

**COMMENTS ON BEHALF OF THE NORTHWEST PULP & PAPER ASSOCIATION,
WESTERN STATES PETROLEUM ASSOCIATION, WESTERN WOOD PRESERVERS
INSTITUTE, TREATED WOOD COUNCIL, ASSOCIATION OF WASHINGTON
BUSINESS, THE BOEING COMPANY, ALCOA WENATCHEE WORKS, INTALCO
ALUMINUM CORPORATION, INLAND EMPIRE PAPER COMPANY, KAISER
ALUMINUM WASHINGTON, LLC, KAPSTONE KRAFT PAPER CORPORATION,
NIPPON PAPER INDUSTRIES USA, NUCOR STEEL SEATTLE, INC., PACKAGING
CORPORATION OF AMERICA, PONDERAY NEWSPRINT COMPANY, SCHNITZER
STEEL INDUSTRIES, THE WEYERHAEUSER COMPANY, AND THE PORT
TOWNSEND PAPER CORPORATION ON THE DEPARTMENT OF ECOLOGY
PROPOSED CHANGES TO WATER QUALITY STANDARDS FOR SURFACE
WATERS OF THE STATE OF WASHINGTON – WAC 173-201A**

WSR 16-04-092 February 1, 2016

April 22, 2016

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ATTACHMENT A: ARCADIS, Summary of Health Risk Assessment Decisions in Environmental Regulations (March 6, 2015)

ATTACHMENT B: J. Louch, V. Tatum, and P. Wiegand (NCASI, Inc.), E. Ebert (Integral Corp.), K. Conner and P. Anderson (ARCADIS-US), A Review of Methods for Deriving Human Health-Based Water Quality Criteria with Consideration of Protectiveness (August 2012)

ATTACHMENT C: HDR, Treatment Technology Review and Assessment for Association of Washington Business, Association of Washington Cities and Washington State Association of Counties (December 2013).

The Northwest Pulp & Paper Association, Western States Petroleum Association, Western Wood Preservers Institute, Treated Wood Council, Association of Washington Business, The Boeing Company, Alcoa Wenatchee Works, Intalco Aluminum Corporation, Inland Empire Paper Company, Kaiser Aluminum Washington, LLC, KapStone Kraft Paper Corporation, Nippon Paper Industries USA, Nucor Steel Seattle, Inc., Packaging Corporation of America, Ponderay Newsprint Company, Schnitzer Steel Industries, The Weyerhaeuser Company, and the Port Townsend Paper Corporation submit the following comments on the Department of Ecology proposed changes to water quality standards for surface waters of the state of Washington- WAC 173-201A announced in WSR 16-04-092 (February 1, 2016).*

Introduction

The signatories to this comment letter appreciate the public involvement opportunities provided by the Department of Ecology to develop revisions to human health-based water quality criteria and implementation tools. We appreciate that over the last four years, it has been a difficult task to fairly balance revising standards that appropriately protect human health uses with reasonably available and foreseeable wastewater treatment technology. We strongly support the proposed water quality criteria for polychlorinated biphenyls (PCBs), arsenic and mercury, as well as the position taken by the Department on the relative source contribution and bioconcentration factors. We also strongly support the three implementation tools proposed by the Department of Ecology—variances, intake credits and expanded compliance schedules. The much more stringent water quality standards will force NPDES permittees to rely on these implementation mechanisms to maintain compliance. There are concerns on whether the Department and permittees will be able to administratively deliver these important permitting tools.

Our greatest concerns remain with the incremental excess cancer risk level and the significantly increased fish consumption rate, which combined with other conservative factors will result in unnecessarily stringent water quality criteria. Water quality criteria serve as the foundation for implementing most Clean Water Act programs. Many of the proposed criteria are unattainable with current wastewater treatment technologies. NPDES permittees—including cities, counties, ports and the private sector—will be challenged with a demand for expensive wastewater treatment system upgrades, an inability to comply with permit terms, and litigation threats. We cite the lack of any meaningful basis in the administrative record for the risk management decision made for the cancer risk factor. The Department of Ecology was unable in supporting materials to demonstrate meaningful health protection gains from these more stringent water quality standards.

*These comments include the attachments identified in the table of contents as well as the documents contained in the Supporting Documents File submitted with these comments. Documents in the Supporting Documents File are identified by page number within in parentheses in footnote citations. We request that the comment letter, attachments and Supporting Documents File be included in the rulemaking docket.

Comment No. 1: Ecology should adopt a criterion for polychlorinated biphenyls based on its risk assessment not the NTR.

Polychlorinated biphenyls (PCBs) present a unique environmental challenge in the state of Washington. Despite a ban and phase out in manufacturing after 1979, PCBs are persistent in the environment due to, for example, airborne deposition, in EPA-allowed incidental PCB concentrations in certain products, and in FDA-allowed concentrations in fish feed used in hatcheries. The burden on regulated entities to comply with stringent PCB water quality criteria is not justified by the limited benefits and potential costs due to the inability to test or treat to extremely low criteria as well as the ongoing sources of PCBs from airborne deposition and products. Over-regulation of PCBs could also lead to a regulatory stalemate resulting in a ban on any new or expanded construction or discharges until Washington waters achieve impossibly low criteria, effectively stifling economic growth in the state of Washington, a suspension of federal, state and Tribal hatchery programs, a complex TMDL process, and management of the NPDES permit process through variances and compliance schedules. This regulatory commitment would likely come at the expense of efforts that could actually reduce PCBs in the environment through sediment cleanup actions and other hazardous waste cleanup actions, source control, implementing the recently approved PCB Chemical Action Plan¹ as well as continued pressure on EPA to reform its Toxic Substance Control Act (TSCA) regulations.

Ecology is well within EPA guidance to address the unique challenges of PCBs through a chemical specific risk management decision.² EPA has approved state standards using alternative risk methodologies—most recently for the state of New Jersey.³ The methodology used by Ecology to derive the PCB criteria is scientifically defensible.

A unique approach to PCBs is justified by the unresolved technical issues in regulating PCBs at a national level. The EPA itself has struggled with how to regulate PCBs. The EPA did not update the national recommended water quality criterion for PCBs in its June 29, 2015, final action on the Clean Water Act (CWA) section 304(a) criteria for the protection of public health. EPA withheld action “due to outstanding technical issues, including new toxicity factors and bioaccumulation factors.”⁴ EPA has also acknowledged the “complex issues” regarding PCBs in declining to enforce current EPA limits on inadvertent generation of PCBs in products.⁵ EPA has further declined to reduce allowed levels of inadvertently generated PCBs due to “policy and scientific challenges.”⁶ Ecology is more than justified to treat PCBs differently in deriving new

¹ Ecology and Department of Health, *PCB Chemical Action Plan*, Publication No. 15-07-002 (February 2015)(04016-4238).

² Ecology, *Washington State Water Quality Standards: Human Health Criteria and Implementation Tools, Overview of Key Decisions in Rule Amendment*, Publication No. 14-10-058 (January 2015)(00001-73), at 39.

³ EPA, *Response to Comments for Water Quality Standards; Withdrawal of Certain Federal Water Quality Criteria Applicable to California, New Jersey and Puerto Rico*, EPA-HQ-OW-2012-0095, 4-5 (2012)(01072-1085) at 6.

⁴ EPA, *Human Health Ambient Water Quality Criteria: Draft 2014 Update*, EPA-820-F-14-003 (May 2014)(01772-1774).

⁵ D. McLerran, Letter to A. Borgias (February 24, 2015)(04239-4241).

⁶ *Id.*

criteria and should consider adopting a total PCB criterion consistent with the methodology and risk management decisions made by Ecology in its prior proposed rulemaking.

The risk management assessment by Ecology is consistent with the EPA national approach to regulating PCBs under the CWA. EPA claimed that it did not update the PCB criterion due to “outstanding technical issues.”⁷ EPA explained the scope of these technical issues with updating the PCB criteria in a letter to the Spokane River Regional Toxics Task Force through Ecology:

Revising current regulations to reduce inadvertently generated PCBs presents both policy and scientific challenges. Before proposing more stringent regulations on the inadvertent generation of PCBs in pigments, the EPA would seek to further understand the complexities and contributions of not only pigments, but also other congeners that be present [in receiving water]....

...The aggregation of PCB congeners may in some instances be problematic for risk assessment because the toxicity of different PCB congeners varies and a fixed water quality concentration for total PCBs may not adequately represent the variable toxicity of the various congeners actually present in a particular water body. While the EPA is not proposing to undertake a comprehensive analysis of the remaining PCB congeners, we are examining the characterization of PCBs in water bodies. As stated above, characterizing all of the PCBs in the EPA recommended water quality criteria for PCBs (i.e., expressed as total PCBs) is one topic we are discussing.⁸

Ecology should not adopt a new PCB criterion for Washington as long as EPA does not have the ability for the reasons set forth in the above letter to revise PCB regulations under the TSCA or the national recommended water quality standards under section 304 of the CWA. EPA affirmed as recently as August 3, 2015, that revising PCB regulations “presents both policy and scientific challenges.”⁹

It will be all but impossible to comply with a more stringent PCB criterion due to the ongoing release of PCBs that EPA authorizes as adequately protective under TSCA. A recent study in Washington documented the presence of low PCB levels in a broad range of manufactured products including paints, used motor oil, road striping paint, dust suppressants, antifreeze, hydro-seed materials, packaging, toothpaste, hand soap, laundry soap and shampoo.¹⁰ The TSCA regulations allow PCB concentrations up to 50 ppm in manufactured products. 40 C.F.R. §§ 761.3 and 761.20. EPA has maintained that PCB concentrations at these levels do not pose a threat to human health or the environment under TSCA, 40 C.F.R. § 761.20.¹¹

⁷ EPA, Human Health Ambient Water Quality Criteria: Draft 2014 Update (01772-1774).

⁸ D. McLerran, Letter to A. Borgias (February 24, 2015)(04239-04240).

⁹ L. Mann, Email to M. MacIntyre at 2 (August 3, 2015)(05063-5065).

¹⁰ City of Spokane, PCBs in Municipal Products (Rev.), Table B-1 (July 21, 2015)(06694-6738).

¹¹ NTR at 60848-01, 60868. (00768-847)

For many dischargers in Washington, the EPA allowed PCB concentrations are a significant portion of the PCBs in their effluent. For pulp and paper mills using recycled paper, their primary source of PCBs is from EPA-allowed concentrations in inks and dyes.¹² The same is true for wastewater treatment plants. In a 2015 report, Spokane County reported that PCB-11, a PCB congener associated with EPA allowed PCB concentrations, “was measured at relatively high concentrations...in both the influent and effluent.”¹³ PCB-11 was the “single most abundant congener in the effluent.”¹⁴ The same study evaluated PCB concentrations from three neighborhoods predominantly developed before 1970, from 1970 to 1985 and after 1985. The study found the highest PCB concentrations from the two most recently developed neighborhoods and concluded that there is “little correlation between the year of construction and the source of PCB contamination.”¹⁵

It is also apparent that tribal and federal fish hatcheries discharge a significant percentage of the annual PCB loading to Washington waters. EPA authorizes the operation of these hatcheries and the contamination of fish released by these hatcheries under the authority of a general NPDES permit.¹⁶ Ecology has identified hatcheries as a significant source of PCB loading to waters of the state. To be clear, these PCBs are not coming from concentrations of PCBs in Washington waters, they are coming from concentrations of PCBs in fishmeal allowed under FDA regulations for use in hatcheries. Ecology has estimated that as much as ten percent of annual PCB loading to Puget Sound is attributable to returning salmon.¹⁷ In 2011, Ecology calculated that returning salmon contribute up to 0.3 kg/yr based on PCB residues per whole-body fish ranging from 7 µg for pink salmon to 336 µg for Chinook salmon.¹⁸

Ecology has also acknowledged, in addition to the PCB loading from returning salmon, that PCB contaminated hatchery fish play a significant role in section 303(d) listings for PCBs.¹⁹ Ecology concluded that hatchery fish “may contribute to impairment and, in some cases, may cause the bulk of impairment.”²⁰

The 2006 Ecology report on hatchery fish included an analysis of skin-on fillets of pre-release rainbow trout from 11 hatcheries with PCB concentrations ranging from <2.3 to 67 ng/g (wet weight) with an average of 13.0 ng/g (wet weight) PCBs.²¹ Assuming that the fillet

¹² D. Krapas, Slide Show “Dealing with PCBs in the Spokane River” at 3 (October 2, 2012)(06443-6463).

¹³ Brown and Caldwell, 2015 Annual Toxics Management Report Spokane County Regional Water Reclamation Facility NPDES Permit WA-0093317 at 2-18 (2015)(04861-4948).

¹⁴ *Id.* at 2-18.

¹⁵ *Id.* at 2-27.

¹⁶ EPA, Preliminary Draft NPDES Permit for Federal Aquaculture Facilities and Aquaculture Facilities Located in Indian Country, Permit No. WAG-130000 (August 2015)(06216-6319).

¹⁷ Ecology, Control of Toxic Chemicals in Puget Sound: Assessment of Selected Toxic Chemicals in Puget Sound 2007-2011 at 93 (2011)(Ecology Pub. 11-03055)(04297-4593).

¹⁸ *Id.*

¹⁹ Ecology, Persistent Organic Pollutants in Feed and Rainbow Trout from Selected Trout Hatcheries (April, 2006)(Ecology Pub. No. 06-03-017)(04681-4732).

²⁰ *Id.* at 30.

²¹ *Id.*

concentrations reflect whole-body concentrations, these concentrations corresponded to <103 to 9,700 ng total PCBs per fish (using hatchery-specific average fish weights, which ranged from 83 to 678g). Other researchers have found between 39 and 59 ng/g total PCBs in whole-body juvenile Chinook salmon from six west coast hatcheries.²² The authors concluded, “contaminated salmon may be a significant source of toxicants in the environment and in the food chain.”²³ A study of British Columbia hatcheries found on average 25.5 and 48.5 ng/g (wet weight) PCBs in Chinook smolts from two hatcheries and 34.9 ng/g (wet weight) in Coho smolts from a third (BC) hatchery.²⁴ An analysis of pre-release juvenile Chinook from eight hatcheries feeding on the Columbia River found whole body concentrations of PCBs ranging from 6.9 to 61 ng/g (wet weight), corresponding to 22 to 323 ng per fish (individual hatchery-specific average weights from 3.2 to 6.2 g).²⁵ An analysis of pre-release juvenile Chinook salmon from the Soos Creek hatchery on Puget Sound over a three year period found total PCB concentrations ranging from 10 to 50 ng/g (wet weight), corresponding to 90 to 125 ng PCB per fish (fish weight ranged from 2.5-9.4 g).²⁶ NOAA Fisheries has also documented the significant PCB concentrations in hatchery fish feed and in hatchery origin fish.²⁷

Tribal and federal hatcheries are undoubtedly an increasing source of PCB loading to Washington waters. In 2010, the combined hatchery release in Washington was 229.5 million fish including 117.4 million Chinook salmon.²⁸ In 2015, the Northwest Indian Fisheries Commission reported that tribal hatcheries alone released 40 million salmon and steelhead.²⁹ EPA appears to believe that this level of PCB loading to Washington waters is consistent with applicable water quality standards and will not cause any degradation to existing beneficial uses. EPA has not sought to regulate these discharges or require any additional monitoring or best management practices in the preliminary draft general hatchery permit in Washington that will authorize tribal hatcheries to continue to release PCBs to the environment.³⁰

Ecology should not adopt a criterion more stringent than the National Toxics Rule (NTR) PCB criterion as long as the outstanding technical issues are unresolved and in light of the on-

²² L. Johnson *et al*, Contaminant Exposure in Outmigrant Juvenile Salmon from Pacific Northwest Estuaries of the United States, 124 ENVIRON. MONIT. ASSESS. 167-194 (2007)(04955-4982).

²³ *Id.* at 22.

²⁴ Kelly *et al*, Persistent Organic Pollutants in Aquafeed and Pacific Salmon Smolts from Hatcheries in British Columbia, Canada, 285 AQUACULTURE 224-233 (2008).

²⁵ Johnson *et al*, Contaminant Concentrations in Juvenile Fall Chinook Salmon from Columbia River Hatcheries, 72 N. AMERIC. J. AQUACULTURE 73-92 (2010).

²⁶ Meador *et al.*, Bioaccumulation of Polychlorinated Biphenyls in Juvenile Chinook Salmon (*Oncorhynchus Tshawytscha*) Outmigrating through a Contaminated Urban Estuary: Dynamics and Application, 19 ECOTOXICOLOGY 141-152 (2010).

²⁷ NOAA Fisheries, Draft Environmental Impact Statement on Two Joint Tribal Resource Management Plans for Puget Sound Salmon and Steelhead Hatchery Programs, Appendix K (2014)(04257-4273).

²⁸ The Role of Hatcheries in North American Wild Salmon Production, The Great Salmon Run: Competition Between Wild and Farmed Salmon, Table IV-1 at 44 (06739-6752).

²⁹ Northwest Indian Fisheries Commission, Tribal Natural Resources Management, A Report from the Treaty Tribes in Western Washington at 4 (2015)(06530-6545).

³⁰ EPA, Preliminary Draft NPDES Permit for Federal Aquaculture Facilities and Aquaculture Facilities Located in Indian Country, Permit No. WAG-130000 (August 2015)(06216-6319).

going PCB loading attributable to EPA authorization of PCB concentrations in manufactured products and in hatchery fish. EPA has concluded through TSCA and its general hatchery permit for federal and tribal hatcheries that these levels of PCBs do not pose a threat to human health or the environment.

Comment No. 2: Ecology has appropriately proposed a separate approach for polychlorinated biphenyls in light of the potential costs that would be incurred in implementing a more stringent and unnecessary criterion.

Available water quality data indicates that large portions of state waters would classify as impaired under CWA section 303(d) for failing to meet the EPA proposed PCB criteria of 7.6 pg/L. It is likely that every publicly owned wastewater treatment plant in Washington has the potential to cause or contribute to a violation of the EPA proposed PCB criteria. The technology to treat for PCBs in a five million gallons a day (MGD) treatment plant would be membrane filtration followed by reverse osmosis, with a Net Present Value (2013 dollars) cost of \$75 to \$175 million. These capital and operation/maintenance costs are documented in Attachment C—HDR, Treatment Technology Review and Assessment for Association of Washington Business, Association of Washington Cities and Washington State Association of Counties, at 38, Table 9 (December 2013).

There is substantial PCB water column data for Puget Sound and the major tributaries to Puget Sound. This data was collected by Ecology in 2009 and 2010.³¹ From this data alone there are well over 12,000 PCB sampling results from Haro Strait, the Strait of Juan de Fuca, the Whidbey Basin, Main Basin, South Sound and Hood Canal.³² This includes PCB water column data for total congeners collected at each of these sites.³³ All of the total congener data is either unqualified or J qualified. EPA, in its separate rulemaking, denied all such data relevant for assuming the cost benefit of proposed water quality standards.

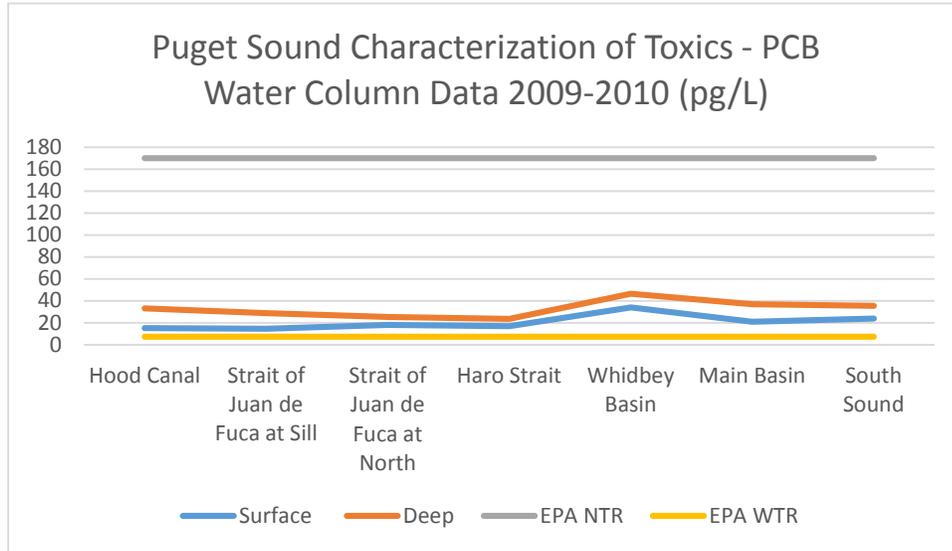
All of the total PCB water column data from the 2011 Ecology report is above the EPA proposed PCB criterion for Washington but below the NTR criteria. The following chart, based on water column data in the 2011 report,³⁴ shows an average of the total PCBs for each monitoring station at the surface and at depth:

³¹ Ecology, Control of Toxic Chemicals in Puget Sound: Characterization of Toxic Chemicals in Puget Sound and Major Tributaries, 2009-10 (January 2011)(05155-5395) (available at <https://fortress.wa.gov/ecy/publications/documents/1103008.pdf>).

³² Ecology, Email (07311) and attached EIM Data for Puget Sound (December 8, 2015)(05987). The attached data is limited to water column data for total PCBs.

³³ *Id.*

³⁴ *Id.*



In evaluating the potential impact of a more stringent PCB criterion it should be noted that every wastewater treatment plant sampled by Ecology in one study, with the exception of two facilities with reporting levels of 600 pg/L, were well above the proposed EPA criteria.³⁵

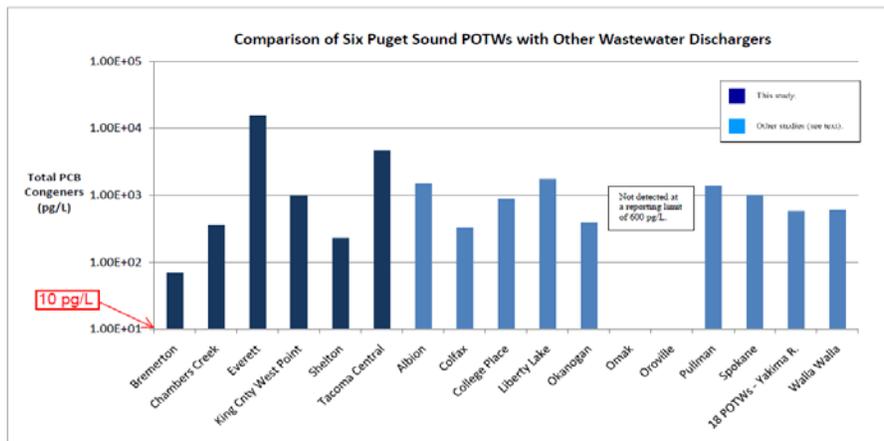


Figure 2. Comparison of Average Total PCB Results among Several POTWs

The EPA proposed PCB criteria would have direct impacts on these and other wastewater treatment plants. EPA has relied on the above information from the Ecology studies to perform a narrative reasonable potential analysis for three municipalities on the Spokane River. In the 2012 Fact Sheet for the City of Coeur d'Alene wastewater treatment plant NPDES permit EPA makes the following statement regarding the data presented in Figure 2:

PCBs have been detected in effluent from POTWs discharging to the Spokane River in the State of Washington (i.e., the City of Spokane and Liberty Lake Sewer and Water District) as well as other POTWs in Washington State operated

³⁵ Ecology, Control of Toxic Chemicals in Puget Sound Summary Technical Report for Phase 3: Loadings from POTW Discharge of Treated Wastewater, Figure 2 (December 2010)(Publication No. 10-10-057)(05746-5986).

by the Cities of Medical Lake, Okanogan, College Place, Walla Walla, Pullman, Colfax, Albion, Bremerton, Tacoma, and Everett, and King and Pierce counties. Effluent concentrations of total PCBs at these 14 facilities (a total of 34 samples) ranged from 46.6 to 39,785 pg/L with a median concentration of 810 pg/L...³⁶

The Spokane River offers a precedent for how Ecology may have to implement a more stringent PCB criterion throughout the state of Washington. At issue on the Spokane River is the EPA-approved water quality standards for the Spokane Tribe of Indians in 2013 that include a PCB criterion of 1.3 pg/L. EPA has represented, in litigation regarding the obligation of EPA to impose a PCB TMDL for the Spokane River, in federal court that year-round tertiary membrane filtration treatment is an appropriate best management practice for a wastewater treatment plant.³⁷

Available data indicate that most state waters would not meet the EPA proposed criteria and that most NPDES wastewater treatment plants will have to apply membrane filtration treatment and additional treatment technologies to address PCBs. Attachment C, at ES-3, Table ES-1, provides an incremental cost for such treatment including construction costs and operation and maintenance costs of between \$75 and \$160 million for a 5 MGD plant and net present value unit cost of between \$15 and \$32 per MGD per day. EPA, in its draft rule documentation, identified 406 NPDES permits administered by Ecology including 73 so-called major permits. If Ecology were to follow the same approach on Puget Sound that it has on the Spokane River, this would amount to a range of compliance costs from nearly \$6 billion to over \$11 billion for just the major permits identified by EPA.³⁸ A more stringent PCB criterion is also likely to impact how stormwater is managed as PCB concentrations have been detected in stormwater throughout the state.³⁹

Ecology has appropriately proposed to maintain a protective standard for PCBs by adopting the current NTR PCB criterion. The uncertainties about PCB toxicity, and potential expense of compliance for more stringent standards justifies this approval.

Comment No. 3: Ecology has appropriately proposed a criterion for arsenic based on the MCL for arsenic under the Safe Drinking Water Act.

The arsenic criteria proposed by Ecology based on the Maximum Contaminant Level (MCL) for arsenic under the Safe Drinking Water Act (SDWA) is the same approach approved by EPA for many states including California, Idaho and Alaska. This approach is protective of public health and recognizes both the high natural background of arsenic in Washington waters

³⁶ EPA, City of Coeur d'Alene Revised Fact Sheet NPDES Permit No. ID0022853 at 17 (2013)(07468-7569).

³⁷ *Sierra Club v. EPA*, Case No.2:11-cv-017959-BJR Doc. No. 129-1 EPA's Plan for Addressing PCBs in the Spokane River (July 14, 2015)(06320-6350).

³⁸ \$75 MM x 73 = \$5.5 Billion; \$160 MM x 73 = \$11.7 Billion.

³⁹ W. Hobbs, Memorandum Spokane Stormwater (October 15, 2015)(06427-6435); Ecology, Western Washington NPDES Phase I Stormwater Permit: Final S8.D Data Characterization 2009-2013 (February 2015)(Ecology Publication No. 15-03-001)(05592-7745);King County, PCB/PBDE Loading Estimates for the Greater Lake Washington Watershed (September 2013)(06546-6617).

and the technical difficulty of regulating arsenic for the protection of human health under the Clean Water Act.

As with PCBs, the June 29, 2015, EPA final updates to the section 304 human health criteria did not include new criteria for arsenic.⁴⁰ EPA stated in the announcement of the proposed updates in 2014, that the agency did not have the ability to update the arsenic criteria due to “outstanding technical issues.”⁴¹

These technical difficulties are reflected in final NTR arsenic criterion where EPA places an asterisk next to its arsenic criteria noting that it only applies to “inorganic arsenic.”⁴² EPA describes in its response to comments that this action reflects that only inorganic arsenic is toxic to humans.⁴³

In 1997 EPA approved arsenic criteria from Alaska based on the SDWA MCL and withdrew application of the NTR criteria to the state.⁴⁴ In that action EPA stated that “a number of issues and uncertainties arose concerning the health effects of arsenic” since the adoption of the NTR.⁴⁵ EPA deemed these issues sufficiently significant to require a careful evaluation of the risks of arsenic exposure. A large area of uncertainty in the regulation of arsenic is the form of arsenic present in marine fish. EPA reported in 1997 that the form of such arsenic is typically organic and thus not relevant to establishing human health criteria.⁴⁶ The report recommends that EPA use the SDWA MCL for arsenic as the ambient water quality criteria until EPA updates its risk assessment for arsenic.⁴⁷

In 2002 EPA adopted toxic criteria for the state of California but did not include criteria for arsenic.⁴⁸ EPA explained that this action was necessary due to the ongoing “issues and uncertainties” and contemplated revision to the SDWA MCL based on a report from the National Research Council (NRC). The NRC recommended to EPA that the MCL be reduced from 50 µg/L to 10 µg/L. EPA stated that after “promulgating a revised MCL for drinking water, the Agency plans to revise the CWA 304(a) human health criteria for arsenic in order to harmonize the two standards.”⁴⁹ EPA has yet to harmonize the two.

⁴⁰ EPA, Final Updated Ambient Water Quality Criteria for the Protection of Public Health, 80 Fed. Reg. 36986, at 36987. (June 29, 2015)(04807-4810).

⁴¹ EPA, Human Health Ambient Water Quality Criteria: Draft 2014 Update, EPA-820-F-14-003 at 1 (May 2014) (01772-1774).

⁴² NTR at 60848-01, 60868. (00768-847)

⁴³ *Id.*

⁴⁴ EPA, Withdrawal from Federal Regulations of Applicability to Alaska of Arsenic Human Health Criteria, 62 Fed. Reg. 27707 (May 21, 1997)(04803-4806).

⁴⁵ *Id.* at 27708.

⁴⁶ EPA, Arsenic and Fish Consumption, 2-5 (December 3, 1997)(05043-5062)

⁴⁷ *Id.* at 1.

⁴⁸ EPA, Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California, 65 Fed. Reg. 31682 (May 18, 2000) (00861-898).

⁴⁹ *Id.* at 31696.

Nationally, about half of the states have obtained EPA approval for arsenic human health criteria based on the SDWA MCL.⁵⁰ The same approach by Ecology is accordingly well within the requirements of the Clean Water Act for developing human health criteria.

Comment No. 4: Ecology has appropriately proposed to defer action on mercury criteria.

Ecology has appropriately proposed to defer action on a methylmercury criterion (MeHg) for the state of Washington. EPA has acknowledged unresolved technical issues and delayed action on updating mercury criteria in its 2015 recommended human health water quality criteria.⁵¹

Washington already has in place criteria for mercury based on human health protection that are more stringent than the NTR criteria.⁵² The NTR criteria are 0.14 µg/L (organisms and water) and 0.15 µg/L (organisms only), 40 C.F.R. § 131.36(b), compared to the Washington chronic freshwater criterion of 0.012 µg/L, WAC 173-201A-240, Table 240(3).

Ecology has previously identified to EPA the numerous technical difficulties it will have in implementing EPA's tissue based criterion.⁵³ These include unresolved technical issues regarding:

- Mixing zones
- Variances
- Field sampling recommendations
- Assessing non-attainment of fish tissue criteria
- Developing TMDLs for water bodies impaired by mercury
- Incorporating methylmercury limits into NPDES permits.⁵⁴

Ecology has explained to EPA that the EPA guidance on implementing the NTR criteria does not address these outstanding issues.⁵⁵ EPA has not responded to these concerns or explained how the state and regulated community in Washington can feasibly implement the tissue based criteria.

Ecology has appropriately not adopted the EPA fish tissue concentration criterion of 0.033 mg/kg (wet weight) proposed in September 2015. This value is derived from the outdated basis for the EPA 2001 recommended criteria for methylmercury.⁵⁶ Additionally, even if the 2001 national criterion was still valid, EPA's proposed MeHg fish tissue criterion of 0.033 mg/kg (wet weight) is not. It is overly conservative and unattainable in Washington (and the rest

⁵⁰ Ecology, Overview at 44 (00050).

⁵¹ EPA, Final Updated Ambient Water Quality Criteria for the Protection of Public Health and. EPA, Human Health Ambient Water Quality Criteria: Draft 2014 Update. (01772-1774)

⁵² Ecology, Overview at 49 (00055).

⁵³ Ecology, Overview at 50 (00056)

⁵⁴ Ecology, Overview. (00001-00073)

⁵⁵ *Id.*

⁵⁶ Ecology, Overview at 50 (00056).

of the United States) as the levels of mercury in fish are consistently higher than the proposed criterion.

EPA derived its proposed criterion following the methodology used to develop the national criterion but changed two key variables in the exposure assumptions: (1) the body weight from 70 kg to 80 kg; and (2) the fish consumption rate of 17.5 g/day to 175 g/day. Ecology offers no information or evidence that the nationally-recommended MeHg fish tissue criterion of 0.3 mg/kg would *not be* protective of residents in Washington, even tribal groups with relatively high fish consumption rates, assuming the issues previously discussed can be and are resolved. This is not surprising as there is no support in the technical literature that human health would be adversely affected if residents consumed fish having an average MeHg concentration of 0.3 mg/kg. There likewise can be no scientific evidence supporting the assumption that consuming fish—even at moderate to high ingestion rates—with tissue concentrations exceeding 0.033 mg/kg causes, or is likely to cause, adverse health effects.

There also is controversy surrounding the reference dose for MeHg (0.1 µg/kg/day) used in deriving the national and Washington criterion. The National Academy of Science selected this value based on a Faroes Island study.⁵⁷ Island residents consumed both fish and pilot whales, and subtle effects were observed in some children. In addition to mercury, the pilot whales contained elevated levels of PCBs and other chlorinated, recalcitrant pollutants. These confounders were not appropriately considered in establishing the mercury reference dose. The most comprehensive study on potential health effects of mercury in children is the Seychelles Island study.⁵⁸ In that study, women of childbearing age consumed fish having mercury levels higher than most fish species in the United States and there was no evidence of developmental or neurological adverse effects in the children studied from birth to age five.

Significantly, the Ecology proposed MeHg fish tissue criterion is well below observed concentrations of mercury in several fish species collected in Washington waters as documented in various studies.⁵⁹ For example, the median concentration of mercury in 97 fish samples collected and analyzed in 2004 and 2005 was 0.154 mg/kg (wet weight), five times the proposed MeHg criterion. A study conducted by USGS in Franklin D. Roosevelt Lake and the upper Columbia River basin reported the mean and minimum mercury concentrations in walleye, smallmouth bass, and rainbow trout, all of which were four to five times higher than EPA's proposed criterion for Washington.⁶⁰ The walleye mean and minimum fillet concentration was

⁵⁷ National Academy of Science, Toxicological effects of methylmercury. Committee on the Toxicological Effects of Methylmercury, Board on Environmental Studies and Toxicology, National Research Council. National Academy Press, (2000)(07570-7934).

⁵⁸ Davidson, et al., Effects of Prenatal and Postnatal Methylmercury Exposure from Fish Consumption on Neurodevelopment: Outcomes at 66 months of Age in the Seychelles Child Development Study. 280 JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION 701-707 (1998)(07349-7355).

⁵⁹ Ecology, Washington State Toxics Monitoring Program: Contaminants in Fish Tissue from Freshwater Environments in 2004 and 2005 (2007)(Publication No. 07-03-024)(available at www.ecy.wa.gov/biblio/0703024.html)(07356-7390).

⁶⁰ United States Geological Survey, Concentrations of Mercury and Other Trace Elements in Walleye, Smallmouth Bass, and Rainbow Trout in Franklin D. Roosevelt Lake and the Upper Columbia River, Washington, USGS Open-File Report 95-195195 (1994)(available at <http://pubs.er.usgs.gov/publication/ofr95195>)(07391-7429); See also Munn and Short, Spatial Heterogeneity of Mercury Bioaccumulation by Walleye in Lake Roosevelt and the Upper

0.33 mg/kg and 0.11 mg/kg, respectively; the smallmouth bass mean and minimum fillet concentration was 0.28 mg/kg and 0.17 mg/kg, respectively; and the rainbow trout mean and minimum fillet concentration was 0.20 mg/kg and 0.16 mg/kg, respectively. From a national perspective, for predator (game fish) species for all states combined, the median mercury concentration was 0.285 mg/kg. The 5th percentile concentration was 0.059 mg/kg.⁶¹ Based on these data, adoption of the proposed criterion would lead to widespread and pervasive water quality impairment in Washington streams, rivers, and lakes. The economic impact would be staggering, while the human health benefit would likely be none.

Indeed, the EPA proposal could result in adverse health impacts if people reduce their consumption of fish because of this criterion. The health benefits of eating fish are well-documented relative to the potential risks of contaminants in the fish.

For major health outcomes among adults, based on both the strength of the evidence and the potential magnitudes of effect, the benefits of fish intake exceed the potential risks. For women of childbearing age, the benefits of modest fish intake, excepting a few selected species, also outweigh risks.⁶²

In future actions on MeHg, Ecology should consider the protective effect selenium has on potential mercury health effects as many toxicologists have advocated that traditional risk assessments of mercury in fish without concomitant information on tissue selenium levels is scientifically flawed and misleading.⁶³ Recent reports have explained the mechanisms of this protective effect.⁶⁴ When the molar ratio of selenium to mercury in fish tissue exceeds 1.0 in freshwater and marine fish, a protective effect can be assumed.⁶⁵

Comment No. 5: The proposed Relative Source Contribution factor is consistent with the Clean Water Act and EPA guidance for deriving human health criteria.

The Relative Source Contribution (RSC) is a factor in the derivation of criteria representing the portion of exposure to a contaminant that is attributable to sources regulated by the CWA.⁶⁶ Ecology has appropriately proposed to use a RSC factor of 1.0 in deriving the proposed criteria where it is simultaneously using a fish consumption rate that includes all fish whether or not that fish is purchased from a store or a marine fish that does not accumulate pollutants in waters regulated by the state's water quality standards. By using a fish

Columbia River, Washington. 126 *TRANSACTIONS OF THE AMERICAN FISHERIES SOCIETY* 477–487 (1997)(07935-7946).

⁶¹ EPA, The National Study of Chemical Residues in Lake Fish Tissue at 2 (2009)(EPA-823-R-09-006)(07430-7433).

⁶² Mozaffarian and Rimm, Fish Intake, Contaminants, and Human Health: Evaluating the Risks and the Benefits, 296 *JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION* 1885 at 1885 (2006)(07434-7449).

⁶³ Zhang, Chan and Larssen, New Insights into Traditional Health Risk Assessments of Mercury Exposure: Implications for Selenium, 48 *ENVIRONMENTAL SCIENCE & TECHNOLOGY* 1206 at 1208 (2014)(07947-7953).

⁶⁴ Ralston and Raymond, Dietary Selenium's Protective Effects Against Methylmercury Toxicity, 278 *TOXICOLOGY* 112 (2010)(07954-7959).

⁶⁵ Peterson, et al., How Might Selenium Moderate the Toxic Effects of Mercury in Stream Fish of the Western U.S., 43 *ENVIRONMENTAL SCIENCE & TECHNOLOGY* 3919 (2009)(07450-7467).

⁶⁶ Ecology, Overview at 21 (00027).

consumption rate that reflects the 90th to 95th percentile of tribal consumption rates that includes all fish, there is no other source of water intake or fish consumption that should be accounted for in a RSC of less than 1.0.

EPA 2014 guidance clearly states that human health considerations in deriving water quality criteria are based only on the risk from exposure to fish and drinking water:

A complete human exposure evaluation for toxic pollutants of concern for bioaccumulation would encompass not only estimates of exposures due to fish consumption but also exposure from background concentrations and other exposure routes[.] The more important of these include recreational and occupational contact, dietary intake from other than fish, intake from air inhalation, and drinking water consumption. For section 304(a) criteria development, EPA typically considers only exposures to a pollutant that occur through the ingestion of water and contaminated fish and shellfish. This is the exposure default assumption, although the human health guidelines provide for considering other sources where data are available. **Thus the criteria are based on an assessment of risks related to the surface water exposure route only.**⁶⁷

This guidance is the same as EPA set forth in the 2000 Human Health Methodology: “[Ambient Water Quality Criteria] for the protection of human health are designed to minimize the risk of adverse effects occurring to humans from chronic (lifetime) exposure to substances through the ingestion of drinking water and consumption of fish obtained from surface waters.”⁶⁸

EPA Region 10 has endorsed the use of an RSC of 1.0 where a state is including all salmon in its criteria development methodology. The state of Oregon applied a RSC of 1.0 in the human health criteria approved by EPA in 2012. The rationale for this risk management decision included a discussion that it is a preferred means to account for salmon consumption compared to a lower or fractional RSC.⁶⁹ EPA Region 10 has urged Northwest states to consider EPA action on water quality standards for other states.⁷⁰ EPA Region 10 has further endorsed the Oregon approach as “the right outcome.”⁷¹

This endorsement is also set forth in a letter dated September 5, 2014, from EPA to the state of Idaho.⁷² EPA submitted this letter to Idaho on the question of whether the state should include or partially include salmon in its consumption rate for developing human health criteria. The letter sets forth alternatives to inclusion of salmon by reducing the RSC. EPA states that an

⁶⁷ EPA, Water Quality Standards Handbook, Chapter 3, Section 3.1.3 (2014)(available at <http://www2.epa.gov/wqs-tech/water-quality-standards-handbook>)(emphasis added)(06158-6215).

⁶⁸ EPA, 2000 Human Health Methodology at 1-11 (00103). See D. Essig, Email to C. Niemi (September 6, 2012)(06685-6688).

⁶⁹ Oregon DEQ, Oregon Human Health Criteria Issue Paper Toxics Rulemaking at 9 (00484). Oregon used RSC values recommended by EPA for 15 of 17 chemicals and a RSC value of 1.0 for all other non-carcinogens.

⁷⁰ L. Macchio, Letter to D. Essig (January 20, 2015)(01086-1088).

⁷¹ C. Niemi, Handwritten Notes (March 20, 2013)(“Dennis [EPA Region 10 Administrator] thinks the OR outcome was the right outcome, regionally wants to explore that position.”)(00455-0458).

⁷² L. Macchio, Letter to D. Essig (September 5, 2014)(04242-4244).

“acceptable approach to reducing the RSC is to fully include salmon consumption in the consumption rate.”⁷³ EPA also approved the Spokane Tribe of Indians human health criteria using a RSC of 1.0 where the tribe used a historical rate of consumption.⁷⁴

Ecology has appropriately described the significant differences between risk assessment in other programs such as the Safe Drinking Water Act (SDWA) and Superfund Cleanup Program from the Clean Water Act.⁷⁵ The SDWA uses a RSC of 0.2 and 0.8 of exposure but does so in terms of goals, not water quality criteria.⁷⁶ The SDWA is using this range of RSC for establishing Maximum Contaminant Level Goals that are not by definition regulatory limits.⁷⁷ This is in contrast to criteria in approved water quality standards that must be enforced through TMDLs and end of the pipe limits in NPDES permits.

In this instance Ecology is proposing a RSC that is entirely consistent with EPA guidance and there is no basis for using a RSC value of less than 1.0.

Comment No. 6: The proposed use of Bioconcentration Factors (BCFs) is consistent with the Clean Water Act and EPA guidance for deriving human health criteria.

As Ecology correctly points out, bioconcentration factors (BCFs) are based in science and have been acceptable for purposes of Clean Water Act criteria development at least since 1980. Historically, EPA relies on BCFs in developing recommended HHWQC and continues to recommend BCFs for many priority pollutants, including PCBs and 2378-TCDD, as evidenced by its most recent (2015) national recommended criteria.

Bioaccumulation represents a more comprehensive model of the degree to which fish and shellfish consumed by humans may become contaminated in the environments in which they live, due to the inclusion of important ecological processes such as contaminant uptake through the food web, sediment/water interactions, metabolic elimination, and others. As part of the process of updating the national human health water quality criteria in 2014 and 2015, EPA developed new factors for representing bioaccumulation (a BAF or BCF) for each substance from either measured or predicted BAFs or BCFs from laboratory or field studies. EPA has provided these new default factors for states to consider using when deriving their own state-specific HHWQC. However, it is widely recognized that BAFs are influenced by several local environmental factors (e.g., food web structure, water temperature, dissolved carbon) that can have a large influence on the resulting value. In other words, a default BAF developed based on field studies for specific species and in waters with specific chemistries, for example, is unlikely to represent bioaccumulation in any water body whose species makeup and chemistry differ from those used to develop the default value.

⁷³ *Id.* at 2.

⁷⁴ EPA, Letter approving Spokane Tribe of Indians Water Quality Standards, *Technical Support Document* dated December 11, 2013 at 22 (December 9, 2013) (the criteria are based on a FCR of 865 g/day) (01020-1071).

⁷⁵ Ecology, Overview at 22. (00028)

⁷⁶ *Id.*

⁷⁷ *Id.*; See also Ecology, Draft Comments from Washington and Idaho on EPA 2013 FAQ (April 17, 2013)(04245-4256).

It is also noteworthy that EPA has not provided an opportunity for the scientific community to adequately evaluate and comment on these new bioaccumulation factors. Given the impact that these factors have on criteria values, and the potential implications for states and dischargers that may result, EPA should allow for substantive comment on the technical merits of EPA's choice of national default values and on the appropriateness of using those values in deriving HHWQC for specific states and water bodies. This is critically important given that many of the chemical-specific bioaccumulation factors in the 2015 EPA HHWQC revisions differ by orders of magnitude relative to prior EPA guidance values. For example, the BAF/BCF for butylbenzyl phthalate was revised from 414 to 19000 L/kg and for several PAH compounds such as benzo-a-pyrene the value increased from 30 to 3900 L/kg. Such dramatic changes illustrate the need for considerably more vetting in the scientific community before they are adopted as "national BAFs." Accordingly, Ecology was correct to continue using BCFs in deriving its HHWQC. The agency identified some of these issues in its documents supporting this rulemaking, as well as in its comments on EPA's proposed HHWQC for the state.

Comment No. 7: The proposed use of a fish consumption rate of 175 grams a day for the rule is arbitrary, capricious and not based on substantial evidence in the record.

The 175 g/day fish consumption rate used to derive the proposed human health criteria is not supported by technical information and is not necessary to protect the residents of Washington. It is also inconsistent with past EPA guidance and is in conflict with the Washington risk policy to protect the average consumption rate of the general population, including consumers and non-consumers, to a risk level of 10^{-6} .

Ecology should use a fish consumption rate that is less than 19 g/day. Ecology documented 18.8 g/day as the average consumption rate for consumers only for the general population in Washington.⁷⁸ Ecology has not provided a consumption rate that reflects both consumers and non-consumers but it must be substantially lower than 18.8 g/day given that Ecology estimated that between 25% and 70% of the general population in the state of Washington does not eat fish.⁷⁹

The fish consumption rate used in the proposed rule exceeds the fish consumption rate used by any state to derive human health criteria, with the exception of the Oregon human health criteria adopted in 2012.⁸⁰ EPA guidance recommends for exposure to carcinogens that states use a fish consumption rate that protects the 90th percentile consumption of the general population while ensuring that subsistence fishers are protected at their average intake rate. EPA guidance recommends a default fish intake rate of 17.5 g/day to protect the general population.⁸¹ The same guidance recommends that state criteria use an average intake rate of 142.4 g/day for

⁷⁸ Ecology, Fish Consumption Rate Technical Support Document Version 2.0, 40-44 at 95 (05514) (January 2013)(Ecology Publication No. 12-09-058)(05398-5591).

⁷⁹ *Id.*

⁸⁰ Ecology, Fish Consumption Rates & Risk Levels for Carcinogens Used in Human Health Criteria Calculations, (November 5, 2013)(00259-00267).

⁸¹ Ecology, Overview at 15 (00021).

subsistence fishers. “EPA believes that the assumption of 142.4 grams/day is within the average consumption estimates for subsistence fishers based on studies reviewed.”⁸²

The rationale for this guidance is to ensure that human health criteria are protective within a broad range of consumption rates in a state from the general population at the 90th to the 99th percentile rates of consumption. EPA guidance describes the use of the general population consumption of 17.5 g/day at the 90th percentile as a baseline to ensure protection of the 99th percentile of the general population and average consumption rate for more exposed populations including subsistence fishers.⁸³ EPA confirmed this policy in a conference call with state regulators on April 17, 2013. EPA was asked during that conference call how EPA defines high exposure or high risk population for determining fish consumption rates. Beth Doyle, on behalf of EPA, responded that “EPA used the 99th percentile of the general population, as representing what they figured approximated the median consumption rate for subsistence fishers.”⁸⁴ The fish consumption rate of 175 g/day used by Ecology is ten times the 90th percentile consumption rate established by EPA guidance for the general population. In response to these comments Ecology should acknowledge that 175 g/day is based on the 50th to 90th percentiles of tribal consumption rates. Oregon developed the 175 g/day fish consumption rate for its criteria using the same consumption studies relied on by Ecology in the 2015 Federal Register Notice and concluded that the value reflects the 95th percentile consumption rate in the Columbia River Inter-Tribal Fish Commission study and the 90th percentile consumption rates documented for Puget Sound Tribes.

Consequently, the recommended rate [175 g/day] reflects consumption of salmon, and lamprey relative to rates documented in the CRITFC study (to protect at least 95% of fish consumers in Oregon), as well as marine fish and shellfish relative to the rates documented in the Puget Sound studies (to protect at least 90% of fish consumers in Oregon).⁸⁵

The following table from the TSD summarizes the consumption rates from Tribal studies. The 175 g/day fish consumption rate exceeds the median (50th percentile) for all Tribes and the 90th percentile for all Tribes with the exception of the Tulalips, 206 g/day, and the Suquamish, 489 g/day. The Suquamish consumption rate shown in this table is heavily influenced by high consumption rates reported by a few individuals. Other studies, such as the Tulalip study, excluded similar high rates from the analysis as “outliers.”⁸⁶ Oregon DEQ recognized that

⁸² EPA, 2000 Human Health Methodology at 4-27 (00186).

⁸³ EPA, Fish Consumption and Environmental Justice at 28 (November 2002). (“EPA’s default value of 142.4 grams/day for subsistence fishers reflects the 99th percentile value of 142.41 grams/day for freshwater and estuarine ingestion by adults.”)(00311).

⁸⁴ D. Essig, Email to S. Kirsch (April 5, 2013)(00453-454).

⁸⁵ Oregon DEQ, Oregon Human Health Criteria Issue Paper Toxics Rulemaking at 9 (May 24, 2011)(00476-0559).

⁸⁶ Oregon DEQ, Human Health Focus Group Report Oregon Fish and Shellfish Consumption Rate Project at 10-12 (June 2008)(00560-631).

“[w]ith no adjustments made for the high consumption rates, it was noted that the reported means may be highly influenced by the consumption of just a few individuals.”⁸⁷

Table 37. Summary of Fish Consumption Rates, All Finfish and Shellfish

| Population | Source of Fish | Number of Adults Surveyed | Mean | Percentiles | | |
|-------------------------------------|-------------------------|---------------------------|------|------------------|------------------|------------------|
| | | | | 50 th | 90 th | 95 th |
| General population (consumers only) | All sources: EPA method | 2,853 | 56 | 38 | 128 | 168 |
| | All sources: NCI method | 6,465 | 19 | 13 | 43 | 57 |
| Columbia River Tribes | All sources | 464 | 63 | 41 | 130 | 194 |
| | Columbia River | – | 56 | 36 | 114 | 171 |
| Tulalip Tribes | All sources | 73 | 82 | 45 | 193 | 268 |
| | Puget Sound | 71 | 60 | 30 | 139 | 237 |
| Squaxin Island Tribe | All sources | 117 | 84 | 45 | 206 | 280 |
| | Puget Sound | – | 56 | 30 | 139 | 189 |
| Suquamish Tribe | All sources | 92 | 214 | 132 | 489 | 797 |
| | Puget Sound | 91 | 165 | 58 | 397 | 767 |

See Polissar et al., 2012, Table E-1.

Ecology commissioned a report from the consultants who conducted the Tulalip, Squaxin and Suquamish studies. A report dated October 31, 2013, analyzed the data for a hypothetical combination of the Puget Sound Tribes.⁸⁸ This analysis calculated the median Tribal consumption rate to be 60.9 g/day for all fish.⁸⁹

ARCADIS also developed a composite distribution of Washington Tribal consumption rates based on the TSD data.⁹⁰ The ARCADIS distribution set the median, 90th and 95th percentiles for Tribal consumption rates to be 55.05, 137.77 and 178.69 g/day.⁹¹

The Clean Water Act and EPA regulations require human health water quality criteria to protect exposures that may result from pollutants in state waters. EPA guidance accordingly does not require human health criteria to regulate pollutant levels in marine fish that do not accumulate pollutants in waters of the United States within the jurisdiction of a state. The default value of 17.5 g/day in EPA guidance thus reflects freshwater/estuarine fish and shellfish

⁸⁷ *Id.* at 12 (00577). Ecology, Fish Consumption Rate Technical Support Document Version 2.0 at 05514 (January 2013)(Ecology Publication No. 12-09-058)(05398-5591).

⁸⁸ Polissar and Hippe, Fish Consumption Rates for a Hypothetical Combination of Puget Sound Tribes (October 31, 2013)(00632-657).

⁸⁹ *Id.*, Table A at 2.

⁹⁰ ARCADIS, Derivation of Alternative Human Health Risk-Based Ambient Water Quality Criteria Using Probabilistic Methods for the State of Washington, Attachment A at 7 (February 4, 2014)(00658-0723).

⁹¹ *Id.*

only.⁹² The range of consumption rates in the 2000 EPA guidance similarly do not include marine fish.⁹³

Salmon, as a marine species, should accordingly be excluded from the consumption rate used to derive Washington's criteria. The data on fish tissue samples from salmon in Puget Sound indicates that fish accumulate the predominant fraction of PCBs detected while in the ocean-phase of their life cycle.⁹⁴ Including all salmon in the fish consumption rate is not likely to benefit public health for contaminants accumulated in marine waters beyond the jurisdiction of the state.⁹⁵ Even for the small percentage of salmon that are resident for longer periods of time more stringent water quality standards are not likely to result in significant reductions in the body burden of contaminants.⁹⁶

Excluding salmon from the fish consumption rate lowers the median consumption rate documented for Puget Sound Tribes to 32.2 g/day or less—less than half of the FCR used for the proposed criteria.⁹⁷ The ARCADIS analysis independently calculated the “non-salmon” median consumption rate for Washington Tribes at 29.73 g/day.⁹⁸ Even if Ecology apportioned consumption rates for those salmon that are found to accumulate pollutants and are resident in Puget Sound for a longer period in their life cycle, Ecology consultants estimated the median tribal consumption rate for all seafood and the portion of anadromous fish to be 49.0 g/day.⁹⁹ The ARCADIS analysis calculated a Washington tribal consumption rate with apportioned salmon at a median rate of consumption to be 37.78 g/day and of 122.63 g/day at the 95th percentile.¹⁰⁰

Ecology should reject demands by EPA to base a FCR on “un-suppressed” fish consumption rates for northwest tribal members as claimed by EPA in its 2015 draft rule. 80 Federal Register at 55068. EPA did not cite to a single study, document or statistic of any kind to support its contention that there are suppressed consumption rates other than what it described

⁹² EPA, 2000 Human Health Methodology at 4-24 (EPA default fish consumption rates represent the ingestion of “freshwater and estuarine fish”)(00184).

⁹³ *Id.* at 4-25; *see also* Ecology, Decision Factors in Development of Human Health Criteria (November 6, 2013)(“Current federal guidelines do not use salmon in the fish consumption rate because most do not reside for their full life in water regulated by the Clean Water Act”)(00726-727).

⁹⁴ National Council for Air and Stream Improvement (NCASI), Comments on Publication No. 11-09-050, Fish Consumption Rates Technical Support Document, Appendix A, page 11 (January 11, 2012) (00728-0740), *see also* NCASI, Comments on Proposed Human Health Criteria and Implementation Tools Rule Proposal, Attachment A at 2 (March 4, 2015) (00741-0767).

⁹⁵ *Id.*

⁹⁶ Hope, Acquisition of Polychlorinated Biphenyls (PCBs) by Pacific Chinook Salmon: An Exploration of Various Exposure Scenarios, 8 INTEGRATED ENVIRONMENTAL ASSESSMENT AND MANAGEMENT 553, 561 (January 2012)(05073-5082).

⁹⁷ Polissar and Hippe, Fish Consumption Rates for a Hypothetical Combination of Puget Sound Tribes at 2 (00633).

⁹⁸ ARCADIS, Derivation of Alternative Human Health Risk-Based Ambient Water Quality Criteria Using Probabilistic Methods for the State of Washington, Attachment A at 7 (00698).

⁹⁹ Polissar and Hippe, Fish Consumption Rates for a Hypothetical Combination of Puget Sound Tribes at 2 (00633).

¹⁰⁰ ARCADIS, Derivation of Alternative Human Health Risk-Based Ambient Water Quality Criteria Using Probabilistic Methods for the State of Washington, Attachment A at 7 (00698).

as “consultation with Washington tribes and Columbia River basin tribes.” *Id.* Reliance on meetings that are closed to the public and on proposals for which there is no documentation or scientific analysis is a facial violation of CWA and state APA requirements to provide a scientific basis for proposed standards and an opportunity for public participation.

The only regulatory authority cited by EPA in the Federal Register notice is a cross-reference to section II.B.c in the same notice that includes a representation that EPA “generally” recommends “selecting a FCR that reflects consumption that is not suppressed by fish availability or concerns about the safety of available fish.” 80 Fed. Reg. at 55065. The sole authority for this proposal is a “Frequently Asked Questions” document that EPA posted online in January 2013. *See* 80 Fed. Reg. 55065, n. 15. EPA has conceded that this posting was done improperly and previously assured state regulators that the document would be withdrawn.¹⁰¹ EPA has also conceded that it is not sure how suppression should be factored into criteria.¹⁰²

It is difficult to understand how EPA “generally” recommends consideration for suppressed consumption rates when there is no guidance on how EPA and the states are supposed to factor this into developing water quality criteria.¹⁰³ EPA has long advised states to use data to develop criteria (with a preference for local or regional data over national data).¹⁰⁴ EPA is now asserting that it is permissible for it to consider unknown impacts on consumption rates for which there are no data.

The Federal Register notice does not reference any evidence to support a contention that fish consumption in Washington is suppressed due to “concerns about the safety of available fish.” There is likewise a lack of any information in the proposed rule docket posted by EPA to support such a contention. An actual survey of potential consumers concerns in Idaho found only 3% of the population indicated that they limited fish consumption due to health concerns about pollution or contamination.¹⁰⁵

It is also inappropriate to employ an alleged lack of availability of fish as a factor in setting human health criteria. Human health criteria do not impact fish availability. Imposing unattainable human health criteria on the state of Washington will in no way enhance fish runs or increase the availability of fish.

Even if it was appropriate to factor availability of fish in consideration of consumption rates, there is no evidence of a lack of availability of fish that would drive suppression. There is no documentation, for example, that tribal members lack access to fish. On the contrary, the tribal consumption studies document that at most two individual tribal members eat as much as

¹⁰¹ S. Braley, Email to M. McCoy, C. Niemi and D. Essig (January 9, 2014); S. Braley, Email to D. Essig and C. Niemi (July 28, 2014)(06692-6693).

¹⁰² D. Essig, Email to B. Burnell (September 30, 2014)(06691).

¹⁰³ D. Opalski, Letter to C. Niemi EPA Comment on Ecology Draft Rule (March 23, 2015)(07230-7249).

¹⁰⁴ EPA, 2000 Human Health Methodology at 2-2 (00108).

¹⁰⁵ Idaho Department of Environmental Quality, Considerations in Deciding Which Fish to Include in Idaho’s Fish Consumption Rate: Policy Summary at 7. (August 2015)(04792-4802).

1600 g/day of fish.¹⁰⁶ This is nearly twice the historic rate of consumption used in deriving the Spokane Tribe of Indians human health criteria.¹⁰⁷

It appears, moreover, that tribal consumption fish rates have been growing and are not suppressed. In 1992, the Columbia River basin tribes claimed a fish consumption rate of 150 g/day.¹⁰⁸ By 2012, the Columbia River Inter-Tribal Fish Commission was claiming that the 95th percentile of tribal members were consuming 175 g/day.¹⁰⁹ In 2015 the Northwest Indian Fisheries Commission claimed that there are contemporary consumption rates of between 500 and 918 g/day.¹¹⁰

EPA itself has increased the fish consumption rate from 6.5 g/day in the NTR to 22 g/day in criteria included in the 2015 update to the Section 304 human health criteria. This trend is consistent with national data showing an increase in consumption of fish over time. The U.S. Department of Agriculture has reported that the per capita consumption of fish grew from 12.4 pounds to nearly 16 pounds from 1980 to 2009.¹¹¹ This indicates that consumption rates used in setting criteria are adjusting with increasing consumption rates. This is illustrated in the following figure from the Idaho negotiated rulemaking process:¹¹²

¹⁰⁶ EPA, Comment on Ecology Draft Rule; *see also* Polissar and Hippe, Fish Consumption Rates for a Hypothetical Combination of Puget Sound Tribes (October 31, 2013)(00632-657).

¹⁰⁷ EPA, Letter approving Spokane Tribe of Indians Water Quality Standards, *Technical Support Document* dated December 11, 2013 at 22 (December 9, 2013) (the criteria are based on a FCR of 865 g/day) (01020-1071).

¹⁰⁸ *Dioxin/Organochlorine Ctr. v. Clarke*, 57 F.3d 1517, 1524 (9th Cir. 1995)(“In addition, the EPA argues that even assuming consumption of 150 grams of fully contaminated fish, as claimed by DOC, the risk level would still be only 23 in a million.”).

¹⁰⁹ EPA, Technical Support Document for Action on the State of Oregon’s New and Revised Human Health Water Quality Criteria and Associated Implementation Tools Submitted July 12 and 21, 2011 at 27 (October 17, 2011)(01908-2010).

¹¹⁰ NWIFC, Comments on the State’s Draft Rule for Human Health Criteria and Implementation Tools in Washington State Water Quality Standards (March 23, 2015).

¹¹¹ U.S. Census Bureau, Statistical Abstract of the United States: 2012, Sec. 3, Table 217 (August 2011)(06986).

¹¹² Idaho Department of Environmental Quality, Considerations in Deciding Which Fish to Include in Idaho’s Fish Consumption Rate: Policy Summary at 7. (August 2015)(04792-4802).

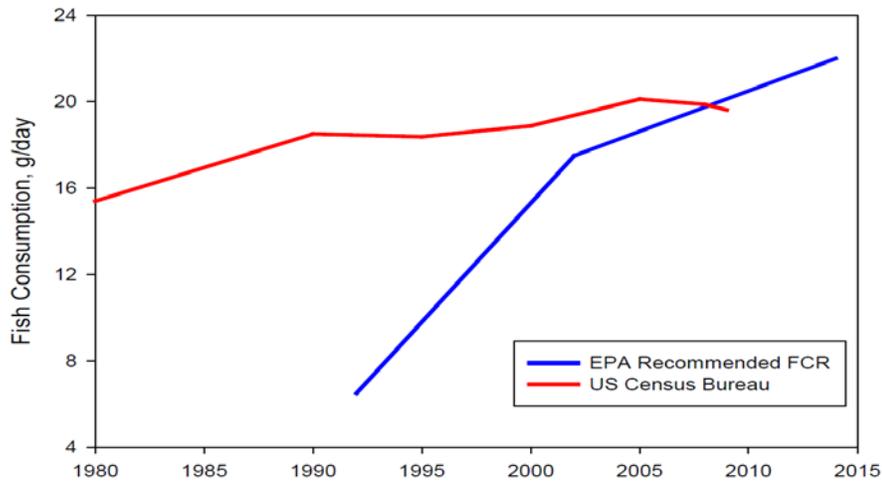


Figure 4. Per capita consumption of fish in the United States and EPA-recommended fish consumption rate (FCR), 1980–2014.

It is not appropriate to speculate on future consumption rates or restoration of consumption rates based on historic information. If fish consumption rates increase over time that information should inform future reviews by Ecology of the human health water quality criteria.

Comment No. 8: The proposed incremental excess cancer risk level factor used in the rule is arbitrary, capricious and not based on substantial evidence in the record.

Ecology has provided no justification for using a one in one million risk level coupled with a high fish consumption rate other than a policy decision by the Governor. It is a decision that succumbs to the pressure from EPA that lacks support under long-standing principles of the CWA, science and public health policy.

The current risk policy in Washington, WAC 173-201A-240(5), is intended to apply the one in one million (or 1×10^{-6}) risk level to the per capita consumption rate of the general population and not to more highly exposed subpopulations. EPA established this as a matter of law in *Dioxin/Organochlorine Center v. Clarke*, 57 F.3d 1517, 1524 (9th Cir. 1995).¹¹³

Ecology has interpreted and publicly stated that its risk policy for human health criteria in the state Water Quality Standards, WAC 173-201A-240(6), is intended to apply to the per capita consumption rate of the general population.¹¹⁴ Washington adopted this risk level for application of the National Toxics Rule (NTR) in Washington. Through the NTR process, EPA offered states the option of human health criteria calculated based on either a 10^{-6} or 10^{-5} risk level for the general population. Washington opted to use a 10^{-6} risk level.¹¹⁵ In the context of the NTR,

¹¹³ EPA, Brief for the Defendant-Appellees, *Dioxin/Organochlorine Center v. Clarke*, Nos. 93-35973 & 93-36000 (May 31, 1994) (00899-0967).

¹¹⁴ Ecology, Washington State Water Quality Standards: Human Health Criteria and Implementation Tools, Overview of Key Decisions in Rule Amendment, (January 2015)(Publication No. 14-10-058)(00001-0073).

¹¹⁵ NTR, 57 Fed. Reg. 60848-01, 60868 (00768-847); 40 C.F.R. §131.36(b)(14)(iii)(00848-0860).

however, this risk level is applicable to the per capita consumption rate of the general population on the assumption that NTR criteria are protective of higher consuming subpopulations at a 10^{-4} risk level and is consistent with long-standing EPA policy.

EPA and Washington have never assumed that the 10^{-6} risk policy set forth in WAC 173-201A-240(6) would apply to all consumers of fish, including some sub-populations of high fish consumers. Otherwise, Washington would not have adopted, nor would EPA have approved, coverage under the NTR where the criteria are based on a range of acceptable risk levels from 10^{-6} to 10^{-4} .¹¹⁶ EPA described this in its brief in the *Dioxin* case as a choice “to provide a high level of protection for the average population in order to provide what they [Washington and other states] deem adequate protection for more sensitive populations.”¹¹⁷

The scope and intent of the 10^{-6} risk policy in WAC 173-201A-240(6) was a central issue in a challenge to a dioxin water quality improvement plan or Total Maximum Daily Load (TMDL) allocation developed by EPA for the Columbia River. The dioxin TMDL was based on the same assumptions for the dioxin criterion in the NTR, including a FCR of 6.5 g/day. The TMDL was challenged in federal court on the basis of evidence that actual FCRs on the Columbia River for recreational fishers and Tribes was as high as 150 g/day. The challengers contended that EPA should have applied WAC 173-201A-240(6) to derive a water quality criterion for dioxin that would protect all fish consumers to a level of 10^{-6} based on the higher FCR. In *Dioxin/Organochlorine Center v. Clarke*, 57 F.3d 1517, 1524 (9th Cir. 1995), the court concluded that Washington did not intend to mandate a 10^{-6} risk level for every fish consumer. The Ninth Circuit held that “the one-in-a-million risk level mandated by the state water quality standards for the general population does not necessarily reflect state legislative intent to provide the highest level of protection for *all* subpopulations but could reasonably be construed to allow for lower yet adequate protection of specific subpopulations.” 57 F.3d at 1524 (emphasis in original).¹¹⁸

In *Dioxin/Organochlorine Center*, EPA successfully argued that the mere fact that actual fish consumption in Washington is greater than the FCR in the TMDL (the same as the NTR) does not mean that the national criteria violate the state risk policy to protect human health under WAC 173-201A-240(6). EPA argued that the FCR and risk levels in the federal criteria are based on consumption of maximally contaminated fish, and are not intended to reflect actual consumption rates.¹¹⁹ EPA also argued that the 6.5 g/day fish consumption rate was not intended to accurately represent total consumption of fish, but instead the ingestion rate of a given contaminant.¹²⁰ According to EPA, the fish consumption rate used in the NTR was “intended to

¹¹⁶ WAC 173-201A-240(6). EPA’s “policy in the NTR [is] to select the risk level that reflect[s] the policies or preferences of CWA programs in the affected States.” 65 Fed. Reg. 31682, 31699 (May 18, 2000)(00861-0898).

¹¹⁷ EPA, Brief for the Defendant-Appellees, *Dioxin/Organochlorine Center v. Clarke*, Nos. 93-35973 & 93-36000 (May 31, 1994) (00899-0967)

¹¹⁸ The risk policies in the NTR were also affirmed in *Natural Resources Defense Council v. EPA*, 16 F.3d 1395 (4th Cir. 1993)(rejecting argument that 6.5 grams per day FCR failed to protect subpopulations with higher than average fish consumption). EPA’s range of acceptable risk levels was also upheld in other contexts. *E.g.*, *Ohio v. EPA*, 997 F.2d 1520, 1533 (D.C. Cir. 1993)(describing range of 10^{-6} to 10^{-4} as adequately protective of human health).

¹¹⁹ *Natural Resources Defense Council v. EPA*, 16 F.3d 1395, 1402 n.11 (4th Cir. 1993).

¹²⁰ EPA, Brief for the Defendant-Appellees.

represent only a subset of total fish consumption.”¹²¹ The FCR is the assumed amount of “maximum residue fish” consumed.¹²² EPA further asserted that consuming anadromous fish, like salmon, is unlikely to cause ingestion of contaminants at a rate equal to consuming maximum residue fish.¹²³ EPA explained: “[T]he total fish consumption rate of various individuals is not determinative; the central question is whether the actual rate of ingestion [of a contaminant] is greater than that assumed by EPA.”¹²⁴

To understand Washington’s risk policy, one must take into consideration the timing and sequence of the state’s adoption of its risk policy and when the state was formally subject to the NTR.¹²⁵ The risk policy, WAC 173-201A-240(5), was promulgated as a state regulation in October 1992.¹²⁶ The promulgation of the regulation referencing the NTR was included with revisions to the state Water Quality Standards, WAC 173-201A-240(6), five years later in November 1997.¹²⁷ In addition to the fact that the NTR does not extend the 10^{-6} risk level to all consumers, there is the intervening ruling in *Dioxin/Organochlorine Center* that the state policy does not reflect any intent to protect high consumers to the 10^{-6} risk level. A basic rule of statutory construction provides that the failure to amend an act following a judicial construction indicates approval of the construction.¹²⁸ Thus, if Ecology believed that the risk policy was intended to more broadly apply in Washington it would have amended the regulation prior to incorporating a reference to the NTR in the state Water Quality Standards.

The risk levels used to develop the NTR are consistent with the EPA 2000 Human Health Methodology. That guidance provides for risk based criteria using a risk level of 10^{-6} or 10^{-5} for the 90th percentile consumption rate for the general population as long as the **median** consumption rate for highly exposed populations is protected to a level of 10^{-4} .¹²⁹ The 2000 Human Health Methodology is clear that EPA deems both 10^{-6} and 10^{-5} risk levels as acceptable,¹³⁰ so long as the selection provides at least a 10^{-4} risk level for the highest consumers of fish. “EPA generally regulates pollutants treated as carcinogens in the range of 10^{-6} to 10^{-4} to

¹²¹ EPA, Brief for the Defendant-Appellees at 44 (00954).

¹²² *Id.*

¹²³ 16 F.3d at 1403; *see also* EPA, Brief for the Defendant-Appellees at 44 (00954).

¹²⁴ EPA, Brief for the Defendant-Appellees at 45 (00955); EPA’s water quality criteria guidance includes a margin of safety for water consumption. 65 Fed. Reg. 31682, 31693 (May 18, 2000) (00861-0898).

¹²⁵ Under controlling Washington law, the sequence of all statutes relating to the same subject matter should be considered. *Dep’t of Labor and Industries v. Estate of MacMillan*, 117 Wn.2d 222, 229, 814 P.2d 194 (1991).

¹²⁶ WSR 92-24-037 (00968-0971).

¹²⁷ WSR 97-23-064. (00972-1019).

¹²⁸ *Hangman Ridge Training Stables, Inc. v. Safeco Title Ins. Co.*, 105 Wn.2d 778, 789, 719 P.2d 531 (1986).

¹²⁹ NTR at 60855.

¹³⁰ EPA asked states covered by the NTR to tell EPA if they preferred the human health criteria for the state be applied at a risk level of 10^{-5} . NTR at 60864. In general, the NTR established AWQC for states based on a 10^{-6} risk level. *Id.* at 60860. A state could ask EPA to remove the state from the rule, and adopt human health criteria for a carcinogen at a 10^{-5} risk level. *Id.* If a state convinced EPA a 10^{-5} risk level was appropriate, public notice and comment would not be required “because the Agency has considered in this rule that criteria based on either 10^{-5} or 10^{-6} risk levels meet the requirements of the Act.” *Id.*

protect average exposed individuals and more highly exposed populations.”¹³¹ “EPA also believes that criteria based on a 10^{-5} risk level are acceptable for the general population as long as States and authorized Tribes ensure that the risk to more highly exposed subgroups (sport fishers or subsistence fishers) does not exceed the 10^{-4} level.”¹³²

EPA guidance addresses the need to consider carefully the impact of criteria on sensitive and subsistence populations. This guidance is reflected in the preference for local data over EPA default values for fish consumption rates.¹³³ That does not mean, however, that a 10^{-6} risk level becomes a baseline for all population exposures. The EPA guidance directs that more specific information on consumption rates should be used to ensure that the criteria are within the protective range of EPA risk policy guidance:

EPA understands that fish consumption rates vary considerably, especially among subsistence populations, and it is such great variation among these population groups that may make either 10^{-6} or 10^{-5} protective of those groups at a 10^{-4} risk level. Therefore, depending on the consumption patterns in a given State or Tribal jurisdiction, a 10^{-6} or 10^{-5} risk level could be appropriate. In cases where fish consumption among highly exposed population groups is of a magnitude that a 10^{-4} risk level would be exceeded, a more protective risk level should be chosen.¹³⁴

EPA has erroneously suggested that the 2000 Human Health Methodology “did not consider how CWA decisions should account for applicable reserved fishing rights.” This is simply a false statement. The Columbia River Inter-Tribal Fish Commission submitted a written comment on the draft 2000 guidance that raised treaty and trust obligations under the CWA.¹³⁵ As seen in the above quoted passage from the guidance, consumption patterns among subsistence populations and within a given tribal jurisdiction were considered in the document.

Moreover, EPA has updated and amended this guidance numerous times since its publication in 2002 as documented on the EPA web site.¹³⁶ EPA actively considered tribal fishing rights in parallel CWA proceedings in 2001 and 2002 that were nearly contemporaneous to the 2000 guidance and predate each of its updates.¹³⁷

¹³¹ NTR at 60855; *see also* 65 FR 31682, 31699 (May 18, 2000) (00861-0898).

¹³² EPA, Methodology for Deriving Ambient Water Quality Criteria for Protection of Human Health, EPA-822-B-00-004 at 1-12 (October 2000)(00074-0258); *see also* NTR at 60848, 60863 (describing 10^{-5} level as “adequately protective”).

¹³³ *Id.* at 1-12, 4-25.

¹³⁴ *Id.* at 2-6.

¹³⁵ EPA, Fish Consumption and Environmental Justice, at 58 (November 2002)(referencing Columbia River Inter-Tribal Fish Commission, Comments to Administrator Browner on the Draft Revisions to the Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health (1999))(00268-0452).

¹³⁶ <http://water.epa.gov/scitech/swguidance/standards/criteria/health/methodology/index.cfm>.

¹³⁷ EPA, Meeting Summary of the Executive Council of the National Environmental Justice Advisory Council December 3, 4, and 6, 2001 (06107-6157); *see also* EPA, Fish Consumption and Environmental Justice (00268-0452).

Ecology cannot rely on the statement by EPA that it “often uses 10^{-6} as a *de minimis* risk level” to justify a more stringent risk policy. EPA, across its environmental programs, the FDA and other federal agencies have consistently deemed 10^{-4} as a *de minimis* risk level when applied to a highly exposed subpopulation. EPA and FDA programs have in fact long considered any exposure within a range of 10^{-6} to 10^{-4} to be a *de minimis* risk and a level of risk that is acceptable and insignificant for setting human health standards including water quality standards.

This long standing policy is reflected in the scientific literature cited by EPA in its independent human health criteria rulemaking. EPA cites one scientific study in the Federal Register, 80 Fed. Reg. at 55068, n. 26: “Castorina, Rosemary and Tracey J. Woodruff (sic), *Assessment of Potential Risk Levels Associated with the U.S. EPA Reference Values*, ENVIRONMENTAL HEALTH PERSPECTIVES, Vol. 111, No. 10, page 1318.” This article, which is about air quality and not water quality standards, does not support the implication in the Federal Register that EPA considers a 10^{-6} risk level to be a bright line standard for *de minimis* risk. The authors in fact state, “As a point of comparison, The U.S. EPA has defined 1 in 1,000,000 excess cancer risk as a *de minimis* risk level for cancer (Caldwell et al. 1998; Clean Air Act Amendments 1990; Fiori and Meyeroff, 2002; U.S. EPA 1991), **although regulatory actions are sometimes limited to instances where risk exceeds 1 in 100,000.**” (Emphasis added.)

“Fiori and Meyeroff, 2002¹³⁸,” one of the references cited in support of the quoted statement in the Castorina article is a proposal for a risk management approach for exposure to mutagens that applies a *de minimis* risk standard. The article provides a short but instructive summary of “regulatory precedents for negligible carcinogenic risk”:

Acceptable risk is a concept that is required because of the adoption of the no threshold theory of carcinogenicity. Setting the acceptable risk level is a risk management decision....When EPA sets an acceptable risk for the general population (as for drinking water standards), the upper bound risk level of one excess cancer per 1 million people (i.e., 10^{-6}) is used. (EPA, 1991).¹³⁹

The “EPA 1991” references in both articles are the same, the draft NTR.¹⁴⁰ EPA states in the draft NTR that its risk based criteria are consistent with EPA guidelines that assume carcinogenicity is a “non-threshold phenomenon” and that there is no “safe” or “no-effect levels” of exposure.¹⁴¹ Consistent with this guidance, EPA elected to use a “relatively stringent” cancer risk level of 10^{-6} as applied to the general population and deemed protective of “subsistence fishermen” who are more exposed than the general population.¹⁴² It was the position of EPA then, based on the law and best available science, that the use of a 10^{-6} risk level “is in part

¹³⁸ Fiori and Meyeroff, Extending the Threshold of Regulation Concept: *De Minimis* Limits for Carcinogens and Mutagens, 35, REGULATORY TOXICOLOGY AND PHARMACOLOGY, 209-16 (April 2002)(06355-6362).

¹³⁹ *Id.* at 210.

¹⁴⁰ EPA, Amendments to the Water Quality Standards Regulation to Establish the Numeric Criteria for Priority Toxic Pollutants Necessary to Bring All States into Compliance with Section 303(c)(2)(B), 56 Fed. Reg. 58420 (November 19, 1991) (06471-6529).

¹⁴¹ *Id.* at 58434.

¹⁴² *Id.* at 58435.

addressing the potential that highly exposed subpopulations exist by selecting a relatively stringent cancer risk level (10^{-6}) for use in deriving State-wide criteria for carcinogens.”¹⁴³

The EPA guidance also illustrates why protecting the highest subpopulation exposure at 10^{-6} would be over-protective of designated uses:

It is important to understand that criteria for carcinogens are based on chosen risk levels that inherently reflect, in part, the exposure parameters used to derive those values. Therefore, changing the exposure parameters also changes the risk. Specifically, the incremental cancer risk levels are *relative*, meaning that any given criterion associated with a particular cancer risk level is also associated with specific exposure parameter assumptions (e.g., intake rates, body weights). When these exposure parameter values change, so does the relative risk. For a criterion derived on the basis of a cancer risk level of 10^{-6} , individuals consuming up to 10 times the assumed fish intake rate would not exceed a 10^{-5} risk level. Similarly, individuals consuming up to 100 times the assumed rate would not exceed a 10^{-4} risk level. Thus, for a criterion based on EPA’s default fish intake rate (17.5 gm/day) and a risk level of 10^{-6} , those consuming a pound per day (i.e., 454 grams/day) would potentially experience between a 10^{-5} and a 10^{-4} risk level (closer to a 10^{-5} risk level). (Note: Fish consumers of up to 1,750 gm/day would not exceed the 10^{-4} risk level.) If a criterion were based on high-end intake rates and the relative risk of 10^{-6} , then an average fish consumer would be protected at a cancer risk level of approximately 10^{-8} . The point is that the risks for different population groups are not the same.¹⁴⁴

EPA’s 2000 Human Health Methodology clearly describes an “accepted risk range” of 10^{-4} to 10^{-6} , and provides that states may adopt a cancer risk level of either 10^{-5} or 10^{-6} for the general population, as long as “the risk to more highly exposed subgroups (sport fishers or subsistence fishers) does not exceed the 10^{-4} level.”¹⁴⁵ Remarkably, the only reference in its proposed rule to this long held policy and practice of addressing the unique health risks to Indian tribes as a high consuming subpopulation is found in a footnote. 80 Fed. Reg. at 55065 n. 6. Rather than acknowledging that its proposed rule is a radical departure from the 2000 Guidance, EPA simply states that the 2000 Human Health Methodology “did not consider how CWA decisions should account for applicable reserved fishing rights, including treaty-reserved rights.” *Id.* at 55068 (§IV.C.b).

The federal government has repeatedly deemed a 10^{-4} risk level to result in a *de minimis* risk when applied to more exposed subpopulations in deriving human health criteria under the CWA. Across EPA and FDA programs exposures at the level of risk between 10^{-6} and 10^{-4} are deemed acceptable because they represent an insignificant and essentially zero increased risk of cancer.¹⁴⁶

¹⁴³ *Id.*

¹⁴⁴ *See*, EPA, 2000 Human Health Methodology at 2-7 (00113).

¹⁴⁵ *Id.* at 1-12.

¹⁴⁶ *See* Attachment A, at 12.

“*De minimis*” is a term of art taken from the principle in common law of *de minimis non curat lex* meaning roughly that the “the law does not concern itself about trifles.”¹⁴⁷ Ecology should not disregard decades of scientific research and sound public policy by implying that highly exposed populations will not be as well protected if their exposure risk is at a risk level of 10^{-4} . On the contrary, it has been well understood that “if only a small population would be at greatest risk, the expected number of excess cancers corresponding to individual risks at the *de minimis* level of 10^{-4} would still be zero.”¹⁴⁸ In actual practice, federal agencies across at least 132 regulatory decisions concluded that for small populations the *de minimis* lifetime risk was considered to be 10^{-4} .¹⁴⁹ These regulatory decisions include actions by the Consumer Product Safety Commission, the Food and Drug Administration, the Occupational Safety and Health Administration and EPA programs for water quality, air, pesticide use, drinking water, toxic substances and radiation.¹⁵⁰ A survey of these decisions concluded that “for small-population effects, regulatory action was never taken for individual risk levels below 10^{-4} .”¹⁵¹

The accepted range of risk levels from 10^{-6} to 10^{-4} reflects a broader regulatory consensus that this range more than adequately protects human health to an insignificant level of risk that is essentially a zero increased risk of incurring cancer.¹⁵² The abiding principle in the regulation of exposure to carcinogens was that there should be no exposure—that there is no safe level or threshold for exposure. An early expression of this principle is found in the 1954 Delaney Clause regulating chemicals in animal feed on the basis that there should be no toxins in toxic amounts.¹⁵³ It was apparent that health and environmental regulation would be impossible under the literal application of this concept. It is impossible to regulate to a zero standard.¹⁵⁴ This led to adoption by EPA and FDA of the Mantel-Bryan equation which is an early precursor to the current methodology for deriving risk based criteria under EPA guidance for human health criteria. Mantel-Bryan proposed using risk levels based at levels of insignificance that would reflect an essential zero risk of cancer at exposures considered in the resulting criteria.¹⁵⁵ As initially conceived, the risk levels were proposed in a range of one in one hundred million to one in a million— 10^{-8} to 10^{-6} .¹⁵⁶

The FDA through the 1970s and 1980s sought to establish amounts of carcinogenic compounds using an appropriate risk that when present as residue in human food would be

¹⁴⁷ BLACK’S LAW Dictionary 524 (2009).

¹⁴⁸ Attachment B, at 18 (*quoting* D. Kocher, Criteria for Establishing *de minimis* Level of Radionuclides and Hazardous Chemicals in the Environment (1996) (Report ES/ER/TM-187 prepared by the Oak Ridge National Laboratory for the U.S. Department of Energy).

¹⁴⁹ See Attachment B, at 18.

¹⁵⁰ Travis, Richter, Crouch, Wilson and Klema, Cancer Risk Management, 21 ENVIRON. SCI. TECHNOLOGY 415, Table 1 (1987).(05083-5088).

¹⁵¹ *Id.* at 418.(05086).

¹⁵² Ecology, Overview at 18. (00024).

¹⁵³ Calabrese, Edward J. “Origin of the Linearity No Threshold (LNT) Dose-Response Concept.” ARCHIVES OF TOXICOLOGY at 7-8 (2013)(01097-1109).

¹⁵⁴ Graham, John D. “The Legacy of One in a Million” RISK IN PERSPECTIVE (1993)(01110-1111).

¹⁵⁵ Hutt, Peter B. “A Brief History of Risk Assessment,” FDA ORAL HISTORY (November 2000)(01112-1132).

¹⁵⁶ 33 Fed. Reg. 19226, 19226 (July 19, 1973)(01133-1137).

consistent with “a zero tolerance (no residue)” policy.¹⁵⁷ To achieve this goal FDA made an early proposal based on the one in one-hundred-million risk level.¹⁵⁸ In its final rule, however, the FDA determined that the proposal was too conservative and offered no additional benefit to public health. As a result, the FDA determined that a one in one million risk was “essentially zero.”¹⁵⁹

The trajectory of FDA regulations was to deem a 10^{-8} risk level as too conservative “after considering that and listening to both the industry and to the scientists in FDA, the final regulation as the sensitivity of the methods and the level chosen by FDA ever since then was reduced to 1 in a million.”¹⁶⁰ FDA has explained that the 10^{-6} risk means no carcinogenic risk at all, that while there is a mathematical possibility, it is not a real risk in the actual practical world.¹⁶¹

EPA engaged in a similar public discussion as the FDA in the 1970s and 1980s.¹⁶² EPA recognized that absolute criteria for carcinogens could not be established given uncertainties

¹⁵⁷ *Id.*

¹⁵⁸ *Id.* at 19227.

¹⁵⁹ FDA, Compounds used in Food-Producing Animals, 38 Fed. Reg. 19227 (July 19, 1973). 37 Fed. Reg. 15747 (Aug. 4, 1972) (FDA adopts the Mantel-Bryan equation and its probit dose-response model as the tool used for quantitative risk assessment. Through Mantel-Bryan, one in 100,000,000 (10^{-8}) becomes a guide for determining safe doses of carcinogenic substances). FDA, Criteria and Procedures for Evaluating Assays for Carcinogenic Residues in Edible Products of Animals, 42 Fed. Reg. 10412 (Feb 22, 1977) (Following public response, industry critique, regulator reevaluation and economic considerations the one in 100,000,000 (10^{-8}) safe dose level is increased to a more lenient one in 1,000,000 (10^{-6})). FDA, Criteria and Procedure for Evaluating Assays for Carcinogenic Residues 44 Fed. Reg. 17070 (Mar. 20, 1979) (The Mantel-Bryan Equation is again adjusted; one in 1,000,000 is maintained). FDA, D&C Green No. 5, 47 Fed. Reg. 24278 (June 4, 1982) (Color additive D&C Green No. 6 permanently listed as acceptable for human consumption by FDA). FDA, Sponsored Compounds in Food-Producing Animals; Criteria and Procedures for Evaluating the Safety of Carcinogenic Residues, 50 Fed. Reg. 45530, 44541 (Oct. 31, 1985) (Responding to the Delaney clause, the FDA argues that one in a million risk level represents a truly insignificant degree of risk but that the agency can’t confidently assert a one in one-hundred thousand risk level would adequately protect the general public). FDA, Cosmetics; Proposed Ban on the Use of Methylene Chloride as an Ingredient of Aerosol Cosmetic Products, 50 Fed. Reg. 51551 (Dec. 18, 1985) (FDA claims one in a million risk level represents a “*de minimis*” level of risk). (01138-1280).

¹⁶⁰ Hutt, “A Brief History of Risk Assessment,” FDA ORAL HISTORY, at 17 (November 2000)(01112-1132).

¹⁶¹ *Id.*

¹⁶² EPA, Health Risk and Economic Impact Assessments of Suspected Carcinogens: Interim Procedures & Guidelines 41 Fed. Reg. 21402 (May 25, 1976) (EPA proposes “a balancing of risks and benefits as the basis for final regulatory action” regarding carcinogenic pesticides). EPA, Water Quality Criteria Documents; Availability, 45 Fed. Reg. 79323 (Nov. 28, 1980) (The EPA presents a range of acceptable risk levels in regard to Superfund (CERCLA) cleanup). EPA, National Emission Standards for Hazardous Air Pollutants: Regulations of Radionuclides, 49 Fed. Reg. 43906-43911 (Oct. 31 1984) (EPA prescribes different levels of protection for those who have carrying levels of exposure; distinguishes between individual risk and population risk). EPA, Regulations of Pesticides in Food: Addressing the Delaney Paradox Policy Statement, 53 Fed. Reg. 41104 (Oct. 19, 1988). (EPA proposes using one in a million as a definitive acceptable risk level in an effort to supersede the Delaney clause). EPA, Hazardous Waste Management System; Identification and Listing of Hazardous Waste; Toxicity Characteristics Revisions, 55 Fed. Reg. 11798 (Mar. 29, 1990) (EPA opts to use a one in one-hundred-thousand carcinogenic risk level for hazardous waste cleanup). EPA, Guidelines for Exposure Assessment, 57 Fed. Reg. 22888-22938 (May 29, 1992) (Discussion of individual and general population risks). EPA, Final Water Quality Guidelines for the Great Lakes System, 60 Fed. Reg. 15366-01 (March 23, 1995) (EPA approves a one in one-

including variances of sensitivities and exposure levels.¹⁶³ Instead, EPA presented a range of concentrations associated with risk levels of 10^{-5} , 10^{-6} and 10^{-7} .¹⁶⁴ EPA's objective in deriving these water quality criteria was to estimate concentrations "which do not represent a significant risk to the public."¹⁶⁵

As discussed above, the EPA risk policy was affirmed in *Dioxin/Organochlorine Center v. Clarke*, 57 F.3d 1517, 1524 (9th Cir. 1995). The same risk policy as applied under CERCLA was affirmed in *State of Ohio v. EPA*, 997 F.2d 1520, 1533 (D.C. Cir. 1993). At issue was whether EPA can allow a lower, one in ten thousand, risk level for the protection of populations near a Superfund site. Washington filed an amicus brief in this proceeding. 997 F.2d at 1524 n.1. The court rejected this contention:

The States next challenge EPA's use of a cancer risk range between 10^{-6} and 10^{-4} in the NCP, arguing that an exposure level greater than 10^{-6} is never appropriate. A 10^{-4} risk subjects the surrounding population to an increased lifetime cancer risk of 1 in 10,000. A 10^{-6} risk subjects the surrounding population to an increased lifetime cancer risk of 1 in 1,000,000. When EPA develops objectives for a remedial action at a site, it selects a remediation goal that "establish[es] acceptable exposure levels that are protective of human health." 40 C.F.R. § 300.430(e)(2)(i). EPA attempts to use health-based ARARs to set the goal, but if ARARs are nonexistent or unsuitable for use, EPA establishes the goal based on criteria in the NCP. 55 Fed. Reg. 8712 (1990). "For known or suspected carcinogens, acceptable exposure levels are generally concentration levels that represent an excess upper bound lifetime cancer risk to an individual of between 10^{-6} and 10^{-4}" 40 C.F.R. § 300.430(e)(2)(i)(A)(2). The NCP expresses a preference for remedial actions that achieve a level of 10^{-6} however, the ultimate decision depends on a balancing of nine criteria, including cost. *Id.*; 55 Fed. Reg. 8718 (1990).

The States contend that by permitting cost to play a role in determining the level of exposure, the cancer risk range fails to meet the requirement in § 9621 that remedial actions be "protective of human health." 42 U.S.C. § 9621(b)(1); *see also* 42 U.S.C. § 9621(d)(1). The States' argument necessarily depends, though, on the notion that an exposure level greater than 10^{-6} is not protective of human health. CERCLA requires the selection of remedial actions "that are protective of human health," not as protective as conceivably possible. A "risk range of 10^{-4} to 10^{-6} represents EPA's opinion on what are generally acceptable levels." 55 Fed. Reg. 8716 (1990). Although cost cannot be used to justify the selection of a remedy that is not protective of human health and the environment, it can be considered in selecting from options that are adequately protective.

hundred-thousand risk level for the general population of the Great Lakes region because the most exposed populations would still be protected at a one in ten-thousand level, which is deemed adequate). (01281-1742).

¹⁶³ 45 Fed. Reg. 79318, 79347 (Nov. 28, 1980)(01743-1767).

¹⁶⁴ *Id.* at 79348.

¹⁶⁵ *Id.* at 79348.

The States also argue that the actual risk range selected is not adequately protective. EPA concluded, though, that all levels of exposure within the risk range are protective of human health. *Id.* EPA has used 10^{-4} as an upper bound for establishing risk levels in the past, *see* 53 Fed. Reg. 51,394, 51,426 (1988), and “[m]any ARARs, which Congress specifically intended be used as cleanup standards at Superfund sites, are set at risk levels less stringent than 10^{-6} ,” 55 Fed. Reg. 8717 (1990). The States offer no evidence challenging EPA’s position that 10^{-4} represents a safe level of exposure, and in any event, we give EPA’s findings on this point significant deference. *See New York v. EPA*, 852 F.2d 574, 580 (D.C.Cir.1988), *cert. denied*, 489 U.S. 1065, 109 S.Ct. 1338, 103 L.Ed.2d 809 (1989).

The States also argue that EPA failed to justify the use of a range, instead of a single point. But EPA explained its decision to use a range. While “[t]he use of 10^{-6} expresses EPA’s preference for remedial actions that result in risks at the more protective end of the risk range,” 55 Fed. Reg. 8718 (1990), the Agency is also required to consider other factors in selecting an appropriate remedy. “Factors related to exposure, uncertainty and technical limitations may justify modifications of initial cleanup levels that are based on the 10^{-6} risk level.” *Id.* A flexible approach to developing remedial goals is justified by the multiple statutory mandates of CERCLA, so long as EPA meets the statutory requirement of protectiveness.

997 F.2d 1520, 1533.

The national policy on acceptable risk is based on an extended scientific evaluation and has withstood legal challenges.¹⁶⁶ The risk policy for human health water quality criteria was resolved in the NTR. The NTR and subsequent EPA guidance documents have consistently articulated a policy to accept human health water quality criteria protecting the general population at a risk level of 10^{-6} or 10^{-5} as long as higher exposed populations are protected to at least a level of 10^{-4} .¹⁶⁷ “Adoption of a 10^{-6} or 10^{-5} risk level, both of which States and authorized Tribes have chosen in adopting water quality standards to date, represents a generally acceptable risk management decision, and EPA intends to continue providing this flexibility to States and Tribes.”¹⁶⁸

A long line of EPA decisions have affirmed the existing risk policy in human health criteria approvals for states on the Great Lakes¹⁶⁹, the California Toxic Rule, 40 C.F.R. § 131.38, and the state of Oregon human health criteria. The 2011 Technical Support Document for the Oregon criteria unequivocally states:

¹⁶⁶ *See* Attachment A at 11-12.

¹⁶⁷ NTR at 60855; *see also*, EPA, 2000 Human Health Methodology at 1-12 (October 2000)(00104).

¹⁶⁸ EPA, 2000 Human Health Methodology at 2-6 (00112); *see also* Attachment A at 13-14.

¹⁶⁹ EPA, Final Water Quality Guidelines for the Great Lakes System, 60 Fed. Reg. 15366-01 (March 23, 1995) (01775-1907)

EPA has identified a risk level range of 1×10^{-6} (1:1,000,000) to 1×10^{-5} (1:100,000) to be an acceptable risk management goal for the general population....

EPA's 2000 Methodology states that criteria based on a 10^{-5} risk level are acceptable for the general population as long as States and authorized Tribes ensure that the risk to more highly exposed subgroups (sport fishers or subsistence fishers) does not exceed the 10^{-4} risk policy.¹⁷⁰

Under the proposed risk policy, compared to the current state risk policy, the general population consumption rate, results in criteria that will be protective to a level more stringent than 10^{-7} . The 100th percentile of tribal consumption will be protected to 10^{-6} . Ecology concluded that the mean consumption rate for the general population in Washington is 18.8 g/day including all fish.¹⁷¹ The effective rate for deriving human health water quality criteria is substantially less than this value, as it includes both fish that are store bought and anadromous fish that do not spend sufficient time in Washington waters to bio accumulate toxics. As such, the proposed criteria would protect the general population at a risk level of 10^{-8} , and median tribal consumption rates at a risk level of 10^{-6} .

Criteria based on the existing state risk policy would be fully protective of tribal consumption without this dramatic change in risk policy. If Ecology used 17.5 g/day as the consumption rate for the general population in Washington, at a risk level of 10^{-6} , the resulting criteria would be protective to a consumption rate of 175 g/day at a 10^{-5} risk level and for a consumption rate of 1,750 g/day at a risk of 10^{-4} . The Washington Office of Financial Management estimates that there are 104,000 American Indian and Alaska natives in Washington.¹⁷² If Ecology followed established guidance and science and applied a 10^{-6} risk level for the general population the resulting exposures at risk levels of 10^{-5} and 10^{-4} would not predict a single excess cancer risk for this population—a result that is more stringent than EPA guidance which calls for no excess cancer risk at the median consumption rate for high consuming populations at 10^{-4} .

ARCADIS, Summary of Health Risk Assessment Decisions in Environmental Regulations (March 6, 2015), Attachment A, explains in detail why tribal consumers would have the equivalent of a zero increased risk of cancer if Ecology complied with EPA guidance in setting criteria based on the general population consumption rate. The risk of cancer from all causes far outweighs the possible risk of cancer from exposure to chemicals in the environment. *Id.* at 2. To add some meaning to these risks, the excess cancer risk that may occur as a result of exposure to a carcinogen in the environment in Washington on an annual basis is 0.54% while the lifetime risk of cancer based on a risk level of 10^{-4} used to set water quality criteria is 0.00014%. *Id.* at 8-9. A 10^{-4} risk level is clearly an acceptable and protective upper bound risk level to use in deriving water quality criteria as there is no real increase in the overall risk of

¹⁷⁰ EPA, Technical Support Document for Action on the State of Oregon's New and Revised Human Health Water Quality Criteria and Associated Implementation Tools Submitted July 12 and 21, 2011, at 27 (October 17, 2011)(01908-2010).

¹⁷¹ Ecology, Fish Consumption Rate Technical Support Document Version 2.0, 40-44 (January 2013)(Ecology Publication No. 12-09-058)(05398-5591).

¹⁷² *Id.* at 18.

incurring cancer. This is especially true when comparing an **annual** risk to a risk level based on a **lifetime** exposure every day for 70 years. In theory only, a 10^{-4} risk level would predict one excess cancer in Washington. *Id.* at 2. This is only theoretical as risk managers across EPA and other federal programs have long considered this level of risk insignificant and, in fact, the absence of any real risk. *Id.* at 9-21. It is inexplicable why Ecology is proposing to ignore and in some sense misrepresent the best available science and policy in risk management.

The risk level proposed by Ecology far exceeds what is required by a principled consideration of environmental justice. This undoubtedly explains why EPA abandoned environmental justice as the basis for its demands on the state of Washington that it adopt EPA's preferred risk policy. In 2013 and 2014 Dennis McLerran made the improbable claims that "everyone deserves to be protected to the same level" and that " 10^{-6} is a baseline for environmental justice."¹⁷³ It is notable that there is virtually no mention of environmental justice in the EPA March 23, 2015 comment letter on Washington's proposed rule and in the Federal Register notice for EPA's own September 2015 proposed rule. This is not surprising since EPA guidance on environmental justice, including consideration of tribal consumption rates, in fact supports the rule proposed by Washington in January 2015.

In May 2015 EPA published formal guidance on considering environmental justice in agency actions, including rulemaking.¹⁷⁴ The guidance document does not reference and therefore implicitly endorses EPA's long-standing policy on the acceptable range of risk levels. The following discussion from the guidance document exemplifies how the agency will determine whether there is a disproportionate impact from an agency action:

It is important to note that the role of the analyst is to assess and present differences in anticipated impacts across population groups of concern to the decision-maker and the public. The determination of whether there is a potential disproportionate impact that may merit Agency action is ultimately a policy judgment informed by analysis, and is the responsibility of the decision-maker. These analyses will depend on the availability of the scientific and technical data. As noted in the *Draft Technical Guidance for Assessing Environmental Justice in Regulatory Analysis* (U.S. EPA 2013), examples of the type of information that may be useful to provide to decision-makers for considering whether or not effects are disproportionate include: the severity and nature of health consequences; the magnitude of the estimated differences in impacts between population groups; **mean or median exposures or risks to relevant population groups**; distributions of exposures or risk to relevant population groups; characterization of the uncertainty; and a discussion of factors that may make population groups more vulnerable.¹⁷⁵

¹⁷³ D. McLerran, Pers. Communication to NWPPA Members (April 9, 2013); *see also* K. Susewind, Email to D. Opalski (March 11, 2014)(00459-0461).

¹⁷⁴ EPA, Guidance on Considering Environmental Justice During the Development of Regulatory Actions (May 2015)(available at <http://www3.epa.gov/environmentaljustice/resources/policy>) (05991-6046).

¹⁷⁵ *Id.* at 6-7 (emphasis added) (06002-6003).

Thus, the EPA 2015 environmental justice guidance focuses on the mean or median consumption or exposure rate of a more highly exposed subpopulation in the same manner as the 2000 EPA guidance focuses on the range of acceptable risk levels.

EPA has consistently defended this range as protective of the entire population under the principles of environmental justice. This was addressed in the response to comments for the 1995 Final Water Quality Guidelines for the Great Lakes System where EPA approved the use of a one in one hundred thousand risk level:

Commentators argued that a 15 gram per day assumption in the methodology would not adequately protect populations that consume greater than this amount (e.g. low-income minority anglers and Native Americans). And that such an approach therefore would be inconsistent with Executive Order 12898 regarding environmental justice (February 16, 1994, 59 Fed. Reg. 7629). **EPA believes that the human health criteria methodology, including the fish consumption rate, will provide adequate health protection for the public, including more highly exposed sub-populations.** In carrying out our regulatory actions under a variety of statutory authorities, including the CWA, EPA has generally viewed an upper bound incremental cancer risk in the range of 10^{-4} to 10^{-6} as adequately protective of public health. As discussed above, the human health criteria methodology is based on a risk level of 10^{-5} . Therefore, if fish are contaminated at the level permitted by the criteria derived under the final Guidance, individuals eating up to 10 times (i.e., 150 grams per day) the assumed fish consumption rate would still be protected to 10^{-4} risk level.¹⁷⁶

In promulgating the California Toxics Rule in 2000 EPA specifically rejected several comments that the 10^{-6} to 10^{-4} risk policy offended notions of environmental justice.

EPA believes that this rule is consistent with the terms of the Executive Order (E.O.) on Environmental Justice. EPA rejects the notion that the rule is, in any respect, discriminatory against persons or populations because of their race, color, or national origin. The final rule establishes criteria that are designed to ensure protection of the public, including highly exposed populations. While some groups and individuals, including some low income and minority persons and populations, may face a greater risk of adverse health effects than the general population due to their particular fish consumption patterns, EPA believes that these groups will nonetheless receive a level of public health protection within the range that EPA has long considered to be appropriate in its environmental programs (e.g., 10^{-4} to 10^{-6} incremental cancer risk). **Obviously, as long as there is variability in fish consumption patterns among various segments of the population, it would be impossible for EPA to ensure that all groups would face identical risk from consuming fish. Therefore, EPA has sought to ensure that, after attainment of water quality criteria in ambient waters, no group is subject to increased cancer risks greater than the risk range that the EPA has long considered protective.** EPA disagrees that individuals who consume up to a pound of fish per day would face a 10^{-3} cancer risk. Given that

¹⁷⁶ EPA, Final Water Quality Guidelines for the Great Lakes System at 15 (emphasis added)(01789).

the basis of the criteria are a 6.5 gm/day assumption at a 10^{-6} risk level, individuals who consume a pound of fish per day would be protected within the established acceptable range of 10^{-4} to 10^{-6} , consistent throughout current EPA program office guidance and regulatory actions.¹⁷⁷

EPA engaged in extensive consultations and considerations of tribal concerns and treaty interests in developing the 2015 guidance. Trust responsibilities and treaty rights were specifically addressed at a meeting of the EPA National Environmental Justice Advisory Council in December 2001 in Seattle, Washington.¹⁷⁸ Treaty rights are also discussed in a 2002 EPA report on fish consumption and environmental justice.¹⁷⁹ The 2002 document had been part of the EPA “EJ” tool kit documents including the “Plan EJ 2014.”¹⁸⁰

In June 2015 EPA published final updated ambient water quality criteria for the protection of public health in accordance with section 304(a)(1) of the Clean Water Act.¹⁸¹ The risk-based criteria were updated based on the application of a 10^{-6} risk level to a general population consumption rate. EPA did not suggest that its risk management decision placed high consuming populations at risk and certainly did not consider whether there was any scientific basis for protecting those populations at a risk of 10^{-6} . The criteria are in fact based on the same understanding of the range of acceptable risk levels used in developing the NTR and the 2000 Human Health Criteria Guidance.¹⁸² EPA proclaimed, based on this approach, that its recommended criteria “are scientifically derived numeric values that EPA determines will generally protect aquatic life or human health from adverse effects of pollutants in ambient water.”¹⁸³

From the inception of rulemaking in early 2013 by Ecology through publication of EPA’s proposed rule in September 2015, EPA has taken a hardened position on two key factors—fish consumption rates and acceptable risk levels—and refused to engage in any discussion on the merits or basis for its demands. Ecology can and should choose a risk factor of 10^{-5} . There is no justification to stray from Ecology’s 2015 risk management decision based on EPA demands.

EPA declared their position on these issues with the regulated community in Washington at a meeting on April 9, 2013. That meeting took place in the offices of EPA Region 10 in Seattle, Washington and was attended by EPA Regional Administrator Dennis McLerran and Daniel Opalski, the manager of the Region 10 Office of Water and Watersheds, representatives of Northwest Pulp & Paper Association, the Association of Washington Business, the

¹⁷⁷ EPA, California Toxics Rule Response to Comments Report, CTR-002-005a (Dec. 1999) (emphasis added)(02311-3812).

¹⁷⁸ EPA, Meeting Summary of the Executive Council of the National Environmental Justice Council.

¹⁷⁹ EPA, Fish Consumption and Environmental Justice at 8 (“[t]he tribes have fought too hard for too long to let the salmon and their treaty rights to harvest salmon to go extinct”)(00291).

¹⁸⁰ EPA, Plan EJ 2014 Legal Tools (December 2011)(03813-3932).

¹⁸¹ EPA, Final Updated Ambient Water Quality Criteria for the Protection of Public Health, 80 Fed. Reg. 36986 (June 29, 2015)(04807-4810).

¹⁸² EPA, Human Health Ambient Water Quality Criteria: Draft 2014 Update, EPA-820-F-14-003 at 2 (May 2014)(01772-1774).

¹⁸³ EPA, Final Updated Ambient Water Quality Criteria at 36987.

Association of Washington Cities, the City of Everett, Weyerhaeuser and Inland Empire Paper Company. Mr. McLerran commenced the meeting by stating that the criteria in Washington should be based on a 175 grams per day (g/day) fish consumption rate and risk policy of one in one million (1×10^{-6} or 10^{-6}). Mr. McLerran explained that this was so because “everyone should be protected to the same level.”¹⁸⁴ Mr. McLerran further stated that there had to be regional, meaning EPA regional, consistency on the toxic criteria. Mr. McLerran further stated that he was unwilling to discuss these factors with the regulated community.

EPA has been equally opaque in its dealings with the state of Washington. Ecology presented the risk level policy issue to EPA Region 10 on numerous occasions over the past three years. The origins and basis for the one in one million risk policy were the subjects of several emails to EPA regional staff in January and February 2013.¹⁸⁵ We believe that EPA staff attended the February 8, 2013, and March 28, 2013 Ecology Policy Forum meetings where the current risk policy in Washington and EPA guidance on risk policy were discussed.¹⁸⁶ EPA staff never indicated in response to these emails or at the meetings that there has been any change in EPA policy—or any circumstances that require toxic criteria in Washington to vary from national guidance.

Ecology specifically raised the risk policy issue to EPA national and regional staff at a meeting on March 20, 2013. The regional staff included Lisa Macchio, Mary Lou Soscia, Matthew Szelag, Lon Kissinger and Angela Chung.¹⁸⁷ The following questions and answers were recorded regarding EPA guidance on risk policy:

Question: Does EPA agree that [the Washington] risk level applies to [the] general population?

Angela Chung: EPA can’t answer that now.

Question: Would EPA disapprove a standard based on 10^{-6} for general population as long as 10^{-4} is max for highly exposed?

Angela Chung: EPA can’t answer that now.¹⁸⁸

Ecology raised this issue with EPA staff again in emails and meetings in October and November 2013.¹⁸⁹ At these meetings between agency staff, the risk policy was listed as a topic for discussion. Ecology also presented its range of policy options at a public meeting on November 6, 2013.¹⁹⁰ EPA staff were present for the meeting but made no comment on national

¹⁸⁴ D. McLerran, Pers. Communication to NWPPA Members (April 9, 2013).

¹⁸⁵ C. Niemi, Email to L. Kissinger (January 2, 2013)(03933-3934).

¹⁸⁶ See Attendance Lists for Meetings on June 24, 2013, November 6, 2013, and July 2014 (03935-3943).

¹⁸⁷ C. Niemi, Handwritten Notes (March 20, 2013)(“Dennis [EPA Region 10 Administrator] thinks the OR outcome was the right outcome, regionally wants to explore that position.”)(00455-0458).

¹⁸⁸ *Id.*

¹⁸⁹ M. Gildersleeve, Email to A. Chung and M. Szelag (October 1, 2013)(03944).

¹⁹⁰ Ecology, Preliminary Draft – HHC Tools Summary, Water Quality Standards Rule Making, Human Health Criteria, Summary, (November 6, 2013)(03945).

guidance for setting risk policy and there is no record of any comments from EPA regarding the policy options presented at this meeting. In meeting after meeting EPA staff remained silent on this issue. This included two public meetings held in 2013 and 2014, at seven delegate table meetings in 2012, 2013 and 2014, and at five Policy Forum meetings in 2013.

The issue was most pointedly raised in a meeting with EPA regional staff on March 11, 2014. After months of silence, Mr. McLerran apparently stated “175 grams a day at 10^{-6} is a baseline for environmental justice.”¹⁹¹ Mr. McLerran reportedly represented that this assertion was based on EPA guidance. In a follow-up email, Ecology requested that Region 10 verify the existence of that guidance. Ecology specifically asked:

I have a copy of the document: “EPA Policy on Environmental Justice for Tribes and Indigenous Peoples.” It is a pre-decisional working draft dated November 14, 2012.

Is that the document Dennis referred to?

...

As we discussed, tribal members, and anyone eating high amounts of fish, are at higher risk. They are at a risk exactly proportionate to the consumption rate and will be at the same ratio (proportion) regardless of where the rule lands. Interpreting this section of the policy to mean that they can't be at a higher risk would frustrate the entire system the HHC equations are based on and make it impossible to comply. **Is there a statement somewhere that one in a million risk rate is the baseline to establish environment justice?**¹⁹²

Mr. Opalski responded to this email and confirmed that there is no such statement. In an email dated March 11, 2014, he conceded: “Regarding the environmental justice concern, you are right that there isn't anything that will/does call out particular risk levels.”¹⁹³

EPA Region 10 provided an additional comment on the Washington proposal in a letter dated July 1, 2014. This letter was in response to two letters from Washington State Senator Doug Ericksen. Sen. Ericksen, in his first letter on April 3, 2014, asked the EPA Regional Administrator, “I specifically would like to know what your agency considers to be an appropriate cancer risk level for the state of Washington.”¹⁹⁴ Three weeks later Mr. McLerran responded with a letter that was not responsive to this question.¹⁹⁵ Sen. Ericksen sent a second letter to Mr. McLerran on May 28, 2014, pointing out that “I asked a specific question relating to a very important issue that will affect Washington's economy and public health, but you did not

¹⁹¹ K. Susewind, Email to D. Opalski (March 11, 2014)(00459-0461).

¹⁹² *Id.* (emphasis added).

¹⁹³ D. Opalski, Email to K. Susewind (March 11, 2014)(03946).

¹⁹⁴ D. Ericksen, Letter to D. McLerran (April 3, 2014)(03947-3948).

¹⁹⁵ D. McLerran, Letter to D. Ericksen (April 24, 2014)(03949).

provide me with a specific answer.”¹⁹⁶ Sen. Ericksen requested an answer to his question and rephrased it as follows:

- (1) Have you or your staff indicated to the Washington Department of Ecology that there is a threshold cancer risk level that must be proposed for the state’s criteria to receive approval?
- (2) Have you or your staff indicated to Ecology that a cancer risk level of 10^{-6} is required or that it is a level you want the state to propose?
- (3) Have you or your staff provided any specific directives to Ecology outlining what you will accept for a cancer risk level for Washington?¹⁹⁷

Mr. McLerran, in a letter dated July 1, 2014, responded that certain “groups could be provided less protection than they have now” if Washington uses a one in one hundred thousand risk policy.¹⁹⁸ There is no merit to this contention where the state was proposing to increase the consumption rates protected within the long accepted range of insignificant risk at 10^{-4} from 650 grams per day under the National Toxics Rule (NTR) to 1750 grams per day under the draft criteria and where the state was proposing criteria that would have been no less stringent than the current NTR criteria.

By the summer of 2014 it was clear that EPA was struggling to find some post-hoc rationalization for its demands. In some instances EPA staff would abandon any pretense of what is required under the CWA and simply assert its policy preferences are appropriate because “Dennis is concerned” or “Dennis feels.”¹⁹⁹ At other times EPA would assert grounds for its demands that later disappeared. In March and July 2014, EPA claimed that its preferred fish consumption rate and risk level was required as a matter of environmental justice. This argument is notably absent from both the EPA comment letter on the Ecology proposed rule and the Federal Register explanation for the basis of the EPA proposed rule.²⁰⁰

On March 23, 2015, EPA submitted a formal comment letter on the Ecology proposed rule. The letter was signed by Mr. Opalski, who participated in many of the meetings and telephone conversations and emails discussed above. EPA’s letter asserted an entirely new basis for EPA’s demands, stating that a one in one million risk level applied to tribal consumption rates is a “compromise position” of Washington tribes.²⁰¹ NWPPA submitted a Freedom of Information Act request to EPA for any documents that reflect the claim in the EPA comment letter. Matthew Szelag and Andre Szalay, EPA Region 10 staff, initially responded in a telephone conference that there were no public records to support the statement by EPA. EPA nonetheless produced twenty-six pages of heavily redacted emails and publicly available documents, not one of which includes a communication from or on behalf of any tribe stating

¹⁹⁶ D. Ericksen, Letter to D. McLerran (May 28, 2014)(03950-3951).

¹⁹⁷ *Id.*

¹⁹⁸ D. McLerran Letter to D. Ericksen (July 1, 2014)(03952-3953).

¹⁹⁹ C. Niemi, Handwritten Notes (00455-8) and A. Chung, Pers. Communication, NWPPA Annual Meeting (June 6, 2013).

²⁰⁰ D. Opalski, Letter to C. Niemi EPA Comment on Ecology Draft Rule (March 23, 2015)(07230-7249).

²⁰¹ *Id.*

that a one in one million risk level is a “compromise position of the tribes.”²⁰² In any event, even if it were a compromise position of the tribes, this is not a basis under the CWA for EPA to depart from long-standing CWA policies, procedures, and requirements to mandate its preferred position on a state as it develops its criteria.

The March 23, 2015, comment letter is also noteworthy as being the first time EPA asserted that tribal treaty rights require the application of a particular risk level to tribal consumption rates. EPA had never before cited this rationale in prior meetings with the regulated community or in communications or meetings EPA had with Ecology staff. Having asserted this claim, however, EPA has consistently refused to explain how a treaty right to take fish dictates any particular risk management decision. This question was specifically posed to EPA by Ecology on July 15, 2015:

Does EPA have an OGC [Office of General Counsel] or other legal opinion or rationale on how risk level and treaty tribal rights are connected, and why 10-6 is looked upon by EPA as fulfilling the rights, and 10-5 is not? Could you send me a copy of the opinion/rationale document?²⁰³

This becomes one of the central questions in the EPA demand that Washington derive criteria using a high consumption rate and 10⁻⁶ risk level—what exactly is the legal and scientific connection between a tribal treaty right and the use of a particular risk level as a factor in the equation that derives water quality criteria. Consistent with its now long-standing refusal to provide a legal, scientific and policy basis for its demands or engage in any meaningful public process, the EPA general counsel in an internal email directed EPA Region 10 to respond to Ecology by referring Ecology back to EPA’s March 23, 2015 comment letter and EPA’s February 2, 2015 decision to disapprove in part human health water criteria developed by the State of Maine.²⁰⁴ It is not surprising that Ecology’s subsequent July 2015 draft responses to comments on the proposed Washington State rule concluded that there is no legal basis for requiring criteria based on tribal consumption rates using a 10⁻⁶ risk level.²⁰⁵

Ecology has not provided an adequate basis in the record for its decision to change course on this issue.

Comment No. 9: Ecology should ensure that implementation of the criteria will be based on approved test methods in effect at the time of rule adoption.

The preliminary cost benefit analysis is limited in scope due to absence of data that effluent and receiving waters are above the proposed criteria. This is due in large part to the fact the criteria are in many cases far below the detection levels in EPA approved test methods. Ecology should acknowledge in response to these comments that test methods approved after the

²⁰² M. Szelag, Email to J. Edgell (July 14, 2015)(06440-2); K. Brown, Email to B. Duncan (June 5, 2015)(06466-6467); M. Szelag, Email to P. Ford (March 17, 2015)(06464-6465), EPA FOIA Response, EPA-R10-2015-008998 (August 2015).

²⁰³ *Id.*, M. Szelag, Email (06442).

²⁰⁴ *Id.*, M. Szelag, Email (06440).

²⁰⁵ Ecology, Draft Responses to Comments on Proposed State Rule (July 2015) (04758).

adoption of a final rule cannot be used for the human health criteria until they are approved through an amendment to the state water quality standards.

The state water quality standards currently limit test methods for numeric criteria to EPA approved methods. This is expressly provided in WAC 173-201A-260(3)(h): “The analytical methods for these numeric criteria must be in accordance with the ‘Guidelines Establishing Test Procedures for the Analysis of Pollutants.’ (40 CFR Part 136)...” The Clean Water Act regulations, at 40 CFR Part 136, require the use of approved test methods for compliance monitoring in NPDES permits. The Pollution Control Hearings Board, in *Puget Soundkeeper Alliance v. Ecology and Seattle Iron and Metals*, PCHB No. 13-137c, Final Findings of Fact, Conclusion of Law and Order (July 23, 2015), held that Ecology is limited to use of approved test methods for NPDES permit compliance monitoring.

Under Washington law Ecology is further constrained to use only those test methods that are approved at the time the water quality standards are adopted. In a parallel provision of the state water quality standards Ecology has concluded that it can only use EPA guidance on deriving numeric limits that was in effect at the time of rule adoption. That provision, WAC 173-201A-240(4), states that “USEPA Quality Criteria for Water, 1986, as revised shall be used in the interpretation of values listed in subsection (3) of this section.” Ecology has specifically interpreted this provision to mean, in the case of copper criteria, that it cannot use the biotic ligand model (BLM) to derive permit limits since the BLM was not part of the EPA guidance document at the time Ecology adopt its copper criteria. This interpretation was affirmed by the PCHB in *Copper Development Association v. Ecology*, PCHB 10-142, Order of Summary Judgment (December 12, 2011).

The same rationale should apply to approved test methods. This is a critical issue to ensure that no test method will be applicable to the new and significantly more stringent human health criteria without a full understanding of how the criteria will be implemented relying on the new test methods, including the costs and benefits of the proposed changes.

Comment No. 10: Submitting the rule package for EPA approval containing both numeric criteria and implementation tools is appropriate under the law and consistent with Ecology’s prior commitments.

Ecology has reiterated its intent to submit a rule package containing both numeric and narrative criteria and implementation tools for water permits on numerous occasions in the 2015 and 2016 public processes. It is extremely helpful for all parties to see a path toward implementation as the rule proposal moves through the state and federal approval processes. Under no circumstances should the rule proposal components be divided up and moved separately through the federal approval process. Appropriate rule language should be included to ensure all components remain together similar to “the numeric criteria in Table 240 for human health protection become effective when the water quality standards implementation policies in revised WAC 173-201A-420 *Variances*, -460 *Intake Credits*, and -510(4) *General Allowance for Compliance Schedule*, are approved by EPA.” If Ecology’s 2016 proposal is not approved by EPA, then Ecology should still immediately adopt these state implementation policies.

Comment No. 11: The rule implementation plan must take into account evolution of the regulatory framework over time.

Ecology's support documents should be designed to implement the proposal considering the evolution over time of regulations and laws and science. Nothing will remain static as this rule proposal is implemented across Washington. We provide a list of factors that will change over time and no one issue is more important than others. First, analytical test methodologies will likely advance and have lower quantification levels leading to more stringent water quality based effluent limits as allowed for by WAC 173-201A-260(3)(h). Second, water permit holders will likely change as populations shift and manufacturing changes. Third, Section 303(d) lists of waters impaired by pollutants under the Clean Water Act will likely change. Fourth, additional large and complex TMDLs will need to be developed in populous areas of Washington. Fifth, applications and drafting water quality permits will become more complex and require additional Ecology staff-time and scientific support activities. Sixth, large-scale treatment technology is likely to advance beyond 2016 technology limitations. Seventh, case law and also legal precedents from the Pollution Control Hearings Board (PCHB) will change, for example, the practical implications of PCHB No. 11-184 for future water permits. Finally, when all is said and done, the situation will likely be chaotic and factors surrounding water permitting will not evolve at the same pace.

As a result the questions for Ecology are at what pace will the evolution in each sector occur; and, how will Ecology respond to the challenge of developing appropriate implementation policies? We encourage Ecology to build a plan based on realistic assessments of available data, implementation tools and science while building in flexibility to meet these evolving challenges.

Comment No.12: Preliminary Cost-Benefit and Least-Burdensome Alternative Analyses are incomplete in key areas and fail to adequately quantify the true costs of the proposed rule.

Ecology's Preliminary Cost-Benefit Analysis inadequately addresses the complex and evolving nature of regulatory costs of the more stringent 2016 proposal which will be phased in over time. The Analysis fails to quantify all regulatory costs across sectors for "prospectively impacted entities." While the February 2016 Analysis is an improvement over the 2015 Analysis—it still fails to identify and quantify all regulatory cost drivers for the private and public sectors and provide information to the public. The analysis should address future federal actions on analytical test methodologies; future PCHB decisions; an increased number of impaired water listings under Section 303(d) of the CWA; Ecology staff costs for preparation and implementation of additional complex TMDLs; incrementally higher remediation costs as the complete program is implemented; and, lost economic opportunities for the public due to increased compliance costs and regulatory uncertainty.

Comment No. 13: Intake credits are necessary and appropriate implementation tools for the rule proposal in WAC 173-201A-460 and allowed by the Clean Water Act.

Intake credits are essential tools for implementing the rule proposal in water permits for point source dischargers and the proposal in WAC 173-201A-460 should be adopted along with numeric criteria. The revised 2016 intake credit rule language is an improvement over the 2015 proposed language as it expands on the 2015 concept and provides additional details on the

intent and functions of intake credits. While an intake credit will not be available in all situations to a discharger, nevertheless it can be a useful tool for permitting when a facility is found not to have the reasonable potential to cause or contribute to an exceedance of the applicable water quality standard but the pollutant is found in intake water.

Comment No. 14: Variances are necessary and appropriate implementation tools for the rule proposal in WAC 173-201A-420 and allowed by the Clean Water Act.

Variances are essential tools for implementing the rule proposal and the proposed language in WAC 173-201A-420 should be adopted along with numeric criteria. A variance is an undesirable but likely necessary implementation tool for the human health rule package. It is a serious tool that modifies a water quality standard and undergoes rigorous evaluation by both the state and EPA and includes public comment. Regulated entities will absolutely require the option of a variance to provide regulatory certainty and a path forward to compliance in certain water permitting situations.

Comment No. 15: Ecology must carefully consider any additional changes to variance rule language and the rule implementation plan to ensure successful implementation of variances for public and private entities.

The variances application process should be a defined path with clear expectations for both the regulated entities and the public. Ecology must develop and disseminate information to assist in applying for a variance with defined steps and timelines to reduce regulatory uncertainty and build trust with the public.

Recent federal guidance on variances should be incorporated into Ecology's rules. Any changes to the proposed variance language should be carefully analyzed to ensure a fair and balanced process with checks and balances. A variance should not be a regulatory roadblock to achieving water quality improvements rather it should be a path to compliance. Ecology should assess whether decisions to initially grant a variance can be adopted through RCW 34.05.350 *Emergency Rule* procedures to allow compliance in specific water permitting situations rather than wait for 12 to 24 months in a typical rule process.

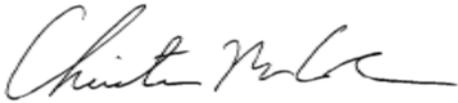
Comment No. 16: Water body and multidischarger variance language is essential and must be retained in WAC 173-201A-420(2).

Water body specific and multidischarger variances are essential types of variances for implementing the rule proposal and the proposal in WAC 173-201A-420(2) should be adopted along with numeric criteria. Ecology must adopt and implement these important types of variances. Ecology should start planning and implementation work for water body and multidischarger variances to mitigate regulatory compliance costs and also provide certainty to regulated entities and the public. A water body variance could establish a framework for improving water quality in a geographical area. It could provide benefits beyond initial compliance with standards as the variance overlay could attract further study, evaluation, and actions by all sectors associated with the waterbody.

Comment No. 17: Compliance schedule language is essential and must be retained in WAC 173-201A-510(4).

Compliance schedule language is essential for implementing the rule proposal and the proposal in WAC 173-201A-510(4) and should be adopted along with numeric criteria. The continued availability and usefulness of compliance schedules is a key part of implementing the rule proposal. Specifically, the proposal acknowledges and allows for additional time to come into compliance with applicable standards in certain circumstances in WAC 173-201A-510(4) (d) and (e). Ecology must adopt these concepts as they provide regulatory certainty for dischargers while working towards improved water quality.

Respectfully submitted this 22nd day of April, 2016.



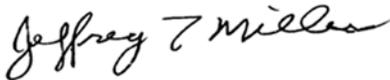
Christian McCabe
Executive Director
Northwest Pulp & Paper Association



Frank E. Holmes
Director, Northwest Region
Western States Petroleum Association



Dallin Brooks
Executive Director
Western Wood Preservers Institute



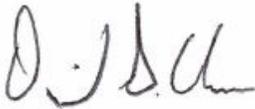
Jeffrey T. Miller
President & Executive Director
Treated Wood Council



Gary Chandler
Vice President of Government Affairs
Association of Washington Business



Steve Shestak
Director, Environment
Environment, Health & Safety
The Boeing Company



David Hulse
Plant Manager
Alcoa Wenatchee Works



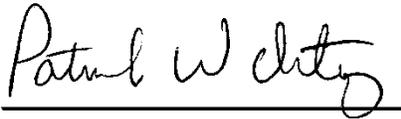
Barry Hullett
President
Intalco Aluminum Corporation



Kevin Rasler
President & General Manager
Inland Empire Paper Company



Bernard P. Leber, Jr.
Environmental Manager
Kaiser Aluminum Washington, LLC



Patrick W. Ortiz
Director, Engineering, Environmental and Safety
KapStone Kraft Paper Corporation



Paul F. Perlwitz
Environmental Manager
Nippon Paper Industries USA



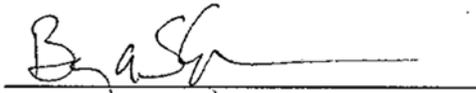
Patrick Jablonski, PE
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Laura Verity
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Ponderay Newsprint Company



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Ken Johnson
Corporate Environmental Manager
The Weyerhaeuser Company



Kevin C. Scott
Engineering & Environmental Manager
Port Townsend Paper Corporation

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