Concise Explanatory Statement Chapter 173-201A WAC Water Quality Standards for Surface Waters of the State of Washington – Natural Conditions

Summary of Rulemaking and Response to Comments

Washington State Department of Ecology
Olympia, Washington

November 2024, Publication 24-10-057

Updated May 2021

Publication Information

This document is available on the Department of Ecology's website at:
https://apps.ecology.wa.gov/publications/summarypages/2410057.html

Contact Information

Water Quality Program
P.O. Box 47600
Olympia, WA 98504-7600
Phone: 360-407-6600

Website: Washington State Department of Ecology[1]

ADA Accessibility

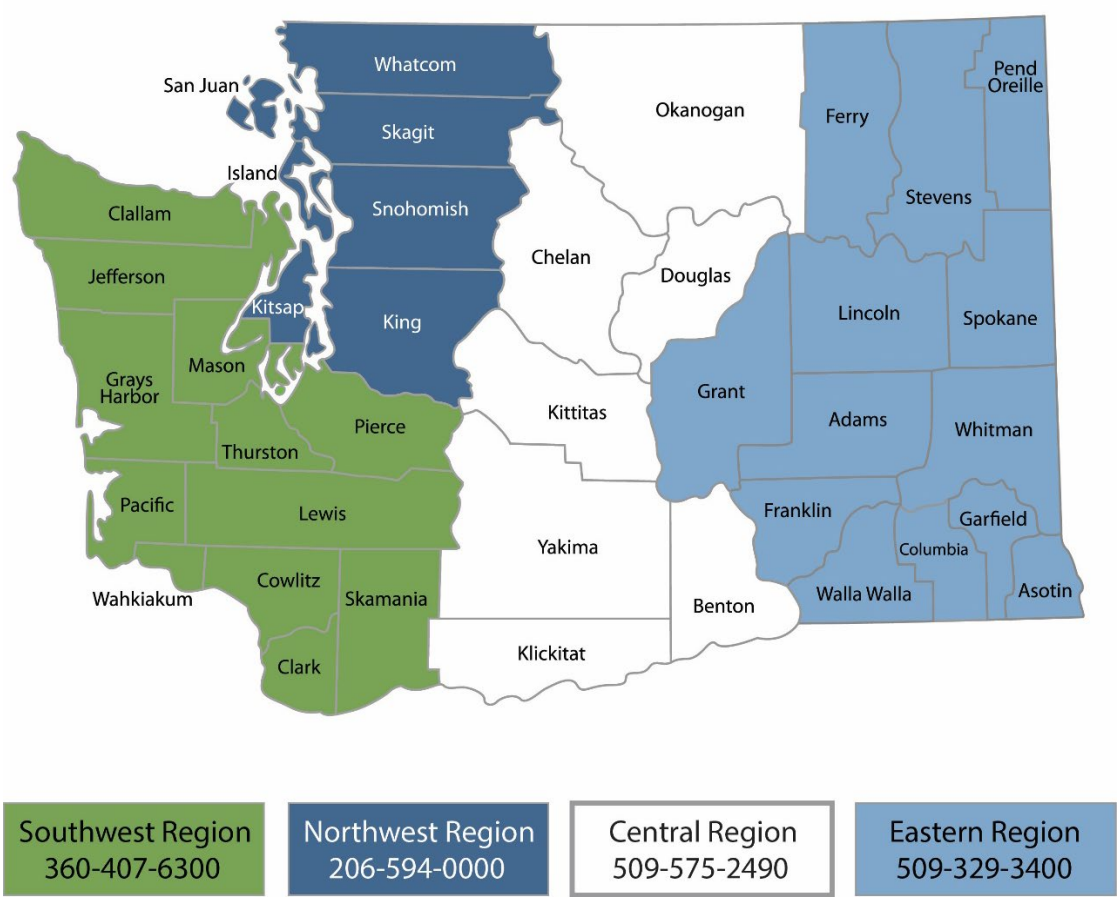
The Department of Ecology is committed to providing people with disabilities access to information and services by meeting or exceeding the requirements of the Americans with Disabilities Act (ADA), Section 504 and 508 of the Rehabilitation Act, and Washington State Policy #188.

To request an ADA accommodation, contact Ecology by phone at 360-407-6600 or email at swqs@ecy.wa.gov. For Washington Relay Service or TTY call 711 or 877-833-6341. Visit Ecology's website for more information.

[1] http://www.ecology.wa.gov/contact

Department of Ecology's Regional Offices

Map of Counties Served



Region	Counties served	Mailing Address	Phone
Southwest	Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Mason, Lewis, Pacific, Pierce, Skamania, Thurston, Wahkiakum	PO Box 47775 Olympia, WA 98504	360-407-6300
Northwest	Island, King, Kitsap, San Juan, Skagit, Snohomish, Whatcom	PO Box 330316 Shoreline, WA 98133	206-594-0000
Central	Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, Yakima	1250 W Alder St Union Gap, WA 98903	509-575-2490
Eastern	Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman	4601 N Monroe Spokane, WA 99205	509-329-3400
Headquarters	Across Washington	PO Box 46700 Olympia, WA 98504	360-407-6000

Concise Explanatory Statement

Chapter 173-201A WAC
Surface Water Quality Standards – Natural Conditions

Water Quality Program
Washington State Department of Ecology
Olympia, WA

November 2024 | Publication 24-10-057

DEPARTMENT OF
ECOLOGY
State of Washington

This page is purposely left blank

Table of Contents

Introduction

The purpose of a Concise Explanatory Statement is to:

- Meet the Administrative Procedure Act (APA) requirements for agencies to prepare a Concise Explanatory Statement (RCW 34.05.325).
- Provide reasons for adopting the rule.
- Describe any differences between the proposed rule and the adopted rule.
- Provide Ecology's response to public comments.

This Concise Explanatory Statement provides information on The Washington State Department of Ecology's (Ecology) rule adoption for:

Title:	Water Quality Standards for Surface Waters of the State of Washington
WAC Chapter(s):	173-201A
Adopted date:	November 14, 2024
Effective date:	December 15, 2024

To see more information related to this rulemaking or other Ecology rulemakings please visit our website: https://ecology.wa.gov/About-us/How-we-operate/Laws-rules-rulemaking.

Reasons for Adopting the Rule

This rulemaking focuses on natural conditions provisions and criteria to refine and provide water quality protection for aquatic life. Natural conditions provisions recognize that conditions in some water bodies naturally do not meet biologically-based aquatic life criteria; for example, a naturally low-flowing stream in a natural prairie without human alteration may have seasonally higher temperatures than the limit set to protect fish. These waters may not meet biologically-based aquatic life criteria because of natural processes or seasonal conditions. Natural conditions criteria are protective of aquatic life because they represent water quality conditions before any anthropogenic impacts. Aquatic organisms have adapted over time to these site-specific water quality conditions which support their survival, growth, and reproduction.

Natural conditions criteria have been a core part of Washington's surface water quality standards (WQS) since the first regulations were adopted in 1967. Since then, multiple updates to these criteria, alongside published guidance documents, have ensured continued protection of designated and existing uses when using natural conditions provisions. Washington previously adopted its last major updates to natural conditions provisions and related criteria in 2003 and 2006, receiving EPA approval in 2008. In those updates, Ecology adopted human-use allowances for fresh water and marine water temperature and dissolved oxygen, lake-class natural conditions criteria, and a general natural conditions provisions. Since adoption of these criteria, EPA has released additional guidance on determining natural conditions criteria for certain parameters. Further, in 2021, EPA acted on these 2003 and 2006 revisions, disapproving some of Washington's previously approved natural conditions criteria and provisions. Adopting this rule restores the ability to consider natural conditions when developing protective site-specific criteria and sets limits to how much human actions can negatively affect water quality when natural conditions criteria values are applicable for a site.

Under Section 303(c) of the Clean Water Act (CWA) and federal implementing regulations at 40 Code of Federal Regulations (CFR) § 131.4, states and authorized Tribes have the primary responsibility for reviewing, establishing, and revising water quality standards. Water quality standards consist primarily of the designated uses of a waterbody or waterbody segment, the water quality criteria that protect those designated uses, and an antidegradation policy to protect high quality waters.

EPA has compiled a list of nationally recommended water quality criteria for the protection of aquatic life and human health in surface waters. These criteria are published pursuant to Section 304(a) of the CWA and provide guidance for states and Tribes to establish water quality standards and provide the foundation for controlling the release of pollutants and identifying impaired waters. The state water quality standards are federally approved by EPA and describe the level of protection for Waters of the State.

Washington state law gives Ecology authority and responsibility to protect the quality of Washington waters and implement federal Clean Water Act programs. This authority and responsibility, with regard to water quality standards, can be found in the Revised Code of Washington (RCW) Water Pollution Control Act: RCW 90.48.030, RCW 90.48.035, and RCW 90.48.260(1).

Differences Between the Proposed Rule and Adopted Rule

RCW 34.05.325(6)(a)(ii) requires Ecology to describe the differences between the text of the proposed rule as published in the Washington State Register and the text of the rule as adopted, other than editing changes, stating the reasons for the differences.

There are some differences between the proposed rule filed on May 10, 2024, and the adopted rule filed on Nov. 14, 2024. Ecology made these changes for all or some of the following reasons:

- In response to comments we received.
- To ensure clarity and consistency.
- To meet the intent of the authorizing statute.

The following content describes the changes and Ecology's reasons for making them. Where a change was made solely for editing or clarification purposes, we did not include it in this section.

Changes to WAC 173-201A-020, Definitions

Edits were made to the definition of a performance-based approach (WAC 173-201A-020) for clarity and to remove references to federal regulations which were not applicable.

> "Performance-based approach" means a water quality standard that is a transparent process (i.e., methodology) which is sufficiently detailed and has suitable safeguards that ensures predictable and repeatable outcomes, rather than a specific outcome. The outcomes from the performance-based approach are site-specific ~~criteria (i.e., concentration limit for a pollutant) consistent with 40 C.F.R. 131.11 and 40 C.F.R. 131.13~~.

Changes to WAC 173-201A-200, Freshwater designated uses and criteria and WAC 173-201A-210, Marine water designated uses and criteria

We clarified in the human-use allowance for dissolved oxygen in fresh (WAC 173-201A-200(1)(d)(i)) and marine (WAC 173-201A-210(1)(d)(i)) waters that D.O. refers to the D.O. concentration and the criteria in the applicable tables are numeric criteria. This was done to make clear that the human-use allowances apply to numeric criteria and not saturation state-based criteria.

> (i) When a water body's D.O. concentration is lower than the numeric criteria in Table 200 (1)(d) (or within 0.2 mg/L of the criteria) and that condition is due to natural conditions, then ((human actions)) local and regional sources of human-caused pollution considered cumulatively may not cause the D.O. concentration of that water body to decrease more than 10 percent or 0.2 mg/L below natural conditions, whichever decrease is smaller.

Changes to WAC 173-201A-260, Natural conditions and other water quality criteria and applications

We revised the general natural conditions provision at WAC 173-201A-260(1)(a) to clarify the required processes when Ecology pursues natural conditions criteria development for a site.

a) It is recognized that portions of many water bodies cannot meet the assigned aquatic life criteria due to the natural conditions of the water body. When a water body does not meet its assigned aquatic life criteria due to natural climatic or landscape attributes, the following will be used to determine site-specific numeric aquatic life criteria representing conditions unique to a water body~~: natural conditions constitute the water quality criteria.~~

(i) Aquatic life criteria based on natural conditions for temperature or dissolved oxygen for fresh or marine waters, or pH for fresh waters, will be derived by following either the site-specific criteria approach pursuant to WAC 173-201A-430 or the performance-based approach pursuant to WAC 173-201A-470.

(ii) For all aquatic life parameters other than those listed in WAC 173-201A-260(1)(a)(i), aquatic life criteria based on natural conditions will be derived by following the site-specific criteria approach pursuant to WAC 173-201A-430.

~~When natural conditions constitute the aquatic life water quality criteria, criteria values may be established using site-specific criteria (see WAC 173-201A-430), use attainability analysis (see WAC 173-201A-440), or the performance-based approach (see WAC 173-201A-470).~~

Changes to WAC 173-201A-430, Site-specific criteria

We made minor edits to WAC 173-201A-430 that removes language regarding the attainable conditions of a waterbody, as site-specific criteria protect existing and designated uses. We also removed the reference and associated citation to designated uses in 173-201A-430(1)(a), as this process is for development of criteria to protect uses, not designating new uses.

(1) Where the ~~attainable condition of~~ existing and designated uses for the water body would be fully protected using an alternative criterion, site-specific criteria may be adopted.

(a) The site-specific criterion must be consistent with the federal regulations on ~~designating and~~ protecting uses (currently 40 C.F.R. ~~131.10 and~~ 131.11); and

(3) The decision to approve the site-specific criterion must be based on a demonstration that it will protect the existing and ~~attainable~~ designated uses of the water body.

Changes to WAC 173-201A-470, Performance-based approach

In the new section for the performance-based approach at WAC 173-201A-470, we made changes to clarify for what purpose and water quality constituents, and under what circumstances the performance-based approach may be used. This includes simplifying language in -470 and removing the "as revised" qualifier in -470(1), as any updates to this document must go through a public process and EPA review and approval before use for federal Clean Water Act (CWA) actions.

WAC 173-201A-470 Performance-based approach. ~~Where the natural water quality of a water body constitutes the aquatic life water quality criteria, a~~ The performance-based

approach may be used by the Department to establish numeric criteria based on natural conditions that are fully protective of existing and designated aquatic life uses.

(1) Aquatic life water quality criteria must be derived using the procedures referenced in ecology publication 24-10-017, "A Performance-Based Approach for Developing Site-Specific Natural Conditions Criteria for Aquatic Life in Washington," ~~as revised~~.

(2) ~~Use~~ Application of the performance-based approach for establishing aquatic life water quality criteria is limited to the following listed water quality constituents:

(a) Aquatic life temperature criteria in fresh water;

(b) Aquatic life dissolved oxygen criteria in fresh water;

(c) Aquatic life pH criteria in fresh water;

(d) Aquatic life temperature criteria in marine water;

(e) Aquatic life dissolved oxygen criteria in marine water.

(4) If the requirements set forth in the ~~development of aquatic life criteria using the~~ performance-based approach cannot be m~~e~~et, then site-specific criteria can be established by following the alternatives listed at ~~the requirements set forth in these procedures, then alternatives specified in the paragraph following~~ WAC 173-201A-260(1)(a)(i) ~~may be used~~.

List of Commenters and Response to Comments

Organization of comments and responses

We accepted comments on the proposed rule from May 10, 2024, to July 26, 2024 (extended from July 12, 2024). During this 78-day comment period, we accepted comments by mail, through our online comment form, and verbally at two public hearings that were held via webinar.

We received 199 comment submissions on this rulemaking, including form letter comments. Some of the comment submissions covered multiple topics. Comments and responses are grouped together and organized by topic. We summarized comments when appropriate and responded to comments below each comment or summarized comments. Commenters who provided a comment related to each topic below are listed after each comment. You can see the original comments we received on our online public comments website.[2] Comments are available through this page until two years after the rule adoption date.

We grouped comments together by the following topics:

1. Comments on Rulemaking Process
   - 1.1. General Comments, including comments on:
     - 90.48 Responsibilities
     - Endangered Species Act Consultation Process
     - Streamline Protection Process
     - Differences between preliminary rule and rule proposal
     - Addressing EPA 2021 disapproval
     - Oregon litigation
     - Assurance that natural conditions protect aquatic life
     - Protection of designated uses and endangered species
   - 1.2. Preliminary Regulatory Analyses
   - 1.3. General comments on rulemaking process
   - 1.4. Environmental Justice
   - 1.5. State Environmental Policy Act (SEPA)
   - 1.6. Tribal consultation and reserved rights
2. Comments on Rule language
   - 2.1. Definitions (WAC 173-102A-020)
   - 2.2. Human use allowance (WAC 173-201A-200 and -210)
   - 2.3. General provision (WAC 173-201A-260)
   - 2.4. Antidegradation (WAC 173-201A-310)
   - 2.5. Site-specific criteria (WAC 173-201A-430)
   - 2.6. Performance-based approach (WAC 173-201A-470)
3. Comments on the Technical Support Document
   - 3.1. General Comments on the Technical Support Document

[2] https://wq.ecology.commentinput.com/comment/extra?id=gHacGx2j4E

List of commenters

Commenters are listed in Table 1 below in alphabetical order by individual's last name or by affiliation. Comment topics are identified by the section and comment number as they are listed in the following section, Comments and Ecology Responses. Under the column Comment Topic in the table below, comment codes are grouped by comment subtopics. The list of form letter commenters is included in Section 7, Form Letter Comment.

Submitted by	**Comment Topic**
Association of Washington Cities	**Comments on Rulemaking process** 1.3.N, 1.3.Q **Comments on rule language** 2.2.G, 2.2.H, 2.2.N **Comments on Technical Support Document** 3.3.C, 3.3.D, 3.3.F, 3.3.G **Comments on rule implementation** 4.3.C, 4.3.D **Miscellaneous comments** 6.C
Black Hills Audubon Society	**Comments on rule language** 2.5.B **Miscellaneous comments** 6.E

Submitted by	Comment Topic
Blessing, Bonnie	**Comments on Rulemaking process** 1.1.I, 1.1.R, 1.2.A, 1.3.A, 1.3.B, 1.3.S **Comments on rule language** 2.3.A **Comments on the Technical Support Document** 3.1.A, 3.2.A **Comments on rule implementation** 4.2.A **Comments on the Performance-based approach** 5.A **Miscellaneous comments** 6.G, 6.H. 6.I, 6.I., 6.J, 6.K, 6.L, 6.M, 6.N, 6.O, 6.P, 6.Q, 6.R, 6.S
City of Everett	**Comments on Rulemaking process** 1.2.F 1.3.I, 1.3.R 1.4.A **Comments on the Performance-based approach** 5.O 5.GG, 5.ZZ 5.PPP **Miscellaneous comments** 6.B

Submitted by	Comment Topic
City of Tacoma	**Comments on Rulemaking process** 1.1.K, 1.1.L 1.2.B, 1.2.C, 1.2.D, 1.2.E, 1.2.H, 1.2.I 1.3.O, 1.3.P, 1.3.Y 1.4.B 1.5.A **Comments on rule language** 2.2.O **Comments on the Technical Support Document** 3.3.E **Comments on rule implementation** 4.3.B, 4.3.E 4.4.C **Comments on the Performance-based approach** 5.L, 5.M, 5.P, 5.R, 5.W, 5.Y 5.AAA, 5.CCC, 5.EEE, 5.FFF, 5.JJJ, 5.KKK, 5.LLL, 5.QQQ 5.FF, 5.II, 5.UU, 5.XX, 5.YY **Miscellaneous comments** 6.D

Submitted by	Comment Topic
Columbia Riverkeeper and 13 other organizations submitted comment together: • Alliance for Community Engagement SW WA • Deschutes Estuary Restoration Team • Friends of Black Diamond • North Cascades Audubon Society • Northwest Environmental Defense Center • Orca Conservancy • Orca Network • Rainier Audubon Society • RE Sources • Snake River Waterkeeper • Spokane Riverkeeper • Trout Unlimited – Washington Council Trout Unlimited • Washington Chapter Sierra Club	**Comments on Rulemaking process** 1.1.Z, 1.1.DD 1.3.L **Comments on rule language** 2.2.S, 2.2.T **Comments on the Performance-based approach** 5.J 5.NN
Confederated Tribes and Bands of the Yakama Nation	**Comments on Rulemaking process** 1.1.E, 1.1.BB 1.3.F 1.6.C, 1.6.D. **Comments on rule implementation** 4.2.B **Comments on the Performance-based approach** 5.JJ, 5.BBB

Submitted by	Comment Topic
EPA Region 10	**Comments on rule language** 2.1.A, 2.1.B, 2.1.C, 2.2.L 2.2.P, 2.2.Q, 2.2.R 2.3.C 2.4.A 2.5.A 2.6.A **Comments on the Technical Support Document** 3.1.C, 3.1.D, 3.1.E, 3.1.F 3.2.B 3.4.A **Comments on rule implementation** 4.1.E, 4.1.F, 4.1.G 4.1.H, 4.1.I 4.2.D **Comments on the Performance-based approach** 5.E
Jamestown S'Klallam Tribe	**Comments on Rulemaking process** 1.3.E 1.6.A **Comments on rule language** 2.2.J **Comments on the Performance-based approach** 5.C, 5.GGG

Submitted by	Comment Topic
King County Department of Natural Resources and Parks	**Comments on Rulemaking process** 1.3.G, 1.3.H **Comments on rule language** 2.2.K **Comments on the Technical Support Document** 3.1.B **Comments on rule implementation** 4.1.D 4.4.A **Comments on the Performance-based approach** 5.D, 5.S, 5.QQ, 5.VV, 5.DDD, 5.NNN, 5.RRR
LaChance, Cynthia	**Comments on Rulemaking process** 1.3.T
LaColla, Chelsea	**Miscellaneous comments** 6.U
Liberty Lake Sewer and Water District No. 1	**Comments on rule language** 2.3.B **Comments on rule implementation** 4.2.C, 4.2.E **Comments on the Performance-based approach** 5.III

Submitted by	Comment Topic
Loehr, Lincoln	**Comments on Rulemaking process** 1.3.D **Comments on rule implementation** 4.1.B 4.3.A **Comments on the Performance-based approach** 5.B, 5.Q **Miscellaneous comments** 6.A
Nooksack Indian Tribe	**Comments on Rulemaking process** 1.1.B, 1.1.H **Comments on rule language** 2.2.C **Comments on rule implementation** 4.1.C **Comments on the Performance-based approach** 5.KK, 5.OO, 5.PP, 5.HHH

Submitted by	Comment Topic
Northwest Environmental Advocates	**Comments on Rulemaking process** 1.1.F, 1.1.J, 1.1.M, 1.1.N, 1.1.O, 1.1.P, 1.1.Q, 1.1.T, 1.1.U, 1.1.V, 1.1.W, 1.1.X, 1.1.Y, 1.1.CC 1.3.C, 1.3.J, 1.3.K, 1.3.U, 1.3.V **Comments on rule language** 2.1.D, 2.1.E 2.2.D, 2.2.F, 2.2.M 2.3.D, 2.3.E 2.6.B, 2.6.C **Comments on the Technical Support Document** 3.2.C 3.3.A, 3.3.B **Comments on rule implementation** 4.1.J, 4.1.K 4.2.F, 4.2.G, 4.2.H **Comments on the Performance-based approach** 5.F, 5.G, 5.H, 5.T, 5.X, 5.Z, 5.AA, 5.BB, 5.CC, 5.LL, 5.MM, 5.RR, 5.WW **Miscellaneous comments** 6.F, 6.T

Submitted by	Comment Topic
Norton, Betsy	**Comments on Rulemaking process** 1.1.S, 1.1.AA **Comments on rule language** 2.2.A **Comments on rule implementation** 4.1.A **Comments on the Performance-based approach** 5.MMM
Snohomish County	**Comments on Rulemaking process** 1.3.M **Comments on the Technical Support Document** 3.1.G **Comments on the Performance-based approach** 5.K, 5.U, 5.V, 5.DD, 5.HH, 5.SS, 5.TT, 5.OOO
Squaxin Island Tribe	**Comments on Rulemaking process** 1.1.A, 1.1.D, 1.1.G 1.6.B **Comments on rule language** 2.2.B, 2.2.I
Thom, Anne	**Miscellaneous comments** 6.V

Submitted by	Comment Topic
Washington Association of Sewer & Water Districts	**Comments on Rulemaking process** 1.2.G **Comments on rule language** 2.2.E **Comments on rule implementation** 4.2.I 4.4.B **Comments on the Performance-based approach** 5.EE
Washington Conservation Action	**Comments on Rulemaking process** 1.1.C 1.3.W **Comments on rule language** 2.2.B 2.2.I **Comments on the Performance-based approach** 5.I **Form letter comments** 7

Submitted by	Comment Topic
Washington Conservation Action and the following organizations submitted comment together: • Duwamish River Community Coalition • Friends of the San Juans • Olympic Environmental Council • Puget Soundkeeper • RE Sources • Seattle Aquarium, Communities for a Healthy Bay • Zero Waste Washington	**Comments on Rulemaking process** 1.1.A, 1.1.D, 1.1.G **Comments on rule language** 2.2.B
Washington Forest Protection Association	**Comments on Rulemaking process** 1.3.X **Comments on rule implementation** 4.1.L, 4.1.M 4.2.J 4.4.D **Comments on the Performance-based approach** 5.N
Wheeler, Andrew	**Comments on Rulemaking process** 1.1.A

Comments and Ecology responses

1. Comments on Rulemaking Process

1.1. General Comments

1.1.A Comment summary –Under Chapter 90.48 of the Revised Code of Washington, "...it is the public policy of the state of Washington to maintain the highest possible standards to insure the purity of all waters of the state consistent with public health and public enjoyment thereof, the propagation and protection of wild life, birds, game, fish and other aquatic life, and the industrial development of the state...." Under no circumstances should Ecology weaken the state water quality standards for dissolved oxygen or temperature, which are both critical to the survival and future of salmon and other aquatic life. Ecology has been managing waters of the state using the human allowances of 0.2 mg/L dissolved oxygen and 0.3ºC temperature using known and reasonable technologies for decades. Any increase in the allowance would be inconsistent with Chapter 90.48 RCW.

- Communities for a Health Bay
- Duwamish River Community Coalition
- Friends of the San Juans
- Olympic Environmental Council
- Puget Soundkeeper
- RE Sources
- Seattle Aquarium
- Squaxin Island Tribe
- Washington Conservation Action
- Wheeler, Andrew
- Zero Waste Washington

1.1.B Comment Summary – Thank you for the opportunity to comment on the proposed updates to the Washington Water Quality Standards for Natural Conditions Provisions in WAC Chapter 173-201A. Nooksack Indian Tribe (NIT) strongly encourages the Washington State Department of Ecology to uphold its legislative mandate to maintain the highest possible standards. As stated explicitly in Chapter 90.48 of the Revised Code of Washington (RCW): "it is the public policy of the state of Washington to maintain the highest possible standards to insure the purity of all waters of the state consistent with public health and public enjoyment thereof, the propagation and protection of wild life, birds, game, fish and other aquatic life, and the industrial development of the state, and to that end require the use of all known available and reasonable methods by industries and others to prevent and control the pollution of the waters of the state of Washington" (Chapter 90.48.010 RCW). [emphasis added] Although Ecology is not suggesting a reduction in allowances for human activities, we foresee that some dischargers may seek to lower standards under the guise of improving public processes. Washington State currently maintains rigorous standards for temperature and dissolved oxygen, and Ecology should not yield. We urge Ecology to maintain the highest possible standards and to strengthen, and never weaken, water quality standards to protect aquatic and human life.

- Nooksack Indian Tribe

1.1.C Comment Summary – First and foremost, we urge Ecology to strengthen, and never weaken, water quality standards to protect aquatic and human life. This concept is explicitly stated in Chapter 90.48 of the Revised Code of Washington (RCW): "…it is the public policy of the state of Washington to **maintain the highest possible standards to insure the purity of all waters of the state** consistent with public health and public enjoyment thereof, the propagation and protection of wild life, birds, game, fish and other aquatic life, and the industrial development of the state, and to that end require the use of **all known available and reasonable methods** by industries and others to prevent and control the pollution of the waters of the state of Washington" (Chapter 90.48.010 RCW). ***[emphasis added]***

We offer these as examples where dischargers have successfully met water quality-based permit limits using known available and reasonable methods. Ecology should not weaken those values, which have been in place for decades, and maintain the public policy of the state of Washington to maintain the highest possible standards to insure the purity of all waters of the state.

While Ecology is not proposing to weaken the allowances for human activities, we anticipate that some dischargers will request weakening standards veiled as better public process. The State of Washington has stringent standards in place for temperature and dissolved oxygen, which is consistent with Ecology's directive under Chapter 90.48 RCW, and Ecology should not capitulate. Moreover, if Ecology considers the measurement precision available with field instruments, Ecology would be justified in decreasing the human allowance to 0.1 mg/L and 0.1 °C 3 as more modern sensitivity of field instruments for oxygen and temperature.

- Washington Conservation Action

Response to 1.1.A, 1.1.B, and 1.1.C

We appreciate your comment, and our adopted rulemaking abides by 90.48 RCW.

Regarding the human-use allowance criteria, we have not chosen to change these values from our draft and proposed rulemaking documents. The 0.2 mg/L dissolved oxygen and 0.3°C temperature human use allowance values have been in Washington's water quality standards since 1977, and this rule clarified the application of these values (when and how they are used) and ensured that these criteria are protective of aquatic life. Further, these criteria are based on biological studies, not based on instrumentation error. Our discussion in the Technical Support Document on instrumentation error considerations is to highlight confidence in the studies that evaluate temperature and dissolved oxygen requirements of organisms.

1.2.D Comment Summary – Ecology should not risk a jeopardy finding under the Endangered Species Act. In 2008, both the National Marine Fisheries Service and US Fish and Wildlife Service found that human allowances of 0.2 mg/L of oxygen or 0.3ºC for temperature when natural conditions are worse than the numerical standards would be insignificant and unlikely to harm endangered species. Any process that deviates beyond those values would require additional Biological Opinions. A jeopardy finding would cause significant delays in the adoption of these water quality standards. The most efficient path that still protects species is to maintain the current levels of 0.2 mg/L dissolved oxygen (or 10% of

natural background conditions, whichever is smaller) and 0.3ºC when natural conditions are worse than the numeric values in the water quality standards.

- Communities for a Health Bay
- Duwamish River Community Coalition
- Friends of the San Juans
- Olympic Environmental Council
- Puget Soundkeeper
- RE Sources
- Seattle Aquarium
- Squaxin Island Tribe
- Washington Conservation Action
- Zero Waste Washington

Response to 1.1.D

We appreciate your comment. We have not chosen to change the human-use allowance values from our draft and proposed rulemaking documents. The 0.2 mg/L dissolved oxygen and 0.3°C temperature human use allowance values have been in Washington's water quality standards since 1977, and this rule clarified the application of these values (when and how they are used) and ensured that these criteria are protective of aquatic life.

1.1.E Comment Summary – [I]t is unclear if this proposed change will include Endangered Species Act (ESA) Section 7 consultation with the National Oceanic Atmospheric Administration Fisheries and U.S. Fish and Wildlife Service.

- Confederated Tribes and Bands of the Yakama Nation

Response to 1.1.E

Following our submittal of our rule to the Environmental Protection Agency (EPA), EPA will determine the level of consultation required under the Endangered Species Act (ESA) during their review (which can include informal consultation with ESA agencies or formal biological opinions written by these agencies, as examples). That said, as these criteria apply statewide, and our state contains threatened and endangered species and critical habitat, we anticipate that EPA's review will include some form of ESA Section 7 consultation with other federal agencies.

1.1.F Comment Summary – EPA almost never engages in Endangered Species Act ("ESA") consultation on TMDLs. To the best of our knowledge, there has never been such a consultation for Washington TMDLs with the exception of EPA's own 1991 Columbia River Basin Dioxin TMDL.

- Northwest Environmental Advocates

Response to 1.1.F

We appreciate your comment.

Ultimately, it is EPA who will determine the level of consultation requested or required under the ESA for any of our federal CWA work, such as water quality standards revisions or

TMDLs. We cannot speak to EPA's future actions regarding our use of the performance-based approach.

1.1.G Comment Summary – We urge Ecology to streamline the process to ensure that the state's waters are protected efficiently. EPA included options for Ecology, including the performance-based process proposed by Ecology for developing site-specific dissolved oxygen and temperature criteria a priori through extensive modeling of the state's waters. Ecology has completed this modeling on only a small fraction of the waters on the Clean Water Act Section 303(d) list to date, and it would require decades to develop models of the rest. We cannot wait – Ecology needs strong approaches for temperature and dissolved oxygen now. We urge you to reject any efforts that would delay implementation of stringent water quality standards across the state.

- Communities for a Health Bay
- Duwamish River Community Coalition
- Friends of the San Juans
- Olympic Environmental Council
- Puget Soundkeeper
- RE Sources
- Seattle Aquarium
- Squaxin Island Tribe
- Washington Conservation Action
- Zero Waste Washington

1.1.H Comment Summary – Modeling site specific conditions costs time we don't have. Determining natural conditions necessitates the use of modeling or statistical methods due to the absence of high-quality, site-specific, representative data from historical periods before human activities. These assessments must be customized for each water body and its specific conditions and cannot be broadly generalized. Therefore, such assessments would likely occur during site-specific regulatory decisions, such as NPDES permitting and TMDLs. Site specific rule-making, such as that in Chesapeake Bay, took over a decade to complete and did not change the requirement to reduce pollution.

Rather than expending additional time and resources to create an alternative path to compliance with water quality criteria, Ecology should invest in the solutions that we know work, including enforcement of non-point source temperature pollution on riparian private property. Our fish are running out of time and regulators cannot afford to be delayed or distracted by exemptions to water quality concerns we know how to fix.

- Nooksack Indian Tribe

Response to 1.1.G and 1.1.H

We appreciate your comments. We agree that a streamlined process benefits the work we do within and outside of Ecology. Our adoption of a performance-based approach in this rulemaking is one step towards reducing the time between identification of a water quality issue and implementing a water clean up plan. The repeatability of the performance-based approach, with EPA approval, allows us to develop protective criteria for aquatic life based on the natural conditions of a site without needing a separate rulemaking to adopt those criteria values into Washington's Water Quality Standards. Further, as we use these criteria in federal

CWA actions, Tribes and the public will still have opportunities to comment on the development of these values. Thus, this process is quicker than our site-specific criteria adoption process (described at WAC 173-201A-430), while still retaining the scientific robustness and opportunity for tribal and public input.

Our work using the performance-based approach will still take some time, however, as we gather and evaluate data, set up and run any models, and validate and evaluate the results. This ensures we capture, as best as possible, the natural conditions of a water body so that we can determine protective aquatic life criteria.

We always welcome suggestions or comments on how we can improve our process to reduce time between identification of water quality issues and implementing clean up of those waters. We also recognize that setting aquatic life criteria is just one important piece in how we address water quality issues across the state, and we appreciate the comments suggesting additional ways to address issues, such as monitoring and reducing nonpoint source impacts.

1.1.I Comment Summary – I noticed some changes between CR-101 and the later CR-102. The difference is a bit unclear but I think CR102 emphasized numeric criteria for dO and Temp and the natural conditions assessment. But then the natural conditions assessment performance manual only says dO, Temp will be assessed. I don't know if this is related but: There may be a problem here because Tier 2 analysis seems very odd. So many projects are being approved and the applicant states their project that degrades water is in the overriding public interest. Then they get this general permit for it. I am unclear on exact what the OPI is. I assume its an economic and social interest of having more housing. But if this additional housing permanently retards the recovery of adjoining endangered species is the permit issuance and/or project really in the public interest?

- Blessing, Bonnie

Response to 1.1.I

Our CR-101 announcement and documents provide a general overview of what revisions we are considering in the rulemaking as well as the general focus of the rule. Our CR-102 phase provides the public and Tribes our proposed changes and new additions to the water quality standards.

For natural conditions criteria development, all aquatic life water quality parameters may go through the site-specific rulemaking process at WAC 173-201A-430, and for specific parameters (e.g., freshwater temperature, marine dissolved oxygen) our performance-based approach process is applicable at WAC 173-201A-470. The limits for human impacts when natural conditions are the applicable and effective water quality criteria are for dissolved oxygen and temperature only.

Tier II analyses at WAC 173-201A-320 are specific only for new or expanded actions in waters that are currently doing better (i.e., higher quality) than the applicable criteria, and updates to this section are not part of this rulemaking.

For additional details for how we apply Tier II and conduct our Overriding Public Interest (OPI) analysis, we encourage you to view our supplemental guidance on implementing Tier II Antidegradation.[3]

1.1.J Comment Summary – Northwest Environmental Advocates ("NWEA") finds this effort by the Washington Department of Ecology ("Ecology") disappointing. In effect, most of what Ecology has proposed is a "trust us while we do the exact same thing we've been doing all along, except with some more paperwork." Granted, it was not at all helpful that in its recent disapproval of Washington's Natural Conditions Criteria ("NCC"), the U.S. Environmental Protection Agency ("EPA") did not spell out all the reasons why it should have disapproved the NCC. See Letter from to Vince McGowan, Ecology, from Daniel Opalski, EPA, Re: EPA's Action on Revisions to the Washington State Department of Ecology's Surface Water Quality Standards for Natural Conditions Provisions (Nov. 19, 2021) at 8 (disapproval of WAC 173-201A-260(1) based solely on the provision's failing to not expressly exclude human health criteria). In focusing on EPA's position that NCC provisions cannot be used to change numeric criteria for human health outside the 303(c) process, EPA induced Ecology to ignore the real problems of its previously-approved NCC rules. But this current proposal demonstrates that Ecology itself is more than happy to keep its blinders firmly on rather than face the inadequacy of its past approaches and, therefore, its proposed future rules that are built on those past approaches.

- Northwest Environmental Advocates

1.1.K Comment Summary – Will the recommendations in the EPA letter that rescinded the natural condition provision be addressed including frequency, duration, etc.? Why isn't this detailed in the Publication?

- City of Tacoma

Response to 1.1.J and 1.1.K

We appreciate the comment. Our proposed and adopted rule did have additional changes from the prior, 2021 EPA-disapproved natural condition provisions besides ensuring that the natural condition provisions only applied to aquatic life water quality parameters. The rule provides clarity on the use of these natural condition provisions. Specifically, our adopted rule is clear that if a water body is impaired due to, in part, natural conditions, numeric site-specific criteria will be developed, either through a site-specific rulemaking process (WAC 173-201A-430) or by using a binding and repeatable performance-based approach for those applicable parameters (WAC 173-201A-470).

The primary purpose of this rule was to develop a process to identify natural water quality conditions for water bodies with unique physiochemical characteristics. Aquatic life that inhabits these waters have adapted over time to these natural, pre-human impact conditions, such that this level of natural water quality supports aquatic life survival, growth, and reproduction.

[3] https://apps.ecology.wa.gov/publications/documents/1110073.pdf

That said, we recognize that additional work is needed in the performance-based approach document before it is final. This includes adding additional details to our methodology. This will ensure any binding natural condition performance-based processes is scientifically-justifiable and repeatable. Our water quality criteria will protect all aquatic life, including threatened and endangered species.

We plan on revising the document and providing additional opportunities for Tribes and the public to comment before finalization and submittal to EPA. Please see our statement in Section 5 (Response to 5.A through 5.ZZ) regarding the future of the performance-based approach document.

1.1.L Comment Summary – "EPA disapproved this provision at WAC 173-201A-260(1)(a). EPA stated in its justification that the provision is broadly drafted and does not specify the types of criteria or pollutants to which it applies. Therefore, such a provision could apply to a wide range of naturally occurring pollutants, including toxic pollutants, and even allow an exception from otherwise applicable numeric human health criteria. This is not consistent with EPA's interpretation of the relationship between natural conditions and protection of designated human health uses. Washington's adopted provision did not limit in scope the natural conditions provision to aquatic life uses or specific pollutants."

How did Ecology specifically address this?

- City of Tacoma

Response to 1.1.L

We proposed updates to WAC 173-201A-260(1)(a) to reflect that natural conditions are applicable to aquatic life parameters only. Further, for the adopted rule, we have updated this section to be more specific on how we will pursue development of site-specific natural conditions criteria. This includes the performance-based approach for applicable parameters, which provides a comprehensive process to determine aquatic life criteria based on natural conditions. These revisions sufficiently address the concerns EPA provided in its 2021 disapproval of our past natural conditions criteria.

1.1.M Comment Summary – ECOLOGY MISSES THE ELEPHANT IN THE ROOM: WHY EPA DISAPPROVED OREGON'S NATURAL CONDITIONS CRITERIA AND ECOLOGY'S MISGUIDED RELIANCE ON THE VARIOUS EPA GUIDANCE AND DECISION DOCUMENTS

Ecology includes a section termed "Litigation" in its TSD. Id. at 19. Here, Ecology discusses the litigation that led to EPA's reconsideration and subsequent disapproval of various NCC provisions in Washington. Notably missing is equally if not more important litigation, over the NCC in Oregon's water quality standards. Instead, Ecology merely alludes to EPA's having disapproved various NCC provisions in that state. See, e.g., TSD at 32-33. While the discussion below addresses the technical reasons why the court found EPA's approval of the Oregon NCC was arbitrary and capricious, as an initial matter it held that narrative criteria may not supplant or supersede numeric criteria:

The EPA's approval of the NCC was arbitrary and capricious for a number of reasons. The first, and most important, is that the NCC supplants otherwise lawful water quality standards. The EPA characterizes the NCC as a narrative criteria utilized to supplement numerical criteria. Under the CWA's regulations, states should establish narrative criteria "where numerical criteria cannot be established or to supplement narrative criteria." 40 C.F.R. § 131.11 (b)(2). Because numeric criteria can be established, the relevant question is whether the NCC supplements narrative criteria. It does not. Instead the NCC supplants rather than supplements the numeric criteria by allowing Oregon to replace the numeric criteria (determined to be protective of salmonids) with a new numeric standard during the TMDL process. The replacement of one numeric standard with another less-protective numeric standard cannot be viewed as "supplementing" the first standard. Accordingly, the court finds that the NCC violates the CWA's § 303 (c) water quality standards review.

Nowhere does Ecology explain how its proposed NCC merely supplements rather than supplants the established numeric criteria in Washington's water quality standards.

- Northwest Environmental Advocates

1.1.N Comment Summary – Ecology also does not explain EPA's technical reasoning for its having disapproved the Oregon NCC provisions. They are as follows:

The court's February 28, 2012 Opinion and Order held that the EPA's approval of the NCC was arbitrary and capricious. The Opinion and Order stated, inter alia, that: (1) the NCC "supplants rather than supplements" the Biologically Based Numeric Criteria, Opinion and Order at 26; (2) the NCC was based on a flawed assumption that historically higher water temperatures would protect salmonids now, id. at 27; (3) the NCC attempts to restore historically higher water temperatures without restoring other conditions that previously allowed salmonids to thrive, id.; and (4) there are "difficulties of estimating the historical water temperatures upon which the NCC depends," which is a "process rife with uncertainty." Id. The Opinion and Order also discussed NWEA's contention that the NCC only protected historically warmer waters without also protecting waters that were naturally cooler than the numeric criteria. Id. at 24. The court ruled that the EPA had "been unable to articulate a rational[] basis for its approval of the NCC." Id. at 27.

Letter from Daniel Opalksi, EPA, to Gregory Aldrich, Oregon Department of Environmental Quality ("DEQ"), Re: Disapproval of Oregon's Water Quality Standards: Natural Conditions Criteria for Temperature OAR 340-041-0028(8); Statewide Narrative Natural Conditions Criteria OAR 340-041-0007(2) (Aug. 8, 2013) (hereinafter "Oregon Disapproval") at 2. EPA disapproved the Oregon statewide narrative NCC on the same basis. Id.

The error made by Ecology now is not only ignoring the underlying court order that caused EPA to reconsider and then disapprove Oregon's NCC provisions and the EPA disapproval itself but also to ignore the fact that there never was a valid Section 7 consultation on the NCC pursuant to the Endangered Species Act ("ESA") because the court also held that biological opinion prepared by the National Marine Fisheries Service ("NMFS") was seriously flawed and by the time that NMFS had completed a new biological opinion, the NCC was no longer EPA-approved. See NMFS, Endangered Species Act Biological Opinion on the Environmental Protection Agency's Proposed Approval of Certain Oregon Water Quality Standards Including

Temperature and Intergravel Dissolved Oxygen (Nov. 3, 2015) (hereinafter "NMFS Oregon BiOp") at 9, fn. 5 (the NCC was not a part of the proposed action). In other words, Ecology's self-comforting assurances that it evaluated "previous Endangered Species Act (ESA) Biological Opinions from the National Marine Fisheries Service and United States Fish and Wildlife Service to determine what additional considerations are needed to protect ESA-listed species in Washington" is without meaning because there was no such opinion for the now-disapproved Oregon NCC. TSD at 11. Similarly, Ecology states that it "evaluated information provided by EPA to Washington in past approval and disapproval decisions" but it failed to look at the disapproval for Oregon that would have provided far more direction. Id. It would be even more enlightening were Ecology to look at the parties' briefs submitted in the Oregon litigation, but it clearly did not do this either.

- Northwest Environmental Advocates

1.1.O Comment Summary – In any event, Ecology ignores all the points made in EPA's disapproval of Oregon's NCC, as enumerated in the quotation from the disapproval above. Instead, it relies on some sort of willful disconnect between the language of the NCC provisions that assure the supplanting result will reflect "natural" conditions and the reality of how those NCC provisions are used.

- Northwest Environmental Advocates

1.1.P Comment Summary –Ecology Incorrectly Relies on Some Past EPA Decisions and Guidance

In its discussion of the now-disapproved Washington general NCC provision, Ecology cited EPA's general approval of these provisions in its biological evaluation ("BE") from 2007. TSD at 17 (emphasis added). This accurately summarizes EPA's assertions in its biological evaluation. See EPA, Biological Evaluation of the Revised Washington Water Quality Standards (April 10, 2007) (hereinafter "EPA 2007 BE") at 171. However, all of this "logic" is flawed, and Ecology is misguided to rely upon it. First, the assertion that a temperature derived from a model is necessarily natural was discussed in Section I.A, supra, with the example of the Umpqua TMDL in Oregon. Examples from Washington are found infra. Second, EPA's position set out in this biological evaluation (and elsewhere) that it can ensure the protectiveness of the NCC outcome in the TMDL approval process is disingenuous at best. In its opening brief in a subsequent Oregon case, pertaining to EPA's approval of Oregon's use of the NCC in temperature TMDLs, EPA said the opposite:

NWEA contends that EPA's approval of the temperature TMDLs was arbitrary and capricious because they "simply do not analyze whether Oregon's new natural condition criteria will protect cold-water species," a designated use that is one component of Oregon's approved water quality standards. This contention fails for several reasons.

Once again, NWEA premises its claim on the erroneous argument that the TMDLs establish new water quality criteria. As discussed above, the TMDLs apply the previously approved water quality standards, which include the narrative criteria – the NCC.

NWEA also errs to the extent it suggests that TMDLs must analyze whether criteria are sufficient to protect designated uses. . . . Thus, the CWA section 303(c) process for establishing water quality standards – not the section 303(d) process for establishing TMDLs based on those standards – determines whether water quality criteria protect designated uses.

For EPA to not have relied on the NCC to evaluate the TMDLs would have been contrary to law. Accordingly, NWEA's claim that EPA improperly relied on the NCC must be rejected. To put a fine point on it, there is no evidence anywhere in Oregon or Washington that EPA has evaluated whether a state has properly calculated NCC-derived supplanting criteria in a TMDL because its position is that is a standards issue, not a TMDL issue.

- Northwest Environmental Advocates

1.1.Q Comment Summary – Citing and relying on EPA's past no effects determinations is rather silly. First, these determinations were made prior to the court's order on the Oregon NCC and EPA's subsequent disapproval of Oregon's NCC.

- Northwest Environmental Advocates

Response to 1.1.M, 1.1.N, 1.1.O, 1.1.P, and 1.1.Q

We appreciate your comment and recognize that there is a legal history of information on this subject. We have reviewed information from 2012 and other information provided to us by EPA. We have worked closely with EPA on this rule package to make sure it is informed by the natural conditions decisions by the courts and EPA in Oregon and updated EPA guidance.

We have updated WAC 173-201A-260(1)(a) to more accurately reflect the process in which we will derive protective criteria for aquatic life based on natural conditions. We have also updated our implementation guidance document regarding public participation requirements when following the performance-based approach.

We note that while previous ESA Biological Opinions and Biological Evaluations were considered as part of support for our criteria, including the human-use allowance values, they are not the only sources of support for those values. We reviewed the latest science and guidance for natural conditions and human-use allowances to determine appropriately protective aquatic life criteria values and a procedure to derive protective natural conditions criteria.

The primary purpose of this rule was to develop a process to identify natural water quality conditions for water bodies with unique physiochemical characteristics. Aquatic life that inhabits these waters have adapted over time to these natural, pre-human impact conditions, such that this level of natural water quality supports aquatic life survival, growth, and reproduction.

That said, we recognize that additional work is needed in the performance-based approach document before it is final. This includes adding additional details to our methodology. This will ensure any binding natural condition performance-based processes is scientifically-justifiable and repeatable. Our water quality criteria will protect all aquatic life, including threatened and endangered species.

We plan on revising the document and providing additional opportunities for Tribes and the public to comment before finalization and submittal to EPA. Please see our statement in Section 5 (Response to 5.A through 5.ZZ) regarding the future of the performance-based approach document.

1.1.R Comment Summary – Protecting aesthetic values may also serendipitously protect recreation and wildlife or cooler water. For instance, protecting aesthetics by protecting wildlife habitat, meadows, trees and shrubs upstream cools water downstream. This in turn (cooler water) reducing harmful algae growth and toxin production from algae Toxins released from cyanobacteria accumulate in livers of turtles and waterfowl (Chen et al 2009). And microcystin may even cause estrogenic effects to frogs (Liu et al 2024). So, even if natural conditions are such that the water temp is approaching 20 Celsius (either naturally or not naturally), its best to keep water temperatures below 20 C if possible to maintain recreation uses, drinking water (Stanton 2023) and wildlife habitat. I believe there is literature that says cyanobacteria blooms or releases toxins at 20 Celsius. (Wallis 2018).

- Blessing, Bonnie

1.1.S Comment Summary – "Natural condition" baselines should protect designated uses but MUST NOT result in lower water quality standards than those already promulgated. The combined anthropogenic impacts historic and current contamination, climate change, over-allocation, should be monitored and managed so that resulting water quality sustains aquatic biota and their habitat. Special emphasis should be placed on potential impacts to rare/listed species and their habitats from any new standards, considering the dire consequences if these species are not protected. The benchmark/water quality standard must be driven by what is needed for species' designated use of the waters and protecting human health - not based on existing site-specific degraded contexts.

- Norton, Betsy

1.1.T Comment Summary – Second, EPA says very clearly in the biological evaluation that no substantial prey decrease could occur because "[n]on [sic] of these standards that are being approved are a substantial deviation from water quality limits derived from the literature that are found to be protective of salmonids." EPA 2007 BE at 173. Ecology should ask itself: How are NCC-derived criteria consistent with the scientific literature substantiating the protectiveness of biologically-based criteria?

- Northwest Environmental Advocates

1.1.U Comment Summary – All Criteria Must Fully Protect Designated and Existing Uses

Ecology repeatedly states, correctly, that all criteria, including those derived through an NCC process, must be "fully protective of designated and existing uses." See, e.g., TSD at 12, 14 (EPA regulations require that criteria protect the most sensitive designated uses), 25 ("EPA notes that so long as these site-specific criteria have firm scientific basis and protect designated uses, the resulting criteria could be more or less stringent compared to adopted numeric criteria and still meet CWA requirements."); 40 C.F.R. §§ 131.11, 131.12(1). The problem is that Ecology provides literally no insight as to whether or how it will ensure that the derived purportedly natural criteria are, in fact, fully protective, not only of aquatic species in general but threatened

and endangered species. As demonstrated above, the fact that the output of a model says something is "natural" does not make it so.

- Northwest Environmental Advocates

1.1.V Comment Summary – In the guidance that it proposes to incorporate by reference in the proposed new rules, that is the guidance that is to provide this assurance of protection, Ecology merely nods to but does not actually address the issue. See, e.g., Performance Guidance at 10 (a project QAPP must provide "[h]ow spatial and temporal variability will be addressed in any model or models to ensure that natural condition estimates protect designated and existing uses."), 17 (the model used must "[i]dentify criteria outcomes that are fully protective of the designated or existing uses."), 25 (the model must "[p]rotect designated and existing uses by removing all human-caused impacts and pollution to the water of interest."), 26 ("Further, criteria values developed using the performance-based approach must protect existing and designated uses in downstream waters and must not cause degradation of downstream receiving waters."). None of these are anything but assertions of the law; not a single proclamation by Ecology explains how it will comply with this fundamental requirement of criteria, one that presumably would require the agency to have a process by which it evaluated the proposed superseding NCC criteria after they were derived to see if they would, in fact, be protective of the designated and existing uses. Not only is there no "test" of the resulting superseding criteria based on the biology of the species affected but there is no consideration given to the other conditions that would have been present with the purportedly natural water quality.

This is not hypothetical. For example, in using the NCC in the Palouse River TMDL, Ecology concluded:

Moderate reductions in water temperature are predicted for hypothetical conditions with system potential mature riparian vegetation. Potential reduced maximum temperatures under critical conditions are still predicted to exceed both the 17.5ºC and 20 ºC criteria and the 22ºC salmonid lethality limit. However, under the more moderate summertime conditions represented by August 25-31, 2007, system potential mature riparian vegetation is expected to result in maximum temperatures that do not exceed 22ºC on many parts of the Palouse River. How are temperatures above the salmonid lethal limit protective of these species?

- Northwest Environmental Advocates

1.1.W Comment Summary – Ecology has likewise failed to explain how its superseding criteria will protect existing uses. Existing uses are: "those uses actually attained in the water body on or after November 28, 1975, whether or not they are included in the water quality standards." 40 C.F.R. § 131.3(e). The only really relevant existing uses needing protection are not those that have been designated. Pardon the apparent tautology but, an existing use cannot be identified as needing protection if it is not first identified. In none of its rulemaking documents does Ecology even mention this problem let alone provide a solution, i.e. a process by which any non-designated existing uses are identified. Given that the criteria at issue are temperature and dissolved oxygen, some obvious beneficial uses that have not been designated and for which superseding criteria would likely pose a risk are amphibians.

Ecology should not wait until these species are listed as threatened or endangered pursuant to the ESA before it decides to protect them under the Clean Water Act. See, e.g., 80 Fed. Reg. 56423 (Sept. 18, 2015) (Cascade torrent salamander identified as undergoing a status review).

- Northwest Environmental Advocates

1.1.X Comment Summary – Had Ecology reviewed the Oregon NCC court opinion and subsequent EPA disapproval discussed in Section I.A, supra, and reviewed the NMFS biological opinion for the Oregon standards that did not include an NCC provision, it would have learned something else about temperatures that exceed the biologically-based numeric criteria. Ecology would have found a discussion about the role of thermal refugia pertaining to Oregon's 20° C migration criteria. Specifically, the Oregon numeric migration criterion initially was found acceptable to the federal agencies only because it included narrative criteria that provided for cold water refugia and a seasonal thermal pattern. Oregon and EPA had asserted that TMDLs would be used to identify thermal refugia. See NMFS Oregon BiOp at 174. As, in fact, the Oregon Department of Environmental Quality did not carry out the thermal refugia narrative in its TMDLs, the migration criterion was later determined to cause jeopardy to threatened and endangered species, and a reasonable and prudent alternative specifically pertaining to cold water refugia was required. See id. at 174-176, 176 ("the narrative criterion pertaining to CWR does not, to date, appear to be an effective means for minimizing the adverse effects likely to be experienced by migrating salmon and steelhead under the 20°C migration corridor criterion."), 269-271. Note that the prior invalidated biological opinion issued by NMFS did not find jeopardy for the migration criterion because the agency (naively) believed EPA and state assertions about the protections that would be provided by thermal refugia. Here, it is unclear why Ecology would think that any temperature in excess of 20° C, as well as some lower temperatures depending on the uses to be protected, that could be the outcome of an NCC modeling exercise, would be considered sufficiently protective on their own, without any other form of mitigation, such as but not limited to cold water refugia.

- Northwest Environmental Advocates

1.1.Y Comment Summary – Ecology also says that, instead of using both the hotter and colder natural temperatures, EPA "note[s] that the state can use the biologically based numeric criteria instead, but Ecology must provide a rationale as to why those criteria are protective of the most sensitive designated use." TSD at 41. Again, this is not captured in the rule language. Moreover, there are several problems with this concept. First, Ecology has not provided any method by which it will judge whether the NCC-derived criteria are protective of the beneficial uses in the first place. Therefore, it is even more unclear how it will make a judgment that setting colder derived temperatures at numeric criteria, or lower dissolved oxygen levels, will be assessed protective or not.

- Northwest Environmental Advocates

1.1.Z Comment Summary – There is nothing in the proposal to ensure that the replacement criteria produced by the NCC will protect aquatic life. Ecology repeatedly states its new NCC will meet EPA regulation requirements to ensure the protection of the most sensitive beneficial uses. But, nowhere in its proposal does it explain how it will achieve that goal. Ecology offers no "test" of the resulting superseding criteria based on the biology of the species affected, and no

consideration, as discussed above, to the other conditions that would have been present with the purportedly natural water quality. There is no purportedly natural temperature too high, nor purportedly low dissolved oxygen too low. We strongly urge Ecology to provide more rationale for how the new NCC criteria meets EPA requirements and actually ensures the protection of the most sensitive beneficial uses and species.

- Alliance for Community Engagement SW WA
- Columbia Riverkeeper
- Deschutes Estuary Restoration Team
- Friends of Black Diamond
- Spokane Riverkeeper
- North Cascades Audubon Society
- Northwest Environmental Defense Center
- Orca Conservancy
- Orca Network
- Rainier Audubon Society
- RE Sources
- Snake River Waterkeeper
- Trout Unlimited – Washington Council Trout Unlimited
- Washington Chapter Sierra Club

Response to 1.1.R through 1.1.Z

We appreciate your comments.

To provide clarity on the protectiveness of natural conditions criteria, we note that these natural conditions criteria are calculated by accounting for and removing *all* sources of human impact, such that the natural conditions criteria values represent water quality in its pre-anthropogenic impact state. These natural conditions criteria support aquatic life, as aquatic life that inhabit these systems have adapted over time to survive, grow, and reproduce in these water quality conditions. Therefore, maintaining naturally occurring water quality conditions are necessary for protection of aquatic life; this includes all existing and designated uses.

Development of natural conditions criteria is a separate process and approach to criteria development compared to biologically-based numeric criteria, which uses scientific and laboratory studies to develop protective aquatic life criteria.

We hold, however, that appropriately derived natural conditions criteria, which must reflect pre-anthropogenic water quality for that site, are protective of the aquatic life that inhabit the system. These natural water quality conditions represent what is needed for full aquatic life protection for that specific site.

Both approaches (natural conditions and biologically-based) are possible paths to derive protective aquatic life criteria, and we argue that while both are different options to providing protection for aquatic life in water bodies, neither supersede the other in regard to quality or accuracy when appropriately determined and calculated. Nor is there any support or guidance currently, either scientifically or from EPA, that one must be used over the other when information for both are available. Further, natural conditions criteria represent site-specific criteria, which takes precedence over larger-scale (e.g., state) applicable criteria. Those site-specific criteria represent site-level conditions (regardless of how said criteria are calculated), and therefore are presumed to be more reflective of what water quality is necessary to protect aquatic life at that site.

That said, the primary purpose of this rule was to develop a process to identify natural water quality conditions for water bodies with unique physiochemical characteristics. Aquatic life that inhabits these waters have adapted over time to these natural, pre-human impact conditions, such that this level of natural water quality supports aquatic life survival, growth, and reproduction.

We recognize that additional work is needed in the performance-based approach document before it is final. This includes adding additional details to our methodology. This will ensure any binding natural condition performance-based processes is scientifically-justifiable and repeatable. Our water quality criteria will protect all aquatic life, including threatened and endangered species.

We plan on revising the document and providing additional opportunities for Tribes and the public to comment before finalization and submittal to EPA. Please see our statement in Section 5 (Response to 5.A through 5.ZZ) regarding the future of the performance-based approach document.

We finally want to note that past TMDLs were based on the criteria applicable at the time and may not represent or reflect natural conditions criteria developed under our adopted approach in this rulemaking.

1.1.AA Comment Summary – "Natural Conditions" sets a bad policy precedent. The use of "natural conditions" criteria means that Ecology will be setting water quality standards on the basis of what polluters can currently achieve, rather than basing those standards on water quality level will sustain species (including humans). As surface waters face more and more threats from climate change/"natural" causes, "natural conditions" criteria allows polluters to add to that degradation. This sets a bad policy precedent that precedent wildlife habitat/designated use is NOT critical criteria for water quality. The policy shift here is to use standards to protect the interests of the polluters(caring about cause, not effect), not to provide a protection of the overriding public interest - protecting biodiversity and species presence in these ecosystems.

- Norton, Betsy

Response to 1.1.AA

We disagree with this assertion on how we define and derive natural conditions criteria.

Natural conditions criteria are calculated by accounting for and removing all sources of human impact, such that the natural conditions criteria values represent water quality in its pre-anthropogenic impact state. These criteria support aquatic life, as aquatic life that inhabit these systems have adapted over time to survive, grow, and reproduce in these water quality conditions. Therefore, these natural water quality conditions are necessary for protection of aquatic life; this includes all existing and designated uses.

These natural conditions criteria are **not based** on what is achievable by permitted dischargers or other human actions.

1.1.BB Comment Summary – This is an inadequate and confusing approach that will result in disjointed and separate permit conditions, monitoring, mitigation measures, and reporting across

critical habitats for ESA-listed and treaty protected resources. There is little to no assurance that this proposed change and process will protect aquatic resources.

- Confederated Tribes and Bands of the Yakama Nation

Response to 1.1.BB

The primary purpose of this rule was to develop a process to identify natural water quality conditions for water bodies with unique physiochemical characteristics. Aquatic life that inhabits these waters have adapted over time to these natural, pre-human impact conditions, such that this level of natural water quality supports aquatic life survival, growth, and reproduction.

That said, we recognize that additional work is needed in the performance-based approach document before it is final. This includes adding additional details to our methodology. This will ensure any binding natural condition performance-based processes is scientifically-justifiable and repeatable. Our water quality criteria will protect all aquatic life, including threatened and endangered species.

We plan on revising the document and providing additional opportunities for Tribes and the public to comment before finalization and submittal to EPA. Please see our statement in Section 5 (Response to 5.A through 5.ZZ) regarding the future of the performance-based approach document.

1.1.CC Comment Summary – [T]here is no temperature that could be established by the NCC provisions that would not be made hotter through the use of the HUA plus unlimited non-HUA warming. There is no level of dissolved oxygen that could be established by the NCC provision that would not be made lower through the use of the HUA plus unlimited non-HUA oxygen depletion. This is simply inconsistent with the requirement that the end result must protect aquatic species.

- Northwest Environmental Advocates

Response to 1.1.CC

Natural conditions criteria are calculated by accounting for and removing all sources of human impact, such that the natural conditions criteria values represent water quality in its pre-anthropogenic impact state. These criteria support aquatic life, as aquatic life that inhabit these systems have adapted over time to survive, grow, and reproduce in these water quality conditions. Therefore, these natural water quality conditions are necessary for protection of aquatic life; this includes all existing and designated uses.

We also want to note that when natural conditions criteria are developed and in effect for federal Clean Water Act actions, no lowering of water quality is allowed unless authorized in our Water Quality Standards (see WAC 173-201A-310(3)). Thus, with these adopted revisions to our WQS, only local and regional impacts to water quality for temperature and dissolved oxygen are allowed, and only for those specified amounts cumulatively.

1.1.DD Comment Summary – For many years, the Washington Department of Ecology (Ecology) has used its now-disapproved Natural Conditions Criteria (NCC) in developing Total

Maximum Daily Loads (TMDLs) to override existing, biologically-based numeric criteria with levels of temperature and dissolved oxygen that it claims are natural. EPA does not review these results, even though many of the automatic overriding pollution levels have lethal and sublethal effects on salmon and other aquatic species. Now, Ecology proposes to conduct business as usual. As such, its proposal for a new NCC does not constitute a "performance-based water quality standard" because it does not assure replicable outcomes, and it does not ensure protection of the most sensitive aquatic species. There are problems both with what Ecology includes and what Ecology fails to include in its proposed rules and guidance.

- Alliance for Community Engagement SW WA
- Columbia Riverkeeper
- Deschutes Estuary Restoration Team
- Friends of Black Diamond
- Spokane Riverkeeper
- North Cascades Audubon Society
- Northwest Environmental Defense Center
- Orca Conservancy
- Orca Network
- Rainier Audubon Society
- RE Sources
- Snake River Waterkeeper
- Trout Unlimited – Washington Council Trout Unlimited
- Washington Chapter Sierra Club

Response to 1.1.DD

The primary purpose of this rule was to develop a process to identify natural water quality conditions for water bodies with unique physiochemical characteristics. Aquatic life that inhabits these waters have adapted over time to these natural, pre-human impact conditions, such that this level of natural water quality supports aquatic life survival, growth, and reproduction.

That said, we recognize that additional work is needed in the performance-based approach document before it is final. This includes adding additional details to our methodology. This will ensure any binding natural condition performance-based processes is scientifically-justifiable and repeatable. Our water quality criteria will protect all aquatic life, including threatened and endangered species.

We plan on revising the document and providing additional opportunities for Tribes and the public to comment before finalization and submittal to EPA. Please see our statement in Section 5 (Response to 5.A through 5.ZZ) regarding the future of the performance-based approach document.

In addition, we have updated our implementation plan to address concerns raised during the comment period.

First, we indicate that any use of criteria following the performance-based approach will include an opportunity for public involvement and review. We are fully committed to holding a public review period when we use the performance-based approach to develop natural conditions criteria. It is anticipated that the majority of our performance-based approach use will be done in conjunction with a water clean up plan (e.g., TMDL, Advanced Restoration Plans), which involves a public review process and EPA review. Regardless of how or when

we use the performance-based approach, we have clarified that the public will have opportunity to review and comment on the developed criteria and process for derivation.

Second, we have clarified that we intend to inform the public when such performance-based criteria have been developed and are in effect for federal Clean Water Act actions.

1.2. Preliminary Regulatory Analyses

1.2.A Comment Summary – I am concerned that more analysis should be done of the economic impacts that will occur in a few small areas with DCH due to protection of existing and designated uses. Small businesses that could be affected include realtors, residential developers small farms. The Washington Regulatory Fairness Act (Chapter 19.85 RCW) requires Ecology to evaluate the relative impact of proposed rules that impose costs on businesses in an industry. There seems to be a discrepancy between the 2020 'Small Business Economic Impact Analysis of 2020' and the Preliminary Regulatory Analysis of May 2024 (publication 24-10-022). The current construction stormwater permit says that the cost of the general permit does have disproportionate impact on small businesses (page 2 of the May 2020 Publication 20-10-022 or Small Business Economic Impact Analysis for the Construction Stormwater General Permit, the NPDES and SWDGP). However the 2024 analysis says that the proposed rule will result in cost-savings for dischargers as compared to analysis (page 52 of the 2024 Preliminary Regulatory Analysis). On the last paragraph of page 10 of publication 24-10-022 it says that Ecology is exempt from assessing the relative costs of the proposed rules on businesses in an industry. However, (my comment) to maintain and protect existing and designated uses there may be costs imposed. Specifically, use of land may be impaired if one cannot develop certain places because Ecology may ask for a TMDL to be honored. To be fair to all, I think Ecology is not exempt from performing additional analysis under the Regulatory Fairness Act because I think that small businesses actually can be affected. Especially if all existing and beneficial uses need to be protected which is in the WAC 173-201A.

However according to RCW 19.85.061 an agency is not required to comply with this chapter when adopting a rule solely for the purpose of conformity or compliance or both with federal statute or regulations. So if Ecology is only rewriting this for the purpose of compliance with the clean water act, then Ecology may not be required to comply with this chapter.

- Blessing, Bonnie

Response to 1.2.A

Thank you for your comment. To best walk through your concerns in the context of this rulemaking, consider that protecting existing and designated (aquatic life) uses through biologically based statewide criteria (e.g. the reality without rule), and site-specific criteria based on natural conditions determined using tools and processes adopted by this rulemaking, could both result in potential costs to permittees. However, keep in mind that the APA requires Ecology to analyze the impacts of any rule amendments relative to the existing rule, within the context of all existing requirements (federal and state laws and rules).

Without natural conditions criteria, the applicable biologically based statewide criteria would still apply for CWA actions and need to be met to protect existing and designated aquatic life uses. Some waters during some periods of the year may not be able to meet these criteria due to natural and seasonal variations. This could be the case even if all human impact was reversed and removed from this determination.

Water that is optionally considered for criteria based on natural conditions because of this rulemaking will likely have already failed to meet statewide biologically based criteria

because of natural factors. Therefore, criteria established using tools and processes adopted by this rulemaking (and resulting permit requirements) are likely easier to meet by permittees and represent a benefit for the analytical purposes of this FRA. **In other words, determining natural conditions criteria using tools and processes adopted by this rulemaking will provide relief to some permittees by protecting aquatic life and meeting our CWA obligations, while reducing costs of compliance that would otherwise be higher based on existing biologically based numeric standards.**

You might see how this analysis of an optional tool for establishing more future site-specific criteria values that likely reduce costs of compliance (this rule) produces a very different set of results than an analysis of an incremental change (or lack of change) to permit stringency, such as the stormwater general permit referenced in your comment, even if the same permit category are potentially impacted by both.

1.2.B Comment Summary – Ecology has failed to assess compliance costs to small businesses as required under the Regulatory Fairness Act.

Ecology cannot adopt a significant legislative rule if it fails to properly conduct the analysis required under the Regulatory Fairness Act (RFA), Ch. 19.85 RCW. The RFA requires agencies to evaluate the relative impact of proposed rules that impose costs on businesses in an industry and compare the relative compliance costs for small businesses to those of the largest businesses affected. RCW 19.85.

Based on its preliminary cost-benefit analysis, Ecology claims it is exempt from compliance under the RFA.39. Ecology asserts that, by not imposing compliance costs "for any business," the proposed rule amendments do not meet the RFA applicability standards under RCW 19.85.030(1)(a), which state the RFA does not apply to the adoption of a rule if an agency is able to demonstrate that the proposed rule does not affect small businesses. This conclusion is also misguided. Ecology cannot simultaneously assert that it does not have enough information to fully assess compliance costs, while also concluding it is not imposing compliance costs "for any business." The Natural Conditions Rulemaking will undeniably impose costs on any entity discharging to a WWTP on Puget Sound, and this group includes many entities that qualify as "small businesses." Ecology can readily assess the impact of its nutrient program on utility rates and needs to do so as part of this rulemaking. Ecology cannot thwart its obligation under the RFA by broadly concluding its rulemaking will have no effect on small businesses with no further justification other than it will not impose compliance costs on "any business."

- City of Tacoma

1.2.C Comment Summary – Ecology has failed to conduct a proper cost-benefit analysis in accordance with the APA.

Ecology cannot adopt a significant legislative rule if it fails to properly conduct the analysis required under RCW 34.05.328. Ecology is required to conduct a preliminary cost-benefit analysis and determine that the probable benefits of the rule are greater than its probable costs, accounting for both the qualitative and quantitative benefits and costs and the specific directives of the statute being implemented. RCW 34.05.328(1)(d). The preliminary analysis issued by

Ecology fails to adequately capture the qualitative and quantitative impacts of its Natural Conditions Rulemaking.

In its Preliminary Cost-Benefit Analysis, Ecology asserts that, since future TMDL studies have not been performed yet, the agency cannot quantify the costs of the proposed rulemaking. Further, Ecology concludes that the most likely actions taken following the proposed rulemaking are not likely to impose new costs, but will instead produce benefits in the form of avoided costs. The claim that Ecology cannot quantify the costs of its Natural Conditions Rulemaking, but that the predicted outcome will result in greater benefits than costs to WWTPs, is misguided, and Ecology is required to perform more thorough cost-benefit analysis.

Ecology is well-aware of the costs its Natural Conditions Rulemaking will impose on WWTPs and respective impacted communities. Ecology is attempting to use its proposed Natural Conditions Rulemaking to reestablish its previous nutrient program and is fully aware of the magnitude of costs that WWTPs will incur as a result. Ecology is aware of the potential costs through its ongoing refinement of the Salish Sea Model (SSM) and intent to impose numeric water quality based effluent limits on Puget Sound WWTPs in the next version of the Puget Sound Nutrient General Permit (PSNGP). The proposed Natural Conditions Rulemaking will require WWTPs to implement cost-prohibitive advanced treatment technologies to reduce nitrogen and limit nutrient discharges currently impacting DO levels in the Puget Sound. There is ample evidence of what it will cost to meet the DO standards imposed by the Natural Conditions Rulemaking.

Ecology has published its own technical and economic evaluation of nitrogen removal at municipal WWTPs that outlines the costs of treatment technologies. Additionally, environmental and engineering consulting firm HDR published a “Treatment Technology Review and Assessment” that analyzes treatment technologies applicable to nitrogen removal and related costs of implementation. Ecology can also compare costs to the “Nitrogen Optimization Plan and Report” required under the PSNGP, which could cost cities tens of millions of dollars to implement over the first two years. Further, Ecology has published guidance for WWTPs to estimate the costs of treatment technology required for nitrogen removal; there is no reason the agency cannot use that same guidance to conduct its own analysis for the Natural Conditions Rulemaking. Ecology published its Draft Interim Financial Capability Assessment Guidance (Financial Guidance) for WWTPs to use when preparing reasonable treatment alternatives as a part of the PSNGP’s required AKART analysis. At both the Mt. Vernon and Olympia workshops provided to outline and answer questions regarding the Financial Guidance, Utility representatives heard Ecology make it clear that the agency is fully aware of how expensive it will be to implement its Natural Conditions Rulemaking.

Ecology has also published the functional equivalent of a TMDL analysis through its bounding scenarios analysis, further demonstrating it cannot use the fact that future TMDLs have not been performed as an excuse for not quantifying the costs of its proposed rulemaking. The SSM water quality modeling and analysis found in agency’s bounding scenarios is exactly the tool Ecology can use to develop hypothetical nutrient TMDLs and estimate associated compliance costs. The bounding scenarios modeling essentially demonstrates what levels of reduction, and therefore associated treatment technology, will be needed to meet its proposed DO standards. Based on this report, Ecology has a thorough idea of what the functional equivalent of a DO TMDL

analysis would look like in the Puget Sound, and the resulting required reductions and associated costs of the agency's proposed standards. Ecology also reviewed historical TMDLs as a part of its Preliminary Cost Benefit Analysis, but noted that, because of the proposed rulemaking, future natural conditions could be calculated differently than the historical TMDLs, and those differences come primarily from amended human impact allowances and the introduction of a performance based approach. Based on the multitude of other resources and tools to create hypothetical TMDLs, this fact is still no excuse for Ecology's failure to estimate compliance costs of the Natural Conditions Rulemaking.

Ecology cannot defer the obligation to conduct a full cost-benefit analysis to WWTPs when it has created the very tools needed to conduct such an analysis for its own rulemaking, as required under statute. There is a multitude of resources, prepared by both Ecology and third parties, that preview the exorbitant costs of treatment technologies WWTPs will need to implement to comply with the Natural Conditions Rulemaking. Ecology knows full well what it intends to implement and how to evaluate the impacts of those decisions. It is therefore inappropriate for Ecology to conclude both that 1) there is not enough data to determine the costs imposed by its rulemaking, and, 2) its rulemaking will provide greater benefits than costs.

The cost-benefit analysis required for SLRs is meant to capture more than monetary costs. The Natural Conditions Rulemaking will impose additional costs on parties and environments outside of the narrow scope within which Ecology considers in its preliminary analyses. Ecology has previously recognized the potential environmental impacts of requiring WWTPs to adopt additional nutrient removal technology, including the likelihood that tertiary treatment will not only generate more effluent sludge that will require disposal, but will also require two to three times the amount of electrical energy currently used in WWTPs.

- City of Tacoma

Response to 1.2.B and 1.2.C

Thank you for your comment. Please recognize that meeting statewide biologically based criteria (without rule), and site-specific natural conditions criteria determined using tools and processes adopted by this rulemaking, both likely result in potential costs to permittees. However, keep in mind that the APA requires Ecology to analyze the impacts of any rule amendments relative to the existing rule, within the context of all existing requirements (federal and state laws and rules).

Without natural conditions criteria, the applicable biologically based statewide criteria would still apply for CWA actions and need to be met to protect existing and designated aquatic life uses (See FRA section 2.2.4). Some waters during some periods of the year may not be able to meet these criteria due to natural and seasonal variations. This could be the case even if all human impact was reversed and removed from this determination.

Water that is optionally considered for criteria based on natural conditions because of this rulemaking will likely have already failed to meet statewide biologically based criteria because of natural factors. Therefore, natural conditions criteria established using tools and processes adopted by this rulemaking (and resulting permit requirements) are likely easier to meet by permittees and represent a benefit for the analytical purposes of this FRA. **In this**

way, determining natural conditions criteria using tools and processes established by this rulemaking will provide relief to some permittees by protecting aquatic life and meeting our CWA obligations, while reducing costs of compliance that would otherwise be higher based on existing biologically based numeric standards.

Attributing positive costs of the PSNGP to this rulemaking is misguided on several fronts. First, AKART requirements in the PSNGP used to meet narrative criteria come from an existing part of the State Water Pollution Control Act (Chapters 90.48.010, 90.52.040 and 90.54.020 RCW) and associated federal rules [40 CFR 122.44(a & b) and 40 CFR 125.3(a)(1)] **and would remain in place and be required in the PSNGP and other NPDES permits to meet CWA requirements for DO in Puget sound with or without the adopted rule (40 CFR §122.44).** This is a baseline cost, and so is not an additional cost that would result from this rulemaking. The purpose of Ecology's Draft Interim Financial Capability Assessment Guidance is to provide PSNGP permittees with a tool to evaluate and report on their community-specific financial capability so that Ecology can determine the "reasonable" component of AKART requirements (see the draft guidance document[4]) which will be compared to Water Quality Based Effluent Limits, based on EPA-approved water quality criteria, to determine which type of limit (Technology/AKART-based vs Water Quality-based) is more stringent and applicable in future PSNGP permit cycles. As cited above, AKART requirements already exist in law and is not associated with, nor affected by this rulemaking.

Second, **in many areas of the Puget Sound, a numeric permit limit for total inorganic nitrogen set without natural conditions would likely be zero or close to zero to meet DO requirements under the CWA**. However, and again, the consensus by Ecology scientists, including those involved with Salish Sea Model and Puget Sound nutrient efforts, is that **site-specific criteria derived using natural conditions—similar to those being explored for future iterations of the PSNGP—would potentially be less costly to comply with, compared to permit limits derived from current biologically-based numeric criteria**. This is because portions of Puget Sound are known to naturally exceed the biological criteria. We have added clarifying language and organization throughout the FRA to make this concept additionally clear.

As discussed above, and throughout the FRA, the overall direction of this difference (a benefit to permittees) is clear and logical, and therefore allows us to make the assertion that the rule will not impose compliance costs (in general, and on small business for the purposes of the RFA). However, the exact level of avoided costs (benefits) cannot be known with available data. Relatedly, uncertainty described in the FRA around "compliance costs" (as cited in comment) are typically referring to avoided costs, which is the level of "relief" the rule represents from the differential between complying with criteria in current laws vs criteria based on natural conditions in the rule.

Deriving these benefits with precision would require wasteload allocations from two separate TMDL studies for applicable listed waterbodies—one to satisfy biologically based statewide standards in the baseline, and another to satisfy criteria based on natural conditions and human allowance as defined by this rulemaking. In practice, this level of effort is unrealistic

[4] https://ecology.wa.gov/regulations-permits/permits-certifications/nutrient-permit

for the purposes of the FRA. Outputs from the Salish Sea Model alone also do not constitute a TMDL, nor do reference conditions used in the Salish Sea Model, and mentioned by the comment, consider allowances to local and regional sources of pollution or global climate change in the same way as defined in this rulemaking.

In the FRA we discuss some special cases where criteria based on natural conditions could theoretically represent costs (e.g. if it were determined that for some part of the year natural conditions criteria are more difficult to meet than the biologically based statewide criteria). In summary, the overwhelming consensus by Ecology scientists, including those involved with Salish Sea Model and Puget Sound nutrient efforts, is that this outcome is very unlikely (Section 3.2.3). Additionally, natural conditions criteria determined using the tools and processes adopted by this rulemaking would allow seasonal variation, where biologically-based criteria are represented by a single value year-round. This means that when paired with the human use allowance, natural conditions criteria would be technically achievable during all parts of the year by permittees. The same cannot be said of meeting biologically based criteria, even if biologically based criteria were more easily met for some part of the year due to natural variation of the water.

1.2.D Comment Summary – Ecology unjustifiably concluded that a Natural Conditions Rulemaking is the least burdensome alternative.

To adopt a significant legislative rule, an agency must determine it is the least burdensome alternative to achieve the goals and objectives of the authorizing statute. RCW 34.05.328(1). The Preliminary Least-Burdensome Alternative Analysis published by Ecology is insufficient to conclude the Natural Conditions Rulemaking is the least-burdensome alternative to achieve the goal of nutrient reduction in the Puget Sound. Ecology unjustifiably dismisses certain alternatives due to the added burden of conducting a proper rulemaking process, even though it is required to do the same when adopting its preferred action of establishing a performance-based approach.

The Least-Burdensome Alternative Analysis issued by Ecology dismisses alternatives for unjustified and misguided reasons. As a first alternative, Ecology considered updating the human allowance and natural conditions provisions without including a performance-based approach. Ecology concluded this alternative was potentially more burdensome, since, “If a water is not meeting biologically based numeric criteria, and that is due in part to natural conditions, then there would only be two pathways for determining protective criteria based on natural conditions: a use change through a Use Attainability Analysis (which could result in different criteria values); or criteria change through site-specific criteria development,” and these approaches would involve a separate rulemaking process. Citing the fact that an approach could result in different criteria values, or that an approach would require a separate rulemaking process, is not valid justification for why an alternative is more burdensome to a covered party. The least-burdensome alternative analysis is meant to measure burden on, “those required to comply” with the rule, not the burden on Ecology. RCW 34.05.328(1)(c). As another alternative, Ecology considered updating only the natural conditions provision, but not including the human allowance or the performance-based approach; Ecology concluded this alternative would also be potentially more burdensome for the same reasons as above, in addition to the fact that, if no human allowance is provided, when natural conditions serve as the applicable criteria, no

degradation for temperature or DO would be allowed. It is unreasonable and unjustified for Ecology to cite additional rulemaking procedures as an argument for why an alternative is more burdensome. The final alternative Ecology considered was foregoing a rulemaking entirely, but concluded that without natural conditions criteria, the applicable biologically based numeric criteria would apply, which some waters would be unable to achieve due to natural conditions, and this would ultimately be more burdensome to covered parties.

Ecology also erred in concluding its performance-based approach is the least burdensome alternative since it will inevitably overburden WWTPs with the costs of implementing advanced treatment technology and in turn overburden communities that must absorb the costs through higher rates and housing prices. Ecology unjustifiably concluded that the Natural Conditions Rulemaking is the least-burdensome alternative and must therefore address these deficiencies in a revised draft rule package that is subject to public notice and comment.

- City of Tacoma

Response to 1.2.D

Thank you for this comment. In comparing the burden of conducting this rulemaking to one without a performance-based option—the latter would require a series of site-specific rulemakings to determine natural conditions, as opposed to this single rulemaking which adopt a performance-based approach.

While the cost of rulemaking for future site-specific criteria are Ecology's and out of the scope of this analysis, the fact remains that alternatives developing site-specific criteria based on natural conditions, but requiring rulemaking, is likely more time intensive than using the performance-based approach. This difference in time represents a delay in which waters could have a site-specific criterion, but don't. During this time, permittees risk being out of compliance, and may expend additional time and resources including but not limited to remediation and penalty payments Rulemaking would also likely involve affected permittees efforts to provide input and feedback during the rule development and public process.

We have revised FRA Section 6.3.1 & 6.3.2 (alternatives referenced by this public comment) for clarity.

Please recognize that meeting statewide biologically based criteria (without rule), and site-specific criteria determined using tools and processes adopted by this rulemaking, both likely result in potential costs to permittees. However, keep in mind that the APA requires Ecology to analyze the impacts of any rule amendments relative to the existing rule, within the context of all existing requirements (federal and state laws and rules). Without natural conditions criteria, the applicable biologically based statewide criteria would still apply for CWA actions and must be met to protect existing and designated aquatic life uses. Some waters during some periods of the year may not be able to meet these criteria due to natural and seasonal variations. This could be the case even if all human impact was reversed and removed from this determination.

Water that will be considered for determining natural conditions criteria using tools and processes adopted by this rulemaking will likely have already failed to meet statewide biologically based criteria because of natural factors. Therefore, natural conditions criteria

established using tools and processes adopted by this rulemaking (and resulting permit requirements) are likely easier to meet by permittees and represent a benefit for the analytical purposes of this FRA. In this way, determining natural conditions of a water body using tools and processes adopted by this rulemaking will provide relief to some permittees by protecting aquatic life and meeting our CWA obligations, while reducing costs of compliance that would otherwise be higher based on existing biologically based numeric standards. We have made edits in the FRA to make this point additionally clear.

As for the distributing benefits of the adopted rule, cost-savings on compliance could theoretically be passed on to customers, though the degree to which would depend on supply/demand conditions and the entity's business model (i.e. whether savings would be kept to fund other business needs, or be reflected in product/service/rate pricing). Without additional information about market conditions, a realistic assumption is that uniform across-the-board reduction in household costs would represent a more significant portion of disposable income for disadvantaged communities.

Also, please note that this rulemaking is not covered under the HEAL act, as its proposal occurred prior to July 1, 2023.

1.2.E Comment Summary – Despite these facts, Ecology has chosen to implement nutrient criteria and modeling that is incompatible with the state of science. Ecology justifies this decision by asserting EPA and Ecology staff have "vetted" the marine DO criteria. However, more is needed than having these agencies "verify" the criteria or "check for accuracy." The Clean Water Act requires that water quality criteria "based on sound scientific rationale" and establish numeric criteria based on "scientifically defensible methods." 40 CFR 131.11(a)(1)-(b)(1). Rather than heed the reasonable concerns voiced by numerous parties and evaluate the implications of using a biologically-based standard instead of a performance-based approach that does not accord with sound scientific rationale, Ecology is attempting to reestablish the nutrient program it had in place previously without considering other, more sound alternatives.

Ecology failed to conduct a reasonable analysis of all alternatives and must therefore address these deficiencies in a revised draft rule package that is subject to public notice and comment.

- City of Tacoma

Response to 1.2.E

We appreciate your comment regarding our marine dissolved oxygen criteria. For this rulemaking, our focus was on natural conditions criteria and site-specific approaches to develop these protective aquatic life criteria. Ecology continues to evaluate new science and EPA criteria recommendations, and we encourage comments regarding the biologically-based numeric criteria in our upcoming triennial review. Also, we continue to offer to look at any new science that is available that says Washington's standards are not accurate. Our previous review of the criteria at the request of the Puget Sound Nutrient Forum did not lead us to any new information that would suggest these criteria are not protective.

In addition, please consider the following resources discussing the state of the science including the performance-based approach as a scientifically defensible method, and using natural conditions as criteria more broadly:

The 1997 Davies (EPA) memo. See Appendix A.[5] Specifically in the discussion:

> *"A State or Tribal procedure for determining natural background will need to be specific enough to establish natural background concentration accurately and reproducibly… For aquatic life uses, where the natural background concentration for a specific parameter is documented, by definition that concentration is sufficient to support the level of aquatic life expected to occur naturally at the site absent any interference by humans."*

EPA's 2007 "Biological Evaluation of the Revised Washington Water Quality Standards". This document was created by EPA in their evaluation of our 2003 and 2006 water quality standards revisions. Specifically in Section 5.H.17 starting on Page 170:

> "*EPA views criteria based on natural conditions to be fully protective of salmonid uses, even if the natural conditions are higher than the numeric criteria for some waterbodies, because the pollutant level prior to human impacts clearly supported healthy salmonid populations. So even if the natural conditions criteria would result pollutant levels that cause adverse effects to salmonids, those adverse effects would be viewed as naturally occurring adverse effects.*
>
> *EPA's Temperature Guidance also recommends that when estimating natural conditions (i.e. natural thermal potential) on a case-by-case basis in the context a TMDL, 303(d) listing, NPDES permit, or a 401 certification, the best available scientific information and techniques should be utilized. The Temperature Guidance provides guidance on what EPA considers are the best available methods to estimate the natural conditions for temperature… EPA's approval of the natural conditions provision is likely to result in pollutant levels in some waters that lead to adverse effects on listed species, but those adverse effects would be naturally occurring and could not be avoided or minimized without artificial measures to lower the naturally occurring pollutant level."*

As a generalized summary, waterbodies have natural regimes of water quality, from diel shifts to decadal changes. Species that live in these waters would have adapted over time to these natural conditions. In essence, the survival and reproduction of these species in these waters indicate that they, in fact, have adapted to these waters that possibly couldn't support these species if the focus was just on biologically based numeric criteria.

Therefore, from a protection and criteria development standpoint, if we determine, with as much certainty as we can, the natural (i.e., pre-anthropogenic) conditions of the system, using a variety of tools and data available to us, we can assert that if an impaired water were to be returned to that natural state, species would be protected.

1.2.F Comment Summary – Ecology should fully document and assess the likely costs of this rulemaking. It appears that Ecology is seeking through this rulemaking to reestablish a natural conditions provision in the state water quality standards that will allow Ecology to proceed with its Puget Sound Nutrient Program, including the Puget Sound Nutrient General Permit (PSNGP). Ecology has sufficient information as to its intent in the program to fully assess the costs of this rule, the impact on small businesses, and the impact on already overburdened communities.

[5] https://www.epa.gov/sites/default/files/2015-02/documents/natural-conditions-framework-2015.pdf

Ecology has been clear that it intends to refine the Salish Sea Model to develop final water quality based effluent limits for Puget Sound wastewater treatment plants for total inorganic nitrogen in the range of 3 mg/L or 8 mg/L. Everett is required under the PSNGP to submit a Nutrient Reduction Evaluation with these values. Ecology has sufficient information to evaluate the costs of treatment technology to achieve these limits and should do so as part of the rulemaking.

- City of Everett

Response to 1.2.F

Thank you for your comment. Please recognize that meeting statewide biologically based criteria (without rule), and site-specific natural conditions criteria determined using tools and processes adopted by this rulemaking, both likely result in potential costs to permittees. However, keep in mind that the APA requires Ecology to analyze the impacts of any rule amendments relative to the existing rule, within the context of all existing requirements (federal and state laws and rules).

Without natural conditions criteria, the applicable biologically based statewide criteria would still apply for CWA actions and need to be met to protect existing and designated aquatic life uses (See FRA section 2.2.4). Some waters during some periods of the year may not be able to meet these criteria due to natural and seasonal variations. This could be the case even if all human impact was reversed and removed from this determination.

Water that is optionally considered for criteria based on natural conditions because of this rulemaking will likely have already failed to meet statewide biologically based criteria because of natural factors. Therefore, natural conditions criteria established using tools and processes adopted by this rulemaking (and resulting permit requirements) are likely easier to meet by permittees and represent a benefit for the analytical purposes of this FRA. **In this way, determining natural conditions criteria using tools and processes established by this rulemaking will provide relief to some permittees by protecting aquatic life and meeting our CWA obligations, while reducing costs of compliance that would otherwise be higher based on existing biologically based numeric standards.**

Attributing positive costs of the PSNGP to this rulemaking is misguided on several fronts. First, AKART requirements in the PSNGP used to meet narrative criteria come from an existing part of the State Water Pollution Control Act (Chapters 90.48.010, 90.52.040 and 90.54.020 RCW) and associated federal rules [40 CFR 122.44(a & b) and 40 CFR 125.3(a)(1)] **and would remain in place and be required in the PSNGP and other NPDES permits to meet CWA requirements for DO in Puget sound with or without the adopted rule (40 CFR §122.44).** This is a baseline cost, and so is not an additional cost that would result from this rulemaking. The purpose of Ecology's Draft Interim Financial Capability Assessment Guidance is to provide PSNGP permittees with a tool to evaluate and report on their community-specific financial capability so that Ecology can determine the "reasonable" component of AKART requirements (see the draft guidance document[6]) which will be compared to Water Quality Based Effluent Limits, based on EPA-approved water quality

[6] https://ecology.wa.gov/regulations-permits/permits-certifications/nutrient-permit

criteria, to determine which type of limit (Technology/AKART-based vs Water Quality-based) is more stringent and applicable in future PSNGP permit cycles. As cited above, AKART requirements already exist in law and is not associated with, nor affected by this rulemaking.

Second, **in many areas of the Puget Sound, a numeric permit limit for total inorganic nitrogen set without natural conditions would likely be zero or close to zero to meet DO requirements under the CWA**. However, and again, the consensus by Ecology scientists, including those involved with Salish Sea Model and Puget Sound nutrient efforts, is that **site-specific criteria derived using natural conditions—similar to those being explored for future iterations of the PSNGP—would potentially be less costly to comply with, compared to permit limits derived from current biologically-based numeric criteria**. This is because portions of Puget Sound are known to naturally exceed the biological criteria. We have added clarifying language and organization throughout the FRA to make this concept additionally clear.

As discussed above, and throughout the FRA, the overall direction of this difference (a benefit to permittees) is clear and logical, and therefore allows us to make the assertion that the rule will not impose compliance costs (in general, and on small business for the purposes of the RFA). However, the exact level of avoided costs (benefits) cannot be known with available data. Relatedly, uncertainty described in the FRA around "compliance costs" (as cited in comment) are typically referring to avoided costs, which is the level of "relief" the rule represents from the differential between complying with criteria in current laws vs criteria based on natural conditions in the rule.

Deriving these benefits with precision would require wasteload allocations from two separate TMDL studies for applicable listed waterbodies—one to satisfy biologically based statewide standards in the baseline, and another to satisfy criteria based on natural conditions and human allowance as defined by this rulemaking. In practice, this level of effort is unrealistic for the purposes of the FRA. Outputs from the Salish Sea Model alone also do not constitute a TMDL, nor do reference conditions used in the Salish Sea Model, and mentioned by the comment, consider allowances to local and regional sources of pollution or global climate change in the same way as defined in this rulemaking.

In the FRA we discuss some special cases where criteria based on natural conditions could theoretically represent costs (e.g. if it were determined that for some part of the year natural conditions criteria are more difficult to meet than the biologically based statewide criteria). In summary, the overwhelming consensus by Ecology scientists, including those involved with Salish Sea Model and Puget Sound nutrient efforts, is that this outcome is very unlikely (Section 3.2.3). Additionally, natural conditions criteria determined using the tools and processes adopted by this rulemaking would allow seasonal variation, where biologically-based criteria are represented by a single value year-round. This means that when paired with the human use allowance, natural conditions criteria would be technically achievable during all parts of the year by permittees. The same cannot be said of meeting biologically based criteria, even if biologically based criteria were more easily met for some part of the year due to natural variation of the water.

1.2.G Comment Summary – The cost-benefit analysis provided with this proposed rule is inadequate. It shows a lack of interaction with local permittees who could provide information

relevant to this analysis. On page 44 of the Preliminary Regulatory Analyses, you calculate a cost for removal of a tiny amount of nitrogen from a WWTP in order to just barely meet a standard as calculated by natural conditions. It is not an appropriate measure of cost, since most dischargers would scale it up to full nutrient removal based on what they expect standards to become in the future. Attempting to low-ball costs with no input from actual dischargers is misleading.

- Washington Association of Sewer & Water Districts

Response to 1.2.G

Thank you for your comment. Please recognize that meeting statewide biologically based criteria (without rule), and site-specific criteria based on natural conditions determined using tools and processes adopted by this rulemaking, could both result in potential costs to permittees. However, keep in mind that the APA requires Ecology to analyze the impacts of any rule amendments relative to the existing rule, within the context of all existing requirements (federal and state laws and rules).

Without natural conditions criteria, the applicable biologically based statewide criteria would still apply for CWA actions and need to be met to protect existing and designated aquatic life uses. Some waters during some periods of the year may not be able to meet these criteria due to natural and seasonal variations. This could be the case even if all human impact was reversed and removed from this determination.

Water that will be considered for criteria based on natural conditions because of this rulemaking will likely have already failed to meet statewide biologically based criteria because of natural factors. Therefore, criteria established using tools and processes adopted by this rulemaking (and resulting permit requirements) are likely easier to meet by permittees and represent a benefit for the analytical purposes of this FRA. **In this way, determining natural conditions criteria using tools and processes adopted by this rulemaking will provide relief to some permittees by protecting aquatic life and meeting our CWA obligations, while reducing costs of compliance that would otherwise be higher based on existing biologically based numeric standards.**

Deriving these benefits with precision would require two separate TMDL studies for listed waterbodies—one to satisfy biologically based statewide standards in the baseline, and another to satisfy criteria based on natural conditions and human allowance as defined by this rulemaking. In practice, this level of effort is unrealistic for the purposes of an FRA. The "cost for removal of a tiny amount of nitrogen" referenced by this comment on page 44 is in the benefits chapter (Chapter 4) of the regulatory analysis and represents **the cost that a permittee might avoid because of the rule.** Without better information, **we chose the smallest cost estimate practical in this section to be conservative, and not overestimate benefits of the rule.**

1.2.H Comment Summary – Ecology fails to account for both the qualitative and quantitative costs and benefits of its Natural Conditions Rulemaking, as required under RCW 34.05.328 (1)(d).

Ecology also fails to consider the impact its Natural Conditions Rulemaking will have on increased wastewater utility rates. This is both an economic and environmental issue; WWTPs will necessarily pass the cost of new treatment technology onto ratepayers and when living expenses increase in urban areas, housing development sprawls to rural areas where urban wastewater systems do not reach and rural septic can be far more polluting.

Additionally, the treatment technology required to comply with the proposed rule will ultimately increase utility rates and housing prices across the state, and when living expenses increase in urban areas, housing development sprawls to rural areas where urban wastewater systems do not reach and rural septic can create significant levels of pollution.

- City of Tacoma

Response to 1.2.H

Thank you for your comment. Please see Section 3, 4 and 5 of the FRA for a discussion of qualitative and quantitative costs and benefits of the Natural Conditions Rulemaking.

Please recognize that meeting statewide biologically based criteria (without rule), and site-specific natural conditions criteria determined using tools and processes adopted by this rulemaking, both likely result in potential costs to permittees. However, keep in mind that the APA requires Ecology to analyze the impacts of any rule amendments relative to the existing rule, within the context of all existing requirements (federal and state laws and rules).

Without natural conditions criteria, the applicable biologically based statewide criteria would still apply for CWA actions and need to be met to protect existing and designated aquatic life uses (See FRA section 2.2.4). Some waters during some periods of the year may not be able to meet these criteria due to natural and seasonal variations. This could be the case even if all human impact was reversed and removed from this determination.

Water that is optionally considered for criteria based on natural conditions because of this rulemaking will likely have already failed to meet statewide biologically based criteria because of natural factors. Therefore, natural conditions criteria established using tools and processes adopted by this rulemaking (and resulting permit requirements) are likely easier to meet by permittees and represent a benefit for the analytical purposes of this FRA. **In this way, determining natural conditions criteria using tools and processes established by this rulemaking will provide relief to some permittees by protecting aquatic life and meeting our CWA obligations, while reducing costs of compliance that would otherwise be higher based on existing biologically based numeric standards.**

Attributing positive costs of the PSNGP to this rulemaking is misguided on several fronts. First, AKART requirements in the PSNGP used to meet narrative criteria come from an existing part of the State Water Pollution Control Act (Chapters 90.48.010, 90.52.040 and 90.54.020 RCW) and associated federal rules [40 CFR 122.44(a & b) and 40 CFR 125.3(a)(1)] **and would remain in place and be required in the PSNGP and other NPDES permits to meet CWA requirements for DO in Puget sound with or without the adopted rule (40 CFR §122.44).** This is a baseline cost, and so is not an additional cost that would result from this rulemaking. The purpose of Ecology's Draft Interim Financial Capability Assessment Guidance is to provide PSNGP permittees with a tool to evaluate and report on

their community-specific financial capability so that Ecology can determine the "reasonable" component of AKART requirements (see the draft guidance document[7]) which will be compared to Water Quality Based Effluent Limits, based on EPA-approved water quality criteria, to determine which type of limit (Technology/AKART-based vs Water Quality-based) is more stringent and applicable in future PSNGP permit cycles. As cited above, AKART requirements already exist in law and is not associated with, nor affected by this rulemaking.

Second, **in many areas of the Puget Sound, a numeric permit limit for total inorganic nitrogen set without natural conditions would likely be zero or close to zero to meet DO requirements under the CWA**. However, and again, the consensus by Ecology scientists, including those involved with Salish Sea Model and Puget Sound nutrient efforts, is that **site-specific criteria derived using natural conditions—similar to those being explored for future iterations of the PSNGP—would potentially be less costly to comply with, compared to permit limits derived from current biologically-based numeric criteria**. This is because portions of Puget Sound are known to naturally exceed the biological criteria. We have added clarifying language and organization throughout the FRA to make this concept additionally clear.

As discussed above, and throughout the FRA, the overall direction of this difference (a benefit to permittees) is clear and logical, and therefore allows us to make the assertion that the rule will not impose compliance costs (in general, and on small business for the purposes of the RFA). However, the exact level of avoided costs (benefits) cannot be known with available data. Relatedly, uncertainty described in the FRA around "compliance costs" (as cited in comment) are typically referring to avoided costs, which is the level of "relief" the rule represents from the differential between complying with criteria in current laws vs criteria based on natural conditions in the rule.

Deriving these benefits with precision would require wasteload allocations from two separate TMDL studies for applicable listed waterbodies—one to satisfy biologically based statewide standards in the baseline, and another to satisfy criteria based on natural conditions and human allowance as defined by this rulemaking. In practice, this level of effort is unrealistic for the purposes of the FRA. Outputs from the Salish Sea Model alone also do not constitute a TMDL, nor do reference conditions used in the Salish Sea Model, and mentioned by the comment, consider allowances to local and regional sources of pollution or global climate change in the same way as defined in this rulemaking.

In the FRA we discuss some special cases where criteria based on natural conditions could theoretically represent costs (e.g. if it were determined that for some part of the year natural conditions criteria are more difficult to meet than the biologically based statewide criteria). In summary, the overwhelming consensus by Ecology scientists, including those involved with Salish Sea Model and Puget Sound nutrient efforts, is that this outcome is very unlikely (Section 3.2.3). Additionally, natural conditions criteria determined using the tools and processes adopted by this rulemaking would allow seasonal variation, where biologically-based criteria are represented by a single value year-round. This means that when paired with the human use allowance, natural conditions criteria would be technically achievable during

[7] https://ecology.wa.gov/regulations-permits/permits-certifications/nutrient-permit

all parts of the year by permittees. The same cannot be said of meeting biologically based criteria, even if biologically based criteria were more easily met for some part of the year due to natural variation of the water.

1.2.I Comment Summary – Ecology also failed to evaluate qualitative or quantitative impacts on low-income and environmental justice communities.

- City of Tacoma

Response to 1.2.I

Thank you for your comment. We recognize that meeting statewide biologically based criteria (without rule), and site-specific criteria based on natural conditions determined using tools and processes adopted by this rulemaking, could both result in potential costs to permittees. However, keep in mind that the APA requires Ecology to analyze the impacts of any rule amendments relative to the existing rule, within the context of all existing requirements (federal and state laws and rules).

Without natural conditions criteria, the applicable biologically based statewide criteria would still apply for CWA actions and must be met to protect existing and designated aquatic life uses. Some waters during some periods of the year may not be able to meet these criteria due to natural and seasonal variations. This could be the case even if all human impact was reversed and removed from this determination.

Water that will be considered for determining natural conditions criteria using tools and processes adopted by this rulemaking will likely have already failed to meet statewide biologically based criteria because of natural factors. Therefore, criteria established using tools and processes adopted by this rulemaking (and resulting permit requirements) are likely easier to meet by permittees and represent a benefit for the analytical purposes of this FRA. **In this way, determining natural conditions of a water body using tools and processes adopted by this rulemaking will provide relief to some permittees by protecting aquatic life and meeting our CWA obligations, while reducing costs of compliance that would otherwise be higher based on existing biologically based numeric standards.** As for the distributing benefits of the adopted rule, cost-savings on compliance could theoretically be passed on to customers, though the degree to which would depend on supply/demand conditions and the entity's business model (i.e. whether savings would be kept to fund other business needs, or be reflected in product/service/rate pricing). Without additional information about market conditions, a realistic assumption is that uniform across-the-board reduction in household costs would represent a more significant portion of disposable income for disadvantaged communities.

Also, please note that this rulemaking is not covered under the HEAL act, as its proposal occurred prior to July 1, 2023.

1.3. General comments on rulemaking process

1.3.A Comment Summary – Can natural conditions include beneficial uses of aesthetics and wildlife habitat? I became very interested in natural conditions while driving past the beautiful

rolling hills and farms in wet meadows in Thurston County. The natural conditions here differed from north Seattle. The eye candy here included meadows, (sometimes with cows) bordered by forest and farmhouses. The only sound breaking the silence was bugling elk and flying geese and occasional logging trucks. And, we could breathe without choking on fumes. These natural conditions were nice. I worried about 'unnatural conditions'. Specifically livestock in a wetland itself which clearly would have increased nutrients and fecal coliform. But then I was told that this was a special site. That careful managed grazing in the wet meadows created openings in the 'unnatural' canary grass and somehow helped maintain frog habitat. So in some cases, human agricultural activity supported rare species in an 'ecosystem'.

- Blessing, Bonnie

1.3.B Comment Summary – In a thesis I did, it showed that some marshes that host Oregon spotted frogs are shrubby with small openings in the canopy. This was based on looking at a limited number of spotted frog marshes. These shrubby areas are sometimes characteristic of the 'natural conditions' that were found in the early GLO surveys as well. But usually now a combination of natural conditions and some level of anthropogenic agricultural land use may still be the 'environmental baseline'.

- Blessing, Bonnie

1.3.C Comment Summary – WILL THE CRITERIA DERIVED FROM A NATURAL CONDITIONS CRITERIA PROTECT DESIGNATED AND EXISTING USES? Before discussing whether NCC-derived criteria will be protective under the proposed rules, we note that when EPA established its guidance on numeric criteria, it called for meeting the criteria at the lowest downstream point for which the uses were being protected, thereby underpinning an assumption that the upstream waters would be colder than the applicable numeric criteria. Despite this assumption, Ecology does not identify waters that are not meeting numeric criteria on this basis, i.e., expecting upstream waters to be cooler. Ecology's failure to regulate on the basis of this assumption results in less protection for aquatic species throughout the process of monitoring, 303(d) listing, modeling, and establishing NCC derived criteria. If Ecology wants to ensure that its proposed rules are sufficient, it will address this ongoing failure.

- Northwest Environmental Advocates

Response to 1.3.A, 1.3.B, and 1.3.C

We note that natural conditions criteria are calculated by accounting for and removing all sources of human impact, such that the natural conditions criteria values represent water quality in its pre-anthropogenic impact state. These criteria support aquatic life, as aquatic life have adapted over time to inhabit these waters, and this level of water quality is therefore necessary for survival and reproduction of aquatic life.

The primary purpose of this rule was to develop a process to identify natural water quality conditions for water bodies with unique physiochemical characteristics. Aquatic life that inhabits these waters have adapted over time to these natural, pre-human impact conditions, such that this level of natural water quality supports aquatic life survival, growth, and reproduction.

That said, we recognize that additional work is needed in the performance-based approach document before it is final. This includes adding additional details to our methodology. This will ensure any binding natural condition performance-based processes is scientifically-justifiable and repeatable. Our water quality criteria will protect all aquatic life, including threatened and endangered species.

We plan on revising the document and providing additional opportunities for Tribes and the public to comment before finalization and submittal to EPA. Please see our statement in Section 5 (Response to 5.A through 5.ZZ) regarding the future of the performance-based approach document.

1.3.D Comment Summary – Natural conditions should only be applied when DO concentrations are lower than biologically based numeric criteria.

- Loehr, Lincoln

Response to 1.3.D

We appreciate your comment.

As natural conditions represent an alternative approach to developing protective aquatic life criteria, both approaches (natural conditions and biologically-based) are paths to derive protective aquatic life criteria. Ecology holds that while both are different options to providing protection for aquatic life in water bodies, neither supersede the other in regard to quality when appropriately determined.

Generally, due to the workload required to derive natural conditions, we would prioritize waters we've identified as needing these criteria based on our Clean Water Act 303(d) list determination and/or TMDL prioritization. In other words, generally, we would not be prioritizing deriving natural conditions water quality criteria for waters that are currently meeting applicable biologically-based numeric criteria.

1.3.E Comment Summary – [W]e want to emphasize that the Tribe will oppose any effort to create less stringent protections or slower, site-specific processes for natural conditions derivations. Any such changes will lead to greater harm of biota and Treaty Resources beyond a given project area.

- Jamestown S'Klallam Tribe

Response to 1.3.E

We appreciate your comment and agree that aquatic life must be (and we argue, is) protected in our revised or new water quality updates. The primary purpose of this rule was to develop a process to identify natural water quality conditions for water bodies with unique physiochemical characteristics. Aquatic life that inhabits these waters have adapted over time to these natural, pre-human impact conditions, such that this level of natural water quality supports aquatic life survival, growth, and reproduction. Therefore, by determining the natural water quality of a water body, we can establish protective aquatic life criteria.

1.3.F Comment Summary – The Yakama Nation's understanding is that with this proposed change, Ecology will allow a process for separate and individual models to determine "natural conditions" for site specific freshwater and marine waters across Washington State. These models will be designed and conducted with the development of individual Quality Assurance Project Plans (QAPPs) which would ultimately provide the basis for developing natural conditions criteria for Total Maximum Daily Loads (TMDLs) to override existing, biologically-based numeric criteria with levels of temperature and dissolved oxygen that exist in current conditions or have been modeled to predict historical natural conditions.

- Confederated Tribes and Bands of the Yakama Nation

Response to 1.3.F

We have updated WAC 173-201A-260(1)(a) to be clearer about the process for deriving protective site-specific criteria based on natural conditions.

Regarding the performance-based approach, you are correct in that it is one option for Ecology to develop site-specific criteria that then could be used in our federal CWA actions, such as TMDLs. When the performance-based approach is EPA-approved and all requirements are followed, the site-specific criteria developed using the performance-based approach would override existing biologically-based numeric criteria for those specific water quality parameters.

The primary purpose of this rule was to develop a process to identify natural water quality conditions for water bodies with unique physiochemical characteristics. Aquatic life that inhabits these waters have adapted over time to these natural, pre-human impact conditions, such that this level of natural water quality supports aquatic life survival, growth, and reproduction.

That said, we recognize that additional work is needed in the performance-based approach document before it is final. This includes adding additional details to our methodology. This will ensure any binding natural condition performance-based processes is scientifically-justifiable and repeatable. Our water quality criteria will protect all aquatic life, including threatened and endangered species.

We plan on revising the document and providing additional opportunities for Tribes and the public to comment before finalization and submittal to EPA. Please see our statement in Section 5 (Response to 5.A through 5.ZZ) regarding the future of the performance-based approach document.

1.3.G Comment Summary – In 2022, King County expanded our decades-long Central Puget Sound marine monitoring to include data collection from Whidbey Basin, focusing on areas that are both sensitive to human influence and difficult to model. Additionally, King County continues to fund research at the University of Washington, Puget Sound Institute, and the University of British Columbia to complement the Department of Ecology's scientific modeling work. We believe that robust scientific research will help all agencies better understand the ecological dynamics of Puget Sound and that it should inform effective policy and regulatory decisions.

- King County Department of Natural Resources and Parks

Response to 1.3.G

We appreciate your comment and your commitment to data collection and furthering scientific research. We agree that further research in Puget Sound can only benefit our water quality work.

1.3.H Comment Summary – Federal regulations (40 CFR 131.10(g)) already detail a method for developing site-specific criteria (including aquatic life criteria) if naturally occurring pollution, low flow, or physical conditions prevent attainment of designated uses for a water body, by performing a use attainability analysis (UAA). The technical support document specifies that a UAA includes adoption of site-specific criteria, while the performance-based approach relies on adoption of a process or methodology. However, the performance-based approach still results in adoption of specific criteria.

It would be helpful to have further clarification on which process may be used in specific cases related to aquatic life use criteria, or whether both may be acceptable approaches to developing site-specific criteria.

- King County Department of Natural Resources and Parks

Response to 1.3.H

We have clarified our rule language at WAC 173-201A-260(1)(a) to address the options for natural conditions and have made clarifications in our supporting documentation regarding UAAs.

Generally speaking, the Use Attainability Analysis (UAA) is separate from site-specific natural conditions criteria development that follows WAC 173-201A-430 or -470 (for those applicable parameters). However, the criteria values developed using the UAA could be (but isn't required to be) based on the natural conditions of the site.

The distinction between the two (UAA versus site-specific criteria development) is based on the designated uses for the water. If a site cannot meet a designated use due to natural conditions preventing attainment of that use, the UAA is the appropriate water quality standard (WQS) tool. If, however, the designated use *can* be met at a site, but just needs a different criterion value because of natural conditions of the site (e.g., because a site naturally has lower DO), then site-specific criteria developed following -430 or -470 would be the WQS appropriate tools, where applicable.

There could be overlap, where aquatic life designated uses could be met for one parameter if adjusted for natural conditions (e.g., dissolved oxygen), but not for another (e.g., temperature). It is difficult to speak on future hypotheticals here or for other future actions, and we note that Ecology has only ever conducted one UAA previously (which is still under EPA review).

1.3.I Comment Summary – The City would welcome an opportunity to discuss these comments with Ecology staff. The City is interested in a clear definition of where and when the human

contribution allowances are applied to the approximation of natural conditions in marine waters and specifically how they will apply to water quality assessments, TMDLs, and NPDES discharge permitting.

- City of Everett

Response to 1.3.I

We appreciate your comment. We have made clarifying edits in our implementation plan regarding use of developed natural conditions criteria.

The primary purpose of this rule was to develop a process to identify natural water quality conditions for water bodies with unique physiochemical characteristics. Aquatic life that inhabits these waters have adapted over time to these natural, pre-human impact conditions, such that this level of natural water quality supports aquatic life survival, growth, and reproduction.

That said, we recognize that additional work is needed in the performance-based approach document before it is final. This includes adding additional details to our methodology. This will ensure any binding natural condition performance-based processes is scientifically-justifiable and repeatable. Our water quality criteria will protect all aquatic life, including threatened and endangered species.

We plan on revising the document and providing additional opportunities for Tribes and the public to comment before finalization and submittal to EPA. Please see our statement in Section 5 (Response to 5.A through 5.ZZ) regarding the future of the performance-based approach document.

Regarding the human-use allowances, we note that such allowances would only be allowed when natural conditions criteria are the applicable and effective criteria for a site, which must first be developed by following WAC 173-201A-260(1)(a), which has had additional edits made for clarity.

Only derived and EPA-approved natural conditions criteria following the processes in WAC 173A-260(1)(a) can be used for federal Clean Water Act actions, such as our water quality assessment, TMDLs, or NPDES permitting.

If you have further questions on this process, we encourage you to reach out to us anytime at swqs@ecy.wa.gov so we can address any more specific questions.

1.3.J Comment Summary – Lest there be any lingering question about whether EPA does, in fact, continue to look over Ecology's shoulder pursuant to either the Clean Water Act or the Endangered Species Act, EPA has made abundantly clear that it does not, as recently as 2020. EPA developed TMDLs for the Deschutes River basin upon its disapproval of some Ecology TMDLs. See EPA, Total Maximum Daily Loads (TMDLs) for the Deschutes River and its Tributaries Sediment, Bacteria, Dissolved Oxygen, pH, and Temperature (July 31, 2020, rev. Aug. 6, 2021). In these TMDLs, EPA relied, inter alia, upon the then-existing NCC. In a memo to the file pertaining to these NCC-based TMDLs, EPA wrote:

The establishment of a TMDL is not an agency action for purposes of ESA consultation because the TMDL merely implements effective applicable water quality standards under the Clean Water Act (CWA) and EPA has no discretion to alter those standards for the benefit of protected species. The Clean Water Act does not grant EPA the discretion to approve or establish a TMDL at a level of protection that is different than the applicable standard in order to benefit ESA listed species and critical habitat.

EPA's authority to approve or establish a TMDL does not go beyond the scope of TMDL statutory and regulatory requirements. If EPA is reviewing or establishing a TMDL, CWA Section 303(d)(1)(C) requires that the TMDL implement the existing applicable standard. Accordingly, the CWA does not grant EPA the discretion to approve or establish a TMDL at a level of protection that is different than the applicable standard in order to benefit ESA-listed species and critical habitat. In light of EPA's opinions in the context of an NCC-based TMDL, it is absurd for Ecology to continue to assert that EPA maintains any oversight over how Ecology will use its NCC in the future.

- Northwest Environmental Advocates

Response to 1.3.J

We appreciate your comment.

We note that the performance-based approach process and external, rule-referenced document are what we will send to EPA for approval. An EPA-approved performance-based approach process serves as EPA approval for outcomes, or uses, of that process as well (USEPA, 2015).

We anticipate that EPA will use the public process for evaluating use of the natural condition performance-based approach to determine whether Ecology has appropriately followed the performance-based approach (e.g., such as during public review of a draft TMDL). However, we cannot speak to what EPA will ultimately do or not do in our Clean Water Act actions.

That said, we have made some updates to our implementation plan regarding this rule. This includes updates where we indicate that any use of criteria developed using the performance-based approach will include an opportunity for public involvement and review before first use. We are fully committed to holding a public review period when we use the performance-based approach to develop natural conditions criteria. It is anticipated that the majority of our use of the performance-based approach will be done in conjunction with an Advanced Restoration Plan or TMDL, which can involve a public review process and EPA review. Regardless of how or when we use the performance-based approach, we have clarified that the public will have opportunity to review and comment on the developed criteria and process for derivation.

References

United States Environmental Protection Agency. 2015. A Framework for Defining and Documenting Natural Conditions for Development of Site-Specific Natural Background Aquatic Life Criteria for Temperature, Dissolved Oxygen, and pH: Interim Document. Office of Water, Washington, D.C. EPA 820-R-15-001.

1.3.K Comment Summary – Ecology suggests that it will cease using the NCC as a "one-way ratchet." TSD at 28. It reiterates that EPA supports this approach. Id. at 41. There is not, however, any place in the proposed rules that establishes this as a requirement for using the NCC provisions. In fact, having colder temperatures is part of the need to create diversity and complexity in the aquatic environment discussed in Section II.B, supra.

- Northwest Environmental Advocates

Response to 1.3.K

We appreciate your comment.

The primary purpose of this rule was to develop a process to identify natural water quality conditions for water bodies with unique physiochemical characteristics. Aquatic life that inhabits these waters have adapted over time to these natural, pre-human impact conditions, such that this level of natural water quality supports aquatic life survival, growth, and reproduction.

That said, we recognize that additional work is needed in the performance-based approach document before it is final. This includes adding additional details to our methodology. This will ensure any binding natural condition performance-based processes is scientifically-justifiable and repeatable. Our water quality criteria will protect all aquatic life, including threatened and endangered species.

We plan on revising the document and providing additional opportunities for Tribes and the public to comment before finalization and submittal to EPA. Please see our statement in Section 5 (Response to 5.A through 5.ZZ) regarding the future of the performance-based approach document.

We note that criteria derived following WAC 173-201A-260(1)(a), which includes language updates compared to our draft proposal, are the effective criteria once developed and approved by EPA (either due to an approved performance-based approach or site-specific rulemaking). In other words, any final and approved criteria using these approaches are the applicable criteria for those identified waters, not the biologically-based numeric criteria, regardless of how these values compare to the biologically-based numeric criteria (i.e., higher or lower).

We do not agree that additional language is needed in our regulations to address this concern.

1.3.L Comment Summary – As written, Ecology's proposed changes to Chapter 173-201A WAC do not constitute a "performance-based water quality standard." The proposal falls severely short by failing to provide the necessary rationale and assurances that the most sensitive beneficial uses are protected and that outcomes are replicable. We strongly urge Ecology to go back to the drawing board and start over.

- Alliance for Community Engagement SW WA
- Columbia Riverkeeper
- Deschutes Estuary Restoration Team
- Friends of Black Diamond
- Spokane Riverkeeper
- North Cascades Audubon Society

- Northwest Environmental Defense Center
- Orca Conservancy
- Orca Network
- Rainier Audubon Society
- RE Sources
- Snake River Waterkeeper
- Trout Unlimited – Washington Council Trout Unlimited
- Washington Chapter Sierra Club

1.3.M Comment Summary – Pg. 66. [of the Draft Technical Support Document] Under Guidance documents and recommendations, it's mentioned that Washington will likely be one of the first states to consider a performance-based approach for natural conditions in the United States. Overall, it appears little is known about how this process will function in practice. If this is a "model for the nation" approach then there are no examples and we recommend further tested prior to adoption.

- Snohomish County

1.3.N Comment Summary – AWC [Association of Washington Cities] supports establishment of water quality criteria based on natural conditions when the waterbody does not meet numeric criteria because of those natural conditions. We also support inclusion of an anthropogenic allowance when it can be provided without harming aquatic life. Based on the information the agency has provided as part of the rulemaking, we are unable to determine what changes the proposal has on impacts to aquatic life.

- Association of Washington Cities

Response to 1.3.L, 1.3.M, and 1.3.N

We appreciate your comments. The purpose of this rule was to develop a process to identify natural water quality conditions for water bodies with unique physiochemical characteristics. Aquatic life that inhabits these waters have adapted over time to these natural, pre-human impact conditions, such that this level of natural water quality supports aquatic life survival, growth, and reproduction.

That said, we recognize that additional work is needed in the performance-based approach document before it is final. This includes adding additional details to our methodology. This will ensure any binding natural condition performance-based processes is scientifically-justifiable and repeatable. Our water quality criteria will protect all aquatic life, including threatened and endangered species.

We plan on revising the document and providing additional opportunities for Tribes and the public to comment before finalization and submittal to EPA. Please see our statement in Section 5 (Response to 5.A through 5.ZZ) regarding the future of the performance-based approach document. We have also made updates for clarity to our technical support document and implementation document.

1.3.O Comment Summary – Ecology should fully comply with state rulemaking requirements.

The adoption of water quality standards is subject to the significant legislative rule (SLR) requirements of the state Administrative Procedures Act (APA). RCW 34.05.328. These include the following:

Statement of general goals and objectives. A detailed statement of the general goals and objectives of the statute that the rule implements. RCW 34.05.328 (1)(a).

Statement of necessity and alternatives analysis. A determination that the rule is necessary to achieve the general goals and specific objectives, an analysis of alternatives to rulemaking, and analysis of the consequences of not adopting the rule. RCW 34.05.328 (1)(b).

Preliminary and final cost-benefit analysis. A preliminary cost-benefit analysis must be prepared at the time a draft rule is published for public comment. A final cost-benefit analysis must be issued when the rule is adopted. RCW 34.05.328 (1)(c). The cost-benefit analysis must include a determination that the "probable benefits of the rule are greater than its probable costs, taking into account both the qualitative and quantitative benefits and costs and the specific directives of the statute being implemented." RCW 34.05.328 (1)(d).

Least burdensome alternative analysis. A determination, after considering alternative versions of the rule, that the rule being adopted is the least burdensome alternative for those required to comply with it that will achieve the general goals and specific objectives identified under RCW 34.05.328 (1)(a). RCW 34.05.328(1)(e).

Justification for more stringent requirements than federal law. Ecology must determine if the rule is more stringent than federal standards. If so, Ecology must determine that the difference is justified either by a state statute that explicitly allows the agency to differ from federal standards or by "substantial evidence" that the difference is necessary to achieve the general goals and specific objectives stated under RCW 34.05.328 (1)(a). RCW 34.05.328(1)(h).

Implementation plan. Prior to adoption, Ecology must provide an implementation plan that describes how the agency intends to implement and enforce the rule including a description of the resources the agency intends to use, how the agency will inform and educate affected persons about the rule, how the agency will promote and assist voluntary compliance, and an evaluation of whether the rule achieves the purpose for which it was adopted. RCW 34.05.328 (3).

Report to joint administrative rules review committee. After adopting a rule regulating the same subject matter as another provision of federal law, Ecology will be required to submit a report to the legislature identifying the existence of any overlap, duplication, or difference with federal law and making recommendations for any legislation necessary to eliminate or mitigate any adverse effects of such overlap, duplication or difference. RCW 34.05.328 (4).

The APA also requires that the Ecology water quality program identify the sources of information reviewed and relied upon by the agency in preparing a SLR. RCW 34.05.272. The APA further requires that a draft rule package include a small business economic impact statement (SBEIS) that complies with RCW 19.85.040. RCW 34.05.320 (1)(j). RCW 34.05.320. The SBEIS must include an evaluation of compliance impacts on small businesses and provide a determination of whether the rule will have a disproportionate cost impact on small businesses.

- City of Tacoma

Response to 1.3.O

We appreciate your comment. The primary purpose of this rule was to develop a process to identify natural water quality conditions for water bodies with unique physiochemical characteristics. Aquatic life that inhabits these waters have adapted over time to these natural, pre-human impact conditions, such that this level of natural water quality supports aquatic life survival, growth, and reproduction.

That said, we recognize that additional work is needed in the performance-based approach document before it is final. This includes adding additional details to our methodology. This will ensure any binding natural condition performance-based processes is scientifically-justifiable and repeatable. Our water quality criteria will protect all aquatic life, including threatened and endangered species.

We plan on revising the document and providing additional opportunities for Tribes and the public to comment before finalization and submittal to EPA. Please see our statement in Section 5 (Response to 5.A through 5.ZZ) regarding the future of the performance-based approach document. We have also made updates for clarity to our technical support document and implementation document.

Further, we disagree with the assertion that this rulemaking did not follow all APA requirements. Natural conditions that are developed following WAC 173-201A-430 (site-specific rulemaking) must follow the procedures listed there, which includes formal rulemaking subject to APA requirements.

Natural conditions site-specific criteria developed following WAC 173-201A-470 do not have separate rulemakings, as this natural conditions rulemaking process serves to meet the APA and rulemaking requirements. EPA notes that approval of a performance-based approach process serves as approval of the outcomes as well (i.e., the criteria values). We note that defining spatial boundaries would be a part of natural conditions criteria development in either process.

That said, we have updated our implementation plan to address concerns raised during the comment period.

First, we indicate that any use of criteria following the performance-based approach will include an opportunity for public involvement and review. We are fully committed to holding a public review period when we use the performance-based approach to develop natural conditions criteria. It is anticipated that the majority of our use of the performance-based approach will be done in conjunction with an Advanced Restoration Plan or TMDL, which involve a tribal, public, and EPA review process. Regardless of how or when we use the performance-based approach, we have clarified that the public will have opportunity to review and comment on the developed criteria and process for derivation.

In addition, we have clarified that we intend to inform the public when such performance-based criteria have been developed and are in effect for federal Clean Water Act actions.

1.3.P Comment Summary – Ecology also ignored climate change impacts of its Natural Conditions Rulemaking, including the fact that nitrogen removal from wastewater converts some

nitrogen in the wastewater to nitrous oxide, a greenhouse gas that is 300 more potent than carbon dioxide.

- City of Tacoma

Response to 1.3.P

We disagree that we ignored climate change as part of this rulemaking.

Natural conditions criteria are calculated by accounting for and removing all sources of human impact to waters, so that the natural conditions criteria values represent water quality in its pre-anthropogenic impact state. These criteria support aquatic life, as aquatic life have adapted over time to inhabit these waters, and these water quality levels are therefore necessary for survival, reproduction, and protection of aquatic life.

Further, when natural conditions criteria have been developed by Ecology and are effective for federal Clean Water Act purposes (whether through separate site-specific rulemaking following WAC 173-201A-430 or the performance-based approach following WAC 173-201A-470), human impacts to a waterbody's temperature and dissolved oxygen are limited to minimal, or *de minimis*, amounts. These insignificant impacts are further limited to just human actions that are considered local or regional (as defined in WAC 173-201A-020). Any other anthropogenic sources of pollution (e.g., extra-jurisdictional impacts, climate change) are not allowed to negatively impact water quality.

This is also stated in our Tier I Antidegradation section at WAC 173-201A-310(3), which states that "[w]here water quality criteria are not met because of natural conditions, human actions are not allowed to further lower the water quality, except where explicitly allowed in this chapter."

In other words, the default state is zero impact, and the only human impacts are the ones that are explicitly allowed in Washington's WQS (such as the ones adopted as part of this rulemaking for temperature and dissolved oxygen, and limited to local and regional sources only).

We recognize that climate change does have an impact on our water quality (see Ecology's Air and Climate website[8]). However, because we say in this adopted rule that climate change cannot have an impact, this impact should be addressed by programs within Ecology (e.g., water clean up plans; the work conducted by our air and climate program) and outside of Ecology (e.g., EPA).

1.3.Q Comment Summary – Is the process of setting natural conditions and defining spatial boundaries subject to APA or rulemaking?

- Association of Washington Cities

[8] https://ecology.wa.gov/air-climate

Response to 1.3.Q

We have updated WAC 173-201A-260(1)(a) regarding how natural conditions criteria will be developed.

Natural conditions that are developed following WAC 173-201A-430 (site-specific rulemaking) must follow the procedures listed there, which includes formal rulemaking subject to APA requirements.

Natural conditions site-specific criteria developed following WAC 173-201A-470 do not have separate rulemakings, as this natural conditions rulemaking process serves to meet the APA and rulemaking requirements. EPA notes that approval of a performance-based approach process serves as approval of the outcomes as well (i.e., the criteria values). We note that defining spatial boundaries would be a part of natural conditions criteria development in either process.

That said, we have updated our implementation plan to address concerns raised during the comment period.

First, we indicate that any use of criteria following the performance-based approach will include an opportunity for public involvement and review. We are fully committed to holding a public review period when we use the performance-based approach to develop natural conditions criteria. It is anticipated that the majority of our use of the performance-based approach will be done in conjunction with an Advanced Restoration Plan or TMDL, which involve a public review process and EPA review. Regardless of how or when we use the performance-based approach, we have clarified that the public will have opportunity to review and comment on the developed criteria and process for derivation.

Second, we have clarified that we intend to inform the public when such performance-based criteria have been developed and are in effect for federal Clean Water Act actions.

1.3.R Comment Summary – The City of Everett supports Ecology's efforts to establish natural conditions provision of the State's water quality criteria. The City requests that this rulemaking be withdrawn in order to develop new biologically based dissolved oxygen marine water quality standards. If Ecology moves forward, the City is interested in Ecology's approach to the application of the natural conditions provision to marine dissolved oxygen criteria.

- City of Everett

Response to 1.3.R

We appreciate your comment regarding our marine dissolved oxygen criteria. For this rulemaking, our focus was on natural conditions criteria and site-specific approaches to develop these protective aquatic life criteria. We have decided to not withdraw these criteria, and instead have moved towards adoption of these natural conditions criteria.

Ecology continues to evaluate new science and EPA criteria recommendations, and we encourage comments and new published science regarding updates to our biologically-based criteria in our upcoming triennial review.

1.3.S Comment Summary – Thank you for extending the comment period. You are tasked with a massive project.

- Blessing, Bonnie

Response to 1.3.S

We appreciate your comment, and we were happy to extend the comment period to ensure all those who wished to comment had the opportunity to do so.

1.3.T Comment Summary – Setting new limits on how much humans can alter the conditions of water bodies that are naturally less than "clean" is vital. Many animals and organisms can still live in this type of water. There's no excuse for further human pollution. At this point in the planet's history, we need to use caution with our human activities.

- LaChance, Cynthia

1.3.U Comment Summary – Ecology is also disingenuous. It states its strategy to update its natural conditions criteria is:

> to ensure consistency with CWA recommendations, continue to protect endangered species, and address disapprovals of our natural condition criteria that had previously been approved by EPA.

Proposed Updates to Natural Conditions Provision in Chapter 173-201A WAC Technical Support Document (hereinafter "TSD") at 21. In fact, Ecology has never used its clean water program to "protect endangered species" so it is literally impossible for it to "continue" to do so. In the comments below there are many specific references to use of the NCC for temperature. We intend for these comments to apply to the provisions of the proposed rule and the proposed guidance that pertain to dissolved oxygen as much as they do to temperature.

- Northwest Environmental Advocates

1.3.V Comment Summary – EPA's assertion that it is the water pollution "effects" that are natural and "not attributable to the provision itself" is a pretzel-like argument. A provision that misleads regulators into finding anthropogenic effects to be nonanthropogenic is, indeed, attributable to the provision itself. Moreover, it fails to account for other natural conditions, as the court in the Oregon NCC case found and EPA cited in its disapproval of Oregon's NCC.

- Northwest Environmental Advocates

1.3.W Comment Summary – [W]e support a pragmatic approach to replace the process by which natural conditions are determined during detailed modeling assessments, the subject of EPA's 2021 reconsideration. Ecology's proposed approach addresses EPA's concern that the previous standards language was overly broad and should apply to dissolved oxygen and temperature for aquatic life, and not to human health criteria for toxic substances. EPA had identified multiple approaches available to Ecology for addressing the need. Importantly, it is Ecology's discretion to set water quality standards for Washington's waters. It is reasonable that

these differ from the approaches used in San Francisco Bay and the Chesapeake Bay for oxygen, for example. Finally, it is appropriate that Puget Sound water quality standards for dissolved oxygen are more stringent than those in the Chesapeake Bay. Likewise, maintaining stringent temperature standards is critical for the survival and long-term recovery of salmonids throughout state waters. Ultimately, municipal sewage dischargers in the Chesapeake Bay and San Francisco Bay are moving toward nutrient-removal technology, regardless of the vastly different marine dissolved oxygen standards approaches in those two waters. If Puget Sound sewage dischargers demand that Ecology re-evaluate the stringent standards for dissolved oxygen to launch a lengthy process with a goal to weaken the standards, Ecology should view that attempt for what it is – a futile effort to maintain 1980s technology in the 21 st century. While not part of this rulemaking, Ecology and sewage dischargers should collaborate with Tribes and environmental organizations and work with our federal and state elected officials to figure out how to pay for needed modernization.

- Washington Conservation Action

1.3.X Comment Summary – One final, related consideration of interest to forest landowners is the effect of increasing summer air temperature on stream temperature, and how that may factor into future work to address temperature impairments. Significant improvements to stream buffering on forestland over the last 25+ years have had the intended effect of minimizing water temperature changes related to forest harvest. However, these effects may be blunted by or only detectable after accounting for the influence of variability in air temperature, particularly in mid to larger streams. In addition, providing high levels of shade to minimize temperature effects of harvest can conflict with achievement of other riparian function objectives. This inherent conflict is particularly apparent in Eastern Washington with substantial forest health issues. While not easily resolvable, these issues and tradeoffs need objective consideration and resolution in order to help encourage forestland owners to keep doing the right thing for water quality in the State of Washington.

- Washington Forest Protection Association

Response to 1.3.T through 1.3.X

We appreciate your comments. We do not believe that these natural condition provisions mislead regulators into finding anthropogenic effects to be non-anthropogenic, and our draft performance-based approach document specifically calls out that *all* anthropogenic effects must be removed, including local, regional, extra-jurisdictional, and climatic impacts.

Regarding our performance-based approach's approach to temperatures, the primary purpose of this rule was to develop a process to identify natural water quality conditions for water bodies with unique physiochemical characteristics. Aquatic life that inhabits these waters have adapted over time to these natural, pre-human impact conditions, such that this level of natural water quality supports aquatic life survival, growth, and reproduction.

That said, we recognize that additional work is needed in the performance-based approach document before it is final. This includes adding additional details to our methodology. This will ensure any binding natural condition performance-based processes is scientifically-

justifiable and repeatable. Our water quality criteria will protect all aquatic life, including threatened and endangered species.

We plan on revising the document and providing additional opportunities for Tribes and the public to comment before finalization and submittal to EPA. Please see our statement in Section 5 (Response to 5.A through 5.ZZ) regarding the future of the performance-based approach document.

1.3.Y Comment Summary – Commenter provided documents for Ecology to review and consider as part of the rulemaking effort.

- City of Tacoma

Response to 1.3.Y

We appreciate your comment and your provided referenced and attached documents.

1.4. Environmental Justice

1.4.A Comment Summary – Ecology should conduct a thorough environmental justice assessment under RCW 70A.02.060. Ecology requires this analysis under the PSNGP and has now published draft guidance on how to conduct the assessment for the general permit. Since Ecology intends to use the proposed natural condition rule as a basis for the PSNGP, Ecology is obligated to provide this analysis for the draft rule. Ecology has sufficient information regarding the cost of treatment to implement the rule and the potential impact on utility rates to conduct the assessment.

- City of Everett

1.4.B Comment Summary – Ecology has failed to prepare an environmental justice assessment as required under RCW 70A.02.060(1)(a), despite the impacts its Natural Conditions Rulemaking will inevitably impart on overburdened and vulnerable communities.

By increasing compliance costs to WWTPs, the Natural Conditions Rulemaking will have a profound impact on utility rates and housing affordability; these consequences will create environmental justice disparities throughout Puget Sound.

Given the nature of the current treatment technology utilized by most WWTPs, it is not an exaggeration to say that every resident within the greater Puget Sound region is going to experience substantial rate increases associated with the Natural Conditions Rulemaking. These rate increases and resulting increase in housing costs will inevitably have the greatest impact on vulnerable communities that likely already struggle with utility costs and housing affordability.

Ecology has failed to consider the impact its rulemaking will have on vulnerable communities, and it is required to conduct a full environmental justice assessment under RCW 70A.02.060. It wholly omits discussion of any environmental justice impacts, environmental concerns apart from aquatic impacts, or the generation of additional waste, among other relevant issues.

- City of Tacoma

Response to 1.4.A and 1.4.B

We appreciate your comments.

We note that that we filed our announcement (CR-101) of this rulemaking on September 27th, 2022. RCW 70A.02.060 only applies to "significant agency action initiated after July 1, 2023"; therefore, this rulemaking is not subject to these requirements and Ecology is not obligated to provide this analysis for either the draft or final rule.

That said, we want to note that we have had multiple meetings and discussions with the public and Tribes regarding this rulemaking at multiple steps along the way between initiation of the rule process through adoption. We have also included, as required, economic analyses of this rulemaking at both the rule proposal (CR-102) phase (Preliminary Regulatory Analyses) and rule adoption (CR-103) phase (Final Regulatory Analyses). Finally, we also consider environmental justice, costs, and affordability to vulnerable communities as part of other Ecology programs and within our guidance documents, such as the Draft Interim Financial Capability Assessment Guidance.[9]

1.5. State Environmental Policy Act (SEPA)

1.5.A Comment Summary – Ecology has failed to comply with SEPA.

SEPA environmental review is required for any state agency decision on policies, plans, and programs, including adopting or amending rules, ordinances, or regulations to regulate future projects such as water quality rules, critical area ordinances, and other state and local regulations. RCW 43.21C.030. Lead agencies, such as Ecology, are required to review the SEPA environmental checklist and other available information to evaluate a proposed rule's likely environmental impacts

Ecology completed a SEPA environmental checklist for its Natural Conditions Rulemaking in which it determined, "the environmental elements are not applicable because the rulemaking action being considered will not result in any physical changes to any waters of the state where the new rules will apply." Ecology also determined that the rulemaking will not result in increased demands on public services and utilities, and therefore does not provide any proposed measures to reduce or respond to such demands. This determination is unfounded and Ecology is required to submit mitigation measures in response to anticipated impacts. There is ample evidence supporting the probable impacts of the proposed rule on public services and utilities, namely the increased costs of treatment technologies that will necessarily be required to comply with the rule. These costs are well-documented by both Ecology and third-party studies. Ecology has also submitted a SEPA Determination of Non-Significance (DNS), in which it concludes the rulemaking proposal, "will not have a probable significant adverse impact on the environment," and therefore an EIS is not required.

[9] https://apps.ecology.wa.gov/publications/documents/2410034.pdf

The conclusion that a Natural Conditions Rulemaking will not have any adverse impacts on the environment and the resulting DNS is unfounded and unjustified, and Ecology is therefore required to submit an EIS in accordance with SEPA. It appears that Ecology plans to require advanced (tertiary) treatment under the Natural Conditions Rule will necessarily require has profound potential adverse impacts to the environment. Ecology has even previously recognized the potential environmental impacts of requiring WWTPs to adopt additional nutrient removal technology, including the likelihood that tertiary treatment will not only generate more effluent sludge that will require disposal, but will also require two to three times the amount of electrical energy currently used in WWTPs.

Given that the Natural Conditions Rulemaking will necessarily require WWTPs implement advanced treatment technology that will have significant potential for adverse environmental impacts, Ecology cannot submit a DNS for its Natural Conditions Rulemaking. It is instead required to submit a full EIS further analyzing the rule's probable environmental impacts.

In its required EIS, Ecology must also identify and assess the impacts of reasonable alternatives. RCW 43.21C.030. Washington courts have equated this alternatives analysis to be "one of the key building blocks, if not the heart of SEPA." The required discussion of alternatives to a proposal, "is of major importance, because it provides a basis for a reasoned decision among alternatives having differing environmental impacts." Ecology has wrongfully issued a DNS for its Natural Conditions Rulemaking and is instead required to submit an EIS complete with a full alternatives analysis.

- City of Tacoma

Response to 1.5.A

Ecology disagrees that we failed to comply with SEPA requirements and stands by the conclusion that this rulemaking will not have any adverse impacts on the environment. The adopted rules will not require any specific treatment technology for facilities. In fact, as noted in our rule documents, this rule will more than likely be beneficial to regulated facilities. The requirement to meet water quality standards in impaired waters is a federal Clean Water Act requirement, not an outcome of this rule.

1.6. Tribal Consultation and reserved Rights

1.6.A Comment Summary – The Tribe has strong interest in the preservation of its treaty rights to fish and gather in their Usual and Accustomed areas. These reserved rights are fundamental to the Tribe's culture and survival and are intricately linked to the health of ecosystems that support these treaty resources. Any rule revision adopted by the State of Washington that affects these interdependent ecosystems should at a minimum, avoid, minimize and mitigate impacts to the Tribe's ability to pursue traditional practices on their traditional lands, and wherever possible, enhance the resiliency of these resources. Poor water quality limits Tribal members from exercising their Treaty rights and damages Treaty resources.

- Jamestown S'Klallam Tribe

1.6.B Comment Summary – The Squaxin Island Tribe is a federally recognized Indian tribe located in Southern Puget Sound in Mason County, Washington with treaty rights to harvest fish and shellfish, "at their usual and accustomed fishing places in the shallow bays, estuaries, inlets and open Sound of Southern Puget Sound and in the freshwater streams and creeks draining into those inlets." The Tribe's cultural and economic well-being depend upon clean water to support abundant and sustainable fisheries. Thus, the Tribe has vital interests in ensuring that laws and regulations intended to protect water quality, and related aquatic habitat, are implemented and enforced, so that it can continue to exercise its federal treaty rights. The Squaxin Island Tribe is uniquely positioned to offer a perspective on water quality. The Tribe is located at the south end of Puget Sound. Pollutants discharged from all parts of Puget Sound affect the quality of waters especially in those shallow bays, estuaries, and inlets of South Puget Sound, so there is a disproportionate impact of Sound-wide pollution on the Squaxin Island Tribe's fisheries and the water quality in its "Usual and Accustomed" (U&A) places. That is why water quality standards in all of Puget Sound are critical to the Squaxin Island Tribe.

- Squaxin Island Tribe

1.6.C Comment Summary – The Yakama Nation is a sovereign and original Native Nation federally-recognized under the Treaty with the Yakamas, U.S. – Yakama Nation, June 9, 1855 ("Treaty of 1855"). The Yakama Nation's history and culture, as well as the lives of our People, are intertwined with Nch'i-Wa'na (the Columbia River) and the salmon, fish, plants, and animals that rely on its waters. The Yakama Nation has reserved rights in these resources pursuant to Article III of the Treaty of 1855. Protecting the waters of the Columbia River and its tributaries is therefore critical to the protection of our Treaty-reserved resources and rights, and ultimately to the health and welfare of our communities.

- Confederated Tribes and Bands of the Yakama Nation

Response to 1.6.A, 1.6.B, and 1.6.C

We appreciate your comments.

We hold that appropriately derived natural conditions criteria, which must reflect pre-anthropogenic water quality for that site, are protective of the aquatic life that inhabit the system, as these species have adapted over time to those water quality conditions and have since survived and reproduced. These natural water quality conditions, therefore, represent what is needed for full aquatic life protection for that specific site.

1.6.D Comment Summary – According to Ecology's webpage for NCC, this proposed change has been in development since September 2022. The webpage reports that a series of public hearings were held but it is unclear what actions were taken to conduct consultation with Tribes. This is a complicated process with little to no opportunity for the Yakama Nation to provide sufficient oversight to protect our Treaty-reserved resources. Ecology's review process appears to be rushed and compartmentalized and has not allowed time for meaningful consultation and input from the Yakama Nation. As a result, there is a potential that unknown and negative impacts to water quality and Treaty-reserved resources will continue throughout the Columbia River Basin.

Official government-to-government consultation with the Yakama Nation must take place between the Yakama Nation Tribal Council and the decision-maker from the agency proposing an action. However, before the Yakama Nation can assess and consider the key elements of an action through consultation, a staff-level technical briefing is required to discuss the action.

Unfortunately, it appears there is not sufficient time to schedule and conduct a staff-level technical meeting. Yakama Nation staff will therefore be unable to fully brief the Yakama Nation Tribal Council in a manner that allows the Council members to make an informed decision regarding consultation. Consequently, under the current schedule, there will be no meaningful consultation opportunity for the Yakama Nation Tribal Council to weigh in on impacts to Treaty-reserved resources.

Without adequate consultation, the Yakama Nation is concerned that impacts to our Treaty-reserved resources will not be sufficiently evaluated and addressed.

- Confederated Tribes and Bands of the Yakama Nation

Response to 1.6.D

We appreciate your comment. We agree that this was a complex and different rulemaking, but respectfully disagree that the Confederated Tribes and Bands of the Yakama Nation ("Yakama Nation"), or other tribes or the public, had little to no opportunity to provide input on the rule, nor do we agree with the claim that our review process was rushed.

In this rulemaking, we provided multiple opportunities for outreach, including public and Tribal informational webinars, public and Tribal preliminary rulemaking decisions, notice of draft rule comment period, two invitations for government-to-government consultation, and formal rule hearings. We also responded to requests and met individually with interested parties throughout the rule process, including staff from the Yakama Nation.

2. Comments on rule language

2.1.Definitions (WAC 173-201A-020)

2.1.A Comment Summary – The EPA recommends deleting the second sentence in the definition of natural conditions: "When estimating natural conditions in the headwaters of a disturbed watershed it may be necessary to use the less disturbed conditions of a neighboring or similar watershed as a reference condition." Although this provision is not new or revised, this sentence could be read as a conflicting approach to the state's new and revised procedures for natural conditions at WAC 173-201A-260, -430, and -470 because a "reference condition" may allow some anthropogenic disturbance, which is inconsistent with the concept of a natural conditions approach.

- Environmental Protection Agency

Response to 2.1.A

We appreciate the comment regarding the natural conditions definition. At this time, we are choosing to not update our Clean Water Act approved natural conditions definition. Ecology will still calculate site-specific natural conditions criteria consistent with WAC 173-201A-260(1)(a).

We also note that less-disturbed watersheds may be useful in estimating non-local and non-regional sources of anthropogenic impact, which could be helpful in calculating natural conditions in the headwaters of a disturbed watershed.

2.1.B Comment Summary –The EPA recommends revising the definition of "performance-based approach" (PBA) to focus on what a PBA is, instead of what it is not, and offers the following revised version: "Performance-based approach" means a water quality standard that is a transparent process (i.e. methodology) which is sufficiently detailed and has suitable safeguards that ensures predictable and repeatable outcomes, rather than a specific outcome. The outcomes from the performance-based approach are site-specific criteria."

Additionally, the EPA recommends removing the references to the CWA federal implementing regulations at 40 CFR Part 131, as they do not specifically address the requirements of a PBA. In the preamble to the 2000 final rule, EPA Review and Approval of State and Tribal Water Quality Standards, 3 the EPA articulated the concept of a "performance-based" approach.

- Environmental Protection Agency

Response to 2.1.B

We appreciate the suggestions for the definition for the performance-based approach and have made edits to the definition to align with these recommendations.

2.1.C Comment Summary –The EPA recommends adding a definition of "mechanistic models" to provide additional clarity about the type of tool that will be used in the PBA. The EPA's Council for Regulatory Environmental Modeling guidance (2009) defines a mechanistic model as "a model whose structure explicitly represents an understanding of physical, chemical, and/or biological processes. Mechanistic models quantitatively describe the relationship between some phenomenon and underlying first principles of cause.".

- Environmental Protection Agency

Response to 2.1.C

We appreciate the suggestion to add clarity around "mechanistic models". We will consider including such a definition as part of the performance-based approach document.

However, as the term is not referenced within the regulations at WAC 173-201A, we found it inappropriate to define this term within the regulations themselves.

2.1.D Comment Summary – Ecology proposes to add a definition for local and regional sources of human-caused pollution. The purpose of this definition is to support the human use

allowances, for example in proposed WAC 173-201A-200(1)(c) for freshwater temperature, where the HUA would cover only the local and regional sources while all other sources, i.e., outside of Washington or the United States. This definition means that the anthropogenic contributions to the natural conditions would not, in fact, be limited. They would be unlimited. In addition to climate change, discussed in Sections IV and IV.A, supra, this is likely most pertinent to waters in the Salish Sea that are affected by Canadian sources of nutrients, such as nitrogen.4 Excluding Canadian sources when identifying how much pollution reduction is required from U.S. sources bakes in anthropogenic pollution into what is purportedly a natural conditions criterion. This is not acceptable, as discussed in Section IV.A, supra.

- Northwest Environmental Advocates

Response to 2.1.D

We disagree that this definition would mean anthropogenic contributions would be allowed to be unlimited.

The adopted rule indicates that only local and regional sources of anthropogenic pollution (as defined in WAC 173-201A-020) are allowed to cause insignificant impacts to water quality for temperature and dissolved oxygen when the applicable criteria are site-specific natural conditions-based, as seen in -200 and -210 of the adopted rule. In these sections, Ecology places limits for the maximum amount that such contributions, considered cumulatively, may impact the waterbody.

All other sources would not be allowed to lower water quality (i.e., may not cause negative impact to the water for DO and temperature). This is further stated in our Tier I Antidegradation policy at WAC 173-201A-310(3): "Where water quality criteria are not met because of natural conditions, human actions are not allowed to further lower the water quality, except where explicitly allowed in this chapter."

2.1.E Comment Summary – The proposed definition for performance-based approach focuses on obtaining “predictable and repeatable outcomes” but because of the reasons explained in this comment letter, the definition does not reflect the problems with the rest of the rulemaking. Running a model with the same inputs numerous times will produce predictable and repeatable outcomes. This definition and none of the other aspects of this proposal address how Ecology will make credible estimates of the flows and temperatures entering downstream waterbodies that remove the anthropogenic influences of, say, upstream logging, again as discussed above. Until Ecology puts out an evaluation of how it has failed to account for such upstream conditions and then explain how it will in the future account for them, it has not made a persuasive case. Also, this definition does not address the other conditions that could mitigate unsafe but natural levels of temperature and dissolved oxygen, as discussed in Section II.B, supra.

- Northwest Environmental Advocates

Response to 2.1.E

The definition of the performance-based approach is to briefly explain what the performance-based approach means in the context of the regulations. The details of the performance-based

approach (such as model requirements, repeatable outcomes, how to estimate and remove anthropogenic sources, etc.) will be further detailed in the performance-based approach document referenced at WAC 173-201A-470.

2.2.Human Use Allowance (WAC 173-201A-200 and -210)

2.2.A Comment Summary – Climate change demands a different way of looking at Water Quality/Water Resources. At what point will Ecology determine climate change has become critical, and instead of spending time and resources figuring out ways to allow polluters to continue to pollute, they turn those resources towards figuring out how humans can ameliorate the impacts of both climate change and historic pollution and restore these water bodies? Will you wait until local extirpation of species becomes the norm? I would advocate Ecology start turning that around now, by sticking with current numeric standards, using the 'seasonal' factors in the TMDL formulae if necessary to pacify the polluters, and focus attention and resources on innovation which will make water quality BETTER, not worse. Better quality will sustain species, conserve habitat and protect wildlife's 'designated use' of the water bodies. The Wildlife and the humans will be best served and sustained by taking this route and abandoning use of 'natural conditions'.

- Norton, Besty

Response to 2.2.A

We recognize that the impact of climate change is happening now and will continue to affect Washington and its ecosystems for decades to come. Ecology is the lead agency on Washington's approach to addressing climate change and has both responded to and is planning for impacts. You can see how Ecology is responding to climate change on our Air & Climate website.[10]

Regarding this rulemaking, we disagree with the assertion that this rulemaking will cause harm to aquatic life species. In fact, for criteria to be developed based on natural conditions, they must be protective of aquatic life.

When developing protective water quality values for a site, there are two pathways that can be taken to protect aquatic life: develop criteria based on the biological needs of the species (i.e., biologically-based criteria), or develop criteria based on the natural (pre-anthropogenic impact) conditions of the system, as these conditions would represent water quality in which species that inhabit the site have adapted to over time and represent the water quality necessary for sustained growth and reproduction.

Our state's water quality standards contain a suite of biologically-based aquatic life criteria alongside the mechanisms for developing new biologically-based numeric criteria. This rulemaking re-introduces the option for developing protective aquatic life criteria based on the natural conditions of the waterbody.

Finally, when natural conditions criteria are developed and in effect for Clean Water Act purposes for a waterbody, only *de minimis* impacts are allowed to those waters by all local

[10] https://ecology.wa.gov/air-climate/responding-to-climate-change

and regional anthropogenic sources, and even then, only for temperature and dissolved oxygen. This allows human activities to occur in the water while still maintaining protective water quality for aquatic life.

2.2.B Comment Summary – Ecology must factor climate change into the human allowances. Climate change will warm waters through a variety of processes, and warmer water holds less oxygen. This means there is less capacity for impacts from current human activities, which will result in more stringent regulatory requirements.

- Communities for a Healthy Bay
- Duwamish River Community Coalition
- Friends of the San Juans
- Olympic Environmental Council
- Puget Soundkeeper
- RE Sources
- Seattle Aquarium
- Squaxin Island Tribe
- Washington Conservation Action
- Zero Waste Washington

2.2.C Comment Summary – Include climate change in the human allowances. Climate change is warming Washington state waters, and warmer water holds less oxygen. Data collected by NIT and others clearly demonstrate increasing temperatures and extended periods of exceedance throughout the watershed. Climate change should be included into the human allowances. This means there is less capacity for impacts from current human activities, which will result in more stringent regulatory requirements. Ecology must integrate climate change impacts into human activity allowances, necessitating stricter regulatory measures to mitigate current impacts effectively.

- Nooksack Indian Tribe

2.2.D Comment Summary – The NCC derived criteria must "reflect pre-climate change conditions when high quality data are available, and data selected for assessment of anthropogenic sources and impacts may be from a more recent timeframe than data used to estimate natural conditions." TSD at 42. Notwithstanding this effort to ensure that only the best data are used to derive superseding criteria, Ecology proposes to undermine this effort by giving an unknown human use allowance, not the one that is described in the various proposed rule changes. These are unknown because they do not take into account any human sources that are not "local or regional." By definition, an unlimited amount of human-created climate change is not factored into the HUA. Neither is an unlimited amount of Canadian impact to dissolved oxygen levels in Puget Sound. See Implementation Plan at 10. Because the human use allowance is an integral part of the NCC, this addition creates an unknowable, non-replicable, and unprotective supplanting criteria to the biologically-based numeric criteria for temperature and dissolved oxygen. Seen another way, the proposal is to identify a purportedly natural condition and add to that any anthropogenic source of warming that is not local or regional (e.g., climate change) and then apply the HUA to that number. In this regard, the purported natural condition is not natural at all. Not only does this turn the concept on its head but it is inconsistent with EPA

guidance. See Regional Guidance at 37 ("if a State or Tribe has a de minimis temperature increase allowance above natural background temperatures (see Section V.1.A), the TMDL allocations should be based on attaining the natural background temperature plus the de minimis temperature allowance (e.g., natural background temperature plus 0.25°C)."); see also id. at 38 (EPA concerns about NCC-derived criteria that exceed 18° C).

- Northwest Environmental Advocates

2.2.E Comment Summary – We are perplexed by the lack of allowance for temperature due to climate change. We agree with Ecology's premise that climate change is man-made, but it is world- wide, and not going away anytime soon. We commented on this on the Columbia River TMDL, where the limits are already conflicting with what climate change is inflicting. Ecology identifies a selection of methods to cool effluent discharges. One of those suggestions is ponds. Ecology should be well aware that many Wastewater Treatment Plants (WWTPs) are site-constrained, and this will not be a viable option. Since planting trees for shade will not work everywhere, will the ultimate tool be to put chillers on discharges to reduce temperatures, which only exacerbates climate change with its increased use of energy?

- Washington Association of Sewer & Water Districts

2.2.F Comment Summary – Proposed Changes to What Human Actions are Included in the HUA

Ecology "propose[s] to adjust the language regarding what actions are considered in the cumulative allowance." TSD at 45. Ecology refers to this as proposing "to keep the prior human action cumulative value," id. at 50, but the prior value did not restrict human contributions to only those from the United States and adjoining states. By building in an exception to what human impacts will be controlled through the HUA, Ecology's assertion that it "reviewed published literature to ensure that the 0.3°C allowance would not harm aquatic life or their designated uses" rings hollow because it is, frankly, irrelevant.

Summarizing the studies completed by EPA, the TMDL found that climate change impacts have already far exceeded the HUA of 0.3° C: "Recorded air temperature monitoring in the vicinity of the South Fork has suggested a 1.3 °C increase from 1905 through 2010." Id. at 164. Looking forward, the EPA studies "developed a total of 18 climate scenarios using scenarios 3 (Existing Vegetation) and 5 (100-year SPV plus microclimate effect) from the TMDL as starting templates to combine with high, medium, and low impact GCMs for climate conditions of the 2020s, 2040s, and 2080s (2 x 3 x 3 scenarios)." Id. at 176. The result of this analysis demonstrated that future climate change impacts would also far exceed the HUA of 0.3° C:

Restoration of full system potential riparian shading (i.e., desired future conditions) can help buffer against temperature increases; however, even with system potential shade, the critical condition maximum 7-day average stream water temperatures are expected to increase by 1.1 to 3.6 °C by the 2080s. In conjunction with this increase, the percent of stream miles in which critical condition water temperatures exceed levels identified as potentially lethal to salmon is predicted by the model simulations to increase dramatically—from about 18% at present to between 60% and 94% in the 2080s, depending on the climate model.

Ecology might argue that in the face of climate change, the HUA is barely detectible, but the reality is that it is being added to an as-yet-unknown purportedly natural criterion and, as defined by Ecology in this proposal, added to the effects of climate change. There is simply no analysis of how this set of unknown but high temperatures is going to be protective of aquatic species.

- Northwest Environmental Advocates

2.2.G Comment Summary – Under the proposed definition of WAC 173-201A-210(1)(d) Marine Water Dissolved Oxygen, the agency proposes "Local and regional sources of human-caused pollution" means sources of pollution caused by human actions, and the pollution originates from: (1) within the boundaries of the State; or (2) within the boundaries of a U.S. jurisdiction abutting to the State that impacts surface waters of the State. On its presentation, the agency summarized: In other words, this applies only for human sources that we can regulate.

There are no allowances for sources we cannot regulate. E.g., global climate, outside jurisdictional waters. Therefore, these sources must meet the applicable criteria.

The result is that impacts from climate change (global) are not considered under local and regional sources of human caused pollution and are also not factored in to determine the natural condition baseline, as stated during the April 24, 2024 rulemaking webinar. These are all natural processes that must be accounted for in the natural conditions baseline otherwise the rule will fail: unnecessarily restrictive for the protection of designated uses, and would lead to unnecessary and costly expenditures.

- Association of Washington Cities

Response to 2.2.B through 2.2.G

We recognize that climate change does have an impact on our water quality. However, this impact should be addressed by programs within Ecology (e.g., water clean up plans; the work conducted by our air and climate program) and outside of Ecology (e.g., the EPA). Those programs are necessary, but represent the implementation side of water quality. This rulemaking, however, must establish protective water quality standards that, when met, ensure protection for aquatic life.

When natural conditions criteria have been developed by Ecology and become in effect for Clean Water Act purposes (whether through separate site-specific rulemaking following WAC 173-201A-430 or the performance-based approach following WAC 173-201A-470), human impacts to a waterbody's temperature and dissolved oxygen are limited to minimal, or *de minimis*, amounts. These impacts are further limited to human actions that are considered local or regional (as defined in WAC 173-201A-020). Any other anthropogenic source of pollution (e.g., extra-jurisdictional impacts, climate change) is not allowed to lower water quality.

This is also stated in our Tier I Antidegradation section at WAC 173-201A-310(3), which states that "[w]here water quality criteria are not met because of natural conditions, human actions are not allowed to further lower the water quality, except where explicitly allowed in this chapter."

In other words, the default state is no lowering of water quality, and the only impacts are the ones that are explicitly allowed (such as the ones adopted as part of this rulemaking for temperature and dissolved oxygen, and limited to local and regional sources only).

Further, when developing natural conditions criteria (whether through site-specific rulemaking or the performance-based approach), Ecology will take into account and remove *all* sources of anthropogenic impact to determine the natural conditions criteria. The subset of limited impact for local and regional sources only applies for the human-use allowance criteria for temperature and dissolved oxygen, *and* only after natural conditions criteria have been developed and are in effect for Clean Water Act purposes.

We determined that to continue to allow humans to use waters while still ensuring aquatic life protection, impacts by humans to waters must be limited to just local and regional sources of impact, and other anthropogenic impacts need to be lowered to zero. The mechanisms and processes for doing so occur both within and outside of Ecology, via programs as mentioned in the prior paragraph.

We disagree that this approach is unnecessarily restrictive for the protection of designated uses, as natural conditions represent water quality that aquatic life have adapted to over time and are necessary for survival and reproduction. In many cases, these natural conditions criteria are different from biologically-based numeric criteria and can represent to cost-savings to permitted local and regional activities in the waters (see the Final Regulatory Analysis for our economic review of this rulemaking).

2.2.H Comment Summary – If climate impacts (local) are not considered part of the natural conditions, and therefore need to be accounted as consideration of local and regional sources that may not cumulatively decrease DO by a threshold, how will ECY break out the components of climate related impacts that are affecting water quality that are specifically from within Washington State or abutting states/provinces as defined in the definition of "local and regional sources of human-caused pollution?"

From the performance based approach document, this seems in conflict with the definition of local and regional sources. WAC 173-201A-020 defines "natural conditions" and refers the reader to WAC 173-201A-260, which states, in part:

(1) Natural and irreversible human conditions. (a) It is recognized that portions of many water bodies cannot meet the assigned criteria due to the natural conditions of the water body. When a water body does not meet its assigned criteria due to natural climatic or landscape attributes, the natural conditions constitute the water quality criteria.

- Association of Washington Cities

Response to 2.2.H

When Ecology determines natural conditions criteria, either through the performance-based approach or site-specific rulemaking, we must consider all sources of anthropogenic impact and account and remove those sources from current conditions to determine the natural conditions of a waterbody (i.e., the natural, pre-anthropogenic water quality). Those conditions represent the natural conditions of a waterbody, and therefore represent the

conditions protective of aquatic life. Thus, those values become the protective numeric criteria for the waters. From there, where applicable, *de minimis* impacts to temperature and dissolved oxygen may be allowed by local and regional activities.

Worldwide emissions of greenhouse gases into the air are changing our climate. Washington contributes a part of those emissions. Ecology will not differentiate the climate impacts from local emissions into the air in relation to global air emissions within the regional/local analysis in this regulation. The impact of local emissions to the air will not be separated from larger scales (e.g., global), and thus not be included in the human use allowance or PBA-derived criteria.

2.2.I Comment Summary – Ecology is also proposing that for waters with very low oxygen levels naturally, that human allowances must be no more than 10% of the natural conditions when those natural conditions are at or below 2.0 mg/L. For example, if the natural condition is 1.0 mg/L, then the total of all human activities could not worsen oxygen levels by more than 0.1 mg/L. This proposal would lead to a more protective water quality standard, which we support as a reasonable clarification to de minimis impacts.

Ecology should not risk a jeopardy finding by weakening the water quality standards by increasing human allowances above the 0.3 °C and 0.2 mg/L in previous Biological Opinions issued under the Endangered Species Act.

- Squaxin Island Tribe
- Washington Conservation Action

2.2.J Comment Summary – We agree with the NMFS and FWS Biological Opinions that the human allowances for temperature of 0.3 degrees Celsius and dissolved oxygen of 0.2 mg/l (or 10% of natural conditions < 2mg/l) of dissolved oxygen are sufficiently protective of not only ESA-listed species but Tribal treaty resources as well. We agree that not including any allowances for waters with natural conditions criteria below Washington's is impractical. We strongly recommend maintaining the proposed allowances and not weakening them to allow for greater impacts to water quality which may cause a jeopardy finding by the Services and unacceptable impacts to tribal treaty resources.

- Jamestown S'Klallam Tribe

2.2.K Comment Summary – King County supports limiting the de minimis human allowance to local and regional sources of human pollution, which appropriately focuses water quality standards on sources of pollution that can be impacted by the regulation rather than human sources of pollution outside of Ecology's control. At the same time, the county continues to advocate for federal regulation of greenhouse gas emissions, and to implement aggressive actions to curb local and regional greenhouse gas emissions.

Retain the proposed limitation of marine dissolved oxygen and temperature de minimis human allowance to local and regional sources of human pollution.

- King County Department of Natural Resources and Parks

Response to 2.2.I, 2.2.J, and 2.2.K

We appreciate your comment of support for the *de minimis* human-use allowance criteria values.

2.2.L Comment Summary – It is our understanding that the provisions for dissolved oxygen at (d)(i) are only applicable to the biologically-based numeric criteria in Table 200(1)(d) and not to the saturation state-based criteria. Therefore, we recommend the provision be revised to clarify that point. Additionally, the EPA recommends referring to "D.O." as "D.O. concentration" or "D.O. criteria" depending on the context, such as "…the D.O. concentration of that waterbody to decrease by more than 10 percent or 0.2 mg/L below the natural conditions-based D.O. criteria, whichever decrease is smaller."

- Environmental Protection Agency

Response to 2.2.L

We appreciate the comment. We have made edits in the final rule language that clarify the human-use allowances for freshwater dissolved oxygen are based on the numeric DO concentrations and not the saturation state-based criteria.

2.2.M Comment Summary – Ecology proposes a new version of the human allowance for insignificant exceedances of the natural condition dissolved oxygen criteria that includes either 10 percent of the NCC or 0.2 mg/L, whichever decrease value is smaller. TSD at 45. We support the concept of an increasingly smaller HUA as purportedly natural conditions become less protective of aquatic species as a method intended to provide some, albeit limited, assurance that the end result will be protective of designated and existing uses. There is, however, no low level of dissolved oxygen beneath which Ecology will not allow even more deadly conditions. This does not make sense if the goal is to ensure protection. Ecology has not clearly demonstrated that its 10 percent of the NCC does provide sufficient protection at low dissolved oxygen levels or whether that should be a smaller increment. And, combined with other ambiguities and lack of protection discussed elsewhere, what protection this does provide cannot provide adequate compensation. For example, removing the Canadian and global sources from the HUA adds more risk to the species, even as Ecology is proposing to reduce risk through this graduated HUA. The graduated HUA cannot be assessed in a vacuum and Ecology does not provide the needed information.

- Northwest Environmental Advocates

Response to 2.2.M

This rulemaking's focus was natural conditions criteria, including the human-use allowance, which provides for *de minimis* impacts to water quality for dissolved oxygen, as an example, when applicable. This rulemaking did not alter any biologically-based numeric criteria.

Natural conditions criteria will be developed by Ecology and become in effect for Clean Water Act purposes either through separate site-specific rulemaking following WAC 173-201A-430 or the performance-based approach following WAC 173-201A-470. In either case, criteria development will be accompanied by scientific support for the determined criteria values for a site. In either case, these developed criteria will go through some form of public review or EPA approval, whether through a formal standards rulemaking (if developed using the site-specific criteria approach), or through another required public process during implementation of the criteria (e.g., public review of a draft TMDL, where the water quality criteria are natural conditions criteria developed following the performance-based approach).

Natural conditions represent the water quality of a system prior to any anthropogenic impacts. Aquatic life that inhabits these systems have adapted over time to these unique conditions, and the natural conditions water quality represent what is required for those site-specific species to survive, reproduce, and be protected.

From a natural condition standpoint, we disagree that there needs to be a "low level" or limit to natural conditions, as properly developed natural conditions criteria are protective of aquatic life and do not represent "deadly conditions". That said, we recognize that additional work is needed in the performance-based approach document before it is final. This includes adding additional details to our methodology. This will ensure any binding natural condition performance-based processes is scientifically-justifiable and repeatable. Our water quality criteria will protect all aquatic life, including threatened and endangered species.

We note that natural conditions and biologically-based numeric criteria are developed in different ways, with natural conditions representing the natural water quality of a system and biologically-based criteria represented laboratory tests that generally do not focus on species only from a specific-site. Both are different approaches that Ecology or other rulemaking agencies (e.g., EPA) can take to develop protective criteria; however, both are protective for aquatic life.

We disagree that the 10% is not shown to be protective of aquatic life. Even when waters are super low in dissolved oxygen, a 10% reduction in dissolved oxygen has not been shown to impact aquatic life based on the available scientific literature. We have not come across any scientific evidence to support a lower percentile or that 10% is not protective. Further, we have updated the Final Technical Support Documentation to indicate that EPA has supported 10% usage for natural conditions in past water quality criteria.

We also want to note that the 10% is only when waters are naturally lower than 2.0 mg/L; otherwise, the human-use allowance is 0.2 mg/L.

2.2.N Comment Summary – AWC requests Ecology move forward with a natural conditions approach but restore the 0.2 mg/l standard without the 10% mechanism for low DO environments as it existed in previous iterations of the criteria until further science on the dissolved oxygen needs of marine organisms in Puget Sound is undertaken.

How can we evaluate whether the proposed decreased human allowances in low oxygen concentration environments represent safe and de minimis impacts when the underlying scientific basis for the marine DO criteria has not been publicly reviewed or updated since its adoption in 1967? Conversely, how do we know that the previous 0.2mg/l standard would not be

protective? We frankly don't know enough about the dissolved oxygen needs of the organisms we are trying to protect

- Association of Washington Cities

2.2.O Comment Summary – Additionally, Ecology has acknowledged that the 0.2 mg/L human-caused difference is not biologically based.14 The nutrient criteria were adopted in 1967 by a predecessor agency that made no effort to understand DO levels throughout the inland marine waters before adopting the criteria. In 1985, the Chairman of the Pollution Control Hearings Board, in a decision to deny waiver appeals from WWTPs, stated that evidence supported the position that the WWTPs' primary-treated effluents were not significantly impacting the marine environment, but there were significant impacts related to economic costs and the added requirements of disposing additional sludge, which, "outweighed the undefined benefits of secondary treatment." Further, the toxic hot spots of pollution in the Puget Sound are site-specific and largely unrelated to a majority of the wastewater (sewer) outfalls in Puget Sound, due to the active circulation within the Puget Sound and the tremendous volume of deep water which acts as a nutrient and DO buffer. A glacial fjord with good tidal circulation, like the Puget Sound, is considerably different from a shallow river valley type of estuary.

- City of Tacoma

Response to 2.2.N and 2.2.O

We appreciate your comment, but we disagree with removal of the 10% mechanism for low dissolved oxygen environments. We have updated the Final Technical Support Documentation to indicate that EPA has supported 10% in past water quality criteria.

We disagree with the assertion that the adopted 0.2 mg/L or 10% allowance for local and regional human impacts is not based on protecting aquatic life. Ecology has updated the Final Technical Support Documentation to indicate that EPA has supported 10% in past water quality criteria. Further, the final Technical Supporting Documentation provides our analysis of the current science to support these values, and includes for completeness an evaluation of water quality sensor technology in detecting small changes in dissolved oxygen, which ensures confidence in study results.

The human-use allowances for dissolved oxygen are only applicable when natural conditions criteria have been developed for a site, either through a site-specific rulemaking process following WAC 173-201A-430 or the performance-based approach following WAC 173-201A-470. In either approach, the criteria are developed based on the natural conditions of a water body, which represent water quality before any human impact (i.e., pre-anthropogenic). These conditions support aquatic life as they represent water quality that species have adapted to over time and represent the needs for survival and reproduction of aquatic life.

The human-use allowance does not apply to biologically-based numeric criteria, such as the numeric marine DO criteria. Further, this rulemaking's focus is only on natural conditions, not biologically-based numeric criteria.

We do appreciate the feedback regarding our marine DO criteria, and we also encourage these comments during our upcoming triennial review of the water quality standards. Also, we

continue to offer to look at any new science that is available that says Washington's standards are not accurate. Our previous review of the criteria at the request of the Puget Sound Nutrient Forum did not lead us to any new information that would suggest these criteria are not protective.

Under the Clean Water Act, Ecology must develop criteria that are protective of aquatic life (amongst other requirements). Based on our research and work in this rulemaking, we determined that a 0.2 mg/L reduction in dissolved oxygen from the natural conditions of a waterbody when dissolved oxygen naturally (i.e., pre-anthropogenic) was less than 2.0 mg/L was not protective of aquatic life and represented significant impacts to aquatic life. Therefore, the 10% limit was added to ensure protection, and is a value previously supported by EPA and review of available scientific literature.

We encourage future and further research on the dissolved oxygen needs for marine organisms in these low dissolved oxygen environments within Puget Sound. However, until such research or science exists, we must default to protective criteria based on the available science for marine life, which indicates that the 10% limit is needed in these low dissolved oxygen environments. As such, we have kept the 10% or 0.2 mg/L criteria in place for our adopted rule.

2.2.P Comment Summary – The EPA recommends adding a sentence to the end of each provision to clarify that human sources of pollution outside of the de minimis allowance for the local and regional sources cannot cause any increase in temperature or decrease in dissolved oxygen.

1. For part (c)(i), please add: "All other sources considered cumulatively may not cause any increase in the natural 7-DADMax temperature."

2. For part (d)(i), please add: "All other sources considered cumulatively may not cause any decrease in the natural dissolved oxygen concentration.".

- Environmental Protection Agency

Response to 2.2.P

We appreciate your comment, but we have chosen not to add this language to the water quality standards. We feel that such inclusions are redundant and not necessary. We point to our Tier I Antidegradation section, which apply to all waters of the state. Specifically, at WAC 173-201A-310(3), our standards state that "[w]here water quality criteria are not met because of natural conditions, human actions are not allowed to further lower the water quality, except where explicitly allowed in this chapter."

In other words, the default allowance for sources of human impact to waters when natural conditions criteria have been developed for a site and are in effect for Clean Water Act purposes is zero. The exceptions are for local and regional sources only, and only for applicable parameters with maximums in place to ensure such impacts are minimal.

2.2.Q Comment Summary – The EPA also recommends removing the "local and regional sources" qualifier and describing such a qualifier in guidance or implementation documentation.

- Environmental Protection Agency

Response to 2.2.Q

We appreciate the comment; however, we have chosen to retain such qualifier in our water quality standards.

We want to make it clear in our water quality standards that other anthropogenic impacts (e.g., extra-jurisdictional waters, global climate change) do not get any part of the human-use allowance when those criteria are applicable. If this were put into guidance or implementation, our standards could therefore allow for some allowance in the future by those other human impacts, which we have determined are not allowances we wish to allow.

2.2.R Comment Summary – We also recommend adding a reference to WAC 173-201A-260 to each of the cumulative cap provisions to connect the natural conditions procedures to natural conditions provisions.

- Environmental Protection Agency

Response to 2.2.R

We appreciate your comment, but have not incorporated these changes into our final rule. We have updated WAC 173-201A-260 to be clear about how natural conditions are developed for use in our water quality actions, including those under the Clean Water Act.

Those natural conditions criteria must be developed and in effect for Clean Water Act actions before the human-use allowances are available for use in Clean Water Act actions, where applicable.

2.2.S Comment Summary – The Human Use Allowance increment will not protect aquatic species. Ecology proposes to define the increment of allowable human impacts to stream warming and dissolved oxygen depletion beyond natural conditions to not include human impacts from outside the country. For example, it does not factor in the Canadian contributions of nitrogen to the Puget Sound's dissolved oxygen problem or global climate change into allowable temperature increases. The results will not reflect natural conditions, and they will not protect aquatic species. Ecology cannot pick and choose which human inputs to include when setting a water quality criterion that is supposedly based on natural conditions. This defeats the purpose of removing these global impacts from the determination of supposedly natural conditions when, later, they are allowed back in with no consequences to pollution sources regulated under Washington water quality standards. We do support Ecology's proposal to use ever smaller human use allowances for dissolved oxygen as modeled natural conditions become less protective of aquatic species. However, this approach should also apply to temperature, and there should be a point where incremental harm from human impacts is simply phased out because the natural level of dissolved oxygen is too low or the natural temperatures are too high.

- Alliance for Community Engagement SW WA
- Columbia Riverkeeper
- Deschutes Estuary Restoration Team
- Friends of Black Diamond
- North Cascades Audubon Society

- Northwest Environmental Defense Center
- Orca Conservancy
- Orca Network
- Rainier Audubon Society
- RE Sources
- Snake River Waterkeeper
- Spokane Riverkeeper
- Trout Unlimited – Washington Council Trout Unlimited
- Washington Chapter Sierra Club

Response to 2.2.S

To provide additional clarity regarding the adopted human-use allowance, when natural conditions criteria have been developed by Ecology and become in effect for Clean Water Act purposes (whether through separate site-specific rulemaking following WAC 173-201A-430 or the performance-based approach following WAC 173-201A-470), human impacts to a waterbody's temperature and dissolved oxygen are limited to minimal, or de minimis, amounts. These insignificant impacts are further limited to human actions that are considered local or regional (as defined in WAC 173-201A-020). Any other anthropogenic source of pollution (e.g., extra-jurisdictional impacts, climate change) is not allowed to negatively impact water quality.

This is also stated in our Tier I Antidegradation section at WAC 173-201A-310(3), which states that "[w]here water quality criteria are not met because of natural conditions, human actions are not allowed to further lower the water quality, except where explicitly allowed in this chapter."

In other words, the default state is no lowering of water quality, and the only impacts are the ones that are explicitly allowed (such as the ones adopted as part of this rulemaking for temperature and dissolved oxygen, and limited to local and regional sources only).

When Ecology determines natural conditions criteria (through the processes mentioned in the first paragraph of this response), we must consider all sources of anthropogenic impact and account and remove those sources from current conditions to determine the natural conditions of a waterbody (i.e., the natural, pre-anthropogenic water quality). Those conditions represent the natural conditions of a waterbody, and therefore represent the conditions protective of aquatic life. Therefore, those become the protective numeric criteria for the waters. From there, where applicable, de minimis impacts to temperature and dissolved oxygen may be allowed by local and regional activities.

We appreciate the support for the adopted *de minimis* human-use allowance criteria. Regarding temperature, we did not find any scientific evidence that would support a percentile approach that would be necessary to include alongside the numeric allowance.

Regarding limits to the human-use allowance based on the underlying natural conditions criteria, we note that natural conditions represent the water quality of a system prior to any anthropogenic impacts. Aquatic life that inhabits these systems have adapted over time to these unique conditions, and the natural conditions water quality represent what is required for those site-specific species to survive, reproduce, and be protected.

Thus, from a natural condition standpoint, we disagree that there needs to be a "low level" or limit to natural conditions for dissolved oxygen (or "high level" or limit to temperature"), as properly developed natural conditions criteria are protective of aquatic life and do not represent "deadly conditions". That said, we recognize that additional work is needed in the performance-based approach document before it is final. This includes adding additional details to our methodology. This will ensure any binding natural condition performance-based processes is scientifically-justifiable and repeatable. Our water quality criteria will protect all aquatic life, including threatened and endangered species.

We note that natural conditions and biologically-based numeric criteria are developed in different ways, with natural conditions representing the natural water quality of a system and biologically-based criteria represented laboratory tests that generally do not focus on species only from a specific-site. Both are different approaches that Ecology or other rulemaking agencies (e.g., EPA) can take to develop protective criteria; however, both are protective for aquatic life.

2.2.T Comment Summary – The proposed NCC language is flawed. Ecology proposes rule language stating that if a waterbody does not meet numeric criteria due to natural conditions, "the natural conditions constitute the water quality criteria." Instead, if Ecology proceeds with this rulemaking, it should make clear that the NCC only applies if Ecology has determined new criteria pursuant to the NCC. The rule language contains no assurance that the result of a performance-based approach will protect the most sensitive beneficial uses. This includes the issues raised above, such as habitat complexity and requiring that modeled water temperatures naturally colder than numeric criteria and modeled dissolved oxygen levels naturally higher than numeric criteria must also apply. Finally, Ecology proposes that it can change the performance-based guidance at will. This results in changing the water quality standard without public input, Tribal input, EPA approval, or consultation under the Endangered Species Act. This is entirely contrary to the principle of the performance-based approach, and this language must be removed to meet consultation and public engagement requirements.

- Alliance for Community Engagement SW WA
- Columbia Riverkeeper
- Deschutes Estuary Restoration Team
- Friends of Black Diamond
- North Cascades Audubon Society
- Northwest Environmental Defense Center
- Orca Conservancy
- Orca Network
- Rainier Audubon Society
- RE Sources
- Snake River Waterkeeper
- Spokane Riverkeeper
- Trout Unlimited – Washington Council Trout Unlimited
- Washington Chapter Sierra Club

Response to 2.2.T

We have clarified in the adopted rule at WAC 173-201A-260 that natural conditions criteria are the water quality criteria once such criteria have been developed, adopted, and in effect for Clean Water Act actions for our programs that require that approval.

Our clarifications indicate that natural conditions criteria must be developed using the site-specific criteria rulemaking at WAC 173-201A-430 or, for those applicable parameters, by following the performance-based approach at WAC 173-201A-470.

We have updated WAC 173-201A-470 to remove the "as revised" qualifier for the referenced performance-based approach document. While Ecology can update this document in the future, any such updates to the document will follow federal requirements under the Clean Water Act for revising water quality standards, which includes a public process component (including receiving tribal input) and EPA review and approval. We note this was always the intent for updates to this document, as EPA notes that such external documents for a performance-based approach constitute a "rule-referenced, legally binding document".

Finally, we note that criteria developed using the performance-based approach will always have some form of public and EPA involvement, whether through review of draft TMDLs, permit applications, or review of the water quality assessment. We clarified in the implementation document with this rulemaking that use of the performance-based approach will include these public processes. These will provide opportunity for the public and EPA to review the application of the performance-based approach and to assess developed criteria against the intended goal for protection of aquatic life.

That said, we disagree that the performance-based approach has no assurance for protection of aquatic life. The draft performance-based approach document requires consideration and removal of all anthropogenic sources to determine the natural conditions of a waterbody. Natural water quality is supportive and protective of aquatic life, as these represent conditions where species that inhabit the site have adapted to over time, and have survived and reproduced in these waters. Therefore, appropriately derived natural conditions criteria represent protective water quality for aquatic life.

The primary purpose of this rule was to develop a process to identify natural water quality conditions for water bodies with unique physiochemical characteristics. Aquatic life that inhabits these waters have adapted over time to these natural, pre-human impact conditions, such that this level of natural water quality supports aquatic life survival, growth, and reproduction.

That said, we recognize that additional work is needed in the performance-based approach document before it is final. This includes adding additional details to our methodology. This will ensure any binding natural condition performance-based processes is scientifically-justifiable and repeatable. Our water quality criteria will protect all aquatic life, including threatened and endangered species.

We plan on revising the document and providing additional opportunities for Tribes and the public to comment before finalization and submittal to EPA. Please see our statement in Section 5 (Response to 5.A through 5.ZZ) regarding the future of the performance-based approach document.

2.3.General provision (WAC 173-201A-260)

2.3.A Comment Summary – I want to comment on WAC 173-201A-260 discusses WAC 173-201A-430 or site specific criteria. WAC-201-430 says that site specific criteria must be

consistent with federal regulation on designated and protecting uses (40 CFR 131.10 and 131.11). The site specific criteria must show that it will protect the existing and attainable uses of the water body (WAC 173-201A-430). 40 CFR 131.10 and 40 CR 131.11.

- Blessing, Bonnie

Response to 2.3.A

We appreciate your comment. We want to note that WAC 173-201A-260(1)(a) has been updated to more clearly indicate the possible approaches we use to develop protective aquatic life numeric criteria based on natural conditions for a site. We have also updated our site-specific criteria language at WAC 173-201A-430 to reflect that criteria developed in this process are for protecting uses.

2.3.B Comment Summary – To clarify these issues, the District requests that Ecology's proposed change to WAC 173-201A260 (1)(a) be revised to state that "When natural conditions constitute the aquatic life water quality criteria, criteria values may (strike) shall be established using site-specific criteria (see WAC 173-201A-430), use attainability analysis (see WAC 173-201A-440), or the performance-based approach (see WAC 173-201A-470). When there is information indicating that nonattainment of aquatic life criteria is potentially due to natural conditions, Ecology shall evaluate natural conditions before developing Total Maximum Daily Loads (TMDLs) for receiving waters and/or before setting new or modified discharge permit effluent limits."

- Liberty Lake Sewer and Water District No. 1

Response to 2.3.B

We have updated WAC 173-201A-260(1)(a) to more clearly indicate the possible approaches we use to develop protective aquatic life numeric criteria based on natural conditions for a site.

While we appreciate your comment regarding the process of how Ecology evaluates waters, we have not adopted this rule language change. We feel such language is a policy decision and not appropriate for water quality standards.

2.3.C Comment Summary – The EPA suggests the following revisions to clarify the applicable criteria when natural conditions are not applicable (i.e. the biologically-based numeric criteria):

a) The applicable aquatic life criteria for water bodies in Washington are the biologically-based numeric criteria in [Tables 200(1)(c)…] unless the application of 260(1)(a)(i)-(ii) results in site-specific numeric aquatic life criteria representing specific conditions unique to a waterbody.

(i) Aquatic life criteria for temperature, pH, or dissolved oxygen for freshwaters or dissolved oxygen or temperature for marine waters based on natural conditions will be derived following either the individual site-specific criteria approach pursuant to WAC 173-201A-430 or the performance-based approach pursuant to WAC 173-201A-470.

(ii) For parameters other than dissolved oxygen, pH, or temperature for freshwaters or dissolved oxygen or temperature for marine waters, aquatic life criteria based on natural conditions will be derived pursuant to WAC 173-201A-430.

(b) When a water body does not meet its assigned criteria due to human structural changes that cannot be effectively remedied (as determined consistent with the federal regulations at 40 C.F.R. 131.10), then alternative estimates of the attainable water quality conditions may be used to establish alternative criteria for the water body (see WAC 173-201A-430 and 173-201A-440).

Note, the EPA's suggested revision to provision "b" deletes the statement about natural conditions. Combining natural conditions and attainability creates ambiguity around how the rules function together.

- Environmental Protection Agency

Response to 2.3.C

We appreciate the comment and have updated WAC 173-201A-260(1)(a) to be clearer about how we will develop natural conditions criteria for use in federal Clean Water Act actions.

We have chosen to not update WAC 173-201A-260(1)(b).

2.3.D Comment Summary – Ecology proposes revisions to its WAC 173-201A-260(1) Natural conditions and other water quality criteria and applications – Natural and irreversible human conditions. There are numerous problems with the proposal. First, paragraph one of subsection (a) appears to stand on its own, stating that if a waterbody does not meet numeric criteria due to natural conditions, "the natural conditions constitute the water quality criteria." This is not accurate. The natural conditions constitute the water quality criteria only if Ecology takes other actions. These are spelled out as criteria that "may be established" by three means.

Second, it seems pointless for Ecology to point out that it may develop site-specific criteria or conduct a use attainability analysis because both of those actions require that Ecology submit the results to EPA for approval. The purpose of this criterion would be better kept narrowly focused on Ecology's desire to supplant numeric criteria with purportedly natural conditions criteria.

- Northwest Environmental Advocates

Response to 2.3.D

We appreciate your comment. We want to note that WAC 173-201A-260(1)(a) has been updated to more clearly indicate the possible approaches we use to develop protective aquatic life numeric criteria based on natural conditions for a site. This also includes removing reference to the Use Attainability Analysis.

However, the site-specific criteria approach is retained in this section, as this is one (and for some water quality parameters, the only) approach to develop natural conditions-based aquatic life criteria which, when once in effect for federal Clean Water Act actions, "supplant" the biologically-based numeric criteria.

2.3.E Comment Summary – Third, there is no reference in this provision to reflect the mantra that Ecology has sprinkled all over its rulemaking documents, namely that the resulting criteria must protect the existing and designated uses. Instead, there is imbedded the false conclusion that whatever Ecology says is natural is inherently protective and that natural conditions are limited to water quality. As the court explained in the Oregon NCC litigation, and as has been recognized by the use of narratives to mitigate the harm from 20° C migration temperatures, and that EPA explained in its regional guidance, that is simply not true.

- Northwest Environmental Advocates

Response to 2.3.E

When developing site-specific criteria following WAC 173-201A-430, Ecology must submit justification for criteria values that ensures aquatic life protection for all existing and designated uses.

When developing site-specific criteria following the performance-based approach for those applicable parameters at WAC 173-201A-470, Ecology must include justification for developed values, and Ecology has updated its implementation guidance documents to indicate that such use must be accompanied by a public process and EPA oversight or review (e.g., the public and EPA review as part of a draft TMDL).

We hold, however, that appropriately derived natural conditions criteria, which must reflect pre-anthropogenic water quality for that site, are protective of the aquatic life that inhabit the system, as such species have adapted over time to those water quality conditions and have since survived and reproduced. These natural water quality conditions, therefore, represent what is needed for full aquatic life protection for that specific site.

Both approaches (natural conditions and biologically-based criteria) are paths to derive protective aquatic life criteria, and we argue that both are different options to providing protection for aquatic life in water bodies, but neither supersede the other when appropriately determined. Nor is there any support currently, either scientifically or from EPA, that one must be used over the other when information for both is available.

2.4.Antidegradation (WAC 173-201A-310)

2.4.A Comment Summary – WAC 173-201A-310(3). Consistency with regulations. The EPA recommends deleting this provision from the Washington WQS to provide consistency with the new revisions contained in the proposed rule. This provision states that "natural conditions constitute the water quality criteria" without any further explanation that the site-specific criteria approaches identified at 173-201A-260 must be followed to establish natural conditions criteria. If this provision is not deleted, please consider revising to include a reference to WAC 173-201A-260(1)(a). If the state opts not to make the suggested revisions, the EPA requests that Ecology provides a clarification to the EPA that this provision will be implemented consistent with WAC 173-201A-260(1)(a).

- Environmental Protection Agency

Response to 2.4.A

We chose to not revise WAC 173-201A-310(3) during this rulemaking.

When referencing natural conditions in our Tier I Antidegradation section, we intend for that provision to mean natural conditions as determined and implemented consistent with WAC 173-201A-260(1)(a), through either the site-specific rulemaking approach at WAC 173-201A-430 or the performance-based approach at WAC 173-201A-470 for applicable parameters.

2.5.Site-specific criteria (WAC 173-201A-430)

2.5.A Comment Summary – WAC 173-201A-430(1) must be revised in accordance with the EPA regulations at 40 CFR section 131.11. Attainability is pertinent to use attainability analyses and establishment of designated uses and should not be included in site specific criteria statements, where the criteria are to protect the current designated use(s). The EPA suggests the following revisions: "Where the existing and designated uses for the water body would be fully protected using an alternative criterion, site-specific criteria may be adopted".

WAC 173-201A-430(1)(a) includes references to designating uses and the federal regulations for designating uses. The establishment of site-specific criteria does not pertain to designating uses; therefore, we recommend deleting the phrases "designating and" as well as the reference to 40 CFR 131.10.

The EPA recommends the following revision for WAC 173-201A-430(3) to ensure consistency with federal regulations: "The decision to approve the site specific criterion must be based on a demonstration that it will protect the existing and designated uses of the water body."

- Environmental Protection Agency

Response to 2.5.A

We appreciate the comment, and we have revised WAC 173-201A-430 to reflect your comment.

2.5.B Comment Summary – New water standards should scale properly. Water quality standards which are isolated to a specific site may not scale well at the watershed level. Especially with the advent of climate change events that increase the risk and scale of flooding and stormwater runoff, we can logically expect increased risk of intermingling of waters which might not typically connect to each other. This increases the potential for a 'naturally conditioned' polluted waterway to flow into other water bodies which are not 'naturally conditioned', causing those bodies to become out of compliance with their numerical water quality standards. We recommend that new standards simply and reliably protect all water bodies in a watershed, and site specificity be extremely limited.

- Black Hills Audubon Society

Response to 2.5.B

We appreciate your comment, and agree that a "bigger picture" may be necessary when developing site-specific criteria. We want to note that "site-specific criteria" development for a site following WAC 173-201A-430 may ultimately include multiple waterbodies in one rulemaking (to account for watershed-level differences), or even apply to a larger watershed where such protection is required and appropriate.

Such determinations would be made on a case-by-case basis, and ultimately any developed criteria must protect existing and designated uses, including those downstream uses for applicable systems.

2.6.Performance-based approach (WAC 173-201A-470)

2.6.A Comment Summary – Please delete “as revised” language at the end of WAC 173-201A-470(1). The EPA cannot approve language that encompasses future revisions.

Additionally, for clarity and consistency, WAC 173-201A-470(4) must reference WAC 173-201A-430 as the only approach to establish natural conditions outside of the PBA. EPA recommends specific revisions to WAC 173-201A470(4) to clarify the criteria in place until a natural criteria using the PBA or other site-specific criteria are established. EPA recommended revisions to WAC 173-201A-470 to address these concerns as well as other rule language improvements.

- Environmental Protection Agency

Response to 2.6.A

It was not the intent for Ecology to make revisions to the performance-based approach document without public involvement and EPA review and approval. We have removed the "as revised' qualifier from the adopted rule language.

We made updates to the adopted rule language to reflect EPA's comment to clarify the approaches possible to develop criteria based on natural conditions when use of the performance-based approach is not possible.

However, we specifically point back to WAC 173-201A-260 which lists the other options for development of natural conditions criteria when the performance-based approach is not possible. At this time, the only other option would be site-specific criteria developed following WAC 173-201A-430. We feel this approach provides future flexibility should additional options for criteria development become available and are incorporated through rulemaking into our water quality standards, while still meeting the "must" that EPA notes for this section.

However, we chose not to include some suggested language (such as applicable criteria in the interim). Until natural conditions criteria have been developed and are in effect for Clean Water Act actions, the applicable criteria for Clean Water Act purposes are the biologically-

based numeric criteria. We feel that such additional statements in WAC 173-201A-470 are not necessary and redundant.

2.6.B Comment Summary – Ecology proposes a new section, WAC 173-201A-470 Performance-based approach. Its purpose is set out in its subsection (3), namely that criteria developed using this approach need not be submitted to EPA for approval. It proposes to meet EPA's requirements for a performance-based approach by including the following requirement:

Aquatic life water quality criteria must be derived using the procedures referenced in Ecology publication 24-10-017, "A Performance-Based Approach for Developing Site-Specific Natural Conditions Criteria for Aquatic Life in Washington," as revised.

Proposed WAC 173-201A-470(1). This is not acceptable. First, the incorporation by reference is to a document "as revised." This means that the water quality standard that Ecology is asking EPA to approve is referencing a document that Ecology can change at any time without EPA approval. That is, of course, entirely absurd as it defeats the purpose of this rulemaking.

Second, the publication is wholly inadequate, as discussed supra.

- Northwest Environmental Advocates

Response to 2.6.B

It was not the intent for Ecology to revise the performance-based approach document without public involvement and EPA review and approval. We have removed the "as revised' qualifier from the adopted rule language.

The primary purpose of this rule was to develop a process to identify natural water quality conditions for water bodies with unique physiochemical characteristics. Aquatic life that inhabits these waters have adapted over time to these natural, pre-human impact conditions, such that this level of natural water quality supports aquatic life survival, growth, and reproduction.

That said, we recognize that additional work is needed in the performance-based approach document before it is final. This includes adding additional details to our methodology. This will ensure any binding natural condition performance-based processes is scientifically-justifiable and repeatable. Our water quality criteria will protect all aquatic life, including threatened and endangered species.

We plan on revising the document and providing additional opportunities for Tribes and the public to comment before finalization and submittal to EPA. Please see our statement in Section 5 (Response to 5.A through 5.ZZ) regarding the future of the performance-based approach document.

2.6.C Comment Summary – Ecology also proposes the following language:

If development of aquatic life criteria using the performance-based approach cannot meet the requirements set forth in these procedures, then alternatives specified in the paragraph following WAC 173-201A-260(1)(a) may be used.

Proposed WAC 173-201A-470(4). This reference is to this language, although bizarrely it is not referenced as WAC 173-201A-260(1)(b) instead of "the paragraph following":

When a water body does not meet its assigned criteria due to human structural changes that cannot be effectively remedied (as determined consistent with the federal regulations at 40 C.F.R. 131.10), then alternative estimates of the attainable water quality conditions, plus any further allowances for human effects specified in this chapter for when natural conditions exceed the criteria, may be used to establish an alternative criteria for the water body (see WAC 173-201A430 and 173-201A-440).

This is nonsensical. Ecology is saying if the performance-based approach isn't going to work, revert to the existing "alternative estimates," which plus a HUA will constitute "an alternative criteria." Is there a more clear-cut example of how Ecology is attempting to package its business-as-usual NCC as a performance-based NCC while actually not changing anything? No, this language is not acceptable for the reasons given by the court in the Oregon NCC litigation and EPA's disapproval of Oregon's NCC.

- Northwest Environmental Advocates

Response to 2.6.C

The "paragraph following" language was an error based on how our water quality standards are formatted for publication, and this has been revised in the final rule language.

The intention was always to point to the other allowed alternatives to the performance-based approach should the requirements of the performance-based approach not be met. At this time, that is only criteria developed following the site-specific criteria requirements at WAC 173-201A-430.

Further, WAC 173-201A-260(1)(a) has been revised to more clearly indicate that natural conditions criteria must be developed through a process (i.e., site-specific criteria or the performance-based approach for those applicable parameters) before use in other federal Clean Water Act actions.

3. Comments on the Technical Support Document

3.1.General Comments on the Technical Support Document

3.1.A Comment Summary – Invasive plants may lower dissolved oxygen:

Invasive plants often occur in the gravel bars on the margins of rivers and streams. Canarygrass itself, often considered an invasive, results in lower dissolved oxygen in the root zones. The dO near the roots of canarygrass was 0.26 mg/liter and near the native juncus was 0.97 mg/liter. Canarygrass has invaded the shorelines of many rivers that also host salmon. See citation in bibliography.

- Blessing, Bonnie

Response to 3.1.A

We appreciate the citation and information regarding invasive vegetation. While we recognize that additional work is needed in the performance-based approach before it is final (please see our statement regarding the future of the performance-based approach document in Section 5, Response to 5.A through 5.ZZ), our draft performance-based approach document had requirements to account for invasive species when determining protective natural conditions criteria, as such species would not be considered part of the natural, pre-anthropogenic conditions of a waterbody.

3.1.B Comment Summary – What is the "design application"? Please define design application.

- King County Department of Natural Resources and Parks

Response to 3.1.B

In this context, the design application refers to the entire model design and use process, from simulations to code to validation and verification of the model. Thus, the recommendation in the technical support document (TSD) states that peer review of our application of the model (either internal or external) must be conducted before the public review of the entire performance-based approach process can begin, with the public process including review of all aspects of how the model was designed, validated, and used.

This term only shows up in Appendix A of our TSD, which is copied verbatim from EPA's draft, staff-level, deliberative recommendations for a performance-based approach specific for Washington. Should these draft recommendations become finalized, or a second draft version released, we encourage EPA to consider this comment for increasing clarity.

3.1.C Comment Summary – General Provision. Please delete “When this occurs, the natural conditions constitute the water quality criteria” from the opening paragraph. Additionally, there are several statements that refer to natural conditions constituting the water quality criteria. As noted in the EPA’s comments on the draft rule and PBA documents, we recommend that the state link similar statements throughout the document to the approaches for establishing natural conditions at WAC 173-201A-260(1)(a) or delete those statements.

Comments on the Technical Support Document: General Comments on the Technical Support Document

- Environmental Protection Agency

Response to 3.1.C

We have updated our Technical Support Document to reflect our updated regulatory language adopted at WAC 173-201A-260(1)(a).

3.1.D Comment Summary – The Davies 1997 memorandum is guidance, not regulation. Therefore, EPA recommends changing the "minimum requirements" and "must include" language to recommendations.

- Environmental Protection Agency

Response to 3.1.D

We appreciate the comment and have updated our Technical Support Document appropriately.

3.1.E Comment Summary – Page 31 includes references to "statistical modeling" approaches as well as mechanistic modeling approaches; however the PBA is only focused on mechanistic modeling approaches. While the statements are factual, the EPA recommends providing more context for when a statistical modeling approach might be used (e.g. currently only allowable under WAC 173-201A-430 for site-specific criteria development).

- Environmental Protection Agency

Response to 3.1.E

We appreciate your comment and have adding clarification in the Technical Support Document.

3.1.F Comment Summary – When referring to the document, *EPA workgroup report on principles to consider when using natural conditions provisions 2005*, please note that this was an informal EPA discussion group and not a formal workgroup. The resulting document was developed to provide clarity but does not represent a formally issued guidance.

- Environmental Protection Agency

Response to 3.1.F

We appreciate the clarification, and we have updated the Technical Support Document to more accurately reflect the nature of this discussion group.

3.1.G Comment Summary – Figure 1. Pg. 27. [of the Draft Technical Support Document] provides an EPA developed flow chart for identifying and documenting natural conditions. This flow chart is not parameter specific or consistent with the process Washington State is proposing. This includes the proposal that natural conditions determinations be administered through the TMDL program, reference to use of the Programmatic QAPP (Publication No. 17-03-107),

pathways for human allowance, relationships to the Water Quality Assessment process, and others. It's recommended that Ecology either update the existing flowchart or develop a new parameter specific flow chart which fully describes Washington's proposed process.

- Snohomish County

Response to 3.1.G

The inclusion of this flowchart was to highlight EPA's recommendations for a performance-based approach based on their 2015 publication.

The primary purpose of this rule was to develop a process to identify natural water quality conditions for water bodies with unique physiochemical characteristics. Aquatic life that inhabits these waters have adapted over time to these natural, pre-human impact conditions, such that this level of natural water quality supports aquatic life survival, growth, and reproduction.

That said, we recognize that additional work is needed in the performance-based approach document before it is final. This includes adding additional details to our methodology. This will ensure any binding natural condition performance-based processes is scientifically-justifiable and repeatable. Our water quality criteria will protect all aquatic life, including threatened and endangered species.

We plan on revising the document and providing additional opportunities for Tribes and the public to comment before finalization and submittal to EPA. Please see our statement in Section 5 (Response to 5.A through 5.ZZ) regarding the future of the performance-based approach document. We may consider providing addition detail in this document, such as a flowchart, to provide additional clarity for our process.

3.2.Endangered Species List

3.2.A Comment Summary – General Comments on page 11 of publication 24-10-015. The Ecology executive summary (page 11) says Ecology reviewed the previous EPA, FWS and natural conditions. This is so very old and doesn't include species recently listed. To inform your analysis please update your list of ESA species in your Technical Support Document (24-10-15 on Page 18 to 19). Oregon spotted frogs are another federally listed that occur below both MS4 outfalls, in agricultural landscapes and in natural areas. This process of identifying natural conditions seems like it could overlap the process described by publication 24-10-027.

- Blessing, Bonnie

Response to 3.2.A

We appreciate your comment. We have updated the Technical Support Document to include mention of the latest endangered species. That said, we want to note that while the previous Biological Opinions and Biological Evaluation are over 15 years old at this point, they remain the latest and most recent reviews of Washington's prior natural conditions criteria.

Comments on the Technical Support Document: Studies used to support criteria values for the human use allowance

3.2.B Comment Summary – The Services finalized a new rule on April 5, 2024, that revises portions of the ESA implementation regulations, including portions of the regulations summarized in the TSD. The new rule became effective May 6, 2024. The EPA recommends referencing the changes in the new rule.

- Environmental Protection Agency

Response to 3.2.B

We appreciate the comment and update on these new revisions. We have updated our Technical Support Document accordingly.

3.2.C Comment Summary – Bizarrely, Ecology cites EPA's biological evaluation for the point that "[t]wo species, the bald eagle and marbled murrelet, are significant piscivores that could be affected by a reduction in prey base (mainly salmonids)." TSD at 53. This ignores EPA's own finding that there were "five predator species" including "three marine mammals (stellar sea lion, humpback whale, and killer whale)" that could be affected indirectly through reduced prey. EPA 2007 BE at 172-173. Ecology conveniently ignores the endangered Southern resident killer whale by mentioning the species exactly once in its TSD, in a list of threatened and endangered species, as if mentioning this species on the verge of extinction—including from lack of sufficient salmonid prey—is some form of analysis and protection. TSD at 19; see also id. at 57-58 (Ecology nearly identical discussion about dissolved oxygen). At least Ecology had the sense to say that southern sea otters and two turtle species "could be considered" as affected by the proposed marine dissolved oxygen standards, after citing the same EPA biological evaluation stating that EPA made a no effect determination. Id. at 58.

- Northwest Environmental Advocates

Response to 3.2.C

We appreciate the comment. We have updated the Technical Support Document to reflect more recent ESA species, as well as additional implementation regulations that were recently revised.

3.3.Studies used to support criteria values for the human use allowance

3.3.A Comment Summary – Ecology's reliance on the 2003 EPA Regional Guidance is also misguided because that guidance pre-dates the Oregon litigation. To provide a feel for why EPA's past approvals of the use of NCC-derived criteria were so flawed (in both Oregon and Washington), one only need look at EPA's approval of Oregon's Umpqua TMDL that was based on that state's now-disapproved NCC. One example of the superseding, purportedly "natural," temperatures was 32.5° C, as demonstrated [for Olalla-Lookingglass Creek] .

It is very much worth noting that 32.5° C is, according to EPA's Regional Guidance and Ecology, lethal to salmon within seconds. Regional Guidance at 33 ("Exposures of less than 10 seconds can cause instantaneous lethality at 32°C (WDOE, 2002)."). This, as well as other

examples, none of which were evaluated by the federal court in the Oregon case or by EPA in its Oregon disapproval, demonstrates that just because an agency has deemed a temperature "natural" through modeling does not in any way mean that it has correctly made that determination. Salmonids could not have lived, let alone thrived, in the NCC-derived temperatures.

- Northwest Environmental Advocates

Response to 3.3.A

We appreciate your comment.

Our support for the human-use allowance value of 0.3 degrees Celsius is not solely based on the 2003 EPA Regional Guidance for Temperature, but also supported by literature review, as documented in the Technical Support Document.

We also note that natural conditions criteria are calculated by accounting for and removing all sources of human impact, such that the natural conditions criteria values represent water quality in its pre-anthropogenic impact state. We hold that appropriately derived natural conditions criteria, which must reflect pre-anthropogenic water quality for that site, are protective of the aquatic life that inhabit the system, as those species have adapted over time to those water quality conditions and have since survived and reproduced. These natural water quality conditions, therefore, represent what is needed for full aquatic life protection for that specific site.

We also note that past TMDLs (such as those referenced from Oregon or Washington) were based on the criteria applicable at the time, and may not reflect the requirements that we adopted in this rulemaking or were provided in the draft rulemaking documents. In other words, the approach that Oregon may have taken in calculating its natural thermal potential may not necessarily be able to meet or be replicated by following our draft performance-based approach for natural conditions criteria.

In fact, the footnote in the provided comment letter regarding the Olalla-Lookingglass Creek temperature simulation results demonstrates that what was done here would not meet what Ecology considers in development of protective criteria in the confines of the draft performance-based approach:

> *"To be sure, Oregon DEQ noted that "[n]atural thermal potential was not modeled during the salmon and steelhead fish use period.""*

If anything, natural conditions modeled during the non-salmon and steelhead fish use period would only be applicable to those time periods, unless it was clearly and scientifically demonstrated that the criteria developed in this window of time were applicable and protective for other parts of the year, which arguably it is not.

The primary purpose of this rule was to develop a process to identify natural water quality conditions for water bodies with unique physiochemical characteristics. Aquatic life that inhabits these waters have adapted over time to these natural, pre-human impact conditions, such that this level of natural water quality supports aquatic life survival, growth, and reproduction.

That said, we recognize that additional work is needed in the performance-based approach document before it is final. This includes adding additional details to our methodology. This will ensure any binding natural condition performance-based processes is scientifically-justifiable and repeatable. Our water quality criteria will protect all aquatic life, including threatened and endangered species.

We plan on revising the document and providing additional opportunities for Tribes and the public to comment before finalization and submittal to EPA. Please see our statement in Section 5 (Response to 5.A through 5.ZZ) regarding the future of the performance-based approach document.

3.3.B Comment Summary –Ecology relies on EPA's previous observations that not allowing the human use allowance ("HUA") for temperature would be "unnecessarily restrictive" and "lead to unnecessary costly expenditures." EPA also states that the HUA for temperature is, by definition, "insignificant because monitoring measurement error for recording instruments typically used in field studies is approximately 0.2°C to 0.3°C." Id. at 53, quoting EPA's 2007 BE. Ecology never discusses, however, that the output of models using the NCC in TMDLs to determine natural conditions criteria is not affected by measurement error.

Ecology cites the U.S. Fish and Wildlife Service's determination that "allowable increases in point sources contribute to the cumulative warming of the waterbodies and maintains degraded baseline conditions in areas where temperatures are already above optimal levels for bull trout" but then proceeded to ignore this concern entirely. TSD at 54. According to Ecology, NMFS simply did not discuss the HUA for temperature at all, except for lakes. Id. at 54. Failing to address the underlying superseding temperature is inconsistent with EPA's guidance. See Regional Guidance at 28 ("EPA believes it is particularly important for the TMDL itself or the TMDL assessment document to address the above aspects of the natural thermal regime for waterbodies where the natural background maximum 7DADM temperature exceeds 18°C and where the river has significant hydrologic alterations (e.g., dams and reservoirs, water withdrawals, and/or significant river channelization) that have resulted in the loss of temperature diversity in the river or shifted the natural temperature pattern."). Ecology should assume that increments of temperature become more hazardous as assumed natural conditions temperatures rise and phase such allowable increases out accordingly in order to meet its purported goal of protecting aquatic species. .

- Northwest Environmental Advocates

Response to 3.3.B

We appreciate your comment.

We recognize that model outputs will have associated ranges and some level of error due to uncertainty within the modeling process and in the underlying dataset. Acceptable model uncertainty and limitations are documented in the project QAPP, which is a requirement of the proposed, draft performance-based approach. Further, when taking model outputs and determining protective natural conditions criteria for the site, the conservative and most protective approach is used. For instance, if the model output indicates natural conditions for

a cell is 4.3 mg/L - 4.6 mg/L for dissolved oxygen, then the criterion value would be 4.6 mg/L.

Once model skill is well established and its accuracy found acceptable, the precision error of the difference of two model runs, such as that of an increment between an existing scenario and a natural conditions scenario, can be calculated. Increments calculated in this manner are then compared to the human use allowance value. Model skill statistics of existing condition scenarios include measurement errors, and thus, natural criteria derived from such scenarios also include such errors. The increment for comparison with the human use allowance, by the approach in which it is calculated, no longer includes random measurement errors.

The primary purpose of this rule was to develop a process to identify natural water quality conditions for water bodies with unique physiochemical characteristics. Aquatic life that inhabits these waters have adapted over time to these natural, pre-human impact conditions, such that this level of natural water quality supports aquatic life survival, growth, and reproduction.

That said, we recognize that additional work is needed in the performance-based approach document before it is final. This includes adding additional details to our methodology. This will ensure any binding natural condition performance-based processes is scientifically-justifiable and repeatable. Our water quality criteria will protect all aquatic life, including threatened and endangered species.

We plan on revising the document and providing additional opportunities for Tribes and the public to comment before finalization and submittal to EPA. Please see our statement in Section 5 (Response to 5.A through 5.ZZ) regarding the future of the performance-based approach document.

Regarding natural conditions criteria themselves, Ecology holds that appropriately derived natural conditions criteria, which must reflect pre-anthropogenic water quality for that site, are protective of the aquatic life that inhabit the system, as these species have adapted over time to those water quality conditions and have since survived and reproduced. These natural water quality conditions, therefore, represent what is needed for full aquatic life protection for that specific site.

Thus, we understand and recognize the complexity of the performance-based approach, and we want to ensure we are as accurate and precise as possible in calculating natural conditions criteria values. That said, based on the available and latest science, we hold that 0.3°C above natural conditions for temperature is insignificant and still protective of aquatic life.

3.3.C Comment Summary – Please share the basis for the 0.2mg/l standard.

Discussion in the document indicates that Ecology is confident that instrument sensitivities now allow for measuring small changes in DO, including at levels +/- 0.01mg/l or lower, indicating that the basis must be biological. Previous Ecology materials have stated that the 0.2mg/l standard was “not a biologically derived value.” Please confirm the basis for the 0.2mg/l standard.

- Association of Washington Cities

Comments on the Technical Support Document: Studies used to support criteria values for the human use allowance

Response to 3.3.C

The basis for the 0.2 mg/L or 10% (whichever is lower) human-use allowance criteria for dissolved oxygen are based on the latest available biological studies, as discussed in our Technical Support Document. We addressed instrument sensitivities within the document to demonstrate confidence in the results of these studies due to the high accuracy of their sensors at measuring DO and small changes in DO concentrations.

3.3.D Comment Summary – Please clarify how the agency compares scientific literature relating to the DO needs of marine organisms in other parts of the world to make determinations on needs of organisms present in the Puget Sound.

The technical support document literature review regarding the marine DO proposal related information from past DO studies performed in New Zealand to determine protective aquatic life criteria in the waters of New Zealand. Logically they studied the DO oxygen needs of fish present in New Zealand. Similarly, the review references data on the behavior of zooplankton species present in the eastern tropical North Pacific Ocean, which extends from Mexico to Peru, but does not provide any analysis indicating how relevant that behavioral observation may or may not be for zooplankton species present in the Puget Sound.

Given that average temperatures of the waters around New Zealand and South America are considerably warmer than the average temperatures of the Puget Sound, one might expect species to have adapted differently in those waters. We know that high water temperatures can increase species sensitivity to low DO, so it is problematic to use the direct results from these regions as a rationale for the marine DO criteria in WA. Please explain how Ecology identifies appropriate surrogate species and utilizes, develops confidence in, and adapts scientific findings from very different ecological systems to Washington State.

The rule proposal documents refer to fish species from New Zealand, which exist in a completely different ecosystem—particularly as it relates to temperature. In previous discussions on the development of the Puget Sound Nutrient General Permit, Ecology defended the existing criteria by pointing to a 2008 study that reviewed scientific literature on many species that do not exist in the Puget Sound and at temperatures not found in the Puget Sound (ie, from the Atlantic and Gulf coasts of the U.S., the Mediterranean Sea, and even brackish ponds in Australia). We couldn't find any data from experiments conducted on the U.S. West Coast organisms in the relied-on 2008 study. We know that high water temperatures (outside of the observed range in WA marine waters) can increase species sensitivity to low DO. It is problematic to use the results from these inapposite regions as a rationale for the marine DO criteria in WA.

- Association of Washington Cities

3.3.E Comment Summary – What studies did Ecology review that were specific to species in Washington State? It appears that the referenced studies are only for species outside of Washington State.

- City of Tacoma

Comments on the Technical Support Document: Studies used to support criteria values for the human use allowance

Response to 3.3.D and 3.3.E

We conducted an extensive literature review to identify studies which considered impacts to organisms that have small changes in their environment related to temperature or DO concentrations. We also focused on those studies that were conducted on organisms that inhabit naturally-low DO waters or naturally-high temperature waters.

However, we recognize that many of these studies considered a variety of aquatic species and habitats, and not just those specific to Washington State. This is because for the information we needed to properly support these adopted values, focusing just on species within Puget Sound or Washington waters would not result in sufficient information.

In essence, the studies we needed to seek out represent a far more limited field of research. For instance, many DO studies look at species tolerance to low DO, including identifying metrics such as LD50 for species. These studies are appropriate for developing biologically-based numeric criteria, but they were not appropriate for our goal of developing protective human-use allowance criteria. This is because we are not developing criteria based on when species die-off or see large impacts to their survival or reproduction as we might be when updating biologically-based criteria updates. Rather, we are interested in scenarios when species are in waters with sufficient DO or temperature conditions for protection (i.e., water quality fully meets their needs) and determining how much of a drop in DO or increase in temperature these species can withstand before *any* impact to their lives.

Because of the few studies available in this field specific to Puget Sound or Washington State, were we to rely just on these studies, we would have insufficient support for our human-use allowance values.

When we develop aquatic life criteria, we must ensure criteria are protective. If insufficient data are available to derive protective criteria when just focusing on site- or state-specific studies, it may be necessary to expand our scope in review of science to ensure we can confidently say criteria are sufficiently protective. That was the case here, where we considered additional data and studies to ensure that are adopted criteria are protective of existing and designated aquatic life uses.

3.3.F Comment Summary – What research did the agency evaluate to arrive at 10% for the marine DO threshold?

The technical support document indicates a scientific literature review found that the proposed standard would not harm designated uses. There was no similar information showing that the existing 0.2mg/l allowance in a low DO marine environment would harm aquatic organisms and, thus, a change was warranted. The lack of clarity and rigor regarding the scientific basis for the 1967 criteria makes evaluation of this rule proposal impossible to determine.

- Association of Washington Cities

3.3.G Comment Summary – A rulemaking webinar made a statement that evidence exists that small deviations in DO are problematic in waters with low DO. It was unclear from the literature review in the technical support document what studies validate the statement below. Could you please confirm?

- Association of Washington Cities

Response to 3.3.F and 3.3.G

We wish to clarify this comment that the 0.2 mg/L or 10% allowance for local and regional sources of human impact are when natural conditions criteria are the applicable and derived criteria. This rulemaking does not involve or change or consider the biologically-based numeric marine DO criteria.

In the Technical Support Document, we provided support for situations where small (under 0.2 mg/L) changes in DO have caused impacts to organisms when waters are naturally low in DO, and therefore, support the need to include the 10% as part of the criteria.

For instance, one study (referred to in the rulemaking webinar) conducted by Wishner et al., 2018 looked at zooplankton tolerance and intolerance to changing dissolved oxygen concentrations. These species live at great depths (100 to 1000 meters) and can survive in very low dissolved oxygen (the study looked at water body concentrations as low as 0.16 mg/L). In the study, there were observed shifts in abundance (and therefore, impact) at small decreases of 0.06 mg/L DO.

We also wrote about larger studies in many areas where long term changes in DO are causing impacts on local scales despite being a small percentage drop, or less than 0.2 mg/L (e.g., as seen in global DO and discussed in Garcia-Soto et al., 2021).

Based on our literature review, we concluded that allowing a 0.2 mg/L drop would not be considered insignificant in these naturally-low DO waters, and a more protective approach is needed; hence, the 10% inclusion in the adopted human-use allowance criteria for dissolved oxygen. This 10% value also aligns with EPA's freshwater DO guidance for natural conditions in their 1986 Quality Criteria for Water.

3.4.Appendices updates

3.4.A Comment Summary – Appendix B: The EPA's comments on the Elements Section of the draft PBA document apply to this appendix.

- Environmental Protection Agency

Response to 3.4.A

We appreciate your comment.

4. Implementation

4.1.General Comments

4.1.A Comment Summary – Expected Impacts are to improve Ecology's administrative performance and reduce required pollution control infrastructure. By Ecology's own analysis, the new standard will take waterbodies off their 303D list, speed up their permitting processes and

reduce the 'cost of compliance' burden for permittees by hundreds of thousands of dollars. This cost relief comes from permittees no longer being required to implement features which would reduce emitted pollutant impacts on the already degraded water body – things like Cooling towners, riparian shading, other shading, chillers, etc. In this way Ecology has bypassed responsibility for protecting wildlife habitat at the same time they are saving polluters money and alleviating Agency workload.

- Norton, Betsy

Response to 4.1.A

Ecology disagrees with this assessment of impacts.

Determining natural conditions site-specific criteria for a water involves additional work by Ecology compared to prior use of natural conditions (i.e., before the 2021 disapproval by EPA) or TMDLs without natural condition components.

If natural conditions are determined using the site-specific criteria rulemaking approach, a rulemaking, separate from the TMDL process, will be required to adopt criteria. This includes both a public process and submission to EPA for review and approval before such calculated criteria values can be used for Clean Water Act actions, such as TMDLs.

If natural conditions are determined using the performance-based approach for applicable parameters, then additional work (when compared to prior process or non-natural condition TMDLs) will be required to ensure all sources of anthropogenic pollution are being accounted for and removed when calculating protective criteria based on natural conditions.

Regarding costs to permittees, while there may be cost savings, those do not come at the expense of aquatic life protection. Natural conditions criteria represent the unique conditions of waters and identifies protective criteria for that water to protect aquatic life. Without natural conditions, waters may not naturally meet applicable biologically-based criteria, and permittees, for instance, might be required to meet a water quality standard that would be impossible to meet, even if all discharge was halted or removed. Natural conditions criteria, therefore, represent water quality conditions that are both protective of aquatic life and their habitat while being realistically achievable by permitted actions. This is because natural condition provisions recognize waters would never meet biologically-based numeric criteria since they exceed those criteria when human impacts are taken out.

4.1.B Comment Summary – Eelgrass beds can have substantial variability in DO during the summer, due to high photosynthetic productivity in the daytime and high respiration from all the biomass in the evening. I suggest that the variability in eelgrass beds be summarized and then not have any DO criteria for eelgrass beds. The biota that thrive there are adapted to substantial and rapid changes in DO. Any efforts to define a DO criterion for eelgrass beds will confront the need for a very complex approach for evaluating compliance that will be of little value. Probably the same is needed for temperature in eelgrass beds, and shallow waters with mudflats exposed at low tide. These will warm up when exposed to the summer sun and then pass the heat on to the water when the tide comes in. Again, the biota will be adapted to the temperature changes, and it is unavoidable that really hot conditions will sometimes result in mass mortalities to benthic

species. Similarly, really prolonged low temperatures can result in mass mortality to benthic species.

- Loehr, Lincoln

Response to 4.1.B

We appreciate the information regarding eelgrass beds and other estuarine ecosystems, and we agree these systems represent areas with high variability and adaptations over time by organisms that inhabit these waters.

That said, our responsibility as an agency under the Clean Water Act includes designating uses for waters (such as protection of aquatic life) and developing criteria that protects those uses (such as D.O. concentration criteria values). When natural conditions criteria are developed for a site, we would take into account aquatic life populations and their environment to develop protective criteria values. This might mean that certain criteria (e.g., D.O.) will be more complexly written for a site compared to the applicable biologically-based numeric criteria. For instance, diel variability of D.O. might necessitate different natural condition-derived D.O. values in the daytime compared to overnight conditions.

We disagree, however, that it will be of little value. Not only is it a requirement for Ecology under the federal Clean Water Act, but natural conditions criteria that accounts for this variability may be best suited for the aquatic life protection needed in such a highly-variable system.

4.1.C Comment Summary – Finally, the ultimate question is whether Ecology will use NCC models to determine the need for riparian buffers and associated enforcement mechanisms to bring point and non-point source polluters into compliance. Deriving these criteria and failing to implement on-the-ground solutions to achieve those criteria is a ridiculous waste of taxpayer resources. Continued failure to implement TMDL recommendations at the pace needed for salmon recovery risks losing opportunities to save critically important species in peril of extinction.

- Nooksack Indian Tribe

Response to 4.1.C

We agree that deriving protective criteria is only the first step in protecting and restoring waters in the state. It is an important step to providing protection for aquatic life while recognizing the unique characteristics of waters, but additional actions (such as those identified in a TMDL) are needed to ensure such determined criteria are met.

4.1.D Comment Summary – Per "Objectively Measured Outcomes", monitoring data "will be used to determine whether designated uses are met." How will Ecology determine what monitoring data will be used?

Providing additional detail on the type of data to be used to measure outcomes would provide greater transparency to the public about the impact of water quality standards to support designated uses.

- King County Department of Natural Resources and Parks

Response to 4.1.D

The evaluation of monitoring data to determine if uses are met is done through the Water Quality Assessment. Ecology relies on our Water Quality Assessment Policy 1-11[11] as the guiding policy for data submittals, data credibility, and how we use the data to assess water quality across our state.

4.1.E Comment Summary – The EPA comments on the rule language and on the PBA should be cross walked and reflected in updates to this document.

- Environmental Protection Agency

4.1.F Comment Summary – Page 11 Use of the Performance Based Approach. Consistent with the comments above, please reference WAC 173-201A-260(1)(a) when developing natural conditions criteria.

2. This statement about establishing natural conditions lacks detail, "…so long as the regional natural condition values with an underlying scientific basis defined in the project-specific QAPP…" Please also reference the appropriate approaches that are allowed under WAC 173-201A-260(1)(a)4.

3. The EPA recommends adding clarifications to the permitting and TMDL implementation sections to clearly identify when in each process a criteria will be derived using the PBA. For example, some statements are confusing, such as on page 15, TMDL status #4, there is a statement to "Include new criteria in study design and sampling and drop old criteria" but the criteria may not have been developed yet if they are via the PBA.

- Environmental Protection Agency

4.1.G Comment Summary – Page 15, Using the Performance Based Approach. This section has some unclear language, including "subtracting" anthropogenic impacts, rather than removing all impacts. In addition, there is mention that "extra jurisdictional sources" will be accounted for from a reference condition. However, such sources should be included in the current conditions simulations and then removed to do the natural conditions simulations under the PBA if technically feasible. Where it is not technically feasible to model extra jurisdictional sources and remove them, it may be possible for the state to account for and remove those separately to establish natural conditions criteria free from anthropogenic pollutants.

[11] https://ecology.wa.gov/water-shorelines/water-quality/water-improvement/assessment-of-state-waters-303d/assessment-policy-1-11

- Environmental Protection Agency

4.1.H Comment Summary – Please clarify that the biologically-based numeric criteria duration and frequencies are applicable to the following statement, "These estimates, alongside the applicable and protective duration and frequency components, represent the natural conditions criteria for that water quality parameter."

- Environmental Protection Agency

Response to 4.1.E through 4.1.H

We appreciate the comments and have made updates to our implementation plan. This includes updates to referenced sections in the comment and clarifications that the duration and frequency components are the applicable components from the biologically-based numeric criteria.

4.1.I Comment Summary – Please clarify the following:

1. Opening sentence: What is meant by the "current rule." Is it the currently effective rule, or the revised rule amendments and updates?

2. Human Action Allowance Considerations. Recommend revising to reflect that the allowances are also "within" a certain amount of each criterion.

3. The revised rules are paraphrased, and some of the qualifying language is not included. Recommend including the draft rules verbatim for clarity.

- Environmental Protection Agency

Response to 4.1.I

During our public comment and participation phase, any proposed rule changes are defined as either "proposed rule" or "adopted rule". Where we say, "current rule", we refer to what is currently in-effect for the state.

We have updated the human allowance limitation language to improve clarity of the section based on the adopted rule and for the final version of this implementation document.

4.1.J Comment Summary – An absolutely essential attribute of an EPA-approvable NCC should be its ability to assure that the resulting, superseding criteria will truly reflect natural conditions. There is, unfortunately, nothing in any of Ecology's supporting documents to this rulemaking that provides that assurance. With few exceptions, Ecology's proposal is to throw more words at the problem and to not provide the up-front assurances that are inherent in the concept of a "performance-based approach" but, rather, to wanly note that it will be the project-specific quality assurance protect plan ("QAPP") that will provide the assurances. But a QAPP is not a water quality standard, future QAPPs will not be incorporated by reference into this proposed rule, and the use of QAPPs to figure out what will be done define the very down-the-road approach that flies in the face of an up-front performance-based approach. Ecology is still

opting for the very we-knowit-when-we-see-it approach that it has been using all these years in its now-disapproved NCC. That is not a water quality standard.

- Northwest Environmental Advocates

Response to 4.1.J

We have clarified throughout the documentation that development of natural conditions criteria will always involve a public process of some form before use in Clean Water Act actions. For instance, if using the performance-based approach, site-specific criteria developed will be used generally in water cleanup plans (which may have a public component and EPA approval process) or Advanced Restoration Plans with public participation components and EPA oversight or review. If developing site-specific criteria following our site-specific rulemaking outlined at WAC 173-201A-430, then the formal rulemaking process, including public involvement and EPA review and approval, is required.

In either path, the public will have opportunity to review Ecology's work demonstrating that developed criteria are protective and represent natural conditions of the system.

4.1.K Comment Summary – Regardless of the outcome of this evaluation, Ecology concluded that these new, cooler, temperatures were not the superseding (or not necessary) natural thermal potential temperatures. Scenario 5 did not even account for "[t]he effect of human activities on stream hydrology and channel geomorphology (e.g. geometry, hydraulics, hyporheic exchange, groundwater flow) on stream temperatures." Id. at 125. Instead, Ecology argued that only in the future "[t]he extent to which the larger tree heights are applicable should be verified as part of implementation, and Load Allocations should be adjusted to include taller trees and wider buffers where applicable as an adjusted estimate of natural conditions." Id. at 128. In other words, Ecology explicitly rejected identifying superseding temperature criteria based on the NCC that assumed no forestry activities in upland areas of the watershed. In none of its rulemaking documents has Ecology explained how it will zero out these upstream effects, not only on shade, channel morphology, downstream sedimentation and the like but on the effect of logging on reducing watershed flows.

- Northwest Environmental Advocates

Response to 4.1.K

The primary purpose of this rule was to develop a process to identify natural water quality conditions for water bodies with unique physiochemical characteristics. Aquatic life that inhabits these waters have adapted over time to these natural, pre-human impact conditions, such that this level of natural water quality supports aquatic life survival, growth, and reproduction.

That said, we recognize that additional work is needed in the performance-based approach document before it is final. This includes adding additional details to our methodology. This will ensure any binding natural condition performance-based processes is scientifically-justifiable and repeatable. Our water quality criteria will protect all aquatic life, including threatened and endangered species.

We plan on revising the document and providing additional opportunities for Tribes and the public to comment before finalization and submittal to EPA. Please see our statement in Section 5 (Response to 5.A through 5.ZZ) regarding the future of the performance-based approach document.

4.1.L Comment Summary – Although not explicitly stated, it appears implementation of the performance-based approach will only be performed by Ecology's TMDL generation team, and therefore only waterbodies listed as impaired will be assessed for natural conditions criteria. Please clarify if this is the case.

- Washington Forest Protection Association

Response to 4.1.L

We have clarified in the rule documents that the performance-based approach is an option to develop site-specific criteria based on the natural conditions of a water, and that development of water quality criteria is done by the Department of Ecology. Due to the complexity and workload, generally use of the performance-based approach will be done as part of our TMDL cleanup plan; however, nothing precludes use for other separate Clean Water Act actions, such as development of Advanced Restoration Plans.

Thus, generally, waterbodies listed as impaired will be assessed for the need for natural conditions criteria as part of the TMDL development process; however, again, nothing precludes Ecology from developing natural conditions criteria for any water of the state regardless of its water quality assessment categorization.

4.1.M Comment Summary –We presume waterbodies will be prioritized for analysis either through the water quality assessment process or through the triennial review; please clarify.

- Washington Forest Protection Association

Response to 4.1.M

Ecology prioritizes Category 5 assessment units for TMDL development. Every year, Ecology holds a prioritization webinar to share with the public what TMDLs we plan to start in the next 1-2 years and receive feedback from the public. Ecology includes a priority ranking for TMDL development (in accordance with 33 U.S.C. 1313(d)(1)(A) and 40 CFR 130.7(b)(4)) as part of our Water Quality Assessment. For further details, please see our Water Quality Assessment Policy 1-11[12], including Section 1H. Prioritizing TMDLs.

During the triennial review, we welcome all comments regarding our current water quality standards as well as future criteria that could be developed by Ecology. This would include requests from the public to consider alternative criteria (such as natural conditions criteria) for waterbodies.

[12] https://ecology.wa.gov/water-shorelines/water-quality/water-improvement/assessment-of-state-waters-303d/assessment-policy-1-11

4.2.Use of the Performance-Based Approach

4.2.A Comment Summary – Please consider that when issuing NPDES permits, that while the permit is not the permit that authorizes the activities after construction, there may be instances where the general permit does not adequately assure that water quality WILL or even can be protected. In those cases Ecology must consider the narrative criteria of WAC 173- 201A-260 when it determines permit limits and conditions. Ecology must consider AKART.

Since wildlife habitat is a beneficial use and the general permit rarely protects wildlife habitat, Ecology could adopt the federal NPDES Construction General Permit for Threatened and Endangered Species. On this page https://www.epa.gov/npdes/construction-general-permit-threatened-and-endangered-species the EPA protocols for assessing in evaluating potential effects is described. I realize that According to the 'Frequent Questions on EPA's construction General Permit,' States are not required to use the requirements in EPA's General Construction Permit (which includes the above appendix and assessment of ESA species) but States must comply with the objectives of the Clean Water Act which is to maintain the biological integrity of the Nations waters.

- Blessing, Bonnie

Response to 4.2.A

We appreciate the comment and agree that we must comply with the objectives of the Clean Water Act, which includes maintaining biological integrity of our waters.

Our policies and process for issuing NPDES permits are outside the scope of this rulemaking, which focuses on natural conditions provisions and implementation of those newly adopted criteria. That said, our Construction Stormwater General Permit (CSGP) requires compliance with all water quality criteria (including protecting designated uses and narrative criteria in WAC 173-201A), as well as all known, available, and reasonable methods of prevention, control, and treatment (AKART). In addition, construction projects in Washington must complete SEPA[13] review, which requires assessment of possible impacts on aquatic organisms, including threatened and endangered species

4.2.B Comment Summary – Additionally, it is not clear what mitigation efforts, such as restoring riparian buffers in these site-specific areas, will be required.

- Confederated Tribes and Bands of the Yakama Nation

Response to 4.2.B

Development of natural conditions criteria is just the first step in cleaning and restoring our state's waters. It's an important first step, as it identifies protective aquatic life criteria values that account for unique features of a site. Once such a value has been calculated and is available for use in Clean Water Act actions (via the performance-based approach or site-

[13] https://ecology.wa.gov/regulations-permits/sepa/environmental-review

specific rulemaking), then our clean up plan (TMDLs or Advanced Restoration Plans) development can identify appropriate mitigation efforts that will ensure waters can meet these applicable criteria for the site. This might include restoration of riparian buffers.

Additional information about our process for improving waters can be found on Ecology's TMDL website.[14]

4.2.C Comment Summary – Correspondingly, the District requests that Ecology provide more details on how it would utilize the approach for specific receiving waters like the Spokane River which exceeds temperature standards due, at least in part, to natural conditions. Information provided in the proposed rulemaking and at the hearings does not include those implementation specifics particularly related to timing and prioritization.

- Liberty Lake Sewer and Water District No. 1

Response to 4.2.C

This rulemaking is focused on updating the state's water quality standards to allow for site-specific criteria development of aquatic life criteria based on the natural conditions of a site. Once these criteria are reviewed and approved by EPA for Clean Water Act actions, it is anticipated that these updates will be used when the need is identified during our clean up plan development. Ecology's Water Quality Assessment Policy 1-11[15] provides further information on how we prioritize TMDL development.

4.2.D Comment Summary – Page 16 Natural Conditions General Provision. If Ecology intends to develop PBA-based criteria during the TMDL process, as described in Ecology's rulemaking presentations and in other documents, it is unclear when that would be triggered unless the state had first listed those waters as impaired pursuant to the biologically based numeric criteria. The EPA recommends revising the following statement since it appears contrary to the intended approach, "Therefore, determination of the natural conditions criteria that constitute the water quality criteria must be done before deciding whether to place waterbody segments into impaired categories when the nonattainment of a standard is only due to natural conditions, and not as result of human-caused pollution."

401 Certifications. Similar to the comment above, the EPA recommends clarifying when/what is applicable under this implementation scenario to reflect the state's intended approach.

- Environmental Protection Agency

Response to 4.2.D

We appreciate the comment and have updated this section to better reflect our intended approach.

---

[14] https://ecology.wa.gov/water-shorelines/water-quality/water-improvement/total-maximum-daily-load-process
[15] https://ecology.wa.gov/water-shorelines/water-quality/water-improvement/assessment-of-state-waters-303d/assessment-policy-1-11

4.2.E Comment Summary – Ecology indicated in the June 27 and July 2, 2024 hearings that it anticipates looking at natural conditions issues in the context of developing Total Maximum Daily Loads (TMDLs) for receiving waters. However, it is not clear if that assessment is obligatory as part of the TMDL, and the timing of the natural conditions characterization is unclear. If dischargers to a receiving water need expeditious assessment of the applicable aquatic life criterion (such as for temperature), e.g., to better inform the development of permit conditions, how does Ecology anticipate prioritizing what appears to be a complex, time-consuming process and assessment?

- Liberty Lake Sewer and Water District No. 1

Response to 4.2.E

We develop the CWA 303(d) list as part of our water quality assessment, and that list is prioritized for TMDL development. Our TMDL website[16] discusses our process for developing TMDLs, and our Water Quality Assessment Policy 1-11[17] discusses how we prioritize waters for TMDL and clean up plan development. We encourage feedback from dischargers and others during our TMDL prioritization webinars on prioritizing waters that may require natural conditions work.

4.2.F Comment Summary – Washington's past TMDLs demonstrate that the purported natural temperatures derived pursuant to its now-disapproved NCC based on models and the use of those models that Ecology fully intends to continue using, are not reliable for determining natural temperatures.

- Northwest Environmental Advocates

Response to 4.2.F

We disagree with the assertion that the models used in past TMDLs are not reliable for determine natural or reference temperature of waters.

We also note that past TMDL work does not necessarily reflect the requirements for determining natural conditions in the performance-based approach, as the proposed approach details requirements on accounting for and removing all sources of anthropogenic impact, including extra-jurisdictional and climate change.

4.2.G Comment Summary – Washington TMDLs Demonstrate Ecology Does Not Make Superseding NCC Targets Sufficiently Clear to be Considered Criteria. In other Washington TMDLs, Ecology uses the NCC to derive purportedly natural temperatures but is vague about what the resulting target is. The Palouse TMDL is an example. Making the point discussed immediately above, Ecology stated that "tributaries were modeled only as inputs into the mainstem Palouse River, with a specified flow and temperature. Separate temperature models

[16] https://ecology.wa.gov/water-shorelines/water-quality/water-improvement/total-maximum-daily-load-process
[17] https://ecology.wa.gov/water-shorelines/water-quality/water-improvement/assessment-of-state-waters-303d/assessment-policy-1-11

were not created for tributaries, and system potential temperatures were not estimated. However, it is expected that larger temperature reductions are possible in the tributaries than in the Palouse River with the implementation of system potential riparian vegetation." Id. at 44. Next, it did not provide superseding criteria but, rather, a wide range of possible temperatures that the TMDL was aiming to achieve. See id. at 41.

- Northwest Environmental Advocates

Response to 4.2.G

In the proposed performance-based approach, numeric criteria development must follow all steps of the binding process. These developed values must contain the three components to be considered criteria: magnitude, duration, and frequency.

That said, based on site-specific conditions, there may be multiple final criteria for a site. For instance, dissolved oxygen criteria in an eelgrass bed might necessitate higher D.O. criteria during the day and lower D.O. criteria during the night to reflect the natural diel cycle in these ecosystems. In that regard, there may be a possible "range" of values for a single site; however, the determined criteria must be specific based on the applicable location and have all three components noted above to be used for Clean Water Act actions, such as TMDL development or the water quality assessment.

4.2.H Comment Summary – Another type of unclear use of the NCC was in some TMDLs developed by Ecology and approved by EPA that specifically stated the results of modeling were being used by the TMDL under the NCC but did not constitute changes to the applicable criteria. For example, the Deschutes River TMDL stated that

When a water body does not meet its assigned criteria due to natural climatic or landscape attributes, the standards state that the natural conditions constitute the water quality criteria (WAC 173-201A-260 (1)(a)). This provision of the water quality standards is implemented by using the modeled natural condition as the TMDL target. Only after the allocations in this TMDL are fully implemented, or designated uses of the water body are being met will Ecology consider a formal rule change to adopt site-specific criteria, as provided by WAC 173-201A-430. At that point the natural condition, determined by empirical and modeled data, will be used to set new water quality criteria through a public rule-making process.

Under this approach, the NCC overrides the numeric criteria but puts nothing in its place, similar to what Ecology's proposed new NCC would appear to do.

- Northwest Environmental Advocates

Response to 4.2.H

We have made edits to both the rule language and associated rule documents to clarify the process of natural conditions criteria.

Specifically, these are site-specific criteria processes, either using the performance-based approach at WAC 173-201A-470 or site-specific rulemaking at WAC 173-201A-430, that

Ecology uses to determine protective aquatic life numeric criteria based on the natural conditions of a waterbody. Once these criteria are applicable for Clean Water Act activities, they would become the criteria for the site, rather than the previously applicable biologically-based numeric criteria.

The approaches taken and statements made in past EPA-approved TMDLs were reflective of Ecology's policy and Washington's water quality standards at that time, and may not be applicable under these revised natural condition rules.

4.2.I Comment Summary – Although not mentioned in this document, is Ecology considering longer term TMDL compliance schedules related to waterbodies that will be largely dependent on reestablishment of riparian vegetation to cool instream temperatures? It seems that this would be a necessity to make this approach work. Either way, this doesn't seem well thought out or provide realistic solutions.

- Washington Association of Sewer & Water Districts

Response to 4.2.I

Any developed compliance schedule for permits and orders issued by Ecology to meet requirements in a TMDL will follow WAC 173-201A-510(4): General allowance for compliance schedules.

Re-establishment of riparian vegetation to cool instream temperatures may be a component of future TMDLs for a site necessary to meet applicable water quality standards, and determination would be done on a site-by-site basis.

4.2.J Comment Summary – Natural conditions modeling presumably adds workload to the TMDL process, how will Ecology avoid additional delays in TMDL generation given the additional modeling burden?

- Washington Forest Protection Association

Response to 4.2.J

While we cannot predict fully how workload and departmental resources may change in the future, you are correct that modeling natural conditions under the very specific performance-based approach no matter the size of the waterbody could add additional tasks compared to implementations of our prior rule. The non-performance-based site-specific criteria approach will also add further costs, and federal approval may take considerable time.

4.3.Salish Sea / Puget Sound, including Salish Sea Model

4.3.A Comment Summary – The Salish Sea Model shows that in many cases, the lower DO values, with the greatest impacts from human causes, are found in shallow inlets. These inlets may have slower tidal exchanges and may also have eelgrass beds. Peer review of the Salish Sea Model has shown that it is not very reliable in shallow water inlets such as Carr Inlet.

- Loehr, Lincoln

4.3.B Comment Summary – The "Salish Sea Model Evaluation and Proposed Actions to Improve Confidence in Model Application" memorandum by University of Washington Puget Sound Institute (PSI) includes a general discussion of continued Salish Sea Model (SSM) improvements, as well as better communications with the public, stakeholders, and decision makers to gain broader acceptance of the Salish Sea Model. The following comments are focused on dissolved oxygen in context of the current Department of Ecology Natural Conditions rulemaking.

A key focus of the PSI report was on model skill assessment in the shallow areas and at specific stations in Puget Sound. Most of the model statistics reported are domain/basin wide and consequently tend to be better as the +/- statistics average out across the entire Sound. Figure 1 presents root mean square error (RMSE) values from the report and plots them in comparison to the entire waterbody wide average. The horizontal line (orange) in the graph is the domain wide average RMSE. It is apparent from the figure that in some areas, the RMSE performance is similar to the overall average RMSE, but in other areas it is not. The RMSE is higher than the average in a number of the inlets to Puget Sound. The Memorandum discusses the accuracy of the model-model calculations for the reference condition representing natural conditions versus the existing conditions, or the load reduction scenario SSM runs. One reference argued that the model accuracy between the 2 runs could cancel each other out and, therefore, the delta results are accurate. The Memorandum cautions that this is only one approach to the assessment and the topic should be explored further.

The Memorandum also addresses the sediment flux model and calculation of sediment oxygen demand (SOD) and nutrient fluxes. The SSM seems to calculate lower SOD than observed data. Further, the model calculation of gross primary production was also less than observed. There are some issues with the data and model years that don't overlap.

- City of Tacoma

Response to 4.3.A and 4.3.B

We appreciate the comments regarding the Salish Sea Model and its performance, including in shallow water inlets, and we have passed along your concerns to our modeling team for evaluation and consideration.

4.3.C Comment Summary – When is the agency planning to set the spatial boundaries and natural conditions in the Puget Sound?

- Association of Washington Cities

Response to 4.3.C

We appreciate your comment regarding the future of natural conditions in Puget Sound. Defining spatial boundaries would be a part of natural conditions criteria development. We are unable to provide an exact timeline of when natural conditions criteria will be available

for use in Clean Water Act actions. The Clean Water Act requires us, following adoption and certification of this rule, to submit our rule updates to EPA for review and approval. EPA also has requirements to evaluate for impacts to endangered and critical species and habitats, which many include consultation with the Biological Services assigned to review the rule.

This review and approval process can be lengthy (years), and thus would delay use of these updated rules. Only once we receive approval for Clean Water Act use from EPA could we then move forward with using this adopted rule.

4.3.D Comment Summary – Given the performance level-approach, at what water body level will the agency set the natural conditions (i.e Salish Sea, basin, inlet, region, etc.)? On what basis will this be decided on and through what process?

- Association of Washington Cities

Response to 4.3.D

Depending on how we finalize the performance-based approach document, we could determine natural conditions criteria at any of those scales. (For the Salish Sea, we would not compute a single natural conditions criterion value for the whole water body, basin, or inlet.) The water body level used will vary on a site-by-site basis depending on the impairment determination and characteristics influencing that impaired water body. The scale could also be proportional with the grid scale of the model used to develop the criteria. The level used may also depend on data availability and the spatial resolution of the models used.

4.3.E Comment Summary – A question that may require further research into Ecology's Bounding Scenarios Report and examination of the SSM is whether the Natural Conditions scenario used in the SSM model is consistent with what Ecology is now proposing in the Natural Conditions rulemaking for a performance-based standard. The Memorandum reports the Reference Condition Scenario as making changes to wastewater treatment plants and rivers. It has been understood that the municipal WWTP point source nutrient discharges to Puget Sound were removed from the Reference Condition in the SSM. However, the Memorandum notes that nutrients from Canadian sources and industrial treatment plants that not included in the Puget Sound Nutrient General Permit (PSNGP) are kept the same in the Reference Condition Scenario (see Figure 2 for insert from Memorandum below). This is inconsistent with Ecology's proposed performance based Natural Conditions standards. It appears that to be consistent with Ecology's proposed performance based Natural Conditions standards, the SSM Reference Condition Scenario would need to be revised to remove both Canadian nutrient sources and industrial treatment plant discharges.

- City of Tacoma

Response to 4.3.E

We appreciate your comment regarding the Salish Sea Model. If the Salish Sea Model is used in a performance-based approach, we agree there may need to be additional tasks to meet the requirements of the performance-based approach to remove Canadian sources of anthropogenic impact to calculate the natural conditions of a site.

The work we have done to date to develop the Reference Condition Scenario would still, however, be relevant. The Reference Condition Scenario allows us to isolate the impact of local/regional anthropogenic nutrient sources from Washington state watersheds and marine point sources, enabling us to determine how much of the anthropogenic sources that fall within our states' jurisdiction need to be reduced to reduce DO noncompliance. In other words, we would have: 1) a 'Reference Condition Scenario' that removes local/regional anthropogenic sources; and 2) a 'natural condition scenario' that removes all other known anthropogenic sources and impacts, including impacts from climate change, in order to establish the natural condition criteria.

Any additional actions may be done on a site-by-site basis, and Ecology will evaluate if any larger revisions are needed to the Salish Sea Model for continued use to meet updated water quality standards.

4.4.Public Review of Performance-Based Approach Document

4.4.A Comment Summary – A top-level issue for King County is concern regarding Ecology's proposed public notice and comment process. Specifically, we recommend that the performance-based approach include a clear, easy to use public notice and comment process for developing natural conditions criteria. We are concerned that the absence of a clear public notice and comment process makes the subsequent permitting decisions applying natural conditions the only opportunity for raising scientific or technical concerns. Providing a pre-permit opportunity for public notice and comment on natural conditions determinations would help all parties best address scientific issues earlier and more effectively.

Establishing an effective public notice and comment process is especially important for the Puget Sound dissolved oxygen water quality issue. According to the Puget Sound Nutrient Reduction Project website, we understand that Ecology intends to undertake regulatory action for nitrogen by creating a Nutrient Reduction Plan, as an alternative to the more traditional total maximum daily load (TMDL) process, which has structured public notice and opportunities for input on science. We recommend that the performance-based approach be modified to reflect the public review steps in the TMDL process by providing opportunities for early notice and comment. Doing so will promote dialogue and collaboration across interested parties, reduce unnecessary and costly appeals, and improve environmental outcomes.

- King County Department of Natural Resources and Parks

4.4.B Comment Summary – With this effort done entirely within Ecology, it lacks important outside peer review. It should have had a robust public process as is typically done with other standards-related rulemaking, particularly those dependent on modeling. Ecology has made great effort to vet the Salish Sea Model, and should expend similar effort to show how this watershed modeling will work before this rule is adopted.

- Washington Association of Sewer & Water Districts

4.4.C Comment Summary – The guidance document does not have adequate opportunity for public comment or an independent peer review that would allow for a transparent process before

Ecology finalizes and moves forward with CWA actions. Please explain why public input is not more in depth for this process.

- City of Tacoma

Response to 4.4.A, 4.4.B, and 4.4.C

This rulemaking process serves as the opportunity for public comment and review on the process to develop natural conditions criteria using the performance-based approach, and Ecology has read and considered all comments made during this time.

Regarding use of the performance-based approach and opportunities for future involvement and comment, Ecology notes that when developing site-specific criteria for a waterbody based on natural conditions, for some parameters Ecology will have two options available: site-specific criteria rulemaking or the performance-based approach. We have updated WAC 173-201A-260(1)(a) regarding how natural conditions criteria will be developed.

Natural conditions that are developed following WAC 173-201A-430 (site-specific rulemaking) must follow the procedures listed there, which includes formal rulemaking subject to APA requirements.

Natural conditions site-specific criteria developed following WAC 173-201A-470 do not have separate rulemakings, as this natural conditions rulemaking process serves to meet the APA and rulemaking requirements. EPA notes that approval of a performance-based approach process serves as approval of the outcomes as well (i.e., the criteria values).

We plan to generally use this approach when developing water clean up plans (e.g., Advanced Restoration Plans, TMDLs). TMDLs have a public review process and EPA review, both which provide opportunity to review and comment on any natural conditions determinations made using the performance-based approach. EPA also reviews (but does not take approval action on) ARPs. Likewise, if the performance-based approach is used for water quality assessment purposes, that will also involve public participation and EPA oversight. Again, in those cases, the public and EPA would have opportunity to review and comment on any natural conditions determinations made using the performance-based approach.

We also want to clarify (and have also made these clarifications in our final Implementation Plan document for this rulemaking) that use of the performance-based approach must still be tied to some form of public process. We are fully committed to holding a public review period whenever we use the performance-based approach to develop natural conditions criteria. For example, we may choose to develop natural conditions criteria following the performance-based approach to set criteria for a site during the process of creating a TMDL. When we go out to the public with our draft TMDL for comment and feedback, all the required performance-based approach documentation and criteria values would be included alongside the customary TMDL documentation, and we would accept comment and feedback on the use of the performance-based approach at that time. Regardless of how or when we use the performance-based approach, we have clarified that the public will have opportunity to comment on the developed criteria values.

In our implementation plan, we have also clarified that we intend to inform the public when such performance-based criteria have been developed and are in effect for federal Clean Water Act actions.

We welcome comment during these review periods on the use and application of models to develop natural conditions criteria, and Ecology may choose to have additional opportunities for public involvement and review on a site-by-site basis.

4.4.D Comment Summary – The performance-based approach methodology document states water quality criteria are applicable to the waterbody "upon derivation." This starting point is unclear and subjective to Ecology. The public should be notified when natural conditions criteria are being considered and provided opportunity to review/comment. Additionally, natural conditions criteria, when adopted, should be easily obtainable by the public.

- Washington Forst Protection Association

Response to 4.4.D

We appreciate the comment. While water quality criteria developed using the performance-based approach are usable for Clean Water Act actions upon derivation, Ecology has clarified in the rule documents that use of criteria developed using the performance-based approach must undergo some form of public process and/or EPA review prior to use (during public review of TMDL, EPA review of our Water Quality Assessment, etc.). This will allow the public opportunity to see and comment on calculated water quality criteria based on natural conditions prior to use.

In addition, the rule documents have been updated to reflect that Ecology will publish on its website criteria developed using the performance-based approach that are applicable for those waters.

5. Comments on the Performance-Based Approach Document

We received many comments on the performance-based approach document, which we have included below. We have responded to most of the comments in a single response near the end of this section (see Response 5.A through 5.ZZ).

5.A Comment Summary – In the EPA guidance from 2015, EPA describes that there maybe inconsistencies between water quality and biological assessment results. For example, assessment of certain water quality criteria (e.g. pH) for any given water body may suggest impairment while other applicable indicators (biological assessment) suggest some uses are being met. So then a state may adopt Site Specific Conditions (SSC) to protect sites specific water quality criteria. When a state does this, the criteria must protect the use. In WA state uses include miscellaneous uses of wildlife habitat and aesthetics, as measured by pollutants and esthetics. The selection criteria are described on page 9 of this document. To determine whether low water quality is 'natural' one must assess whether a) upstream areas are surrounded by undisturbed vegetation and natural buffers, b) whether current land use do not indicate anthropogenic land use, c) whether there is significant groundwater withdrawal in the area, d) whether point source discharges are upstream, e) whether the area has high biological integrity

based on state or region wide data. Can you ensure these items are in the Dept of Ecology protocol? If Ecology added item a or item e that would further protect wildlife habitat. Add presence of salmon, peat bogs and oregon spotted frogs to biological measures.

- Blessing, Bonnie

5.B Comment Summary – The subject is complex and the complexity becomes evident in the levels of detail the procedure requires. The definition of "Performance-based approach" emphasizes that it must ensure predictable and repeatable outcomes. I found the described process to be confusing and complex and I have doubts that predictable and repeatable outcomes are possible.

Ecology should test the repeatability of the process by having two different groups take on an identical task, say figuring out the natural conditions for marine DO in Carr Inlet. Leave it to each group to get their hands on relevant data and do the modeling and see what they come up with. Do not let the two groups talk to each other until they are both done. If the procedures are indeed predictable and repeatable, then they should come up with the identical result.

- Loehr, Lincoln

5.C Comment Summary – The performance-based approach for the natural conditions provision in WAC 173-201A seems appropriate and sufficiently robust to encourage accurate modeling and criteria derivation. The model development requirements listed in the publication 24-10-017, A Performance-Based Approach for Developing Site-Specific Natural Conditions Criteria for Aquatic Life in Washington provide replicable and scientifically defensible parameters to determine natural conditions before human activities.

- Jamestown S'Klallam Tribe

5.D Comment Summary – Unclear whether process-based approach is the same or different from performance-based approach. Please define process-based approach and distinguish from performance-based approach.

- King County Department of Natural Resources and Parks

5.E Comment Summary – A Performance-Based Approach for Developing Site-Specific Natural Conditions Criteria for Aquatic Life in Washington, Publication 24-10-017, adopted by reference into WAC 173-201A470 requires significant revisions to be sufficiently detailed and have suitable safeguards to ensure predictable, repeatable outcomes to be approved as a PBA since the approval of the approach serves as the approval of the outcomes as well. The PBA should specify methodologies and minimum data requirements and be binding, clear, predictable, and transparent to be consistent with 40 CFR section 131.11.

The commenter provided comments under the following categories, summarized below for brevity. The specific comments in the provided comment letter are grouped by section, following in order of the PBA, as per the steps identified in EPA's recommended reorganization.

Comments on the Performance-Based Approach Document: Public Review of Performance-Based Approach Document

Missing Steps. Critical steps in the PBA process are missing (see comment 3.b.4. below). Additionally, critical data and elements requirements are missing from the approach which are described below.

Binding Language. All steps in the approach must be binding. Several areas need revision to convey that the step is binding and required (i.e. revising "may" or "should" terminology to "must").

Consistency with Regulations. The PBA includes anthropogenic impacts into the determination of the natural condition by including reference conditions or irreversible human sources into the approach. All references to any anthropogenic impacts must be revised.

Additional Detail or Prescriptiveness. Overall, more detail is needed throughout the document to ensure a repeatable and transparent process. The following must be included for each step in the process: binding principle language, procedures for how specific steps will be executed, and sideboards, such as minimum data requirements, and spatial and temporal resolution requirements.

Reorganization. Reorganization to increase clarity and transparency of the process that will be followed to derive the site-specific criteria based on natural conditions.

Recommendations for Improvement. The EPA offers suggested revisions for areas of improvement.

- Environmental Protection Agency

5.F Comment Summary – Ecology's Proposed Performance-Based Approach Does Not Guarantee Better Outcomes Than Past TMDLs' Use of the NCC

Ecology summarizes the performance-based approach as "specify[ing] the procedures it uses to derive site-specific criteria (including methods, minimum data requirements, and decision thresholds) into its WQS regulation or other binding procedure document" because "EPA states that when 'such a performance-based approach is sufficiently detailed and has suitable safeguards to ensure predictable, repeatable outcomes, EPA approval of such an approach serves as approval of the outcomes as well[].'" TSD at 31. The two-fold problem arises here: there is nothing in this EPA description to ensure that aquatic species are protected and there is nothing in Ecology's proposal that will "ensure predictable, repeatable outcomes." This is primarily because Ecology seems to ask the question: if someone runs the same model with the same assumptions, will it have a predictable, repeatable outcome?2 But that really is not the most important issue. The issue is whether different people would make the same assumptions because, as the saying goes, "garbage in/garbage out."

- Northwest Environmental Advocates

5.G Comment Summary – Ecology very specifically takes a position that does not ensure a predictable outcome:

Ecology recognizes that unique characteristics of waterbodies may result in different, yet still firm scientifically, approaches taken to calculate natural conditions. Our proposed performance-based approach balances these items by providing project requirements (e.g., QAPP, model, elements) while also leaving details of such requirements within the projects themselves (e.g., model precision, amount of undisturbed vegetation of a stream). Every use of the performance-based approach must have a report detailing the evaluation, data usage, and criteria calculations. This report follows alongside the natural conditions criteria for subsequent use in any state or federal CWA action. This includes during public involvement, such as during draft TMDLs.

TSD at 66. Ecology's proposal is to require that there are a QAPP, a model, and "elements," but to "leav[e] details of such requirements within the projects themselves" and just to make sure that "all methods and assumptions made [are] documented." Id. at 42, 66. There are only vague references to sensitivity testing. Id. at 42, 85 (it must be conducted); Performance Guidance at 17 (same); id. at 12 (asserting merely that conservative assumptions will be used). The details are precisely the issue when one is attempting to produce an outcome that is predictable and repeatable. The example of the South Fork Nooksack TMDL is a stark example of the difference in the results that occurs when different assumptions are plugged in to a model.

- Northwest Environmental Advocates

5.H Comment Summary – Last, please explain how Ecology's providing a rationale after-the-fact of EPA's approval of the NCC, and ESA consultation, in any way constitutes a "performance-based approach" and in any way would ensure the outcome is protective of the species as required by the regulations.

- Northwest Environmental Advocates

5.I Comment Summary – To date, Ecology has developed dozens of TMDLs; however, the Clean Water Action Section 303(d) list includes thousands of water bodies. The state cannot wait for Ecology to complete all of the modeling up front and then set site-specific water quality standards, as some may propose in this rulemaking process. Some may cite the Chesapeake Bay approach, which did develop site-specific dissolved oxygen standards. However, the process took over years to complete and still did not change the regulatory requirement to reduce nutrient pollution from sewage treatment plants and agricultural operations. We urge Ecology not to fall into this trap. While it is an option that EPA has identified, Ecology should continue with the pragmatic approach outlined in the draft rule. Ecology also should not conduct rulemaking to establish individual watershed standards for temperature and/or dissolved oxygen, which would be administratively inefficient. Ecology's proposed approach appears consistent with the methodology that EPA outlined, administratively efficient, and would be least disruptive to water quality management throughout the state. Further, the approach in A Performance-Based Approach for Developing Site-Specific Natural Conditions Criteria for Aquatic Life in Washington (Ecology Publication No. 24-10-017) outlines a repeatable scientific method. Finally, the approach requires Quality Assurance Project Plans with data quality objectives and model calibration and evaluation approaches, plus established approaches for agency peer review, to ensure consistency of processes applied to different water bodies. The state cannot wait years to decades to act on dissolved oxygen and temperature, particularly in a changing climate and facing extraordinary population increases with associated development. We support

the balanced approach Ecology proposes in A Performance-Based Approach for Developing Site-Specific Natural Conditions Criteria for Aquatic Life in Washington (Ecology Publication No. 24-10-017). The performance-based methodology is an expedient approach to natural conditions determinations.

- Washington Conservation Action

5.J Comment Summary – Ecology fails to provide assurance that the resulting replacement criteria will reflect natural temperatures and dissolved oxygen levels. Ecology's use of models to determine natural temperatures relies heavily on making assumptions. Instead of showing how those assumptions will ensure that the modeling results achieve the most likely natural temperatures and dissolved oxygen levels, Ecology specifically states that it will determine its plan of action later, and figure out the details through future Quality Assurance Project Plans (QAPPs). Making these decisions down the road does not meet the definition of a performance-based approach that will "ensure predictable, repeatable outcomes." Ecology cites its history of developing TMDLs using its old NCC, but those TMDLs do not eliminate all human inputs. In this rulemaking, Ecology fails to explain how it will fix that problem and ensure that it removes all human inputs before it produces automatically overriding criteria. Ecology says almost nothing about how it will ensure that upstream water inputs will not include human impacts when it makes assumptions integrated into the TMDL models. Finally, although Ecology purports to address data gaps, it says nothing substantive about how it will address this key issue before EPA approves the new provision. In light of these glaring omissions, Ecology must explain, now, how it will make assumptions, address data gaps, and not rely on QAPPs prepared later to provide assurances that its modeling exercise will achieve natural temperatures and dissolved oxygen levels. This specifically includes how Ecology will ensure that upstream water inputs do not include human impacts.

- Alliance for Community Engagement SW WA
- Columbia Riverkeeper
- Deschutes Estuary Restoration Team
- Friends of Black Diamond
- North Cascades Audubon Society
- Northwest Environmental Defense Center
- Orca Conservancy
- Orca Network
- Rainier Audubon Society
- RE Sources
- Snake River Waterkeeper
- Spokane Riverkeeper
- Trout Unlimited – Washington Council Trout Unlimited
- Washington Chapter Sierra Club

5.K Comment Summary – Pg 18. The process in determining if human factors within the project area appear to be as follows:

1. Construct model using calibration data,

2. Validate model performance using an independent data set/ describe sensitivity of the model,

3. Identify human impacts and pollutants that might cause changes to water quality (temperature, pH, DO),

4. Predict outcome of water quality conditions with impact sources in place,

5. Systematically remove impacts sources to determine if: a) water quality conditions change (= not a natural condition), b) water quality conditions remain the same (= may be a natural condition).

The order and combination of impact source removal and/or reinstatement for testing is not clear. We recommend disclosing a set of rules establishing the order and combination for which impact sources are removed and/or added back into each model to test for no change.

- Snohomish County

5.L Comment Summary – Ecology's performance-based approach is overly complex and based on an entirely hypothetical natural condition that depends upon the assumptions made about pre-anthropogenic conditions, which cannot be known, measured, or verified.

Developing pre-anthropogenic conditions as part of setting natural conditions criteria is unlikely to meet Ecology's objectives that the process should result in predictable and repeatable criteria. This is because developing pre-anthropogenic conditions will require many assumptions in estimating load reductions from land-based sources (including groundwater and river/tributary inputs), atmospheric deposition, and ocean boundary conditions. In addition, human-induced structural changes will need to be estimated to remove impacts associated with shoreline hardening, dredging activities, and river control structures such as dams and diversions. Most likely a model (e.g., watershed, such as the Salish Sea Model) will need to be used to estimate the natural conditions criteria associated with the pre-anthropogenic conditions, which will have its own set of application assumptions.

EPA acknowledges that the performance-based approach that Ecology is proposing has limited application in other States, so an established precedent that the process is predictable and repeatable is also limited and may not exist. This suggests that Ecology's novel application of the performance-based approach may result in unpredictable outcomes when applied to Washington waters. It is unlikely that Ecology's performance-based approach meets Ecology's own stated goal in the proposed rulemaking to "Increase clarity and transparency on the process we use to determine natural conditions in surface waters" given the complexity of the process and challenges in characterizing and accounting for pre-anthropogenic conditions predating European settlement, agricultural development, climate change, etc. The assumptions made to conduct the natural conditions analysis are likely to vary depending upon the individuals or institutions conducting the analysis and their opinions.

The proposed process is complex and has many areas that are open to interpretation where more detail would provide a clearer understanding of the steps Ecology would take with this method.

- City of Tacoma

5.M Comment Summary – The guidance is generic and not does not contain detailed requirements specific to different waterbody types.

- City of Tacoma

5.N Comment Summary – The performance-based approach methodology is somewhat ambiguous as currently written. Ecology should include details within the performance-based approach methodology describing specifically how the method will be implemented. For example, the minimum model duration, the minimum quantity of data needed to establish an impairment is due in part to natural conditions, and recommended modeling software to implement the methodology.

- Washington Forest Protection Association

5.O Comment Summary – EPA acknowledges that the performance-based approach that Ecology is proposing has limited application in other States, so an established precedent that the process is predictable and repeatable is also limited and may not exist. This suggests that Ecology's novel application of the performance-based approach may result in unpredictable outcomes when applied to Washington waters. It is unlikely that Ecology's performance-based approach meets Ecology's own stated goal in the proposed rulemaking to "Increase clarity and transparency on the process we use to determine natural conditions in surface waters" given the complexity of the process and challenges in characterizing and accounting for pre-anthropogenic conditions predating European settlement, agricultural development, climate change, etc. The assumptions made to conduct the natural conditions analysis are likely to vary depending upon the individuals or institutions conducting the analysis and their opinions.

- City of Everett

5.P Comment Summary – "Capture the impacts to all designed uses, including the most sensitive designated use, and provide rationale for this determination in the project QAPP or final report." This should be changed to the most sensitive species to align with the EPA guidance.

- City of Tacoma

5.Q Comment Summary – Another approach to setting a natural condition criteria below which the human allowance would be applied, is to look at all the modeled natural condition DO concentrations for a site, and sort it from lowest to highest. Then pick the lowest 1 percentile, or lowest 5 percentile as the criteria, and when evaluating such waters, assure that it is not exceeded more than 1 or 5 percent of the time.

- Loehr, Lincoln

5.R Comment Summary – "Natural conditions criteria cannot be developed for areas where reliable estimates of the natural conditions cannot be produced." See comment on "Salish Sea Model Evaluation and Proposed Actions to Improve Confidence in Model Application in Context of Current Natural Conditions Rulemaking".

- City of Tacoma

5.S Comment Summary – The section on Types of Data states that "Data sourced for water quality and site characterization is not limited to numeric datasets." Please explain how the commitments to credible data are being applied to Site Characterization and Non-numeric data sets?

"If combining data across multiple time frames to estimate natural conditions, the methodology used in combining data sets must be documented and will be appropriately conservative to capture the range of conditions that protect existing and designated uses across the scales of aggregation." Please define "appropriately conservative" sufficient to allow similar or identical conclusions to be independently replicated by others.

- King County Department of Natural Resources and Parks

5.T Comment Summary – Data Gaps and Conservative Assumptions

Ecology's discussion of "data gaps" is ludicrous. The guidance notes they "may be present." Performance Guidance at 12. The sum total of the explication of how to address such data gaps—a significant issue in replicability—is as follows:

Any data gaps in the data compilation should be identified. If data gaps are filled (such as through estimation), or any data are estimated for the project, the process for doing so must be described in the project QAPP and final report, and its use must be supported with best professional and scientific judgement.

Id. at 15. This describes a process by which staff will make estimates and describe them later. It in no way explains how this process of making estimates will ensure that the outcome of "estimates," also known as assumptions, will result in a replicable outcome. The output of a model is based on the assumptions that are put into it. Therefore, a description of how one is going to make those assumptions that merely says that the work will be done later is not a description of a performance-based approach. It is a description of how Ecology has worked under the previously now disapproved NCC. Likewise, the observation that "[c]onservative assumptions reflective of natural conditions will be made based upon sensitivity (range) testing" is too vague to ensure replicable results. Id. at 12.

- Northwest Environmental Advocates

5.U Comment Summary – Pg. 67. of the technical support doc allows for use of data from "other state or federal water quality data portals or published data from reputable research journals - many data portals do not define the level of data review/QC nor provide for consistency of QC levels across platforms. It's unclear how Ecology will make determinations of credibility for data used in models? We recommend a description of how the credibility of data retrieved from various sources will be assessed for use in models.

- Snohomish County

5.V Comment Summary – Programmatic QAPP - Water Quality Impairment Studies. Publication No. 17-03-107. Ecology plans on using this document to support development of Natural Conditions Criteria. Sections 6.1 and 6.2 Data Quality and Measurement Quality Objectives. It's commendable that Ecology has established measurement quality objectives for temperature, pH, and dissolved oxygen for reference and/or use in natural conditions studies. The Process-Based Modeling Approach for natural conditions determinations acknowledges the use of historic water quality data and non-numeric datasets. It's not clear if or how Ecology will evaluate historic and non-numeric data relative to measurement quality objectives and/or consider the data credible for use where the data may not have been supported by a quality assurance project plan. We strongly recommend developing a process for determining the credibility of historic data consistent with Washington's Water Quality Data Act in RCW 90.48.585 and Water Quality Policy 1-11 Chapter 2.

- Snohomish County

5.W Comment Summary – "Any data gaps in the data compilation should be identified. If data gaps are filled (such as through estimation), or any data are estimated for the project, the process for doing so must be described in the project QAPP and final report, and its use must be supported with best professional and scientific judgement." "best professional and scientific judgement" should be replaced with the guidelines that will actually be followed. This is broad, open to interpretation, and should include an independent peer review (e.g. review by the Washington State Academy of Sciences) and public comment.

- City of Tacoma

5.X Comment Summary – The paperwork that Ecology claims will be added—"a report detailing the evaluation, data usage, and criteria calculations"—is merely paperwork and likely not much more than Ecology already includes in TMDLs now that are based on the previous now-disapproved NCC. This is all business-as-usual with Ecology suggesting that more paperwork—produced after EPA's hoped-for approval of the NCC, and after any ESA consultation—somehow makes this a performance-based approach that can be approved prior to its being used.

- Northwest Environmental Advocates

5.Y Comment Summary – Ecology should include a step to solicit an independent review of the science by the Washington State Academy of Sciences which frequently conducts this type of scientific review. Please see Gordon Holtgrieve attachments.

In addition to "documented", the development of the criteria should include a thorough and robust independent peer review as well as opportunity for public comment similar to a TMDL process. This document does not appear to have this included. Please see the attached documents from Gordon Holtgrieve, Lincoln Loehr, Michael Connor PhD. And William Stelle, on this topic. The recommendations and concerns in those comment letters should be incorporated.

"5. Model peer-review approach and/or documentation."

More information and details should be included for this. Concerns have been provided regarding over the lack of a true third-party neutral peer review of the Salish Sea Model Bounding Scenarios Report (see comments from Holtgrieve letter on this topic).

- City of Tacoma

5.Z Comment Summary – Upstream Water Inputs

Nothing in the documents provided by Ecology explains how the result of using the performance-based approach will ensure a sufficient level of protection. While the guidance referenced in the rule has lots of "elements," it does not do anything substantive to ensure predictability of outcomes. See Performance Guidance. Ecology acknowledges that upstream waters may be among those that affect the "site of interest." Ecology does not say how it will consistently decide whether it is an "is" or "is not." The guidance states that for modeling purposes, "[t]he flow and water quality information for any groundwater, tributaries, upstream inflows, and open boundary inflows must be set at estimated natural conditions of those waters based on readily available and credible information," but it fails to say anything about what is meant by "readily available and credible information," including how state law affects this definition, and how the "estimated natural conditions of those waters" will be reliable and replicable. Id. at 17. It asserts that "[a]ny impacts by humans on tributaries which influence the site of interest," "[l]oss of stream baseflow or other flow changes (e.g., stagnant conditions)," and "[d]ecreased groundwater availability due to human withdrawals, among other anthropogenic changes to groundwater, sedimentation, benthic vegetation, and residence times "must be accounted for and removed in the natural condition estimation" but it does not say how and to what extent this must be done. Id. at 19. That is, in current uses of models under the now-disapproved NCC, Ecology claimed to accomplish this outcome and yet the results were highly variable and therefore did not meet the requirements of a performance-based approach.

- Northwest Environmental Advocates

5.AA Comment Summary – Riparian Buffer Width Inputs The guidance completely ignores the matter of what riparian buffer width will be assumed in determining what the purportedly natural temperatures and dissolved oxygen levels are. The word "width" literally does not appear in the document, which is ludicrous when one considers how much riparian buffer width is the central issue fought over with regard to logging practice regulations. Other references are exceedingly vague. See id. at 12 (a description of existing riparian conditions and vegetation "may include, but is not limited to, tree canopy cover data, system shade potential, any applicable stream buffer zones[.]"). System shade potential and "applicable stream buffer zones," which sound more like a regulation than an on-the-ground measurement, are themselves inputs based on even more assumptions. Determining what constitutes the "system shade potential" is not obvious, again as already discussed. In evaluating the model riparian conditions, the guidance urges "[c]omparison of vegetation height or density to applicable reference sites" without explaining how this will be done and why it is reliable and replicable. Id. at 20. It asserts that "loss of riparian shade or other vegetation impacts along the shoreline due to human actions must be accounted for and removed in natural condition estimations," but it does not mandate how this will be done, reverting instead to the paperwork solution: "The methods used must be

documented." Id. The only detail provided is in a footnote and pertains to system potential tree height.

- Northwest Environmental Advocates

5.BB Comment Summary – Tree Height Assumption Input

In many Ecology TMDLs, the determination of what riparian width to use to approximate natural temperatures is based on tree height.

Notwithstanding Ecology's own experience, it has not addressed the problem in its guidance here. There is simply nothing definitive provided by Ecology and nothing that ensures that anthropogenic influences are entirely removed. The guidance provides a little input into how to determine the height (and nothing that ties the riparian width to heights). It suggests that reference sites can be used, "historical tree height comparisons," and use of tree diameter data. Performance Guidance at 20. It is unclear what some of these items mean, how one approach would be chosen over another, what test there will be to ensure that the maximum tree heights under historical conditions are chosen, what Ecology would do where there are no extant trees, and most of all whether it will continue to use 100-year old tree heights with the full knowledge that doing so does not remove all anthropogenic heat influences.

- Northwest Environmental Advocates

5.CC Comment Summary – Channel Morphology. Assumptions of channel morphology, along with related matters such as sedimentation that alters width:depth ratios is another area in which Ecology fails to ensure that results of a new NCC will be replicable.

How can a list that is not complete and kicks the determination of how these anthropogenic impacts will be accounted for and removed constitute a performance-based approach? There is no other discussion of making assumptions about sedimentation and no reference at all to changes in width:depth ratios of streams. There is literally one use of the word "logging" in the entire methodology on using the performance-based approach and it merely states there might be useful records from other agencies, but says nothing about how to assume that logging did not occur in a watershed in order to accurately determine a natural temperature. Id. at 15.

- Northwest Environmental Advocates

5.DD Comment Summary – Human actions must be taken into account to establish its influence on natural conditions. Neither the proposed rule or the performance-based approach document adequately define or describe human actions. Pgs. 14 and 15 of the performance based approach under types of data for site characterization lists records from relevant state or federal agencies - historic or current mining, roads, other human-constructed structures, forest logger (or other major human actions - NPDES permits within or upstream of the site. Additionally, Pgs. 20 and 21 indicates use of point and non-point source discharges. Outside of this language, there was none other found which clearly identified what human actions will be considered relevant. We recommend including a new section in the performance-based approach document which clearly identifies all potential human actions used to account for influence on natural conditions.

- Snohomish County

5.EE Comment Summary – A performance-based approach to developing site specific natural conditions criteria for aquatic life protection will allow Ecology to move ahead with this work without the need to take each site back to rulemaking, thus saving valuable time in administering TMDLs where natural conditions do not match current standards. However, the unknowns relating to how modeling will be accomplished in light of varying environmental situations seem overwhelming at this stage in the development of this approach. For instance, how will the models evaluate items like loss of refugia in-stream? Loss of tree cover over time may be available from historic photos and surveys, but instream areas that act as protection from higher temperatures and lower dissolved oxygen would probably not have historic data. We fear that there would still be an emphasis mainly on NPDES permittees' discharges because this is easy to quantify, thus potentially negating any proposed benefit of the analysis of the natural conditions criteria. Watershed modeling has never been easy. When this approach runs up against human caused limits that are within the limits of instrument accuracy, and already being overwhelmed by climate change, this approach seems like it will take a lot of time, money and resources for little, if any, benefit in the end.

- Washington Association of Sewer & Water Districts

5.FF Comment Summary – "Point source discharges." This should include depth of the discharge to accurately model the mixing zone of the outfall.

"Investigate differences in these conditions between current and unaltered habitats." What steps would take place if there are differences? How would Ecology investigate?

"Evaluate scale-appropriate inputs that influence factors such as algal photosynthesis, productivity, mixing, or stratification." How will Ecology know they are "appropriate"? What are the guidelines?

"Model how removal or reduction of a pollutant in discharged effluent would affect the water quality parameters of interest." For natural conditions, shouldn't this just be a removal? Why is a reduction included?

"These impacts from discharges (e.g., NPDES permitted discharges, wastewater, stormwater outfalls) must be accounted for and removed in natural condition estimations. Methods and process for doing so must be included in documentation and the final report." This list is very small. "not limited to" leaves this open for interpretation. The guidance should have more detail. This should also have more detail specific to the type of water body: marine, freshwater, river, lake, etc.

"Make comparisons to reference sites to estimate non-point impact." What does this mean?

"Kinetic and physical rates and ratios relate to temporal or speed attributes at which chemical, biological, or physical reactions or processes take place." Shouldn't this be required and not optional (e.g. "may be used"?)

- City of Tacoma

5.GG Comment Summary – Further, it would be inconsistent with the level of accuracy of water quality model predictions with and without anthropogenic sources when model skill assessment results exceed the selected de minimis DO decrease of 0.2 mg/L. Model skill assessment of the Salish Sea Model presented in the Journal of Geophysical Research4 and in Ecology's Model Updates and Bounding Scenarios report5 indicate overall Sound wide mean error (bias) ranging for DO from -0.7 to 1.0 mg/L and root mean square error (RMSE) ranging from 0.6 to 1.6 mg/L. These two statistics measure the difference between observed data and the model predictions with the model performance varying in the different regions of the Sound (i.e., Bellingham, Samish and Padilla Bays, Whidbey Basin, Admiralty Inlet, Main Basin, Hood Canal, South Sound). Although these model statistics results are similar to other complex marine DO modeling studies, the accuracy of the model needs to be accounted for when evaluating natural conditions DO criteria and the allowable DO decrease associated with anthropogenic sources.

- City of Everett

5.HH Comment Summary – Pg. 16. Development of a predictive water quality model is a large undertaking and includes efforts in developing a Hydrodynamic Routing Model in addition to having access to continuous temperature data at compliance points within the boundaries of the modeled area, and water quality data at these locations. Water quality data would require two sets of data, one for calibration of the model and the other to validate (via independent observations) sensitivity of the model. It's not directly stated that evaluation of sensitivity includes reservation of some data for validation. We recommend doing so.

- Snohomish County

5.II Comment Summary – "Conservative assumptions reflective of natural conditions will be made based upon sensitivity (range) testing."

"Conservative assumptions" is open for interpretation. More detail is needed to understand what "conservative" would cover. See other comments regarding an independent peer review by the Washington Academy of Sciences.

"Calibration of the model must be done using reasonable adjustments of model parameters, as defined using best professional judgement and comparison to typical parameter ranges documented in literature, peer reviewed reports, and other similar studies, to achieve a reasonable fit between model estimated and measured conditions based upon the peer review of the individual model, or by comparing to documented model fit statistics from other similar applications using the same model."

"best professional judgement" – more detail is needed. See attached previous comments from Gordon Holtgrieve.

- City of Tacoma

5.JJ Comment Summary – Ecology's proposed process to model and identify historical natural temperatures is a simplistic approach that does not adequately take into consideration the

complex and diverse habitats that historically existed prior to major alterations at the reach, watershed, and landscape scale. Historically, cold water refuge was provided through diverse complex instream habitat, groundwater upwelling, hyporheic connection, floodplain connectivity, beaver dams, and robust riparian and forested areas providing shade and large wood for cover and respite from seasonally heated waters. These habitats and cold water refuges provide critical habitat for all life history stages of salmonids and other aquatic species. Today, these types of habitats rarely exist in our watersheds and are the focus of billions of dollars in restoration efforts.

- Confederated Tribes and Bands of the Yakama Nation

5.KK Comment Summary – Consider diversity of thermal regime when establishing natural backgrounds. Maximum temperature is only one of many factors affecting aquatic health. Other aspects of a natural thermal regime include diurnal and seasonal temperature variation, the spatial extent and persistence of thermal refugia (waters >2°C colder than ambient water), and climatic patterns (PDO, ENSO, etc.). All of these factors affect the resilience of salmonids and cold-water species to changes in temperature. For example, a natural thermal regime may exhibit temperatures near the numeric criteria, but exceedances were short-lived and habitat complexity created areas of temporary thermal refugia from cold tributaries and groundwater seepage. Therefore, the impact of a higher numeric criteria would be greater in a disturbed system compared to a "natural condition". This is not to say that identification of thermal refuges is a route to weakening existing criteria, but rather that historical conditions that allowed for healthy populations of aquatic life cannot be summarized only by maximum temperature at the reach scale. As stated in the disapproval of Oregon's Natural Conditions Criteria, "the NCC was based on a flawed assumption that historically protective water temperatures would protect salmonids now" and "the NCC attempts to restore historically higher water temperatures without restoring other conditions that previously allowed salmonids to thrive," (Northwest Environmental Advocates V. U.S. EPA, et al.).

- Nooksack Indian Tribe

5.LL Comment Summary – Ecology cites the EPA 2007 biological evaluation to assert that the previous temperature "criteria are intended to restore thermal refuges to protect sensitive native salmonids" when there is no more evidence of criteria's—or any other action taken by Ecology—being used to identify the sufficiency of or call for the restoration of thermal refugia. TSD at 52. This reference only serves to highlight Ecology's complete failure to address the need for refugia, and other forms of habitat complexity such as sufficient large woody debris, in those places where natural temperatures really did exceed the numeric criteria. The word "refuge" or "refugia" shows up exactly zero (0) times in the Performance and Implementation documents that are a part of this rulemaking. The need to address the very complexity called out by the Oregon court and EPA's disapproval of the Oregon NCC was set out long ago by EPA. Nonetheless, Ecology ignores this entire issue.

- Northwest Environmental Advocates

5.MM Comment Summary – As the court found in the Oregon litigation, choosing purportedly natural temperatures is only one part of assessing whether the resulting temperature is protective

of the beneficial uses. The court, and EPA subsequently, specifically found that "the NCC attempts to restore historically higher water temperatures without restoring other conditions that previously allowed salmonids to thrive."

There are many different types of stream complexity at different geographic scales that salmonids would have relied upon to escape the higher water temperatures. But Ecology's proposal makes no attempt to assure any of them. For example, there is no reference to the role that beavers historically played in creating that thermal diversity. To explain this, we incorporate by reference NWEA's comments on Washington's 2022 draft Section 319 Nonpoint Plan in which we discussed the role of beavers and ecological site potential.

Second, Ecology has said nothing in its rule language or all the documents about the need to protect and restore thermal and other complexity that would have made natural temperatures supportive of aquatic species in the past. Therefore, it has no way of judging whether the NCC-derived criteria would be protective at purely hotter and colder temperatures or only hotter temperatures.

- Northwest Environmental Advocates

5.NN Comment Summary – Ecology fails to include historically higher water temperatures associated with significant habitat complexity in its proposed NCC. Ecology proposes to take a simplistic look at what historically natural temperatures were in Washington's waters. While natural temperatures may have exceeded the protective temperatures now established in the state's numeric criteria, those naturally high temperatures were also accompanied by significant habitat complexity—cold water refugia large and small, side channels, hyporheic flows, beaver dams, large woody debris, etc. None of these mitigating elements are mentioned by Ecology in its proposal, despite the fact that it sets no limit on how high supposedly "natural" temperatures could be. 1 We urge Ecology to revise its proposal by acknowledging the habitat complexity of Washington's historic natural temperatures because historically high temperatures were not present without other conditions that mitigated their effect on cold-water species such as salmon. We further urge Ecology to only apply NCC when there is a demonstrable showing of complex mitigating habitat.

- Alliance for Community Engagement SW WA
- Columbia Riverkeeper
- Deschutes Estuary Restoration Team
- Friends of Black Diamond
- North Cascades Audubon Society
- Northwest Environmental Defense Center
- Orca Conservancy
- Orca Network
- Rainier Audubon Society
- RE Sources
- Snake River Waterkeeper
- Spokane Riverkeeper
- Trout Unlimited – Washington Council Trout Unlimited
- Washington Chapter Sierra Club

5.OO Comment Summary – Uncertainty in modeling. Modeling by its very nature includes uncertainty. Due to various factors, including loss of traditional ecological knowledge as a direct

result of colonialism, western science's understanding of historical conditions is often based on anecdotal information and inferred from data not collected for the purpose of environmental study. This can lead to a mischaracterization of historic conditions and result in an interpretation that is full of uncertainties. Without a complete understanding of historical habitat conditions, it becomes difficult to estimate historical water temperatures upon which the Natural Conditions Criteria depend. Instead, models rely on a set of assumptions, all of which impart uncertainty, and can require extensive site-specific data for extrapolation. Each change in the assumptions made to the model input affects the model outputs and thus the characterization of "natural conditions".

- Nooksack Indian Tribe

5.PP Comment Summary – Additionally, accounting for the effects of forestry practices on downstream temperatures is increasingly vital as more research emerges documenting reductions in watershed flows due to upstream timber harvest (e.g., Perry & Jones Summer streamflow deficits from regenerating Douglas-fir forest in the Pacific Northwest, USA, Ecohydrology 1-13 (2016); Dickerson-Lange, et al., Modeling the effects of forest management on August Streamflow: South Fork Nooksack River Pilot Research Study (2022)). Furthermore, agricultural impacts of historical clearing and grading of valley floors along with straightening and diking of streams has had a profound effect on the hydrological regimes of our rivers. Shallow, aggraded systems, such as seen in the South Fork and Mainstem Nooksack River, are far from "natural". However, there is no explanation in Ecology's documentation for how legacy and current land use in the upper watershed impacts downstream temperatures. We are very concerned that failure to account for upstream and adjacent floodplain land use impacts in temperature modeling will lead to temperature regimes being characterized as natural conditions, when in fact elevated temperatures reflect degraded watershed conditions.

- Nooksack Indian Tribe

5.QQ Comment Summary – Water Quality Policy 1-11 Chapter 2 (Ecology publication 21-10-032) is referenced with regard to data quality/credibility, but not with regard to the modeling approach to be used. Ensure that accepted models are employed in the approach. Consider specifying that models employed will be limited to those referred to in WQ Policy 1-11 Chapter 2.

- King County Department of Natural Resources and Parks

5.RR Comment Summary – Geographic Scope

Ecology states that “[t]he site boundary consists of the entire model domain” and that “[n]atural conditions criteria for each assessment unit will be derived based on the resolution of the model and the spatial and temporal variability of its predictions.” Performance Guidance at 9-10; see also id. at 17. This is not clear. The “entire model domain” is never defined in the guidance although the second part implies that Ecology will model every single waterbody to which it applies the NCC. It should clarify what this means because this could be a very significant question of resources. Alternatively, if Ecology is proposing that it will continue as it has, modeling mainstems and significant tributaries and attributing some natural characteristics to

other watershed streams, then Ecology is not breaking any new ground here to explain how this is a performance-based approach that will provide replicable results.

- Northwest Environmental Advocates

5.SS Comment Summary – Pg. 11. Ecology references use of the Programmatic QAPP publication 17-03-107 as the basis for establishing data quality objectives for data used in the process-based modeling approach. The Programmatic QAPP lists and describes various models available for use. The performance-based approach document does not list the various models that may be used, rather it's understood the performance-based approach follows closely with established procedures and policies for TMDL development, including model requirements. Models used for Total Maximum Daily Load studies are listed and offered for download at https://ecology.wa.gov/Research-Data/Data-resources/Models-spreadsheets/Modeling-the-environment/Models-tools-for-TMDLs. It's recommended that Ecology list and describe specific models considered for use in the performance-based approach document and that they are consistent across the Programmatic QAPP, Ecology's webpage, and the performance-based approach document.

- Snohomish County

5.TT Comment Summary – Pg. 12. Using a predictive water quality model appears to relegate applicability to larger rivers and streams. The type of model resolution required is a 3-dimensional model (e.g., EFDC or CE-QUAL-W2) be used (Page 16). A method or some guidance for identifying the upper- and lower extent of model applicability is not clearly described. Would outcome of modeling scenarios be different if boundaries of a reach were longer or shorter? We recommend developing or referencing a method for identifying the upper and lower extent of model applicability to stream or river size.

- Snohomish County

5.UU Comment Summary – Further, it would be inconsistent with the level of accuracy of water quality model predictions with and without anthropogenic sources when model skill assessment results exceed the selected de minimis DO decrease of 0.2 mg/L. Model skill assessment of the Salish Sea Model presented in the Journal of Geophysical Research and in Ecology's Model Updates and Bounding Scenarios report indicate overall Sound wide mean error (bias) ranging for DO from -0.7 to 1.0 mg/L and root mean square error (RMSE) ranging from 0.6 to 1.6 mg/L. These two statistics measure the difference between observed data and the model predictions with the model performance varying in the different regions of the Sound (i.e., Bellingham, Samish and Padilla Bays, Whidbey Basin, Admiralty Inlet, Main Basin, Hood Canal, South Sound). Although these model statistics results are similar to other complex marine DO modeling studies, the accuracy of the model needs to be accounted for when evaluating natural conditions DO criteria and the allowable DO decrease associated with anthropogenic sources.

"The model framework, including the model code, will have undergone a formal peer-review process before application, or be recognized as widely-used code in the published literature, if not peer reviewed previously and fully documented."

Comments on the Performance-Based Approach Document: Public Review of Performance-Based Approach Document

"Published literature" does not mean that it was independently peer reviewed. Regardless, an independent peer review should be conducted. See Gordon Holtgrieve comments that recommend that the Washington Academy of Sciences provide this type of review. Please explain the reasoning for not using this valuable scientific resource.

"Natural condition criteria magnitude estimations must reflect the natural conditions of the system without any human impacts"

See previous comments, including Comment 11 [Salish Sea Model Evaluation and Proposed Actions to Improve Confidence in Model Application in Context of Current Natural Conditions Rulemaking], on the difficulties for removing all human sources in complex water bodies (e.g. Puget Sound).

- City of Tacoma

5.VV Comment Summary – "Sources of readily available data include state and federal water quality databases. Washington maintains the Environmental Information Management (EIM) database, which contains environmental monitoring data collected by Ecology scientists and partners." To achieve stated goal of transparency, consider ensuring consistent inclusion of sampling plans/QAPPs/reports from data submitters alongside the associated data in EIM.

- King County Department of Natural Resources and Parks

5.WW Comment Summary – Ecology leans hard on the idea that a QAPP is going to resolve all the problems with its weak performance-based approach. A future document that sets out various elements is simply not a performance-based approach. Moreover, Ecology proposes to incorporate this document by reference in the rule itself but the performance-based approach guidance refers to yet other guidance documents that Ecology can change at any time.

- Northwest Environmental Advocates

5.XX Comment Summary – Ecology has not addressed the spatial and temporal applicability or the frequency of exceedance of the natural conditions criteria in order to establish a transparent process for interpretation of where and when and how often the natural conditions criteria apply.

EPA recommendations for the performance-based approach call for definition of the spatial (e.g., monitoring location, embayment, assessment unit) and temporal (e.g., summer, low flow, diurnal) boundaries of natural conditions criteria. Further, Ecology has not addressed the allowable exceedance frequency of the natural conditions criteria that would allow a transparent interpretation of the de minimis impact to natural conditions criteria due to anthropogenic sources. These missing considerations are needed to develop natural conditions criteria that include the required magnitude, duration, and frequency components of water quality standards.

- City of Tacoma

5.YY Comment Summary – "How spatial and temporal variability will be addressed in any model or models to ensure that natural condition estimates protect designated and existing uses."

Comments on the Performance-Based Approach Document: Public Review of Performance-Based Approach Document

The supporting information for this item is generic and open to interpretation. More detail is needed.

- City of Tacoma

5.ZZ Comment Summary – Ecology's performance-based approach is overly complex and based on an entirely hypothetical natural condition that depends upon the assumptions made about pre-anthropogenic conditions, which cannot be known, measured, or verified. Developing pre-anthropogenic conditions as part of setting natural conditions criteria is unlikely to meet Ecology's objectives that the process should result in predictable and repeatable criteria. This is because developing pre-anthropogenic conditions will require many assumptions in estimating load reductions from land-based sources (including groundwater and river/tributary inputs), atmospheric deposition, and ocean boundary conditions. In addition, human-induced structural changes will need to be estimated to remove impacts associated with shoreline hardening, dredging activities, and river control structures such as dams and diversions. Most likely a model (e.g., watershed, such as the Salish Sea Model) will need to be used to estimate the natural conditions criteria associated with the pre-anthropogenic conditions, which will have its own set of application assumptions.

- City of Everett

Response to 5.A through 5.ZZ

Statement Regarding the Performance-Based Approach

First, we want to thank everyone again for all your comments during this rulemaking process. It is helpful and valuable to get insight from a wide range of parties regarding our natural conditions rulemaking.

We recognize that this subject and process is complex. Your comments on our performance-based approach allowed us to recognize that additional work is needed in the performance-based approach document before it is final. We want to take this time to discuss our plans for this rulemaking and the future of the performance-based approach.

Alongside the publication of this response document, we will have adopted updates in our water quality standards for natural conditions criteria. This includes revisions to our general provision at WAC 173-201A-260(1)(a) for how we will calculate natural conditions criteria, updates to our site-specific rulemaking process at WAC 173-201A-430 to allow for natural conditions as an option for scientifically-defensible site-specific criteria, revising our human-use allowance criteria for dissolved oxygen and temperature to limit impacts to water quality by human actions when natural conditions criteria are applicable for a site, and a new site-specific criteria development approach for certain parameters: the performance-based approach.

When Ecology determines natural conditions criteria, we must consider all sources of anthropogenic impact and account and remove those sources from current conditions to determine the natural conditions of a waterbody (i.e., the natural, pre-anthropogenic water quality). Those conditions represent the natural conditions of a waterbody and represent the conditions protective of aquatic life, including threatened and endangered species. This is

because aquatic life that inhabit these systems have adapted over time to these unique conditions, and the natural conditions water quality represent what is required for those site-specific species to survive, reproduce, and be protected. Therefore, those natural condition values become the protective numeric criteria for the waters. From there, where applicable, small impacts to temperature and dissolved oxygen may be allowed by local and regional activities.

Our adopted revisions for the new performance-based approach site-specific criteria process includes reference to an external publication, Ecology document 25-10-001 titled "A Performance-Based Approach for Developing Site-Specific Natural Conditions Criteria for Aquatic Life in Washington". This document was released in draft form alongside the draft revisions to our Water Quality Standards in May 2024 (publication 24-10-017). However, unlike our regulation revisions which we have finalized and adopted, this document's finalization is not planned until next year.

Over the next few months, our plan is to re-work this Ecology publication based on the extensive feedback received during the public comment period. We will consider all above comments made on the performance-based approach document during our revisions. As of now, our approach is to narrow the scope of this document parameter-wise and first focus on marine DO, while simultaneously providing additional details to our methodology on how to carry out this performance-based process and calculate protective criteria values based on the natural conditions of the system. This includes adding more information across each section of the document, such as how we will address data gaps, ensure data credibility, and what models we may use to calculate protective criteria, which include values (or magnitude), frequency, and duration components.

In our modeling, we recognize that model outputs will have associated ranges and some level of error due to uncertainty within the modeling process and in the underlying dataset. Acceptable model uncertainty and limitations are documented in project QAPPs, which is a requirement of the draft performance-based approach. Further, when taking model outputs and determining protective natural conditions criteria for the site, the conservative and most protective approach is used. For instance, if the model output indicates natural conditions for a cell is 4.3 mg/L - 4.6 mg/L for dissolved oxygen, then the criterion value would be 4.6 mg/L.

Once model skill is well established and its accuracy found acceptable, the precision error of the difference of two model runs, such as that of an increment between an existing scenario and a natural conditions scenario, can be calculated. Increments calculated in this manner are then compared to the human use allowance value. Model skill statistics of existing condition scenarios include measurement errors, and thus, natural criteria derived from such scenarios also include such errors. The increment for comparison with the human use allowance, by the approach in which it is calculated, no longer includes random measurement errors.

For the performance-based approach document, our goal is to share our progress early next year and go back out for public comment in Spring 2025. From there, we would carefully consider comments received and aim to publish our final version of the publication alongside our response to comments by Summer 2025. After we finalize the Performance-Based Approach document next year, the Office of the Attorney General will certify that the

document is legally binding, and then we will send the performance-based approach document to EPA for review and approval.

Because the performance-based approach document is only referenced, and not part of the Water Quality Standards regulations at WAC 173-201A-470, and revisions to the document would not change the adopted rule language, we are not required nor will we be conducting a separate formal rulemaking for this document. However, we feel it is important to provide another opportunity for public and Tribal input on a revised draft. Further, this document, which governs how Ecology will use the performance-based approach for site-specific criteria development, must meet federal Clean Water Act requirements, which includes a public review process and EPA review and approval before use in federal Clean Water Act actions.

Until we publish a final version of this document and receive EPA approval following their review, we will not be able to use the performance-based approach for site-specific criteria under the federal Clean Water Act, such as for water cleanup plans (ARPs, TMDLs).

We want to clarify the use of the performance-based approach and corresponding document. The performance-based approach is used to develop site-specific water quality criteria for aquatic life based on the natural conditions of a site. The Department of Ecology is the authorizing agency in the State of Washington for rules and regulations related to water quality standards in the state and for substances discharged into our waters (RCW 90.48.035). This performance-based approach, therefore, serves as an available tool for Ecology to use when developing site-specific criteria. As discussed throughout this rulemaking, the benefit of such a tool is that, when properly designed and has EPA approval, it can be used to develop site-specific water quality criteria without needing additional formal rulemaking. That said, the performance-based approach is specifically for criteria development. Implementation of criteria (such as through advanced restoration plans or TMDLs) are separate processes. Please see our final Implementation Plan document for additional information.

We also want to clarify (and have also made these clarifications in our final Implementation Plan document for this rulemaking) that use of the performance-based approach must still be tied to some form of public process. We are fully committed to holding a public review period whenever we use the performance-based approach to develop natural conditions criteria. For example, we may choose to develop natural conditions criteria following the performance-based approach to set criteria for a site during the process of creating a TMDL. When we go out to the public with our draft TMDL for comment and feedback, all the required performance-based approach documentation and criteria values would be included alongside the customary TMDL documentation, and we would accept comment and feedback on the use of the performance-based approach at that time. Regardless of how or when we use the performance-based approach, we have clarified that the public will have opportunity to comment on the developed criteria values.

If you have questions about our planned process for finalizing the performance-based approach document, please feel free to reach out to us at any time. Again, we want to thank everyone for their understanding regarding our next steps and timeline and for your comments in this rulemaking.

5.AAA Comment Summary – Will this [spatial and temporal variability] include an effort to define the dominant species to ensure that it is protected?

- City of Tacoma

Response to 5.AAA

Natural conditions criteria are calculated by accounting for and removing all sources of human impact, such that the natural conditions criteria values represent water quality in its pre-anthropogenic impact state. These criteria support aquatic life, as aquatic life have adapted over time to inhabit these waters, and these water qualities are therefore necessary for survival and reproduction of aquatic life.

As natural conditions criteria are based on the natural water quality of the waterbody itself, rather than the species that inhabit the site, there is not a need to define the species, including dominant species, that inhabit the system. Again, natural conditions criteria, when appropriately and scientifically developed, protect all aquatic life species in the system, including existing and designated uses for the water and the dominant species that inhabit the water.

5.BBB Comment Summary – It is concerning, that nowhere in the documents reviewed does Ecology set a limit for how high these natural temperatures could be set.

Based on the documents provided and the process proposed by Ecology, it is unclear if this proposed process would result in even higher temperature levels based on modeled natural conditions being used as criteria for TMDLs.

- Confederated Tribes and Bands of the Yakama Nation

Response to 5.BBB

Natural conditions criteria are calculated by accounting for and removing all sources of human impact, such that the natural conditions criteria values represent water quality in its pre-anthropogenic impact state. These criteria support aquatic life, as aquatic life have adapted over time to inhabit these waters, and these water qualities are therefore necessary for survival and reproduction of aquatic life.

Therefore, it is not appropriate nor needed to set limits on natural conditions criteria, as those values represent natural conditions that species have adapted to over time.

In addition, natural conditions criteria may differ from criteria developed that follows a biologically-based approach, which uses the biological limits of organisms to develop protective criteria.

Both approaches (natural conditions criteria and biologically-based criteria) are paths to derive protective aquatic life criteria, and Ecology argues that both are different options to providing protection for aquatic life in water bodies, but neither supersede the other in regards when appropriately determined. Nor is there any support currently, either scientifically or from EPA, that one must be used over the other when information for both are available.

The primary purpose of this rule was to develop a process to identify natural water quality conditions for water bodies with unique physiochemical characteristics. Aquatic life that inhabits these waters have adapted over time to these natural, pre-human impact conditions,

such that this level of natural water quality supports aquatic life survival, growth, and reproduction.

That said, we recognize that additional work is needed in the performance-based approach document before it is final. This includes adding additional details to our methodology. This will ensure any binding natural condition performance-based processes is scientifically-justifiable and repeatable. Our water quality criteria will protect all aquatic life, including threatened and endangered species.

We plan on revising the document and providing additional opportunities for Tribes and the public to comment before finalization and submittal to EPA. Please see our statement in Section 5 (Response to 5.A through 5.ZZ) regarding the future of the performance-based approach document.

5.CCC Comment Summary – "Existing, available, and credible data may also be found in academic and literature sources, and these published data from reputable research journals must be obtained and considered."

This should be specific to species that exist in the State of Washington. Previous efforts by Ecology (including for the Puget Sound Nutrient Reduction Project) have referenced species that do not exist in Washington. More guidance and detail is needed to protect actual species in Washington and not elsewhere. In addition, an independent review from the Washington State Academy of Sciences should be included (see Gordon Holtgrieve attachments).

- City of Tacoma

Response to 5.CCC

The primary purpose of this rule was to develop a process to identify natural water quality conditions for water bodies with unique physiochemical characteristics. Aquatic life that inhabits these waters have adapted over time to these natural, pre-human impact conditions, such that this level of natural water quality supports aquatic life survival, growth, and reproduction.

That said, we recognize that additional work is needed in the performance-based approach document before it is final. This includes adding additional details to our methodology. This will ensure any binding natural condition performance-based processes is scientifically-justifiable and repeatable. Our water quality criteria will protect all aquatic life, including threatened and endangered species.

We plan on revising the document and providing additional opportunities for Tribes and the public to comment before finalization and submittal to EPA. Please see our statement in Section 5 (Response to 5.A through 5.ZZ) regarding the future of the performance-based approach document.

We note that when developing aquatic life criteria, we must ensure criteria are protective. If insufficient data are available to derive protective criteria when just focusing on site- or state-specific studies, it may be necessary to expand our scope in review of science to ensure we can confidently say criteria are sufficiently protective.

5.DDD Comment Summary – It is unclear from the rule proposal and supporting rule documents if there will be public notice and comment process as part of the performance based approach process. This absence may be less important in the context of a TMDL, where the public process for the TMDL would include implementation of the Performance-Based Approach. However it is unclear how the public would be informed of natural conditions determinations to support permitting or TMDL alternative processes. This could create situations where underlying scientific data or questions are only able to be addressed through subsequent permitting actions rather than earlier in the process. Include public notice and input in the performance based approach process.

- King County Department of Natural Resources and Parks

5.EEE Comment Summary – Limited Opportunity for Public Comment and Transparency. The City is generally concerned that if this rule is implemented then there will be a significant lack of transparency and opportunities for independent, scientific peer review and public input as Ecology is working through setting the natural conditions criteria for a water body. This is a theme that is brought up continually in our comments below.

- City of Tacoma

5.FFF Comment Summary – "This report will undergo agency peer review through established departmental processes with a specific mention for reviewers to focus on the natural conditions analyses. This peer review must be completed prior to the use of these natural condition criteria values in further state and federal Clean Water Act actions (e.g., TMDLs, NPDES permits, CWA 401 certifications)."

This should include an independent peer review by the Washington Academy of Sciences. Explain why this isn't included. There should also be an opportunity for public comment. Explain why this isn't included.

- City of Tacoma

Response to 5.DDD, 5.EEE, and 5.FFF

We have updated our implementation plan to address concerns raised during the comment period.

First, we indicate that any use of criteria following the performance-based approach will include an opportunity for public involvement and review. We are fully committed to holding a public review period when we use the performance-based approach to develop natural conditions criteria. It is anticipated that the majority of our use of the performance-based approach will be done in conjunction with an Advanced Restoration Plan or TMDL, which involve a public review process and EPA review. Regardless of how or when we use the performance-based approach, we have clarified that the public will have opportunity to review and comment on the developed criteria and process for derivation.

We are not sure what the commentor means by peer review, as this could be a public review, a consultant review, or some other formal process. As stated above, the use of the

performance-based approach will be done with a public process and the finalization of the performance-based approach document will also get tribal, public, and EPA review. Currently, we make project-by-project determinations on when to use a formal peer review process in our regulatory work. Those decisions will continue to be made on a project-by-project basis, and they could be related to the application of the performance-based approach to develop site-specific criteria.

Second, we have clarified that we intend to inform the public when such performance-based criteria have been developed and are in effect for federal Clean Water Act actions.

The primary purpose of this rule was to develop a process to identify natural water quality conditions for water bodies with unique physiochemical characteristics. Aquatic life that inhabits these waters have adapted over time to these natural, pre-human impact conditions, such that this level of natural water quality supports aquatic life survival, growth, and reproduction.

That said, we recognize that additional work is needed in the performance-based approach document before it is final. This includes adding additional details to our methodology. This will ensure any binding natural condition performance-based processes is scientifically-justifiable and repeatable. Our water quality criteria will protect all aquatic life, including threatened and endangered species.

We plan on revising the document and providing additional opportunities for Tribes and the public to comment before finalization and submittal to EPA. Please see our statement in Section 5 (Response to 5.A through 5.ZZ) regarding the future of the performance-based approach document.

Finally, for the performance-based approach itself, including regulations at WAC 173-201A-470 and the separate, rule-referenced, external publication, this rulemaking served as an opportunity for the public to comment on our revisions. Ecology followed all requirements for formal rulemaking under applicable federal regulations and law, including the state APA process.

5.GGG Comment Summary – While accounting for impacts largely outside of the State's control (i.e. climate change and shared international waters) may be difficult to model effectively, it is imperative that Ecology assess the best available science and include climate impacts into the natural conditions criteria derivation process as best as possible. Failure to account for climate related changes to water bodies will result in erroneously derived natural conditions criteria for temperature, dissolved oxygen and pH. This will impact the waters of the State beyond the intention of the natural conditions provision and allow additional disturbances to ecosystems that are already at risk of irreversibly crossing ecological impact thresholds.

- Jamestown S'Klallam Tribe

5.HHH Comment Summary – Temperature regimes in streams and rivers are influenced by a complex array of processes and conditions, and we are particularly concerned about the potential for natural conditions modeling to overestimate natural condition temperatures. Nooksack Tribe staff participating in TMDL development expressed concerns that this would not accurately reflect natural conditions historically present, including:

- Mature, intact riparian forests (Increased effective shade due to increased vegetation height and riparian buffer width)

- Cooler headwater and tributary input temperatures

- Historical channel planform

- Enhanced hyporheic exchange

The influence on South Fork Nooksack River maximum temperatures of these conditions was assessed individually and cumulatively through modeling of 5 additional scenarios. Model results indicate the cooling effect of each of these conditions, both individually and cumulatively, relative to the "natural conditions" scenario (Scenario 5). Estimated average maximum temperature in the South Fork in the cumulative "historic conditions" scenario, which incorporated the effects of each of the above conditions, was 2.9°C cooler than Scenario 5. Parameterization of these 5 additional scenarios was informed by analyses conducted by Nooksack Tribe technical staff, illustrating the importance of engaging knowledgeable staff from Tribal natural resources departments in temperature modeling and water resources protection and restoration efforts. Even given the substantial effort it took to develop the historical scenario, it was still based on estimates of historic riparian tree species from GLO survey notes, a snapshot of the channel planform and width from early channel surveys, and best professional judgement to assess how changes in land use have affected tributary temperatures and the nature of bed material in the river.

- Nooksack Indian Tribe

Response to 5.GGG and 5.HHH

The primary purpose of this rule was to develop a process to identify natural water quality conditions for water bodies with unique physiochemical characteristics. Aquatic life that inhabits these waters have adapted over time to these natural, pre-human impact conditions, such that this level of natural water quality supports aquatic life survival, growth, and reproduction.

That said, we recognize that additional work is needed in the performance-based approach document before it is final. This includes adding additional details to our methodology. This will ensure any binding natural condition performance-based processes is scientifically-justifiable and repeatable. Our water quality criteria will protect all aquatic life, including threatened and endangered species.

We plan on revising the document and providing additional opportunities for Tribes and the public to comment before finalization and submittal to EPA. Please see our statement in Section 5 (Response to 5.A through 5.ZZ) regarding the future of the performance-based approach document.

It was always our intent that natural conditions represent the water quality of a site before *any* sort of human impact, from local sources of pollution to larger and longer scale changes such as climate change. Any developed criteria must therefore reflect pre-anthropogenic water quality for a site.

5.III Comment Summary – Ecology has suggested that a performance-based approach may be a preferred means for addressing natural conditions in receiving water. The District is, however, concerned that the difficulties inherent in evaluating natural conditions and calculating criteria that account for those conditions, could undermine the viability of the proposed rulemaking. Specifically, the performance-based approach is detailed and fact-intensive. Its implementation would require, among other things, numerous analytical steps, including defining a site boundary; collecting data; developing a quality assurance project plan (a QAPP); developing and calibrating a model; using the data to assess whether nonattainment of the aquatic life criteria is due to natural processes, and quantifying known and human-caused impacts. The process would be resource-intensive and technically complicated. The burdens associated with the approach would be substantial, i.e., similar to those associated with the development of site-specific criteria per WAC 173-201A-430 or to performing a use attainability analysis per WAC 173-201A440. These are processes that only Ecology has the resources to implement, as opposed to the regulated community.

- Liberty Lake Sewer and Water District No. 1

Response to 5.III

The primary purpose of this rule was to develop a process to identify natural water quality conditions for water bodies with unique physiochemical characteristics. Aquatic life that inhabits these waters have adapted over time to these natural, pre-human impact conditions, such that this level of natural water quality supports aquatic life survival, growth, and reproduction.

That said, we recognize that additional work is needed in the performance-based approach document before it is final. This includes adding additional details to our methodology. This will ensure any binding natural condition performance-based processes is scientifically-justifiable and repeatable. Our water quality criteria will protect all aquatic life, including threatened and endangered species.

We plan on revising the document and providing additional opportunities for Tribes and the public to comment before finalization and submittal to EPA. Please see our statement in Section 5 (Response to 5.A through 5.ZZ) regarding the future of the performance-based approach document.

We do want to note that the performance-based approach must have a level of detail necessary to ensure repeatability, predictability, and be scientifically justifiable and defensible.

We also wish to state that the performance-based approach is a pathway for developing site-specific aquatic life criteria for those applicable parameters, and the Department of Ecology is the agency authorized by the State of Washington to carry out these Clean Water Act duties and requirements.

In short, protective water quality criteria development is both Ecology's authority and responsibility. The updates in this rulemaking are to expand the pathways available to Ecology to develop these protective water quality criteria.

5.JJJ Comment Summary – "This approach can be used regardless of the level of human disturbance to the water body being evaluated, so long as the natural conditions for the parameter

and site of interest can be quantified via the approach (i.e., the performance-based approach can be followed in its entirety)."

Why isn't the level of human disturbance a consideration? If there is no change in the water body from point sources, then what is the justification for using the performance- based approach?

- City of Tacoma

Response to 5.JJJ

The primary purpose of this rule was to develop a process to identify natural water quality conditions for water bodies with unique physiochemical characteristics. Aquatic life that inhabits these waters have adapted over time to these natural, pre-human impact conditions, such that this level of natural water quality supports aquatic life survival, growth, and reproduction.

That said, we recognize that additional work is needed in the performance-based approach document before it is final. This includes adding additional details to our methodology. This will ensure any binding natural condition performance-based processes is scientifically-justifiable and repeatable. Our water quality criteria will protect all aquatic life, including threatened and endangered species.

We plan on revising the document and providing additional opportunities for Tribes and the public to comment before finalization and submittal to EPA. Please see our statement in Section 5 (Response to 5.A through 5.ZZ) regarding the future of the performance-based approach document.

We want to note that the level of human disturbance is not relevant when determining natural conditions for a waterbody, as all sources of human impact must be accounted for and removed to determine the pre-anthropogenic water quality of a site.

5.KKK Comment Summary – In the draft guidance, there is no mention of defining the dominant aquatic species.

- City of Tacoma

Response to 5.KKK

The primary purpose of this rule was to develop a process to identify natural water quality conditions for water bodies with unique physiochemical characteristics. Aquatic life that inhabits these waters have adapted over time to these natural, pre-human impact conditions, such that this level of natural water quality supports aquatic life survival, growth, and reproduction.

That said, we recognize that additional work is needed in the performance-based approach document before it is final. This includes adding additional details to our methodology. This will ensure any binding natural condition performance-based processes is scientifically-justifiable and repeatable. Our water quality criteria will protect all aquatic life, including threatened and endangered species.

We plan on revising the document and providing additional opportunities for Tribes and the public to comment before finalization and submittal to EPA. Please see our statement in Section 5 (Response to 5.A through 5.ZZ) regarding the future of the performance-based approach document.

We wish to note that appropriately derived natural conditions criteria, which must reflect pre-anthropogenic water quality for that site, are protective of the aquatic life that inhabit the system, as such species have adapted over time to those water quality conditions and have since survived and reproduced. These natural water quality conditions, therefore, represent what is needed for full aquatic life protection for that specific site.

Thus, since such criteria are protective of all aquatic life and existing / designated uses for the system, there is not a need to identify nor define dominant species in the system.

5.LLL Comment Summary – Overall, the document is generic and not specific to how the boundaries will be defined. There is not enough detail to understand how Ecology will implement this requirement. More detail should be added as well as an independent peer review and public comment.

"All technically feasible steps to improve model performance and representativeness of the model, based on available information, must be taken prior to model acceptance and use to estimate natural conditions." Yes, this should have more detail including an independent peer review by the Washington Academy of Sciences as well as an opportunity for public comment.

- City of Tacoma

5.MMM Comment Summary – "Natural Condition" is a purely theoretical construct, modeled and consumed by Ecology without oversight. This 'standard' can't be independently verified – it is defined and implemented only by Ecology and relies on modeling a lot of historical data unlikely to be comprehensively available and reliable. (whole history of natural and human impacts to a waterway in WA?). This complex modeling with partial data and many assumptions is also not subject to oversight. This seems like a very shaky foundation for standard.

- Norton, Betsy

Response to 5.LLL and 5.MMM

The primary purpose of this rule was to develop a process to identify natural water quality conditions for water bodies with unique physiochemical characteristics. Aquatic life that inhabits these waters have adapted over time to these natural, pre-human impact conditions, such that this level of natural water quality supports aquatic life survival, growth, and reproduction.

That said, we recognize that additional work is needed in the performance-based approach document before it is final. This includes adding additional details to our methodology. This will ensure any binding natural condition performance-based processes is scientifically-justifiable and repeatable. Our water quality criteria will protect all aquatic life, including threatened and endangered species.

We plan on revising the document and providing additional opportunities for Tribes and the public to comment before finalization and submittal to EPA. Please see our statement in Section 5 (Response to 5.A through 5.ZZ) regarding the future of the performance-based approach document.

In addition, we have updated our implementation plan to address concerns raised during the comment period.

First, we indicate that any use of criteria following the performance-based approach will include an opportunity for public involvement and review. We are fully committed to holding a public review period whenever we use the PBA to develop natural conditions criteria. It is anticipated that the majority of our use of the performance-based approach will be done in conjunction with an Advanced Restoration Plan or TMDL, which involves a public review process and EPA review. Regardless of how or when we use the performance-based approach, we have clarified that the public will have opportunity to review and comment on the developed criteria and process for derivation.

Second, we have clarified that we intend to inform the public when such performance-based criteria have been developed and are in effect for federal Clean Water Act actions.

5.NNN Comment Summary – Could the performance based approach be extended to other aquatic life criteria, such as marine pH? Because the process described in the proposed Performance-Based Approach is relatively generic, it is not clear from Ecology's rulemaking documents why the approach could not be extended to other aquatic life criteria. Please clarify if other aquatic life criteria, such as marine pH, could use the proposed performance based approach.

- King County Department of Natural Resources and Parks

Response to 5.NNN

The primary purpose of this rule was to develop a process to identify natural water quality conditions for water bodies with unique physiochemical characteristics. Aquatic life that inhabits these waters have adapted over time to these natural, pre-human impact conditions, such that this level of natural water quality supports aquatic life survival, growth, and reproduction.

That said, we recognize that additional work is needed in the performance-based approach document before it is final. This includes adding additional details to our methodology. This will ensure any binding natural condition performance-based processes is scientifically-justifiable and repeatable. Our water quality criteria will protect all aquatic life, including threatened and endangered species.

We plan on revising the document and providing additional opportunities for Tribes and the public to comment before finalization and submittal to EPA. Please see our statement in Section 5 (Response to 5.A through 5.ZZ) regarding the future of the performance-based approach document.

We did not originally consider extending the performance-based approach to marine pH due to infrequency of use based on past TMDLs and anticipated difficulty in receiving approval following EPA review. Please see our technical support document for further details.

Finally, unless otherwise authorized in our water quality standards, the performance-based approach will only be applicable to those identified parameters that have a corresponding EPA-approved methodology. We could consider expansion to future water quality parameters in the future. Note, however, that EPA only provides guidance for temperature, dissolved oxygen, and pH for a natural conditions performance-based approach.

5.OOO Comment Summary – Programmatic QAPP - Water Quality Impairment Studies. Publication No. 17-03-107. Ecology plans on using this document to support development of Natural Conditions Criteria. Appendix A. Pg. 108. Snohomish County is shown in the table as having or collecting groundwater data. Snohomish County does not have a groundwater monitoring program. Recommend removing groundwater. Snohomish does actively collect surface water and flow data under a quality assurance project plan and associated standard operating procedures which can be found at https://snohomishcountywa.gov/6362/Monitoring-Plan-and-Field-Procedures. We request Ecology update the link.

- Snohomish County

Response to 5.OOO

The primary purpose of this rule was to develop a process to identify natural water quality conditions for water bodies with unique physiochemical characteristics. Aquatic life that inhabits these waters have adapted over time to these natural, pre-human impact conditions, such that this level of natural water quality supports aquatic life survival, growth, and reproduction.

That said, we recognize that additional work is needed in the performance-based approach document before it is final. This includes adding additional details to our methodology. This will ensure any binding natural condition performance-based processes is scientifically-justifiable and repeatable. Our water quality criteria will protect all aquatic life, including threatened and endangered species.

We plan on revising the document and providing additional opportunities for Tribes and the public to comment before finalization and submittal to EPA. Please see our statement in Section 5 (Response to 5.A through 5.ZZ) regarding the future of the performance-based approach document. We appreciate the information regarding Snohomish's updated link.

5.PPP Comment Summary – Ecology has not addressed the spatial and temporal applicability, nor the frequency of exceedance of the natural conditions criteria, in order to establish a transparent process for interpretation of where, when, and how often the natural conditions criteria apply. EPA recommendations for the performance-based approach call for definition of the spatial (e.g., monitoring location, embayment, assessment unit) and temporal (e.g., summer, low flow, diurnal) boundaries of natural conditions criteria.

Further, Ecology has not addressed the allowable exceedance frequency of the natural conditions criteria that would allow a transparent interpretation of the de minimis impact to natural

conditions criteria due to anthropogenic sources. These missing considerations are needed to develop natural conditions criteria that include the required magnitude, duration, and frequency components of water quality standards. These omissions may result in Ecology's additional DO decrease (i.e., 10% or 0.2 mg/L) below the natural conditions criteria due to anthropogenic sources being interpreted as a not to exceed value at any point and at any time, which constitutes an extremely high bar for water quality assessments. It would be inappropriate to consider a numerical value which has simply been selected as a representation of a de minimis impact (i.e., within monitoring measurement error) that is not linked to maintenance of a specific aquatic life beneficial use.

- City of Everett

5.QQQ Comment Summary – These omissions may result in Ecology's additional DO decrease (i.e., 10% or 0.2 mg/L) below the natural conditions criteria due to anthropogenic sources being interpreted as a not to exceed value at any point and at any time, which constitutes an extremely high bar for water quality assessments. It would be inappropriate to consider a numerical value which has simply been selected as a representation of a de minimis impact (i.e., within monitoring measurement error) that is not linked to maintenance of a specific aquatic life beneficial use.

- City of Tacoma

Response to 5.PPP and 5.QQQ

The primary purpose of this rule was to develop a process to identify natural water quality conditions for water bodies with unique physiochemical characteristics. Aquatic life that inhabits these waters have adapted over time to these natural, pre-human impact conditions, such that this level of natural water quality supports aquatic life survival, growth, and reproduction.

That said, we recognize that additional work is needed in the performance-based approach document before it is final. This includes adding additional details to our methodology. This will ensure any binding natural condition performance-based processes is scientifically-justifiable and repeatable. Our water quality criteria will protect all aquatic life, including threatened and endangered species.

We plan on revising the document and providing additional opportunities for Tribes and the public to comment before finalization and submittal to EPA. Please see our statement in Section 5 (Response to 5.A through 5.ZZ) regarding the future of the performance-based approach document.

Regarding the *de minimis* human-use allowance criteria, these are magnitude components of numeric natural conditions criteria, and these values work in conjunction with the developed and effective natural conditions numeric criteria to ensure aquatic life uses are protected. The human-use allowance regulations in our standards do not modify nor change the other components of water quality criteria: frequency and duration. Therefore, those components remain unchanged from the biologically-based numeric criteria.

For example, if natural conditions criteria for D.O. are developed and are in effect for a fresh water, the applicable criteria duration would be a 1-Day Minimum (WAC 173-201A-200(1)(d)) and the applicable criteria frequency would be a "not to fall below criteria" at a probability frequency of more than once every 10 years on average (WAC 173-201A-200(1)(d)(iii)).

We also note that these human-use allowance values are based on protection of aquatic life and not just measurement error. Please see our Final Technical Support Document for full details of how these values were derived in order to protect aquatic life.

5.RRR Comment Summary – Per this section, "criteria values developed using this [performance-based] approach are applicable to the waterbody immediately following the process." Does this refer to the whole process for a given CWA action, or a single time at which the criteria are set indefinitely?

Clarify the timeline(s) of how the performance-based approach would be used in the context of a single CWA action. Also, would natural conditions criteria determined in the context of one permitting action be applied to other permits authorizing discharges to the same waterbody? How would other permittees be made aware of the determination and be able to participate in the process for making it? A diagram showing the steps, including opportunities for public review, would be helpful.

- King County Department of Natural Resources and Parks

Response to 5.RRR

Criteria developed through the performance-based approach would be effective for federal Clean Water Act actions in the same fashion as those criteria developed through a site-specific rulemaking (following WAC 173-201A-430) or any other applicable criteria in our water quality standards. Essentially, unless a time constraint (e.g., effective only for 5 years after approval) is specified, the criteria remain in effect until revised or replaced through the appropriate criteria development and adoption process.

This means criteria developed through the performance-based approach are in effect moving forward for the specified site unless revisions to those criteria are made, either through a new application of the performance-based approach following WAC 173-201A-470 or a site-specific rulemaking following WAC 173-201A-430.

We have updated and clarified our implementation plan regarding use of the performance-based approach, and how we will communicate with the public the criteria in effect for a waterbody.

6. Miscellaneous Comments

6.A Comment Summary – It is unfortunate that after more than half a century, Ecology still has marine DO numeric criteria that have no scientifically defensible biological basis. Criteria are needed that resemble what EPA developed for Chesapeake Bay, which identify different types of

water bodies, that include averaging of values, that recognize lower DO conditions in deep water than surface water, and that recognize seasonal differences.

There is no biological basis behind our current numeric criteria. Both the Extraordinary, Excellent and Good "uses" claim to be fully protective of the identical biota. That suggests that there is no need to invoke natural condition-based criteria when marine DO levels are equal to or greater than 5 mg/L.

- Loehr, Lincoln

6.B Comment Summary – Ecology should consider new biologically based marine dissolved oxygen standards as an alternative or significant component of this rulemaking. The current dissolved oxygen standards were adopted by a predecessor agency to Ecology. They are not biologically based and there is no record as to the basis for the development of the standards. While Ecology may deem the standards "protective," they are not based on sound science and certainly do not reflect the need to have standards that are consistent with the highly variable temporal and spatial conditions in Puget Sound.

- City of Everett

6.C Comment Summary – Ecology has acknowledged that it has no documentation as to the scientific basis for the marine DO standards that were adopted by a predecessor agency in 1967. In its acknowledgment of the lack of a scientific foundation, the agency pointed to a report from 1968 that included recommended marine DO criteria but also included a cautionary clause regarding its recommendation: The committee would like to stress the fact that, due to a lack of fundamental information on the DO requirements of marine and estuarine organisms, these requirements are tentative and should be changed when additional data indicate that they are inadequate.

These "tentative" requirements have become permanent simply through the passage of time. With that 56-year standing invitation to update the underlying criteria with "the fundamental information on the DO requirements" of the organisms, it is startling that Ecology continues to move forward without seeking or incorporating information on the dissolved oxygen needs of the organisms present in Puget Sound.

This is not just an academic concern. The technical support document recognizes the projected impacts of future climate change on DO conditions in marine waters, indicating more challenges as climate change accelerates. It is now more critical than ever to utilize the best available science to understand what actions are necessary to protect the health of species residing in the Puget Sound. This need is further reinforced by concerns raised in the comments received to date on this rulemaking from nongovernmental organizations that seem to indicate questions about the legality, and potential litigation, of any natural conditions allowance. In this environment of uncertainty, it is prudent to ensure that we are informed by the most contemporary science about the needs of the specific species we are trying to protect.

We also request that Ecology reconsider its opposition to a scientific review and potential update of the underlying Marine DO criteria because it is impossible to effectively gauge the

implications of this proposal without doing so. Specific to Marine Dissolved Oxygen, we don't have the necessary data to evaluate the impacts of this proposal without updated science on the underlying dissolved oxygen needs of the organisms present in the Puget Sound.

- Association of Washington Cities

6.D Comment Summary – Ecology has failed to reasonably consider alternatives.

The Ecology alternatives analysis is inadequate as Ecology fails to consider one essential alternative: developing a biologically-based and site specific marine DO criteria to replace the current DO criteria (WAC 173-201A-210) or a Puget Sound biologically-based and site specific marine DO criteria. Ecology has ignored inputs from EPA, multiple municipalities, Tribes, and other parties urging the adoption of such a standard. The current DO water quality standard is outdated (over 55 years old) and fails to consider the geography and hydrology of the Puget Sound.8 Puget Sound is comprised of multiple deep-water basins separated by shallow sills, and many basins terminate in shallow inlets; the current marine DO standards are neither reasonable nor realistic in many locations due to these physical factors. The state has identified waters not meeting the DO standard, but that determination does not confirm the waters are truly impaired. Currently, marine waters with 5 mg/L DO in many deep-water basins are considered non-compliant, when in fact this oxygen level poses no threat to affected organisms. A DO concentration of 5 mg/L is identified as protective for most uses, included fish migration, rearing, and spawning; however, the proposed rule may trigger natural conditions criteria if a sector of water is below even 6 or 7 mg/L. One cannot justifiably assert there is impairment when DO is less than 6 or 7 mg/L but still meets the 5 mg/L level. Ecology intends to use its proposed Natural Conditions Rule to simply extend its current approach to aquatic life criteria; this will ultimately result in many areas qualifying as "impaired" without any scientific basis.

In the draft guidance, there is no mention of...updating the underlying water quality standards for the marine water bodies for DO or temperature.

- City of Tacoma

Response to 6.A through 6.D

> We appreciate your comments regarding our marine dissolved oxygen criteria. For this rulemaking, our focus was on natural conditions criteria and site-specific approaches to develop these protective aquatic life criteria. Ecology continues to evaluate new science and EPA criteria recommendations, and we encourage comments like this in our upcoming triennial review.

We continue to offer to look at any new science that is available that says Washington's standards are not accurate. We previously reviewed the history and application of the marine dissolved oxygen criteria (Washington State's Marine Dissolved Oxygen Criteria: Application to Nutrients[18]). Our previous review of the criteria at the request of the Puget Sound Nutrient Forum did not lead us to any new information that would suggest these criteria are not protective.

The "Puget Sound biologically-based and site-specific marine DO criteria", referenced as an alternative in this comment, is already in current standards and therefor analogous to the "no rule" alternative in section 6.3.3 of FRA. Note that the no rule alternative is applied extensively throughout the FRA to describe the most likely baseline outcome. Compared to this existing set of standards used by Ecology to meet CWA requirements (see Section 2.4.1 "baseline option a"), determining natural conditions of a water body using tools and processes adopted by this rulemaking (alternative rule action 1 in Section 2.4.1) would result in technically attainable site-specific alternative to biologic-based site-specific criteria that in many cases would not be met with any level of pollution reduction because of natural conditions. In this way, determining natural conditions criteria using tools and processes adopted by this rulemaking will provide relief to some permittees by protecting aquatic life and meeting our CWA obligations, while reducing costs of compliance that would otherwise be higher based on existing biologically based numeric standards.

Regarding the statement that "the proposed rule may trigger natural conditions criteria if a sector of water is below even 6 or 7 mg/L" and subsequent comment— Ecology would typically only determine natural conditions of a water body using tools and processes adopted by this rulemaking after a waterbody has been listed because of violating biologically based standards. The tools and processes used to establish natural conditions is an optional approach made available to Ecology by this rulemaking to establish alternative (and again, likely more achievable) site-specific criteria.

As for the concern that resulting natural conditions-based criteria, if developed, being more difficult to meet than the existing biologically-based standard that was initially violated, we acknowledge this is a theoretical possibility in section 3.2.3 of the FRA. In summary, the overwhelming consensus by Ecology scientists, including those involved with Salish Sea Model and Puget Sound nutrient efforts, is that this outcome would almost never be the case. Additionally, the tools and processes for establishing natural conditions criteria adopted by this rulemaking allow seasonal variation, where biologically-based criteria are represented by a single value year-round. This means that when paired with the human use allowance, natural conditions criteria determined using tools and processes adopted by this rulemaking would be technically achievable during all parts of the year by permittee. The same cannot be said of meeting biologically based criteria, even if they were more easily met for some part of the year due to natural variation of the water.

6.E Comment Summary – Water Quantity should be added as a Water Quality standard. Wildlife species (along with humans) need sufficient levels of both water quality and water

[18] https://www.ezview.wa.gov/Portals/_1962/Documents/PSNSRP/Marine%20DO%20Paper%20Guidance%20Updated%20July%202018.pdf

quantity, some of them with very specific needs. In addition to this designated use, water quantity should be called out explicitly as a water quality standard, since the volume of water is a key measurement factor when calculating dissolved oxygen (DO) and allowed pollutant concentrations, temperature, and pH. Sufficient levels of water (usually a minimum, but sometimes also a maximum) are required to support local species' designated use of the aquatic environment as life-sustaining habitat. Finally, water quantity changes should be included as part of this water quality standard in order to protect sensitive species from sudden significant surges or withdrawals of water volume which can destabilize wildlife aquatic habitat and put the species at risk. Ecology already sets quantity standards via 'instream flow' rules, but there appears to be no agency connection between the side of Ecology which administers water rights and in-stream flow rules (water quantity), and the side of Ecology which manages water quality standards, despite the interdependency between quality and quantity. In addition, instream flow rules only protect selected rivers – not wetlands, ponds and lakes. From Audubon's point of view, all these aquatic habitats have water level needs critical to the 'designated use' of that waterbody as habitat by its typical wildlife species, so all waterbodies should be included in a water quality standard.

- Black Hills Audubon Society

Response to 6.E

We appreciate your comment. For this rulemaking, our focus was on natural conditions criteria and site-specific approaches to develop these protective aquatic life criteria. Ecology continues to evaluate new science and EPA criteria recommendations, and we encourage comments like this in our upcoming triennial review.

We would like to note that Ecology considers and manages water resources to benefit all those who live in Washington and protect our natural resources. We have more information on our website for Water Supply.[19]

6.F Comment Summary – ECOLOGY SHOULD IMPROVE THE FORMATTING OF ITS DOCUMENTS

Ecology uses a very basic outline form in its various documents, but it hides the ball and creates ambiguity by not making the outline form clear. The form, such as it is, can be seen in the Table of Contents, without any indicators of outline level, i.e., a combination of Roman and Arabic numerals, capital and lower case letters. The lack of anything other than two levels in the Table of Contents renders the document to have less than ideal clarity for the reader. The point is that if Ecology used an outline format—used by nearly every other regulatory agency—every reader would have more clarity and less ambiguity as they are reading, and in consulting the document later.

- Northwest Environmental Advocates

[19] https://ecology.wa.gov/water-shorelines/water-supply

Response to 6.F

We appreciate your comment regarding our document formatting.

6.G Comment Summary – I laud the policy of the state of Washington to insure the purity of all waters of the state consistent with public health, enjoyment and the propagation and protection of wildlife, birds game fish and other aquatic life (RCW 90.49.010). I encourage the state to develop antidegradation policy that protects uses in all water of the United States (40 CFR 131.12(a)(1).

I thought the state should develop an antidegradation policy due to 40 CFR 131.12. I believe there is more to protecting designated uses than just temperature and dissolved oxygen.

- Blessing, Bonnie

Response to 6.G

We appreciate your comment. We would like to note that Ecology has previously adopted a three-tiered antidegradation policy that protects uses in our waters. This antidegradation policy applies to applicable water quality criteria, including but not limited to temperature and dissolved oxygen. Our antidegradation policy is located at WAC 173-201A-300.

6.H Comment Summary – Page 23 of Ecology Document # 24-10-15 says the state must support the most sensitive designated use of the waterbody and contain enough parameters to protect the uses of the waters.

I am concerned that there are not enough parameters to support the uses of the waters or if so they are rarely applied. In specific areas, Ecology should protect the beneficial use wildlife habitat by 1) setting criteria for flows temperature and invasive species, 2) honor state written TMDLS that protect natural conditions in watersheds above salmon or threatened and endangered wildlife species and wildlife habitat and 3) because the point of the standards is to protect exiting uses (which include wildlife habitat), if environmental baseline (and not natural conditions) protects existing uses in site specific locations, then the environmental baseline should be protected.

- Blessing, Bonnie

Response to 6.H

We appreciate your comment. For this rulemaking, our focus was on natural conditions criteria and site-specific approaches to develop these protective aquatic life criteria. Ecology continues to evaluate new science and EPA criteria recommendations, and we encourage comments such as those noted in (1) and (2) in our upcoming triennial review.

For (3), we appreciate your comment. Based on the Clean Water Act and EPA's guidance, generally there are two pathways available for developing criteria that protect existing and designated uses for aquatic life: biologically-based criteria and natural conditions. Biologically-based numeric criteria reflect scientific studies and the needs of the organisms

themselves, while natural conditions represent the water quality of a site before any human-impact, as these would represent conditions which species that live within the site have adapted to over time.

In either approach, aquatic life (existing and designated uses) are protected with scientifically-justified and appropriate criteria. That said, site-specific criteria can be developed using alternative methods so long as scientifically justifiable, and we have updated WAC 173-201A-430 to reflect federal regulations on site-specific criteria development.

6.I Comment Summary – To protect wildlife habitat, a designated use, prevent introductions of invasive species in site specific locations. I encourage Ecology to to protect the most sensitive biological life and other uses of water (WAC 173-201A-260). To do so, Ecology should not permit habitat creation that benefits American Bullfrog which is a prohibited level 3 species according to WAC 220-640-050 especially in site specific locations adjoining federally listed aquatic species threatened by bullfrogs.

Similarly, Ecology should also establish criteria for invasive species. This will help Ecology be more consistent with Chapter 77.135 RCW Invasive Species. In site specific locations, even level 3 invasive species highly degrade wildlife habitat so criteria should include presence of invasive species. Specifically, Can Ecology change the definition of 'polluting matter' or pollution to include invasive species that degrade wildlife habitat. Many invasive species occur in a 'water body' that is reservoirs, ponds, tanks that are both natural or not natural. Construction and maintenance of 'water bodies like stormwater ponds of these water bodies are requirements of the NPDES permits issued by Ecology.

I ask that Ecology calls Bullfrogs pollution. New NPDES permits should consider TMDLS that have written in 'waste load allocations' for invasive species. Specifically that pollution (bullfrog adults, juveniles, tadpoles eggs) do not leave the stormwater pond. In WAC 173-201A-320, the department (Ecology?) must ensure that information is developed and used expeditiously to revise permit or program requirements. Can such information on bullfrogs be used as soon as possible.

As an example, for the Oregon spotted frog, as flows diminish in summer, water levels decline and usually water temperature increase. The water level declines place Oregon spotted frogs in close proximity to bullfrogs. The water temperature increases benefit bullfrogs more than spotted frogs. Bullfrogs often thrive and reproduce more at temps above 20 C. But, at least 3 reports suggest that temperatures where OSF were found were often actually below 20 Celsius. OSF also need beaver dams which may increase water temperatures (Majerova 2020). If both salmon and spotted frogs occur in a given drainage, assess whether cold water refugia could be established for salmon and allow more warmer water for spotted frogs. (I think EPA was sued for this though in Oregon). Man-made activities that increase water temperatures include creation of wet ponds. A wet pond can increase the temperature of water. Wetponds support bullfrogs an invasive species.

Ecology should assess the type of wetpond that does not support bullfrogs. Consider a HSI model by Graves (1987). The estimated costs to control bullfrogs in order to recover a species is almost 2 billion dollars. Please do not allow creation of bullfrog ponds near special habitats.

At another place (formerly called Adams Garden), special species occurred in a marsh and associated ponds. And three man-made features seemed to influence habitat suitability for the rare frog. The natural condition (according to early General Land office surveys), was 'uninhabitable swamp' This 'natural condition' was likely a stream with beaver dams in a flat area with beaver dams and occasional migration of water across the flat valley. Humans try to find a way to 'reclaim the swamp'. Farmers dredged a ditch in a north to south direction. Farm ponds were excavated, perhaps for waterfowl. An unimproved gravel road was built x the marsh. Somehow Oregon spotted frogs a priority species were able to occupy this combination of manmade and natural features. As the old road and ditch aged and became poorly maintained, they both seemed ok for the frog. One site feature, The farm pond however hosts abundant bullfrogs. In one year at least 40 bullfrog eggs were found in the ~17000 square foot farm pond. This was reduced substantially by controlling bullfrog egg masses tadpoles and adults over 10 years. Prevention of bullfrogs is recommended as a recovery action. Because Ecology still approves of wetponds near spotted frog habitats, this is not consistent with the federal recovery plan. To meet federal ESA objectives could the state impose greater restrictions on private property owner near spotted frog designated critical habitat? If Ecology does impose greater restrictions this benefits the state and federally listed wildlife habitat. Protecting aquatic frog habitat also protects groundwater. Protecting aquatic frog habitat also mean protecting salmon.

- Blessing, Bonnie

6.J Comment Summary – Add watershed condition. In site specific locations to protect the most sensitive uses like 'wildlife dependent on water' and salmon the state may have to protect watersheds above threatened and endangered fish, aquatic species and wildlife habitat. One criteria should be watershed condition or some other term. I believe when the state issues a permit the permit must include requirements of the TMDL (page 30 of the appendix for the Permit writes handbook). In some cases, I believe the permit writers may not have looked up the TMDLS issue by State Ecology Some TMDLS that include provisions for Low Impact Development that the state wrote mainly to protect beneficial and existing uses. Even if EPA happens to disagree with a given TMDL, the state of Washington can use more strict guidelines right because the people get to set the standards right? (RCW 90.48.010). I think specifically the state needs to vigorously defend some TMDLs to protect the Deschutes Watershed and its natural conditions especially in watersheds that still could host native runs of salmon!

- Blessing, Bonnie

6.K Comment Summary – Another use is aesthetics, beneficial use. In Washington State, aesthetics is recognized as a use (WAC 173-201A200(4) that should not be degraded WAC 173-201A-260. Can Dept of Ecology add or modify aesthetic criteria to the natural conditions. Protecting the aesthetic value protects some wildlife species dependent on aquatic habitats. Specifically the aesthetic value of wildlife habitat. While some may view swamps as undesirable (Tribot 2018), perennial meadows have aesthetic value (Southon 2017). Yet, aesthetics has received little attention. However views of wildlife habitat are very appealing. I ask Ecology to consider that protecting the aesthetics of upstream areas often protects downstream water body criteria (WAC 173- 201A-260). Views of forests and meadows that also support wildlife habitat. Views preferred by many people include savannah like grasslands with clusters of trees that may

support prospect refuge views preferred by people and animals and protect 'negative space' (discussed pages 75 to 78 in 'Joyful' by Lee 2018).

- Blessing, Bonnie

6.L Comment Summary – Comments on when beneficial uses seem to be protected even when the area doesn't meet criteria. The extremely challenging issue for Ecology and EPA is that some threatened wildlife species may occur in conditions that actually do not meet water quality standards.

As an example both Beaver Creek (Listing ID 41118) and Salmon Creek (Listing id 73993) are listed as not meeting temperature and dissolved oxygen criteria. The Black River is listed in places as not meeting dissolved oxygen criteria for criteria. Nor does Salmon Creek. Yet these areas host Oregon spotted frogs and their designated critical habitat. The listing of the frog states that when water quality criteria do not meet standards that those water quality criteria are a threat to spotted frogs. The normal measures to 'improve water quality for these species include planting trees and excluding cattle which would not be conducive to the maintenance of conditions necessary for Oregon spotted frog egg-laying habitat. 79FR51690 states that where OSF overlap with documented poor water quality, USFWS considers poor water quality and contaminants to be a threat to the Oregon spotted frog.

- Blessing, Bonnie

Response to 6.I through 6.L

We appreciate your comments. For this rulemaking, our focus was on natural conditions criteria and site-specific approaches to develop these protective aquatic life criteria. We continue to evaluate new science and EPA criteria recommendations, and we encourage comments like these in our upcoming triennial review.

We note that when natural conditions criteria are developed for a site (either through a performance-based approach following -470 or site-specific rulemaking following -430), all existing and designated uses must be protected.

Generally, there are two pathways available for developing criteria that protect existing and designated uses for aquatic life: biologically-based criteria and natural conditions criteria. Biologically-based numeric criteria reflect scientific studies and the needs of the organisms themselves, while natural conditions represent the water quality of a site before any human-impact, as these would represent conditions which species that live within the site have adapted to over time.

In either approach, aquatic organisms (existing and designated uses) are protected with scientifically-justified and appropriate criteria.

6.M Comment Summary – Comments on 24-10-017

This document helped me understand the difference between the CWA and the state criteria. Its interesting that 'states may adopt water criteria different from EPAs as long as the state criteria are based on sound scientific rationale, contain sufficient parameter to protect the designated

uses and support the most sensitive designated use of a waterbody. According to page 28 of EPAs Water criteria, EPA supports the use of biological criteria to refine aquatic life designated uses. (EPA 823-23-001). That is why page 12 of Publication 23-10-005 is confusing. “In many situations, anadromous species would not be appropriate for determining impairment of a designated use because of the difficulty in linking the organisms condition to the condition of the water body it was collected in. However, we do acknowledge that there are situations where this connection can be documented. We have removed the requirement for biological information or data based on resident species in this section of the policy (Section 1G).” This removal does not make any sense because the beneficial uses are wildlife and aquatic life.

- Blessing, Bonnie

Response to 6.M

The referenced Ecology publication 23-10-005 is a response to comment specifically addressing the language in Section 1E of our Water Quality Policy 1-11, "Information submittals based on narrative standards", and is outside the scope of this rulemaking focused on natural conditions.

6.N Comment Summary – In other states (See San Diego 2023), rare wildlife and aquatic species are included as designated uses that need water quality criteria standards. Locally, in the upper Chehalis river, Oregon spotted frogs should be called a designated use to maintain genetic grouping and recover the species. The TMDL for San Mateo Creek Aquatic Invasive offers template or example of how ESA listed species could be protected under Ecology’s guidance. As an example, I suggest that Upper Chehalis could be placed on the CWA 303d list of impaired water bodies, with rare and endangered species as the impaired use.

The impairment of Upper Chehalis is from release and introduction of invasive species, warming that enhances the spread of bullfrogs, and unsuitable hydroperiod. This proposal would be more consistent with 40 CFR 131.11(a) where states adopt narrative criteria to protect designated uses. A scientifically defensible technical method could be developed to implement the narrative criteria. To maintain hydrological conditions a) encourage Low Impact development, especially in watersheds with rare aquatic species. In Western Washington LID methods also improves aesthetics, recreational use and wildlife habitat. An example locally is the Ken Lake ordinance for LID (Thurston 2022). b) maintain water flows into designated critical habitat whether or not the water is delivered.

- Blessing, Bonnie

Response to 6.N

We appreciate your comment. For this rulemaking, our focus was on natural conditions criteria and site-specific approaches to develop these protective aquatic life criteria. Ecology continues to evaluate new science and EPA criteria recommendations, and we encourage comments like this in our upcoming triennial review.

We note that when natural conditions criteria are developed for a site (either through a performance-based approach following WAC 173-201A-470 or site-specific rulemaking

following -430), all existing and designated uses must be protected. Aquatic life designated uses are protective of the most sensitive species. In Washington, we use protection of salmon spawning, rearing, and migration to form the basis of our standards. These salmon-based criteria provide protection for amphibians and other species. The basis for standards is the need to protect for the most sensitive species and life stages, including any threatened or endangered species.

We encourage comments on our CWA 303(d) list during the public review of our water quality assessments.

6.O Comment Summary – On page 11 of 24-10-022 it says that the WAPA requires Ecology to determine after considering alternative versions that the rule being adopted is the least burdensome alternatives for those required to comply etc. However the WAPA also says something like (RCW 34.05.328(1)(f)) that the rule adopted shall not require those to whom it applies to take an action that violates requirements of another federal or state law. My comment is this then: it can be burdensome to adopt a rule that requires others to get a different permit because otherwise they'd violate a different law. Can Ecology then ensure that the stormwater rules don't require those to whom it applies to do anything that violates requirements of the endangered species act. Those requirements would likely include avoiding harm to a federal listed wildlife or fish species.

- Blessing, Bonnie

Response to 6.O

Thank you for your comment. After adoption, this rulemaking will undergo EPA review (including any ESA consultation with NOAA NMFS and USFWS) and approval prior to being in effect for CWA purposes. Upon approval, this rule will not violate requirements of another federal or state law.

In developing the rule, Ecology also utilized information from previous ESA consultations, prior EPA biological evaluations, EPA memorandums, EPA guidance documents, exploration of how other states and tribes address natural conditions. From similar documentation and consultation with federal agencies, Ecology also ensured that other aspects of the rulemaking, such as human allowances, are de minimis. See Section 3.2.3 subheading "Impacts to Aquatic Life" of the FRA for additional discussion.

6.P Comment Summary – Is there a larger role for the Army Corps of Engineers? Please explain this: Under Section 304a of CWA EPA advises states on water quality standards. And in some cases, the US Army Corps of Engineers assesses for compliance with the Endangered Species Act. But we all known that there are timing restrictions and sometimes the USACE must approve sometimes without a full review. In some cases it appears there is a lapse in communication. Can Ecology fill that gap? For instance, residential development may need a Nationwide Permit if any listed species or designated critical habitat might be affected or is in the vicinity of the activity. I believe sometimes this nationwide permit process just does not happen. But then Ecology issues their STATE construction general stormwater permit. But according to some websites, no activity is authorized under any NWP which may affect a listed

species or designated critical habitats unless ESA section 7 addressing the consequence of the proposed activity on listed species or critical habitat has been completed.

- Blessing, Bonnie

Response to 6.P

This rulemaking is focused on our adoption of natural conditions provisions, and discussion of federal actions by the US Army Corps of Engineers or enforcement of federal laws (e.g., ESA) is outside the scope of this rulemaking.

Our implementation actions, such as issuance of permits, must comply with Washington's water quality standards (alongside any other applicable state and federal regulations). These water quality standards and associated criteria are developed and adopted following the requirements of the state's APA and federal Clean Water Act. Criteria are set to protect designated and existing uses, including protecting the most sensitive species. In doing so, we ensure protection for all aquatic life, including threatened and endangered species and critical habitat. However, as a state agency, Ecology does not enforce the federal Endangered Species Act. Federal agencies and departments, such as US Fish & Wildlife and NOAA National Marine Fisheries Service, provide ESA Section 7 consultation where required.

6.Q Comment Summary – Low dissolved oxygen seem to occur in many places where non-salmonid fish and nonfish aquatic species occur. The EPA natural conditions framework (page 12) states that low dO may be natural in areas with a low channel gradient and high decomposition of wetland vegetation. One very special status state species, the Olympic mudminnow often occur where dO is low. (See: Kuehne and Olden 2016 entitled Environmental drivers of occupancy and detection of Olympic mudminnow). Perhaps this is because other fish cannot tolerate the conditions the Olympic mudminnow tolerates. Several water bodies that host Oregon spotted frogs have low dissolved oxygen (How's my Waterway EPA website). It seems unclear exactly causes the low dO. It is interesting that Olympic mudminnow also occur in many of these waters impaired by low dissolved oxygen. These include Black River, Salmon Creek, Blooms ditch, Dempsey Creek, Beaver Creek. Some bullfrog ponds at lower Salmon Creek have remarkably low dissolved oxygen. I can send that data later. I suspect the low dO stems from low dO groundwater, accumulation of organics that breakdown as well as very low gradient.

- Blessing, Bonnie

Response to 6.Q

We appreciate your comment.

Ecology continues to evaluate new science and EPA criteria recommendations, and we encourage comments like this in our upcoming triennial review as well as any submittal of data or science that can support revisions or new water quality standards.

6.R Comment Summary – In WAC 173-201A-240, criteria discussed for toxic substances, aquatic life protection and human health protection. Protect western Washington lakes from release of toxics from blue-green algae and from aluminum sulfate.

- Blessing, Bonnie

6.S Comment Summary – Consider aesthetics more fully or set real criteria. There is little discussion of aesthetics of natural conditions of wildlife habitats in and near surface waters. Changes to natural conditions affect both wildlife habitat, aquatic habitat and the design of stormwater management systems. Yes aesthetics is sometimes a natural condition and sometimes environmental baseline condition and changed by human activities.

- Blessing, Bonnie

Response to 6.R and 6.S

We appreciate your comment. For this rulemaking, our focus was on natural conditions criteria and site-specific approaches to develop these protective aquatic life criteria. Ecology continues to evaluate new science and EPA criteria recommendations, and we encourage comments like this in our upcoming triennial review.

We also want to note that we recently adopted updates to our aquatic life criteria to protect against harmful toxic amounts. We did this, in part, by updating Table 240 to reflect the latest science.

6.T Comment Summary – ALL THE ATTENTION TO THE NCC BEGS THE QUESTION: WILL ECOLOGY USE ITS NCC MODELS TO DETERMINE WHAT NONPOINT SOURCES NEED TO DO TO MEET ALLOCATIONS AND CRITERIA?

Frankly, all of Ecology's attention to the NCC is utterly irrelevant to meeting its mission to protect and restore aquatic health to Washington's waters. Ecology already invests significant resources into the development of TMDLs, when it bothers to issue them, the vast majority of which are based on the now-disapproved NCC provisions. Ecology has never used its TMDL models to determine the needed riparian buffers, let alone taken any enforcement action against nonpoint sources based on the TMDL outputs. Yet it asserts that for EPA-approved TMDLs it should "[c]ontinue implementation measures." Implementation Plan at 14. No amount of pages in those TMDLs is a guarantee of any actual on-the-ground and in-the-water implementation of the findings made in them. Deriving superseding purportedly natural conditions criteria and not using them to restore water quality to anywhere remotely resembling natural conditions is an absurd use of agency and taxpayer resources. Moreover, by failing to take the necessary enforcement actions against point and nonpoint pollution sources, Ecology wastes the opportunity to save species that are on the brink of extinction, along with those that are extirpated in Washington waters, along with those that surely will join such lists of species in the future.

- Northwest Environmental Advocates

Response to 6.T

We believe Ecology has a strong nonpoint program and are doing work to address unpermitted nonpoint pollution. For example, our recent 2023 annual report[20] covers our activities to implement our water quality plan to control nonpoint source pollution.

6.U Comment Summary – Is it true, that there is traceable concentrations of the drug "Meth" within the waters of Puget Sound & this exposure is caused by the wastes of drug users?

- LaColla, Chelsea

Response to 6.U

For this rulemaking, our focus was on natural conditions criteria and site-specific approaches to develop these protective aquatic life criteria. We encourage the commenter to reach out to Ecology's Water Quality Department[21] for questions regarding specific water quality parameters.

6.V Comment Summary – I urge the Washington State Dept of Ecology to further limit the acceptable amount of glyphosate in all environments. It is measurably damaging fish (see link) and frankly everything else. Other countries have 1/3 or less allowable limits. Please stop this ridiculous and harmful big chem money grab. Thank you.

- Thom, Anne

Response to 6.V

For this rulemaking, our focus was on natural conditions criteria and site-specific approaches to develop these protective aquatic life criteria. Ecology continues to evaluate new science and EPA criteria recommendations, and we encourage comments like this in our upcoming triennial review.

7. Form Letter Comments

We received 172 public comments from supporters and members of the Washington Conservation Action that were provided within a single document. A list of individuals that submitted these comments are found at the end of this section.

7.A Comment Summary – First and foremost, we remind Ecology that under Chapter 90.48 of the Revised Code of Washington, "...it is the public policy of the state of Washington to maintain the highest possible standards to insure the purity of all waters of the state consistent with public health and public enjoyment thereof, the propagation and protection of wild life, birds, game, fish and other aquatic life, and the industrial development of the state...." Under no

[20] https://apps.ecology.wa.gov/publications/documents/2410029.pdf
[21] https://ecology.wa.gov/water-shorelines/water-quality

circumstances should Ecology weaken the state water quality standards for dissolved oxygen or temperature, which are both critical to the survival and future of salmon and other aquatic life. Ecology has been managing waters of the state using the human allowances of 0.2 mg/L dissolved oxygen and 0.3ºC temperature using known and reasonable technologies for decades. Any increase in the allowance would be inconsistent with Chapter 90.48 RCW.

- Form Letter A Commenters

Response to 7.A

We appreciate your comment, and our adopted rulemaking abides by 90.48 RCW. The natural conditions human use allowance adopted for temperature and dissolved oxygen in this rule are equal or more stringent than previous iterations.

7.B Comment Summary – Secondly, Ecology should not risk a jeopardy finding under the Endangered Species Act. In 2008, both the National Marine Fisheries Service and US Fish and Wildlife Service found that human allowances of 0.2 mg/L of oxygen or 0.3ºC for temperature when natural conditions are worse than the numerical standards would be insignificant and unlikely to harm endangered species. Any process that deviates from those values would require additional Biological Opinions. A jeopardy finding would cause significant delays in the adoption of these water quality standards. The most efficient path that maintains species protections is to maintain the current levels of 0.2 mg/L dissolved oxygen and 0.3ºC when natural conditions are worse than the numeric values in the water quality standards.

- Form Letter A Commenters

Response to 7.B

We appreciate your comment. The natural conditions human use allowance adopted for temperature and dissolved oxygen in this rule are equal or more stringent than previous iterations.

7.C Comment Summary – Third, Ecology must factor climate change into the human allowances. Climate change will warm waters through a variety of processes, and warmer water holds less oxygen. This means there is less capacity for impacts from current human activities, which will result in more stringent regulatory requirements.

- Form Letter A Commenters

Response to 7.C

Ecology disagrees that we ignored climate change as part of this rulemaking.

Natural conditions criteria are calculated by accounting for and removing all sources of human impact to waters, so that the natural conditions criteria values represent water quality in its pre-anthropogenic impact state. These criteria support aquatic life, as aquatic life have adapted over time to inhabit these waters, and these water quality levels are therefore necessary for survival, reproduction, and protection of aquatic life.

Further, when natural conditions criteria have been developed by Ecology and are effective for federal Clean Water Act purposes (whether through separate site-specific rulemaking following WAC 173-201A-430 or the performance-based approach following WAC 173-201A-470), human impacts to a waterbody's temperature and dissolved oxygen are limited to minimal, or *de minimis*, amounts. These insignificant impacts are further limited to just human actions that are considered local or regional (as defined in WAC 173-201A-020). Any other anthropogenic sources of pollution (e.g., extra-jurisdictional impacts, climate change) are not allowed to negatively impact water quality.

This is also stated in our Tier I Antidegradation section at WAC 173-201A-310(3), which states that "[w]here water quality criteria are not met because of natural conditions, human actions are not allowed to further lower the water quality, except where explicitly allowed in this chapter."

In other words, the default state is no lowering of water quality, and the only human impacts are the ones that are explicitly allowed in Washington's WQS (such as the ones adopted as part of this rulemaking for temperature and dissolved oxygen, and limited to local and regional sources only).

Ecology recognizes that climate change does have an impact on our water quality (see Ecology's Air and Climate website[22]). However, because we say in this adopted rule that climate change cannot have an impact, this impact should be addressed by programs within Ecology (e.g., water clean up plans, or TMDLs; the work conducted by our air and climate program) and outside of Ecology (e.g., EPA).

7.D Comment Summary – While some polluters may suggest a long process to make room for weaker standards, we cannot wait years for a decision. Ecology needs protective approaches for temperature and dissolved oxygen now. We urge you to reject any efforts that would delay implementation of stringent water quality standards across the state.

- Form Letter A Commenters

Response to 7.D

We appreciate your comment.

Form Letter Authors

Adams, Marsha	Bannerman, Lynne	Bates, James
Aiken, Randi	Bartlett, Faye	Bell, Richard
Alexander, Virginia	Bartlett, Tina	Berado, Pamela
Anderson, Judith	Bartlett, Vivian	Berman, Cara
Anderson, Sharon	Bartley, William	Bhakti, Sara

[22] https://ecology.wa.gov/air-climate

Biale, Cheryl
Blitzer, Mark
Bowersox-Johnson, Brandon
Bozied, Shary
Brent, Patti
Buch, Anthony
Bullock, Gene
Burgess, Sara
Burke, Sally
Caicco, Jody
Carsey, Frank
Christ, M'Lou
Christoffersen, Lisa
Ciske, Sandra
Clark, Maxine
Clark, Roger
Claus-McGahan, Elly
Clissold, Catherine
Compton, Clayton
Conn, Patrick
Conrad, Norm
Craighead, Tom
Currier, Lynette
Curtis, Colleen
Darr, Margaret
Davis, Kevin
Davis, Virginia
Devlin, Felicity
Dils, Laurie
Dinger, Lorena
DuBois, Barbara
Dunn, John
Dunneback, David
Easley, Jackie
Efron, Deborah
Ehler, Noah
Erbs, Lori
Ferrari, Paul
Fox, Sophia
Franz, Natalie
Frey, Mark
Garcia, Mariana
Go, Malayka
Golic, Kathy
Goodwin, Greg
Graham, Gianina
Greenwald, Beatrice
Gylland, Kathleen
H, Jadelyn
Hamilton, Aimee
Hanson, Maxwell
Hare, Ed
Hartmann, Lorraine
Henling, Daniel
Henry, Marilee
Holmes, Katherine
Holtz, Eric
Huddlestone, Laura
Hughes, Mark
Hunt, Ross
Hurst, Sally
Inghram, Anna
Jamison, Vanessa
Johnson, Erin
Johnson, Lucy
Johnson, Richard
Jones, Clayton
Josund, Kim
Kelly, JoAnne
Kim, Ji-Young
King, Ruth
Knowles, Lorelette
Krantz, Marquam
Kreutziger, Ava
Kreutziger, Clara
Kronenberger, Eliza
Lague, Rich
Lambros, Kathryn
Lane, Nathan
Langgin, Diane
Ledden, Dennis
Leigh, Steve
Lengel, Elizabeth
Lepore, Sue
Link-New, Virgene
Lovelady, Delorse
LovellFord, Peggy
Lunceford, Kate
Lundquist, John
Markley, Shannon
Marks, Diane
Martinez, Priscilla
McClintock, Gloria
McKay, Candi
McMahon, Nancy
Melusky, Jonathan
Milo, Marie
Mincin, Ken

Mohr, Jay
Mulcare, James
Mundhenk, Norm
Nakamura, Alex
Neary, Sally
Niblack, Natalie
Nichols, James
Nickum, Nora
Parker, Tiger
Pauley, Jean
Pennoyer, Isaac
Pilger, Carrie
Ramon, Laura
Randles, Ev
Ranz, Gary
Rathor, Divya
Reagel, Peter
Riley, Sean
Rodda, Linda
Rogers, Mickey
Rose, Rebecca
Rowland, Danielle
Rudisill, Amanda
Rumiantseva, Elena
Ryan, Kathryn
Sanborn, Barbara
Schwartz, Phebe
Scwinberg, Jean
Seater, Kim
Seppanen, Loretta
Shapiro, Steven
Soperanes, Wren
Spear, Vana
Speed, Andrea
Starbuck, Judith
Stefano, Lori
Stone, Miriam
Stutheit, Don
Tallar, Nathan
Teed, Cornelia
Thomas, Vicki
Turner, Diane
Uyenishi, Steve
Valentine, Jennifer
Van Alyne, Emily
Vining, Jennifer
Wade, Valerie
Waldroup, Jana
Weis, Karen
Widman, Susan
Willett, Greg
Williams, Don
Wilson, Rachel
Wineman, Marian
Winner, Jeanne
Winters, Lisa
Woll, Margaret
Wood, Gordon
Wood, R

Appendix A: Citation List

Chapter 173 – 201A WAC

Water Quality Standards for Surface Waters of the State of Washington
Natural Conditions

AO # 22 – 05

This citation list contains references for data, factual information, studies, or reports on which the agency relied in the adoption for this rule making (RCW 34.05.370(f)).

At the end of each citation is a number in brackets identifying which of the citation categories below the sources of information belongs. (RCW 34.05.272).

Table 1 Citation Categories

Citation Categories	
1	Peer review is overseen by an independent third party.
2	Review is by staff internal to Department of Ecology.
3	Review is by persons that are external to and selected by the Department of Ecology.
4	Documented open public review process that is not limited to invited organizations or individuals.
5	Federal and state statutes.
6	Court and hearings board decisions.
7	Federal and state administrative rules and regulations.
8	Policy and regulatory documents adopted by local governments.
9	Data from primary research, monitoring activities, or other sources, but that has not been incorporated as part of documents reviewed under other processes.
10	Records of best professional judgment of Department of Ecology employees or other individuals.
11	Sources of information that do not fit into one of the other categories listed.

1. Ali, B., Anushka, and A. Mishra. 2022. Effects of dissolved oxygen concentration on freshwater fish: A review. International Journal of Fisheries and Aquatic Studies. Volume 10(4):113-127. [1]
2. Breitburg, D., Levin, L.A., Oschlies, A., Grégoire, M., Chavez, F.P., Conley, D.J., Garçon, V., Gilbert, D., Guitiérrez, D., Isensee, K., Jacinto, G.S., Limburg, K.E., Montes, I., Naqvi, S.W.A., Pitcher, G.C., Rabalais, N.N., Roman, M.R., Rose, K.A., Seibel, B.A., Telszewski, M., Yasuhara, M., and J. Zhang. 2018. Declining oxygen in the global ocean and coastal waters. Science. Volume 359(46):1-11. [1]
3. Brodersen, J., Rodriguez-Gil, J.L., Jönsson, M., Hansson, L., Brönmark, C., Nilsson, P.A., Nicolle, A., and O. Berglund. 2011. Temperature and Resource Availability May Interactively Affect Over-Wintering Success of Juvenile Fish in a Changing Climate. PLoS ONE. Volume 6(10):e24022. [1]
4. Davies, Tudor T. 1997. Establishing Site Specific Aquatic Life Criteria Equal to Natural Background. Memorandum. Office of Water, Washington, D.C. [11]
5. Dowling, D.C. and M.J. Wiley. 1986. The Effects of Dissolved Oxygen, Temperature, and Low Stream Flow on Fishes: A Literature Review. Aquatic Biology Section Technical Report to Springfield City Water, Light, and Power Company. 66 pages. [1]
6. Franklin, P.A. 2014. Dissolved oxygen criteria for freshwater fish in New Zealand: a revised approach. New Zealand Journal of Marine and Freshwater Research. Volume 48(1):112-126. [1]
7. Fromm, Paul O. 1980. A review of some physiological and toxicological responses of freshwater fish to acid stress. Environmental Biology of Fishes. Volume 5:79-93. [1]
8. Fuller, Matthew R., Ebersole, J.L., Detenbeck, N.E., Labiosa, R., Leinenbach, P., and C.E. Torgersen. 2021. Integrating thermal infrared stream temperature imagery and spatial stream network models to understand natural spatial thermal variability in streams. Journal of Thermal Biology. Volume 100:1-19. [1]
9. Fuller, Matthew R., Leinenbach, P., Detenbeck, N.E., Labiosa, R., and D.J. Isaak. 2022. Riparian vegetation shade restoration and loss effects on recent and future stream temperatures. Restoration Ecology. Volume 30(7):1-17. [1]
10. Garcia-Soto, C., Cheng, L., Caesar, L., Schmidtko, S., Jewett, E.B., Cheripka, A., Rigor, I., Caballero, A., Chiba, S., Báez, J.C., Zielinski, T., and J.P. Abraham. 2021. An Overview of Ocean Climate Change Indicators: Sea Surface Temperature, Ocean Heat Content, Ocean pH, Dissolved Oxygen Concentration, Arctic Sea Ice Extent, Thickness and Volume, Sea Level and Strength of the AMOC (Atlantic Meridional Overturning Circulation). Frontiers in Marine Science. Volume 8:642372. [1]
11. Hiscock, K., Southward, A., Tittley, I., and S. Hawkins. 2004. Effects of changing temperature on benthic marine life in Britain and Ireland. Aquatic Conservation: Marine and Freshwater Ecosystems. Volume 14(4):333-362. [1]
12. Ignatz, Eric H., Zanuzzo, F.S., Sandrelli, R.M., Clow, K.A., Rise, M.L., and A. Kurt Gamperl. 2021. Phenotypic stress response does not influence the upper thermal tolerance of male Atlantic salmon (*Salmo salar*). Journal of Thermal Biology. Volume 101:1-14. [1]
13. Kim, H., Hirose, N., and K. Takayama. 2022. Physical and Biological Factors Underlying Long-Term Decline of Dissolved Oxygen Concentration in the East/Japan Sea. Frontiers in Marine Science. Volume 9:1-17. [1]

14. Kleinhappel, Tanja K., Burman, Oliver H.P., John, Elizabeth A., Wilkinson, Anna, and Thomas W. Pike. 2019. The impact of water pH on association preferences in fish. International Journal of Behavioral Biology – Ethology. Volume 125(4):195-202. [1]
15. Matear, R.J. and A.C. Hirst. 2003. Long-term changes in dissolved oxygen concentrations in the ocean caused by protracted global warming. Global Biogeochemical Cycles. Volume 17(4):1-17. [1]
16. McKenzie, David J., Zhang, Y., Eliason, E., Schulte, P., Claireaux, G., Blasco, F., Nati, Julie J.H., and A. Farrell. 2020. Intraspecific variation in tolerance of warming in fishes. Journal of Fish Biology. 1-20. [1]
17. Mellery, J., Geay, F., Tocher, D.R., Kestemont, P., Debier, C., Rollin, X., and Y. Larondelle. 2016. Temperature Increase Negatively Affects the Fatty Acid Bioconversion Capacity of Rainbow Trout (*Oncorhynchus mykiss*) Fed a Linseed Oil-Based Diet. PLoS One. Volume 11(10):e0164478. [1]
18. Morris, R., Taylor, E.W., Brown, D.J.A., and J.A. Brown. 1989. Acid Toxicity and Aquatic Animals. Cambridge University Press, Cambridge, U.K. [1]
19. Mugwanya, Muziri, Dawood, Mahmood A.O., Kimera, Fahad, and Hani Sewilam. 2022. Anthropogenic temperature fluctuations and their effect on aquaculture: A comprehensive review. Aquaculture and Fisheries. Volume 7:223-243. [1]
20. National Marine Fisheries Service (NMFS). 2008. Endangered Species Act – Section 7 Consultation Biological Opinion And Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation; EPA's Proposed Approval of Revised Washington Water Quality Standards for Designated Uses, Temperature, Dissolved Oxygen, and Other Revisions; Statewide Consultation. National Marine Fisheries Service, Northwest Region, Seattle, Washington. NMFS Tracking No. 2007/02301. [11]
21. Ni, W., Li, M., Ross, A.C., and R.G. Najjar. 2019. Large Projected Decline in Dissolved Oxygen in a Eutrophic Estuary Due to Climate Change. Journal of Geophysical Research: Oceans. Volume 124:8271-8289. [1]
22. Nixon, Scott W., Fulweiler, Robinson W., Buckley, Betty A., Granger, Stephen L., Nowicki, Barbara L., and Kelly M. Henry. 2009. The impact of changing climate on phenology, productivity, and benthic-pelagic coupling in Narragansett Bay. Estuarine, Coastal and Shelf Science. Volume 82(1):1-18. [1]
23. Opalski, Daniel. 2021. EPA's Action on Revisions to the Washington State Department of Ecology's Surface Water Quality Standards for Natural Conditions Provisions. Water Division, USEPA Region 10, Seattle, Washington. Available at: https://fortress.wa.gov/ecy/ezshare/wq/standards/EPA_ActionsNCC_Nov192021.pdf. [11]
24. Ren, A.S., Chai, F., Xue, H., Anderson, D.M., and F.P. Chavez. 2018. A Sixteen-Year Decline in Dissolved Oxygen in the Central California Current. Nature Scientific Reports. Volume 8(7290):1-9. [1]
25. Robertson-Bryan, Inc. 2004. Technical Memorandum: pH Requirements of Freshwater Aquatic Life. Elk Grove, California. Prepared for California's Central Valley Water Quality Control Board. [1]
26. Snazelle, Teri T. 2015. Evaluation of Xylem EXO water-quality sondes and sensors. USGS Survey Open File Report. 2015-1063. 28 pages. [9]
27. Spietz, R.L., Williams, C.M., Rocap, G., and M.C. Horner-Devine. 2015. A Dissolved Oxygen Threshold for Shifts in Bacterial Community Structure in a Seasonally Hypoxic Estuary. PLoS ONE. Volume 10(8):e0135731. [1]

28. Stephen, Charles E., Mount, Donald I., Hansen, David J., Gentile, John R., Chapman, Gary A., and William A. Brungs. 1985. Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses. Office of Research and Development, Environmental Research Laboratories. Duluth Minnesota, Narragansett, Rhode Island, and Corvallis, Oregon. PB85-227049. [11]
29. Turko, Andy J., Nolan, Colby B., Balshine, Sigal, Scott, Graham R., and Trevor E. Pitcher. 2020. Thermal tolerance depends on season, age and body condition in imperilled redside dace *Clinostomus elongatus*. Conservation Physiology. Volume 8(1):1-15. [1]
30. United States Environmental Protection Agency (USEPA). 1986. Quality Criteria for Water 1986. Office of Water, Regulations and Standards, Washington, D.C. EPA 440/5-86-001. [11]
31. United States Environmental Protection Agency (USEPA). 1994. Water Quality Standards Handbook: Second Edition. Office of Water, Washington, D.C. EPA 823-B-94-005a. [11]
32. United States Environmental Protection Agency (USEPA). 2000. Ambient Aquatic Life Water Quality Criteria for Dissolved Oxygen (Saltwater): Cape Cod to Cape Hatteras. Office of Water, Washington, D.C. EPA-822-R-00-012. [11]
33. United States Environmental Protection Agency (USEPA). 2003. EPA Region 10 Guidance For Pacific Northwest State and Tribal Temperature Water Quality Standards. Region 10, Office of Water, Seattle, Washington. EPA 910-B-03-002. [11]
34. United States Environmental Protection Agency (USEPA). 2005. EPA Region 10 Natural Conditions Workgroup Report on Principles to Consider When Reviewing and Using Natural Conditions Provisions. Office of Water and Watersheds, USEPA Region 10, Seattle, Washington. Version 1. [11]
35. United States Environmental Protection Agency (USEPA). 2007. Biological Evaluation of the Revised Washington Water Quality Standards. USEPA Region 10, Seattle, Washington. [11]
36. United States Environmental Protection Agency (USEPA). 2009. Guidance on the Development, Evaluation, and Application of Environmental Models. Office of the Science Advisor, Washington, D.C. EPA/100/K-09/003. [11]
37. United States Environmental Protection Agency (USEPA). 2015. A Framework for Defining and Documenting Natural Conditions for Development of Site-Specific Natural Background Aquatic Life Criteria for Temperature, Dissolved Oxygen, and pH: Interim Document. Office of Water, Washington, D.C. EPA 820-R-15-001. [11]
38. United States Environmental Protection Agency (USEPA). 2023. EPA Water Quality Standards Program Recommendations for Performance-Based Approach for Natural Conditions (DO, Temperature, Freshwater pH) Required Elements. Washington, D.C. Draft, deliberative document. [11]
39. United States Environmental Protection Agency (USEPA). 2023. Water Quality Standards Handbook Chapter 3: Water Quality Criteria. Office of Water, Office of Science and Technology. Washington, D.C. EPA 823-B-23-001. [11]
40. United States Fish and Wildlife Service (USFWS). 2008. U.S. Fish and Wildlife Service Biological Opinion for Environmental Protection Agency's Proposed Approval of the Revised Washington Water Quality Standards for Designated Uses, Temperature, Dissolved Oxygen, and Other Revisions. Western Washington Fish and Wildlife Office, Lacey, Washington. USFWS Reference 13410-2007-F-0298. [11]

41. United States Geological Survey (USGS). 2006. Temperature: U.S. Geological Survey Techniques and Methods 9-A6.1. Book 9, Chapter A6.1. 22 pages. [11]
42. United States Geological Survey (USGS). 2020. Dissolved oxygen: U.S. Geological Survey Techniques and Methods 9-A6.2. Book 9, Chapter A6.2. 33 pages. [11]
43. Verberk, Wilco C.E.P., Sandker, J.F., van de Pol, I.L.E., Urbina, M.A., Wilson, R.W., McKenzie, D.J., and F.P. Leiva. 2022. Body mass and cell size shape the tolerance of fishes to low oxygen in a temperature-dependent manner. Global Change Biology. Volume 28:5695-5707. [1]
44. Washington State Department of Ecology (Ecology). 2017. Programmatic Quality Assurance Project Plan. Water Quality Impairment Studies. Olympia, Washington. Publication No. 17-03-107. [2]
45. Wishner, K.F., Seibel, B.A., Roman, C., Deutsch, C., Outram, D., Shaw, C.T., Birk, M.A., Mislan, K.A.S., Adams, T.J., Moore, D. and S. Riley. 2018. Ocean deoxygenation and zooplankton: Very small oxygen differences matter. Science Advances. Volume 4:1-8. [1]