usually lead to the collection of three or more composite samples from at least one species. Sometimes we are not able to collect three composite samples from one or more species, which is why the Category 5 pathway allows for the use of one composite sample from three different species as long as the tissue value from each of those species exceeds the TECn.

Comments on using a multiplier for TEC_c thresholds

Comment from [Everett]: Pages 67-69, Category Determinations for Fish and Shellfish Harvest Use. The assessment that tissue levels support a category 5 (impaired) listing for carcinogens is based on three or more species tested having median concentrations greater than 10 times the TECc, or two species tested have a median concentration greater than 100 times the TECc. For non-carcinogens, a category 5 listing is based on three or more species tested having median concentrations greater than the TECn by factors of 1 to10, or two species tested having a median concentration greater than 10 times the TECn. Recommendation: The City supports the listing process described in the policy for determinations for fish and shellfish harvest use.

Ecology Response: *Comment noted.*

Comment from [NWIFC]: Ecology's draft includes a new approach for carcinogens that also departs from the applicable WQS; NWIFC finds this approach problematic. For carcinogens, a Category 5 listing could only be demonstrated where fish tissue contamination exceeds the TECc (which is derived from the currently effective water quality standards) by a factor of 10, as evidenced by a minimum of 3 composite samples (or by a factor of 100, as evidenced by a minimum of 2 composite samples). Importantly, there is no mechanism for designating waters as impaired with data showing contamination levels at the TECc. That is to say, Ecology's approach judges impairment against a benchmark reflecting contamination at levels at least ten times greater than the applicable WQS for carcinogens. In sum, there is no justification for departing from the WQS for carcinogens by Ecology's "magnitude of exceedance" device.

Ecology Response: *The "multiplier" that is noted in the comment was intended to address the multiple sources of cumulative uncertainties in the analysis. The TEC_C values should be viewed as estimates rather than absolute thresholds. TECs rely upon cancer potency factors derived from dose response relationships that are extrapolated to predict estimated risk of carcinogenicity at low doses. Additionally, TECs are based on the cumulative estimated risk over a lifetime of exposure. Laboratory analytical accuracy and precision introduce further uncertainty. The accuracy and precision of an analytical method inherently decreases as method detection limits are approached. This is important to consider because many of the TEC_C values are below practical quantitation or even method detection limits. Another source of uncertainty is introduced when estimating a median tissue concentration based on few composite samples and using the estimated median value to assume long-term exposure. Given this uncertainty, Ecology determined that when the tissue level exceeds the TEC_C by an order of magnitude we can confidently determine that the harvest use is impaired. When tissue levels are within an*

order of magnitude of the TEC_C we are less confident that the tissue contaminant levels are actually resulting in harvest use impairment. To make this determination, improved risk estimation methods, improved analytical technique, and/or more data would be needed to narrow the range of uncertainty. In contrast, the TEC_N evaluation for 303(d) listing does not include a multiplier to account for uncertainty because uncertainty in a TEC_N is largely addressed by the inclusion of a modifying safety factor in the derivation of an EPA reference dose. Additionally, laboratory analytical accuracy and precision is less of an issue since the magnitude of the TEC_N thresholds will, in most cases, be greater than practical quantitation limits.

Comment from [PSKA & SRK]: Soundkeeper is particularly alarmed that for all carcinogens, Ecology's new impairment designations per this Guidance won't be triggered except at levels greater than (less protective than) the effective water quality standards for Washington. This is a fatal flaw and must be corrected. Ecology plans to apply a 10x multiplier across the board for carcinogens. (Draft p. 67). What is the scientific basis for use of a multiplier? Applying a functional 10x multiplier was a fundamental flaw in Ecology's earlier proposed Human Health Criteria and it was the basis of its sound rejection by tribes, NGOs, community members and the US EPA. How does this proposed multiplier square with that clear message received by Ecology? How was this particular multiplier derived? For PCBs, although the TECc is 0.23 ppb, this means that a water segment would only be listed as Category 5 if the median of 3 composite samples was 2.3 ppb or higher, which is under-protective for PCBs. For medians between 1x and 10x the TECc, only a Category 2 listing would result. This is unacceptable. Ecology cannot change the treatment of data to effectively render the human health criteria less protective, especially where the carcinogenic effects of chemicals are concerned. By adding a 10x multiplier, Ecology is weakening existing water quality standards.

Ecology Response: *See above response to NWIFC regarding use of the multiplier factor. For PCBs, from Ecology's perspective, placing an AU in Category 5 when the median PCB tissue concentration for three composite samples exceeds 2.3 ppb is highly protective. We are not aware of any other state, federal, or international human health risk thresholds for PCBs in fish tissue that is less than 2.3ppb. We note that at 23 ppb, the PCB level that WA DOH has been using to trigger a fish consumption advisory is 10 times higher than the TECc of 2.3 ppb which Ecology will use to conclude that the fish and shellfish harvest use is impaired. We also note that the method detection limit for most historical arochlor analyses (the most commonly used PCB analytical technique) in Ecology's EIM database has ranged between 5 and 10ppb, which is well above the 10 times TECc (i.e. 2.3ppb) this means that if PCBs are detected using arochlor analysis, they automatically exceed the 10X TECc threshold. Lastly, to put this issue in perspective, Ecology sampling data suggests that out of hundreds of PCB in tissue samples that Ecology has collected to date from samples throughout Washington state, less than 20% of these samples have had PCB values below 2.3ppb. This means that for the vast majority of samples, the issue of the 10X multiplier is irrelevant.*

Comment from [Suquamish Tribe]: The Tribe objects to Ecology's proposed revision incorporating exceedance factors to reduce the inherent variability in tissue as a matrix, as well as the uncertainty associated with analytical detection limits, when comparing fish tissue data to TECs. Exceedance factors do not identify or account for the impact on health protective endpoints. The Tribe appreciates that higher exceedances allow greater confidence in the role that professional judgement plays when determining impairment based on limited data sets.

However, incorporating exceedance factors effectively alters the HHC endpoints of a 10-6 risk level for carcinogens and a hazard quotient (HQ) of 1 for non-carcinogens, rendering the endpoints less protective.

Ecology Response: *See above response to NWIFC regarding use of the multiplier factor.*

Comment from [Upper Skagit Tribe]: Additionally, we have concerns about the proposed 10-fold and 100-fold multipliers for the carcinogen Tissue Exposure Concentration (TECc). Since the TECc is derived directly from the same information as the Human Health Criteria (HHC) water quality criteria, these multipliers effectively raise the HHC 10- fold or 100-fold. For example. in a case where the samples show an exceedence of less than 10 times the TECc (for cases with 3 samples), there would be no listing despite the fact that there are multiple composite samples showing concentrations higher than the TECc. This appears to circumvent the purpose of the HHC by raising the level of contamination necessary to show an impairment and result in a listing.

Ecology Response: *See above response to NWIFC regarding use of the multiplier factor*

Comments on the uncertainty of using TEC thresholds

Comment from [Kalispel Tribe]: Compositing five fish of a species from a waterbody for sample analysis in itself provides integration of the effects of the pollutant's presence over space and time minimizing the risk of obtaining a non-representative characterization of the level of contamination and use impairment. If uncertainty exists after the listing, follow-up fish sampling can resolve the uncertainties and any needs for alternative actions.

Ecology Response: *While we do agree with the concept that fish tissue is an integrator over time and space we do not agree that a single composite sample of fish provides sufficient confidence to determine that the harvest use is impaired. Our monitoring experience has shown that there can be substantial variability in the contaminant concentration of composite samples. For this reason we are requiring a minimum of three composite samples to support a 303(d) listing (Category 5) and a minimum of ten composite samples for Category 1 determinations. Please also see the response to other comments regarding additional sources of uncertainty in the analysis.*

Comment from [Kalispel Tribe]: Applying any form of deemphasizing multiplication factor in the decision making process for using fish tissue concentrations as a listing criterion is inappropriate. This is especially the case when applying the current water human health criteria for PCB and Dioxin which were derived without considering that biomagnification is occurring in the waterbody and excludes the cancer risk of consuming Dioxin.

Ecology Response: *The multiplication factor was primarily intended as a means to create a 303(d) listings based on fewer samples when those samples had high contaminant concentrations. We have removed this provision in the policy, but have retained the 10X multiplication factor for TECc for a different reason. Please see the response to other comments on this topic for further information.*

Comment from [King County DNR]: Page 67. "Fish and Shellfish Harvest Use Assessment". Reference doses and cancer slope factors are based on arithmetic mean exposure concentrations over a day or lifetime, respectively. On this basis, we believe Ecology's use of the median fish

tissue concentration is inappropriate. This is especially true for environmental data like fish tissue contaminant concentrations that are almost always log-normally distributed. In these cases, use of the median concentration is biasing the assessment lower in a non-conservative manner. While King County recognizes that Ecology chose the median in an attempt to avoid substitutions for non-detect results, there are important toxicological reasons to use the arithmetic mean exposure concentration. Results below detection limits are typically incorporated into risk assessments following EPA guidance using 1/2 the detection limit in the arithmetic average calculations. This avoids loss of potentially important information in highly skewed datasets.

> **Ecology Response**: *There are two reasons why we have proposed the median rather than the average. The first reasons is that we are not trying to represent what the toxin level is in the fish population, we are trying to represent the concentration of a chemical that a person would typically be exposed to if they were to consume fish from a waterbody on a daily basis. Larger, older fish tend to have relatively higher accumulations of toxins, yet older age classes are less abundant in the population. Therefore a person is more likely to be consuming the typical size fish rather than the average size fish. Giving equal weight to fish that occur at a lower frequency with fish that occur at a higher frequency would not be representative of a typical human exposure pattern.*
>
> *The second reason is that the substitution of values for non-detects, which has been called data "fabrication", can cause erroneous category determinations. (See Helsel, D. 2010. Much Ado About Next to Nothing: Incorporating Nondetects in Science. The Annals of Occupational Hygiene, Volume 54, Issue 3, Pgs. 257-262) The TECc threshold for some chemicals may be well below the analytical detection limit such that choice of substituted values may be the primary driver of the category determination (also note that we will be using "J" flagged results at face value in the calculation of median). For these chemicals, substituting the detection limit for non-detect samples in order to permit the calculation of an average would mean that these waterbodies would be placed in Category 5 because the lowest average concentration would always be greater than the TECc. An alternative would be to substitute in the TECc or TECn value for non-detect samples whenever the TECc or TECn is below the detection limit. This however, may still inflate the Type I error rate. For example, consider a scenario for a non-carcinogen in which the TECn is below the detection limit. Assume 10 tissue samples are available, 9 of which are non-detects and one of which is just slightly above the TECn. Substituting in the TECn value or the detection limit value for the non-detects would result in an average that exceeds the TECn, yet the true average may be well below the TECn.*

Comment from [King County DNR]: Page 74: "PCB Sums" King County recommends that Ecology clearly specify that the sum of PCB congeners will use only detected congeners. Ecology has previously stated that non-detect values for any parameter are not used to conclude that an AU is impaired. The policy would be strengthened if the applications of non-detect values were more specifically defined. For instance, how a non-detect value may be used in part to derive a median, but is not used in arithmetic or geometric mean calculations except in specific circumstances.

> **Ecology Response**: *The 'Use of non-detect samples' section in Chapter 1E has been revised to provide more information on the use of non-detects. Non-detect samples that have a detection limit greater than the criteria will not be used in the assessment, as it is*

unknown if the non-detect meets criteria. For those parameters (including PCBs) that are summed to generate a "total" value, only the detected values for the individual addends are used for summing. Values that are qualified as non-detects are assigned a value of zero for the summing process when the group of analytes being summed has both detected and non-detected result values.

Comment from [NWEA]: Second, Ecology appears to eliminate from consideration data collected via semipermeable membrane devices (SPMD) in favor of only water column data and tissue data (although there are references to the SPMDs listed). See Draft Methodology at 63. SPMDs are a scientifically accurate way of measuring toxics in water. See, e.g., Ecology, Concentrations of 303(d) Listed Pesticides, PCBs, and PAHs Measured with Passive Samplers Deployed in the Lower Columbia River (March 2005) ("Semipermeable membrane devices were used to monitor chlorinated pesticides, polychlorinated biphenyls (PCBs), and polynuclear aromatic hydrocarbons (PAHs) in the Lower Columbia River below Bonneville Dam during 2003-2004. Washington and Oregon have placed the river on the federal Clean Water Act Section 303(d) list because fish and/or water samples have exceeded human health criteria for some of these compounds. . . . Results showed that human health criteria were commonly exceeded for dieldrin and PCBs, less frequently exceeded for DDT compounds, and not exceeded for PAHs. . . . . PCBs exceeded human health criteria at Bonneville Dam due to upstream sources[.]") (emphasis added). As Ecology knows, the value of SPMDs is that "water column concentrations were expected to be low, a passive sampling technique employing a semipermeable membrane device (SPMD) was used to concentrate and quantify the chemicals of interest." Id. at 1; see also id. at 32 – 45.

Ecology Response: *The current challenge to using such data is that Ecology does not have standardized protocols for conducting such sampling nor for analyzing the data. Our previous work in this area has identified some sampling and analytical problems that have yet to be resolved (e.g. contamination from the SPMD housing). However, the methodology for the domestic water supply use states that data from standardized "pre-concentration" sampling methods (e.g. high-volume water samplers) may be considered in the evaluation. This provision also allows for the use of semi-permeable membrane devices. In other words, once Ecology has reliable scientific methods for collecting and using such data, or when we are presented with such data from an external entity that is credible, we will consider it in our evaluation.*

Comment from [NWIFC]: For carcinogens, Ecology's draft approach is at odds with EPA regulations, which direct states to assess impairment as judged against the applicable water quality standards. More generally, Ecology's approach is troubling to the extent that it artificially narrows the universe of AUs deemed to be impaired. As a result, Ecology will effectively be divested of the ability to address waters that do not meet Washington's water quality standards. A better approach is to accurately assess the status of Washington waters, and then work creatively to remedy any impairment identified - ultimately attaining clean water and healthy fish. The tribes have consistently stated that they are willing to help tackle the challenges of meeting this goal, working to innovate within the bounds set by the Clean Water Act.

Ecology Response: *If Ecology were to assess impairment of waterbodies for protection of human health using only the human health criteria, we would be limited to using water*

column data only, since that is how the human health criteria are designed. With the exception of mercury, we do not have fish tissue criteria for the priority pollutants adopted in the standards. However, Ecology is taking a different approach to assessing waters for impairment in order to ensure that we are adequately protecting the uses associated with human health (harvesting of fish/shellfish and drinking untreated water). This is a somewhat unprecedented approach to assessment of human health protection, and therefore we are forging new ground in developing an assessment methodology that uses fish tissue data to determine impairment of a water for harvesting use. We've received many diverse comments on our approach and have judiciously reviewed those comments to make changes to Policy 1-11 that we believe represents an accurate and defensible listing methodology for Washington.

Comment from [NWIFC]: Finally, with respect to carcinogens, NWIFC appreciates that Ecology's draft removes a requirement that sediment and/or water quality data would also be required for a Category 5 designation, and supports not requiring this additional evidence, for all of the reasons explained in its earlier comments.

Ecology Response: *Comment noted.*

Comment from [Seattle]: If Ecology decides to include their new tissue proposal in the policy, SPU recommends that Ecology employ tissue data evaluation criteria that help account for the uncertainty in use of tissue data. The current proposal regarding Category 5 evaluations for carcinogens (bottom of page 67) already incorporates such criteria. These criteria include use of median composite values and TECc exceedance factors of 10 to 100 times. Such criteria will maintain protectiveness while reducing over-listing. SPU recommends that Ecology reevaluate its proposed criteria for non-carcinogens and consider whether they provide a balanced, protective assessment approach.

Ecology Response: *Language has been added to the policy that addresses the uncertainty associated with TECc thresholds.*

Comment from [Snoqualmie Tribe]: The draft assessment benchmarks for carcinogens are considerably less protective than the previous water quality standards. This is problematic. Ecology would require tissue exposure concentrations for carcinogens (TECc) to exceed for a single species in 3 composite samples or for the majority composite samples to exceed TECc. The plan must allow for designating waters as impaired at the TECc contamination level and not require the fisheries to be in exceedance of carcinogenic levels of impairment and experiencing deleterious health effects before Ecology will apply protective measures. Moreover, the TECN does not account for the carcinogenic effect of the contaminants and must never be used in lieu of a TECc. The carcinogenic effects of these contaminants must be included in the "impairment" for waters not meeting the WQS.

Ecology Response: *We disagree that the tissue evaluation methodology will be less protective. For example, the PCB tissue threshold used in previous assessments was 5.3 ppb whereas moving forward the threshold will be half as much (2.3ppb). As mentioned in our response to other comments on this topic, we are not aware of any other PCB tissue level being applied either in the United States or internationally that is less than 2.3ppb. Our response to the other comments also discusses why we will require*

carcinogen levels to be 10 times higher than the TECc in order to support a 303(d) listing. In regards to sample numbers, please refer to the responses to other comments on this topic. Lastly, the TECn thresholds are entirely separate from the TECs thresholds and are necessary for evaluating levels of contaminants known to have non-carcinogenic effects. When a chemical has both carcinogenic and non-carcinogenic effects, an exceedance of the lowest threshold will result in a 303(d) listing.

Comments on methodologies for arsenic and dioxins

Comment from [AWB]: Page 65 - It is likely that inorganic arsenic and perhaps other earth metals naturally occur in state waters at concentrations greater than WAC 173-201A-240 human health numeric criteria. Ecology should provide direction on how the proposed listing criteria will be applied for these data. It is Ecology's obligation to characterize natural conditions before any consideration for Category 5 listing can occur. AWB would again caution against the instinct to list on Category 5 and then depend on the TMDL development process to sort out the natural conditions component. This is counter to the plain language of WAC 173-201A. Category 2 or Category 3 would be appropriate interim listing choices while sufficient ambient monitoring is completed to more fully characterize water quality and natural sources.

Ecology Response: *We do not concur that it is Ecology's obligation to characterize natural conditions before any consideration for Category 5 listings can occur. EPA has been clear in previous guidance and direction that decisions for Category 5 listings should be made based on readily available data and not deferred or delayed because of data gaps. That said, where there is information available from historic data and/or studies that have concluded that a chemical is naturally occurring and there are no known sources within the study area, a natural conditions call can be made and the listing would go to Category 1.*

Comment from [Everett]: Pages 73-74, Arsenic. The policy notes that because EPA is reevaluating the existing federal arsenic human health criteria, there is no basis by which to evaluate arsenic impairment based on carcinogenic effects. They will evaluate freshwater by comparing it to the drinking water MCL of 10 ppb. This is a smart approach by Ecology. Ecology also acknowledges that "When credible studies that address natural background levels of arsenic are available, Ecology will consider this information in making impairment listing decisions." The City notes that NOAA's mussel watch provides an extensive data set covering more than two decades for more than 20 stations throughout the state. Ecology already uses the NOAA mussel watch data in 303(d) listing decisions, so Ecology is aware of the quality of that data set. Recommendation: Lincoln Loehr will provide Ecology with a spreadsheet presenting all the NOAA mussel watch arsenic tissue data for Washington which can inform Ecology of actual tissue concentrations.

Ecology Response: *If the NOAA data is part of a study to determine natural background levels, then it is feasible that we may be able to use the data to establish natural background levels of arsenic for use in the water quality assessment.*

Comment from [Kalispel Tribe]: The calculation for water concentration criteria for PCB and Dioxin already ignores the important biomagnification mechanism for accumulating PCB,

Dioxin, and similar toxicants in fish by excluding the bioaccumulation factor (BAF) and only uses the bioconcentration factor (BCF). The EPA Water Quality Standards Handbook specifically describes methods and models to use for estimating the BAF for inclusion in the calculation of water concentration criteria where none exists. The Dioxin water criterion is already magnitudes less protective than it should be since it pretends that there is no cancer risk associated with consumption of fish contaminated by Dioxin.

> **Ecology Response**: *Direct evaluation of tissue exposure concentrations relies upon neither BAFs nor BCFs. We do not believe that the BAFs and BCFs associated with the numeric criteria are reliable at the scale of individual waterbodies due to differences in factors such as trophic status, hydrology, water temperatures, sediment chemistry, etc. The BAFs and BCFs are not necessary to evaluate harvest use support because rather than translating a tissue concentration to a water concentration, the evaluation basically focuses on whether or not the contamination concentration in tissue exceeds the amount that a person should be ingesting on a daily basis. Please see our responses to other comments on this topic.*

Comment from [King County DNR]: Page 73: The only dioxin or furan congener regulated as a pollutant in Washington State is 2,3,7,8-TCDD. The other dioxin/furan congeners are not regulated pollutants on WAC 173-201A Table 240, nor as part of EPA's regulations in FR 85430. Ecology should adopt water quality standards for dioxins and furans other than 2,3,7,8-TCDD if analytical results from these chemicals are going to be used to make impairment decisions. If toxicity equivalent quotients are proposed by Ecology, they could be appropriately incorporated into that rulemaking.

> **Ecology Response**: *As stated in the comment, Ecology does not have water quality standards for the other dioxin/furan congeners. However, the toxicity of the other dioxin/furan congeners are known and toxicity equivalent factors (TEFs) are well established. The resulting toxic equivalent values (TEQs) will be compared to the 2,3,7,8-TCDD thresholds and any exceedances will result in a Category 2 listing. The policy has been revised to reflect this change.*

Comment from [King County DNR]: Page 73: "Parameter Specific Data Requirements - Arsenic". King County appreciates Ecology's efforts to develop a realistic health protective evaluation protocol for arsenic in water and tissues.

> **Ecology Response**: *Comment noted.*

Comment from [NWEA]: Third, Ecology seems to think that it can ignore certain criteria, namely for arsenic and dioxin. It cannot. It is not clear what Ecology means when it states: "Evaluating arsenic at carcinogenic effect levels must occur using the approach to directly evaluate attainment of human health criteria." Draft Methodology at 74. There is nothing in the water quality standards that allows Ecology to ignore the applicable criteria and, instead, use drinking water exposure concentrations "that are rooted in the human health criteria equations[.]" Id. at 70. There are two arsenic criteria promulgated to protect human health in Washington, one of which is for "water and organisms." Ecology is not free to tease apart the equation that generated the 0.018 ug/l water plus organisms National Toxics Rule criterion in order to determine a new criterion to apply to ambient levels of arsenic. It certainly is not free to use the

Safe Drinking Water Act (SDWA) MCL of 10 ug/l value because that value includes the cost of treatment, an element of analysis allowed under the SDWA but not under the Clean Water Act. Yet that is what Ecology proposes to do. Id. at 74.

> **Ecology Response**: *Ecology has the latitude to uncouple drinking water exposure concentrations and tissue exposure concentrations from the human health criteria and evaluate each separately under our narrative criteria provisions in the water quality standards. It makes sense to do so because the fish/shellfish harvesting and drinking water supply are two separate designated uses that need to be individually protected. Evaluating these two uses separately are options in addition to a direct evaluation of the human health criteria attainment.*
>
> *The human health criteria can be used to evaluate arsenic and dioxin concentrations when sufficient credible data are available. However, what we are stating in the policy is that we will not also be evaluating drinking water exposure concentrations and tissue exposure concentrations for carcinogenic effects for these two toxics because their associated cancer slope factors have recently been identified by EPA as requiring re-evaluation of their accuracy and therefore we do not feel comfortable using erroneous cancer slope factors to derive DWECs and TECs from the human health criteria. Please refer to the parameter specific information subsection within the Toxics- Human Health Criteria section of the policy for further explanation of this issue.*

Comment from [NWIFC]: When viewed against its previous water quality assessment policy, Ecology's current draft raises the bar for listing an AU as impaired for numerous parameters. In the case of WQS that protect the harvest use, Ecology's draft increases the number of composite-sample exceedances required for Category 5 listings for both carcinogens and non-carcinogens. It also ignores entirely the fact that dioxins and arsenic are carcinogens - and that the currently effective WQS recognize them as such. And it devises assessment benchmarks for carcinogens that are less protective than the state's current WQS. As a consequence, Ecology's draft approach will result in fewer Category 5 listings than would an approach that did not increase the evidentiary requirements and alter the assessment benchmarks. Specifically, NWIFC again urges that Policy 1-11 enlist benchmarks (e.g.,a tissue exposure concentration (TEC)) for all contaminants that reflect the criteria in the currently effective water quality standards (i.e.Table 1- Human Health Criteria for Washington, 81 Fed. Reg at 85430-31). Thus, Policy 1-11 should provide for a TECc for each of 2,3,7,8-TCDD (dioxins), and arsenic using the "cancer slope factor" in Table 1 to derive a TECc per the standard method outlined in Ecology's draft at p. 65 for "chemicals that have a carcinogenic effect." Ecology's justification for ignoring these contaminants' carcinogenic effects misses the mark, given that "impairment" is a statement about whether or not waters are meeting the applicable WQS.

> **Ecology Response**: *Ecology will evaluate the non-carcinogenic effects of dioxins and arsenic for the protection of public health, but because of the uncertainties around the cancer slope factors for these two compounds, and especially in light of EPA's partial disapproval of Washington's human health criteria, we cannot in good faith apply numbers that EPA has deemed to be indefensible. In EPA's Technical Support Document issued in November 2016 as part of their partial approval/disapproval of Washington's human health criteria, EPA noted its intent to reevaluate the existing federal human health criteria for these two compounds by 2018. EPA noted that it was withdrawing its*

federal proposal of proposed criteria for dioxin and arsenic, given the uncertainty regarding aspects of the science, and was taking no action on Washington's dioxin criteria. As a default, EPA left the existing criteria from the NTR in effect for Washington based on assumptions made in the criteria equations at that time. The TECn and DWECn for these compounds are well below the NTR numbers EPA promulgated. Given this and the short timeframe that EPA indicated it is reevaluating the federal criteria for these compounds, we have decided to wait until EPA has come out with defensible numbers before applying a TECc or DWECc.

Comment from [PSKA & SRK]: Ecology's plan for dioxins and arsenic is harmful and insufficient to protect human health. (Draft pp. 73-74). Ecology can and should immediately calculate and implement a TECc and DWECc for these compounds. Until that time, Ecology should apply the NTR standards. Because TCDD is so toxic both as a non-carcinogen and as a carcinogen, perhaps a single detection or exceedance in fish tissue (TECn or TECc) should result in a Category 5 listing instead of a Category 2 listing.

Ecology Response: *See above response to NWIFC.*

Comment from [WSPA]: Given the current analytical detection limits, application of this proposed Policy is anticipated to lead to many more Category 5 impairment listings. The stringent human health-based water quality criteria for arsenic, mercury, selenium and dioxin, coupled with more sensitive analytical methods, and pollutant contributions from natural or societal non-point sources, are of particular concern to WSPA. More specifically, WSPA is concerned with the stringent water quality standards and how they affect specific substances such as metals, particularly arsenic, mercury, selenium, and dioxin. For example, the PCB levels could be found in pristine mountain streams due to atmospheric deposition, outside of the control of any businesses that might wish to use the water.

Ecology Response: *Ecology must use the applicable water quality standards in determining whether or not a waterbody's designated uses are impaired.*

Comment from [WSPA]: Assumptions should not be made that water quality data is human caused versus natural. This is arguably poor policy and questionable science because it is subjective analysis in guidance not based on scientific data. For example, the goal should be to avoid standards – such as with arsenic – that "clean" natural water quality by setting standards lower than the natural background levels in some water bodies.

Ecology Response: *Comment noted.*

Comments on fish species to be used for assessment

Comment from [Boeing]: Page 66 — High Site Fidelity. In order to ensure transparency and allow for meaningful comment, Ecology needs to include in a revised Draft Policy a list or table of acceptable species that would be considered to have high site fidelity. The Draft Policy includes a requirement that tissue samples used for fish harvest use assessment in AUs for listing in Category 5 and Category' 1 must be from fish species with high site fidelity. The Draft Policy

further explains that fish tissue samples from fish species that travel long distances would not be representative of water quality conditions within the AU grid cell in which it is caught. Boeing supports this approach, as it is consistent with the principle that a Category 5 or Category 1 listing for an AU would not be based on fish tissue samples from fish that do not reflect the water quality within that AU. However, the Draft Policy includes formulas on page 65 for tissue exposure concentrations ("TEC") that are not scientifically robust. Specifically, both formulas for TEC (TECN and TECc) rely on a "fish consumption rate" that includes anadromous fish and other fish that are not high fidelity species. The effect of this is the formulas include a component that is reflects risk that cannot be addressed by the water quality in that AU, which does not meet the requirement of credible data. This aspect of the TEC formulas is not adequately discussed or explained, either from a scientific or policy standpoint in the Draft Policy. Boeing requests that Ecology provide such explanation in a revised Draft Policy.

> **Ecology Response**: *The comment seems to make an argument that nonresident salmon may comprise a larger proportion of consumed fish relative to resident fish and therefore resident fish can be allowed to have higher levels of toxins in their tissue. The comment also suggests that Ecology cannot assess fish tissue toxins unless we know actual waterbody specific fish consumption rates. Ecology does not agree with the premises suggested by the comment. The fish consumption rate in the human health criteria was established as a statewide number, and is applicable to all state waters, regardless of species present or species proportions consumed. This section has been revised to clarify that for Category 5 listing purposes, fish/shellfish tissue data must be representative of chemical contamination in the waterbody from which the fish was collected. Therefore, Category 5 listings will be made using tissue data from resident fish/shellfish species. In freshwaters and marine waters, anadromous fish species are generally considered to be non-resident unless information exists that the species is resident to the area (such as blackmouth chinook salmon). When tissue data from a resident species is not available for a given AU but tissue data from a nonresident species is available, the AU will be placed in Category 2 as a "Water of Concern" if the composite tissue sample for a nonresident species exceeds a TEC.*

Comment from [Boeing]: Page 66 — Composite samples and pages 67 — 69 — Category determinations for fish and shellfish harvest use. Please clarify if the terms "composite sample" and "sample' refer to the same definition "composite samples is made of up at least three individual fish." The following are examples of where the text is unclear: Page 66, Composite samples: "Composite samples are made up of at least three individual fish" "All samples are treated as independent whether or not they are collected in the same day, season or year. Does the term "All samples" refer to a composite sample or a sample of an individual fish? Page 67 and 68, Category 5 determination for both carcinogen and non-carcinogen pollutants. The use of "composite sample" and "sample" is confusing. The revised Draft Policy also needs to clarify the minimum number of fish or shellfish required to trigger a Category 5 listing. Page 66 — Quasi-composite samples. This section allows for a composite sample to be made using fish of different species under certain conditions. The allowance for "quasi- composite sample is unclear and does not ensure that listings are based on credible data, and should therefore be deleted.

> **Ecology Response**: *The language regarding composite samples has been edited. The minimum number of fish/shellfish composite samples needed to trigger a category 5 listing is 3 samples exceeding the applicable TEC threshold.*

We disagree that the language about quasi-composite samples is unclear and decline to remove this provision.

Comment from [Boeing]: Page 68 — Category 2 determinations. There is a notation that this applies to all species, including those caught in migration or that have low site fidelity (e.g. salmon and steelhead). In order to ensure transparency, the Policy should include a mechanism to ensure that EIM submittals document the species that the submitted data analysis is based upon.

Ecology Response: *EIM contains a field that designates the species from which a sample was collected.*

Comment from [King County DNR]: Page 66: "Fish and Shellfish Harvest Use Assessment". King County does not support the use of quasi-composite samples to make listing decisions. Two individual fish of one species should not be combined with 1 individual of another species to make listing decisions. We believe that collecting six or nine fish from a waterbody to form 2 to 3 composite samples represents a bare minimum data requirement. King County recommends that waterbodies be placed in Category 2 or 3 when fewer than the minimum number of fish/shellfish samples are available.

Ecology Response: *Common sampling protocols do not combine multiple species within a single composite sample. A quasi-composite is the median chemical concentration from individual fish of the same species collected at different times in a single year; a quasi-composite requires results from at least three individual fish.*

A Category 5 determination requires a minimum of three composite samples (or quasi-composite samples) with a median value above the applicable numeric threshold. We note that the three composites may come from three different species. When each composite sample comes from a different species, the value from each of those species must exceed the threshold. For example, three rainbow trout composite samples having a median PCB value that exceeds the TECn would result in Category 5 as would one rainbow trout composite sample, one walleye composite sample, and one largemouth bass composite sample, when all three of the PCB values from those species exceed the TECn.

Comment from [King County DNR]: Pages 65-66: "Fish and Shellfish Harvest Use Assessment". Inclusion of a list or table of "high site fidelity marine species" would improve the clarity of this subsection.

Ecology Response: *Ecology considered providing a list but upon researching the issue, decided a list of specific species could not be reliably developed. Instead, this section has been revised to clarify that for Category 5 listing purposes, fish/shellfish tissue data must be representative of chemical contamination in the waterbody from which the fish was collected. Therefore, Category 5 listings will be made using tissue data from resident fish/shellfish species. In freshwaters and marine waters, anadromous fish species are generally considered to be non-resident unless information exists that the species is resident to the area (such as blackmouth chinook salmon). When tissue data from a resident species is not available for a given AU but tissue data from a nonresident*

species is available, the AU will be placed in Category 2 as a "Water of Concern" if the composite tissue sample for a nonresident species exceeds a TEC.

Comment from [NWEA]: Page 63 – 2I. Toxics-Human Health Criteria Ecology is evidently working hard to prevent its new human health criteria for toxics from being used. There are numerous problems with its proposal. First, Ecology states that "[s]amples from anadromous fish will not be used to place freshwaters in Category 5." This is an incorrect understanding of how fish reflect water quality. (See comment letter for several examples of studies showing that anadromous fish are a scientifically sound measure of poor water quality).

Ecology Response: *The presence of a contaminant in an adult anadromous fish caught in a river does not necessarily mean that the fish accumulated the contaminant in the river. The resident species in the river are a more reliable indicator of the pollutant levels associated with land uses in the watershed that can be controlled through a TMDL. This section has been revised to clarify that for Category 5 listing purposes, fish/shellfish tissue data must be representative of chemical contamination in the waterbody from which the fish was collected. Therefore, Category 5 listings will be made using tissue data from resident fish/shellfish species. In freshwaters and marine waters, anadromous fish species are generally considered to be non-resident unless information exists that the species is resident to the area (such as blackmouth chinook salmon). When tissue data from a resident species is not available for a given AU but tissue data from a nonresident species is available, the AU will be placed in Category 2 as a "Water of Concern" if the composite tissue sample for a nonresident species exceeds a TEC.*

Comment from [NWIFC]: NWIFC also supports Ecology's recognition in this draft that a 10-year sliding window, rather than a 5-year sliding window, for data consideration is more appropriate. NWIFC further supports Ecology's recognition that it is appropriate to consider quasi-composite samples comprised of multiple fish species, as provided in this draft.

Ecology Response: *Comment noted.*

Comment from [PSKA & SRK]: In the Draft, the definitions of the "edible portions" of species that will be used for analysis may not mesh with what people are actually eating. (Draft p. 65). For example, some individuals or populations may consume more than just the fillet of a finfish. Some individuals or populations may consume the entire fish, therefore the entire fish should be considered "edible" – not just the part of fish that the dominant culture prefers to consume.

Ecology Response: *We recognize that there are populations that may consume more than just the fillet portions of fish. Given that fish fillets are the most common portion of fish consumed, using the fillets provides a representative baseline of contaminants in fish. Using the same portion of fish allows for more consistent evaluation of contaminant levels in fish tissue over time.*

Comment from [PSKA & SRK]: We previously raised concerns during the summer of 2017 regarding the types of fish that will be used for tissue sampling. We remain concerned. The Draft states that marine tissue samples must generally be from species with high site fidelity. What about salmon? What about other anadromous fish or species that do not have high site fidelity?

People eat many kinds of fish including those that do not remain in one location. People also eat fish of many ages. In particular, older fish tend to be larger and thus more prized in some species. People can and do eat older fish, and in some instances prefer a larger, older fish. If people eat it, it should be tested and considered with equal weight for listing purposes.

> **Ecology Response**: *The intent of describing what tissue samples will be used in the assessment is to help ensure that the samples are representative of the waterbody where the sample was taken. Ecology intends to assess data from both resident and non-resident fish. However, Ecology will only use data from resident fish as the basis for a 303(d) listing unless supporting information demonstrate that a non-resident fish accumulated the contaminant in the waterbody assessment unit being evaluated. Based on comments, we revised language to clarify that for Category 5 listing purposes, fish/shellfish tissue data must be representative of chemical contamination in the waterbody from which the fish was collected. Therefore, Category 5 listings will be made using tissue data from resident fish/shellfish species. In freshwaters and marine waters, anadromous fish species are generally considered to be non-resident unless information exists that the species is resident to the area (such as blackmouth chinook salmon). When tissue data from a resident species is not available for a given AU but tissue data from a nonresident species is available, the AU will be placed in Category 2 as a "Water of Concern" if the composite tissue sample for a nonresident species exceeds a TEC. Regarding age of fish, since the assessment includes fish that are of harvestable size, a range of ages are captured.*

Comment from [WSPA]: WSPA believes that the assessment of fish tissue to evaluate the "harvest" designated use should include all the fish species harvested in the assessment unit. This would include salmonids, and not just the resident fish/shellfish described in the Policy.

> **Ecology Response**: *See above response to PSKA & SRK.*

Comments on methodology for Domestic Water Supply

Comment from [AWB]: Page 70, 2 I(3) Category Determinations for Domestic Water Supply – The rationale for Category 5 listing based on the domestic water supply designated use is very confusing and reflects an improbable exposure scenario. Does Ecology have evidence that the target population drinks 2.4 liters/day of untreated surface water from any Assessment Unit? Given this improbability, Ecology should be very careful that this proposed listing criteria does not actually drive a Category 5 listing independent of evaluation criteria for other designated uses. As an example, why does the Category 5 evaluation criteria even mention fish/shellfish tissue concentrations detected during the last 10 years? These data would presumably be relevant for the harvest designated use, but not apparently for domestic water supply.

> **Ecology Response**: *The assumption that the target population drinks 2.4 liters/day of untreated surface water comes from EPA recommendations to states as a default assumption and has been adopted by Ecology in developing the human health criteria for Washington. Thus, we are using this assumption in developing the DWECs for assessing consumption of untreated drinking water. Regarding your comment on considering fish/shellfish concentrations, we have taken this out of the final policy as suggested.*

Comment from [Boeing]: Page 71 — Category 5 determinations. The Drinking Water Exposure Concentrations ("DWEC") for both carcinogen and non-carcinogen pollutants (DWECc and DWECn) include a listing trigger if the parameter has been detected in fish/shellfish tissue during-the last 10 years. The reliance on fish tissue data for a determination of drinking water exposure is not justified by any scientifically valid theory; to rely on fish/shellfish tissue sample results to supporting a listing based on drinking water exposure would not meet the requirement of credible data. These provisions need to be deleted.

> **Ecology Response**: *We have removed the requirement for tissue data to corroborate water data in the domestic water supply evaluation.*

Comment from [Everett]: Pages 70-72. A minimum of two exceedances of a DWECc or a DWECn, which also must occur in two or more water years is required for a category 5 listing. That part seems sensible. However, the policy does something very strange here in that it can also list as category 5 for domestic water supply simply if the parameter has been detected in fish/shellfish tissue during the last 10 years. This creates the oddity that to be listed as impaired for fish or shellfish harvest the tissue data needs to exceed the TECc by a factor of 10 or more, as a median of composite samples, for several species, yet the same tissue data that may pass the category 5 listing criteria for fish or shellfish harvest use can be used to list as impaired for domestic water supply use, based simply on any detection in fish or shellfish, at any levels, even below the TECc or TECn. Recommendation: Delete the use of tissue data in the domestic water supply use assessment.

> **Ecology Response**: *We have removed the requirement for using tissue data to support a domestic water supply listing. The intention for the tissue data requirement was to help determine if there was evidence of persistence of the chemical in the waterbody since it is difficult to infer persistence of a chemical based on water samples alone. The idea was that if a chemical is showing up in tissue, then its presence is indicative of a longer term issue rather than a transitory occurrence of the chemical in the waterbody.*

Comment from [King County DNR]: Page 71-72: "Domestic Water Supply Use Assessment". Freshwater bivalves are often sparse in urban systems, a keystone element of healthy freshwater ecosystems, and also increasingly threatened by habitat alteration, pollution, and invasive species. The depuration rates of contaminants from freshwater bivalves, which can live decades and in some cases over 100 years, are also unknown. These characteristics make them poor candidates and predictors of PAH persistence. The Category Determination for Domestic Water Supply appears to require analysis of bivalves to demonstrate that PAHs are not "persistent" in the AU. EIM currently does not include chemistry data for any freshwater mussels. King County believes the widespread collection of freshwater bivalves to evaluate drinking water designated uses is inappropriate. Therefore, we recommend that Ecology rewrite the test for non-attainment (Category 5) to require the average detected PAH concentration of three or more water samples collected over at least two years exceed the DWECc. Because non-carcinogenic effects are expressed as daily allowable reference doses, the average detected water concentration from three or more sampling events exceeding the DWECn is sufficient basis to determine impairment for non-carcinogens.

> **Ecology Response**: *We have removed the requirement for fish or shellfish tissue data for assessing the domestic water supply use.*

Comment from [King County DNR]: Page 72: "Domestic Water Supply Use Assessment". The basis to require that 90% of the water sample values are below the DWECc and DWECn has not been articulated and does not appear to be based on risks from carcinogens or non-carcinogens. King County recommends that 95% (i.e., a 5% error rate) of water concentrations be less than the DWECn to ensure that any day exceeding the DWECn is a rare event. Because carcinogenic effects are based on lifetime exposures. King County recommends that the 95%ile upper confidence limit (UCL) of the arithmetic mean be compared to the DWECc. AUs with a 95%ile UCL less than the DWECc would be considered Category 1 . This would be consistent with other EPA risk assessment guidelines, assumptions, and avoids the current arbitrary Policy 1-11 rule that no single sample exceed 100 times the DWECc or 10 times the DWECn. Highly skewed datasets will instead have a higher 95%ile UCL and remain classified as impaired. King County agrees that 25 or more water samples collected over three or more years is adequate to conclude that the domestic water supply designated use is being met. While freshwater bivalves may in some select circumstances be another line of evidence to document attainment of designated uses, they are not widely monitored for contaminants at this time and should not be a required component of water quality monitoring programs.

> **Ecology Response**: *We would prefer to assess the water concentrations based on confidence intervals. However, until laboratory detection limits become consistently lower than the numeric thresholds we are using, it isn't practical to construct non-parametric confidence intervals for individual assessment units that can appropriately deal with non-detect values for every waterbody in the state with data. At this time we will retain the requirement for 90% of samples to meet the threshold for Category 1 determinations, which would mean that less than three samples could exceed the applicable threshold if the minimum required number of 25 samples is available in a three year period.*

Comment from [King County DNR]: Page 71: "Domestic Water Supply Use Assessment". Median contaminant concentrations are used for comparison with the calculated DWECn and DWECc values. When conducting a toxicological assessment, reference doses and cancer slope factors are not based on median exposures; they are based on arithmetic average exposures. This is particularly important for environmental media where exposures are frequently log-normally distributed. When some detection limits are not adequate for comparison with the DWECn and DWECc that represents a situation where more, higher quality data are warranted. In lieu of analysis with adequate detection limits, we request that Ecology utilize Category 2 to highlight the AU is of concern.

> **Ecology Response**: *We think that the exceedance of a DWECc by the median sample value for a given chemical provides sufficient confidence that the waterbody should be placed in Category 5. The datasets we will use to evaluate domestic water supply use support are small, likely from a non-normally distributed population, will include values censored by multiple detection limits, and comparison thresholds (DWECs) whose relationship to the detection limit may vary from sample to sample. Substitution for non-detects in this scenario can result in incorrect conclusions (See Helsel, D. 2010. Much Ado About Next to Nothing: Incorporating Nondetects in Science. The Annals of Occupational Hygiene, Volume 54, Issue 3, Pgs. 257-262). Given these factors, we think that the median is a more appropriate measure than the mean concentration.*

Comment from [King County DNR]: Page 71: "Domestic Water Supply Use Assessment". Ecology's EIM database has never accepted "blank" results in the past and we know of no initiatives to incorporate laboratory or field QA samples into EIM. King County agrees that evaluating blanks is a critical step in examining low level organic contaminants in water. We recommend water data that is validated according to EPA data validation guidelines be identified as such in EIM so that it may be incorporated into the assessment appropriately. Data not validated according to EPA Superfund Contract Laboratory National Functional Guidelines (e.g., EPA document EPA-540-R-2017-002) should not be included in the assessment as these un-validated results cannot confidently be considered representative of the AU exposure concentrations. The text on page 71 implies that Ecology data managers may not be following EPA National Functional Guidelines for data validation and the National Functional Guidelines for Data Review are also not cited in Policy 1- 11, Chapter 2. While not every analytical result requires such a high level of scrutiny to be credible under Washington's Credible Data Act, low level organic contaminant analyses are frequently cross-contaminated in the field or the laboratory and only results validated under the National Functional Guidelines should be included as credible for comparison with DWECc and DWECn values.

> **Ecology Response**: *The intent of the language on page 71 is to provide an additional quality control step for potential Category 5 listings. It is not meant to imply that Ecology data managers, or external data submitters, are not validating their data. Datasets submitted to EIM should follow the data quality objectives outlined in the project QAPP and have the appropriate level of quality planning and quality assurance marked in EIM. We recognize that low level organic sampling and analyses are subject to contamination. By manually reviewing blank data for these low level results as part of the assessment process, there is greater confidence in a resulting Category 5 listing. This review of potential Category 5 listings will require obtaining information from reports or project managers because, as the commenter noted, the blank information is not stored in EIM.*

Section 2J: Turbidity

Comment from [EPA Region 10]: We understand that Ecology is not proposing any changes to turbidity methods. However, the EPA is interested in learning more about the population of background turbidity levels measured at reference or sentinel sites used by Ecology to implement the applicable criterion.

> **Ecology Response**: *The turbidity criteria are applied by evaluating the difference in paired daily values measured at an assessed site and a site upstream of the land use suspected as the source of the turbidity. We currently do not use turbidity values at Ecology's reference or sentinel sites to establish background numbers for implementing the criteria.*

Comment from [Streamkeepers]: The Category 5 listing policy for turbidity should include a way to calculate percent exceedances based solely on data collected during storms, as you generally wouldn't expect to see turbidity in creeks under normal conditions except during storms. Ecology's listing policy for Category 1 makes clear that to be unimpaired, a water body

shouldn't show exceedances specifically during 95% o the storm events sampled. Obviously it's the storm event that defines the condition under which the impairment occurs, so the Category 5 policy should reflect that condition.

> **Ecology Response**: *The policy was clarified by adding the following language: "Temporal variability will be considered in the evaluation. For example, if elevated turbidity only occurs during high flows, then high flow conditions will be evaluated separately from low flows."*

Part 3. Sediment Quality Criteria

Comment from [Boeing]: Page 85 — Please clarify if the "Bioassay Decision Flowchart" is the "Biological Flowchart" referenced in the Chemistry Decision Flowchart

> **Ecology Response**: *The naming convention will be consistently applied to avoid confusion. The "Biological Flowchart" referenced in Figure 1 "Chemistry Decision Flowchart" will be renamed "Bioassay Decision Flowchart".*

Comment from [Everett]: Pages 78-81, Part 3: Concern: Category 5 Administrative Override on page 81is suspect. There are sediment stations that have been listed as Category 5 by Ecology in the past for zinc (and probably some other metals as well), and the listings have been highly misleading. The actual data showed that the zinc sediment quality standards were met, but since it was a cleanup site, it was listed anyway as impaired for zinc. This in turn has been used to describe how many stations in Puget Sound exceed the sediment quality standards for zinc. Recommendation: Although a particular sediment segment is a cleanup site, it should not be listed as Category 5 for any parameters that do not exceed criteria. There should be some parameters in the segment that exceed criteria and Category 5 listings should be based only on those parameters.

> **Ecology Response**: *A Category 5 listing is based on data exceeding the Sediment Management Standards chemical or biological criteria. The data used can be from Ecology's EIM database or hardcopy data from reports (this is the Administrative Override).*
>
> *There is a two-step process in Category 4B listing as described below. The first step involves identifying 1/4 grids that are part of known cleanup sites. Information is obtained from Site Managers to identify specific 1/4 grids and the chemicals and biological exceedances being addressed by the cleanup work. This process is known as an Administrative Override and is a different process from the Category 5 Administrative Override (see flowcharts). All of the 1/4 grids identified by the Site Managers are then categorized as 4B. All chemicals related to these grids in the cleanup Site exceeding SQS and SIZmax are listed in the basis statement for each grid being addressed by the cleanup. The second step involves reviewing appropriate EIM data. This data is linked to the appropriate grid and the assessment is based upon the EIM bioassay and chemistry data. Listings can be based upon step one or step two or both in combination.*

Comment from [King County DNR]: Page 60: "Toxics - Aquatic Life Criteria". King County agrees that multiple bioassay results measuring statistically significant responses with known pollutants present (even if below criteria) are cause for additional investigation of the impairment. By extension, when bioassays fail to show significant impairments of growth, mortality, or reproduction, the lack of adverse effects demonstrates that the aquatic life beneficial use is met and the AU should at a minimum be placed in Category 2. We request that these same principles be applied to sediments evaluated in later sections of Policy 1-11 and under MTCA.

> **Ecology Response**: *Page 60 refers to water column bioassays only, not sediment bioassays. Therefore MTCA does not apply.*

Comment from [King County DNR]: Page 79: "Assessment Information and Data Requirements - Sediment Data Requirements". King County does not agree with using a 0-16 cm sediment depth as a default biologically active zone. We recommend revising this section to recognize that that default marine biologically active zone according to the Sediment Cleanup User's Manual is 10 cm. When important biological resources are known to burrow deeper (e.g., ghost shrimp), deeper depths may be appropriate on an AU specific basis.

> **Ecology Response**: *For intertidal samples, there may be a need to site-specifically assess the depth of the biologically active zone (BAZ) and harvestable resources to ensure protectiveness. Ecology has determined that in order to ensure no significant BAZ are disregarded in this global assessment, a default 16 cm depth was included rather than the 10 cm minimum default depth.*
>
> *It should be noted, that all BAZ sample depths for King County were ≤ 10 cm.*
>
> *Additional considerations for benthic sampling include the following from Sediment Cleanup User's Manual II (SCUM II): "Not all benthic organisms have the same biologically active zone. A biologically active zone for typical subtidal, soft-bottom sediment (10 cm) has been established for Puget Sound that is protective of most benthic organisms. Important resources at the site may be identified for the Conceptual Site Model that require protection and live in a different (typically deeper) biologically active zone. That particular depth should be sampled for evaluation of risk to that organism (e.g., geoduck, burrowing shrimp, horse clam, etc.)."*

Comment from [King County DNR]: Page 79: "Assessment Information and Data Requirements - Sediment Data Requirements". The EPA Solid Waste Methods in SW-846 no longer reference or report method detection limits. King County agrees that the practical quantitation limits and the new 'lower limit of quantitation' (LLOQ) cited in SW-846 are functionally synonymous. We request that Ecology remove currently approved EPA methods.

> **Ecology Response**: *Ecology agrees that Lower Limit of Quantitation (LLOQ) is functionally equivalent to the Practical Quantitation Limit (PQL) as long as the Minimum Detection Limit (MDL) is provided. This will be updated as it was similarly updated in the Sediment Cleanup User's Manual II (SCUM II).*
>
> *Per SCUM II: "Ecology recognizes that the PQL, method reporting limit (MRL), and LLOQ are generally the same concept (i.e., PQL ≈ MRL ≈ LLOQ). Ecology will accept reporting of the LLOQ (EPA SW-846 method) and recognizes that EPA SW-846 no longer includes method detection limits (MDL). However, since this is a requirement in MTCA, reporting of the MDL is also required. Also refer to SCUM II Chapter 11, Section 11.2.2 and Appendix D Section D2 SCUM II for further discussion.*

Comment from [Seattle]: Part 3 (Sediment Quality Criteria), page 79, 5th bullet. Recommend a footnote to help reader stating that, currently, the SMS does not include freshwater biological or chemical tests and sediment quality standards for freshwater are reserved/case-by-case.

> **Ecology Response**: *A statement will be placed in the policy which states: "Freshwater sediments are evaluated on a case-by-case basis as established in Part III (WAC 173-204-340). Bioassays are the definitive tool to determine impact to freshwater sediments.*

Comment from [Seattle]: Part 3 (Sediment Quality Criteria), page 83, Category 1. Suggested edits.

> **Ecology Response**: *Ecology will add the following edit as suggested: "A quarter grid AU will be placed in Category 1 if it has been determined by Ecology to meet the SQS benthic criteria (WAC 173-204-320 through 173-204-340), which includes marine, low salinity, and freshwater sediment."*

Comment from [Seattle]: Part 3 (Sediment Quality Criteria), page 79, section on Assessment Information, first sentence. Recommend expanding to help reader understand what numeric and biological criteria are currently available for the different salinity conditions.

> **Ecology Response**: *Ecology will add the following sentence: WAC 173-204-200 "Sediments are defined as follows: Marine sediments have pore water salinity ≥ 25 ppt. Low salinity sediments have pore water salinity is > 0.5 ppt and < 25 ppt salinity. Freshwater sediments have pore water ≤ 0.5 ppt salinity. Numeric and biological criteria are established for saline and freshwater environments. Low salinity conditions are generally assessed using marine criteria."*

Comment from [Seattle]: Part 3 (Sediment Quality Criteria), page 79, section on Assessment Information, first bullet. Based on earlier drafts of the sediment assessment approach (e.g., see November 14, 2016 Ecology presentation on sediment listing policy), the concentrations of each of the three highest concentrations of a chemical would be averaged and that average would be compared to the SMS chemical criteria. That approach is not clear in the February 2018 draft policy.

> **Ecology Response**: *The approach has been changed from the previous draft and assessment. With guidance from EPA, the new policy was developed to ensure that both Sediment Management Standards chemical criteria (SQS and SIZmax) are used independently and consistent with how the biological criteria are used in the biological assessment process. Using a mean for chemistry does not result in independently using both the SQS and SIZmax criteria. We believe that using both SQS and SIZmax criteria independently in the assessment meets the intent of the Sediment Management Standards rule.*

Comment from [Seattle]: Part 3 (Sediment Quality Criteria), Regulatory Authorities, page 78, last para.: Restate to conform simply to EPA's December 18, 2015, decision regarding Washington's revised Sediment Management Standards,

> **Ecology Response**: *The following will be used to replace the sentence in the Policy: "Parts I - IV were promulgated under the authority of Chapter 90.48 RCW, Water Pollution Control Act, and Chapter 70.105D RCW, Model Toxics Control Act (MTCA), to establish marine, low salinity, and freshwater surface sediment management standards for the state of Washington. They are EPA approved water quality standards consistent with CWA Section 303. EPA did not take action on Part V, therefore Part V is not used as water quality standards in this policy.*

Comment from [Seattle]: Part 3 (Sediment Quality Criteria), page 79, section on Assessment Information, second bullet. Is the comparison in this bullet intended to be done for each chemical? That should be clarified.

> **Ecology Response**: *Yes, a grid is assessed on a chemical by chemical basis. Each chemical in a grid will have a category determination. This will be clarified in the policy.*

Comment from [Seattle]: Part 3 (Sediment Quality Criteria), page 80, third bullet on BioScore. The phrase "and there can be multiple spatially distinct and chemically similar stations per grid" is not clear. Can more context or an illustrative example of this concept be included here?

> **Ecology Response**: *WAC 173-204-510 and Sediment Cleanup User's Manual II (SCUM II) Chapter 2 addresses these terms in relation to cleanup and identification of station clusters. We will clarify Policy 1-11 to reflect that there may be multiple stations within the same 1/4 grid. Each of these stations may exceed the chemical standards for multiple SMS chemicals. Each station within a 1/4 grid with similar spatial and non-contaminant-related chemical attributes (e.g., water depth, current, salinity zone, pH, DO, temperature, Total Organic Carbon, sediment grain size, etc.) for each chemical, will be assessed as a group. If chemical attributes of sample-station locations are determined by Ecology to be dissimilar (e.g., divergent salinities, grain size, etc.), those locations will not be considered chemically and spatially similar to one another and thus will not be assessed as part of the same assessment grouping.*

Comment from [Seattle]: Part 3 (Sediment Quality Criteria), page 80, BioScore. For the BioScore system, in addition to Category 5, need to define Categories 1, 2, 3, and 4 as is done for ChemScore.

> **Ecology Response**: *The following will be added at the end of page 80 to clarify the categorization. Some differences exist between ChemScore and BioScore designations, (see footnote) therefore matching the ChemScore format exactly is not possible.*
>
> *For each BioStation, bioassay points (BioPoints) are assigned based upon the number and level (SQS and SIZmax) of SMS bioassay exceedances as follows:*
> *No exceedance of SMS bioassay criteria = 0 BioPoints,*
> *SQS exceedance = 1 BioPoint, and*
> *SIZmax exceedance = 2 BioPoints.*
>
> *The total BioPoints for a 1/4 grid containing 3 BioStations with the highest number of bioassay exceedances (BioPoints) are summed. This sum per 1/4 grid = BioScore.**
>
> *The 1/4 grid is placed in the appropriate listing category as follows:*
> *0 BioScore = Category 1*
> *1 or 2 BioScore = Category 2*
> *≥ 3 BioScore = Category 5*
>
> **If fewer than 3 BioStations exist within a 1/4 grid, then based upon the BioScore, the 1/4 grid will be placed in the following Categories:*
> *1 or 2 BioScore = Category 2*
> *≥ 3 BioScore = Category 5*
> *0 BioScore = Category 3 (Insufficient number of BioStations)*

Comment from [Seattle]: Part 3 (Sediment Quality Criteria), page 81. The first four bullets at the top of this page seem out of place. Do they belong in the earlier Data Requirements section of this part?

> **Ecology Response**: *These bullets will be moved into assessment information section on page 79/80.*

Comment from [Seattle]: Part 3 (Sediment Quality Criteria), page 82, paragraph on Category 3. The second sentence states: "For example, this could include sites where the ChemScore = 1 or 2 or where the preliminary assessment criteria are not met." It is not clear why a ChemScore of 1 or 2 necessarily leads to an assessment of Category 3 (AU lacks sufficient data). Should the sentence be talking about ChemStations? Please clarify.

> **Ecology Response**: *Per the chemistry decision flowchart (Figure 1), if ChemScore = 1 or 2 and there are < 3 ChemStations then Category 3. If less than 3 ChemStations exist in a 1/4 grid then not enough data exists to properly categorize the 1/4 grid. Category 3 represents this lack of data.*

Comment from [Suquamish Tribe]: It is recommended that the policy be clarified to state that approved clean-up plans must address all the contaminants of concern for listing in Category 4B. For example, if there is a cleanup plan for PCBs, but there are exceedances of PCBs and mercury, the waterbody should be listed in Category 5 rather than 4B, as mercury would not be addressed under the clean-up plan.

> **Ecology Response**: *The SMS rule requires cleanup of all contaminants identified at the Site to a concentration at, or below SMS cleanup levels. Clarification of this was added to Policy 1-11. Additionally, a slight modification to the listing process was made in order to more transparently identify all the contaminants at cleanup Sites that are above SMS cleanup levels. This will clarify that the contaminants above SMS cleanup levels at the Site are being addressed in the Category 4B listed waterbody. The two step listing process is described in the following paragraph.*
>
> *There is a two-step process in category listing. The first step involves identifying 1/4 grids that are part of known cleanup sites. Information is obtained from Site Managers to identify specific 1/4 grids and the chemicals and biological exceedances being addressed by the cleanup work. This process is known as an Administrative Override (see flowcharts). All of the 1/4 grids identified by the Site Managers are then categorized as 4B. All chemicals related to these grids in the cleanup Site exceeding SQS and SIZmax are listed in the basis statement for each grid being addressed by the cleanup. The second step involves reviewing appropriate EIM data. This data is linked to the appropriate grid and the assessment is based upon the EIM bioassay and chemistry data. Listings, therefore, can be based upon step one or step two or both in combination.*