UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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OFFICE OF
WATER AND
WATERSHEDS

JAN - 9 2017

Ms. Wendy Wiles
Administrator
Environmental Solutions Division

Ms. Lydia Emer
Administrator
Operations Division
Oregon Department of Environmental Quality
700 Lloyd Building at 700 NE Multnomah St., Suite #600
Portland, Oregon 97232

Re: EPA's Action on the State of Oregon's November 14, 2016 Revisions to Oregon's Surface Water Quality Standards

Dear Ms. Wiles and Ms. Emer:

The U.S. Environmental Protection Agency (EPA) has completed its Clean Water Act (CWA) review of the revised water quality standards that Oregon submitted to the EPA on November 14, 2016. Under CWA Section 303, 33 U.S.C Section 1313, states must establish water quality standards and submit them to the EPA for approval or disapproval. Revisions to a state's water quality standards must also be submitted to the EPA for approval or disapproval. A summary of the EPA's actions is provided below and further described in the enclosed *Technical Support Document for Action on the State of Oregon's Revised Surface Water Quality Standards Submitted on November 14th, 2016* (hereafter referred to as the EPA TSD).

Summary of the EPA's Approval Action

Pursuant to the EPA's authority under CWA Section 303(c) and implementing regulations found at 40 CFR Part 131, the EPA is approving the following provisions:

- Toxic Substances Narrative OAR 340-041-0033
- Freshwater aquatic life criteria for copper (Table 30, OAR 340-041-8033) including introductory text, inclusion of Footnotes C and N for the copper criteria; deletion of Footnote E as it pertains to copper criteria and revisions to Endnote E, and new Endnote N introductory narrative and its Sections [subparts] (1), (2), and (3)(a)
- Numerous non-substantive editorial revisions on previously approved water quality standards

The revisions adopted by Oregon, and approved today, address the EPA's January 31, 2013 disapproval of Oregon's previously adopted freshwater aquatic life criteria for copper.

Provisions the EPA Did Not Take Action on

The EPA did not take an action on OAR-340-041-8033, Table 30, Endnote N, Section [subpart] (3b) submitted by Oregon because it is not a water quality standard under section 303(c) of the CWA. The EPA TSD (Section IV) provides the EPA's rationale for not acting on the provision. In addition, the

EPA is not acting on Oregon's non-substantive editorial revisions to the arsenic reduction provisions in OAR-340-041-0033. As further described in the EPA TSD Section IV, the EPA previously reviewed the arsenic reduction policy provisions in OAR-340-041-0033 and concluded that they are not water quality standards.

Lastly, Oregon includes a strikeout of all of Table 30 (pages 9-17 of Oregon's submitted "copper standards rules redline" document), together with a redline/strikeout of specific WQS revisions (pages 18-28 of Oregon's submitted "redline" document). Oregon has communicated that the strikeout of Table 30 on pages 9-17 is for administrative Oregon state rule purposes only, not Clean Water Act purposes. Therefore, the EPA is not taking action on this revision.

Next Steps

Now that the criteria are approved and can be used for CWA purposes, the EPA looks forward to continuing to coordinate with Oregon as it develops additional implementation methods for the copper BLM criteria to support the 303(d) listing, TMDL, and NPDES permitting programs. As part of those discussions, it will be important to further consider the implementation recommendations included in the letter from the EPA to Wendy Wiles and Lydia Emer, dated June 14, 2016 and in the EPA's comment letter on Oregon's proposed revisions submitted to Wendy Wiles on September 15, 2016.

We appreciate the coordinated effort that the State of Oregon has led on its freshwater copper criteria rulemaking. If you have any questions about the EPA's action, please feel free to contact me at (206) 553-1855 or have your staff contact Rochelle Labiosa at (206) 553-1172.

Sincerely,

Daniel D. Opalski, Director
Office of Water and Watersheds

Enclosure

cc: Ms. Jennifer Wigal, ODEQ
Ms. Debra Sturdevant, ODEQ

Technical Support Document

for Action on the State of Oregon's Surface Water Quality Standards Submitted on November 14, 2016

January 9, 2016

Table of Contents

I. Introduction

The Oregon Environmental Quality Commission adopted new and revised water quality standards (WQS) in Chapter 340, Division 41, of Oregon's Administrative Rules (OAR 340-041) on November 2, 2016 (hereafter referred to as the "2016 adoption"). Oregon submitted the 2016 adoption of new and revised WQS to the U.S. Environmental Protection Agency (EPA) on November 14, 2016.

Revisions addressed in today's decision include revisions to Oregon's Toxics Substances Narrative at OAR 340-041-0033, Oregon's Table 30: Aquatic Life Toxics located at OAR-041-8033, and Oregon's freshwater copper rules to protect aquatic life within Table 30, and non-substantive revisions to the text.

This document is organized as follows:

Part II of this document describes the Clean Water Act (CWA) requirements for action on WQS submissions.

Part III contains the basis for the EPA's approval under section 303(c) of the CWA of the new or revised WQS in the 2016 adoption. This part distinguishes between two categories of revisions to Oregon's WQS: (1) revised provisions that are WQS and (2) non-substantive revisions to the WQS.

Part IV discusses a provision that the EPA is not acting on because the EPA has determined that the provision is not a WQS under the CWA. This provision includes a narrative provision at OAR 240-041-8033, Table 30, Endnote N, subpart 3(b), which indicates a preference on the part of Oregon to use site-specific data in calculating copper criteria for the purposes of listing and assessment.

II. Clean Water Act Requirements for Water Quality Standards

Under Section 303(c) of the CWA and federal implementing regulations at 40 CFR §131.4, states have the primary responsibility for reviewing, establishing, and revising WQS, which consist of the designated uses of a waterbody or waterbody segment, the water quality criteria necessary to protect those designated uses, and an antidegradation policy. This statutory framework allows states to work with local communities to adopt appropriate designated uses (as required in 40 CFR §131.10(a)) and to add criteria to protect those designated uses (as required in 40 CFR §131.11(a)).

States are required to review applicable WQS periodically, and as appropriate, modify and adopt these standards (40 CFR §131.20). Each state must follow its own legal procedures for adopting such standards (40 CFR §131.5) and submit certification by the state's attorney general, or other appropriate legal authority within the state, that the WQS were duly adopted pursuant to state law (40 CFR §131.6(e)).

Section 303(c)(2)(B) of the CWA requires states to establish water quality criteria for toxic pollutants listed pursuant to Section 307(a)(1) for which the EPA has published criteria under

Section 304(a) where the presence of these toxics could reasonably be expected to interfere with the designated uses established by the state. In establishing such criteria, states should establish numeric values based on one of the following:

(1) 304(a) guidance;
(2) 304(a) guidance modified to reflect site-specific conditions; or,
(3) Other scientifically defensible methods (40 CFR §131.11(b)(1)).

In addition, states should establish narrative criteria where numeric criteria cannot be determined or to supplement numeric criteria (see 40 CFR §131.11(b)(2)).

Section 303(c) of the CWA also requires states to submit new or revised WQS to the EPA for review and action. The EPA is required to review these changes to ensure revisions to WQS are consistent with the CWA. The EPA considers four questions (described below) when evaluating whether a particular provision is a new or revised WQS. If all four questions are answered "yes" then the provision would likely constitute a new or revised WQS that the EPA has the authority and duty to approve or disapprove under CWA § 303(c)(3).[1]

(1) Is it a legally binding provision adopted or established pursuant to state or tribal law?
(2) Does the provision address designated uses, water quality criteria (narrative or numeric) to protect designated uses, and/or antidegradation requirements for waters of the Unit States?
(3) Does the provision express or establish the desired condition (e.g., uses, criteria) or instream level of protection (e.g., antidegradation requirements) for waters of the United States immediately or mandate how it will be expressed or established for such waters in the future?
(4) Does the provision establish a new WQS or revise an existing WQS?

Furthermore, the federal WQS regulations at 40 CFR §131.21 state, in part, that when the EPA disapproves a state's WQS, the EPA shall specify the changes that are needed to ensure compliance with the requirements of § 303(c) of the CWA and federal WQS regulations.

Finally, the EPA considers non-substantive edits to existing WQS to constitute new or revised WQS that the EPA has the authority to approve or disapprove under § 303(c)(3). While these edits and changes do not substantively change the meaning or intent of the existing WQS, the EPA believes it is reasonable to treat such edits and changes in this manner to ensure public transparency as to which provisions are applicable for CWA purposes. The EPA notes that the scope of its review and action on non-substantive edits or editorial changes extend only to the edits or changes themselves. The EPA is not re-opening or reconsidering the underlying WQS which are the subject of the non-substantive edits or editorial changes.

III. EPA Action on New and Revised Water Quality Standards

[1] See the EPA's *What is a New or Revised Water Quality Standard Under CWA 303(c)(3)? Frequently Asked Questions,* October 2012.

A. Revised Provisions of Oregon's Water Quality Standards

Oregon has submitted the following items in support of its rulemaking and to meet the requirements of 40 CFR § 131.6:

(1) a Certificate and Order of Filing from Oregon's Secretary of State that the rules were duly adopted by the Environmental Quality Commission dated November 2, 2016;
(2) a State of Oregon Attorney General's Certification that the rules were adopted consistent with Oregon Law, dated November 8, 2016;
(3) the adopted rules in clean copy and track changes;
(4) a Public Rule Package submitted to Oregon's Environmental Quality Commission, which includes information regarding two public hearings that Oregon held in person and simulcast via webinar on August 30th and 31st during the 45-day comment period for the proposed rule revisions August 1 – September 15, 2016, along with supporting analysis for the proposed rules, among other information regarding public involvement related to Oregon's rule revision process;
(5) A Technical Support Document dated July 2016[2] which includes data analyses that Oregon conducted in support of the revised rules.

For the Oregon provisions from the 2016 adoption identified below, all underlined text indicates language that is new and strikeout text indicates that language that was removed by the 2016 adoption.

1. Toxic Substances (OAR 340-041-0033)

The following presents the new and revised language to the WQS contained in the Toxic Substances Section (OAR 340-041-0033) introductory paragraph and in 340-041-0033(2).

Toxic Substances

340-041-0033

Toxic Substances

~~Effectiveness. Amendments to this rule and associated revisions to Table 30 under OAR 340-041-8033 do not become applicable for purposes of ORS chapter 468B or the federal Clean Water Act until EPA approves the revisions it identifies as water quality standards according to 40 CFR 131.21 (4/27/2000).~~

(2) Aquatic Life Numeric Criteria. Levels of toxic substances in waters of the state may not exceed the applicable aquatic life criteria ~~listed~~ as defined in Table 30 under OAR 340-041-8033.

The EPA Action

[2] Oregon TSD, 2016: *Technical Support Document: An Evaluation to Derive Statewide Copper Criteria Using the Biotic Ligand Model*, July 2016. Herein referred to as Oregon TSD 2016.

In accordance with its CWA authority, 33 U.S.C. Section 1313(c)(3) and 40 CFR Part 131, the EPA approves the revisions to the introductory language in OAR 340-041-0033 and the revision to 340-041-0033(2). The EPA approves the revisions because the introductory language is non-substantive and the revision in (340-041-0033(2) more accurately describe the content of Table 30. The revision to the introductory text of OAR 340-041-0033 for Table 30 deletes the Effectiveness clause that applies to Table 30, OAR 340-041-8033. The Effectiveness clause restates existing federal law and regulations that new or revised WQS revisions are not effective for CWA purposes until the EPA approves such WQS pursuant to 303(c) and is therefore not a necessary part of Oregon's WQS. The EPA notes that the deletion of the Effectiveness clause renders amendments and revisions to Table 30 applicable for State regulatory purposes immediately. While Oregon indicates that the revision is non-substantive, the EPA considers the revision to 340-041-0033(2) to be substantive because Oregon does not only list criteria in Table 30 (as the previous wording held) but includes additional descriptions of the magnitude, duration, and frequency as well as other descriptive information for the criteria in Table 30.

2. EPA Action on Freshwater Aquatic Life Criteria for Copper, Table 30, OAR 340-041-8033

The following presents the introductory language for Section OAR 340-041-8033 and the new freshwater copper criteria contained in Table 30. All blue underlined text indicates language that is new and red strikeout indicates the language that was removed by the 2016 adoption.

340-041-8033

Toxics Water Quality Criteria Tables

Table 30: Aquatic Life Water Quality Criteria for Toxic Pollutants. This table, referenced in OAR 340-041-0033, contains information about the applicability and content of the criteria contained in the table.

Table 31: Aquatic Life Water Quality Guidance Values for Toxic Pollutants. This table, referenced in OAR 340-041-0033, contains information about the applicability and content of the criteria contained in the table.

Table 40: Human Health Water Quality Criteria for Toxic Pollutants. This table, referenced in OAR 340-041-0033, contains information about the applicability and content of the criteria contained in the table.

~~The tables listed above in this rule are referenced in the water quality standards Toxics Substances Rule under OAR 340-041-0033. See that rule for important information about the applicability and content of these tables.~~

~~**NOTE:** In January 2015, the Environmental Quality Commission adopted revisions to Table 30 that revised the aquatic life freshwater criteria for ammonia. The Table 30 version accessed below reflects the revision to the ammonia criteria including several other clarifications. **Revised Table 30 is not applicable for Clean Water Act purposes until EPA approves the revisions.**~~

~~REVISED~~ TABLE 30: Aquatic Life Water Quality Criteria

for Toxic Pollutants

~~*Revised Version of This Table Not in Effect Until Approved By EPA*~~

Aquatic Life Criteria Summary

The concentration for each compound listed in Table 30 is a criterion ~~not to be exceeded in~~established for waters of the state in order to protect aquatic life. The aquatic life criteria apply to waterbodies where the protection of fish and aquatic life is a designated use. All values are expressed as micrograms per liter (µg/L). Compounds are listed in alphabetical order with the corresponding information: the Chemical Abstract Service (CAS) number, whether there is a human health criterion for the pollutant (i.e. "y"= yes, "n" = no), and the associated aquatic life freshwater and saltwater acute and chronic criteria. Italicized pollutants are not identified as priority pollutants by EPA. Dashes in the table column indicate that there is no aquatic life criterion.

Unless otherwise noted in the table below, the acute criterion is the Criterion Maximum Concentration (CMC) applied as a one-hour average concentration, and the chronic criterion is the Criterion Continuous Concentration (CCC) applied as a 96-hour (4 days) average concentration. The CMC and CCC criteria may not be exceeded more than once every three years. Footnote A, associated with eleven pesticide pollutants in Table 30, describes the exception to the frequency and duration of the toxics criteria stated in this paragraph.

Oregon Department of Environmental Quality
~~Revised~~ Table 30 ~~—Not In Effect Until Approved by EPA~~
Aquatic Life Water Quality Criteria for Toxic Pollutants
340-041-8033

	Pollutant	CAS Number	Human Health Criterion	Freshwater *(µg/L)*	Saltwater *(µg/L)*

				Acute Criterion (CMC)	Chronic Criterion (CCC)	Acute Criterion (CMC)	Chronic Criterion (CCC)
1	Aldrin	309002	y	3 [A]	--	1.3 [A]	--
[A] *See expanded endnote A at bottom of Table 30 for alternate frequency and duration of this criterion.*							
2	*Alkalinity*		n	--	20,000 [B]	--	--
[B] *Criterion shown is the minimum (i.e. CCC in water may not be below this value in order to protect aquatic life).*							
3	*Ammonia*	7664417	n	*The ammonia criteria are pH and temperature dependent — See ammonia criteria Tables 30(a)-(c) at end of Table 30.* [M]		*The ammonia criteria are pH, temperature and salinity dependent. Values for saltwater criteria (total ammonia) can be calculated from the tables specified in Ambient Water Quality Criteria for Ammonia (Saltwater)—1989 (EPA 440/5-88-004) See DEQ's calculator for calculating saltwater ammonia criteria at: http://www.deq.state.or.us/wq/standards/toxics.htm*	
[M] *The acute criteria in Table 30(a) apply in waterbodies where salmonids are a designated use in OAR 340-041-0101 through OAR 340-041-0340. The acute criteria in Table 30(b) apply in waterbodies where salmonids are not a designated use. The chronic criteria in Table 30(c) apply where fish and aquatic life is a designated use. It is not necessary to account for the presence or absence of salmonids or the presence of any early life stage of fish for the chronic criteria. Refer to DEQ's beneficial use website at: http://www.deq.state.or.us/wq/standards/uses.htm for additional information on salmonid beneficial use designations, including tables and maps.*							
4	Arsenic	7440382	y	340 [C, D]	150 [C, D]	69 [C, D]	36 [C, D]
[C] *Criterion is expressed in terms of "dissolved" concentrations in the water column.* [D] *Criterion is applied as total inorganic arsenic (i.e. arsenic (III) + arsenic (V)).*							
5	BHC Gamma (Lindane)	58899	y	0.95	0.08 [A]	0.16 [A]	--
[A] *See expanded endnote A at bottom of Table 30 for alternate frequency and duration of this criterion.*							
6	Cadmium	7440439	n	*See* E	*See* C, F	40 [C]	8.8 [C]
[C] *Criterion is expressed in terms of "dissolved" concentrations in the water column.* [E] *The freshwater criterion for this metal is expressed as "total recoverable" and is a function of hardness (mg/L) in the water column. To calculate the criterion, use formula under expanded endnote E at bottom of Table 30.* [F] *The freshwater criterion for this metal is expressed as a function of hardness (mg/L) in the water column. To calculate the criterion, use formula under expanded endnote F at bottom of Table 30.*							
7	Chlordane	57749	y	2.4 [A]	0.0043 [A]	0.09 [A]	0.004 [A]
[A] *See expanded endnote A at bottom of Table 30 for alternate frequency and duration of this criterion.*							
8	*Chloride*	16887006	n	860,000	230,000	--	--
9	*Chlorine*	7782505	n	19	11	13	7.5

Oregon Department of Environmental Quality

~~Revised~~ Table 30 ~~—Not In Effect Until Approved by EPA~~

Aquatic Life Water Quality Criteria for Toxic Pollutants

340-041-8033

	Pollutant	CAS Number	Human Health Criterion	Freshwater (µg/L)		Saltwater (µg/L)	
				Acute Criterion (CMC)	Chronic Criterion (CCC)	Acute Criterion (CMC)	Chronic Criterion (CCC)
10	*Chlorpyrifos*	2921882	n	0.083	0.041	0.011	0.0056
11	Chromium III	16065831	n	*See* C, F	*See* C, F	--	--
	[C] *Criterion is expressed in terms of "dissolved" concentrations in the water column.* [F] *The freshwater criterion for this metal is expressed as a function of hardness (mg/L) in the water column. To calculate the criterion, use formula under expanded endnote F at bottom of Table 30.*						
12	Chromium VI	18540299	n	16 [C]	11 [C]	1100 [C]	50 [C]
	[C] *Criterion is expressed in terms of "dissolved" concentrations in the water column.*						
13	Copper	7440508	y	*See* ~~E~~ C, N	*See* ~~E~~ C, N	4.8 [C]	3.1 [C]
	[C] *Criterion is expressed in terms of "dissolved" concentrations in the water column.* ~~[E] The freshwater criterion for this metal is expressed as "total recoverable" and is a function of hardness (mg/L) in the water column. To calculate the criterion, use formula under expanded endnote E at bottom of Table 30.~~ [N] *The freshwater criterion for copper is a function of the concentration of ions, alkalinity, organic carbon, pH and temperature in the water column. To calculate the criterion, use the Biotic Ligand Model referenced in endnote N at the bottom of Table 30. The acute copper criterion (CMC) is applied as a one-hour average concentration. The chronic criterion (CCC) is applied as a 96-hour (4 days) average concentration. See endnote N also for procedures and information.* *[Note: The Environmental Quality Commission adopted these revised copper criteria on 11/02/2016. However, the revised criteria become effective for federal Clean Water Act purposes upon approval by the U.S. Environmental Protection Agency.*						
14	Cyanide	57125	y	22 [J]	5.2 [J]	1 [J]	1 [J]
	[J] *This criterion is expressed as µg free cyanide (CN)/L.*						
15	DDT 4,4'	50293	y	1.1 [A, G]	0.001 [A, G]	0.13 [A, G]	0.001 [A, G]
	[A] *See expanded endnote A at bottom of Table 30 for alternate frequency and duration of this criterion.* [G] *This criterion applies to DDT and its metabolites (i.e. the total concentration of DDT and its metabolites should not exceed this value).*						
16	*Demeton*	8065483	n	--	0.1	--	0.1
17	Dieldrin	60571	y	0.24	0.056	0.71 [A]	0.0019 [A]

Oregon Department of Environmental Quality

~~Revised~~ Table 30 ~~— Not In Effect Until Approved by EPA~~

Aquatic Life Water Quality Criteria for Toxic Pollutants

340-041-8033

	Pollutant	CAS Number	Human Health Criterion	Freshwater (µg/L)		Saltwater (µg/L)	
				Acute Criterion (CMC)	Chronic Criterion (CCC)	Acute Criterion (CMC)	Chronic Criterion (CCC)
	[A] *See expanded endnote A at bottom of Table 30 for alternate frequency and duration of this criterion.*						
18	Endosulfan	115297	n	0.22 [A, H]	0.056 [A, H]	0.034 [A, H]	0.0087 [A, H]
	[A] *See expanded endnote A at bottom of Table 30 for alternate frequency and duration of this criterion.* [H] *This value is based on the criterion published in Ambient Water Quality Criteria for Endosulfan (EPA 440/5-80-046) and should be applied as the sum of alpha- and beta-endosulfan.*						
19	Endosulfan Alpha	959988	y	0.22 [A]	0.056 [A]	0.034 [A]	0.0087 [A]
	[A] *See expanded endnote A at bottom of Table 30 for alternate frequency and duration of this criterion.*						
20	Endosulfan Beta	33213659	y	0.22 [A]	0.056 [A]	0.034 [A]	0.0087 [A]
	[A] *See expanded endnote A at bottom of Table 30 for alternate frequency and duration of this criterion.*						
21	Endrin	72208	y	0.086	0.036	0.037 [A]	0.0023 [A]
	[A] *See expanded endnote A at bottom of Table 30 for alternate frequency and duration of this criterion.*						
22	*Guthion*	86500	n	--	0.01	--	0.01
23	Heptachlor	76448	y	0.52 [A]	0.0038 [A]	0.053 [A]	0.0036 [A]
	[A] *See expanded endnote A at bottom of Table 30 for alternate frequency and duration of this criterion.*						
24	Heptachlor Epoxide	1024573	y	0.52 [A]	0.0038 [A]	0.053 [A]	0.0036 [A]
	[A] *See expanded endnote A at bottom of Table 30 for alternate frequency and duration of this criterion.*						
25	*Iron (total)*	7439896	n	--	1000	--	--
26	Lead	7439921	n	*See* C , F	*See* C , F	210 [C]	8.1 [C]
	[C] *Criterion is expressed in terms of "dissolved" concentrations in the water column.* [F] *The freshwater criterion for this metal is expressed as a function of hardness (mg/L) in the water column. To calculate the criterion, use formula under expanded endnote F at bottom of Table 30.*						
27	*Malathion*	121755	n	--	0.1	--	0.1
28	Mercury (total)	7439976	n	2.4	0.012	2.1	0.025
29	*Methoxychlor*	72435	y	--	0.03	--	0.03

Oregon Department of Environmental Quality

~~Revised~~ Table 30 ~~—Not In Effect Until Approved by EPA~~

Aquatic Life Water Quality Criteria for Toxic Pollutants

340-041-8033

	Pollutant	CAS Number	Human Health Criterion	Freshwater (µg/L)		Saltwater (µg/L)	
				Acute Criterion (CMC)	Chronic Criterion (CCC)	Acute Criterion (CMC)	Chronic Criterion (CCC)
30	*Mirex*	2385855	n	--	0.001	--	0.001
31	Nickel	7440020	y	*See* C , F	*See* C , F	74 [C]	8.2 [C]
[C] *Criterion is expressed in terms of "dissolved" concentrations in the water column.* [F] *The freshwater criterion for this metal is expressed as a function of hardness (mg/L) in the water column. To calculate the criterion, use formula under expanded endnote F at bottom of Table 30.*							
32	*Parathion*	56382	n	0.065	0.013	--	--
33	Pentachlorophenol	87865	y	*See* H	*See* H	13	7.9
[H] *Freshwater aquatic life values for pentachlorophenol are expressed as a function of pH, and are calculated as follows: CMC=(exp(1.005(pH)-4.869); CCC=exp(1.005(pH)-5.134).*							
34	*Phosphorus Elemental*	7723140	n	--	--	--	0.1
35	Polychlorinated Biphenyls (PCBs)	NA	y	2 [K]	0.014 [K]	10 [K]	0.03 [K]
[K] *This criterion applies to total PCBs (e.g.* determined as Aroclors or congeners)							
36	Selenium	7782492	y	*See* C , L	4.6 [C]	290 [C]	71 [C]
[C] *Criterion is expressed in terms of "dissolved" concentrations in the water column.* [L] *The CMC=(1/[(f1/CMC1)+(f2/CMC2)]µg/L) * CF where f1 and f2 are the fractions of total selenium that are treated as selenite and selenate, respectively, and CMC1 and CMC2 are 185.9 µg/L and 12.82 µg/L, respectively. See expanded endnote F for the Conversion Factor (CF) for selenium.*							
37	Silver	7440224	n	*See* C , F	0.10 [C]	1.9 [C]	--
[C] *Criterion is expressed in terms of "dissolved" concentrations in the water column.* [F] *The freshwater acute criterion for this metal is expressed as a function of hardness (mg/L) in the water column. To calculate the criterion, use formula under expanded endnote F at bottom of Table 30.*							
38	*Sulfide Hydrogen Sulfide*	7783064	n	--	2	--	2
39	Toxaphene	8001352	y	0.73	0.0002	0.21	0.0002
40	*Tributyltin (TBT)*	688733	n	0.46	0.063	0.37	0.01
41	Zinc	7440666	y	*See* C , F	*See* C , F	90 [C]	81 [C]

Oregon Department of Environmental Quality

~~Revised~~ Table 30 ~~—Not In Effect Until Approved by EPA~~

Aquatic Life Water Quality Criteria for Toxic Pollutants

340-041-8033

	Pollutant	CAS Number	Human Health Criterion	Freshwater (µg/L)		Saltwater (µg/L)	
				Acute Criterion (CMC)	Chronic Criterion (CCC)	Acute Criterion (CMC)	Chronic Criterion (CCC)

[C] *Criterion is expressed in terms of "dissolved" concentrations in the water column.*

[F] *The freshwater criterion for this metal is expressed as a function of hardness (mg/L) in the water column. To calculate the criterion, use formula under expanded endnote F at bottom of Table 30.*

Expanded Endnotes A, E, F, N

Endnote A: Alternate Frequency and Duration for Certain Pesticides

This criterion is based on EPA recommendations issued in 1980 that were derived using guidelines that differed from EPA's 1985 Guidelines which update minimum data requirements and derivation procedures. The CMC may not be exceeded at any time and the CCC may not be exceeded based on a 24-hour average. The CMC may be applied using a one hour averaging period not to be exceeded more than once every three years, if the CMC values given in Table 30 are divided by 2 to obtain a value that is more comparable to a CMC derived using the 1985 Guidelines.

Endnote E: Equations for Hardness-Dependent Freshwater ~~Metals Criteria for~~ Cadmium Acute ~~and Copper Acute and Chronic~~ Criteria

The freshwater criterion for this metal is expressed as total recoverable with two significant figures, and is a function of hardness (mg/L) in the water column. Criteria values ~~for~~ based on hardness are calculated using the following formula~~s~~ (CMC refers to the acute criterion~~; CCC refers to the chronic criterion~~):

$$\mathbf{CMC} = (\exp(m_A*[\ln(\text{hardness})] + b_A))$$

~~$$\text{CCC} = (\exp(m_C*[\ln(\text{hardness})] + b_C))$$~~

Chemical	m_A	b_A	m_C	b_C
Cadmium	1.128	-3.828	N/A	N/A
~~Copper~~	~~0.9422~~	~~-1.464~~	~~0.8545~~	~~-1.465~~

Endnote F: Equations for Hardness-Dependent Freshwater Metals Criteria and Conversion Factor Table

The freshwater criterion for this metal is expressed as dissolved with two significant figures, and is a function of hardness (mg/L) in the water column. Criteria values ~~for~~ based on hardness are calculated using the following formulas (CMC refers to the acute criterion; CCC refers to the chronic criterion):

$$\mathbf{CMC} = (\exp(m_A*[\ln(\text{hardness})] + b_A))*CF$$

$$\mathbf{CCC} = (\exp(m_C*[\ln(\text{hardness})] + b_C))*CF$$

"CF" is the conversion factor used for converting a metal criterion expressed as the total recoverable fraction in the water column to a criterion expressed as the dissolved fraction in the water column.

Chemical	m_A	b_A	m_C	b_C
Cadmium	N/A	N/A	0.7409	-4.719
Chromium III	0.8190	3.7256	0.8190	0.6848
Lead	1.273	-1.460	1.273	-4.705
Nickel	0.8460	2.255	0.8460	0.0584
Silver	1.72	-6.59	--	--
Zinc	0.8473	0.884	0.8473	0.884

The conversion factors (CF) below must be used in the equations above for the hardness-dependent metals in order to convert total recoverable metals criteria to dissolved metals criteria. For metals that are not hardness-dependent (i.e. arsenic, chromium VI, selenium, and silver (chronic)), or are saltwater criteria, the criterion value associated with the metal in Table 30 already reflects a dissolved criterion based on its conversion factor below.

Conversion Factor (CF) Table for Dissolved Metals

Chemical	Freshwater		Saltwater	
	Acute	Chronic	Acute	Chronic
Arsenic	1.000	1.000	1.000	1.000
Cadmium	N/A	1.101672-[(ln hardness)(0.041838)]	0.994	0.994
Chromium III	0.316	0.860	--	--
Chromium VI	0.982	0.962	0.993	0.993
Copper	N/A	N/A	0.83	0.83
Lead	1.46203-[(ln hardness)(0.145712)]	1.46203-[(ln hardness)(0.145712)]	0.951	0.951
Nickel	0.998	0.997	0.990	0.990
Selenium	0.996	0.922	0.998	0.998
Silver	0.85	0.85	0.85	--
Zinc	0.978	0.986	0.946	0.946

Endnote N: Deriving freshwater copper criteria

The freshwater copper criteria at any time are the Biotic Ligand Model (BLM) derived Instantaneous Water Quality Criteria (IWQC) output based on a concurrently measured set of model input parameter values. The Biotic Ligand Model uses multiple ambient water quality parameters to derive 1-hour acute exposure (CMC) and 96-hour chronic exposure (CCC) water quality criteria (IWQC) for copper based on the site specific water chemistry that determines the toxicity of copper to aquatic life. If measured data for one or more of the model input parameters used to derive the acute and chronic IWQC is not available, the procedures in section (1) or (2) of this endnote will be used as specified to substitute an estimate or a default value for the missing input parameter. BLM results (IWQC) based on sufficient measured input parameter data are more accurate and supersede results based on estimates or default values. The acceptable BLM software to calculate the IWQC include version 2.2.3, referenced in "Aquatic Life Ambient Freshwater Quality Criteria – Copper": EPA-822-R-07-001, February 2007, and version 2.2.4. The criteria are expressed as dissolved copper in micrograms per liter (to the nearest one-tenth).

(1) Input Parameter Substitution and Estimation Procedures to Derive BLM Criteria (IWQC)

If the measured value for any input parameter needed to derive an IWQC using the BLM is not available, DEQ will substitute an estimated input parameter value according to the procedures described in this section [Endnote N (1)]. If the data required to determine the estimated parameter value is not available, DEQ will use default values derived according to the procedures in Endnote N (2).

(a) Total recoverable concentration measurements will be substituted for dissolved concentration measurements that are not available. For alkalinity, calcium, chloride, magnesium, potassium, sodium and sulfate, total recoverable concentration measurements will be used as a direct substitute for dissolved concentration measurements. Total organic carbon (TOC) measurements will be multiplied by 0.83 to convert the TOC value to an equivalent dissolved organic carbon (DOC) value; except where sufficient TOC and DOC data are available for a site, DEQ will calculate and apply a site-specific translator in place of 0.83 to convert TOC values to DOC for use in the BLM.

(b) Alkalinity, calcium, chloride, magnesium, potassium, sodium and sulfate:
If data for any of these BLM input parameters are missing from a particular dataset, DEQ will estimate its value based on the relationship of the ion or alkalinity to specific conductance measurements for that data set using the regression analysis equations in Table 1. Specific conductance measurements must be concurrent with the other BLM input parameters dataset.

Table N-1.

Parameter	Regression Equation
Alkalinity	$Alk. = \exp^{(0.88 \cdot [\ln(SpC)] - 0.41)}$
Calcium	$Ca = \exp^{(0.96 \cdot [\ln(SpC)] - 2.29)}$
Chloride	$Cl = \exp^{(1.15 \cdot [\ln(SpC)] - 3.82)}$
Magnesium	$Mg = \exp^{(0.91 \cdot [\ln(SpC)] - 3.09)}$
Potassium	$K = \exp^{(0.84 \cdot [\ln(SpC)] - 3.74)}$
Sodium	$Na = \exp^{(0.86 \cdot [\ln(SpC)] - 2.22)}$
Sulfate	$SO_4 = \exp^{(1.45 \cdot [\ln(SpC)] - 5.59}$

Where, "SpC" is a measurement of specific conductance in µmhos/cm, "ln" is the natural logarithm, and "exp" is a mathematical constant that is the base of the natural logarithm.

(c) pH
If concurrent pH data is missing from the sample dataset, DEQ will use a representative pH value determined by interpolating from data available for the site or proximate monitoring locations where conditions (such as type of water body, stream flow and geology) are similar to the site. DEQ will use the available data and methods to produce the best practicable estimate of pH for the site and time for which the IWQC is being derived.

(d) Temperature
If concurrent temperature data is missing from the sample dataset, DEQ will use a monthly mean temperature based on data available for the site or proximate monitoring locations where conditions (such as type of water body and stream flow) are similar to the site.

(e) Humic Acid
If sufficient high quality data on the percentage of humic acid as a proportion of DOC is available for a site, DEQ will use that value in the BLM in place of the default value of 10% used in the model.

(2) Default Action Values

If the measured value for DOC, alkalinity, calcium, chloride, magnesium, potassium, sodium or sulfate is not available to derive an IWQC using the BLM, and the parameter value cannot be estimated as specified in section (1) above, DEQ will use a conservative input value for the missing parameter as described in this section [Endnote N (2)] to derive a default action value using the Biotic Ligand Model. The default action value will be used for Clean Water Act purposes until measured or estimated input parameter data are available to derive accurate copper criteria (IWQC) based on site specific water chemistry.

(a) The default input parameter values for DOC, alkalinity calcium, chloride, magnesium, potassium, sodium and sulfate will be the percentile value from the distribution of the high quality data available for surface waters in the region as shown in Table N-2.

Table N-2. Percentile of data distribution to be used as default value by region

Region	DOC percentile	Alkalinity and Ions percentile
Willamette	20th	20th
Coastal	20th	20th
Cascades	20th	20th
Eastern	15th	15th
Columbia River	20th	20th

(b) The regional default values for each parameter and region will be updated periodically as additional high quality data becomes available and is added to DEQ's database.
(c) The regional default values for each parameter are available on DEQ's website.
(d) The regions listed in Table N-2 are comprised of the following EPA Level III ecoregions or waterbody:
(i) Willamette: the Willamette Valley
(ii) Coastal: Coast Range and Klamath Mountains

(iii) Cascades: Cascades
(iv) Eastern: Eastern Cascades Slopes and Foothills, Columbia Plateau, Blue Mountains, Northern Basin and Range and Snake River Plain
(v) Columbia River: Columbia River mainstem in Oregon

(3) General Policies

(a) The copper BLM derives instantaneous criteria results (IWQC) that vary at a site over time reflecting the effect of local water chemistry on copper toxicity to aquatic organisms. DEQ will apply the BLM criteria for Clean Water Act purposes to protect the water body during the most bioavailable or toxic conditions.

(b) For assessing waters of the state, DEQ will use approaches that give preference to the use of BLM criteria derived with site-specific measured input parameter data.

The EPA Action

In accordance with its CWA authority, 33 U.S.C. Section 1313(c)(3) and 40 CFR Part 131, the EPA approves the introductory language text revisions under OAR-340-8033, which include the addition of a title to OAR 340-041-8033; the addition of separate references added to Tables 30, 31, and 40 which describe the information contained in each table and a reference to OAR 340-041-0033, and the deletion of that same text below the individual Table provisions; and the deletion of a note that references the adoption of revised ammonia criteria.

In addition, the EPA is approving the introductory title and text changes to Table 30, *Aquatic Life Water Quality Criteria for Toxic Pollutants*. The revisions include the deletion of terms "Revised" and phrase "Revised Version of This Table Not in Effect Until Approved By EPA." The EPA is also approving the replacement of the phrase "not to be exceeded in" with "established for."

Lastly, the EPA is also approving the magnitude, frequency, and duration of the acute and chronic freshwater copper criteria contained in Table 30; the inclusion of footnote C, the addition of footnote N, and the deletion of footnote E from the freshwater copper criteria; the revisions to Endnote E; and certain parts of the new Endnote N including the narrative introductory text and Sections [subparts] (1) in its entirety, (2) in its entirety, and (3)(a).

The EPA Rationale

EPA's WQS regulations at 40 C.F.R. 131 require that criteria protect the designated uses. Oregon's aquatic life toxics criteria are to protect aquatic life designated uses in Oregon and thus must be established at a level to protect those uses. Therefore, EPA must evaluate whether the new and revised WQS protect Oregon's aquatic life uses.

Regarding the introductory text to Table 30, all of the revisions are considered explanatory and descriptive, and thus are non-substantive. The ammonia criteria were approved by the EPA in 2016 and thus the note regarding the applicability of the ammonia criteria is no longer needed in Oregon rules. Similarly, the title and text deletions do not change the applicability of WQS in effect for CWA purposes and therefore are unnecessary and may be deleted.

It is stated further in the introductory text that, "the CMC and CCC criteria may not be exceeded more than once every three years. Footnote A, associated with eleven pesticide pollutants in Table 30, describes the exception to the frequency and duration of the toxics criteria stated in this paragraph." The allowable frequencies of exceedance of the magnitude (CCC and CMC) of the criteria have been established for the pollutants in Oregon WQS within Table 30. Because the criteria concentration magnitudes (i.e., CCC's and CMC's) may be exceeded in accordance with the frequencies of exceedance that have been established in Oregon rules and approved by the EPA, the "established for" language is more accurate than the "not to be exceeded in" language highlighted in Oregon's revision to the introductory text to Table 30. Therefore, the EPA is approving the aforementioned revisions to the introductory text to Table 30.

The revised freshwater copper criteria adopted by Oregon and established in Table 30 are consistent with the EPA's 2007 304(a) recommendations for freshwater copper aquatic life criteria. The EPA's 304(a) recommendation provides an extensive technical basis and justification as to how the recommended aquatic life criteria adequately protect aquatic life uses.[3,4] The 2007 304(a) recommendation, the copper biotic ligand model (BLM), uses ten input parameters to calculate instantaneous water quality criteria (IWQC), which are the protective criteria magnitudes corresponding to the water quality conditions for which they are calculated. The copper BLM more accurately reflects the aqueous toxicity of copper in a waterbody than the EPA's previous recommendation, which used an equation that calculated copper criteria based solely on the hardness of the water.

Endnote N of the Oregon revised freshwater copper rules sections [subparts] (1) and (2) include procedures that will be used to substitute an estimate or default value for missing input parameter data when calculating copper criteria with the copper BLM. These substitution methods are important for situations when sufficient high-quality input data to represent a waterbody's water quality conditions are unavailable.

For sections (1) and (2), Oregon followed the data analysis procedures identified in the EPA's Draft Missing Parameters Document (EPA 2016),[5] applied to an Oregon dataset that contained additional data sources, including high quality data from Oregon's database, along with other government data sources (U.S. Geological Survey). Oregon's total dataset included over 155,000 individual measured results, and 4,607 samples included concurrently measured parameters most influential on Cu bioavailability (pH, DOC) and were analyzed in the Oregon TSD 2016[6] Figure 16, p 55 and page 56). For section (1)(a), Oregon has provided several analyses to demonstrate the suitability of substituting total recoverable values in place of dissolved concentrations for the ions, alkalinity, and dissolved organic carbon. For the ions and alkalinity, the relationship between total and dissolved concentration was highly significant (total captured over 99% of the variability in dissolved concentrations for each ion and alkalinity), and the total-to-dissolved concentrations align to a 1:1 line, which demonstrates that there should be little difference in substituting total for dissolved ions and alkalinity directly.[7] In the case of total organic carbon (TOC), the statewide relationship is adequate, with TOC capturing over 90% of the variability in

[3] *Aquatic Life Ambient Water Quality Criteria for Copper – Freshwater, 2007, EPA 822-R-07-001.*

[4] Note: the duration for the acute criterion included in the EPA's 304(a) recommendation is 24-hours, not the 1-hour average that is included in Oregon's rules. The EPA has concluded that the acute criteria duration of 1-hour, not 24-hours, is appropriate for BLM acute criteria calculations. The information that the EPA reviewed and that Oregon used as a basis for the 1-hour acute is cited in the Copper EQC Report Item G, page 000158.

[5] The EPA's Draft Missing Parameters Document 2016: *Draft Technical Support Document: Recommended Estimates for Missing Water Quality Parameters for Application in EPA's Biotic Ligand Model* March 2016 EPA 820-R-15-106

[6] Oregon TSD, 2016: *Technical Support Document: An Evaluation to Derive Statewide Copper Criteria Using the Biotic Ligand Model*, July 2016.

[7] EQC Item G, 2016: *Oregon Department of Environmental Quality Nov. 2-3, 2016 Oregon Environmental Quality Commission meeting Rulemaking, Action item G Water Quality Standards for Copper*. Issue Paper: Water Quality Standards Revisions for Freshwater Copper Section 6.2.2, pp. 000212-213.

dissolved organic carbon (DOC) (p value < $1x10^{-6}$). Based on the statewide relationship, Oregon has included a 0.83 ratio to convert TOC to DOC. The data were insufficient or too variable to develop regional TOC to DOC conversions for all of the regions at this time. Based on sufficient regional data that are available, the 0.83 translator is a conservative conversion between TOC and DOC for the Eastern and Willamette Regions (Eastern Region translator of 0.85 and Willamette Valley of 0.95). To develop the statewide translator, Oregon is using all of the high quality data available to capture the variability in the input parameters. The EPA is also aware that Oregon intends to continue to collect DOC data, with a focus on continuing to acquire seasonally representative regional data and may develop regional translators over time.[8] For provision 1(b), Oregon has demonstrated that a strong positive correlation exists between specific conductivity and the suite of ions and alkalinity (Spearman's rank correlation coefficients ranging from 0.81-0.97, $p<0.001$), and that the substitution method using specific conductance can accurately predict IWQC calculated using measured data (R^2 >0.99 for all parameters; Oregon TSD 2016, Figure 21, page 89).

Regarding sections 1(c) and 1(d), Oregon has collected pH and temperature data corresponding to the majority of sampling events in Oregon's database for which DOC and estimated or measured ions and alkalinity are available to calculate IWQC (Oregon EQC Item G 2016;[9] Table 6.2; 1% of sample events to calculate IWQC lack pH data while 0.05% of samples lack temperature data; 8% and 7% of copper samples lack pH and temperature data, respectively). In case such data are missing for a particular time or waterbody, Oregon has included estimation methods for these input parameters. For pH, because it can vary over the day, season, and year, Oregon has included a provision to substitute a representative measured pH datapoint from a site with comparable conditions (such as type of water body, stream flow and geology) for any IWQC calculation that is missing pH data, with procedures outside of the rule describing intended implementation.[10] For temperature, to which the BLM is not sensitive under the range of temperatures within the database (Oregon TSD 2016, Figure 16), Oregon will use a monthly mean temperature estimate from a site that is comparable to the waterbody for which the data will be substituted. EPA's Draft Missing Parameters Document (2016) recommends that measured data be used for temperature and pH in the BLM criteria calculations, and the Document did not specify methods to be used to estimate pH and temperature where data are unavailable at a site. Such methods, including those provided by Oregon, are essential in order to evaluate copper data and calculate IWQC for past samples where concurrent collection of the

[8] EQC Item G, 2016: *Oregon Department of Environmental Quality Nov. 2-3, 2016 Oregon Environmental Quality Commission meeting Rulemaking, Action item G Water Quality Standards for Copper*. Issue Paper: Water Quality Standards Revisions for Freshwater Copper Section 6.2.2, pp. 000212-213.

[9] EQC Item G, 2016: *Oregon Department of Environmental Quality Nov. 2-3, 2016 Oregon Environmental Quality Commission meeting Rulemaking, Action item G Water Quality Standards for Copper*. Issue Paper: Water Quality Standards Revisions for Freshwater Copper Section 6.2, Table 6.2, p 000211.

[10] EQC Item G, 2016: *Oregon Department of Environmental Quality Nov. 2-3, 2016 Oregon Environmental Quality Commission meeting Rulemaking, Action item G Water Quality Standards for Copper*,
Issue Paper: Water Quality Standards Revisions for Freshwater Copper Section 6.2.6, pp. 000226-227.

BLM input parameter data did not take place. Similarly, in regards to section 1(e), for humic acid, if sufficient high quality site-specific data are available, Oregon intends to use such data in lieu of the automatic default in the BLM. The EPA supports Oregon's efforts to rely on sufficient, representative data,[11] and the EPA also agrees that substitution of high quality data according to the procedures outlined in provisions 1(c)-(e) will result in protective BLM IWQC for waterbodies in Oregon.

In section 2, "Default Action Values" narrative text and Sections 2(a)-(d), Oregon has included conservative default input parameters for DOC, alkalinity, and ions to be used in the BLM where sufficient data or estimates (as in Section 1) are unavailable. Per Section 2(a), the default action input parameter values are based on the 20th percentiles of the data distributions for four regions, the Willamette, Coastal, Cascades, and Columbia River regions, and the 15th percentile of the data distributions for the Eastern Region. Oregon intends to recalculate the default input values at intervals as data are collected; as stated in Section 2(b) of Endnote N, the input parameters will be reanalyzed periodically as data are added to Oregon databases, as additional high quality data become available.[12] As stated in Section 2(c), the default inputs values will be provided on Oregon's website, thus the default input data to be used in calculating the criteria will be readily available to the public. In Section 2(d), Oregon has identified the five physiographic regions for which individual sets of default inputs are derived. Oregon's 2016 TSD provides justification for combining data from certain Level III ecoregions for statistical strength, as Oregon found that there was no statistical difference between the separate Level III ecoregional values for the estimated or default parameters. Although the EPA Missing Parameters Document (2016) provides Level III ecoregional estimates for certain default inputs from the nine ecoregions in Oregon, Oregon based the selection of the defaults on a dataset inclusive of more individual sampling events and sites in Oregon and has appropriately identified only the physiographic regions with statistically different sets of default input parameters as defaults to be used when sufficient site-specific input data are unavailable.[13]

Oregon has demonstrated that the default input percentiles of the DOC distribution it will use to calculate IWQC will result in sufficiently protective criteria outcomes.[14] Based on a comparison

[11] Oregon has included in its latest sampling and analysis plan for the monitoring program the collection of all major copper BLM input parameters with each concurrent copper sample (Oregon Statewide Toxics Monitoring 2016 Water: Willamette, John Day, Walla Walla, Grande Ronde, Powder and Burnt Basins). According to Oregon DEQ, the inclusion of the input parameters in the monitoring program means that defaults and estimates will be used mainly for 303(d) listing and assessment using historically collected copper data that may lack one or more of the concurrently collected input parameters. Humic acid data has not been included as a part of the sampling and analysis plan and we expect Oregon to use appropriate analytical and statistical methods to determine the sufficiency of humic acid data available on a site-specific basis.

[12] As shown in Oregon TSD 2016, e.g., Figure 49, the criteria magnitudes can be variable on a site-specific basis and quite low at times, and therefore, the collection of sufficient site specific data is important to ensure that the most bioavailable conditions are captured by the sampling over time in case conditions change.

[13] Oregon relied upon all of the data in its database, including data that served as the basis for EPA's Missing Parameters Document.

[14] EQC Item G, 2016: *Oregon Department of Environmental Quality Nov. 2-3, 2016 Oregon Environmental Quality Commission meeting Rulemaking, Action item G Water Quality Standards for Copper*, pp. 000214-226.

with dissolved copper data above the quantitation limit from the Oregon database, use of Oregon's conservative defaults for DOC results in a high rate of protection, 96-100% of samples across all physiographic regions, with a low statewide Type II Error rate (i.e., probability of missed exceedances; 3%, EQC Item G Tables 6.12 and 6.11). In addition, the use of the 20th percentile of the distribution in deriving protective water column concentrations for pollutant criteria has a precedent in the EPA's final freshwater aquatic life criterion recommendation for selenium,[15] where the 20th percentile of the distribution was used to derive conservative egg-ovary criteria magnitudes with a high degree of probability of protection. Further, the EPA has calculated that when using the conservative default input values for all parameters (alkalinity, ions, and DOC), the results are even more protective, with the default input parameters calculating IWQC that are generally much more stringent in comparison to IWQC calculated using measured values, for all samples where copper concentrations were above the reporting limit.[16] Given the high probability of protectiveness demonstrated for samples evaluated using conservative defaults, it is reasonable to infer that waterbodies as a whole will be protected when evaluated using multiple samples (as would typically be expected). If there are indications that default values would not be protective for a particular waterbody, then collection of waterbody-specific input parameter data should be a priority.

Endnote N also includes the provision that "BLM results (IWQC) based on *sufficient* measured input parameter data are more accurate and supersede results based on estimates or default values" (emphasis added). The EPA interprets "sufficient" to mean that Oregon will ensure the availability of high quality site-specific data that represent waterbody conditions and, where such sufficient data are not available, Oregon will continue to rely on conservative defaults or estimates as needed.

Endnote N incorporates the version of the copper BLM software identified in the EPA's 304(a) recommendation by reference (2.2.3), and includes version 2.2.4, which allows for streamlined data assimilation. The EPA is approving Oregon's reference to the BLM software version 2.2.4 insofar as it is used to calculate IWQC that are equivalent to those calculated using version 2.2.3. The EPA is not approving the use of BLM software version 2.2.4 for calculating criteria based on the application of the fixed monitoring benchmark (FMB) tool included with version 2.2.4 or any other module of version 2.2.4 other than the BLM IWQC calculations. The inclusion of the software versions by reference will ensure that criteria are calculated in a consistent and repeatable manner using the available data.

Lastly, Endnote N includes Section [subpart] 3(a) under the "General Policies," which states that Oregon will apply the BLM criteria for CWA purposes to protect the water body during the most bioavailable or toxic conditions. The EPA interprets provision 3(a) to mean that the State will

[15] U.S. EPA 2016. *Aquatic Life Ambient Water Quality Criterion for Selenium – Freshwater 2016.* June 2016, EPA 822-R-16-006.

[16] For example, in comparing IWQC calculated using the full suite of defaults compared to measured IWQC, the ratios are low, with median ratios of the defaults to the measured IWQC of 0.24, 0.29, 0.52, 0.35, 0.64, and 0.31 (Eastern, Coast, Cascades, Willamette, and Columbia Regions, and Statewide) for the samples where reportable copper was recorded in the Oregon DEQ database.

calculate criteria that protect the designated uses of Oregon waterbodies at all times, including under the most bioavailable or toxic conditions, and in doing so, that Oregon will determine where and when the most bioavailable condition occurs at a site. The EPA anticipates that the State will use appropriate statistical methods to collect sufficiently representative data in order to ensure that the most bioavailable period is captured by the dataset.[17] For example, in Oregon's 2016 TSD and supported by analyses therein, Oregon concludes that, "At least 12 to 24 monthly samples may be necessary to accurately estimate the temporal variability of BLM IWQC at a site."[18] Based on the supplementary information and procedures included in Oregon's rule package, including the Oregon TSD 2016 and Oregon's 2016 sampling and analysis plan, the EPA anticipates that Oregon will continue to collect data and recalculate the criteria as necessary to ensure protectiveness over the long term should water quality conditions change.

Oregon's legally binding provisions governing the use of the copper BLM are described by Oregon as a performance-based standard.[19,20] Given that the legally-binding provisions in the rule provide for derivation of individual numeric values in a manner that is publicly transparent and repeatable, any site-dependent copper criteria derived using these criteria procedures should be consistent with CWA requirements and do not require individual EPA approval under § 303(c) of the CWA. Further, because Oregon's copper criteria align with the EPA's current 304(a) recommendations, incorporate the copper BLM software by reference, and include additional rule provisions in Endnote N that describe in detail how the freshwater copper criteria will be calculated using conservative defaults or site-specific data, and the State will calculate criteria to protect waterbodies when copper is most bioavailable or toxic, the EPA deems that Oregon's new criteria are protective of Oregon's aquatic life uses, and are consistent with the

[17] As stated in a letter that the EPA transmitted to Wendy Wiles and Lydia Emer, Oregon Department of Environmental Quality on June 14, 2016, the EPA has provided suggestions for Oregon to use in developing implementation methods for its CWA programs, including NPDES permitting, 303(d) listing, and TMDL development. As with all equation-based criteria, the EPA expects the state to use appropriate analytical methods, such as a Monte Carlo simulation or another analytical tool, to determine if the monitoring methods are sufficient to capture the temporal trends, and the resultant calculated criteria are adequate to represent the most bioavailable conditions for copper over time at the site. Oregon has for example included analysis to identify sampling regimes to sufficiently represent variability at certain sites in the Oregon BLM TSD 2016 (see e.g., Figures 60-61).

[18] For permitting purposes, the EPA would anticipate that, once sufficient data are collected, for example, Oregon can comply with this provision by using a conservative low-end estimate of the distribution of the IWQC at the site (along with other critical conditions assumptions) in calculating reasonable potential.

[19] Oregon EQC Item G, 2016: Oregon Department of Environmental Quality Nov. 2-3, 2016 Oregon Environmental Quality Commission meeting Rulemaking, Action item G Water Quality Standards for Copper, Supplementary Analysis (Item G page 000006). "…In order to approve a performance-based standard, EPA requires that the method generate results that are predictable and repeatable. This is straight-forward when it comes to adopting the model and deriving instantaneous water quality criteria based on measured data inputs. However, the procedures for deriving BLM results using estimated and default input parameter values must also be clear. DEQ has worked with a technical advisory committee, a policy advisory committee and EPA to develop a proposed rule to meet these objectives. In addition, in response to public comment, DEQ has made further revisions to ensure the proposed standard rule accomplishes this objective and can be approved as a performance based standard."

[20] U.S. EPA 40 CFR Part 131 [FRL–6571–7] RIN 2040–AD33 EPA Review and Approval of State and Tribal Water Quality Standards Final Rule 2000

reasonable and prudent alternative for copper criteria in the August 2012 National Marine Fisheries Service Biological Opinion.

Oregon's adoption of the freshwater copper criteria and the EPA's approval resolves the disapproval action taken by the EPA on January 31, 2013.

B. Editorial Non-substantive Revisions to the Water Quality Standards

Listed below are the editorial non-substantive revisions to water quality standards that the EPA previously approved in 2011,[21] 2014,[22] and 2015.[23] Today, the EPA is approving the non-substantive revisions to these previously approved water quality standards. These non-substantive revisions, upon approval, do not change the underlying substantive WQS that were previously approved by the EPA for purposes of the CWA.

Revisions to OAR-041-0033 do not substantively revise Oregon WQS (2011 EPA Action)	**EPA approval comments**
Subpart 5: (5) Establishing Site-Specific Background Pollutant Criteria: This provision is a performance-based water quality standard that results in site-specific human health water quality criteria under the conditions and procedures specified in this rule section. It addresses existing permitted discharges of a pollutant removed from the same body of water. For waterbodies where a discharge does not increase the pollutant's mass and does not increase the pollutant concentration by more than 3 percent, and where the water body meets a pollutant concentration associated with a risk level of 1 x 10-4, DEQ concludes that the pollutant concentration continues to protect human health.	This edit comprises the inclusion of a hyphen and is for grammatical correctness.
Subpart 5(a): (C) "Same body of water": An intake pollutant is considered to be from the "same body of water" as the discharge if DEQ finds that the intake pollutant would have reached the vicinity of the outfall point in the receiving water within a reasonable period had the permittee not removed it ~~not been removed by the permittee~~. To make this finding, DEQ requires information showing that:	This edit is to change the location of the phrase in order to change from passive to active voice
Subpart 5(a)(ii): (I) DEQ may also consider other site-specific factors relevant to the transport and fate of the pollutant to make the finding in a particular case that a pollutant would or would not have reached the vicinity of the outfall point in the receiving water within a reasonable period had the permittee not removed it~~it not been removed by the permittee~~.	This edit is to change the location of the phrase in order to change from passive to active voice
Subpart 5(a)(ii): (II) An intake pollutant from groundwater may be considered to be from the "same body of water" if DEQ determines that the pollutant would have reached the vicinity of the outfall point in the receiving water within a reasonable period had the permittee not removed it~~it not been removed by the permittee~~. A pollutant is not from the same body of water if the groundwater contains the pollutant partially or entirely due to past or present human activity, such as industrial, commercial, or municipal operations, disposal actions, or treatment processes.	This edit is to change the location of the phrase in order to change from passive to active voice
Subpart 5(b): (D) The site-specific background pollutant criterion will be effective when DEQ issues ~~upon DEQ issuance of~~ the permit for the specified permittee.	This edit is to change the location of the phrase in order to change from passive to active voice and for plain language
Subpart 5: (d) The site-specific background pollutant criterion must be the most conservative of the following four values. Section (5)(e) of this rule describes ~~T~~the procedures for deriving these values ~~are described in the sections (5)(e) of this rule~~.	This edit is to change the location of the phrase in order to change from passive to active voice

[21] *Technical Support Document for EPA's Action on Oregon's New and Revised Human Health Water Quality Criteria for Toxics and Associated Implementation Provisions Submitted July 12 and 21, 2011 October 17, 2011.*

[22] *Technical Support Document for EPA's Action on the State of Oregon's Revised Surface Water Quality Standards Submitted on January 8, 2014. April 11, 2014.*

[23] *Technical Support Document for EPA's Action on the State of Oregon's Revised Surface Water Quality Standards Submitted on January 23, 2015. August 4, 2015.*

Subpart 5(i)(B): (iv) Allowable pollutant effluent limit; and,	This edit adds a comma for grammatical correctness
Provision of OAR 340-041-8033, Table 30, does not substantively revise Oregon WQS (2014 EPA Action) Endnote F: Equations for Hardness-Dependent Freshwater Metals Criteria and Conversion Factor Table The freshwater criterion for this metal is expressed as dissolved with two significant figures, and is a function of hardness (mg/L) in the water column. Criteria values ~~for~~ based on hardness are calculated using the following formulas (CMC refers to the acute criterion; CCC refers to the chronic criterion):	This edit comprises a clarification- the use of the phrase "based on" is more clear because the sentence refers to criteria values that are calculated based on (or using) hardness data.
Provision of OAR 340-041-8033, Table 30, does not substantively revise Oregon WQS (2015 EPA Action) 3 | *Ammonia* | 7664417 | n | *The ammonia criteria are pH and temperature dependent — See ammonia criteria Tables 30(a)-(c) at end of Table 30.*[M] | *The ammonia criteria are pH, temperature and salinity dependent. Values for saltwater criteria (total ammonia) can be calculated from the tables specified in Ambient Water Quality Criteria for Ammonia (Saltwater)—1989 (EPA 440/5-88-004)* *See DEQ's calculator for calculating saltwater ammonia criteria at: http://www.deq.state.or.us/wq/standards/toxics.htm.*	This edit comprises a correction to the website address for the previously approved ammonia criteria calculator

IV. Provisions Which the EPA Has Determined Are Not Water Quality Standards

The EPA has reviewed and concluded that the Section [subpart] 3(b) of Endnote N referenced within Table 30 does not establish a legally binding requirement, and it does not describe a desired ambient condition of a waterbody to support a particular designated use. Therefore, the EPA does not consider it a WQS subject to EPA review and approval under § 303(c) of the CWA.[24] Rather, the provision merely expresses Oregon's preference in using site-specific measured input parameter data for assessment purposes. Therefore, the EPA is not taking action on this provision.

Further, Oregon submitted non-substantive revisions to provisions that the EPA did not previously take action on because the EPA concluded the previously submitted provisions were not WQS.[25] Therefore, the EPA is not taking action on the non-substantive revisions to these provisions. These non-substantive revisions include the following provisions under OAR-041-0033 Subpart 6, Arsenic Reduction Policy:

6(b)(C) (i) A~~a~~ discharge will increase the concentration of inorganic arsenic in the receiving water by 10 percent or more after mixing with the harmonic mean flow of the receiving water; or
6(b)(C) (ii) A~~a~~s an alternative, if sufficient data are available, the discharge will increase the concentration of inorganic arsenic in the surface water intake water of a public water system by 0.021 micrograms per liter or more based on a mass balance calculation.

[24] See the EPA's What is a New or Revised Water Quality Standard Under CWA 303(c)(3)? Frequently Asked Questions, October 2012.

[25] *Technical Support Document for EPA's Action on Oregon's New and Revised Human Health Water Quality Criteria for Toxics and Associated Implementation Provisions Submitted July 12 and 21, 2011 October 17, 2011*, pages 57-58

6(c) (A) The discharge adds inorganic arsenic; and,
6(d) (D) Propose specific inorganic arsenic reduction or control measures, if feasible, and an implementation schedule; and,

Lastly, the strikeout of Table 30 on pages 9-17 of the "copper standards rules redline" document submitted with Oregon's rule package represents an administrative change to Oregon's rules and does not represent a change for CWA purposes.[26] Therefore, the EPA is not taking action on the edits to these provisions.

[26] As clarified in a letter from Jennifer Wigal to Dan Opalski, January 6, 2016.