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ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 131

[EPA-HQ-OW-2015-0174; FRL-7253.1-01-OW]

RIN 2040-AG21

Restoring Protective Human Health Criteria in Washington

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: The Environmental Protection Agency (EPA) has determined that Washington's human health criteria (HHC) are not protective of Washington's designated uses and are not based on sound scientific rationale and, accordingly, is proposing to restore protective HHC for Washington's waters. EPA partially approved and partially disapproved Washington's HHC in November 2016, and simultaneously promulgated federal HHC based on sound scientific rationale. In May 2019, EPA reversed its November 2016 disapproval and approved Washington's HHC, and in June 2020 withdrew the 2016 HHC that EPA promulgated for Washington. Based on the best scientific information and analyses currently available, and consideration of these past decisions, EPA has concluded that Washington's existing HHC are not based on sound scientific rationale and are therefore not protective of the applicable designated uses in Washington. EPA is therefore proposing to reinstate the protective and science-based federal HHC that EPA withdrew in June 2020 to protect Washington's waters, including waters where tribes hold treaty-reserved rights to fish.

DATES: Comments must be received on or before [***INSERT DATE* 60 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER***]. *Public Hearing:* EPA will hold two

public hearings during the public comment period. Please refer to the **SUPPLEMENTARY INFORMATION** section for additional information on the public hearings.

ADDRESSES: You may send comments, identified by Docket ID No. EPA-HQ-OW-2015-0174, by any of the following methods:

- Federal eRulemaking Portal: https://www.regulations.gov/ (our preferred method). Follow the online instructions for submitting comments.
- Mail: U.S. Environmental Protection Agency, EPA Docket Center, Standards and Health Protection Division Docket, Mail Code 28221T, 1200 Pennsylvania Avenue NW, Washington, D.C. 20460.
- Hand Delivery or Courier (by scheduled appointment only): EPA Docket Center, WJC West Building, Room 3334, 1301 Constitution Avenue NW, Washington, D.C. 20004. The Docket Center's hours of operations are 8:30 a.m. – 4:30 p.m., Monday – Friday (except Federal holidays).

Instructions: All submissions received must include the Docket ID No. EPA-HQ-OW-2015-0174 for this rulemaking. Comments received may be posted without change to https://www.regulations.gov/, including any personal information provided. For detailed instructions on sending comments and additional information on the rulemaking process, see the "Public Participation" heading of the **SUPPLEMENTARY INFORMATION** section of this document. Out of an abundance of caution for members of the public and our staff, the EPA Docket Center and Reading Room are open to the public by appointment only, to reduce the risk of transmitting COVID-19. Our Docket Center staff also continues to provide remote customer service via email, phone, and webform. Hand deliveries and couriers may be received by scheduled appointment only. For further information on EPA Docket Center services and the current status, please visit us online at https://www.epa.gov/dockets.

EPA is offering two public hearings on this proposed rulemaking. Refer to the **SUPPLEMENTARY INFORMATION** section below for additional information.

FOR FURTHER INFORMATION CONTACT: Erica Fleisig, Office of Water, Standards and Health Protection Division (4305T), Environmental Protection Agency, 1200 Pennsylvania Avenue NW, Washington, D.C. 20460; telephone number: (202) 566-1057; email address: fleisig.erica@epa.gov.

SUPPLEMENTARY INFORMATION: This proposed rulemaking is organized as follows:

I. Public Participation
- A. Written Comments
- B. Public Hearings

II. General Information
- A. Does this Action Apply to Me?

III. Background
- A. Statutory and Regulatory Background
- B. General Recommended Approach for Deriving Human Health Criteria
- C. Prior EPA Actions Related to Washington's Human Health Criteria

IV. Administrator's Determination that New or Revised HHC are Necessary for Washington
- A. Existing Criteria Are Not Protective of Designated Uses of Waters in the State of Washington
- B. Clean Water Act 303(c)(4)(B) Administrator's Determination

V. Derivation of Human Health Criteria for Washington
- A. Scope of EPA's Proposal
- B. Washington-Specific Human Health Criteria Inputs
- C. Proposed Human Health Criteria for Washington
- D. Applicability
- E. Alternative Regulatory Approaches and Implementation Mechanisms

VI. Economic Analysis
- A. Identifying Affected Entities
- B. Method for Estimating Costs to Point Sources
- C. Results

VII. Statutory and Executive Order Reviews
- A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review
- B. Paperwork Reduction Act
- C. Regulatory Flexibility Act
- D. Unfunded Mandates Reform Act
- E. Executive Order 13132: Federalism
- F. Executive Order 13175: Consultation and Coordination with Indian Tribal Governments
- G. Executive Order 13045: Protection of Children from Environmental Health and Safety Risks
- H. Executive Order 13211: Actions That Significantly Affect Energy Supply, Distribution, or Use
- I. National Technology Transfer and Advancement Act of 1995
- J. Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

I. Public Participation

A. Written Comments

Submit your comments, identified by Docket ID No. EPA-HQ-OW-2015-0174, at https://www.regulations.gov (our preferred method), or the other methods identified in the **ADDRESSES** section. Once submitted, comments cannot be edited or removed from the docket. EPA may publish any comment received to its public docket. Do not submit to EPA's docket at https://www.regulations.gov any information you consider to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Multimedia submissions (audio, video, etc.) must be accompanied by a written comment. The written comment is considered the official comment and should include discussion of all points you wish to make. EPA will generally not consider comments or comment contents located outside of the primary submission (i.e., on the web, cloud, or other file sharing system). For additional submission methods, the full EPA public comment policy, information about CBI or multimedia submissions, and general guidance on making effective comments, please visit https://www.epa.gov/dockets/commenting-epa-dockets.

Due to public health concerns related to COVID-19, the EPA Docket Center and Reading Room are open to the public by appointment only. Our Docket Center staff also continues to provide remote customer service via email, phone, and webform. Hand deliveries or couriers will be received by scheduled appointment only. For further information and updates on EPA Docket Center services, please visit us online at https://www.epa.gov/dockets.

EPA continues to carefully and continuously monitor information from the Centers for Disease Control and Prevention (CDC), local area health departments, and our federal partners so that we can respond rapidly as conditions change regarding COVID-19.

B. Public Hearings

Please note that because of current CDC recommendations, as well as state and local orders for social distancing to limit the spread of COVID-19, EPA cannot hold in-person public meetings at this time. EPA is offering two online public hearings so that interested parties may also provide oral comments on this proposed rulemaking. For more details on the online public hearings and to register to attend the hearings, please visit https://www.epa.gov/wqs-tech/federal-human-health-criteria-washington-state-waters.

II. General Information

A. Does this Action Apply to Me?

Entities that are subject to Clean Water Act (CWA) regulatory programs such as industrial facilities, stormwater management districts, or publicly owned treatment works (POTWs) that discharge pollutants to surface waters of the United States under the State of Washington's jurisdiction could be affected by this rulemaking because the federal water quality standards (WQS) in this rulemaking, once finalized, will be the applicable WQS for surface waters in Washington for CWA purposes. Categories and entities that could potentially be affected by this rulemaking include the following:

Category	Examples of potentially affected entities
Industry	Industrial point sources discharging pollutants to waters of the United States in Washington.
Municipalities	Publicly owned treatment works or similar facilities discharging pollutants to waters of the United States in Washington.
Stormwater Management Districts	Entities responsible for managing stormwater in the State of Washington.

This table is not intended to be exhaustive, but rather provides a guide for readers regarding entities that could be indirectly affected by this action. If you have questions regarding the applicability of this action to a particular entity, consult the person listed in the **FOR FURTHER INFORMATION CONTACT** section.

III. Background

A. Statutory and Regulatory Background

CWA Section 101(a)(2) establishes as a national goal "water quality which provides for the protection and propagation of fish, shellfish, and wildlife, and recreation in and on the water, wherever attainable." EPA interprets these CWA Section 101(a)(2) goals to include, at a minimum, designated uses providing for the protection of aquatic communities and human health related to consumption of fish and shellfish.[1]

Consistent with the CWA, EPA's WQS program assigns to states and authorized tribes the primary authority for adopting WQS.[2] CWA Section 303(c)(2)(A) and EPA's implementing regulations at 40 CFR part 131 require, among other things, that a state's WQS specify appropriate designated uses of the waters, and water quality criteria that protect those uses. EPA's regulations at 40 CFR 131.11(a)(1) provide that "[s]uch criteria must be based on sound scientific rationale and must contain sufficient parameters or constituents to protect the designated use. For waters with multiple use designations, the criteria shall support the most sensitive designated use."

Under CWA Section 304(a), EPA periodically publishes criteria (including HHC) recommendations for states to consider when adopting water quality criteria for particular pollutants to protect CWA Section 101(a) goal uses. Where EPA has published recommended criteria, states should establish numeric water quality criteria based on EPA's CWA Section 304(a) criteria recommendations, CWA Section 304(a) criteria recommendations modified to reflect site-specific conditions, or other scientifically defensible methods (40 CFR 131.11(b)(1)).

After a state adopts a new or revised WQS, the state must submit it to EPA for review and action in accordance with CWA Section 303(c).[3] If EPA determines that a state's new or revised WQS is not consistent with the requirements of the Act, the state has 90 days to submit a

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[1] USEPA. 2000. Memorandum 1BWQSP-00-03. U.S. Environmental Protection Agency, Office of Water, Washington, D.C. https://www.epa.gov/sites/production/files/2015-01/documents/standards-shellfish.pdf.
[2] 33 U.S.C. 1313(a), (c).
[3] 33 U.S.C. 1313(c)(2)(A), (c)(3).

modified standard. If the state fails to adopt a revised WQS that EPA approves, CWA Section 303(c)(4)(A) requires EPA to propose and promulgate a revised or new standard for the waters involved. In addition, CWA Section 303(c)(4)(B) grants the EPA Administrator discretion to determine "that a revised or new standard is necessary to meet the requirements of [the Act]."[4] After making such a determination, known as an Administrator's Determination,[5] the agency must "promptly" propose an appropriate WQS and finalize it within ninety days unless the state adopts an acceptable standard in the interim.[6]

B. General Recommended Approach for Deriving Human Health Criteria

EPA's 2000 *Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health*[7] (2000 Methodology) recommends that HHC be designed to reduce the risk of adverse cancer and non-cancer effects occurring from lifetime exposure to pollutants through the ingestion of drinking water and consumption of fish/shellfish obtained from inland and nearshore waters. EPA's practice is to establish a criterion for both drinking water ingestion and consumption of fish/shellfish from inland and nearshore waters combined and a separate criterion based on ingestion of fish/shellfish from inland and nearshore waters alone. This latter criterion applies in cases where the designated uses of a waterbody include supporting fish/shellfish for human consumption but not drinking water supply sources (e.g., non-potable estuarine waters).

As discussed in EPA's 2000 Methodology, EPA recommends basing HHC on two types of toxicological endpoints: (1) carcinogenicity and (2) noncancer toxicity (i.e., all adverse effects other than cancer). Where sufficient data are available, EPA derives criteria using both carcinogenic and non-carcinogenic toxicity endpoints and recommends the lower (i.e., more stringent) value. Under the 2000 Methodology, HHC for carcinogenic effects are calculated

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[4] *Id.* at (c)(4)(B).
[5] 40 CFR 131.22(b)
[6] 33 U.S.C. 1313(c)(4)(B).
[7] USEPA. 2000. Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health. U.S. Environmental Protection Agency, Office of Water, Washington, D.C. EPA-822-B-00-004. https://www.epa.gov/sites/default/files/2018-10/documents/methodology-wqc-protection-hh-2000.pdf.

using the following input parameters: cancer slope factor (CSF), cancer risk level (CRL), body weight, drinking water intake rate, fish consumption rate (FCR), and a bioaccumulation factor(s). HHC for both non-cancer and nonlinear carcinogenic effects are calculated using a reference dose (RfD) and relative source contribution (RSC) in place of a CSF and CRL. The RSC is applied to apportion the RfD among the media and exposure routes of concern for a particular chemical to ensure that an individual's total exposure from all exposure sources does not exceed the RfD. Each of these inputs is discussed in more detail in sections III.B.a through III.B.d of this preamble and in EPA's 2000 Methodology.[8]

a. Cancer Risk Level

EPA's 2000 Methodology generally assumes, in the absence of data to indicate otherwise, that carcinogens exhibit linear "non-threshold" dose-responses which means that there are no "safe" or "no-effect" levels. Therefore, EPA calculates CWA Section 304(a) national recommended HHC for carcinogenic effects as pollutant concentrations corresponding to lifetime increases in the risk of developing cancer. EPA calculates its CWA Section 304(a) national recommended HHC values at a 10^{-6} (one in one million) CRL and recommends CRLs of 10^{-6} or 10^{-5} (one in one hundred thousand) for the general population.[9] EPA notes that states and authorized tribes can also choose a more stringent risk level, such as 10^{-7} (one in ten million), when deriving HHC.

b. Cancer Slope Factor and Reference Dose

A dose-response assessment is required to understand the quantitative relationships between exposure to a pollutant and adverse health effects. EPA evaluates dose-response relationships based on the available data from animal toxicity and human epidemiological studies to derive dose-response metrics. For carcinogenic effects, EPA uses an oral CSF to derive the

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[8] *Id.*

[9] EPA's 2000 Methodology also states: "Criteria based on a 10^{-5} risk level are acceptable for the general population as long as states and authorized tribes ensure that the risk to more highly exposed subgroups (sport fishers or subsistence fishers) does not exceed the 10^{-4} level."

HHC. The oral CSF is an upper bound, approximating a 95 percent confidence limit, on the increased cancer risk from a lifetime oral exposure to a pollutant. For non-carcinogenic effects, EPA uses the reference dose (RfD) to calculate the HHC. A RfD is an estimate of a daily oral exposure of an individual to a substance that is likely to be without an appreciable risk of deleterious effects during a lifetime. A RfD is often derived from a laboratory animal toxicity multi-dose study from which a no-observed-adverse-effect level (NOAEL), lowest-observed-adverse-effect level (LOAEL), or benchmark dose level can be identified. However, human epidemiology studies can also be used to derive a RfD. Uncertainty factors are applied to account for gaps or deficiencies in the available data (e.g., differences in response among humans) for a chemical. For the majority of EPA's latest (2015) updated CWA Section 304(a) national recommended HHC, EPA's Integrated Risk Information System (IRIS)[10] was the source of both cancer and noncancer toxicity values (i.e., RfD and CSF).[11] For some pollutants, EPA selected risk assessments produced by other EPA program offices (e.g., Office of Pesticide Programs, Office of Water, Office of Land and Emergency Management), other national and international programs, and state programs.

c. Exposure Assumptions

In the 2000 Methodology, EPA states that its assumptions "afford an overall level of protection targeted at the high end of the general population." Toward this end, EPA selects a combination of high-end and central tendency inputs to the criteria derivation equation and avoids "double counting" of exposures and combining unlikely co-occurrences. Per EPA's latest CWA Section 304(a) national recommended HHC, EPA uses a default drinking water intake rate of 2.4 liters per day (L/day) and default rate of 22 grams per day (g/day) for consumption of fish and shellfish from inland and nearshore waters, multiplied by pollutant-specific bioaccumulation

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[10] USEPA. Integrated Risk Information System (IRIS). U.S. Environmental Protection Agency, Office of Research and Development, Washington, D.C. www.epa.gov/iris.

[11] Final Updated Ambient Water Quality Criteria for the Protection of Human Health, (80 FR 36986, June 29, 2015). See also: USEPA. 2015. Final 2015 Updated National Recommended Human Health Criteria. U.S. Environmental Protection Agency, Office of Water, Washington, D.C. https://www.epa.gov/wqc/human-health-water-quality-criteria.

factors (BAFs) to account for the amount of the pollutant in the edible portions of the ingested species.

EPA's national default drinking water intake rate of 2.4 L/day represents the per capita estimate of combined direct and indirect community water ingestion at the 90th percentile for adults ages 21 and older.[12] EPA's national FCR of 22 g/day represents the 90th percentile consumption rate of fish and shellfish from inland and nearshore waters for the U.S. adult population 21 years of age and older, based on National Health and Nutrient Examination Survey (NHANES) data from 2003 to 2010.[13,14] EPA calculates its CWA Section 304(a) national recommended HHC using a default body weight of 80 kilograms (kg), the average weight of a U.S. adult age 21 and older, based on NHANES data from 1999 to 2006.

One reason EPA has determined that a subset of Washington's 2016 HHC are inadequate is due to their reliance on bioconcentration factors (BCFs) rather than BAFs. To provide background for our discussion below, the history of the agency's use of BCFs and BAFs is reviewed here. Prior to publication of the 2000 Methodology, in which EPA began recommending the use of BAFs to reflect the uptake of a contaminant from all sources by fish and shellfish,[15] EPA relied on bioconcentration factors (BCFs) to estimate chemical accumulation of waterborne chemicals by aquatic organisms. However, BCFs only account for chemical accumulation in aquatic organisms through exposure to chemicals in the water column. In 2000, EPA noted that "there has been a growing body of scientific knowledge that clearly

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[12] USEPA. 2011. EPA Exposure Factors Handbook. 2011 edition (EPA 600/R-090/052F). http://cfpub.epa.gov/ncea/risk/recordisplay.cfm?deid=236252.

[13] USEPA. 2014. Estimated Fish Consumption Rates for the U.S. Population and Selected Subpopulations (NHANES 2003-2010). United States Environmental Protection Agency, Washington, D.C.. EPA 820-R-14-002.

[14] EPA's national FCR is based on the total rate of consumption of fish and shellfish from inland and nearshore waters (including fish and shellfish from local, commercial, aquaculture, interstate, and international sources). This is consistent with a principle that each state does its share to protect people who consume fish and shellfish that originate from multiple jurisdictions.

[15] USEPA. 2000. Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health. U.S. Environmental Protection Agency, Office of Water, Washington, D.C. EPA-822-B-00-004. https://www.epa.gov/sites/default/files/2018-10/documents/methodology-wqc-protection-hh-2000.pdf at 5-4. (Explaining that "[t]he 1980 Methodology for deriving 304(a) criteria for the protection of human health emphasized the assessment of bioconcentration (uptake from water only) through the use of the BCF…The 2000 Human Health Methodology revisions contained in this chapter emphasize the measurement of bioaccumulation (uptake from water, sediment, and diet) through the use of the BAF.").

supports the observation that bioaccumulation and biomagnification occur and are important exposure issues to consider for many highly hydrophobic organic compounds and certain organometallics." For that reason, the 2000 Methodology concluded that "[f]or highly persistent and bioaccumulative chemicals that are not easily metabolized, BCFs do not reflect what the science indicates."[16] EPA's 2000 Methodology emphasizes using, when data are available, measured or estimated BAFs, which account for chemical accumulation in aquatic organisms from all potential exposure routes, including, but not limited to, food, sediment, and water.[17] This BAF-based approach includes separate procedures to be used according to the physicochemical properties of the chemical. Separate BAFs for each trophic level are derived to account for potential biomagnification of chemicals in aquatic food webs, as well as physiological differences among organisms that may affect bioaccumulation.[18]

EPA derives national default BAFs, in part, as a resource for states and authorized tribes with limited resources for deriving site-specific BAFs.[19] EPA's approach for developing national BAFs represents the long-term average bioaccumulation potential of a pollutant in aquatic organisms that are commonly consumed by humans across the United States. In the 2015 national CWA Section 304(a) HHC update, EPA relied on field-measured BAFs and laboratory-measured BCFs available from peer-reviewed, publicly available databases to develop national BAFs for three trophic levels of fish.[20] If this information was not available, EPA selected octanol-water partition coefficients (K_{ow} values) from publicly available, published peer-reviewed sources for use in calculating national BAFs. As an additional line of evidence, EPA

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[16] 65 FR 66444 November 3, 2000.
[17] USEPA. 2000. Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health. U.S. Environmental Protection Agency, Office of Water, Washington, D.C. EPA-822-B-00-004. https://www.epa.gov/sites/default/files/2018-10/documents/methodology-wqc-protection-hh-2000.pdf.
[18] USEPA. 2003. Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health (2000). Technical Support Document Volume 2: Development of National Bioaccumulation Factors. U.S. Environmental Protection Agency, Office of Water, Washington, D.C. EPA-822-B-03-030. https://www.epa.gov/sites/default/files/2018-10/documents/methodology-wqc-protection-hh-2000.pdf.
[19] 65 FR 66444 November 3, 2000.
[20] Final Updated Ambient Water Quality Criteria for the Protection of Human Health, (80 FR 36986, June 29, 2015). See also: USEPA. 2015. Final 2015 Updated National Recommended Human Health Criteria. U.S. Environmental Protection Agency, Office of Water, Washington, D.C. https://www.epa.gov/wqc/human-health-water-quality-criteria.

reported model-estimated BAFs for every chemical based on the Estimation Program Interface (EPI) Suite to support the field-measured or predicted BAFs.[21]

Although EPA uses national default exposure-related input values to calculate CWA Section 304(a) national recommended criteria, EPA's methodology notes a preference for the use of local data, when available, to calculate HHC (e.g., locally derived FCRs, drinking water intake rates and body weights, and waterbody-specific bioaccumulation rates) over national default values. Using local data helps ensure that HHC represent local conditions.[22] EPA also recommends, where sufficient data are available, selecting a FCR that reflects consumption that is not suppressed by fish availability or concerns about the safety of available fish.[23] Deriving criteria using an unsuppressed FCR furthers the restoration goals of the CWA and ensures protection of human health as pollutant levels decrease, fish habitats are restored, and fish availability increases. Moreover, as explained further below, selecting a FCR that reflects unsuppressed fish consumption could be necessary where tribal treaty or other reserved fishing rights apply. In such circumstances, if sufficient data regarding unsuppressed fish consumption levels are unavailable or inconclusive, states should consult with tribes when deciding which fish consumption data should be used in selecting an FCR.

d. Relative Source Contribution

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[21] *Id.*

[22] USEPA. 2000. Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health. U.S. Environmental Protection Agency, Office of Water, Washington, D.C. EPA-822-B-00-004. https://www.epa.gov/sites/default/files/2018-10/documents/methodology-wqc-protection-hh-2000.pdf.

[23] As noted by the National Environmental Justice Advisory Council in the 2002 publication *Fish Consumption and Environmental Justice*, "a suppression effect may arise when fish upon which humans rely are no longer available in historical quantities (and kinds), such that humans are unable to catch and consume as much fish as they had or would. Such depleted fisheries may result from a variety of affronts, including an aquatic environment that is contaminated, altered (due, among other things, to the presence of dams), overdrawn, and/or overfished. Were the fish not depleted, these people would consume fish at more robust baseline levels. . . . In the Pacific Northwest, for example, compromised aquatic ecosystems mean that fish are no longer available for tribal members to take, as they are entitled to do in exercise of their treaty rights."). National Environmental Justice Advisory Council, *Fish Consumption and Environmental Justice,* p.44, 46 (2002) (NEJAC Fish Consumption Report) *available at* https://www.epa.gov/sites/default/files/2015-02/documents/fish-consump-report_1102.pdf.

The inclusion of an RSC factor[24] is important for protecting public health. When deriving HHC for non-carcinogens and nonlinear carcinogens, EPA recommends including an RSC factor to account for sources of exposure other than drinking water and consumption of fish and shellfish from inland and nearshore waters. These other sources of exposure include ocean fish consumption (which is not included in EPA's default national FCR), non-fish food consumption (e.g., fruits, vegetables, grains, meats, poultry), dermal exposure, and inhalation exposure. Using an RSC ensures that the level of a chemical allowed by a water quality criterion, when combined with other exposure sources, will not result in exposures that exceed the RfD and helps prevent adverse health effects from exposure to a given chemical over a person's lifetime. EPA's guidance[25] includes an approach for determining an appropriate RSC for a given pollutant ranging in value from 0.2 to 0.8 to ensure that drinking water and fish consumption alone are not apportioned the entirety of the RfD. This approach, known as the Exposure Decision Tree, considers the adequacy of available exposure data, levels of exposure, relevant sources/media of exposure, and regulatory agendas. As explained below in section V.B.d of this preamble, EPA made science-based adjustments to the application of the RSC in this proposed rulemaking to avoid "double counting" exposures. Washington's failure to make such adjustments is another reason for EPA's finding that its HHC are inadequate.

C. Prior EPA Actions Related to Washington's Human Health Criteria

In 1992, EPA promulgated the National Toxics Rule (NTR) at 40 CFR 131.36, establishing chemical-specific numeric criteria for 85 priority toxic pollutants for 14 states and territories (states), including Washington, that were not in compliance with the requirements of CWA Section 303(c)(2)(B). Subsequently, when states covered by the NTR adopted their own criteria for toxic pollutants that were consistent with the CWA and EPA's implementing

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[24] "[RSC] defines the portion of the total exposure that comes from ingestion of water and fish from the ambient water body of interest. Other exposure information such as that from dietary, inhalation, and dermal routes should be considered and accounted for as part of the RSC human exposure analysis." https://www.epa.gov/wqs-tech/supplemental-module-human-health-ambient-water-quality-criteria.

[25] *Id.*

regulations, EPA amended the NTR to remove those chemical-specific criteria for those states. In 2015, Washington was one of the states that remained covered by the NTR.

On September 14, 2015, the EPA Administrator determined that updated HHC for Washington were "necessary" pursuant to CWA Section 303(c)(4)(B). EPA proposed HHC to protect the health of Washington residents, including tribes with treaty-reserved rights to fish.[26] In that proposal, EPA explained that the majority of waters under Washington's jurisdiction are subject to tribal treaty-reserved fishing rights.[27] To give effect to such rights in establishing revised WQS for Washington waters, EPA determined that tribal treaty fishing rights "appropriately must be considered when determining which criteria are necessary to adequately protect Washington's fish and shellfish harvesting designated uses."[28] Specifically, EPA proposed to consider the tribal populations exercising their legal right to harvest and consume fish and shellfish as the general population for purposes of deriving protective HHC. To this end, EPA proposed HHC based on a FCR of 175 g/day and CRL of 10^{-6} to reflect consideration of tribal treaty-reserved rights, as informed by consultation with the tribes and fish consumption surveys of tribal members.[29] In addition to a FCR and CRL calculated to ensure protection of applicable tribal treaty-reserved rights, EPA also utilized other inputs to derive the proposed HHC based on the agency's latest science. Specifically, EPA calculated the proposed HHC using the national trophic level four BAFs and updated chemical-specific RSC values from its June 2015 CWA Section 304(a) criteria updates.[30] EPA's approach to deriving HHC using these inputs is described further in section III.B. of this preamble.

Before EPA finalized the proposed Federal criteria, the State of Washington adopted HHC following an extensive public process and submitted the updated HHC to EPA for review

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[26] 80 FR 55,063 (September 14, 2015).
[27] *Id.* at 55,067.
[28] *Id*.
[29] *Id.* at 55,067-68.
[30] *Id.* at 55,068-69.

on August 1, 2016. The updated HHC incorporated some of the new data and information from EPA's June 2015 CWA Section 304(a) criteria updates. Washington's HHC were based on the same 175 g/day FCR and 10^{-6} CRL that EPA used to derive the proposed federal HHC, with the exception of the CRL for polychlorinated biphenyls (PCBs).[31] Although Washington used the same FCR and CRL as EPA, because WA's HHC did not use BAFs and used an RSC of 1, the resulting HHC for the majority of pollutants were less stringent than the HHC in EPA's proposed rulemaking.

On November 15, 2016, EPA partially approved and partially disapproved Washington's HHC.[32] For the criteria that were disapproved, EPA concurrently signed a final rule promulgating the Federal criteria it had proposed in 2015.[33] Like EPA's 2015 proposal, the 2016 final rule articulated EPA's conclusion that it is necessary and appropriate to consider tribal treaty-reserved rights within the framework of the CWA, and provided a discussion of the tribal treaties relevant to the State of Washington and applicable case law.[34] The 2016 final rule was informed by public comment that addressed both the proposed criteria and EPA's consideration of tribal treaties, as well as consultation with a number of federally recognized tribes.

As explained further in section IV.A of this preamble, EPA's disapproval of Washington's HHC was largely predicated on Washington's use of input values that were not reflective of sound scientific rationale. In its letter to the State, EPA explained that the agency "evaluated Washington's criteria values against criteria that EPA determined would be protective of the State's designated uses and scientifically defensible (e.g., based on appropriate bioaccumulation factors (BAFs) and protective relative source contribution (RSC) values of less

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[31] For PCBs, Washington's criteria were based on a chemical-specific CRL of 2.3×10^{-5}.
[32] Letter from Dan D. Opalski, Director, EPA Region 10 Office of Water and Watersheds to Maia Bellon, Director, Department of Ecology, Re: EPA's Partial Approval/Partial Disapproval of Washington's Human Health Water Quality Criteria and Implementation Tools; Enclosure, Technical Support Document (November 15, 2016) (2016 Partial Approval/Partial Disapproval).
[33] 81 FR 85417, November 28, 2016.
[34] 81 FR 85422-27, November 28, 2016.

than 1)."[35] EPA found that Washington had not demonstrated that the majority of its criteria were based on sound scientific rationale as required by the CWA and EPA's implementing regulations.[36] Specifically for PCBs, EPA found that Washington had not provided adequate support or analysis to justify its use of a chemical-specific CRL (2.3×10^{-5}) that was less stringent than the CRL used for all other pollutants, and did not explain how the use of this CRL was protective of the State's designated uses.[37]

With respect to the criteria that EPA approved, the agency also explained that "while the EPA carefully considers the scientific defensibility and protectiveness of both the inputs used to derive criteria and the resulting criteria values, it is ultimately on the criteria values that the EPA takes approval or disapproval action under CWA Section 303(c)."[38] After evaluating Washington's criteria against criteria using appropriate scientific inputs, EPA determined that certain of Washington's criteria were as or more stringent than scientifically defensible criteria that the EPA determined would be protective of Washington's designated uses.[39] Accordingly, EPA approved those criteria.[40]

In a petition dated February 21, 2017, several regulated entities requested that EPA reconsider its November 15, 2016, partial disapproval and repeal its concurrent promulgation of Federal criteria.[41] Following the 2017 petition, Washington and several federally recognized

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[35] 2016 Partial Approval/Disapproval at 3.
[36] *Id.* at 16-17.
[37] *Id.* at 26 (Determining that Washington "did not provide adequate justification for using the Washington Department of Health cancer risk level for this specific chemical and then adjusting that cancer risk level so that the criteria would be equivalent to the NTR criteria" and "did not demonstrate how the criteria were derived using a cancer risk level that is based on scientifically sound rationale and protective of applicable designated uses, including the tribal subsistence fishing portion of the fish and shellfish harvesting use as informed by treaty-reserved fishing rights.").
[38] *Id.* at 8.
[39] *Id.*
[40] *Id.*
[41] Petition submitted by Northwest Pulp and Paper Association, America Forest and Paper Association, Association of Washington Business, Greater Spokane Incorporated, Treated Wood Council, Western Wood Preservers Institute, Utility Water Act Group and the Washington Farm Bureau.

tribes with treaty-reserved fishing rights sent letters urging EPA to deny the petition and to leave the federally promulgated HHC in place.[42]

Despite objections from the State and several tribes, on May 10, 2019, EPA granted the 2017 industry petition by reversing the agency's prior partial disapproval of certain HHC and subsequently issuing a final rule withdrawing the federally promulgated criteria.[43] EPA's May 10, 2019 approval concluded that the State's reliance on scientific inputs that were no longer reflective of the latest science was an appropriate risk-management decision.[44] The withdrawal of the federal rule went into effect on June 12, 2020, and as of that date, the HHC submitted by Washington on August 1, 2016 and approved by EPA on May 10, 2019 were in effect for CWA purposes.

On June 6, 2019, the State of Washington filed a complaint challenging the legality of EPA's May 2019 decision to reverse its November 2016 partial disapproval.[45] The Sauk-Suiattle Indian Tribe and Quinault Indian Nation subsequently joined Washington's lawsuit as plaintiff-intervenors. On June 6, 2020, following EPA's withdrawal of the promulgated federal HHC, another lawsuit was filed by the Makah Indian Tribe, the Pacific Coast Federation of Fishermen's Associations, and environmental groups challenging both EPA's withdrawal of the federally promulgated HHC and its May 10, 2019 decision to reverse the November 2016 partial disapproval.[46] In September 2020, the Plaintiffs in the case filed by the State of Washington amended their complaints to also challenge EPA's rule withdrawing the federal HHC.

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[42] EPA received letters from the Washington State Department of Ecology, Washington State Attorney General, the Northwest Indian Fisheries Commission, the Lower Elwha Klallam Tribe, the Nooksack Indian Tribe, the Jamestown S'Klallam Tribe, and Earthjustice (on behalf of the Pacific Coast Federation of Fishermen's Associations, Institute for Fisheries Resources, and several Washington Waterkeepers).
[43] May 10, 2019 letter and enclosed Technical Support Document from Chris Hladick, Regional Administrator, EPA Region 10, to Maia Bellon, Director, Department of Ecology, Re: EPA's Reversal of the November 15, 2016 Clean Water Act Section 303(c) Partial Disapproval of Washington's Human Health Water Quality Criteria and Decision to Approve Washington's Criteria; Withdrawal of Certain Federal Water Quality Criteria Applicable to Washington, 85 FR 28494 (May 13, 2020).
[44] May 10, 2019 letter at pp. 8, 14-15.
[45] *State of Washington v. U.S. Envt'l Prot. Agency*, No. 2:19-cv-884-RAJ (W.D. Wash.).
[46] *Puget Soundkeeper Alliance et al. v. U.S. Envt'l Prot. Agency*, No. 2:20-cv-907-RAJ (W.D. Wash.).

Consistent with Executive Order 13990,[47] in February 2021, EPA sought and was granted an abeyance in both cases to conduct an initial review to determine whether it intended to reconsider the challenged actions. During this initial three-month abeyance, EPA decided to reconsider the challenged actions. Based on its initial review of the agency's prior actions, EPA sought a longer abeyance from the court, expressing substantial concern that Washington's HHC may not be adequately protective and may not be based on sound scientific rationale. On July 6, 2021, the Court granted EPA an abeyance to reconsider its prior actions and to propose protective HHC for Washington and take final action on the proposal within 18 months.

IV. Administrator's Determination that New or Revised HHC are Necessary for Washington

For the reasons explained below in section IV.A of this preamble, EPA has concluded that the Washington HHC that EPA disapproved in 2016 and later approved in 2019 (the "2019 Reconsidered HHC")[48] are not based on sound scientific rationale and are therefore not protective of the applicable designated uses in Washington. Accordingly, as set forth in section IV.B of this preamble, the Administrator has determined pursuant to CWA Section 303(c)(4)(B) that revised HHC are necessary. Pursuant to the authority of CWA Section 303(c)(4)(B), EPA is proposing new standards for Washington waters, as set forth in section V of this preamble.

The agency's determination and its decision to issue the proposed rulemaking are based on application of the CWA and EPA's regulations to the facts before the agency at this time. In

[47] 86 FR 7037 (January 25, 2021).

[48] EPA disapproved 143 of Washington's HHC in 2016. In 2019, EPA reversed its disapproval of 141 of those HHC, leaving its disapproval of the two HHC for arsenic in place. This rule addresses the 141 HHC that EPA reversed its decision on in 2019.

reaching the conclusions supporting these decisions, the agency has also carefully evaluated its 2016 and 2019 actions on the State's criteria.

A. Existing Criteria Are Not Protective of Designated Uses of Waters in the State of Washington

EPA has determined that the 2019 Reconsidered HHC do not protect designated uses because the input values on which they rely are not supported by a sound scientific rationale. We review each of those input values – namely an RSC value of 1, BCFs, and a CRL of 2.3×10^{-5} for PCBs – in turn.

1. RSC Value: Washington's use of an RSC value of 1 to derive HHC is not based on sound scientific rationale as it apportions the entire "safe" dose of certain chemicals to drinking water and fish consumption, ignoring exposures to other sources of those chemicals. As discussed in section III.B above of this preamble, other sources of exposure include consumption of ocean fish and other foods (e.g., fruits, vegetables, grains, meats, poultry), dermal exposure, and inhalation exposure, and other routes. Washington's use of an RSC of 1 to derive its criteria is based on the flawed assumption that 100% of human exposure to a pollutant is from fish and drinking water from waters that are subject to the State's WQS. Because humans are exposed to pollutants through other sources of exposure, this assumption is scientifically unsound.

EPA has considered the statements made by the agency in its 2019 approval of Washington's HHC. In that approval, the agency concluded that the RSC value should be "evaluated . . . in the context of the overall HHC package," noting that Washington used other "conservative" inputs such as a FCR of 175 g/day and a 10^{-6} CRL.[49] After careful review, the agency concludes that this rationale does not reasonably support the conclusion that the State's criteria protect the designated uses and are based on sound scientific rationale.

First, the CRL utilized by the State is irrelevant to evaluating the reasonableness of the State's RSC because the CRL and RSC are inputs for derivation of criteria for mutually

[49] May 10, 2019 letter at p. 19.

exclusive categories of pollutants: the CRL is an input for deriving criteria for carcinogens, whereas the RSC is an input for deriving criteria for non-carcinogens. Therefore, the CRL cannot offset or compensate for the health risk associated with the State's use of an RSC which assumes that 100% of human exposure to pollutants is from waters covered by the criteria.

Second, while the State's use of a FCR of 175 g/day more accurately represented Washington fish consumers than the prior FCR of 6.5 g/day, that revision did not take into account risks associated with other routes of exposure. Given the lack of any other criteria derivation components that implicitly or explicitly account for other sources of exposure discussed above, the agency concludes that the State's use of an RSC which ignores other sources does not protect designated uses and is not based on sound scientific rationale.

When Washington submitted its criteria in 2016, it asserted that its RSC choice was informed, in part, by the conclusion that the CWA has limited ability to control sources outside of its jurisdiction (i.e., in non-water media).[50] The agency has considered the State's assertions and concludes that they do not support the conclusion that the State's criteria protect designated uses and are based on sound scientific rationale. First, as a factual matter, several of the other pollutant exposure routes that the RSC is intended to account for (e.g., dermal exposure, inhalation) are impacted by water quality.[51] Second, and more fundamentally, EPA's longstanding approach to determining whether water quality criteria protect human health considers the totality of exposure which can contribute to adverse health effects. Even if the

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[50] May 10, 2019 letter at pp. 16-17; *see* Department of Ecology. *Washington State Water Quality: Human health criteria and implementation tools, Overview of key decisions in rule amendment*. August 2016. Ecology Publication No. 16-10-025, p. 37. https://fortress.wa.gov/ecy/publications/documents/1610025.pdf ("The use of an RSC to compensate for sources of exposure outside the scope of the Clean Water Act when establishing HHC is a risk management decision that states need to carefully weigh. If the scope of the Clean Water Act is limited to addressing potential exposures from NPDES- or other Clean Water Act regulated discharges to surface water, it could be argued that an RSC of less than 1.0 inappropriately expands of the scope of what the Clean Water Act would be expected to control.").

[51] From p. 4-16 of the 2000 Methodology: "A number of drinking water contaminants are volatile and thus diffuse from water into the air where they may be inhaled. In addition, drinking water is used for bathing and, thus, there is at least the possibility that some contaminants in water may be dermally absorbed. Volatilization may increase exposure via inhalation and decrease exposure via ingestion and dermal absorption. The net effect of volatilization and dermal absorption upon total exposure to volatile drinking water contaminants is unclear in some cases and varies from chemical to chemical. Dermal exposures are also important to consider for certain population groups, such as children and other groups with high soil contact."

CWA does not provide a vehicle for addressing other sources of exposure, the protection of public health requires that those sources be accounted for when HHC are established. In the agency's judgment, this approach to deriving criteria is consistent with and advances the CWA's directive that WQS "shall be as such to protect the public health or welfare" (CWA Section 303(c)(2)(A)).

Accordingly, since 2000, EPA has recognized the need to account for contributions from other sources to ensure protection of individuals whose exposure could be greater than indicated by currently available data about exposures from drinking water and freshwater and estuarine fish consumption. The 2000 Methodology recommends that states account for unknown sources of exposure and additional potential exposures to unknown levels from other sources, such as ocean fish consumption, food consumption other than fish, respiratory exposure, and/or dermal exposure. While states can and do make risk management choices in developing criteria, using an RSC value that allocates the entirety of exposure to a subset of specific pathways directly addressed in criteria derivation inappropriately disregards the risks from other exposure routes. In deriving water quality criteria to protect human health, an appropriate exercise of risk management discretion would be to make any necessary adjustments to the pollutant-specific RSCs to account for state-specific or pollutant-specific information about other exposure routes.

EPA's 2019 decision reversing our 2016 disapproval of a subset of Washington's HHC rested in part on a conclusion that the disapproval was based solely on Washington's failure to follow EPA's guidance in setting the RSC.[52] To be clear, EPA's guidance informs, but does not dictate, EPA's implementation of applicable statutory and regulatory requirements. Regarding RSC, the guidance recognizes the indisputable fact that exposure to pollutants through routes other than fish consumption can contribute to adverse impacts on human health and therefore need to be considered to ensure that criteria are scientifically sound and protect designated uses,

[52] For example, the 2019 decision states that the disapproval decision "appears to treat the 304(a) recommendation to use an RSC range of 0.2-0.8 as a requirement" and also relied on a Frequently Asked Questions document that "does not have the force and effect of law."

as required by EPA's regulations. EPA's determination in this respect rests on the fact that the State's RSC ignores entirely those other routes of exposure.

As explained in section V below of this preamble, EPA followed the recommended approach in EPA's 2015 CWA Section 304(a) national recommended HHC to derive the water quality criteria in the proposed rulemaking, as well as in the final rule for Washington in 2016. We have applied pollutant-specific RSC values of less than or equal to 0.8 for all non-carcinogens and nonlinear carcinogens.[53] Attributing 80% or less of exposure to drinking water or fish consumption (i.e., using an RSC value less than or equal to 0.8) ensures that an individual's total exposure to a contaminant does not exceed the RfD of non-carcinogenic and nonlinear carcinogenic chemicals.

2. *Use of Bioconcentration Factors (BCFs) instead of Bioaccumulation Factors (BAFs)*: Washington used BCFs rather than BAFs to calculate its HHC, despite the availability of data to derive BAFs and EPA's default recommended BAFs. The use of BCFs rather than BAFs, where BAF data are available, to calculate the HHC is inconsistent with sound scientific rationale on the bioaccumulation of pollutants. As noted in section III.B.c of this preamble, BAFs account for the multiple pathways for bioaccumulation of a contaminant in an aquatic organism. BCFs only account for accumulation of a contaminant through water, whereas BAFs account for bioaccumulation through food, sediment, and water. As a result, the magnitude of bioaccumulation by aquatic organisms of certain chemicals can be substantially greater than the magnitude of bioconcentration absorbed solely from water. Using BCFs alone can therefore underestimate the extent of chemical accumulation in aquatic organisms, and can, in turn, affect human health through harmful exposure through fish and shellfish consumption. When data to derive BAFs are unavailable or inconclusive, it may be necessary to use BCFs to provide some

[53] Final Updated Ambient Water Quality Criteria for the Protection of Human Health, (80 FR 36986, June 29, 2015). See also: USEPA. 2015. Final 2015 Updated National Recommended Human Health Criteria. U.S. Environmental Protection Agency, Office of Water, Washington, D.C. https://www.epa.gov/wqc/human-health-water-quality-criteria.

approximation of pollutant uptake in aquatic organisms. Washington did have the data needed for the pollutants at issue here. Rather than use EPA's national recommended default BAFs or develop State-specific BAFs, Washington used decades-old national default BCFs that were recommended prior to the development of its current national default recommended BAFs, which are available for states to use in the absence of local data. Thus, because the 2019 Reconsidered HHC are based on BCFs even where scientifically defensible BAFs are available, they are insufficiently protective of Washington's designated uses and therefore do not meet the requirements of the CWA.

When EPA approved Washington's HHC in 2019, the agency acknowledged that Washington had spent several years engaging with stakeholders to develop its HHC. EPA's 2019 approval asserted that Washington "was preparing to finalize its proposed HHC based on the EPA's prior recommended BCFs, not the new national default BAFs."[54] Because of that timing, in 2019 EPA determined that Washington's failure to incorporate BAFs was not a reason for disapproval.

EPA has determined that rationale was not well grounded then and should not apply now. As discussed above in section III.B.c. of this preamble, EPA began recommending the use of BAFs, rather than BCFs, in its 2000 Methodology, 15 years prior to its issuance of revised criteria recommendations in 2015. Furthermore, Washington was aware of the agency's scientific judgment that BAFs more accurately reflect the total uptake of a chemical.[55] The 2015 CWA Section 304(a) recommendations included pollutant-specific national default BAFs for states and authorized tribes to rely on. Even in the absence of these national default BAFs, states could still develop their own BAFs following EPA's 2000 Methodology. Therefore, not only was Washington aware of the science supporting the importance of using BAFs, it also had the

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[54] May 10, 2019 letter at p. 16.

[55] Department of Ecology. *Washington State Water Quality: Human health criteria and implementation tools, Overview of key decisions in rule amendment*. August 2016. Ecology Publication No. 16-10-025, pp. 46-49. https://fortress.wa.gov/ecy/publications/documents/1610025.pdf

opportunity to develop its own BAFs prior to developing its revised HHC and sufficient notice of EPA's nationally recommended pollutant-specific default BAFs.

In approving Washington's criteria relying on BCFs in 2019, EPA also emphasized consideration of the State's prerogative to make its own risk-management decisions. This rationale improperly accepted Washington's justifications for its use of BCFs as "risk management" decisions.[56] Washington gave four reasons for using BCFs 1) BCFs are more closely related to the environmental media (water) that is regulated under the CWA; 2) BCFs do not include as many inputs and predictions based on national datasets that may not be reflective of Washington's waters; 3) BCFs have fewer inputs and less uncertainty; and 4) relying on BCFs alone is acceptable under the CWA for criteria development.[57]

These justifications are not risk management decisions. The first one ignores the fact that the other exposure pathways taken into account in a BAF – food consumed by aquatic organisms and sediment – are affected by water quality regulated under the CWA. The second justification disregards the fact that EPA's national default recommended BCFs from 1980 are no more reflective of Washington's waters than EPA's national default recommended BAFs from 2015. As for the third justification, accounting for more exposure pathways may increase the inputs in a BAF calculation, and therefore potentially increase uncertainty. But excluding known sources of chemical accumulation in aquatic organisms because additional inputs have the potential to introduce additional uncertainty is not scientifically supportable. The fourth justification mischaracterizes the use of BCFs. EPA used BCFs prior to 2000 but now only uses those BCFs when data to derive BAFs are unavailable or inconclusive. As noted above, while states have latitude to make risk management decisions in developing WQS, in doing so, that discretion does

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[56] May 10, 2019 letter at p. 17.

[57] Department of Ecology. *Washington State Water Quality: Human health criteria and implementation tools, Overview of key decisions in rule amendment*. August 2016. Ecology Publication No. 16-10-025, p. 56. https://fortress.wa.gov/ecy/publications/documents/1610025.pdf.

not go so far as to permit states to make decisions that are not consistent with EPA's regulations which require that criteria be based on sound scientific rationale (40 CFR 131.11).

3. PCB Cancer Risk Level (CRL): The State-adopted HHC for PCBs are not protective of Washington's designated uses because of the selected chemical-specific CRL, which is not based on a sound scientific rationale. Washington adopted HHC for PCBs of 0.00017 µg/L for both "water + organism" and "organism only" based on a chemical-specific CRL of 2.3×10^{-5}. Washington's selected CRL of 2.3×10^{-5} is akin to a cancer risk of approximately 1 in 43,478, which is a greater risk than the 1 in 100,000 or 1 in 1,000,000 CRLs which are commonly used by states and authorized tribes in their WQS. For all other pollutants except PCBs, Washington used a CRL of 1 in 1,000,000 or 1×10^{-6}. As explained below, Washington's criteria for PCBs do not protect designated uses and are not based on sound scientific rationale.

First, Washington inappropriately links the stringency of its CRL with a value associated with its fish advisory program. In its 2016 submittal, Washington explained that "[t]he chemical-specific risk level for PCBs was chosen to be consistent with the level of risk/hazard in the toxicity factor used by the [Washington Department of Health] in developing fish advisories."[58] The toxicity value that the Washington Department of Health uses for fish advisories is an RfD for the non-cancer impacts of one particular mixture of PCBs. Fish advisory programs are not bound by the same statutory and regulatory obligations as WQS. Setting protective HHC for PCBs requires evaluating the carcinogenic effects of PCBs in addition to the non-cancer impacts, since PCBs are reasonably anticipated to be a human carcinogen.[59] EPA has published a quantitative estimate of carcinogenic risk for PCBs.[60] Relying on a risk level associated solely with an RfD for non-cancer impacts used by the state's fish advisory program is thus not a sound

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[58] Department of Ecology. *Washington State Water Quality: Human health criteria and implementation tools, Overview of key decisions in rule amendment*. August 2016. Ecology Publication No. 16-10-025, p. 67. https://fortress.wa.gov/ecy/publications/documents/1610025.pdf.
[59] U.S. Department of Health and Human Services (HHS). National Toxicology Program. 15th Report on Carcinogens. December 21, 2021. https://ntp.niehs.nih.gov/whatwestudy/assessments/cancer/roc/index.html.
[60] https://iris.epa.gov/static/pdfs/0294_summary.pdf.

scientific rationale for HHC that must protect against *both* carcinogenic and non-carcinogenic adverse health effects. Additionally, fish advisories are intended to advise the public where current levels of pollution may result in designated uses not being met, whereas under EPA regulations, water quality criteria must be set at levels that "protect" the designated use (40 CFR 131.11(a)). Thus, criteria which are based in part on impaired water quality are not consistent with EPA's regulations.[61]

Washington's choice of a less protective CRL for PCBs also cannot be reconciled with the particular characteristics of PCBs in the environment and the science underlying human exposure to PCBs. PCBs are a group of man-made compounds that are highly bioaccumulative in aquatic organisms and have high environmental persistence. Humans are exposed to PCBs through fish and shellfish consumption, and PCBs can accumulate in human tissue, causing adverse health effects. The primary source of exposure to PCBs is through high-fat foods[62] such as higher trophic-level fish. Moreover, these higher trophic-level fish are a major component of a high fish consumers' diet in Washington. While there is no specific CRL mandated by EPA regulations, the selected CRL of 2.3×10^{-5} is over an order of magnitude greater than the CRL Washington uses for all other pollutants. Despite the particular risks present here, EPA has discerned no rationale related to health protection or risk management to support using a less protective pollutant specific CRL for this pollutant, which is of particular environmental concern, than is otherwise applicable for all other pollutants in the State (1×10^{-6} in Washington).

Finally, Washington's PCB criteria are based on an application of the HHC derivation equation that was outcome-determinative. Washington arrived at the PCB CRL by solving for what the CRL would be if the body weight and FCR inputs into the equation were updated and

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[61] While EPA has determined that fish advisories may be used in determining attainment of WQS, this is distinct from using such advisories in establishing WQS. *See* Letter from Geoffrey Grubbs, USEPA. 2000. ("EPA considers fish and shellfish tissue pollutant concentrations a scientifically defensible basis for determining attainment of water quality standards.").

[62] https://www.atsdr.cdc.gov/csem/polychlorinated-biphenyls/what_routes.html.

the desired end result was the NTR PCB criteria already in effect at the time. As noted above, Washington began with a CRL based on the level of risk/hazard associated with that the State uses to develop fish advisories. When this CRL, paired with the updated body weight and FCR, resulted in criteria that were less stringent than the NTR PCB criteria, Washington then adjusted the CRL to maintain the NTR value.[63]

Thus, Washington's PCB criteria are the same as the PCB criteria in the NTR that EPA had determined in 2015 to be insufficient because they were based, in part, on a FCR of 6.5 g/day that EPA concluded was not representative of fish consumption in Washington, including consumption by tribes with reserved rights.[64] While the State revised its FCR to 175 g/day, its PCB-specific change to the CRL offset any additional health protection afforded by the FCR adjustment and therefore failed to remedy EPA's previous finding that the criteria did not adequately protect fish consumers in Washington. For the reasons above, EPA concludes that Washington's State-adopted HHC currently in effect for PCBs are not sufficient to protect Washington's designated uses and do not meet the requirements of the CWA.

B. Clean Water Act 303(c)(4)(B) Administrator's Determination

Because the 2019 Reconsidered HHC, which are currently effective for CWA purposes in Washington, are not based on sound scientific rationale and are not protective of the applicable designated uses per the CWA and EPA's regulations at 40 CFR 131.11, EPA determines under CWA Section 303(c)(4)(B) that revised WQS for the protection of human health in Washington waters are necessary to meet the requirements of the CWA. EPA, therefore, proposes to revise these HHC for Washington in accordance with this CWA Section 303(c)(4)(B) Administrator's determination, as set forth in section V of this preamble. EPA's determination is not itself a final

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[63] Department of Ecology. *Washington State Water Quality: Human health criteria and implementation tools, Overview of key decisions in rule amendment*. August 2016. Ecology Publication No. 16-10-025, p. 67. https://fortress.wa.gov/ecy/publications/documents/1610025.pdf

[64] As described in EPA's 2016 final Washington WQS rule, 81 FR 85422-26, numerous tribes in Washington have treaty-reserved rights to fish for their subsistence on waters throughout the State. EPA found that tribal members consume far greater quantities of fish in the exercise of those rights than the 6.5 g/day associated with the NTR PCB criteria, and accordingly found that those criteria were insufficiently protective. *See* 80 FR 55066.

action, nor part of a final action, at this time. After consideration of comments on the proposed rulemaking, EPA will take final agency action on this proposed rulemaking. It is at that time that any change to the WQS applicable to Washington waters for CWA purposes would occur.

V. Derivation of Human Health Criteria for Washington

A. Scope of EPA's Proposal

Based on the determination explained above, EPA is proposing Federal criteria that would supersede the 2019 Reconsidered HHC. EPA is not proposing to change or supersede the federal HHC that EPA promulgated for arsenic,[65] methylmercury, or bis (2-chloro-1-methylethyl) ether in 2016 and that remain in place for CWA purposes, nor Washington's HHC that EPA approved in 2016.[66]

The HHC in this proposed rulemaking would apply to surface waters under the State of Washington's jurisdiction, and not to waters within Indian country,[67] unless otherwise specified in federal law.

B. Washington-Specific Human Health Criteria Inputs

a. Fish Consumption Rate, Body Weight, Drinking Water Intake

EPA proposes to derive HHC for Washington using the same FCR of 175 g/day, body weight of 80 kg and drinking water intake rate of 2.4 L/day that Washington used in 2016[68] and that EPA used in its 2016 federal rule.[69] EPA does not have new data or information suggesting a need to revisit those choices at this time, and thus is applying the same rationale here as the agency articulated to support its use of those inputs in the 2016 federal rule.[70] The agency

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[65] EPA promulgated arsenic HHC for Washington in the National Toxics Rule of 1992. EPA's federal rule in 2016 moved the arsenic criteria from 40 CFR 131.36 to 40 CFR 131.45.
[66] EPA is not proposing to change or supersede Washington's HHC for dioxin and thallium that EPA approved in 2019. EPA had previously taken no action on these pollutants in 2016.
[67] *See* 18 U.S.C. 1151 for definition of Indian Country.
[68] Department of Ecology. *Washington State Water Quality Standards: Human health criteria and implementation tools, Overview of key decisions in rule amendment.* August 2016. Ecology Publication no. 16-10-025.
[69] *Revision of Certain Water Quality Standards Applicable to Washington*, 81 FR 85417 (November 28, 2016).
[70] *Id.* at 85,420; 85,426-428.

believes it is important to keep these values consistent between the HHC in this rule and the other HHC that this rule will not impact (i.e., the HHC that Washington adopted and EPA approved in 2016, and the federal HHC that remain in place for arsenic, methylmercury, or bis (2-chloro-1-methylethyl) ether), because these values are associated with the population that the criteria are intended to protect and are not pollutant-specific.

b. Pollutant-Specific Reference Doses and Cancer Slope Factors

EPA proposes to derive HHC for Washington using the same reference doses and cancer slope factors that Washington used in 2016[71] and that EPA used in its 2016 federal rule.[72] These are the same toxicity values that EPA uses in its CWA Section 304(a) national recommended HHC. While there may be new toxicity information available for certain pollutants that is not yet reflected in EPA's CWA Section 304(a) national recommended HHC, such information has not yet been reviewed through EPA's comprehensive CWA Section 304(a) criteria development process and therefore is not incorporated into this proposal.[73] See Table 1, columns B1 and B3 for a list of EPA's proposed toxicity factors by pollutant.

c. Cancer Risk Level

EPA proposes to derive HHC for Washington using the same CRL of 10^{-6} that Washington used in 2016[74] and that EPA used in its 2016 federal rule[75] for all pollutants, including PCBs.

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[71] Department of Ecology. *Washington State Water Quality Standards: Human health criteria and implementation tools, Overview of key decisions in rule amendment.* August 2016. Ecology Publication no. 16-10-025.
[72] *Revision of Certain Water Quality Standards Applicable to Washington*, 81 FR 85417 (November 28, 2016).
[73] For example, there are 7 polycyclic aromatic hydrocarbons for which there is new toxicity information available since the promulgation of the 2016 federal rule. Because the CWA Section 304(a) criteria development process can take several years, EPA is not able to review this information and complete this rulemaking by the end of the 18-month abeyance. Once EPA has developed updated CWA Section 304(a) criteria for these pollutants, the State may evaluate its HHC for these pollutants (e.g., during a triennial review), adopt new HHC based on the CWA Section 304(a) updates, and submit these HHC to EPA for review.
[74] Department of Ecology. *Washington State Water Quality Standards: Human health criteria and implementation tools, Overview of key decisions in rule amendment.* August 2016. Ecology Publication no. 16-10-025.
[75] *Revision of Certain Water Quality Standards Applicable to Washington*, 81 FR 85417 (November 28, 2016).

EPA's selection of a 10^{-6} CRL is consistent with EPA's 2000 Methodology, which states that EPA intends to use the 10^{-6} level when promulgating water quality criteria for states and tribes, which reflects an appropriate risk for the general population.[76] In addition, as noted above and in EPA's 2016 final rule for Washington,[77] several tribes in Washington have treaty-reserved rights to fish on waters throughout the State. Consistent with those rights, tribal members catch and consume fish for their subsistence. EPA's selection of a 10^{-6} CRL is protective of tribal members exercising their legal right to harvest and consume fish and shellfish at subsistence levels.[78]

Finally, many of Washington's rivers are in the Columbia River basin, upstream of Oregon's portion of the Columbia River. Oregon's criteria for PCBs and other pollutants are based on a FCR of 175 g/day and a CRL of 10^{-6}. EPA's proposal to derive HHC for Washington using a CRL of 10^{-6} along with a FCR of 175 g/day helps ensure that Washington's criteria will provide for the attainment and maintenance of Oregon's downstream WQS as required by 40 CFR 131.10(b).

d. Relative Source Contribution

EPA recommends using an RSC for non-carcinogens and nonlinear carcinogens to account for sources of exposure other than drinking water and consumption of inland and nearshore fish and shellfish (see section III.B.d). In 2015, after evaluating information on chemical uses, properties, occurrences, releases to the environment and regulatory restrictions, EPA developed chemical-specific RSCs for non-carcinogens and nonlinear carcinogens ranging

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[76] EPA 2000 Methodology, p. 2-6. The Methodology recommends that states set human health criteria CRLs for the target general population at either 10^{-5} or 10^{-6} (p. 2-6) and also notes that states and authorized tribes can always choose a more stringent risk level, such as 10^{-7} (p. 1-12).
[77] 81 FR 85422-26.
[78] In 2016, tribes in Washington State generally viewed 175 g/day as a compromise minimum consumption rate so long as it is coupled with a CRL of 10^{-6}. 2016 Partial Approval/Disapproval p. 15.

from 0.2 (20 percent) to 0.8 (80 percent) following the Exposure Decision Tree approach described in EPA's 2000 Human Health Methodology.[79,80]

When EPA promulgated HHC for Washington in 2016, EPA adjusted RSC values using a ratio of the national dataset characterizing all FCRs versus inland and nearshore-only FCRs derived from the NHANES dataset. We then applied this ratio to the proportion of the RfD reserved for inland and nearshore fish consumption in the RSC. We used this adjustment to account for double-counted potential exposure to certain chemicals in certain anadromous fish species (e.g., salmon). This approach involves the following assumptions:

- the pollutant concentrations in anadromous fish are the same as those in inland and nearshore fish; and
- the ratio of all fish to inland and nearshore fish from NHANES data approximates the ratio of inland, nearshore, and anadromous fish to just inland and nearshore fish from Columbia River Inter-Tribal Fish Commission (CRITFC)[81] data (since CRITFC data were used to derive the 175 g/day FCR).

At the 90th percentile rate of consumption, the national adult consumption rate from NHANES data for all fish is 53 g/day and 22 g/day for inland and nearshore-only fish, or a ratio of 2.4. Applying this to an RSC of 0.2 yields 0.48, or 0.5 rounding to a single decimal place. Because the 175 g/day FCR includes some but not all marine species, EPA decided to use this approach to adjust the RSC values. However, EPA only adjusted RSC values to 0.5 for criteria calculations previously using an RSC between 0.2 and 0.5. Criteria derived using an RSC greater than 0.5 remained unchanged. EPA proposes to use these same 2016 RSCs to derive HHC for

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[79] USEPA. 2000. Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health. U.S. Environmental Protection Agency, Office of Water, Washington, D.C. EPA-822-B-00-004. https://www.epa.gov/sites/default/files/2018-10/documents/methodology-wqc-protection-hh-2000.pdf.

[80] Final Updated Ambient Water Quality Criteria for the Protection of Human Health, (80 FR 36986, June 29, 2015). See also: USEPA. 2015. Final 2015 Updated National Recommended Human Health Criteria. U.S. Environmental Protection Agency, Office of Water, Washington, D.C. https://www.epa.gov/wqc/human-health-water-quality-criteria.

[81] *Fish Consumption Survey of the Umatilla, Nez Perce, Yakama, and Warm Springs Tribes of the Columbia River Basin* (CRITFC 1994).

Washington in this rule, having no new data or information to suggest revising RSCs. The inclusion of protective RSCs in the development of HHC is a science-based decision that protects human health by ensuring that a person's exposure to multiple sources of a chemical is accounted for. See Table 1, column B2 for a list of EPA's proposed RSCs by pollutant.

e. Pollutant-Specific Bioaccumulation Factors

Where data are available, EPA uses BAFs to account for the uptake and retention of waterborne chemicals by aquatic organisms from all surrounding media and to ensure that resulting criteria are science-based and protect designated uses for human health. As in the 2016 federal rule for Washington,[82] EPA proposes to apply the trophic level four BAF from the 2015 CWA Section 304(a) HHC updates in conjunction with the 175 g/day FCR.[83] EPA has no new data or information to suggest an alternative to its 2016 decision to use the trophic level four BAF, given that the species commonly consumed in Washington are trophic level four fish (e.g., salmon). Where science-based BAFs are not available at this time for certain pollutants, EPA proposes to use the BCFs that EPA used the last time it updated its CWA Section 304(a) recommended criteria for those pollutants as the best available scientific information. See Table 1, columns B4 and B5 for a list of EPA's proposed bioaccumulation factors by pollutant.

C. Proposed Human Health Criteria for Washington

EPA proposes 141 HHC for 72 different pollutants (70 organism-only criteria and 71 water-plus-organism criteria) to protect the applicable designated uses of Washington's waters (see Table 1). The proposed HHC are the same criteria that EPA promulgated in 2016. The water-plus-organism criteria in column C1 of Table 1 are the applicable criteria for any waters that include the Domestic Water use (domestic water supply) defined in Washington's WQS

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[82] *Revision of Certain Water Quality Standards Applicable to Washington*, 81 FR 85417 (November 28, 2016).
[83] Because the surveyed population upon which the 175 g/day FCR is based consumed almost exclusively trophic level four fish (i.e., predator fish species), EPA proposes to use the trophic level four BAF from the 2015 CWA Section 304(a) HHC updates in conjunction with the 175 g/day FCR, in order to derive protective criteria. See *Fish Consumption Survey of the Umatilla, Nez Perce, Yakama, and Warm Springs Tribes of the Columbia River Basin* (CRITFC 1994).

(WAC 173-201A-600). The organism-only criteria in column C2 of Table 1 are the applicable criteria for any waters that do not include the Domestic Water use (domestic water supply) and that Washington defines at WAC 173-201A-600 and 173-201A-610 as the following:

- Fresh waters – Harvesting (fish harvesting), and Recreational Uses;
- Marine waters – Shellfish Harvesting (shellfish—clam, oyster, and mussel—harvesting), Harvesting (salmonid and other fish harvesting, and crustacean and other shellfish—crabs, shrimp, scallops, etc.—harvesting), and Recreational Uses.

EPA solicits comment on the criteria and the inputs EPA used to derive these criteria.

Table 1. EPA Proposed Human Health Criteria for Washington									
	A		B					C	
	Chemical	CAS Number	Cancer Slope Factor, CSF (per mg/kg·d) (B1)	Relative Source Contribution, RSC (-) (B2)	Reference Dose, RfD (mg/kg·d) (B3)	Bio-accumulation Factor (L/kg tissue) (B4)	Bio-concentration Factor (L/kg tissue) (B5)	Water & Organisms (µg/L) (C1)	Organisms Only (µg/L) (C2)
1	1,1,1-Trichloroethane	71556	-	0.50	2	10	-	20,000	50,000
2	1,1,2,2-Tetrachloroethane	79345	0.2	-	-	8.4	-	0.1	0.3
3	1,1,2-Trichloroethane	79005	0.057	-	-	8.9	-	0.35	0.90
4	1,1-Dichloroethylene	75354	-	0.50	0.05	2.6	-	700	4,000
5	1,2,4-Trichlorobenzene	120821	0.029	-	-	430	-	0.036	0.037
6	1,2-Dichlorobenzene	95501	-	0.50	0.3	82	-	700	800
7	1,2-Dichloroethane	107062	0.0033	-	-	1.9	-	8.9	73
8	1,2-Diphenylhydrazine	122667	0.8	-	-	27	-	0.01	0.02
9	1,2-Trans-Dichloroethylene	156605	-	0.50	0.02	4.7	-	200	1,000
10	1,3-Dichlorobenzene	541731	-	0.50	0.002	190	-	2	2
11	1,3-Dichloropropene	542756	0.122	-	-	3.0	-	0.22	1.2
12	1,4-Dichlorobenzene	106467	-	0.50	0.07	84	-	200	200
13	2,4-Dichlorophenol	120832	-	0.50	0.003	48	-	10	10
14	2,4-Dinitrophenol	51285	-	0.50	0.002	4.4	-	30	100
15	2-Chloronaphthalene	91587	-	0.80	0.08	240	-	100	100
16	2-Methyl-4,6-Dinitrophenol	534521	-	0.50	0.0003	10	-	3	7
17	4,4'-DDD	72548	0.24	-	-	240,000	-	7.9E-06	7.9E-06
18	4,4'-DDE	72559	0.167	-	-	3,100,000	-	8.8E-07	8.8E-07
19	4,4'-DDT	50293	0.34	-	-	1,100,000	-	1.2E-06	1.2E-06
20	Acenaphthene	83329	-	0.50	0.06	510	-	30	30
21	Aldrin	309002	17	-	-	650,000	-	4.1E-08	4.1E-08
22	alpha-BHC	319846	6.3	-	-	1,500	-	4.8E-05	4.8E-05
23	alpha-Endosulfan	959988	-	0.50	0.006	200	-	6	7
24	Anthracene	120127	-	0.50	0.3	610	-	100	100
25	Antimony	7440360	-	0.50	0.0004	-	1	6	90
26	Benzo(a) Anthracene	56553	0.73	-	-	3,900	-	0.00016	0.00016
27	Benzo(a) Pyrene	50328	7.3	-	-	3,900	-	1.6E-05	1.6E-05
28	Benzo(b) Fluoranthene	205992	0.73	-	-	3,900	-	0.00016	0.00016
29	Benzo(k) Fluoranthene	207089	0.073	-	-	3,900	-	0.0016	0.0016
30	beta-BHC	319857	1.8	-	-	180	-	0.0013	0.0014
31	Bis(2-Ethylhexyl) Phthalate	117817	0.014	-	-	710	-	0.045	0.046
32	Bromoform	75252	0.0045	-	-	8.5	-	4.6	12
33	Butylbenzyl Phthalate	85687	0.0019	-	-	19,000	-	0.013	0.013
34	Chlordane	57749	0.35	-	-	60,000	-	2.2E-05	2.2E-05
35	Chlorobenzene	108907	-	0.50	0.02	22	-	100	200
36	Chlorodibromomethane	124481	0.04	-	-	5.3	-	0.60	2.2
37	Chloroform	67663	-	0.50	0.01	3.8	-	100	600
38	Chrysene	218019	0.0073	-	-	3,900	-	0.016	0.016
39	Cyanide	57125	-	0.50	0.0006	-	1	9	100

40	Dibenzo(a,h) Anthracene	53703	7.3	-	-	3,900	-	1.6E-05	1.6E-05
41	Dichlorobromomethane	75274	0.034	-	-	4.8	-	0.73	2.8
42	Dieldrin	60571	16	-	-	410,000	-	7.0E-08	7.0E-08
43	Diethyl Phthalate	84662	-	0.50	0.8	920	-	200	200
44	Dimethyl Phthalate	131113	-	0.50	10	4,000	-	600	600
45	Di-n-Butyl Phthalate	84742	-	0.50	0.1	2,900	-	8	8
46	Endosulfan Sulfate	1031078	-	0.50	0.006	140	-	9	-
47	Endrin	72208	-	0.80	0.0003	46,000	-	0.002	0.002
48	Ethylbenzene	100414	-	0.50	0.022	160	-	29	31
49	Fluoranthene	206440	-	0.50	0.04	1,500	-	6	6
50	Fluorene	86737	-	0.50	0.04	710	-	10	10
51	gamma-BHC; Lindane	58899	-	0.50	0.0047	2,500	-	0.43	0.43
52	Heptachlor	76448	4.1	-	-	330,000	-	3.4E-07	3.4E-07
53	Heptachlor Epoxide	1024573	5.5	-	-	35,000	-	2.4E-06	2.4E-06
54	Hexachlorobenzene	118741	1.02	-	-	90,000	-	5.0E-06	5.0E-06
55	Hexachlorobutadiene	87683	0.04	-	-	1,100	-	0.01	0.01
56	Hexachlorocyclopentadiene	77474	-	0.50	0.006	1,300	-	1	1
57	Hexachloroethane	67721	0.04	-	-	600	-	0.02	0.02
58	Indeno(1,2,3-cd) Pyrene	193395	0.73	-	-	3,900	-	0.00016	0.00016
59	Methyl Bromide	74839	-	0.50	0.02	1.4	-	300	-
60	Methylene Chloride	75092	0.002	-	-	1.6	-	10	100
61	Nickel	7440020	-	0.50	0.02	-	47	80	100
62	Nitrobenzene	98953	-	0.50	0.002	3.1	-	30	100
63	Pentachlorophenol (PCP)	87865	0.4	-	-	520	-	0.002	0.002
64	Phenol	108952	-	0.50	0.6	1.9	-	9,000	70,000
65	Polychlorinated Biphenyls (PCBs)		2	-	-	-	31,200	[a]7E-06	[a]7E-06
66	Pyrene	129000	-	0.50	0.03	860	-	8	8
67	Selenium	7782492	-	0.50	0.005	-	4.8	60	200
68	Tetrachloroethylene	127184	0.0021	-	-	76	-	2.4	2.9
69	Toluene	108883	-	0.50	0.0097	17	-	72	130
79	Trichloroethylene	79016	0.05	-	-	13	-	0.3	0.7
71	Vinyl Chloride	75014	1.5	-	-	1.7	-	-	0.18
72	Zinc	7440666	-	0.50	0.3	-	47	1,000	1,000
[a]	This criterion applies to total PCBs (e.g., the sum of all congener or isomer or homolog or Aroclor analyses).								

D. Applicability

Under the CWA, Congress gave states primary responsibility for developing and adopting WQS for their navigable waters (CWA Section 303(a)-(c)). Although EPA is proposing revised HHC for Washington, Washington continues to have the option to adopt and submit to EPA revised HHC for the State's waters consistent with CWA Section 303(c) and EPA's

implementing regulations at 40 CFR part 131. Consistent with CWA Section 303(c)(4), if Washington adopts and submits revised HHC and EPA approves such criteria before finalizing this proposed rulemaking, EPA would not proceed with the final rule for those waters and/or pollutants for which EPA approves Washington's criteria.

If EPA finalizes this proposed rulemaking, and Washington subsequently adopts and submits new HHC, EPA's federally promulgated criteria will remain applicable for purposes of the CWA until EPA withdraws the federally promulgated criteria. EPA would undertake such a rulemaking to withdraw the Federal criteria if and when Washington adopts and EPA approves corresponding criteria that meet the requirements of Section 303(c) of the CWA and EPA's implementing regulations at 40 CFR part 131.

E. Alternative Regulatory Approaches and Implementation Mechanisms

The federal WQS regulation at 40 CFR part 131 provides several tools that Washington has available to use at its discretion when implementing or deciding how to implement these HHC, once finalized. Among other things, EPA's WQS regulation: (1) specifies how states and authorized tribes establish, modify, or remove designated uses (40 CFR 131.10); (2) specifies the requirements for establishing criteria to protect designated uses, including criteria modified to reflect site-specific conditions (40 CFR 131.11); (3) authorizes and provides a regulatory framework for states and authorized tribes to adopt WQS variances where it is not feasible to attain the applicable WQS at that time (40 CFR 131.14); and (4) allows states and authorized tribes to authorize the use of compliance schedules in NPDES permits to meet water quality-based effluent limits (WQBELs) derived from the applicable WQS (40 CFR 131.15). Each of these approaches is discussed in more detail in the next sections. Whichever approach a state pursues, however, all NPDES permits would need to comply with EPA's regulations at 40 CFR 122.44(d)(1)(i).

a. *Designated Uses*

EPA's proposed HHC apply to waters that Washington has designated for the following:

- Fresh waters – Harvesting (fish harvesting), Domestic Water (domestic water supply), and Recreational Uses;
- Marine waters – Shellfish Harvesting (shellfish—clam, oyster, and mussel—harvesting), Harvesting (salmonid and other fish harvesting, and crustacean and other shellfish—crabs, shrimp, scallops, etc.—harvesting), and Recreational Uses (see WAC 173-201A-600 and WAC 173-201A-610).

The federal regulation at 40 CFR 131.10(g) provides requirements for establishing, modifying, and removing designated uses when attaining the use is not feasible based on one of the six factors in the regulation. If Washington removes a use and adopts the highest attainable use,[84] the State must also adopt criteria to protect the newly designated highest attainable use consistent with 40 CFR 131.11. It is possible that criteria other than the federally promulgated criteria would protect the highest attainable use. If EPA finds removal or modification of the designated use and the adoption of the highest attainable use and criteria to protect that use to be consistent with CWA Section 303(c) and the implementing regulation at 40 CFR part 131, the agency would approve the revised WQS. EPA would then undertake a rulemaking to withdraw the corresponding federal WQS for the relevant water(s).

b. *WQS Variances*

Washington's WQS provide authority to apply WQS variances when implementing federally promulgated HHC, as long as such WQS variances are adopted consistent with 40 CFR 131.14 and submitted to EPA for review under CWA Section 303(c). The federal regulation at 40 CFR 131.3(o) defines a WQS variance as a time-limited designated use and criterion, for a specific pollutant or water quality parameter, that reflects the highest attainable condition during

[84] If a state or authorized tribe adopts a new or revised WQS based on a required use attainability analysis, then it must also adopt the highest attainable use (40 CFR 131.10(g)). The highest attainable use is the modified aquatic life, wildlife, or recreation use that is both closest to the uses specified in Section 101(a)(2) of the CWA and attainable, based on the evaluation of the factor(s) in 40 CFR 131.10(g) that preclude(s) attainment of the use and any other information or analyses that were used to evaluate attainability. There is no required highest attainable use where the state demonstrates the relevant use specified in Section 101(a)(2) of the Act and sub-categories of such a use are not attainable (see 40 CFR 131.3(m)).

the term of the WQS variance. A WQS variance may be appropriate if attaining the use and criterion would not be feasible during the term of the WQS variance because of one of the seven factors specified in 40 CFR 131.14(b)(2)(i)(A). These factors include a situation where NPDES permit limits more stringent than technology-based controls would result in substantial and widespread economic and social impact. WQS variances adopted in accordance with 40 CFR 131.14 (including a public hearing consistent with 40 CFR 25.5) provide a flexible but defined pathway for states and authorized tribes to issue NPDES permits with limits that are based on the highest attainable condition during the term of the WQS variance. This allows dischargers to make water quality improvements when the WQS is not immediately attainable but may be in the future. When adopting a WQS variance, states and authorized tribes specify the interim requirements of the WQS variance by identifying a quantitative expression that reflects the highest attainable condition (HAC) during the term of the WQS variance, establishing the term of the WQS variance, and describing the pollutant control activities expected to occur over the specified term of the WQS variance. WQS variances provide a legal avenue by which NPDES permit limits can be written to comply with the WQS variance rather than the underlying WQS for the term of the WQS variance. If dischargers are still unable to meet the WQBELs derived from the applicable WQS once a WQS variance term is complete, the regulation allows the State to adopt a subsequent WQS variance if it is adopted consistent with 40 CFR 131.14. EPA is proposing HHC that apply to use designations that Washington has already established. Washington's WQS regulations currently include provisions to use WQS variances when implementing criteria (see WA 173-210A-420), as long as such WQS variances are adopted consistent with 40 CFR 131.14 and approved by EPA. Washington may use the State's EPA-approved WQS variance procedures when adopting such WQS variances.

c. *NPDES Permit Compliance Schedules*

EPA's regulations at 40 CFR 122.47 and 131.15 address how permitting authorities can use schedules for compliance with a limit in the NPDES permit if the discharger needs additional

time to undertake actions like facility upgrades or operation changes to meet a WQBEL based on the applicable WQS. EPA's regulation at 40 CFR 122.47 allows a permitting authority to include a compliance schedule in the NPDES permit, when appropriate and where authorized by the state, to provide a discharger with additional time to meet a WQBEL implementing applicable WQS. EPA's regulation at 40 CFR 131.15 requires that a state that intends to allow the use of NPDES permit compliance schedules adopt specific provisions authorizing their use and obtain EPA approval under CWA Section 303(c) to ensure that a decision to allow a permit compliance schedule is transparent and allows for public input.[85] EPA already has approved Washington's State law provision authorizing the use of permit compliance schedules (see WAC-173-201A-510(4)), consistent with 40 CFR 131.15. Washington's compliance schedule authorizing provision is not affected by this rule. Washington is authorized to grant permit compliance schedules, as appropriate, based on the federal HHC in Washington, if such permit compliance schedules are consistent with EPA's permitting regulation at 40 CFR 122.47.

VI. Economic Analysis

EPA focused its economic analysis on the potential cost impacts to current holders of individual NPDES permits (point sources) and the costs the State of Washington may bear to develop Total Maximum Daily Loads (TMDLs) for waters newly identified as impaired under CWA Section 303(d) using the proposed WQS. Costs might also arise to holders of general permits[86] should the State modify those permits in some manner as a result of the proposed WQS, once finalized. Costs might also arise to sectors whose operations are nonpoint sources of pollutants through implementation of TMDLs or through other voluntary, incentivized, or State-imposed controls. This rule does not directly regulate nonpoint sources and under the CWA states are responsible for the regulation of nonpoint sources. EPA recognizes that controls for nonpoint sources may be part of future TMDLs, but any such future decisions will be made by

[85] 80 FR 51022, August 21, 2015.
[86] General permits typically focus on best management practices.

the State. Nonpoint sources are intermittent, variable, and occur under hydrologic or climatic conditions associated with precipitation events. Data to model and evaluate the potential cost impacts associated with nonpoint sources were not available and any estimate would be too uncertain to be informative. EPA also did not estimate potential sediment remediation costs for this analysis.

These WQS may serve as a basis for development of NPDES permit limits. Washington has NPDES permitting authority and retains considerable discretion in implementing standards. EPA evaluated the potential costs to NPDES dischargers associated with State implementation of EPA's proposed criteria. This analysis is documented in "Economic Analysis for Water Quality Standards Applicable to the State of Washington," which can be found in the record for this rulemaking. Any NPDES-permitted facility that discharges pollutants for which the revised HHC are more stringent than the applicable aquatic life criteria (or for which HHC are the only applicable criteria) could potentially incur compliance costs. The types of affected facilities could include industrial facilities and POTWs discharging wastewater to surface waters (i.e., point sources).

A. Identifying Affected Entities

EPA identified 406 point source facilities that could ultimately be affected by this proposed rulemaking. Of these potentially affected facilities, 73 are major dischargers and 333 are minor dischargers. EPA did not include general permit facilities in its analysis because data for such facilities are limited and requirements typically focus on best management practices. Of the potentially affected facilities, EPA evaluated a sample of 18 major facilities. Minor facilities are less likely to incur costs as a result of implementation of the rule because of the reduced potential for significant presence of toxic pollutants in their effluent. EPA did not have effluent data on toxic pollutants to evaluate minor facilities for this analysis. Table 2 summarizes these potentially affected facilities by type and category.

Table 2. Potentially Affected Facilities			
Category	Minor	Major	All
Municipal	169	44	213
Industrial	164	29	193
Total	333	73	406

B. Method for Estimating Costs to Point Sources

EPA evaluated the two major municipal facilities with design flows greater than 100 mgd and the largest industrial facility, to attempt to capture the facilities with the potential for the largest costs. For the remaining major facilities, EPA evaluated a random sample of facilities to represent discharger type and category. For all sample facilities, EPA evaluated existing baseline permit conditions, reasonable potential to exceed HHC based on the proposed rulemaking, and potential to exceed projected effluent limitations based on the last three years of effluent monitoring data (if available). Only compliance actions and costs that would be needed above the baseline level of controls are attributable to the proposed rulemaking.

EPA assumes that dischargers would pursue the least cost means of compliance with WQBELs. Compliance actions attributable to the proposed rulemaking may include pollution prevention, end-of-pipe treatment, and alternative compliance mechanisms (e.g., WQS variances). EPA annualizes capital costs, including study (e.g., WQS variance) and program (e.g., pollution prevention) costs, over 20 years using discount rates of 3 percent and 7 percent to obtain total annual costs per facility. To obtain an estimate of total costs to point sources, EPA extrapolates the annualized costs for the random sample based on the flow volume for the sample facilities and the flow volume for all facilities.

C. Results

Based on the results for 18 sample facilities across 10 industrial and municipal categories,[87] EPA did not identify any incremental costs to any major point source discharges of process wastewater from POTWs or industrial facilities attributable to the proposed criteria revisions. This does not mean that EPA anticipates there would be no costs to point sources over time to implement controls or modify processes to meet future permit limits, only that available data did not indicate the immediate need for the facilities evaluated. It would be highly speculative to attempt to estimate potential costs either based on the possibility of measuring pollutant levels at lower levels as a result of future requirements or future technology, or based on changes to facility operations or practices.

One important contributing factor to examining point source costs is the limitations of required analytical methods to measure chemical concentrations in effluents. Nearly half of pollutant parameters addressed in this proposed rulemaking have analytical quantitation limits that are above both the criteria currently in place and the proposed criteria. PCBs are a good example. The current criterion in place is 170 picograms per liter (pg/L) and the proposed criterion is 7 pg/L. However, the State identifies the analytical quantitation limit for effluent measurement as 500,000 pg/L. EPA has completed a multi-laboratory validation of a new analytical method for PCBs (method 1628) that has an average analytical quantitation limit for each PCB congener of approximately 2,000 pg/L, which is a substantial improvement over the current regulatory method, but still well above either the criterion currently in place or the proposed criterion. As a general matter, analytical methods and quantitation limits are subject to change over time. As such, it is important that WQS reflect the necessary level of protection regardless of contemporary limitations of analytical methods.

[87] Ten industrial categories (coal mining, food and kindred products, paper and allied products, chemicals and allied products, petroleum refining and related industries, primary metal industries, fabricated metal products, electric, gas and sanitary services, and national security and international affairs) and municipal POTWs.

EPA also evaluated potential administrative costs to the State for developing additional TMDLs under CWA Section 303(d) for any waters that are newly identified as impaired as a result of the proposed criteria. Using available ambient monitoring data, EPA compared pollutant concentrations to the baseline and proposed criteria, identifying waterbodies that may be incrementally impaired (i.e., impaired under the proposed criteria but not under the baseline). EPA identified 36 impairments under the baseline criteria and 66 under the proposed criteria, resulting in 30 potential incremental impairments. The estimated total annual costs for TMDL development range from $98,000 to $179,000, at a 3 percent discount rate, based on single-cause single-waterbody TMDL development costs. Actual costs may be reduced if the State develops multi-cause or multi-waterbody TMDLs.

VII. Statutory and Executive Order Reviews

A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review

It has been determined that this proposed rulemaking is not a "significant regulatory action" under the terms of Executive Order 12866 (58 FR 51735, October 4, 1993) and is, therefore, not subject to review under Executive Orders 12866 and 13563 (76 FR 3821, January 21, 2011).

B. Paperwork Reduction Act

This action does not impose any new information collection burden under the provisions of the Paperwork Reduction Act, 44 U.S.C. 3501 et seq. OMB has previously approved the information collection activities contained in the existing regulations at 40 CFR part 131 and has assigned OMB control number 2040-0049.

C. Regulatory Flexibility Act

I certify that this proposed rulemaking will not have a significant economic impact on a substantial number of small entities under the Regulatory Flexibility Act (RFA). Small entities, such as small businesses or small governmental jurisdictions, are not directly regulated by this rule. This proposed rulemaking will not impose any requirements on small entities.

D. Unfunded Mandates Reform Act

This action does not contain any unfunded mandate as described in UMRA, 2 U.S.C. 1531–1538, and does not significantly or uniquely affect small governments. The action imposes no enforceable duty on any state, local or tribal governments or the private sector.

E. Executive Order 13132: Federalism

This action does not have federalism implications. It will not have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government. This rule does not alter Washington's considerable discretion in implementing these WQS, nor would it preclude Washington from adopting WQS that EPA concludes meet the requirements of the CWA, either before or after promulgation of the final rule, which would eliminate the need for federal standards. Thus, Executive Order 13132 does not apply to this action.

In the spirit of Executive Order 13132 and consistent with EPA policy to promote communications between EPA and state and local governments, EPA specifically solicits comments on this proposed action from state and local officials.

F. Executive Order 13175: Consultation and Coordination with Indian Tribal Governments

This action has tribal implications. However, it will neither impose substantial direct compliance costs on federally recognized tribal governments, nor preempt tribal law. This rule could affect federally recognized Indian tribes in Washington because the numeric criteria for Washington will apply to waters adjacent to (or upstream or downstream of) the tribal waters,

and because the proposed Washington criteria are informed by tribal reserved rights. Additionally, there are six federally recognized Indian tribes in the Columbia River Basin located in the states of Oregon and Idaho that this rule could affect because their waters could affect or be affected by the water quality of Washington's downstream or upstream waters.

EPA consulted with tribal officials under the EPA Policy on Consultation and Coordination with Indian Tribes early in the process of developing this regulation to permit them to have meaningful and timely input into its development. In August 2021, EPA held tribes-only technical staff and leadership consultation sessions to hear their views and answer questions of all interested tribes on the proposed rulemaking. Representatives from approximately 17 tribes and two tribal consortia participated in two leadership meetings held in August 2021. The tribes have repeatedly asked EPA to reinstate the 2016 federal HHC for Washington, which EPA is proposing to do in this rule. EPA considered the input received during consultation with tribes when developing this proposal.

A *Summary of EPA's Pre-Proposal Consultation, Coordination, and Outreach with Federally Recognized Tribes on Potential Restoration of Protective Human Heath Criteria for Washington* is available in the docket for this proposal.

G. Executive Order 13045: Protection of Children From Environmental Health and Safety Risks

This proposed rulemaking is not subject to Executive Order 13045 because it is not economically significant as defined in Executive Order 12866, and because EPA does not believe the environmental health or safety risks addressed by this action present a disproportionate risk to children. As noted in section III.A of this preamble, EPA recommends that HHC be designed to reduce the risk of adverse cancer and non-cancer effects occurring from lifetime exposure to pollutants through the ingestion of drinking water and consumption of fish/shellfish obtained from inland and nearshore waters. EPA's proposed HHC for Washington are similarly based on reducing the chronic health effects occuring from lifetime exposure and

therefore are expected to be protective of a person's exposure during both childhood and adult years.

H. Executive Order 13211: Actions That Significantly Affect Energy Supply, Distribution, or Use

This action is not subject to Executive Order 13211, because it is not a significant regulatory action under Executive Order 12866.

I. National Technology Transfer and Advancement Act of 1995

This proposed rulemaking does not involve technical standards.

J. Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

1. *Introduction*

EPA defines Environmental Justice (EJ) as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies.[88] Three Executive Orders (E.O. 12898[89], 13985[90] and 14008[91]) advance EJ by calling on federal agencies to identify and address disproportionate impacts on historically underserved,

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[88] Fair treatment means that "no group of people should bear a disproportionate burden of environmental harms and risks, including those resulting from the negative environmental consequences of industrial, governmental and commercial operations or programs and policies." Meaningful involvement occurs when "1) potentially affected populations have an appropriate opportunity to participate in decisions about a proposed activity [e.g., rulemaking] that will affect their environment and/or health; 2) the public's contribution can influence [the EPA's rulemaking] decision; 3) the concerns of all participants involved will be considered in the decision-making process; and 4) [the EPA will] seek out and facilitate the involvement of those potentially affected." A potential EJ concern is defined as "the actual or potential lack of fair treatment or meaningful involvement of minority populations, low-income populations, tribes, and tribal peoples in the development, implementation and enforcement of environmental laws, regulations and policies." See "Guidance on Considering Environmental Justice During the Development of an Action." Environmental Protection Agency, www.epa.gov/environmentaljustice/guidanceconsidering-environmental-justice-duringdevelopment-action. See also https://www.epa.gov/environmentaljustice.

[89] Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. Available at https://www.epa.gov/environmentaljustice/federal-actions-address-environmental-justice-minority-populations-and-low, accessed October 6, 2021.

[90] Advancing Racial Equity and Support for Underserved Communities Through the Federal Government. Available at https://www.federalregister.gov/documents/2021/01/25/2021-01753/advancing-racial-equity-and-support-for-underserved-communities-through-the-federal-government, accessed October 6, 2021.

[91] Tackling the Climate Crisis at Home and Abroad. Available at https://www.federalregister.gov/documents/2021/02/01/2021-02177/tackling-the-climate-crisis-at-home-and-abroad. Accessed October 6, 2021.

marginalized, and economically disadvantaged people. Additionally, EPA has expressed a commitment to conducting EJ analyses for rulemakings as described in the April 30, 2021 revisions to the Cross-State Air Pollution Rule (CSAPR).[92]

EPA believes that this proposed rulemaking, if finalized, is not expected to have disproportionately high and adverse human health or environmental effects on low-income populations, people of color, or tribal populations, as specified in Executive Order 12898 (59 FR 7629, February 16, 1994). In its economic impact analysis, EPA only estimates administrative costs to the State of Washington to develop TMDLs and no incremental costs to point source discharges based on available data, as explained above in Section VI of this preamble. Therefore, EPA does not anticipate that this rule will impose any additional costs or other negative impacts on tribes or other low income or disadvantaged communities.

Instead, this action identifies and ameliorates disproportionately high and adverse human health effects on tribal communities, people of color and low-income populations in Washington by proposing to restore HHC in Washington that account for sound scientific rationale and protect high fish consumers.

Many groups in Washington, such as Asian, Pacific Islanders, and subsistence and recreational tribal and non-tribal fishers consume large amounts of fish and shellfish as part of traditionally influenced diets.[93] The 2019 Reconsidered HHC currently expose these high fish consumers to greater risk from toxic pollutants because the criteria do not accurately account for pollutant bioaccumulation from water into fish and expose fish consumers to a greater risk of cancer from PCB exposure.

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[92] 86 FR 23054, 23162 (April 30, 2021) ("Going forward, EPA is committed to conducting environmental justice analysis for rulemakings based on a framework similar to what is outlined here, in addition to investigating ways to further weave environmental justice into the fabric of the rulemaking process including through enhanced meaningful engagement with environmental justice communities.").

[93] Department of Ecology. *Fish Consumption Rates: Technical Support Document, A Review of Data and Information about Fish Consumption in Washington, Version 2.0 Final*. January 2013. Ecology Publication No. 12-09-058, p.18. https://apps.ecology.wa.gov/publications/documents/1209058.pdf.

Environmental impacts to tribes may be considered under the category of EJ in recognition that tribes may at times be among the disadvantaged communities disproportionately impacted by environmental degradation. Where tribal communities are part of a larger non-tribal community, many of the EJ considerations are very similar to those of other disadvantaged groups. However, there is a very unique set of EJ considerations for tribes, particularly in this context where tribes are exercising their cultural practices and reserved rights off their reservations on state waters.

While the overall impacts to communities with EJ concerns are improved as a result of this rule, by relying on the fish consumption rates based on tribal data, this rule helps ensure that tribal members, in particular, and their treaty-protected activities and resources are protected.[94] Specifically, this rule proposes to establish HHC based on a FCR of 175 g/day reflective of regional tribal FCR survey data[95] to represent and protect higher fish consumers. Because a FCR of 175 g/day is a compromise rate in the absence of conclusive data regarding unsuppressed fish consumption levels, the rule proposes to use a CRL of 10^{-6} to derive HHC for all cancer-causing pollutants, including PCBs, to ensure that the effective CRL for tribes exercising treaty rights to fish is no greater than 10^{-5}.

Central to working with tribes on their environmental issues and opportunities is government to government consultation, which is consistent with Executive Order 13175 (65 FR 67249, November 6, 2000). To ensure that this proposed rulemaking considers the interests and perspective of tribes, we engaged with tribes that may be affected by this action to receive

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[94] 80 FR 55063 (September 14, 2015) ("In Washington, many tribes hold reserved rights to take fish for subsistence, ceremonial, religious, and commercial purposes, including treaty-reserved rights to fish at all usual and accustomed fishing grounds and stations in waters under state jurisdiction, which cover the majority of waters in the state. Such rights include not only a right to take those fish, but necessarily include an attendant right to not be exposed to unacceptable health risks by consuming those fish.").

[95] *Fish Consumption Survey of the Umatilla, Nez Perce, Yakama, and Warm Springs Tribes of the Columbia River Basin* (CRITFC 1994).

meaningful and timely input from tribal officials as we developed the proposal. See section VII.F for a summary of tribal consultation.

In addition to Executive Orders 12898 and 13175, and in accordance with Title VI of the Civil Rights Act of 1964, each federal agency shall ensure that all programs or activities receiving federal financial assistance that affect human health or the environment do not directly, or through contractual or other arrangements, use criteria, methods, or practices that discriminate on the basis of race, color, or national origin. With that directive in mind, in August 2011 the Environmental Justice Interagency Working Group established a Title VI Committee to address the intersection of agencies' environmental justice efforts with their Title VI enforcement and compliance responsibilities. If Washington receives federal funds for CWA implementation, they are legally prohibited from discriminating on the basis of race, color or national origin under Title VI when engaging in CWA implementation activities. Additionally, and in compliance with Executive Order 12898, EPA expects that Washington will consider disproportionately high adverse human health and environmental effects on minority and low-income populations when implementing this rulemaking under the CWA.

List of Subjects in 40 CFR Part 131

Environmental protection, Indians-lands, Intergovernmental relations, Reporting and recordkeeping requirements, Water pollution control.

Michael S. Regan,

Administrator.

For the reasons set forth in the preamble, EPA proposes to amend 40 CFR part 131 as follows:

PART 131—WATER QUALITY STANDARDS

1. The authority citation for part 131 continues to read as follows:

Authority: 33 U.S.C. 1251 *et seq.*

Subpart D—Federally Promulgated Water Quality Standards

2. Amend § 131.45 by revising paragraph (b) to read as follows:

§ 131.45 Revision of certain Federal water quality criteria applicable to Washington.

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(b) *Criteria for priority toxic pollutants in Washington*. The applicable human health criteria are shown in Table 1 to paragraph (b).

TABLE 1 TO PARAGRAPH (b)—HUMAN HEALTH CRITERIA FOR WASHINGTON

	A		B					C	
	Chemical	**CAS Number**	**Cancer Slope Factor, CSF (per mg/kg·d) (B1)**	**Relative Source Contribution, RSC (-) (B2)**	**Reference Dose, RfD (mg/kg·d) (B3)**	**Bio-accumulation Factor (L/kg tissue) (B4)**	**Bio-concentration Factor (L/kg tissue) (B5)**	**Water & Organisms (µg/L) (C1)**	**Organisms Only (µg/L) (C2)**
1	1,1,1-Trichloroethane	71556	-	0.50	2	10	-	20,000	50,000
2	1,1,2,2-Tetrachloroethane	79345	0.2	-	-	8.4	-	0.1	0.3
3	1,1,2-Trichloroethane	79005	0.057	-	-	8.9	-	0.35	0.90
4	1,1-Dichloroethylene	75354	-	0.50	0.05	2.6	-	700	4,000
5	1,2,4-Trichlorobenzene	120821	0.029	-	-	430	-	0.036	0.037
6	1,2-Dichlorobenzene	95501	-	0.50	0.3	82	-	700	800
7	1,2-Dichloroethane	107062	0.0033	-	-	1.9	-	8.9	73
8	1,2-Diphenylhydrazine	122667	0.8	-	-	27	-	0.01	0.02
9	1,2-Trans-Dichloroethylene	156605	-	0.50	0.02	4.7	-	200	1,000
10	1,3-Dichlorobenzene	541731	-	0.50	0.002	190	-	2	2
11	1,3-Dichloropropene	542756	0.122	-	-	3.0	-	0.22	1.2
12	1,4-Dichlorobenzene	106467	-	0.50	0.07	84	-	200	200
13	2,4-Dichlorophenol	120832	-	0.50	0.003	48	-	10	10
14	2,4-Dinitrophenol	51285	-	0.50	0.002	4.4	-	30	100
15	2-Chloronaphthalene	91587	-	0.80	0.08	240	-	100	100
16	2-Methyl-4,6-Dinitrophenol	534521	-	0.50	0.0003	10	-	3	7
17	4,4'-DDD	72548	0.24	-	-	240,000	-	7.9E-06	7.9E-06
18	4,4'-DDE	72559	0.167	-	-	3,100,000	-	8.8E-07	8.8E-07
19	4,4'-DDT	50293	0.34	-	-	1,100,000	-	1.2E-06	1.2E-06
20	Acenaphthene	83329	-	0.50	0.06	510	-	30	30
21	Aldrin	309002	17	-	-	650,000	-	4.1E-08	4.1E-08
22	alpha-BHC	319846	6.3	-	-	1,500	-	4.8E-05	4.8E-05
23	alpha-Endosulfan	959988	-	0.50	0.006	200	-	6	7
24	Anthracene	120127	-	0.50	0.3	610	-	100	100
25	Antimony	7440360	-	0.50	0.0004	-	1	6	90
26	Arsenic*	7440382	1.75	-	-	-	44	[a]0.018	[a]0.14
27	Benzo(a) Anthracene	56553	0.73	-	-	3,900	-	0.00016	0.00016
28	Benzo(a) Pyrene	50328	7.3	-	-	3,900	-	1.6E-05	1.6E-05
29	Benzo(b) Fluoranthene	205992	0.73	-	-	3,900	-	0.00016	0.00016
30	Benzo(k) Fluoranthene	207089	0.073	-	-	3,900	-	0.0016	0.0016
31	beta-BHC	319857	1.8	-	-	180	-	0.0013	0.0014

	A		B					C	
	Chemical	**CAS Number**	**Cancer Slope Factor, CSF (per mg/kg·d) (B1)**	**Relative Source Contribution, RSC (-) (B2)**	**Reference Dose, RfD (mg/kg·d) (B3)**	**Bio-accumulation Factor (L/kg tissue) (B4)**	**Bio-concentration Factor (L/kg tissue) (B5)**	**Water & Organisms (µg/L) (C1)**	**Organisms Only (µg/L) (C2)**
32	Bis(2-Chloro-1-Methylethyl) Ether**	108601	-	0.50	0.04	10	-	400	900
33	Bis(2-Ethylhexyl) Phthalate	117817	0.014	-	-	710	-	0.045	0.046
34	Bromoform	75252	0.0045	-	-	8.5	-	4.6	12
35	Butylbenzyl Phthalate	85687	0.0019	-	-	19,000	-	0.013	0.013
36	Chlordane	57749	0.35	-	-	60,000	-	2.2E-05	2.2E-05
37	Chlorobenzene	108907	-	0.50	0.02	22	-	100	200
38	Chlorodibromomethane	124481	0.04	-	-	5.3	-	0.60	2.2
39	Chloroform	67663	-	0.50	0.01	3.8	-	100	600
40	Chrysene	218019	0.0073	-	-	3,900	-	0.016	0.016
41	Cyanide	57125	-	0.50	0.0006	-	1	9	100
42	Dibenzo(a,h) Anthracene	53703	7.3	-	-	3,900	-	1.6E-05	1.6E-05
43	Dichlorobromomethane	75274	0.034	-	-	4.8	-	0.73	2.8
44	Dieldrin	60571	16	-	-	410,000	-	7.0E-08	7.0E-08
45	Diethyl Phthalate	84662	-	0.50	0.8	920	-	200	200
46	Dimethyl Phthalate	131113	-	0.50	10	4,000	-	600	600
47	Di-n-Butyl Phthalate	84742	-	0.50	0.1	2,900	-	8	8
48	Endosulfan Sulfate	1031078	-	0.50	0.006	140	-	9	-
49	Endrin	72208	-	0.80	0.0003	46,000	-	0.002	0.002
50	Ethylbenzene	100414	-	0.50	0.022	160	-	29	31
51	Fluoranthene	206440	-	0.50	0.04	1,500	-	6	6
52	Fluorene	86737	-	0.50	0.04	710	-	10	10
53	gamma-BHC; Lindane	58899	-	0.50	0.0047	2,500	-	0.43	0.43
54	Heptachlor	76448	4.1	-	-	330,000	-	3.4E-07	3.4E-07
55	Heptachlor Epoxide	1024573	5.5	-	-	35,000	-	2.4E-06	2.4E-06
56	Hexachlorobenzene	118741	1.02	-	-	90,000	-	5.0E-06	5.0E-06
57	Hexachlorobutadiene	87683	0.04	-	-	1,100	-	0.01	0.01
58	Hexachlorocyclopentadiene	77474	-	0.50	0.006	1,300	-	1	1
59	Hexachloroethane	67721	0.04	-	-	600	-	0.02	0.02
60	Indeno(1,2,3-cd) Pyrene	193395	0.73	-	-	3,900	-	0.00016	0.00016
61	Methyl Bromide	74839	-	0.50	0.02	1.4	-	300	-
62	Methylene Chloride	75092	0.002	-	-	1.6	-	10	100
63	Methylmercury	22967926	-	2.7E-05	0.0001	-	-	-	[b]0.03 (mg/kg)
64	Nickel	7440020	-	0.50	0.02	-	47	80	100
65	Nitrobenzene	98953	-	0.50	0.002	3.1	-	30	100
66	Pentachlorophenol (PCP)	87865	0.4	-	-	520	-	0.002	0.002
67	Phenol	108952	-	0.50	0.6	1.9	-	9,000	70,000
68	Polychlorinated Biphenyls (PCBs)		2	-	-	-	31,200	[c]7E-06	[c]7E-06
69	Pyrene	129000	-	0.50	0.03	860	-	8	8
70	Selenium	7782492	-	0.50	0.005	-	4.8	60	200

	A		B					C	
	Chemical	**CAS Number**	**Cancer Slope Factor, CSF (per mg/kg·d) (B1)**	**Relative Source Contribution, RSC (-) (B2)**	**Reference Dose, RfD (mg/kg·d) (B3)**	**Bio-accumulation Factor (L/kg tissue) (B4)**	**Bio-concentration Factor (L/kg tissue) (B5)**	**Water & Organisms (µg/L) (C1)**	**Organisms Only (µg/L) (C2)**
71	Tetrachloroethylene	127184	0.0021	-	-	76	-	2.4	2.9
72	Toluene	108883	-	0.50	0.0097	17	-	72	130
73	Trichloroethylene	79016	0.05	-	-	13	-	0.3	0.7
74	Vinyl Chloride	75014	1.5	-	-	1.7	-	-	0.18
75	Zinc	7440666	-	0.50	0.3	-	47	1,000	1,000
[a]	This criterion refers to the inorganic form of arsenic only.								
[b]	This criterion is expressed as the fish tissue concentration of methylmercury (mg methylmercury/kg fish). See *Water Quality Criterion for the Protection of Human Health: Methylmercury* (EPA-823-R-01-001, January 3, 2001) for how this value is calculated using the criterion equation in EPA's 2000 Human Health Methodology rearranged to solve for a protective concentration in fish tissue rather than in water.								
[c]	This criterion applies to total PCBs (e.g., the sum of all congener or isomer or homolog or Aroclor analyses).								
*	These criteria were promulgated for Washington in the National Toxics Rule at 40 CFR 131.36, and are moved into 40 CFR 131.45 to have one comprehensive human health criteria rule for Washington.								
**	Bis(2-Chloro-1-Methylethyl) Ether was previously listed as Bis(2-Chloroisopropyl) Ether.								

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