WSR 24-05-043
PROPOSED RULES
DEPARTMENT OF ECOLOGY
[Order 22-04—Filed February 15, 2024, 7:35 a.m.]

Original Notice.

Supplemental Notice to [Preproposal statement of inquiry was filed as] WSR 22-14-001.

Title of Rule and Other Identifying Information: The Washington state department of ecology (ecology) is proposing amendments to chapter 173-201A WAC, Water quality standards for surface waters of the state of Washington. We propose the following revisions in this rule making:

- Amending WAC 173-201A-240 Toxic substances, specifically updating aquatic life toxics criteria in Table 240 and footnotes.
- Minor, nonsubstantive edits to rule language in WAC 173-201A-240 to correct typographical, calculation, and formatting errors, and to cite federal regulations for human health criteria where they apply for Clean Water Act (CWA) purposes.

For more information on this rule making, please visit https://ecology.wa.gov/regulations-permits/laws-rules-rulemaking/rulemaking/wac-173-201a-aquatic-life-toxics-criteria.

Hearing Location(s): On April 4, 2024, at 1:30 p.m., via webinar. Presentation, question and answer session, followed by the hearing. This is an online meeting that you can attend from any computer using internet access. Join online and see instructions https://waecy-wa-gov.zoom.us/meeting/register/tZIvdeigqDsvE9K0JMbUp6w5Kt0WFhGN5egU. For audio, call US Toll number 1-253-205-0468 and enter access code 862 2186 0596. Or to receive a free call back, provide your phone number when you join the event; and

On April 10, 2024, at 5:30 p.m., via webinar. Presentation, question and answer session, followed by the hearing. This is an online meeting that you can attend from any computer using internet access. Join online and see instructions https://waecy-wa-gov.zoom.us/meeting/register/tZMpfu2gqj8iG9fkV1RVT5tELvDX7eLhmrc-. For audio, call US Toll number 1-253-205-0468 and enter access code 874 9484 4813. Or to receive a free call back, provide your phone number when you join the event.

Date of Intended Adoption: July 10, 2024.

Submit Written Comments to: Marla Koberstein, US mail: Department of Ecology, Water Quality Program, P.O. Box 47696, Olympia, WA 98504-7696; or parcel delivery services: Department of Ecology, Water Quality Program, P.O. Box 47696, Olympia, WA 98504-7696. Submit comments by mail, at the hearing(s), or online https://wq.ecology.commentinput.com?id=apZ8BGx2sQ, by April 17, 2024.

Assistance for Persons with Disabilities: Contact ecology ADA coordinator, phone 360-407-6831, speech disability call TTY 877-833-6341, impaired hearing call Washington relay service 711, email ecyADAcoordinator@ecy.wa.gov, by April 1, 2024.

Purpose of the Proposal and Its Anticipated Effects, Including Any Changes in Existing Rules: **Aquatic life toxics criteria:** We are proposing revisions to aquatic life toxics criteria to provide additional water quality protection for organisms that live in water.

We reviewed all of Washington's current aquatic life toxics criteria to ensure they are consistent with nationally recommended water quality criteria issued by the Environmental Protection Agency (EPA).

This process included an evaluation of pollutant protection levels for endangered species and their populations in Washington waters since this rule update will require Endangered Species Act (ESA) review.

We evaluated current scientific data, methods, and modeling tools to update protection levels necessary for aquatic life in Washington's surface waters. We have also added new toxic substances into the water quality standards that EPA has recommended or that the state of Washington designates as high priority for the protection of aquatic life.

The lists below show existing criteria that we updated, and new criteria we are proposing that are not currently included in Washington's water quality standards for aquatic life toxics.

Existing criteria revised:

- Aldrin (freshwater and saltwater acute).
- Arsenic (freshwater acute and chronic and saltwater acute and chronic).
- Cadmium (freshwater acute and chronic and saltwater acute and chronic).
- Chromium III (freshwater acute and chronic).
- Chromium VI (freshwater acute and chronic).
- Copper (freshwater acute and chronic).
- Cyanide (freshwater acute and chronic).
- Dieldrin (freshwater acute and chronic).
- Endrin (freshwater acute and chronic).
- Gamma-BHC (freshwater acute).
- Mercury (freshwater acute).
- Nickel (freshwater acute and chronic).
- Pentachlorophenol (freshwater acute and chronic and saltwater chronic).
- Selenium (freshwater acute and chronic).
- Silver (freshwater and saltwater acute).
- Zinc (freshwater acute and chronic).

Proposed new criteria:

- 6PPD-quinone (freshwater acute).
- Aluminum (freshwater acute and chronic).
- Acrolein (freshwater acute and chronic).
- Carbaryl (freshwater acute and chronic and saltwater acute).
- Demeton (freshwater and saltwater chronic).
- Diazinon (freshwater acute and chronic and saltwater acute and chronic).
- Guthion (freshwater and saltwater chronic).
- Malathion (freshwater and saltwater chronic).
- Methoxychlor (freshwater and saltwater chronic).
- Mirex (freshwater and saltwater chronic).
- Nonylphenol (freshwater acute and chronic and saltwater acute and chronic).
- PFOS (freshwater acute and chronic and saltwater acute).
- PFOA (freshwater acute and chronic and saltwater acute).
- Silver (freshwater and saltwater chronic).
- Tributyltin (freshwater acute and chronic and saltwater acute and chronic).

Minor Nonsubstantive Edits: We are adding a footnote in the surface water quality standards that cite the federal regulations for EPA promulgated human health criteria where they are the applicable criteria for CWA programs in Washington.

Reasons Supporting Proposal: ***A. History of Aquatic Life Toxics Criteria:*** We submitted freshwater and marine aquatic life criteria for 26 toxic chemicals in 1988, and EPA approved these criteria in 1988. EPA determined that additional aquatic life criteria were needed to comply with CWA Section 303 (c)(2)(B) and promulgated aquatic life criteria for Washington in the 1992 National Toxics Rule for acute and chronic freshwater and marine arsenic and selenium criteria, chronic marine copper criteria, and chronic marine cyanide criteria. Following EPA's promulgation of the 1992 National Toxics Rule, we submitted updates to toxic chemicals in 1993, 1998, and 2007, leading to Washington's withdraw from the National Toxics Rule for aquatic life toxics criteria. Washington's last update to aquatic life criteria for toxic chemicals was in 2007.

The majority of Washington's aquatic life toxics criteria have not been updated since 1992 or prior. Since the National Toxics Rule of 1992, EPA has added additional toxic substances to their list of recommended criteria and provided several updates to previously established criteria. In this rule making, we evaluated the current science for each of Washington's aquatic life toxic criteria and any new aquatic life criteria for toxic substances in this rule making.

B. Litigation: On December 29, 2021, the United States District Court ruled that EPA would be required to determine within 180 days if Washington's current aquatic life toxics criteria are consistent with CWA or if they need to be revised (*NWEA v. EPA*, 2021, Case No. C20-1362 MJP). If they are determined to be inadequate, CWA requires EPA to promulgate new regulations for Washington, unless the state adopts them in the meantime.

The settlement agreement requires EPA to evaluate 17 pollutants for consistency with CWA, including nine pollutants by June of 2023 and the last eight pollutants by June of 2026. EPA has determined that new and revised aquatic life criteria are necessary to protect against adverse aquatic life impacts related to the following nine pollutants: Acrolein, aluminum, arsenic, cadmium, copper, cyanide, mercury, nickel, and selenium. This determination is made in accordance with a court order directing EPA to determine whether new or revised aquatic life criteria for these nine pollutants are necessary to meet the requirements of CWA. *Nw. Envtl. Advocates v. EPA*, No. 2:20-cv-1362-MJP, Dkt. 84 (W.D. Wash.).

C. Triennial Review: During the last public review of ecology's draft water quality standards workplan in 2021, known as the triennial review, we received overwhelming support from commenters for updating rules for aquatic life toxics criteria based on new information and approaches to aquatic life protection. We considered and received feedback on several approaches to rule making. The different approaches to revising the aquatic life toxics criteria include:

- Updating different classes (such as metals and organics) of toxic substances in staggered rule makings.
- Rule makings for different groups of toxic substances based on highest priority.
- A review and update of all necessary criteria in a single rule making.

We received public support for updates to aquatic life toxics in a single rule making and a strategy that involves two rule makings based on different chemical classes.

D. Approach to this Rule Making: We have decided to proceed with updating all necessary aquatic life toxics criteria in a single rule

making. This decision is influenced in part by ongoing litigation for EPA to evaluate and potentially promulgate aquatic life toxics criteria. We anticipate that a single rule making of all aquatic life toxics criteria will be more efficient than multiple rule makings. Stakeholders, tribes, and other interested parties will be able to engage in the full scope of aquatic life toxic criteria considerations within one rule making, without ecology placing one toxic substance or group of substances at a higher priority than others.

In this rule making, we compared EPA's nationally recommended aquatic life toxics criteria against Washington's current criteria to determine if updates are needed. We also considered draft EPA criteria that were finalized before the rule proposal phase of this rule making. Furthermore, we evaluated previous ESA consultations and associated National Marine Fisheries Service (NMFS) and United States Fish and Wildlife Service (USFWS) biological opinions from other Pacific Northwest states (such as Idaho and Oregon) to anticipate whether EPA national recommendations will meet ESA protection requirements.

Previous ESA consultation reports for criteria in other states have indicated that EPA's recommendations for some aquatic life toxics may not adequately protect ESA listed species. If particular toxics are not deemed "approvable" through ESA consultation, we evaluated new scientific data, alternative methods to calculate criteria, and the new modeling tools as remedies to providing full protection to aquatic life species, including endangered species and their populations.

E. Rule-Making Scope: We have identified several aquatic life toxics criteria that we reviewed based on EPA's updates to nationally recommended criteria. For several toxic substances, EPA recommended 304(a) criteria are more stringent than ecology's aquatic life toxics criteria or have yet to be incorporated into Washington's surface water quality standards. We evaluated EPA recommendations using information from ESA consultation. If no endangered species protection concerns were present, then we proposed EPA recommendations. For those toxics with endangered species protection concerns, we proposed state-specific criteria.

In some cases, we updated criteria regardless of EPA recommendations based on new data and/or the need to adopt more protective values for endangered species and their populations.

Other background information and issues related to this rule making: Updating the aquatic life toxics criteria is a high priority for ecology. Updating the aquatic life toxics criteria was included in the five-year work plan developed as part of the 2010 triennial review. More recently, updates to aquatic life toxics criteria were outlined in our performance partnership agreement (PPA) with EPA in 2021 and in our most recent triennial review submitted to EPA in April 2022.

Since the 2010 triennial review, we have focused our toxics expertise on updating human health criteria. The decision to prioritize human health criteria updates ahead of aquatic life toxics criteria was made, in part, because of significant delays in the several ESA consultations for EPA's nationally recommended aquatic life toxics criteria. We decided it was in the state's best interest to wait for the outcomes of ESA consultations and subsequent EPA determinations of adjacent state aquatic life toxics criteria before investing resources to update our aquatic life toxics criteria.

EPA Region 10 states have submitted updates to their aquatic life toxics criteria over the past few decades, but EPA's required ESA consultations with the National Oceanographic and Atmospheric Administration, National Marine Fisheries Service (NMFS), and the United States

Fish and Wildlife Service (USFWS) have been significantly delayed for several states (e.g., Oregon and Idaho). EPA consideration of Oregon's aquatic life toxics criteria adopted in 2004 was significantly delayed as the federal agencies worked through ESA Section 7 consultation. In 2013, EPA disapproved a number of aquatic life criteria that the Oregon Environmental Quality Commission (ODEQ) adopted in 2004. Since 2013, ODEQ adopted, and EPA approved, revisions to several of the disapproved criteria. EPA's approvals of Idaho's aquatic life criteria likewise have been stalled, leaving the state-adopted criteria unusable for CWA actions.

In the 2010 triennial review, ecology decided it would be most beneficial for our state to wait until final ESA consultations and subsequent EPA approvals had been completed for the adjacent states before moving forward with adopting aquatic life toxics criteria in order to increase the likelihood they would meet ESA considerations and be approved by EPA. Given the probability of a delay in federal approval, ecology decided to move forward with developing human health toxics criteria as a higher priority, to be followed by aquatic life toxics criteria when there was more certainty that EPA-recommended criteria would make it through ESA consultation.

Statutory Authority for Adoption: RCW 90.48.035 provides clear and direct authority to ecology to revise the surface water quality standards (SWQS). Additionally, 40 C.F.R. 131.20 requires states and tribes with CWA authority to periodically review and update SWQS.

Statute Being Implemented: Chapter 90.48 RCW, Water pollution control.

Rule is necessary because of federal law, 40 C.F.R. 131.20.

Agency Comments or Recommendations, if any, as to Statutory Language, Implementation, Enforcement, and Fiscal Matters: For more information, see the technical support document, Ecology Publication 24-10-007, the draft rule implementation plan, Ecology Publication 24-10-008, and the preliminary regulatory analyses, Ecology Publication 24-10-009, available on our rule-making web page.

Name of Proponent: Department of ecology, governmental.

Name of Agency Personnel Responsible for Drafting: Bryson Finch, Lacey, Headquarters, 360-999-9610; Implementation: Melissa Gildersleeve, Lacey, Headquarters, 360-522-6441; and Enforcement: Vincent McGowan, Lacey, Headquarters, 360-407-6405.

A school district fiscal impact statement is not required under RCW 28A.305.135.

A cost-benefit analysis is required under RCW 34.05.328. A preliminary cost-benefit analysis may be obtained by contacting Marla Koberstein, Department of Ecology, Water Quality Program, P.O. Box 47696, Olympia, WA 98504-7696, phone 360-628-6376, speech disability call TTY at 877-833-6341, impaired hearing call Washington relay service at 711, email marla.koberstein@ecy.wa.gov.

This rule proposal, or portions of the proposal, is exempt from requirements of the Regulatory Fairness Act because the proposal:

Is exempt under RCW 19.85.025(3) as the rules are adopting or incorporating by reference without material change federal statutes or regulations, Washington state statutes, rules of other Washington state agencies, shoreline master programs other than those programs governing shorelines of statewide significance, or, as referenced by Washington state law, national consensus codes that generally establish industry standards, if the material adopted or incorporated regulates the same subject matter and conduct as the adopting or in-

corporating rule; and rules only correct typographical errors, make address or name changes, or clarify language of a rule without changing its effect.

Scope of exemption for rule proposal:

Is partially exempt:

Explanation of partial exemptions: Ecology baselines are typically complex, consisting of multiple requirements fully or partially specified by existing rules, statutes, or federal laws. Where the proposed rule differs from this baseline of existing requirements, it is typically subject to (i.e., not exempt from) analysis required under the Regulatory Fairness Act (RFA), chapter 19.85 RCW), based on meeting criteria referenced in RCW 19.85.025(3) as defined by the Administrative Procedure Act in RCW 34.05.310. The small business economic impact statement (SBEIS) below includes a summary of the baseline for this rule making, and whether or how the proposed rule differs from the baseline.

The proposed rule does impose more-than-minor costs on businesses.

SBEIS

This SBEIS presents the:

- Compliance requirements of the proposed rule.
- Results of the analysis of relative compliance cost burden.
- Consideration of lost sales or revenue.
- Cost-mitigating action taken by ecology, if required.
- Small business and local government consultation.
- Industries likely impacted by the proposed rule.
- Expected net impact on jobs statewide.

A small business is defined by RFA as having 50 or fewer employees. Estimated costs are determined as compared to the existing regulatory environment, the regulations in the absence of the rule. The SBEIS only considers costs to "businesses in an industry" in Washington state. This means that impacts, for this document, are not evaluated for government agencies.

The existing regulatory environment is called the "baseline" in this document. It includes only existing laws and rules at federal and state levels.

This information is excerpted from ecology's complete set of regulatory analyses for this rule making. For complete discussion of the likely costs, benefits, minimum compliance burden, and relative burden on small businesses, see the associated regulatory analyses document (**Ecology publication no. 24-10-009, February 2024**).

COMPLIANCE REQUIREMENTS OF THE PROPOSED RULE, INCLUDING PROFESSIONAL SERVICES: The baseline for our analyses generally consists of existing laws and rules. This is what allows us to make a consistent comparison between the state of the world with and without the proposed rule amendments. Should ecology not adopt the proposed rule making, standards for aquatic life criteria and their administration are determined as described within the remainder of this chapter.

Existing Aquatic Life Toxics Criteria:

State Criteria: As listed in WAC 173-201A-240, Table 240 and relevant footnotes.

National EPA Recommended Water Quality Criteria: EPA periodically updates their recommended water quality criteria based on new information for each toxic chemical. Aquatic life criteria for toxic chemicals are considered by the EPA to be the highest concentration of specific pollutants or parameters in water that are not expected to pose a significant risk to the majority of species in a given environment or a narrative description of the desired conditions of a water body being "free from" certain negative conditions. **Not moving forward with this rule making would subject ecology to EPA's promulgation of their federal criteria.**

Clean Water Act: Section 303 (c)(2)(A).

Water Pollution Control Act: RCW 90.48.010 and 90.48.035.

Permitting Guidelines: Permitting guidelines help permit writers determine how to approach different permit scenarios. They assist permit writers in how to think through meeting water quality criteria for protection of aquatic life to permittee-specific requirements. While not a legal requirement, guidance informs how aquatic life criteria might impact permittees who discharge effluent to water bodies. Therefore, in describing the baseline for this analysis of the rule amendments, it is necessary to consider the permitting guidelines in the baseline and amended scenarios, as they will contribute to the cost and benefit estimates and discussion of impacts.

Ecology uses the Water Quality Program Permit Writer's Manual (Ecology, 2018) for technical guidance when developing wastewater discharge permits. A general overview of the permitting process for all dischargers includes:

- Ecology receiving the permit application.
- Review of the application for completeness and accuracy.
- Derivation of applicable technology-based effluent limits.
- Determination of whether effluent will cause, or have reasonable potential to cause or contribute to, violation of water quality standards.
- If yes, derivation of water quality-based effluent limits.
- Determination of monitoring requirements and other special conditions.
- Review process for the draft or proposed permit.
- Issuance of the final permit decision.

To evaluate the effect of effluent toxic pollutants on a receiving water, the permit writer uses the water quality criteria and standards, the criteria for mixing zones, and an analysis of the concentrations of specific pollutants or effects of pollutants within or at the edge of the mixing zone or the assigned dilution factor. The requirement for imposing effluent limitations for the protection of water quality does not require a demonstration of impact beyond any doubt but only that there is a determination of reasonable potential determined by a rational and scientific process.

Defining water quality impacts and developing effluent limits is usually more complex for toxic pollutants than for the other pollutants. The aquatic life toxic criteria are given at two levels (acute and chronic), each of which contains three components (magnitude, duration, and frequency). The analysis to predict water quality impacts and thus to define effluent limits must be conducted for both acute and chronic criteria to define the most limiting criteria. Many of the criteria for toxic pollutants depend on variable receiving water conditions. Permit writers calculate effluent limits to protect receiving water quality during critical (worst-case) conditions.

Impaired Waterbody Listing and Cleanup Plan: The CWA's section 303(d) established a process to identify and clean up polluted waters. Every two years, all states are required to perform a water quality assessment of surface waters in the state, including all the rivers, lakes, and marine waters where data are available. Ecology compiles its own water quality data and federal data and invites other groups to submit water quality data they have collected. All data submitted must be collected using appropriate scientific methods. The assessed waters are placed in categories that describe the status of water quality. Once the assessment is complete, the public is given a chance to review it and give comments. The final assessment is formally submitted to the EPA for approval.

Waters with beneficial uses, such as for drinking, recreation, aquatic habitat, and industrial use, that are impaired by pollutants are placed in the polluted water category in the water quality assessment 303(d) list. These water bodies fall short of state surface water quality standards and are not expected to improve within the next two years. The 303(d) list, so called because the processes for developing the list and addressing the polluted waters on the list are described in section 303(d) of the federal CWA, comprises waters in the polluted water category.

Ecology's assessment of which waters to place on the 303(d) list is guided by federal laws, state water quality standards, and the policy on the Washington State Water Quality Assessment (WQP Policy 1-11; March 2023). This policy describes how the standards are applied, requirements for the data used, and how to prioritize total maximum daily loads (TMDL), among other issues. In addition, even before a TMDL is completed, the inclusion of a water body on the 303(d) list can reduce the amount of pollutants allowed to be released under permits issued by ecology.

Waters placed on the 303(d) list require the preparation of a water cleanup plan (TMDL) or other approved water quality improvement project. The improvement plan identifies how much pollution needs to be reduced or eliminated to achieve clean water and allocates that amount of required pollution reduction among the existing sources.

Past or existing compliance behavior: The baseline includes past or existing compliance behavior. This includes behavior undertaken in response to federal and state laws, rules, permits, guidance, and policies. This also includes business decisions in response to regulatory, economic, or environmental changes. Such behavior might include, but is not limited to, existing treatment technologies, production processes, and effluent volumes. Including these behaviors in the baseline is necessary to assess the incremental impacts of the proposed rule over existing requirements.

Discharger and TMDL growth trajectories: The amended rule applies to existing and future dischargers, on existing and future impaired water bodies, and water bodies with TMDLs and without TMDLs, so the baseline must also account for attributes and behaviors of future dischargers and future TMDLs.

The baseline forecast of future growth in the number, locations, and types of TMDLs is based on past TMDL behavior and planned structuring of TMDL planning. We forecast expected types of TMDLs based on prospective new locations, and how they fit into the framework for planning and completing TMDLs.

The baseline forecast of future dischargers is based on attributes of existing dischargers. The forecast assumes that future discharger contaminants and concentrations are the same as in existing

dischargers. This means unexpected changes in technology over time (e.g., using different inputs or technologies) that reduce pollutants in effluent would reduce the actual impacts of the proposed rule.

Existing allowance for compliance schedules: The baseline includes existing compliance schedules. A compliance schedule is an enforceable tool used as part of a permit, order, or directive to achieve compliance with applicable effluent standards and limitations, water quality standards, or other legally applicable requirements. Compliance schedules include a sequence of interim requirements such as actions, operations, or milestone events to achieve the stated goals. Compliance schedules are a broadly used tool for achieving compliance with state and federal regulations; compliance schedules under CWA are defined federally at CWA 502(17) and 40 C.F.R. Section 122.2.

Proposed rule amendments: The proposed rule amendments would amend WAC 173-201A-240 Toxic substances, specifically aquatic life criteria including, but not limited to, Table 240 and footnotes.

Revisions to existing aquatic life criteria:

- Arsenic (all).
- Cadmium (all).
- Chromium III (freshwater acute and chronic).
- Chromium VI (freshwater acute and chronic).
- Copper (freshwater acute and chronic).
- Cyanide (freshwater acute and chronic).
- Dieldrin (freshwater acute and chronic).
- Endrin (freshwater acute and chronic).
- Gamma-BHC (freshwater acute).
- Mercury (freshwater acute).
- Nickel (freshwater acute and chronic).
- Pentachlorophenol (freshwater acute and chronic and saltwater chronic).
- Selenium (freshwater acute and chronic).
- Silver (freshwater and saltwater acute).
- Zinc (freshwater acute and chronic).
- Aldrin (freshwater and saltwater acute).

New criteria:

- 6PPD-quinone (freshwater acute).
- Aluminum (freshwater acute and chronic).
- Acrolein (freshwater acute and chronic).
- Carbaryl (freshwater acute and chronic and saltwater acute).
- Demeton (freshwater and saltwater chronic).
- Diazinon (all).
- Guthion (freshwater and saltwater chronic).
- Malathion (freshwater and saltwater chronic).
- Methoxychlor (freshwater and saltwater chronic).
- Mirex (freshwater and saltwater chronic).
- Nonylphenol (all).
- PFOS (freshwater acute and chronic and saltwater acute).
- PFOA (freshwater acute and chronic and saltwater acute).
- Silver (freshwater and saltwater chronic).
- Tributyltin (all).
- Make minor, nonsubstantive edits to rule language in WAC 173-201A-240 to correct typographical, calculation, and formatting errors.

Note that since the EPA criteria recommendations are in this rule making's baseline, the analytical scope of this regulatory analysis is

reduced to new or existing aquatic life criteria that: (1) Differ from WAC 173-201A-240 (Table 240); and (2) differ from EPA guidance or EPA derivation methods (due to ESA concerns, new science, and/or having no EPA recommendation). Applying this filter (see Table 16 in Appendix B for illustration and additional information), this analysis includes the following:

Analytical Scope:

- Arsenic (all).
- Cadmium (freshwater acute and chronic).
- Copper.
- Chromium VI (freshwater acute and chronic).
- Nickel (freshwater acute and chronic).
- Silver (freshwater acute and chronic).
- Zinc (freshwater acute and chronic).
- 6PPD-quinone (freshwater acute).
- Cyanide (freshwater acute and chronic).
- Pentachlorophenol (all).
- PFOS (freshwater acute and chronic and saltwater acute).
- PFOA (freshwater acute and chronic and saltwater acute).
- Minor, nonsubstantive edits to rule language in WAC 173-201A-240 to correct typographical, calculation, and formatting errors associated with the list above.

COSTS OF COMPLIANCE: EQUIPMENT, SUPPLIES, LABOR, AND PROFESSIONAL SERVICES: Costs would originate from permit holders (in most cases, facilities) that change behavior to comply with new or revised permit conditions based on the proposed rule. However, many permit holders do not process the materials or operate equipment that would lead to any change in permit limits based on the new criteria, or already report effluent numbers low enough to comply with the proposed rule. Therefore, costs are not created by all permits and all criteria.

Estimated costs are generated by potential increases in level 1, 2, and 3 exceedances and the corrective actions required by them for existing criteria (with copper and zinc accounting for all of the level 2 and 3 exceedances), and increased monitoring and lab costs for new criteria. For additional context, level 1 violation would lead to the equivalent of minor adjustments like sweeping and moving materials away from drains to come into compliance (labor costs). Level 2 violation might lead to installing berms, removing materials suspected of contributing to pollutants, and coating various pipes and surfaces (equipment, supply, and labor costs). At a minimum, a level 2 violation would necessitate development and implementation of a source control plan. Level 3 violation requires facility improvements likely to include water treatment filters, catch basins, and other engineering solutions (equipment, supply, labor, and professional services costs). Due to project complexity and data availability, compliance costs below reflect combined labor, professional services, and supplies where applicable.

Estimated Present Value of Total Cost

Action Level	Low-Cost Estimate	High-Cost Estimate
1	$12,304	$24,608
2	$173,531	$173,531
3	$14,250,000	$42,750,000
Lab Costs	$3,128,218	$9,428,912
Total	$17,564,053	$52,377,051

COMPARISON OF COMPLIANCE COST FOR SMALL VERSUS LARGE BUSINESSES: We calculated the estimated per-business costs to comply with the proposed rule amendments, based on the costs estimated in Chapter 3 of this document. In this section, we estimate compliance costs per employee.

The average affected small business likely to be covered by the proposed rule amendments employs about 20 people. The largest 10 percent of affected businesses employ an average of 4,638 people. These estimates were generating by cross referencing permit addresses with Dun and Bradstreet data on global employment.[1] Based on cost estimates in Chapter 3, we estimated the following compliance costs per employee.

1 https://www.dnb.com/.

Compliance costs per employee

Type of cost (or total cost)	Small Businesses	Largest 10% of Businesses
Average employment	20	4,638
Compliance costs per entity (low)	$8,005	$89,947
Compliance costs per entity (high)	$23,897	$268,593
Cost per employee (low)	$410	$19
Cost per employee (high)	$1,223	$58

We conclude that the proposed rule amendments are likely to have disproportionate impacts on small businesses and, therefore, ecology must include elements in the proposed rule amendments to mitigate this disproportion as far as is legal and feasible.

MITIGATION OF DISPROPORTIONATE IMPACT: RFA (RCW 19.85.030(2)) states that: "Based upon the extent of disproportionate impact on small business identified in the statement prepared under RCW 19.85.040, the agency shall, where legal and feasible in meeting the stated objectives of the statutes upon which the rule is based, reduce the costs imposed by the rule on small businesses. The agency must consider, without limitation, each of the following methods of reducing the impact of the proposed rule on small businesses:

(a) Reducing, modifying, or eliminating substantive regulatory requirements;

(b) Simplifying, reducing, or eliminating recordkeeping and reporting requirements;

(c) Reducing the frequency of inspections;

(d) Delaying compliance timetables;

(e) Reducing or modifying fine schedules for noncompliance; or

(f) Any other mitigation techniques including those suggested by small businesses or small business advocates."

We considered all of the above options, the goals and objectives of the authorizing statutes (see Chapter 6), and the scope of this rule making. We limited compliance cost-reduction methods to those that:

- Are legal and feasible.
- Meet the goals and objectives of the authorizing statute.
- Are within the scope of this rule making.

Modifying regulatory requirements, changing reporting requirements, reducing the frequency of inspections, delaying compliance timetables, or modifying fine schedules would not meet statutory objectives or are not feasible and within the scope of this rule making. This rule making was initiated specifically to amend WAC 173-201A-240 aquatic life toxics criteria (and make necessary supporting changes),

while not amending other aspects of requirements and implementation of broader surface water quality standards.

It was not feasible in the proposed rule amendments to directly mitigate disproportionate impacts to small businesses, however, multiple elements of the baseline rule already in place serve to mitigate compliance costs for small businesses:

WAC 173-224-090 may reduce fees for all small businesses holding or applying for a state waste discharge or NPDES permit issued by ecology.

WAC 173-224-090 allows small businesses to receive a fee reduction of 50 percent, but not less than the minimum permit fee of $150, if they are determined to be eligible under the following criteria:

(1) Be a corporation, partnership, sole proprietorship, or other legal entity formed for the purpose of making a profit;

(2) Be independently owned and operated from all other businesses (i.e., not a subsidiary of a parent company);

(3) Have annual sales of $1,000,000 or less of the goods or services produced using the processes regulated by the waste discharge or individual stormwater discharge permit (we identified 605 small business permittees in Washington that meet this definition); and

(4) Have an original annual permit fee assessment totaling $500 or greater.

In addition to the small business fee reduction, any small business with annual gross revenue totaling $100,000 or less from goods and services produced using the processes regulated by the discharge permit may apply for an extreme hardship fee reduction. If the permit holder is determined eligible, the annual permit fee is reduced to the minimum annual permit fee of $150.

SMALL BUSINESS AND LOCAL GOVERNMENT CONSULTATION: We involved small businesses, local governments, and tribes in its development of the proposed rule amendments, using: Public webinars in October 2022, April 2023, and October 2023; and tribal webinars in April 2023 and October 2023.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES OF INDUSTRIES IMPACTED BY THE PROPOSED RULE: Businesses that hold permits potentially affected by the proposed rule fall within the following industry categories. Note that associated NAICS codes and definitions are discussed further at https://www.census.gov/naics/.

Industries and their associated NAICS codes that are impacted by the rule

NAICS Code	Description
111x	Crop Production
112x	Animal Production and Aquaculture
113x	Forestry and Logging
114x	Fishing, Hunting and Trapping
221x	Utilities
236x	Construction of Buildings
237x	Heavy and Civil Engineering Construction
238x	Specialty Trade Contractors
311x	Food Manufacturing
312x	Beverage and Tobacco Product Manufacturing
314x	Textile Product Mills
321x	Wood Product Manufacturing
322x	Paper Manufacturing

NAICS Code	Description
324x	Petroleum and Coal Products Manufacturing
325x	Chemical Manufacturing
326x	Plastics and Rubber Products Manufacturing
327x	Nonmetallic Mineral Product Manufacturing
331x	Primary Metal Manufacturing
332x	Fabricated Metal Product Manufacturing
333x	Machinery Manufacturing
334x	Computer and Electronic Product Manufacturing
335x	Electrical Equipment, Appliance, and Component Manufacturing
336x	Transportation Equipment Manufacturing
337x	Furniture and Related Product Manufacturing
339x	Miscellaneous Manufacturing
423x	Merchant Wholesalers, Durable Goods
424x	Merchant Wholesalers, Nondurable Goods
441x	Motor Vehicle and Parts Dealers
444x	Building Material and Garden Equipment and Supplies Dealers
445x	Food and Beverage Retailers
455x	General Merchandise Retailers
457x	Gasoline Stations and Fuel Dealers
458x	Clothing, Clothing Accessories, Shoe, and Jewelry Retailers
459x	Sporting Goods, Hobby, Musical Instrument, Book, and Miscellaneous Retailers
481x	Air Transportation
482x	Rail Transportation
484x	Truck Transportation
485x	Transit and Ground Passenger Transportation
488x	Support Activities for Transportation
492x	Couriers and Messengers
493x	Warehousing and Storage
522x	Credit Intermediation and Related Activities
524x	Insurance Carriers and Related Activities
531x	Real Estate
532x	Rental and Leasing Services
533x	Lessors of Nonfinancial Intangible Assets (except Copyrighted Works)
541x	Professional, Scientific, and Technical Services
561x	Administrative and Support Services
562x	Waste Management and Remediation Services
621x	Ambulatory Health Care Services
624x	Social Assistance
713x	Amusement, Gambling, and Recreation Industries
722x	Food Services and Drinking Places
811x	Repair and Maintenance
928x	National Security and International Affairs

CONSIDERATION OF LOST SALES OR REVENUE, IMPACT ON JOBS: Businesses that would incur costs could experience reduced sales or revenues if the proposed rule amendments significantly affect the prices of the goods they sell. The degree to which this could happen is strongly related to each busi-

ness's production and pricing model (whether additional lump-sum costs would significantly affect marginal costs), as well as the specific attributes of the markets in which they sell goods, including the degree of influence each firm has on market prices, as well as the relative responsiveness of market demand to price changes. Finally, overall shifts in economic activity in the state, including competition within markets and attributes of the labor market simultaneously adjust in response to changes in compliance costs. Similarly, employment within directly impacted industries, other industries in Washington, the labor market within and outside of the state, and in the state as a whole would also adjust in response to a change in costs.

We used the REMI E3+ model for Washington state to estimate the impact of the proposed rule amendments on directly affected markets, accounting for dynamic adjustments throughout the economy. The model accounts for variables including but not limited to: Interindustry impacts; price, wage, interstate and international trade, and population or labor market changes; and dynamic adjustment of all economic variables over time.

The results of the REMI E3+ model shows that the rule would impact a variety of industries, costing the Washington economy an estimated range between $23 million to $69 million in annual output at its peak (total amount of goods and services produced by Washington businesses) across all sectors. For reference, in the first quarter of 2023, Washington state's annual gross domestic product (GDP) was estimated at $761 billion. In percentage terms, this impact amounts to .003 percent and .009 percent of GDP for low and high estimates, respectively.

Output losses are projected to begin in 2025 following the proposed rule implementation and increase as permits become renewed. These amount to a loss of roughly $1 million in the low- and high-cost scenario in the first year of the rule and increase to $23 million and $69 million for the low- and high-cost scenarios, respectively by 2030. Output losses slowly decrease after 2030, and by 2045 the output loss is projected to have declined under the low- and high-cost scenarios to $1 million and $2 million, respectively.

Retail trade, and construction is impacted the most among all industries, accounting for 13 percent each of the total output loss in high and low scenarios, followed by wholesale trade, real estate, and state and local government. Note that it is not unusual for the construction and retail industries to have high projected impacts from a rule as they are often quite sensitive to any changes to the market in REMI models. The rule also impacts a breadth of affected industries, many of which indirectly support retail and construction activities.

Modeled economic impacts to output

Industry	2030 (low)	2030 (high)	2045 (low)	2045 (high)
Whole state	-23	-69	-1	-2
Retail trade	-3	-9	0	0
Construction	-3	-9	0	0
Wholesale trade	-2	-7	0	0
Real estate	-2	-7	0	0
State and local government	-1	-3	0	0

The proposed rule would result in transfers of money within and between industries, as compared to the baseline. The modeled impacts on employment are the result of these transfers and the way in which

REMI projects these transfers to be utilized within the broader economy, as well as changes to prices and other economic variables across all industries in the state. REMI results project an immediate statewide loss of one full-time equivalent positions (FTEs) under the low-cost scenario and four in the high-cost scenario in the year 2025. This loss increases over the next two years, peaking in 2030 with a projected loss of 113 and 337 FTEs, under the low- and high-cost scenarios, respectively. The statewide loss in FTEs is lessened after 2030 such that in 2045 the statewide projected loss is reduced to two FTEs in the low-cost scenario, and six FTEs in the high-cost scenario in 2045.

Industries that are most impacted are listed below. The construction sector is projected to be the most heavily impacted industry, accounting for about 17 percent of the FTE loss from this rule statewide in 2030. Closely related to sensitivities in economic output discussed above, it is not unusual for the construction industry to have high projected job impacts from a rule as the construction industry is often quite sensitive to any changes in the market in REMI models. The next four sectors most heavily impacted in terms of projected job loss are retail trade, state and local government, wholesale trade, and real estate. While some of these sectors may not be as directly impacted from the rule making as others, note that the REMI model is sensitive to reductions in population growth compared to baseline, potentially leading to lower demand for retail goods, public services, and housing.

Impacts on Jobs

Industry	2030 Jobs Impact (low)	2030 Jobs Impact (high)	2045 Jobs Impact (low)	2045 Jobs Impact (high)
Whole state	-113	-337	-2	-6
Construction	-20	-60	0	1
Retail trade	-13	-39	0	0
State and local government	-6	-19	0	-1
Wholesale trade	-6	-17	0	0
Real estate	-6	-17	0	0

A copy of the statement may be obtained by contacting Marla Koberstein, Department of Ecology, Water Quality Program, P.O. Box 47696, Olympia, WA 98504-7696, phone 360-628-6376, speech disability call TTY at 877-833-6341, impaired hearing call Washington relay service at 711. To request ADA accommodation for disabilities, or printed materials in a format for the visually impaired, call ecology at 360-407-7668 or visit https://ecology.wa.gov/accessibility, email marla.koberstein@ecy.wa.gov.

February 15, 2024
Heather R. Bartlett
Deputy Director

OTS-5054.6

AMENDATORY SECTION (Amending WSR 20-02-091, filed 12/30/19, effective 1/30/20)

WAC 173-201A-240 Toxic substances. (1) Toxic substances shall not be introduced above natural background levels in waters of the state which have the potential either singularly or cumulatively to adversely affect characteristic water uses, cause acute or chronic toxicity to the most sensitive biota dependent upon those waters, or adversely affect public health, as determined by the department.

(2) The department shall employ or require chemical testing, acute and chronic toxicity testing, and biological assessments, as appropriate, to evaluate compliance with subsection (1) of this section and to ensure that aquatic communities and the existing and designated uses of waters are being fully protected.

(3) USEPA Quality Criteria for Water, 1986, as revised, shall be used in the use and interpretation of the values listed in subsection (5) of this section.

(4) Concentrations of toxic, and other substances with toxic propensities not listed in Table 240 of this section shall be determined in consideration of USEPA Quality Criteria for Water, 1986, and as revised, and other relevant information as appropriate.

(5) The following criteria, found in Table 240, shall be applied to all surface waters of the state of Washington. Values are µg/L for all substances except ammonia and chloride which are mg/L, tissue-based aquatic life criteria for selenium, perfluorooctane sulfonic acid (PFOS), and perfluorooctanoic acid (PFOA) which are mg/kg, and asbestos which is million fibers/L. The department shall formally adopt any appropriate revised criteria as part of this chapter in accordance with the provisions established in chapter 34.05 RCW, the Administrative Procedure Act. The department shall ensure there are early opportunities for public review and comment on proposals to develop revised criteria.

(a) **Aquatic life protection.** The department may revise the criteria in Table 240 for aquatic life on a statewide or water body-specific basis as needed to protect aquatic life occurring in waters of the state and to increase the technical accuracy of the criteria being applied. The department shall formally adopt any appropriate revised criteria as part of this chapter in accordance with the provisions established in chapter 34.05 RCW, the Administrative Procedure Act.

(b) **Human health protection.** The following provisions apply to the human health criteria in Table 240. All waters shall maintain a level of water quality when entering downstream waters that provides for the attainment and maintenance of the water quality standards of those downstream waters, including the waters of another state. The human health criteria in the tables were calculated using a fish consumption rate of 175 g/day. Criteria for carcinogenic substances were calculated using a cancer risk level equal to one-in-one-million, or as otherwise specified in this chapter. The human health criteria calculations and variables include chronic durations of exposure up to ((~~seventy~~)) 70 years. All human health criteria for metals are for total metal concentrations, unless otherwise noted. Dischargers have the obligation to reduce toxics in discharges through the use of AKART.

Table 240
Toxics Substances Criteria

((Compound/Chemical	Chemical Abstracts Service (CAS)#	Category	Aquatic Life Criteria - Freshwater		Aquatic Life Criteria - Marine Water		Human Health Criteria for Consumption of:	
			Acute	Chronic	Acute	Chronic	Water & Organisms	Organisms Only
Metals:								
Antimony	7440360	Metals, cyanide, and total phenols	-	-	-	-	12	180
Arsenic	7440382	Metals, cyanide, and total phenols	360.0 (e,dd)	190.0 (d,dd)	69.0 (e,ll,dd)	36.0 (d,ee,ll,dd)	10 (A)	10 (A)
Asbestos	1332214	Toxic pollutants and hazardous substances	-	-	-	-	7,000,000 fibers/L (C)	-
Beryllium	7440417	Metals, cyanide, and total phenols	-	-	-	-	-	-
Cadmium	7440439	Metals, cyanide, and total phenols	(i,e,dd)	(j,d,dd)	42.0 (e,dd)	9.3 (d,dd)	-	-
Chromium (III)	16065831	Metals, cyanide, and total phenols	(m,e,gg)	(n,d,gg)	-	-	-	-
Chromium (VI)	18540299	Metals, cyanide, and total phenols	15.0 (e,l,ii,dd)	10.0 (d,jj,dd)	1,100.0 (e,l,ll,dd)	50.0 (d,ll,dd)	-	-
Copper	7440508	Metals, cyanide, and total phenols	(o,e,dd)	(p,d,dd)	4.8 (e,ll,dd)	3.1 (d,ll,dd)	1,300 (C)	-
Lead	7439921	Metals, cyanide, and total phenols	(q,e,dd)	(r,d,dd)	210.0 (e,ll,dd)	8.1 (d,ll,dd)	-	-
Mercury	7439976	Metals, cyanide, and total phenols	2.1 (e,kk,dd)	0.012 (d,ff,s)	1.8 (e,ll,dd)	0.025 (d,ff,s)	(G)	(G)
Methylmercury	22967926	Nonconventional	-	-	-	-	-	-
Nickel	7440020	Metals, cyanide, and total phenols	(t,e,dd)	(u,d,dd)	74.0 (e,ll,dd)	8.2 (d,ll,dd)	150	190
Selenium	7782492	Metals, cyanide, and total phenols	20.0 (e,ff)	5.0 (d,ff)	290 (e,ll,dd)	71.0 (d,x,ll,dd)	120	480
Silver	7440224	Metals, cyanide, and total phenols	(y,a,dd)	-	1.9 (a,ll,dd)	-	-	-
Thallium	7440280	Metals, cyanide, and total phenols	-	-	-	-	0.24	0.27
Zinc	7440666	Metals, cyanide, and total phenols	(aa,e,dd)	(bb,d,dd)	90.0 (e,ll,dd)	81.0 (d,ll,dd)	2,300	2,900
Other chemicals:								
1,1,1-Trichloroethane	71556	Volatile	-	-	-	-	47,000	160,000
1,1,2,2-Tetrachloroethane	79345	Volatile	-	-	-	-	0.12 (B)	0.46 (B)
1,1,2-Trichloroethane	79005	Volatile	-	-	-	-	0.44 (B)	1.8 (B)
1,1-Dichloroethane	75343	Volatile	-	-	-	-	-	-
1,1-Dichloroethylene	75354	Volatile	-	-	-	-	1200	4100
1,2,4-Trichlorobenzene	120821	Base/neutral compounds	-	-	-	-	0.12 (B)	0.14 (B)
1,2-Dichlorobenzene	95501	Volatile	-	-	-	-	2000	2500
1,2-Dichloroethane	107062	Volatile	-	-	-	-	9.3 (B)	120 (B)
1,2-Dichloropropane	78875	Volatile	-	-	-	-	0.71 (B)	3.1 (B)
1,3-Dichloropropene	542756	Volatile	-	-	-	-	0.24 (B)	2 (B)
1,2-Diphenylhydrazine	122667	Base/neutral compounds	-	-	-	-	0.015 (B)	0.023 (B)
1,2-Trans-Dichloroethylene	156605	Volatile	-	-	-	-	600	5,800
1,3-Dichlorobenzene	541731	Volatile	-	-	-	-	13	16
1,4-Dichlorobenzene	106467	Volatile	-	-	-	-	460	580
2,3,7,8-TCDD (Dioxin)	1746016	Dioxin	-	-	-	-	0.000000064	0.000000064
2,4,6-Trichlorophenol	88062	Acid compounds	-	-	-	-	0.25 (B)	0.28 (B)
2,4-Dichlorophenol	120832	Acid compounds	-	-	-	-	25	34

((Compound/Chemical	Chemical Abstracts Service (CAS)#	Category	Aquatic Life Criteria - Freshwater		Aquatic Life Criteria - Marine Water		Human Health Criteria for Consumption of:	
			Acute	Chronic	Acute	Chronic	Water & Organisms	Organisms Only
2,4-Dimethylphenol	105679	Acid compounds	-	-	-	-	85	97
2,4-Dinitrophenol	51285	Acid compounds	-	-	-	-	60	610
2,4-Dinitrotoluene	121142	Base/neutral compounds	-	-	-	-	0.039 (B)	0.18 (B)
2,6-Dinitrotoluene	606202	Base/neutral compounds	-	-	-	-	-	-
2-Chloroethyvinyl Ether	110758	Volatile	-	-	-	-	-	-
2-Chloronaphthalene	91587	Base/neutral compounds	-	-	-	-	170	180
2-Chlorophenol	95578	Acid compounds	-	-	-	-	15	17
2-Methyl-4,6-Dinitrophenol (4,6-dinitro-o-cresol)	534521	Acid compounds	-	-	-	-	7.1	25
2-Nitrophenol	88755	Acid compounds	-	-	-	-	-	-
3,3'-Dichlorobenzidine	91941	Base/neutral compounds	-	-	-	-	0.0031 (B)	0.0033 (B)
3-Methyl-4-Chlorophenol (parachlorometa cresol)	59507	Acid compounds	-	-	-	-	36	36
4,4'-DDD	72548	Pesticides/PCBs	-	-	-	-	0.000036 (B)	0.000036 (B)
4,4'-DDE	72559	Pesticides/PCBs	-	-	-	-	0.000051 (B)	0.000051 (B)
4,4'-DDT	50293	Pesticides/PCBs	-	-	-	-	0.000025 (B)	0.000025 (B)
4,4'-DDT(and metabolites)		Pesticides/PCBs	1.1 (a)	0.001 (b)	0.13 (a)	0.001 (b)	-	-
4-Bromophenyl Phenyl Ether	101553	Base/neutral compounds	-	-	-	-	-	-
4-Chorophenyl Phenyl Ether	7005723	Base/neutral compounds	-	-	-	-	-	-
4-Nitrophenol	100027	Acid compounds	-	-	-	-	-	-
Acenaphthene	83329	Base/neutral compounds	-	-	-	-	110	110
Acenaphthylene	208968	Base/neutral compounds	-	-	-	-	-	-
Acrolein	107028	Volatile	-	-	-	-	1.0	1.1
Acrylonitrile	107131	Volatile	-	-	-	-	0.019 (B)	0.028 (B)
Aldrin	309002	Pesticides/PCBs	2.5 (a,e)	0.0019 (b,e)	0.71 (a,e)	0.0019 (b,e)	0.0000057 (B)	0.0000058 (B)
alpha-BHC	319846	Pesticides/PCBs	-	-	-	-	0.0005 (B)	0.00056 (B)
alpha-Endosulfan	959988	Pesticides/PCBs	-	-	-	-	9.7	10
Anthracene	120127	Base/neutral compounds	-	-	-	-	3,100	4,600
Benzene	71432	Volatile	-	-	-	-	0.44 (B)	1.6 (B)
Benzidine	92875	Base/neutral compounds	-	-	-	-	0.00002 (B)	0.000023 (B)
Benzo(a) Anthracene	56553	Base/neutral compounds	-	-	-	-	0.014 (B)	0.021 (B)
Benzo(a) Pyrene	50328	Base/neutral compounds	-	-	-	-	0.0014 (B)	0.0021 (B)
Benzo(b) Fluoranthene	205992	Base/neutral compounds	-	-	-	-	0.014 (B)	0.021 (B)
Benzo(hi) Propylene	191242	Base/neutral compounds	-	-	-	-	-	-
Benzo(k) Fluoranthene	207089	Base/neutral compounds	-	-	-	-	0.014 (B)	0.21 (B)
beta-THC	319857	Pesticides/PCBs	-	-	-	-	0.0018 (B)	0.002 (B)

((Compound/Chemical	Chemical Abstracts Service (CAS)#	Category	Aquatic Life Criteria - Freshwater		Aquatic Life Criteria - Marine Water		Human Health Criteria for Consumption of:	
			Acute	Chronic	Acute	Chronic	Water & Organisms	Organisms Only
alpha-Endosulfan	33213659	Pesticides/PCBs	-	-	-	-	9.7	10
Bis(2-Chloroethoxy) Methane	111911	Base/neutral compounds	-	-	-	-	-	-
Bis(2-Chloroethyl) Ether	111444	Base/neutral compounds	-	-	-	-	0.02 (B)	0.06 (B)
Bis(2-Chloroisopropyl) Ether	39638329	Base/neutral compounds	-	-	-	-	-	-
Bis(2-Ethylhexyl) Phthalate	117817	Base/neutral compounds	-	-	-	-	0.23 (B)	0.25 (B)
Bromoform	75252	Volatile	-	-	-	-	5.8 (B)	27 (B)
Butylbenzyl Phthalate	85687	Base/neutral compounds	-	-	-	-	0.56 (B)	0.58 (B)
Carbon Tetrachloride	56235	Volatile	-	-	-	-	0.2 (B)	0.35 (B)
Chlordane	57749	Pesticides/PCBs	2.4 (a)	0.0043 (b)	0.09 (a)	0.004 (b)	0.000093 (B)	0.000093 (B)
Chlorobenzene	108907	Volatile	-	-	-	-	380	890
Chlorodibromomethane	124481	Volatile	-	-	-	-	0.65 (B)	3 (B)
Chloroethane	75003	Volatile	-	-	-	-	-	-
Chloroform	67663	Volatile	-	-	-	-	260	1200
Chrysene	218019	Base/neutral compounds	-	-	-	-	1.4 (B)	2.1 (B)
Cyanide	57125	Metals, cyanide, and total phenols	22.0 (e,ee)	5.2 (d,ee)	1.0 (e,mm,ee)	(d,mm,ee)	19 (D)	270 (D)
delta-BHC	319868	Pesticides/PCBs	-	-	-	-	-	-
Dibenzo(a,h) Anthracene	53703	Base/neutral compounds	-	-	-	-	0.0014 (B)	0.0021 (B)
Dichlorobromomethane	75274	Volatile	-	-	-	-	0.77 (B)	3.6 (B)
Dieldrin	60571	Pesticides/PCBs	2.5 (a,e)	0.0019 (b,e)	0.71 (a,e)	0.0019 (b,e)	0.0000061 (B)	0.0000061 (B)
Diethyl Phthalate	84662	Base/neutral compounds	-	-	-	-	4,200	5,000
Dimethyl Phthalate	131113	Base/neutral compounds	-	-	-	-	92,000	130,000
Di-n-Butyl Phthalate	84742	Base/neutral compounds	-	-	-	-	450	510
Di-n-Octyl Phthalate	117840	Base/neutral compounds	-	-	-	-	-	-
Endosulfan		Pesticides/PCBs	0.22 (a)	0.056 (b)	0.034 (a)	0.0087 (b)	-	-
Endosulfan Sulfate	1031078	Pesticides/PCBs	-	-	-	-	9.7	10
Endrin	72208	Pesticides/PCBs	0.18 (a)	0.0023 (b)	0.037 (a)	0.0023 (b)	0.034	0.035
Endrin Aldehyde	7421934	Pesticides/PCBs	-	-	-	-	0.034	0.035
Ethylbenzene	100414	Volatile	-	-	-	-	200	270
Fluoranthene	206440	Base/neutral compounds	-	-	-	-	16	16
Fluorene	86737	Base/neutral compounds	-	-	-	-	420	610
Hexachlorocyclohexane (gamma-BHC; Lindane)	58899	Pesticides/PCBs	2.0 (a)	0.08 (b)	0.16 (a)	-	15	17
Heptachlor	76448	Pesticides/PCBs	0.52 (a)	0.0038 (b)	0.053 (a)	0.0036 (b)	0.0000099 (B)	0.00001 (B)
Heptachlor Epoxide	1024573	Pesticides/PCBs	-	-	-	-	0.0000074 (B)	0.0000074 (B)
Hexachlorobenzene	118741	Base/neutral compounds	-	-	-	-	0.000051 (B)	0.000052 (B)

((Compound/Chemical	Chemical Abstracts Service (CAS)#	Category	Aquatic Life Criteria - Freshwater		Aquatic Life Criteria - Marine Water		Human Health Criteria for Consumption of:	
			Acute	Chronic	Acute	Chronic	Water & Organisms	Organisms Only
Hexachlorobutadiene	87683	Base/neutral compounds	-	-	-	-	0.69 (B)	4.1 (B)
Hexachlorocyclopentadiene	77474	Base/neutral compounds	-	-	-	-	150	630
Hexachloroethane	67721	Base/neutral compounds	-	-	-	-	0.11 (B)	0.13 (B)
Indeno(1,2,3-cd) Pyrene	193395	Base/neutral compounds	-	-	-	-	0.014 (B)	0.021 (B)
Isophorone	78591	Base/neutral compounds	-	-	-	-	27 (B)	110 (B)
Methyl Bromide	74839	Volatile	-	-	-	-	520	2,400
Methyl Chloride	74873	Volatile	-	-	-	-	-	-
Methylene Chloride	75092	Volatile	-	-	-	-	16 (B)	250 (B)
Napthalene	91203	Base/neutral compounds	-	-	-	-	-	-
Nitrobenzene	98953	Base/neutral compounds	-	-	-	-	55	320
N-Nitrosodimethylamine	62759	Base/neutral compounds	-	-	-	-	0.00065 (B)	0.34 (B)
N-Nitrosodi-n-Propylamine	621647	Base/neutral compounds	-	-	-	-	0.0044 (B)	0.058 (B)
N-Nitrosodiphenylamine	86306	Base/neutral compounds	-	-	-	-	0.62 (B)	0.69 (B)
Pentachlorophenol (PCP)	87865	Acid compounds	(w,e)	(v,d)	13.0 (e)	7.9 (d)	0.046 (B)	0.1 (B)
Phenanthrene	85018	Base/neutral compounds	-	-	-	-	-	-
Phenol	108952	Acid compounds	-	-	-	-	18,000	200,000
Polychlorinated Biphenyls (PCBs)		Pesticides/PCBs	2.0 (b)	0.014 (b)	10.0 (b)	0.030 (b)	0.00017 (E)	0.00017 (E)
Pyrene	129000	Base/neutral compounds	-	-	-	-	310	460
Tetrachloroethylene	127184	Volatile	-	-	-	-	4.9 (B)	7.1 (B)
Toluene	108883	Volatile	-	-	-	-	180	410
Toxaphene	8001352	Pesticides/PCBs	0.73 (c,z)	0.0002 (d)	0.21 (c,z)	0.0002 (d)	0.000032 (B)	0.000032 (B)
Trichloroethylene	79016	Volatile	-	-	-	-	0.38 (B)	0.86 (B)
Vinyl Chloride	75014	Volatile	-	-	-	-	0.02 (B, F)	0.26 (B, F)
Ammonia (hh)		Nonconventional	(f,e)	(g,d)	0.233 (h,e)	0.035 (h,d)	-	-
Chloride (dissolved) (k)		Nonconventional	860.0 (h,e)	230.0 (h,d)	-	-	-	-
Chlorine (total residual)		Nonconventional	19.0 (e)	11.0 (d)	13.0 (e)	7.5 (d)	-	-
Chlorpyrifos		Toxic pollutants and hazardous substances	0.083 (e)	0.041 (d)	0.011 (e)	0.0056 (d)	-	-
Parathion		Toxic pollutants and hazardous substances	0.065 (e)	0.013 (d)	-	-	-	-

Footnotes for aquatic life criteria in Table 240:

a. An instantaneous concentration not to be exceeded at any time.
b. A 24-hour average not to be exceeded.
c. A 1-hour average concentration not to be exceeded more than once every three years on the average.
d. A 4-day average concentration not to be exceeded more than once every three years on the average.
e. Aldrin is metabolically converted to Dieldrin. Therefore, the sum of the Aldrin and Dieldrin concentrations are compared with the Dieldrin criteria.
f. Shall not exceed the numerical value in total ammonia nitrogen (mg N/L) given by:

~~*For salmonids present:*~~ $\frac{0.275}{1+10^{7.204-pH}} + \frac{39.0}{1+10^{pH-7.204}}$

~~*For salmonids absent:*~~ $\frac{0.411}{1+10^{7.204-pH}} + \frac{58.4}{1+10^{pH-7.204}}$

~~g. Shall not exceed the numerical concentration calculated as follows:~~
~~Unionized ammonia concentration for waters where salmonid habitat is an existing or designated use:~~

~~0.80 ÷ (FT)(FPH)(RATIO)~~

~~where: RATIO = 13.5; 7.7 ≤ pH ≤ 9~~

~~RATIO = $(20.25 \times 10^{(7.7-pH)}) \div (1+10^{(7.4-pH)})$; 6.5 ≤ pH ≤ 7.7~~

~~FT = 1.4; 15 ≤ T ≤ 30~~

~~FT = $10^{[0.03(20-T)]}$; 0 ≤ T ≤ 15~~

~~FPH = 1; 8 ≤ pH ≤ 9~~

~~FPH = $(1+10^{(7.4-pH)}) \div 1.25$; 6.5 ≤ pH ≤ 8.0~~

~~Total ammonia concentrations for waters where salmonid habitat is not an existing or designated use and other fish early life stages are absent:~~

$$\text{Chronic Criterion} = \left(\frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}}\right) \times \left(1.45 \times 10^{0.028(25-A)}\right)$$

~~where: A = the greater of either T (temperature in degrees Celsius) or 7.~~

~~Applied as a thirty-day average concentration of total ammonia nitrogen (in mg N/L) not to be exceeded more than once every three years on average. The highest four-day average within the thirty-day period should not exceed 2.5 times the chronic criterion.~~

~~Total ammonia concentration for waters where salmonid habitat is not an existing or designated use and other fish early life stages are present:~~

$$\text{Chronic Criterion} = \left(\frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}}\right) \times B$$

~~where: B = the lower of either 2.85, or 1.45 x $10^{0.028 \times (25-T)}$. T = temperature in degrees Celsius.~~

~~Applied as a thirty-day average concentration of total ammonia nitrogen (in mg N/L) not to be exceeded more than once every three years on the average. The highest four-day average within the thirty-day period should not exceed 2.5 times the chronic criterion.~~

~~h. Measured in milligrams per liter rather than micrograms per liter.~~
~~i. ≤ (0.944)(e(1.128[ln(hardness)]-3.828)) at hardness = 100. Conversion factor (CF) of 0.944 is hardness dependent. CF is calculated for other hardnesses as follows: CF = 1.136672 - [(ln hardness)(0.041838)].~~
~~j. ≤ (0.909)(e(0.7852[ln(hardness)]-3.490)) at hardness = 100. Conversions factor (CF) of 0.909 is hardness dependent. CF is calculated for other hardnesses as follows: CF = 1.101672 - [(ln hardness)(0.041838)].~~
~~k. Criterion based on dissolved chloride in association with sodium. This criterion probably will not be adequately protective when the chloride is associated with potassium, calcium, or magnesium, rather than sodium.~~
~~l. Salinity dependent effects. At low salinity the 1-hour average may not be sufficiently protective.~~
~~m. ≤ (0.316)($e^{(0.8190[\ln(\text{hardness})] + 3.688)}$)~~
~~n. ≤ (0.860)($e^{(0.8190[\ln(\text{hardness})] + 1.561)}$)~~
~~o. ≤ (0.960)($e^{(0.9422[\ln(\text{hardness})] - 1.464)}$)~~
~~p. ≤ (0.960)($e^{(0.8545[\ln(\text{hardness})] - 1.465)}$)~~
~~q. ≤ (0.791)($e^{(1.273[\ln(\text{hardness})] - 1.460)}$) at hardness = 100. Conversion factor (CF) of 0.791 is hardness dependent. CF is calculated for other hardnesses as follows: CF = 1.46203 - [(ln hardness)(0.145712)].~~
~~r. ≤ (0.791)($e^{(1.273[\ln(\text{hardness})] - 4.705)}$) at hardness = 100. Conversion factor (CF) of 0.791 is hardness dependent. CF is calculated for other hardnesses as follows: CF = 1.46203 - [(ln hardness)(0.145712)].~~
~~s. If the four-day average chronic concentration is exceeded more than once in a three-year period, the edible portion of the consumed species should be analyzed. Said edible tissue concentrations shall not be allowed to exceed 1.0 mg/kg of methylmercury.~~
~~t. ≤ (0.998)($e^{(0.8460[\ln(\text{hardness})] + 3.3612)}$)~~
~~u. ≤ (0.997)($e^{(0.8460[\ln(\text{hardness})] + 1.1645)}$)~~
~~v. ≤ $e^{[1.005(pH) - 5.290]}$~~
~~w. ≤ $e^{[1.005(pH) - 4.830]}$~~
~~x. The status of the fish community should be monitored whenever the concentration of selenium exceeds 5.0 ug/l in salt water.~~
~~y. ≤ (0.85)($e^{(1.72[\ln(\text{hardness})] - 6.52)}$)~~
~~z. Channel Catfish may be more acutely sensitive.~~
~~aa. ≤ (0.978)($e^{(0.8473[\ln(\text{hardness})] + 0.8604)}$)~~
~~bb. ≤ (0.986)($e^{(0.8473[\ln(\text{hardness})] + 0.7614)}$)~~
~~cc. Nonlethal effects (growth, C-14 uptake, and chlorophyll production) to diatoms (*Thalassiosira aestivalis* and *Skeletonema costatum*) which are common to Washington's waters have been noted at levels below the established criteria. The importance of these effects to the diatom populations and the aquatic system is sufficiently in question to persuade the state to adopt the USEPA National Criteria value (36 µg/L) as the state threshold criteria, however, wherever practical the ambient concentrations should not be allowed to exceed a chronic marine concentration of 21 µg/L.~~

dd. These ambient criteria in the table are for the dissolved fraction. The cyanide criteria are based on the weak acid dissociable method. The metals criteria may not be used to calculate total recoverable effluent limits unless the seasonal partitioning of the dissolved to total metals in the ambient water are known. When this information is absent, these metals criteria shall be applied as total recoverable values, determined by back-calculation, using the conversion factors incorporated in the criterion equations. Metals criteria may be adjusted on a site-specific basis when data are made available to the department clearly demonstrating the effective use of the water effects ratio approach established by USEPA, as generally guided by the procedures in USEPA Water Quality Standards Handbook, December 1983, as supplemented or replaced by USEPA or ecology. The adjusted site specific criteria are not in effect until they have been incorporated into this chapter and approved by EPA. Information which is used to develop effluent limits based on applying metals partitioning studies or the water effects ratio approach shall be identified in the permit fact sheet developed pursuant to WAC 173-220-060 or 173-226-110, as appropriate, and shall be made available for the public comment period required pursuant to WAC 173-220-050 or 173-226-130(3), as appropriate. Ecology has developed supplemental guidance for conducting water effect ratio studies.

ee. The criteria for cyanide is based on the weak acid dissociable method in the 19th Ed. Standard Methods for the Examination of Water and Wastewater, 4500-CN I, and as revised (see footnote dd, above).

ff. These criteria are based on the total-recoverable fraction of the metal.

gg. Where methods to measure trivalent chromium are unavailable, these criteria are to be represented by total-recoverable chromium.

hh. The listed fresh water criteria are based on un-ionized or total ammonia concentrations, while those for marine water are based on un-ionized ammonia concentrations. Tables for the conversion of total ammonia to un-ionized ammonia for freshwater can be found in the USEPA's Quality Criteria for Water, 1986. Criteria concentrations based on total ammonia for marine water can be found in USEPA Ambient Water Quality Criteria for Ammonia (Saltwater)-1989, EPA440/5-88-004, April 1989.

ii. The conversion factor used to calculate the dissolved metal concentration was 0.982.

jj. The conversion factor used to calculate the dissolved metal concentration was 0.962.

kk. The conversion factor used to calculate the dissolved metal concentration was 0.85.

ll. Marine conversion factors (CF) which were used for calculating dissolved metals concentrations are given below. Conversion factors are applicable to both acute and chronic criteria for all metals except mercury. The CF for mercury was applied to the acute criterion only and is not applicable to the chronic criterion. Conversion factors are already incorporated into the criteria in the table. Dissolved criterion = criterion x CF

Metal	CF
Arsenic	1.000
Cadmium	0.994
Chromium (VI)	0.993
Copper	0.83
Lead	0.951
Mercury	0.85
Nickel	0.990
Selenium	0.998
Silver	0.85
Zinc	0.946

mm. The cyanide criteria are: 2.8µg/l chronic and 9.1µg/l acute and are applicable only to waters which are east of a line from Point Roberts to Lawrence Point, to Green Point to Deception Pass; and south from Deception Pass and of a line from Partridge Point to Point Wilson. The chronic criterion applicable to the remainder of the marine waters is 1 µg/L.))

Compound/Chemical	Chemical Abstracts Service (CAS)#	Aquatic Life Criteria - Freshwater		Aquatic Life Criteria - Marine Water		Human Health Criteria for Consumption of:	
		Acute	Chronic	Acute	Chronic	Water & Organisms	Organisms Only
Metals:							
Aluminum	7429905	West: 510 East: 820 (a,e)	West: 270 East: 480 (b,e)	-	-	-	-
Antimony	7440360	-	-	-	-	12 (H)	180 (H)
Arsenic	7440382	300 (a,f)	130 (b,f)	27 (a,f,g)	12 (b,f,g)	10 (A,H)	10 (A,H)
Asbestos	1332214	-	-	-	-	7,000,000 fibers/L (C)	-
Beryllium	7440417	-	-	-	-	-	-
Cadmium	7440439	(a,f,h)	(b,f,i)	33 (a,f)	7.9 (b,f)	-	-
Chromium (III)	16065831	(a,j,k)	(b,j,ll)	-	-	-	-
Chromium (VI)	18540299	18 (a,f,m)	4.5 (b,f,n)	1,100.0 (a,f,g)	50.0 (b,f,g)	-	-
Copper	7440508	West: 2.0 East: 2.5 (a,f,o)	West: 1.6 East: 1.8 (b,f,p)	4.8 (a,f,g)	3.1 (b,f,g)	1,300 (C)	-
Lead	7439921	(a,f,q)	(b,f,r)	210.0 (a,f,g)	8.1 (b,f,g)	-	-
Mercury	7439976	1.4 (a,f,s)	0.012 (b,t,u)	1.8 (a,f,g)	0.025 (b,t,u)	(G)	(G)
Methylmercury	22967926	-	-	-	-	-	- (H)
Nickel	7440020	(a,f,v)	(b,f,w)	74.0 (a,f,g)	8.2 (b,f,g)	150 (H)	190 (H)

Compound/Chemical	Chemical Abstracts Service (CAS)#	Aquatic Life Criteria - Freshwater		Aquatic Life Criteria - Marine Water		Human Health Criteria for Consumption of:	
		Acute	Chronic	Acute	Chronic	Water & Organisms	Organisms Only
Selenium	7782492	(x)	(y)	290 (a,f,g)	71.0 (b,f,g)	120 (H)	480 (H)
Silver	7440224	(a,f,z)	(b,f,aa)	2.2 (a,f,g)	0.87 (b,f,g)	-	-
Thallium	7440280	-	-	-	-	0.24	0.27
Zinc	7440666	(a,f,bb)	(b,f,cc)	90.0 (a,f,g)	81.0 (b,f,g)	2,300 (H)	2,900 (H)
Other chemicals:							
1,1,1-Trichloroethane	71556	-	-	-	-	47,000 (H)	160,000 (H)
1,1,2,2-Tetrachloroethane	79345	-	-	-	-	0.12 (B,H)	0.46 (B,H)
1,1,2-Trichloroethane	79005	-	-	-	-	0.44 (B,H)	1.8 (B,H)
1,1-Dichloroethane	75343	-	-	-	-	-	-
1,1-Dichloroethylene	75354	-	-	-	-	1200 (H)	4100 (H)
1,2,4-Trichlorobenzene	120821	-	-	-	-	0.12 (B,H)	0.14 (B,H)
1,2-Dichlorobenzene	95501	-	-	-	-	2000 (H)	2500 (H)
1,2-Dichloroethane	107062	-	-	-	-	9.3 (B,H)	120 (B,H)
1,2-Dichloropropane	78875	-	-	-	-	0.71 (B)	3.1 (B)
1,3-Dichloropropene	542756	-	-	-	-	0.24 (B)	2 (B)
1,2-Diphenylhydrazine	122667	-	-	-	-	0.015 (B,H)	0.023 (B,H)
1,2-Trans-Dichloroethylene	156605	-	-	-	-	600 (H)	5,800 (H)
1,3-Dichlorobenzene	541731	-	-	-	-	13 (H)	16 (H)
1,4-Dichlorobenzene	106467	-	-	-	-	460 (H)	580 (H)
2,3,7,8-TCDD (Dioxin)	1746016	-	-	-	-	0.000000064	0.000000064
2,4,6-Trichlorophenol	88062	-	-	-	-	0.25 (B)	0.28 (B)
2,4-Dichlorophenol	120832	-	-	-	-	25 (H)	34 (H)
2,4-Dimethylphenol	105679	-	-	-	-	85	97
2,4-Dinitrophenol	51285	-	-	-	-	60 (H)	610 (H)
2,4-Dinitrotoluene	121142	-	-	-	-	0.039 (B)	0.18 (B)
2,6-Dinitrotoluene	606202	-	-	-	-	-	-
2-Chloroethyvinyl Ether	110758	-	-	-	-	-	-
2-Chloronaphthalene	91587	-	-	-	-	170 (H)	180 (H)
2-Chlorophenol	95578	-	-	-	-	15	17
2-Methyl-4,6-Dinitrophenol (4,6-dinitro-o-cresol)	534521	-	-	-	-	7.1 (H)	25 (H)
2-Nitrophenol	88755	-	-	-	-	-	-
3,3'-Dichlorobenzidine	91941	-	-	-	-	0.0031 (B)	0.0033 (B)
3-Methyl-4-Chlorophenol (parachlorometa cresol)	59507	-	-	-	-	36	36
4,4'-DDD	72548	-	-	-	-	0.000036 (B,H)	0.000036 (B,H)

Compound/Chemical	Chemical Abstracts Service (CAS)#	Aquatic Life Criteria - Freshwater		Aquatic Life Criteria - Marine Water		Human Health Criteria for Consumption of:	
		Acute	Chronic	Acute	Chronic	Water & Organisms	Organisms Only
4,4'-DDE	72559	-	-	-	-	0.000051 (B,H)	0.000051 (B,H)
4,4'-DDT	50293	-	-	-	-	0.000025 (B,H)	0.000025 (B,H)
4,4'-DDT (and metabolites)	50293	1.1 (c)	0.001 (d)	0.13 (c)	0.001 (d)	-	-
4-Bromophenyl Phenyl Ether	101553	-	-	-	-	-	-
4-Chorophenyl Phenyl Ether	7005723	-	-	-	-	-	-
4-Nitrophenol	100027	-	-	-	-	-	-
Acenaphthene	83329	-	-	-	-	110 (H)	110 (H)
Acenaphthylene	208968	-	-	-	-	-	-
Acrolein	107028	3 (a)	3 (b)	-	-	1.0	1.1
Acrylonitrile	107131	-	-	-	-	0.019 (B)	0.028 (B)
Aldrin	309002	3 (c,dd)	0.0019 (d,dd)	1.3 (c,e)	0.0019 (d,dd)	0.0000057 (B,H)	0.0000058 (B,H)
alpha-BHC	319846	-	-	-	-	0.0005 (B,H)	0.00056 (B,H)
alpha-Endosulfan	959988	0.22 (c,ee)	0.056 (d,ee)	0.034 (c,ee)	0.0087 (d,ee)	9.7 (H)	10 (H)
Ammonia	7664417	(a,ff,ii)	(b,gg,ii)	0.233 (a,hh,ii)	0.035 (b,hh,ii)	-	-
Anthracene	120127	-	-	-	-	3,100 (H)	4,600 (H)
Benzene	71432	-	-	-	-	0.44 (B)	1.6 (B)
Benzidine	92875	-	-	-	-	0.00002 (B)	0.000023 (B)
Benzo(a) Anthracene	56553	-	-	-	-	0.014 (B,H)	0.021 (B,H)
Benzo(a) Pyrene	50328	-	-	-	-	0.0014 (B,H)	0.0021 (B,H)
Benzo(b) Fluoranthene	205992	-	-	-	-	0.014 (B,H)	0.021 (B,H)
Benzo(ghi) Perylene	191242	-	-	-	-	-	-
Benzo(k) Fluoranthene	207089	-	-	-	-	0.014 (B,H)	0.21 (B,H)
beta-BHC	319857	-	-	-	-	0.0018 (B,H)	0.002 (B,H)
beta-Endosulfan	33213659	0.22 (c,ee)	0.056 (d,ee)	0.034 (c,ee)	0.0087 (d,ee)	9.7	10
Bis(2-Chloroethoxy) Methane	111911	-	-	-	-	-	-
Bis(2-Chloroethyl) Ether	111444	-	-	-	-	0.02 (B)	0.06 (B)
Bis(2-Chloroisopropyl) Ether	39638329	-	-	-	-	- (H)	- (H)
Bis(2-Ethylhexyl) Phthalate	117817	-	-	-	-	0.23 (B,H)	0.25 (B,H)
Bromoform	75252	-	-	-	-	5.8 (B,H)	27 (B,H)
Butylbenzyl Phthalate	85687	-	-	-	-	0.56 (B,H)	0.58 (B,H)
Carbaryl	63252	2.1 (a)	2.1 (b)	1.6 (a)	-	-	-
Carbon Tetrachloride	56235	-	-	-	-	0.2 (B)	0.35 (B)

Compound/Chemical	Chemical Abstracts Service (CAS)#	Aquatic Life Criteria - Freshwater		Aquatic Life Criteria - Marine Water		Human Health Criteria for Consumption of:	
		Acute	Chronic	Acute	Chronic	Water & Organisms	Organisms Only
Chlordane	57749	2.4 (c)	0.0043 (d)	0.09 (c)	0.004 (d)	0.000093 (B,H)	0.000093 (B,H)
Chloride (dissolved)	168870	860 (a,hh,jj)	230 (b,hh,jj)	-	-	-	-
Chlorine (total residual)	7782505	19 (a)	11 (b)	13 (a)	7.5 (b)	-	-
Chlorobenzene	108907	-	-	-	-	380 (H)	890 (H)
Chlorodibromomethane	124481	-	-	-	-	0.65 (B,H)	3 (B,H)
Chloroethane	75003	-	-	-	-	-	-
Chloroform	67663	-	-	-	-	260 (H)	1200 (H)
Chlorpyrifos	2921882	0.083 (a)	0.041 (b)	0.011 (a)	0.0056 (b)	-	-
Chrysene	218019	-	-	-	-	1.4 (B,H)	2.1 (B,H)
Cyanide	57125	12 (a,kk)	2.7 (b,kk)	1.0 (a,kk,ll)	1.0 (b,kk,ll)	19 (D,H)	270 (D,H)
delta-BHC	319868	-	-	-	-	-	-
Demeton	8065483	-	0.1 (b)	-	0.1 (b)	-	-
Diazinon	333415	0.17 (a)	0.17 (b)	0.82 (a)	0.82 (b)	-	-
Dibenzo(a,h) Anthracene	53703	-	-	-	-	0.0014 (B,H)	0.0021 (B,H)
Dichlorobromomethane	75274	-	-	-	-	0.77 (B,H)	3.6 (B,H)
Dieldrin	60571	0.24 (a,dd)	0.056 (b,dd)	0.71 (c,dd)	0.0019 (d,dd)	0.0000061 (B,H)	0.0000061 (B,H)
Diethyl Phthalate	84662	-	-	-	-	4,200 (H)	5,000 (H)
Dimethyl Phthalate	131113	-	-	-	-	92,000 (H)	130,000 (H)
Di-n-Butyl Phthalate	84742	-	-	-	-	450 (H)	510 (H)
Di-n-Octyl Phthalate	117840	-	-	-	-	-	-
Endosulfan Sulfate	1031078	-	-	-	-	9.7 (H)	10
Endrin	72208	0.086 (a)	0.036 (b)	0.037 (c)	0.0023 (d)	0.034 (H)	0.035 (H)
Endrin Aldehyde	7421934	-	-	-	-	0.034	0.035
Ethylbenzene	100414	-	-	-	-	200 (H)	270 (H)
Fluoranthene	206440	-	-	-	-	16 (H)	16 (H)
Fluorene	86737	-	-	-	-	420 (H)	610 (H)
Guthion	86500	-	0.01 (b)	-	0.01 (b)	-	-
Hexachlorocyclohexane (gamma-BHC; Lindane)	58899	0.95 (a)	0.08 (d)	0.16 (c)	-	15 (H)	17 (H)
Heptachlor	76448	0.52 (c)	0.0038 (d)	0.053 (c)	0.0036 (d)	0.0000099 (B,H)	0.00001 (B,H)
Heptachlor Epoxide	1024573	-	-	-	-	0.0000074 (B,H)	0.0000074 (B,H)
Hexachlorobenzene	118741	-	-	-	-	0.000051 (B,H)	0.000052 (B,H)
Hexachlorobutadiene	87683	-	-	-	-	0.69 (B,H)	4.1 (B,H)

Compound/Chemical	Chemical Abstracts Service (CAS)#	Aquatic Life Criteria - Freshwater		Aquatic Life Criteria - Marine Water		Human Health Criteria for Consumption of:	
		Acute	Chronic	Acute	Chronic	Water & Organisms	Organisms Only
Hexachlorocyclopentadiene	77474	-	-	-	-	150 (H)	630 (H)
Hexachloroethane	67721	-	-	-	-	0.11 (B,H)	0.13 (B,H)
Indeno(1,2,3-cd) Pyrene	193395	-	-	-	-	0.014 (B,H)	0.021 (B,H)
Isophorone	78591	-	-	-	-	27 (B)	110 (B)
Malathion	121755	-	0.1 (b)	-	0.1 (b)	-	-
Methoxychlor	72435	-	0.3 (b)	-	0.3 (b)	-	-
Methyl Bromide	74839	-	-	-	-	520 (H)	2,400
Methyl Chloride	74873	-	-	-	-	-	-
Methylene Chloride	75092	-	-	-	-	16 (B,H)	250 (B,H)
Mirex	2385855	-	0.001 (b)	-	0.001 (b)	-	-
N-(1,3-Dimethylbutyl)-N'-phenyl-p-phenylenediamine-quinone(6PPD-q)		0.008 (c)	-	-	-	-	-
Napthalene	91203	-	-	-	-	-	-
Nitrobenzene	98953	-	-	-	-	55 (H)	320 (H)
N-Nitrosodimethylamine	62759	-	-	-	-	0.00065 (B)	0.34 (B)
N-Nitrosodi-n-Propylamine	621647	-	-	-	-	0.0044 (B)	0.058 (B)
N-Nitrosodiphenylamine	86306	-	-	-	-	0.62 (B)	0.69 (B)
Nonylphenol	84852153	28 (a)	6.6 (b)	7 (a)	1.7 (b)	-	-
Parathion	56382	0.065 (a)	0.013 (b)	-	-	-	-
Pentachlorophenol (PCP)	87865	(a,mm)	(b,nn)	13 (a)	6.7 (b)	0.046 (B,H)	0.1 (B,H)
Perfluorooctane sulfonic acid (PFOS)		3000 (a)	(oo)	550 (a)	-	-	-
Perfluorooctanoic acid (PFOA)		49000 (a)	(pp)	7000 (a)	-	-	-
Phenanthrene	85018	-	-	-	-	-	-
Phenol	108952	-	-	-	-	18,000 (H)	200,000 (H)
Polychlorinated Biphenyls (PCBs)		2.0 (d)	0.014 (d)	10.0 (d)	0.03 (d)	0.00017 (E,H)	0.00017 (E,H)
Pyrene	129000	-	-	-	-	310 (H)	460 (H)
Tetrachloroethylene	127184	-	-	-	-	4.9 (B,H)	7.1 (B,H)
Toluene	108883	-	-	-	-	180 (H)	410 (H)
Toxaphene	8001352	0.73 (a)	0.0002 (b)	0.21 (a)	0.0002 (b)	0.000032 (B)	0.000032 (B)
Tributyltin		0.46 (a)	0.072 (b)	0.42 (a)	0.0074 (b)	-	-
Trichloroethylene	79016	-	-	-	-	0.38 (B,H)	0.86 (B,H)
Vinyl Chloride	75014	-	-	-	-	0.02 (B,F)	0.26 (B,F,H)

Footnotes for aquatic life criteria in Table 240:

a. A 1-hour average concentration not to be exceeded more than once every three years on the average.

b. A 4-day average concentration not to be exceeded more than once every three years on average.
c. An instantaneous concentration not to be exceeded at any time.
d. A 24-hour average not to be exceeded at any time.
e. Criteria are calculated using the Aluminum Criteria Calculator V.2.0 that is published in EPA's "Final Aquatic Water Quality Criteria for Aluminum 2018" (EPA-822-R-1-001). The freshwater default acute criterion of 510 µg/L is applicable in western Washington and 820 µg/L is the applicable default acute criterion in eastern Washington. The freshwater default chronic criterion of 270 µg/L is the applicable default criterion in western Washington and 480 µg/L is the applicable default chronic criterion in eastern Washington. The boundaries for eastern and western Washington are defined in WAC 222-16-010. The default criterion is used in the absence of concurrently sampled pH, hardness, and dissolved organic carbon for a site-specific location or water body. Criteria calculated using concurrently sampled pH, hardness, and dissolved organic carbon for a specific water body supersede the default criteria.
f. These ambient criteria in the table are for the dissolved fraction. The cyanide criteria are based on the weak acid dissociable method. The metals criteria may not be used to calculate total recoverable effluent limits unless the seasonal partitioning of the dissolved to total metals in the ambient water are known. When this information is absent, these metals criteria shall be applied as total recoverable values, determined by back-calculation, using the conversion factors incorporated in the criterion equations. Metals criteria may be adjusted on a site-specific basis when data are made available to the department clearly demonstrating the effective use of the water effects ratio approach established by USEPA, as generally guided by the procedures in USEPA Water Quality Standards Handbook, December 1983, as supplemented or replaced by USEPA or ecology. The adjusted site specific criteria are not in effect until they have been incorporated into this chapter and approved by EPA. Information which is used to develop effluent limits based on applying metals partitioning studies or the water effects ratio approach shall be identified in the permit fact sheet developed pursuant to WAC 173-220-060 or 173-226-110, as appropriate, and shall be made available for the public comment period required pursuant to WAC 173-220-050 or 173-226-130(3), as appropriate. Ecology has developed supplemental guidance for conducting water effect ratio studies.
g. Marine conversion factors (CF) which were used for calculating dissolved metals concentrations are given below. Conversion factors are applicable to both acute and chronic criteria for all metals except mercury. The CF for mercury was applied to the acute criterion only and is not applicable to the chronic criterion. Conversion factors are already incorporated into the criteria in the table. Dissolved criterion = criterion x CF

Metal	CF
Arsenic	1.000
Cadmium	0.994
Chromium (VI)	0.993
Copper	0.83
Lead	0.951
Mercury	0.85
Nickel	0.990
Selenium	0.998
Silver	0.85
Zinc	0.946

h. Acute criterion = (CF)($e^{(0.9789[\ln(\text{hardness})]-4.189)}$). Conversion factor (CF) is hardness dependent. CF is calculated for other hardnesses as follows: CF = 1.136672 - [(ln hardness)(0.041838)].
i. Chronic criterion = (CF)($e^{(0.7977[\ln(\text{hardness})]-4.446)}$). Conversion factor (CF) is hardness dependent. CF is calculated for other hardnesses as follows: CF = 1.101672 - [(ln hardness)(0.041838)].
j. Where methods to measure trivalent chromium are unavailable, these criteria are to be represented by total-recoverable chromium.
k. Acute criterion = (0.316)($e^{(0.8190[\ln(\text{hardness})] + 3.7256)}$)
l. Chronic criterion = (0.860)($e^{(0.8190[\ln(\text{hardness})] + 0.6848)}$)
m. The conversion factor used to calculate the dissolved metal concentration is 0.982.
n. The conversion factor used to calculate the dissolved metal concentration is 0.962.
o. The acute criterion is represented by the higher criteria value of the two equations: 1) Acute criterion = $e^{(0.700*\ln(\text{DOC}) + 0.579*\ln(\text{hardness}) + 0.778*\text{pH} - 6.738)}$ and 2) Acute criterion = $e^{(0.855*\ln(\text{DOC}) + 0.221*\ln(\text{hardness}) + 0.216*\text{pH} - 1.183)}$. The freshwater default acute criterion of 2.0 µg/L is applicable in western Washington and 2.5 µg/L is the applicable default acute criterion in eastern Washington. The boundaries for eastern and western Washington are defined in WAC 222-16-010. The default criterion is used in the absence of concurrently sampled pH, hardness, and dissolved organic carbon for a site-specific location or water body. Criteria calculated using concurrently sampled pH, hardness, and dissolved organic carbon for a specific water body supersede the default criteria.
p. Chronic criterion = $e^{(0.855*\ln(\text{DOC}) + 0.221*\ln(\text{hardness}) + 0.216*\text{pH} - 1.402)}$. The freshwater default chronic criterion of 1.6 µg/L is applicable in western Washington and 1.8 µg/L is the applicable default chronic criterion in eastern Washington. The boundaries for eastern and western Washington are defined in WAC 222-16-010. The default criterion is used in the absence of concurrently sampled pH, hardness, and dissolved organic carbon for a site-specific location or water body. Criteria calculated using concurrently sampled pH, hardness, and dissolved organic carbon for a specific water body supersede the default criteria.
q. Acute criterion = (CF)($e^{(1.273[\ln(\text{hardness})] - 1.460)}$). Conversion factor (CF) is hardness dependent. CF is calculated for other hardnesses as follows: CF = 1.46203 - [(ln hardness)(0.145712)].
r. Chronic criterion = (CF)($e^{(1.273[\ln(\text{hardness})] - 4.705)}$). Conversion factor (CF) is hardness dependent. CF is calculated for other hardnesses as follows: CF = 1.46203 - [(ln hardness)(0.145712)].
s. The conversion factor used to calculate the dissolved metal concentration is 0.85.
t. These criteria are based on the total-recoverable fraction of the metal.
u. If the four-day average chronic concentration is exceeded more than once in a three-year period, the edible portion of the consumed species should be analyzed. Said edible tissue concentrations shall not be allowed to exceed 1.0 mg/kg of methylmercury.
v. Acute criterion = (0.998)($e^{(0.8460[\ln(\text{hardness})] - 0.3604)}$)
w. Chronic criterion = (0.997)($e^{(0.8460[\ln(\text{hardness})] - 2.176)}$)
x. There is no freshwater acute criterion for aquatic life for selenium. The freshwater chronic criterion is expected to adequately protect against acute effects.
y. Freshwater chronic selenium criteria:

15.1 mg/kg dry weight (egg-ovary tissue)[1]
8.5 mg/kg dry weight (whole-body tissue)[2]
11.3 mg/kg dry weight (muscle tissue)[2]
1.5 ug/L (water lentic)[3]
3.1 ug/L (water lotic)[3]
$WQC_{int} = WQC - C_{bkgrnd}(1 - f_{int}) / f_{int}$ (water lentic or lotic)[3,4]

[1] Egg-ovary supersedes any whole-body, muscle, or water column element when fish egg-ovary concentrations are measured, except as noted in footnote 4. Tissue criterion is not to be exceeded.
[2] Fish whole-body or muscle tissue supersedes the water column element when both fish tissue and water concentrations are measured, except as noted in footnote 4. Tissue criterion is not to be exceeded.

[3] Water column values are based on dissolved total selenium in water and are derived from fish tissue values via bioaccumulation modeling. When selenium inputs are increasing, water column values are the applicable criterion element in the absence of steady-state condition fish tissue data. Water column criteria are based on a 30-day average concentrations, except for WQC_{int} (see footnote 4). Water column criteria are not to be exceeded more than once every three years on average.

[4] Where WQC_{int} is the intermittent exposure concentration in ug/L; WQC is the applicable water column element, for either lentic or lotic waters; C_{bkgrnd} is the average daily background concentration occurring during the remaining time, integrated over 30 days; f_{int} is the fraction of any 30-day period during which elevated selenium concentrations occur, with f_{int} assigned a value ≥ 0.033 (corresponding to one day). Intermittent exposure criteria averaging period is the number of days per month with an elevated concentration.

z. Acute criterion = $(0.85)(e^{(1.72[\ln(\text{hardness})] - 8.420)})$

aa. Chronic criterion = $(0.85)(e^{(1.72[\ln(\text{hardness})] - 9.342)})$

bb. Acute criterion = $(0.978)(e^{(0.8473[\ln(\text{hardness})] + 0.1564)})$

cc. Chronic criterion = $(0.986)(e^{(0.8473[\ln(\text{hardness})] - 0.2323)})$

dd. Aldrin is metabolically converted to Dieldrin. Therefore, the sum of the Aldrin and Dieldrin concentrations are compared with the Dieldrin criteria.

ee. This value was derived from data for endosulfan. Where concentrations for both alpha-endosulfan and beta-endosulfan are available, the sum of alpha-endosulfan and beta-endosulfan concentrations shall be compared to the criteria.

ff. Shall not exceed the numerical value in total ammonia nitrogen (mg N/L) given by:

For salmonids present:

$$\frac{0.275}{1 + 10^{7.204-pH}} \pm \frac{39.0}{1 + 10^{pH-7.204}}$$

For salmonids absent:

$$\frac{0.411}{1 + 10^{7.204-pH}} \pm \frac{58.4}{1 + 10^{pH-7.204}}$$

gg. Shall not exceed the numerical concentration calculated as follows:

Unionized ammonia concentration for waters where salmonid habitat is an existing or designated use:

$$0.80 \div (FT)(FPH)(RATIO)$$

where:

RATIO	=	$13.5;\ 7.7 \le pH \le 9$
RATIO	=	$(20.25 \times 10^{(7.7-pH)}) \div (1 + 10^{(7.4-pH)});\ 6.5 \le pH \le 7.7$
FT	=	$1.4;\ 15 \le T \le 30$
FT	=	$10^{[0.03(20-T)]};\ 0 \le T \le 15$
FPH	=	$1;\ 8 \le pH \le 9$
FPH	=	$(1 + 10^{(7.4-pH)}) \div 1.25;\ 6.5 \le pH \le 8.0$

Total ammonia concentrations for waters where salmonid habitat is not an existing or designated use and other fish early life stages are absent:

$$Chronic\ Criterion = \left(\frac{0.0577}{1 + 10^{7.688-pH}} + \frac{2.487}{1 + 10^{pH-7.688}}\right) \times \left(1.45 \times 10^{0.028(25-A)}\right)$$

where: A = the greater of either T (temperature in degrees Celsius) or 7.

Applied as a 30-day average concentration of total ammonia nitrogen (in mg N/L) not to be exceeded more than once every three years on average. The highest four-day average within the 30-day period should not exceed 2.5 times the chronic criterion.

Total ammonia concentration for waters where salmonid habitat is not an existing or designated use and other fish early life stages are present:

$$Chronic\ Criterion = \left(\frac{0.0577}{1 + 10^{7.688-pH}} + \frac{2.487}{1 + 10^{pH-7.688}}\right) \times B$$

where: B = the lower of either 2.85, or $1.45 \times 10^{0.028 \times (25-T)}$. T = temperature in degrees Celsius.

Applied as a 30-day average concentration of total ammonia nitrogen (in mg N/L) not to be exceeded more than once every three years on the average. The highest four-day average within the 30-day period should not exceed 2.5 times the chronic criterion.

hh. Measured in milligrams per liter rather than micrograms per liter.

ii. The listed freshwater criteria are based on un-ionized or total ammonia concentrations, while those for marine water are based on un-ionized ammonia concentrations. Tables for the conversion of total ammonia to un-ionized ammonia for freshwater can be found in the USEPA's Quality Criteria for Water, 1986. Criteria concentrations based on total ammonia for marine water can be found in USEPA Ambient Water Quality Criteria for Ammonia (Saltwater)-1989, EPA440/5-88-004, April 1989.

jj. Criterion based on dissolved chloride in association with sodium. This criterion probably will not be adequately protective when the chloride is associated with potassium, calcium, or magnesium, rather than sodium.

kk. The criteria for cyanide is based on the weak acid dissociable method in the 19th Ed. Standard Methods for the Examination of Water and Wastewater, 4500-CN I, and as revised (see footnote f, above).

ll. The cyanide criteria are: 2.8 µg/L chronic and 9.1 µg/L acute and are applicable only to waters which are east of a line from Point Roberts to Lawrence Point, to Green Point to Deception Pass; and south from Deception Pass and of a line from Partridge Point to Point Wilson. The chronic criterion applicable to the remainder of the marine waters is 1 µg/L.

mm. Acute criterion = $e^{[1.005(pH) - 5.595]}$

nn. Chronic criterion = $e^{[1.005(pH) - 6.299]}$

oo. Freshwater chronic PFOS criteria:

8.4 µg/L (water)[1,2]
0.937 mg/kg ww (invertebrate whole-body)[1,3,4]

6.75 mg/kg ww (fish whole-body)[1,3,4]
2.91 mg/kg ww (fish muscle)[1,3,4]

[1] All water column and tissue criteria are intended to be independently applicable for compliance determinations and no one criterion takes primacy.
[2] Water column criteria are based on a four-day average concentration not to be exceeded more than once every three years on average.
[3] Tissue criteria derived from the chronic water column concentration with the use of bioaccumulation factors and are expressed as wet weight (ww) concentrations.
[4] Tissue data is an instantaneous point measurement that reflect integrative accumulation of PFOS over time and space. Criteria are not to be exceeded more than once every 10 years on average.

pp. Freshwater chronic PFOA criteria:

94 µg/L (water)[1,2]
1.11 mg/kg ww (invertebrate whole-body)[1,3,4]
6.10 mg/kg ww (fish whole-body)[1,3,4]
0.125 mg/kg ww (fish muscle)[1,3,4]

[1] All water column and tissue criteria are intended to be independently applicable for compliance determinations and no one criterion takes primacy.
[2] Water column criteria are based on a four-day average concentration not to be exceeded more than once every three years on average.
[3] Tissue criteria derived from the chronic water column concentration with the use of bioaccumulation factors and are expressed as wet weight (ww) concentrations.
[4] Tissue data is an instantaneous point measurement that reflect integrative accumulation of PFOS over time and space. Criteria are not to be exceeded more than once every 10 years on average.

Footnotes for human health criteria in Table 240:

A. This criterion for total arsenic is the maximum contaminant level (MCL) developed under the Safe Drinking Water Act. The MCL for total arsenic is applied to surface waters where consumption of organisms-only and where consumption of water + organisms reflect the designated uses. When the department determines that a direct or indirect industrial discharge to surface waters designated for domestic water supply may be adding arsenic to its wastewater, the department will require the discharger to develop and implement a pollution prevention plan to reduce arsenic through the use of AKART. Industrial wastewater discharges to a privately or publicly owned wastewater treatment facility are considered indirect discharges.
B. This criterion was calculated based on an additional lifetime cancer risk of one-in-one-million (1×10^{-6} risk level).
C. This criterion is based on a regulatory level developed under the Safe Drinking Water Act.
D. This recommended water quality criterion is expressed as total cyanide, even though the integrated risk information system RfD used to derive the criterion is based on free cyanide. The multiple forms of cyanide that are present in ambient water have significant differences in toxicity due to their differing abilities to liberate the CN-moiety. Some complex cyanides require even more extreme conditions than refluxing with sulfuric acid to liberate the CN-moiety. Thus, these complex cyanides are expected to have little or no "bioavailability" to humans. If a substantial fraction of the cyanide present in a water body is present in a complexed form (e.g., Fe4[Fe(CN)6]3), this criterion may be overly conservative.
E. This criterion applies to total PCBs, (e.g., the sum of all congener or all isomer or homolog or Aroclor analyses). The PCBs criteria were calculated using a chemical-specific risk level of 4×10^{-5}. Because that calculation resulted in a higher (less protective) concentration than the current criterion concentration (40 C.F.R. 131.36) the state made a chemical-specific decision to stay at the current criterion concentration.
F. This criterion was derived using the cancer slope factor of 1.4 (linearized multistage model with a twofold increase to 1.4 per mg/kg-day to account for continuous lifetime exposure from birth).
G. ((~~The human health criteria for mercury are contained in 40 C.F.R. 131.36.~~)) EPA has removed Washington from the National Toxics Rule at 40 C.F.R. 131.36 for mercury and promulgated new human health criteria for methylmercury in the EPA's final federal rule at 40 C.F.R. 131.45.
H. Human health criteria applicable for Clean Water Act purposes in the state of Washington are contained in 40 C.F.R. 131.45 and effective as of December 19, 2022 (87 FR 69183).

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency and appear in the Register pursuant to the requirements of RCW 34.08.040.