

ID	Entity	To	From	Date	Comment	Response
1	Esvelt Environmental Engineering	Brian Crossley	Larry A. Esvelt PhD PE BCEE	9/23/2008	<ul style="list-style-type: none"> • Exposure Factors: The Tribal Specific Exposure Factors (EFs) appear to be unrealistic. Since EFs are intended to help predict long term health risks (e.g., 70 years of continuous exposure). <ul style="list-style-type: none"> ○ Water consumption EF of 4 liters per day appears to be excessive (especially on a year-round basis). More consideration should be given to the actual water consumption rate, especially for surface waters (e.g., 90 % tile) for the Spokane Tribal population. ○ Consumption of approximately one lb of fish flesh per day appears to be unrealistic (especially in light of the demise of the Columbia River salmon runs that effectively halted primary dependence on this source of protein for the native population). More consideration should be given to the actual EF (e.g., 90 % tile) for the Spokane Tribal population. <p>This applies to the table of EFs in the cover letter, and also to provisions in paragraphs 6.(6) and 6.(7).</p>	<p>Water consumption of 4 L/d reflects the traditional active outdoor lifestyle in an arid climate, including 1L/d to rehydrate after daily sweatlodge use.</p> <p>Contemporary ingestion rates for any parameter means that no return to higher rates would be safe, thus locking people into suppressed lifestyles.</p> <p>Any decision to not protect the top 10% of users is a policy call outside the scope of these technical comments.</p> <p>The fish consumption rate reflects traditional rates. A policy determination to use current fish stock levels to derive a fish consumption rate is not the usual approach, since that could undermine efforts to continue to recover fish numbers.</p>
2	Esvelt Environmental Engin	Brian Crossley	Larry A. Esvelt PhD PE	9/23/2008	<ul style="list-style-type: none"> • Table 1. Water Quality Criteria for Toxic Pollutants has a duplicate listing for compounds 4,4'-DDE through Isophorone. 	<p>The first set of 4,4'-DDE through Isophorone on revised page 17, should have appeared as revised (strike-through). This error has been rectified and only the single set of 4,4'-DDE through Isophorone appears in the revised</p>

	engineering		BCEE			regulation.
3	Esvelt Environmental Engineering	Brian Crossley	Larry A. Esvelt PhD PE BCEE	9/23/2008	<ul style="list-style-type: none"> • Table 1. <ul style="list-style-type: none"> ○ Ammonia limits should be mg/l (not µg/l). <p>Are the concentrations for arsenic (As) intended to be in µg/l, or should they be in mg/l in columns 5 and 6? These values are more than a couple of orders of magnitude below detection limits.</p> <ul style="list-style-type: none"> ○ It appears that 0.00E+00 for Chloride under column 5 is an error and should be deleted. ○ The criteria for “PCB Total” in columns 5 and 6 does not appear to be practical from an analytical reliability standpoint. Replication of analytical testing results have been shown to have excessive variations. MDL for various congeners of PCBs have not been shown to be consistent. <p>In addition the carcinogenicity of various congeners of PCBs varies widely, with the heavier congeners (e.g., Tetra through Deca CBs) much more carcinogenic than the lighter congeners (e.g., Mono through Tri CBs). The limitation on total PCBs (presumed to be the total of the concentration all congeners) should be congener, or at least congener range, specific.</p>	<p>The limits for ammonia were originally expressed in mg/L. The Tribe has revised these limits to be expressed in ug/L.</p> <p>The units for arsenic are correct. The TSWQS are based on incremental risk above natural background. Instances in which a substance is limited by modern detection limits, means that measurable quantities in excess of natural background, exceed the TSWQS.</p> <p>This has been revised.</p> <p>The units are correct. The TSWQS are based on incremental risk above natural background. PCB Total being anthropogenic means that natural background for this substance is zero. Instances in which a substance is limited by modern detection limits, means that measurable quantities in excess of natural background, exceed the TSWQS.</p> <p>The DNR realizes that the carcinogenic toxicity varies as described; however, from a practical standpoint, the standards are currently method-limited.</p>

3	Esvelt Envir onme ntal Engin eering	Brian Crossley	Larry A. Esvelt PhD PE BCEE	9/23/ 2008	<ul style="list-style-type: none"> The limitation on Total PCBs is much lower than that included in EPA recommended limits. Presumably this may have occurred due to the much higher Specific Exposure Factors assumed for the Spokane Tribal standards. As discussed above, these higher EFs appear to be excessive in light of their intended use to be for continuous application for an exposure of 70 years at the limitation level. 	Commented noted. See response to comment No. 1.
4	Esvelt Envir onme ntal Engin eering	Brian Crossley	Larry A. Esvelt PhD PE BCEE	9/23/ 2008	<ul style="list-style-type: none"> The limitations on other toxicants have apparently been lowered also, due to the increased EFs assumed for the Spokane Tribal members. 	Commented noted. See Response to Comment No. 1.

5	Heller Ehrman, LLP	Brian Crossley	Lincoln C. Loehr	9/25/2008	<p>The very substantial decrease in the human health related water quality criteria presents a desired scenario that simply can never be met. The Tribe should consider performing a use attainability analysis to determine what is feasible and acceptable. The human health criteria have been reduced to represent a 1 in a million hypothetical chance that an individual consuming 865 grams of fish a day and 4 liters of water a day for a lifetime, might get cancer, or might exceed a hazard index of 1. (See, Section 6.(4), (5), (6), and (7)) In implementation, if there is more than one trace contaminant present, not just in the water but in other media and other exposure pathways, then the criteria are further reduced such that the cumulative effect of all trace contaminants will not add more than a one in a million life time added cancer risk. (See Section 1.(4)(d))</p> <p>The background groundwater arsenic concentration in the state (based on the upper 90th percentile level) is 5 ug/l.¹ The upper 90th percentile value for groundwater arsenic on or near the reservation is 4.5 ug/l.² The federal</p>	<p>The Tribe strongly disagrees with the statement “The very substantial decrease in the human health related water quality criteria presents a desired scenario that simply can never be met.”</p> <p>A Use Attainability Analysis is appropriate where a Tribe or State is changing a designated use. <i>See</i> 40 CFR § 131.10. The Tribe is <u>not</u>, in these updated Water Quality Standards, changing any designated uses.</p> <p>The Tribe is taking into consideration new studies, which indicate that the current standards are not protective enough for subsistence use by current and future Tribal members. That being said, the Tribe changed certain numeric criteria to reflect the new study findings in these updated Water Quality Standards.</p>
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¹ See, Model Toxics Control Act Method A groundwater cleanup level for arsenic in table 720-1 of WAC 173-340-900.

² See, USGS arsenic groundwater data attached.

				<p>drinking water standard for arsenic is 10 ug/l under the Safe Drinking Water Act. Typical natural arsenic concentrations in surface waters throughout the state are in the range of 0.2 to 1.0 ug/l.³ The arsenic human health standards in the proposed rule revisions are set at 0.000951 ug/l (to protect for both drinking the water and consuming organisms that live in the water) and at 0.00105 ug/l (to protect from consuming the organisms that live in the water). The following table illustrates these differences.</p> <table> <tr> <td>10 ug/l</td> <td>Drinking water standard</td> </tr> <tr> <td>5 ug/l</td> <td>90th percentile groundwater level in Washington State</td> </tr> <tr> <td>4.5 ug/l</td> <td>90th percentile groundwater on or near Spokane reservation.</td> </tr> <tr> <td>0.2 to 1 ug/l</td> <td>typical natural surface water arsenic concentrations</td> </tr> <tr> <td>0.00105 ug/l</td> <td>proposed standard for organisms only</td> </tr> <tr> <td>0.000951 ug/l</td> <td>proposed standard for drinking water and organisms</td> </tr> </table> <p>The drinking water standard, background</p>	10 ug/l	Drinking water standard	5 ug/l	90 th percentile groundwater level in Washington State	4.5 ug/l	90 th percentile groundwater on or near Spokane reservation.	0.2 to 1 ug/l	typical natural surface water arsenic concentrations	0.00105 ug/l	proposed standard for organisms only	0.000951 ug/l	proposed standard for drinking water and organisms	<p>The revised standards, are based on incremental or excess risk above natural background. See Response to Comment No. 3</p> <p>Background concentrations of arsenic, or other substances, measured in groundwater have no bearing on the proposed surface water quality standards.</p>
10 ug/l	Drinking water standard																
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³ Johnson and Golding, 2002. Results and Recommendations from Monitoring Arsenic Levels in 303(d) Listed Rivers in Washington. Washington Department of Ecology. Pub. No. 02-03-045.

				<p>groundwater concentrations and surface water concentrations shown above are for total arsenic. The arsenic human health standards are for inorganic arsenic. Most of the arsenic present in ground and surface water will be inorganic arsenic. The amount of inorganic arsenic present naturally in groundwater and surface waters will be substantially greater than the impossibly low proposed standard. Since this one parameter, by itself, will result in a greater than one in a million added cancer risk, the criteria for everything else essentially goes to zero, and even if zero for everything else was attainable, the desired one in a million risk level would be unattainable.</p> <p>I understand the difference between a voluntarily assumed risk and an imposed risk, and I do not mean to be insensitive to the legitimate concerns about imposed risks. However, voluntarily assumed risks can provide some meaningful context, and I suspect that individuals are not aware of the extent of voluntarily assumed risks they are currently accepting just around water and fish consumption.</p> <p>Consider arsenic. The groundwater routinely consumed by members of the Spokane Tribe is probably about a thousand times higher in arsenic than the proposed standards. The</p>	<p>Again, since arsenic is a naturally occurring element, the proposed standard for arsenic will be measured in excess of natural background.</p> <p>Comment noted.</p>
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				<p>surface waters that the fish live in will also be about a thousand times higher in arsenic than the proposed standards. The same is true throughout Washington State.</p> <p>Now consider carcinogenic PAHs. Fish do not bioaccumulate PAHs because they metabolize them. (EPA's criteria and the Tribe's proposed standards are incorrectly based on the assumption that PAHs do bioaccumulate in fish tissue.) However, an unidentified percentage of the fish caught are smoke cured and consumed later, and smoke curing results in highly elevated PAHs and associated risks, which depending on the consumption rate, may provide a risk as much as ten thousand times higher than the proposed standards. Other methods of cooking fish such as grilling, barbecuing, or cooking over an open fire or coals, may also introduce combustion PAHs. (Similar PAH risks may also occur with cooking or curing methods used on other products as well.)</p> <p>Consider the risk of other protein sources and the risk of risk avoidance. Consuming fish is highly beneficial, especially compared to a red meat diet. What are the risks of a high red meat diet? There are high cardiovascular and cancer risks associated with a red meat diet. The risks of a high red meat diet may be</p>	<p>Comment noted. See discussion above. The numerical standards are derived following EPA protocols. The Tribe shares your concern with risk associated with fish preparation; however, preparation techniques as are beyond the scope of these standards.</p>
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				<p>somewhat different for the subsistence consumer than for the grocery store consumer, and I do not have an idea how different they may be. However, should someone decide to avoid eating fish out of a concern for the risks, they could default to much greater risks by switching to a red meat protein source.</p> <p>In summary, the appropriateness of a hypothetical one in a million risk level is something that warrants reconsideration. How many subsistence level consumers are there who consume at the levels used in the proposed standards? If 1,000, then the Tribe is setting a risk level based on one additional cancer per thousand generations. If 100, then the risk level becomes one additional cancer per ten thousand generations.</p>	<p>The Tribe has the primary authority to determine the appropriate limits to pollutants that will protect the human health and welfare of residents within the Reservation. <i>See</i> Clean Water Act § 303(c)(2). The Tribe has taken into consideration recent studies and, consistent with long-standing Tribal policy, is setting its Water Quality Standards to protect current and future Reservation residents that use the waters of the Reservation for subsistence and cultural purposes.</p>
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6	Heller Ehrman, LLP	Brian Crossley	Lincoln C. Loehr	9/25/2008	<p><u>Section 1.(4)(c)</u> notes that,</p> <p>(c) Where multiple criteria for the same water quality parameter are assigned to a water body to protect different uses, the most stringent criteria for each parameter is to be applied.</p> <p>How do you apply the different criteria given that acute, chronic, and human health criteria have significantly different duration of exposure assumptions? Acute criteria are based on a 1 hour exposure, chronic criteria on a 4 day exposure, and human health criteria based on much longer exposures, combining both the life time exposures of organisms that will be consumed, and lifetime exposures for the human who consumes the organisms.</p> <p>For the human health criteria in particular, evaluation needs to be based on a long term averaging.</p>	<p>Regulation of surface waters begins with a comparison of standards to samples that represent water at an instant in time. As stated, the most stringent criteria (numerical standard) is applied. Using this approach ensures that the Tribe is aware of surface water quality problems and enables staging actions to ensure that these standards are not exceeded for durations that could cause a concern.</p> <p>The approach you promote is retrospective and is inconsistent with the goals of monitoring surface water.</p>
7	Heller Ehrman, LLP	Brian Crossley	Lincoln C. Loehr	9/25/2008	<p><u>Section 1.(4)(d)</u> notes that:</p> <p>(d) Where multiple contaminants of concern have been identified or where multiple media has been contaminated, or where more than one exposure pathway has been identified, water</p>	

				<p>quality standards shall be determined using the cumulative risk assessment approach and definitions described in the Tribal Cleanup Law.</p> <p>There is an implication here, and also on page 3 of the cover letter accompanying the proposed revisions, that because of multiple exposure pathways, and multiple contaminants, that the individual toxics criteria must be driven lower. Because the surface water (and groundwater) inorganic arsenic levels will naturally be much higher than the proposed 0.000951 ug/l range, perhaps as much as a thousand times higher, essentially the criteria for all the other parameters becomes effectively zero.</p> <p>See, Model Toxics Control Act Method A groundwater cleanup level for arsenic in table 720-1 of WAC 173-340-900.</p> <p>² See, USGS arsenic groundwater data attached.</p> <p>³ Johnson and Golding, 2002. Results and Recommendations from Monitoring Arsenic Levels in 303(d) Listed Rivers in Washington. Washington Department of Ecology. Pub. No. 02-03-045.</p>	<p>See the portion or portions of Response to Comment No. 3 pertaining to incremental risk.</p>
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8	Heller Ehrman, LLP	Brian Crossley	Lincoln C. Loehr	9/25/2008	<p><u>Section 3.(2)</u> establishes that:</p> <p>(2) Whenever the natural conditions of any specific surface waters of the Reservation are of a lower quality than the criteria assigned to waters typical of that class, the Department may determine that the natural conditions shall constitute the water quality criteria.</p> <p>How will this determination be made?</p>	The Tribe is currently characterizing background conditions for waters of the reservation.
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9	Heller Ehrman, LLP	Brian Crossley	Lincoln C. Loehr	9/25/2008	<p><u>Section 6.9</u> notes that:</p> <p>Site-specific numerical criteria as described in the Tribal Cleanup Law must be developed in the event these assumptions are incorrect. If natural background conditions exceed the risk criteria defined in this section, then the natural background conditions are the numerical standard.</p> <p>Perhaps this section is the route to solve the arsenic dilemma. However, it may not be that simple. Regarding natural conditions as referred to in the above two sections, EPA has a memo regarding establishing site specific aquatic life criteria equal to natural background.⁴ The memo sets EPA policy for aquatic life use criteria, and says that it does not apply to human health uses. The memo then states:</p> <p>“For human health uses, where the natural background concentration is documented, this new information should result in, at a minimum, a re-evaluation of the human health use</p>	<p>The memo is entitled “Establishing Site-Specific Criteria for Aquatic Life Criteria Equal to Natural Background.” The first sentence of the excerpted paragraph begins with: “This policy does not apply to human health uses.” The Tribe is well aware of EPA Policy including this memo.</p> <p>The Tribe is well aware of EPA guidance as well as your concerns. However, the presumption that natural background for arsenic is exceeded reservation-wide is currently unfounded. The Tribe is pursuing characterization of background conditions for various</p>
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⁴ See, <http://www.epa.gov/waterscience/criteria/library/naturalback.pdf>

				<p>designation. Where the new background information documents that the natural background concentration does not support a human health use previously believed attained, it may be prudent for the State or Tribe to change the human health use to one the natural background concentration will support (e.g., from drinking water supply to drinking water supply only after treatment).”</p> <p>Given that the natural conditions for arsenic in surface water is substantially higher than the proposed human health criteria, the EPA policy suggests that the Tribe needs to change the human health uses specific to harvesting in Sections 9.1)(b)(v), 9.2)(b)(v) and 9.3)(b)(v) to those that the natural background concentration will support. Perhaps the natural condition supports (at the desired risk levels) a lower level of fish and water consumption, or perhaps the natural condition supports a high level of fish and water consumption, but at a less stringent risk level.</p> <p>I call this to the Tribe’s attention now to identify the dilemma that is arsenic and how it must temper expectations. The natural arsenic levels assure that the surface waters covered under the Tribe’s water quality standards</p>	<p>constituents of concern for various watersheds.</p> <p>See Response to Comment No. 5</p>
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					<p>cannot support the health uses at the level of risk demanded by the standards. There are other issues with arsenic that will be discussed later.</p> <p>⁴See, http://www.epa.gov/waterscience/criteria/library/naturalback.pdf</p>	
10	Heller Ehrman, LLP	Brian Crossley	Lincoln C. Loehr	9/25/2008	<p><u>Section 6.(9).</u> The last sentence before Table 1 notes that:</p> <p style="text-align: center;">“All concentrations, except asbestos, are micrograms per liter (ug/l).”</p> <p>Ammonia is in milligrams/liter (mg/l) and should be noted both in the above sentence and in Table 1 itself. Check to make sure that the units are correct for each of the other parameters as well.</p>	The units for the numerical standard for ammonia has been revised to be consistent with the other standards.
11	Heller Ehrman, LLP	Brian Crossley	Lincoln C. Loehr	9/25/2008	<p><u>Section 6.(9) – Table 1.</u></p> <p><u>Extra zeros.</u> Throughout Table 1 there are extra zeros added to criteria implying a precision that is not found in the originating documents. This occurs out of the uniform presentation of all criteria as a three digit number, one to the left of the decimal, two to the right, and an exponent value. An example is the standard for Mirex, where EPA’s</p>	The table has been revised to portray the correct numerical precision.

					<p>criterion is 0.001 ug/l, while the Tribe's proposed standard is presented as 1.00E-03, which is the same as 0.00100 ug/l. The concern can be an issue since 0.001 may be reported from rounding 0.00149, whereas 0.00100 could not. Mirex is used here just as an example. There are quite a few other similarly proposed standards.</p>	
12	Heller Ehrman, LLP	Brian Crossley	Lincoln C. Loehr	9/25/2008	<p><u>The practicality of standards far below detection limits.</u> Many of the proposed criteria are 4, 5 or even 6 orders of magnitude lower than the detection limits. Just something to be aware of.</p>	<p>The Tribe is aware of your concern. In such instances, detection of anthropogenic analytes in surface waters are considered an exceedance of the criterion. Natural background would be the criterion for naturally occurring analytes.</p>
13	Heller Ehrman, LLP	Brian Crossley	Lincoln C. Loehr	9/25/2008	<p><u>Aluminum.</u> The chronic criterion of 87 ug/l should be deleted. The Tribe should also consider deleting the acute aluminum criteria.</p> <p>Many states have chosen to not adopt any standards for aluminum, and of those that have, many have specifically only adopted the acute criteria as a standard. Significantly, in the cases where EPA has adopted standards for states, they have not adopted standards for aluminum.⁵</p> <p>An explanation of why the chronic</p>	<p>The DNR does not find the Pennsylvania's Department of Environmental Protection argument compelling, and will employ EPA's approach on this matter.</p>

⁵ See, 57 FR 60911 in the National Toxics Rule; 65 FR 31712 in the California Toxics Rule and; 60 FR 15391-15392 in the Great Lakes Rule.

				<p>aluminum criterion should not be adopted was provided in June of 2000 by Pennsylvania's Department of Environmental Protection⁶ as follows:</p> <p>"The Department believes that the chronic criterion of 87 ug/l should not be adopted because it is based on chronic toxicity test results that show inconsistencies within tests and between studies. The chronic studies described in EPA's 1988 Ambient Water Quality Criteria for Aluminum document do not show a consistent pattern of toxicological response to the different exposure concentrations within or between the various tests described. The final chronic value developed following EPA's procedures and based on available acute-chronic ratios is 750 ug/l, the same value as the acute criterion. However, EPA then lowered the final chronic value to 87 ug/l, claiming it to be necessary to protect brook trout and striped bass. EPA's justification for this adjustment was data derived from studies that EPA later described as data that should not</p>	
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⁶ See, <http://www.dep.state.pa.us/dep/subject/eqb/2000/June20/FinalPreamble517009293959697.pdf> pages 16-17.

					<p>be used in the criteria development. EPA staff have agreed that the aluminum toxicity is very complex due, in part, to the complexity of its chemistry and interactions with local water quality conditions and biological community. EPA also agrees that the studies that were used in driving the derivation of the chronic criterion are limited in their application and should receive additional review. The Department cannot adopt the flawed chronic criterion for use in Pennsylvania without better justification. As recently as December 1999, EPA reiterated that aluminum criteria issues are not a priority of the agency. Therefore, we believe that aluminum toxicity to fish and aquatic life will be adequately managed using the acute criterion of 750 ug/l. The Department will also continue to monitor the scientific literature and EPA's evaluations of aluminum toxicity and amend the criterion or add a chronic criterion, if indicated."</p>	
14	Heller Ehrman, LLP	Brian Crossley	Lincoln C. Loehr	9/25/2008	<p><u>Ammonia</u>. Criteria are mg/l, not ug/l, and should be so noted. Also, it appears that the acute and chronic criterion values have been reversed. The footnotes f and g also are in the</p>	<p>The units for the numerical standard for ammonia has been revised to be consistent with the other standards.</p>

					order of the chronic first (f) and the acute second (g), and probably should be arranged to present the acute first.	
15	Heller Ehrman, LLP	Brian Crosley	Lincoln C. Loehr	9/25/2008	<p><u>Arsenic</u>. Human health criteria are 0.000951 ug/l (water and organism consumption) and 0.00105 ug/l (organism only). The proposed criteria are about three orders of magnitude lower than natural background, are unattainable and should be replaced. I propose that the criterion for water and organisms consumption be changed to 5 ug/l, which is the Washington State Department of Ecology’s Model Toxics Control Act Method A groundwater cleanup standard, based on the upper 90th percentile in groundwater in the state and is lower than the drinking water standard of 10 ug/l.</p> <p>EPA's arsenic human health criteria to protect from the consumption of organisms</p>	<p>The approach employed by EPA may be conservative; however, it is protective. The Tribe retains the current EPA approach.</p> <p>Again, instances in which tabled standards are below modern analytical capabilities, natural background <i>is</i> the standard. The Tribe does not agree with your statement that “<i>The proposed criteria are about three orders of magnitude lower than natural background..</i>”. Natural background of surface waters is a function of the interaction of natural ground and surface waters and the geology of a given watershed or basin—natural background is not a function of political boundary.</p> <p>The assumption is that arsenic is inorganic when in</p>

⁷ See page C-7 in, EPA 1980. *Ambient Water Quality Criteria for Arsenic*. EPA 440/5-80-021.

⁸ See, Johnson A., and S. Golding, 2002. Results and Recommendations from Monitoring Arsenic Levels in 303(d) Listed Rivers in Washington. DOE Publication No. 02-03-045, which reported values ranging from 0.43 to 0.67 ug/l total arsenic from 12 Spokane River samples at the Stateline Bridge.

⁹ See, <http://water.usgs.gov/nawqa/trace/arsenic/>

				<p>has a significant technical error. Even though the footnote to EPA's criteria says that it pertains to inorganic arsenic only, the reality is that the criteria were developed on the basis of bioconcentration of total arsenic in fish tissue, treating it as all carcinogenic. Most of the arsenic in fish tissue is present as organic arsenic and is not the problem. For freshwater species, inorganic arsenic makes up about 10% of the total arsenic.</p> <p>The bioconcentration factor of 44 used by EPA in developing the human health criteria is based on a weighted average of freshwater fish consumption (with a bioconcentration factor of 1) and saltwater shellfish consumption (with a bioconcentration factor of 350, based on an eastern oyster species).⁷ Where the criteria are developed based only on freshwater</p>	<p>the water column. When doing a risk assessment for arsenic in fish, we assume that only 10% is inorganic (even though organic forms do have some toxicity). However, EPA water quality standards assume that concentrations in the fish are inorganic. The standard is based on the assumption that total cyanide is fully thermodynamically-effective and fully bio-available. See Response to Comment 5.</p>
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¹⁰ See, WAC 173-340-900, Table 720-1 Cleanup Levels for Ground Water.

¹¹ A statement to this effect is often included in Fact Sheets for NPDES permits written by the Department of Ecology. For an example, see pages 5-6 in the Fact Sheet for Simpson Tacoma Kraft Mill at http://www.ecy.wa.gov/programs/swfa/industrial/IND_PERMITS/NPDESPermits/PulpPaperMills/simpsonFS.pdf

¹² See, <http://www.epa.gov/waterscience/library/wqcriteria/naturalback.pdf>, EPA Memo of November 5, 1997 to State and Tribal Water Quality Management Program Directors

				<p>species consumption, the bioconcentration factor is appropriately 1 instead of 44.</p> <p>Applying these two corrections to the proposed criteria for consumption of organisms only, results in $0.00105 * 10 * 44 = 0.462$ ug/l inorganic arsenic, which is in the range of the <u>total</u> arsenic concentration in the Spokane River.⁸</p> <p>The arsenic human health criteria from EPA have proven to be very problematic because the natural level of arsenic in the world's oceans is between 1 and 2 ug/L and the natural level throughout surface waters in Washington is in the 0.2 to 1 ug/L range. The level in groundwater is typically higher than in surface water simply because of a longer time for the water to be exposed to minerals. Groundwater flowing through volcanic rocks tend to have more arsenic than other geologic formations. The U.S. Geological Survey has compiled data on groundwater arsenic throughout the country.⁹ The Washington State Model Toxics Control Act's Method A cleanup levels for arsenic in groundwater is 5 ug/L and is based on background concentrations in groundwater for the state of Washington.¹⁰ Groundwater routinely flows to surface water.</p>	
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					<p>Surface waters exceed EPA's human health criteria for arsenic (and greatly exceed the criteria proposed by the Tribe) essentially everywhere. As currently worded in the proposed revisions, surface water arsenic concentrations may be expected to use up more than all of the 1 in a million risk basis, essentially driving all of the rest of the Tribe's criteria to zero. Groundwater, used by the Tribe, is likely to have a higher arsenic concentration than the surface water. When a standard is set lower than background it creates many difficulties.</p> <p>Washington State has looked at the issue, realized that there are substantial issues and uncertainties surrounding the low human health standard and they have determined they will not implement it in discharge permits at this time.¹¹ This is done in the hope that EPA will eventually resolve some of the uncertainties.</p> <p>In 1992 the Pueblo of Isleta adopted the same EPA based arsenic standards as the 1 in a million risk based numbers in the National Toxics Rule. (0.14 ug/l and 0.018 ug/l). The standards were more stringent than the standards for New Mexico and greatly impacted the City of Albuquerque.</p>	
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				<p>Significantly, in 2002 the Puebla of Isleta revised their arsenic human health criteria based on fish consumption only, to 4.2 ug/L and EPA has approved the new standard.</p> <p>There is an interesting dilemma posed by a human health standard set lower than natural conditions. EPA allows states and tribes to change water quality standards based on natural conditions, and wants such changes adopted in regulation and subject to EPA approval. EPA's guidance however does not favor changing human health standards based on natural conditions. In cases where natural conditions exceed human health standards, EPA says that states or tribes should reconsider the appropriateness of their designated uses.¹²</p> <p>To summarize, it is important to not have a surface water standard for arsenic that is lower than the natural background surface water. It also makes sense that since groundwater flows to surface water, that too should be recognized and allowed for. I recommend that the drinking water MCL of 10 ug/L be adopted as the surface water human health standard for total arsenic for drinking only purposes (for compatibility with the drinking water standard) and that</p>	
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				<p>because natural groundwater flows to surface waters and because the proposed Tribe's standards do not allow the benefit of any mixing zone for discharges of toxics such as arsenic to surface waters, the Tribe should use 5 ug/l total arsenic to protect for the consumption of organisms, based on the upper 90th percentile natural background groundwater arsenic concentrations in the state, which commonly flows to surface waters.</p> <p>⁷ See page C-7 in, EPA 1980. <i>Ambient Water Quality Criteria for Arsenic</i>. EPA 440/5-80-021.</p> <p>⁸ See, Johnson A., and S. Golding, 2002. Results and Recommendations from Monitoring Arsenic Levels in 303(d) Listed Rivers in Washington. DOE Publication No. 02-03-045, which reported values ranging from 0.43 to 0.67 ug/l total arsenic from 12 Spokane River samples at the Stateline Bridge.</p> <p>⁹ See, http://water.usgs.gov/nawqa/trace/arsenic/</p> <p>¹⁰ See, WAC 173-340-900, Table 720-1 Cleanup Levels for Ground Water.</p> <p>¹¹ A statement to this effect is often included in Fact Sheets for NPDES permits</p>	
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					<p>written by the Department of Ecology. For an example, see pages 5-6 in the Fact Sheet for Simpson Tacoma Kraft Mill at http://www.ecy.wa.gov/programs/swfa/industrial/IND_PERMITS/NPDESPermits/PulpPaperMills/simpsonFS.pdf</p> <p>¹² See, http://www.epa.gov/waterscience/library/wqcriteria/naturalback.pdf, EPA Memo of November 5, 1997 to State and Tribal Water Quality Management Program Directors</p>	
16	Heller Ehrman, LLP	Brian Crossley	Lincoln C. Loehr	9/25/2008	<p><u>Bis(2-chloromethyl)ether</u>. Check the name on this compound. EPA has a recommended criteria for “Ether, Bis (Chloromethyl)” which may be the same, and Washington Department of Ecology permits require priority pollutant monitoring for “Bis (chloromethyl) Ether”, and maybe these are all the same thing.</p>	<p>After review, it appears that the compound name was in error. The compound name has been revised to “Bis(chloromethyl)ether”.</p>
17	Heller Ehrman, LLP	Brian Crossley	Lincoln C. Loehr	9/25/2008	<p><u>Carcinogenic PAHs</u>. The Spokane Tribe is proposing identical human health standards of 0.000320 ug/l (for organism and water consumption) and 0.000370 ug/l (for organism consumption) for each of the following PAHs:</p> <p style="text-align: center;">Benz(a)Anthracene Benzo(a)Pyrene Benzo(b)Fluoranthene</p>	

				<p>Benzo(k)Fluoranthene Chrysene Dibenzo(a,h)Anthracene Indeno (1,2,3-cd)Pyrene</p> <p>There are several problems with these human health criteria. The first is that these are not equal in carcinogenicity and it is appropriate to apply some Toxicity Equivalent Factors (TEFs) to reflect the differences between them. EPA has developed the factors shown below in parentheses to relate them to Benzo(a)Pyrene.</p> <table data-bbox="835 824 1234 1084"> <tr> <td>Benz(a)Anthracene</td> <td>0.1</td> </tr> <tr> <td>Benzo(a)Pyrene</td> <td>1.0</td> </tr> <tr> <td>Benzo(b)Fluoranthene</td> <td>0.1</td> </tr> <tr> <td>Benzo(k)Fluoranthene</td> <td>0.1</td> </tr> <tr> <td>Chrysene</td> <td>0.01</td> </tr> <tr> <td>Dibenzo(a,h)Anthracene</td> <td>1.0</td> </tr> <tr> <td>Indeno (1,2,3-cd)Pyrene</td> <td>0.1</td> </tr> </table> <p>The second problem is that the derivation of these criteria failed to recognize that fish do not bioaccumulate PAHs. Rather, they are metabolized in the liver.</p> <p>Note however that these, and other PAHs are added to fish and other products when</p>	Benz(a)Anthracene	0.1	Benzo(a)Pyrene	1.0	Benzo(b)Fluoranthene	0.1	Benzo(k)Fluoranthene	0.1	Chrysene	0.01	Dibenzo(a,h)Anthracene	1.0	Indeno (1,2,3-cd)Pyrene	0.1	<p>The DNR uses the Benzo(a)Pyrene slope factor for all PAHs which is a conservative approach. We recognize other methods for risk assessment purposes; however, DNR's policy is to use the same approach EPA applied during development of the standards. See Response to Comment 5.</p>
Benz(a)Anthracene	0.1																		
Benzo(a)Pyrene	1.0																		
Benzo(b)Fluoranthene	0.1																		
Benzo(k)Fluoranthene	0.1																		
Chrysene	0.01																		
Dibenzo(a,h)Anthracene	1.0																		
Indeno (1,2,3-cd)Pyrene	0.1																		

					they are smoke cured, so substantial exposures do happen, but not through bioaccumulation by the fish, and not related to water quality concerns.	
18	Heller Ehrman, LLP	Brian Crossley	Lincoln C. Loehr	9/25/2008	<u>Chloride</u> . 0.00 ug/l is listed as a human health criteria while acute and chronic criteria are listed as 860,000 and 230,000 ug/l. The human health criteria appears to be an error and should be deleted.	This was a transcription error. The numerical standard for Chloride has been deleted.
19	Heller Ehrman, LLP	Brian Crossley	Lincoln C. Loehr	9/25/2008	<u>Chromium (Tri)</u> . There should be a note “j” with this parameter directing the user to the note and formulas.	This was a transcription error. The “j” qualifier has been re-introduced.
20	Heller Ehrman, LLP	Brian Crossley	Lincoln C. Loehr	9/25/2008	<u>Cyanide</u> . EPA’s criteria are for “free cyanide”. There is not an EPA approved method for “free cyanide”. Any measure of “total cyanide” is not relevant to the criteria. Washington specifies in its water quality standards that the criteria are based on the weak acid dissociable (WAD) method in the 17 th Ed. Standard Methods for the Examination of Water and Wastewater, 4500-CN I, and as revised. EPA approves of this approach in Washington’s water quality standards. I recommend that the Spokane Tribe do the same.	The standard is based the assumption that total cyanide is fully thermodynamically-effective and fully bio-available. See Response to Comment 5.
21	Heller Ehrman,	Brian Cros	Lincoln C. Loehr	9/25/2008	<u>Dibutyl phthalate</u> . Does this table mean to say “Di-n-Butyl Phthalate”?	The two are synonymous; however, Di-n-butyl phthalate, is a better choice. The compound name has been revised.

	LLP	sley				
22	Heller Ehrman, LLP	Brian Crossley	Lincoln C. Loehr	9/25/2008	<u>Dichlorodifluoromethane.</u> This is Freon-12, a refrigerant whose production has been banned in the U.S., so its presence in the environment should be decreasing. Where did the proposed standard come from? What is it based on? It is not in EPA's national recommended water quality criteria.	Dichlorodifluoromethane (CASRN 75-71-8) is regulated under the current TSWQS. Numerical standards were updated with the modern exposure factors.
23	Heller Ehrman, LLP	Brian Crossley	Lincoln C. Loehr	9/25/2008	<u>Dieldrin.</u> The chronic value is 0.00190 ug/l. It should be 0.056 ug/l.	The DNR has retained the older National Toxics Rule Standard 0.00190 ug/l freshwater chronic criteria.
24	Heller Ehrman, LLP	Brian Crossley	Lincoln C. Loehr	9/25/2008	<u>Parathion.</u> The human health criteria is presented as 0.00. Does the Spokane Tribe really mean "zero" or would anything that rounds to less than 0.00 be OK, or do they just mean that there is not a human health based criteria?	This was a transcription error. The numerical standard for parathion has been deleted.
25	Heller Ehrman, LLP	Brian Crossley	Lincoln C. Loehr	9/25/2008	<u>Sections 9.(1)(c), and 9.(2)(c) and Table 5. - Temperature standards</u> The detailed step differences day to day for temperatures in April, May and September imply a uniform fit that Nature probably does not fit into. Has the Tribe compared these standards to any temperature observations on their lands to see if they compare to real conditions? There should be some provision for human caused allowances for temperature similar to Washington's standards. Section 13 does allow mixing zones for temperature, and	The Department has reviewed historical temperature data. The current standards allow a step difference of 5.5°C in a single day, which generally is not observed in the historical data. The proposed steps will create a smoother curve that more closely mimics natural temperature fluctuations without losing the goal of the current temperature standards. The Department disagrees with the need for an allowance for anthropogenic discharges of water that could cause temperature fluctuations of in stream

					some human caused allowance would fit with the mixing zone concept.	waters.
26	Heller Ehrman, LLP	Brian Crossley	Lincoln C. Loehr	9/25/2008	<p><u>Section 11. Specific Classifications.</u></p> <p>Are the Spokane River and the Columbia River on the Reservation or are they the border of the reservation? Section 11 assigns specific classifications for these rivers, but they should not be included if they are not part of the reservation.</p>	<p>The boundaries of the Spokane Indian Reservation are described in the following Executive Order. “It is hereby ordered that the following tract of land, situated in Washington Territory, be, and the same is hereby, set aside and reserved for the use and occupancy of the Spokane Indians, namely: Commencing at a point where Chamokane Creek crosses the forty-eighth parallel of latitude; thence down the <u>east bank</u> of said creek to where it enters the Spokane River; thence across said Spokane River westwardly along the <u>southern bank</u> thereof to a point where it enters the Columbia River; thence across the Columbia River, northwardly along its <u>western bank</u> to a point where said river crosses the said forty-eighth parallel of latitude; thence east along said parallel to the place of beginning.” Executive Order, January 18, 1881, President Hayes.</p> <p>The Reservation was formally established on August 18, 1877 as recognized by <i>Northern Pac. Ry. v. Wismer</i>, 246 U.S. 283 (1918).</p>
27	Heller Ehrman	Brian	Lincoln C.	9/25/2008	<u>Section 13.(2) Mixing zone language.</u>	The Tribe acknowledges your concern and has incorporated your suggestion to delete Paragraph

	n, LLP	Crossley	Loehr		<p>The wording in this section should be provided in the affirmative, at the Tribe's discretion, instead of in the exception language. The opening sentence should say,</p> <p>“(2) The standards required in this chapter may be met at the edge of a mixing zone, awarded at the Tribe's discretion, where:”</p> <p>Paragraph 13.(2)(b) should be deleted, and the subsequent paragraphs re lettered.</p> <p>One concern this comment is trying to address is that the acute, chronic and human health criteria carry various duration of exposure considerations, and it is through the use of mixing zones that the duration of exposure aspects of the criteria may be met. Water quality criteria are intended to apply to surface waters, and not directly to discharges. If they applied directly to discharges then they would be effluent limits only, and would not be implemented in a manner that relates to the assumptions behind the criteria.</p>	<p>13.(2)(b). Additionally, the Tribe has clarified in Paragraph 13(2)(a) that mixing zones established under this provision must be at least as protective as required under the laws of the State of Washington.</p> <p><i>(a) the allowable size, location and duration of the mixing zone and associated effluent limits are established by the Department as part of a cleanup performed under the Federal or Tribal cleanup laws, and as established, the mixing zone will be at least as protective of human health and the environment as a mixing zone established under the laws of the State of Washington; and</i></p>
28	WADO E	Brian Crossley	Melissa Gildersleeve	9/26/2008	"Comment Table 5: In the water quality criteria section for each class of water, there is a clear method identified to measure temperature; 7-DADMax. It may be useful to include that unit of measure in Table 5."	Table 5 has been revised to include the unit of measure (degrees Celsius)

29	WADO E		Brandy Lubliner	<p>NTR human health criteria for PCBs (170 pg/L) were derived primarily from acceptable fish tissue concentrations. The most recent revisions to the NTR applicable to PCBs were effective December 9, 1999 in which the cancer slope factor (q1*) was changed from 7.7 per mg/kg-d to 2 per mg/kg-d. Spokane Tribe continues to use..... the q1* of 7.7 per mg/kg-d or did this change too?</p>	<p>Upon review of revisions to the NTR, The DNR has adopted the newer cancer slope factor of 2 per mg/kg-d.</p>
30	NWP PA		Llewellyn Matthews,	<p>The Spokane Tribe is proposing to develop water quality standards based on 865 grams per day fish consumption as compared to the 6.5 grams per day currently used in Washington State. NWPPA does not have the expertise to assess what tribal fish consumption patterns are or should be. However, we are concerned the proposal is based on a value that exceeds the 99th percentile of recognized surveys of tribal consumers and seems to be based on the assumption that simply increasing fish consumption rates means that tribal fish consumers are automatically protected accordingly.</p> <p>Focusing on increasing fish consumption factors to a very high level (even though that rate may be reflective of tribal consumption patterns) does not necessarily translate proportionately to higher protection. Increasing the fish consumption rate does not</p>	<p>The cited studies do not reflect historic fish consumption rates developed for the Tribe. The bulleted concerns are incorrect or inapplicable. See Response to Comment No. 3 and 15.</p>

				<p>without examining the other variables in the equation used to determine water quality standards leads to extremely odd results that do not result in more protection.</p> <p>For example, the proposal will lead to water quality standards that are:</p> <ul style="list-style-type: none"> • far lower than background for naturally occurring earth metals ; • far lower than drinking water standards; • not measurable for many constituents and not achievable by current technology 	
31		Llewellyn Matthews,		<p>1. <u>Recognized Fish Consumption Rates</u></p> <p>Again, it is not NWPPA’s purpose to critique fish consumption rates, however, we note for the record that the number selected by the Spokane Tribe is more than twice as high the 99th percentile found by the Columbia River Intertribal Fish Commission (CRITFC). Normally water quality standards, as most standards, protect to the 90th percentile. In comparison:</p> <ul style="list-style-type: none"> • 63.5 g/day - tribal adult average (CRITFC) • 113 g/day - EPA letter 2005 “acceptable” upper range for tribal 	See Response to Comment No. 30.

				<p>WQS</p> <ul style="list-style-type: none"> • 389 g/day - 99th percentile tribal consumer (CRITFC) <p>NWPPA questions the usefulness of the very high rate suggested in the current proposal.</p>	
32		Llewellyn Matthews,	<p>2. <u>The Equation for Establishing Water Quality Standards.</u></p> <p>HH WQC = Dose x [BW ÷ (DWI + FI x BCF)]</p> <p>Where:</p> <p>Dose, risk-specific toxic dose, mg/kg/day</p> <ul style="list-style-type: none"> • RSD or 10⁻⁶/ql* - cancer effects • RfD * RSC – non-cancer effects • BW, Body Weight - 70 kg (adult human) • DWI, Drinking Water Intake, 2 L/day (4 L/day for Spokane Tribe) • FI, Fish Intake, g/day (17.5 is basis for EPA’s latest criteria) • BCF, Bioconcentration Factor (Chemical-specific) <p>All of these factors have a large degree of uncertainty associated with them. For example, the bioconcentration factors are not understood equally well for all chemicals of concern. Regulators have compensated for this</p>	The degree of conservatism afforded to the general public via water quality standards and the Tribe via these proposed standards are equivalent.	

				<p>lack of knowledge by developing very conservative factors. This conservatism is increased by the way in which the factors are multiplied in the equation for establishing water quality standards. For example, it is fairly standard to increase the conservatism of water quality criteria by an order of magnitude <i>each</i> for: absence of information on “no effects” levels, availability of animal effects information but no human effects information, and variability of data. This means a criteria may have a thousand fold margin of safety at the outset.</p> <p>Unless the tribe is also revisiting the accuracy of the other factors in the formula, particularly bioconcentration factors, the exercise to revise the fish consumption factor to a very high level will not necessarily produce meaningful results.</p>	
33		Llewellyn Matthews,	<p>3. <u>The Proposed WQS for Naturally Occurring Arsenic Will Be Far Below Background and Capability of Analytical Methods.</u></p> <p>The Pacific Northwest is a geologic region that is shaped by its volcanic past. One consequence is that soils contain, and water carries naturally occurring earth metals such as arsenic, cadmium, copper, mercury, etc. These</p>	See pertinent portions of Response to Comments No. 3 and 15.	

levels existed prior to the coming of salmon and other fishes and prior to the arrival of the people that consume them. The proposed Spokane tribal water quality standards would be far lower than background and lower than drinking water criteria for arsenic in particular.

In addition, more than half of the resulting standards would be below analytical methods¹³.

Comparison of Proposed Spokane Water Quality Criteria to Drinking Water Criteria and Common Background Examples

Constituent	HH WQC (ppb)	National Drinking	Regional
Arsenic	0.000951	10	0.27 – 0.90
Cadmium	0.038	5	0.2 to 0.4 median ¹⁴
Iron	300	300	-

		<p>yn Matthe ws,</p>	<p>The proposed Spokane Tribal Water Quality Standards contain only one section addressing implementation issues. NWPPA appreciates that a section was added regarding mixing zones, although we believe it is overly restrictive.</p> <p>Apart from the provision on mixing zones, the implementation section is seriously deficient in light of the proposal to utilize a vastly greater fish consumption factor. The use of this factor will create any number of difficulties for which no policy is identified and the standards contain no mechanism to address. Some of the difficulties include:</p> <p><i>Problems from water quality policy perspective:</i></p> <ul style="list-style-type: none"> • The existing water quality will not meet most of the criteria, meaning increased listings of impaired waters in reservation lands. • Listings of impaired waters triggers the need for TMDLs; however, the TMDLs will not be able to achieve the water quality criteria because there is no treatment technology to meet these very low levels and because of high background for arsenic. • There appears to be no plan to 	<p>3, 8, and 15.</p> <p>One of the purposes of the Clean Water Act is to force innovation in pollution reduction and removal technology. The Tribe recognizes the difficulties presented by the goals of its Water Quality standards, but as a sovereign Indian nation it is choosing to pursue such goals. In addition, please see pertinent parts of the response to comment 5 and 27.</p>
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					<p>determine historic background levels.</p> <p><i>Problems from a discharger perspective:</i></p> <ul style="list-style-type: none"> • Absence of typical implementation mechanisms such as “de minimus” exemptions, pass-through credits, variances, compliance schedules, etc. • Absence of provisions for addressing constituents that may be present but are lower than current analytical methods. <p>Alternately, the authors of the proposed rules should be more transparent about the results the rule will trigger, including no development on tribal lands.</p>	