

The Indiana Department of Environmental Management (IDEM) is providing notice of its intent to publish proposed criteria for preliminary adoption that will revise Indiana's aquatic life and human health ambient water quality criteria (WQC) for select metals currently at 327 IAC 2-1-6 and 327 IAC 2-1.5-8. IDEM reviewed and modified, as warranted, proposed criteria following careful review and consideration of recommendations provided by stakeholders during the First and Second Notice of Comment Period, in developing proposed criteria for preliminary adoption.

IDEM solicited public comment on its intent to revise these criteria during a First Notice of Comment Period and Second Notice of Comment Period. Proposed revisions to criteria reflect updates based on current science and many are National Recommended Water Quality Criteria (NRWQC) at Section 304(a) of the Clean Water Act (CWA). IDEM proposed these revisions in order to remain consistent with state and federal laws and to ensure that Indiana's WQC for metals continue to reflect the best available science and support sound water quality management policies to improve and protect the water resources of the state. Based on the latest scientific knowledge, updated aquatic life and human health ambient WQC for these metals may become more or less stringent than current criteria.

For the First Notice of Comment Period, IDEM provided tables showing proposed criteria revisions. For the Second Notice of Comment Period, IDEM provided updated criteria tables along with comments to help explain some of the changes made to the First Notice tables. When applicable, the comments included information regarding the stringency of the proposed criteria relative to current criteria.

In the Second Notice of Comment Period, IDEM proposed to adopt USEPA 2016 NRWQC for cadmium and selenium. These updated criteria reflect best available science and will support water quality management practices to improve and protect water resources of the state.

For selenium, the latest scientific knowledge indicates that toxicity to aquatic life is primarily based on organisms consuming selenium-contaminated food rather than from exposure to selenium dissolved in water. The NRWQC is expressed both in terms of fish tissue concentration (egg/ovary, whole body, muscle) and water column concentration (lentic or "standing" waters, lotic or "flowing" waters). Proposed criteria for preliminary adoption will include the fish tissue and water column numeric 2016 NRWQC criterion elements and clarifying modifications specific to Indiana rules and processes to the NRWQC footnotes, for waters within and outside of the Great Lakes system. IDEM will also propose for preliminary adoption a site-specific criterion for selenium with less stringent fish tissue and water column numeric criterion elements for those waters outside of the Great Lakes system where neither sturgeon nor paddlefish (Order Acipenseriformes) occur.

With the exception of selenium, aquatic life criteria for metals are expressed in terms of either total recoverable metal or dissolved metal in the water column. For those metals expressed in terms of dissolved metal in the water column, the water quality criterion is calculated by multiplying the aquatic life criterion formula, which is expressed in terms of total recoverable metal, by the water-effects ratio, then by a conversion factor.

The aquatic life WQC proposed for preliminary adoption are presented in Tables 1 for waters outside of the Great Lakes system and in Table 2 for waters within the Great Lakes system. Calculated values for dissolved metals at a hardness of 100 mg/L as CaCO₃ are included in Table 1a for waters outside of the Great Lakes System, and Table 2a for waters within the Great Lakes System. The human health WQC proposed for preliminary adoption for waters outside of the Great Lakes system are presented in Table 3. IDEM did not propose to change any human health WQC for waters within the Great Lakes system.

Table 1: Water quality criteria for the protection of aquatic life for surface waters outside of the Great Lakes System.

Metal ¹	Current Aquatic Life Criteria (µg/L)		2 nd Notice Proposed Aquatic Life Criteria (11/15/2017) (µg/L)		Aquatic Life Criteria Proposed for Preliminary Adoption
	Acute	Chronic	Acute	Chronic	
Aluminum (Total Recoverable)	No current criterion	No current criterion	$WER(e^{(1.3695 [\ln(\text{hardness})+1.8308])})$	$WER(e^{(1.3695 [\ln(\text{hardness})+0.9161])})$	USEPA published NRWQC for aluminum in 2018; the criteria are based on bioavailability of total recoverable aluminum and are calculated based on the interaction of aluminum with pH, DOC and hardness. 2 nd Notice proposed criteria are not equivalent to NRWQC. IDEM will consider adopting NRWQC in a future rulemaking. No aluminum criteria proposed for preliminary adoption.
Arsenic (Dissolved)	WER (360) X 1.000	WER (190) X 1.000	WER (340) X 1.000	WER (150) X 1.000	2 nd Notice proposed criteria are for Total Arsenic instead of Arsenic III and are NRWQC. 2nd Notice proposed for preliminary adoption
Cadmium (Dissolved)	$WER(e^{(1.128 [\ln(\text{hardness})]-3.828)}) \times 1.136672 - [(\ln \text{hardness})(0.041838)]$	$WER(e^{(0.7852 [\ln(\text{hardness})]-3.490)}) \times 1.101672 - [(\ln \text{hardness})(0.041838)]$	$WER(e^{(0.9789 [\ln(\text{hardness})]-3.866)}) \times 1.136672 - [(\ln \text{hardness})(0.041838)]$	$WER(e^{(0.7977 [\ln(\text{hardness})]-3.909)}) \times 1.101672 - [(\ln \text{hardness})(0.041838)]$	2 nd Notice proposed criteria are 2016 NRWQC and are more stringent than current criteria 2nd Notice proposed for preliminary adoption

NRWQC: USEPA National Recommended Water Quality Criteria at Section 304(a) of the Clean Water Act.

¹ For those metals expressed in terms of dissolved metal in the water column, aquatic life criteria are expressed as a dissolved concentration and are calculated using the water-effect ratio (WER) and the specified conversion factor (CF). The AAC and CAC for dissolved metal are calculated by multiplying the WER by the criterion value or formula and then by the appropriate conversion factor. A value of one (1) must be used for the WER unless an alternate value is established under 327 IAC 2-1-8.9. The equation for this calculation is shown on the table. The equations can be used to calculate numeric criteria at any water hardness up to 400 mg/L CaCO₃. The criteria at a water hardness of 400 mg/L CaCO₃ are used for water hardnesses above 400 mg/L CaCO₃. The term “ln(hardness)” is the natural log of hardness.

Table 1: Water quality criteria for the protection of aquatic life for surface waters outside of the Great Lakes System.

Metal ¹	Current Aquatic Life Criteria (µg/L)		2 nd Notice Proposed Aquatic Life Criteria (µg/L)		Aquatic Life Criteria Proposed for Preliminary Adoption
	Acute	Chronic	Acute	Chronic	
Chromium (III) (Dissolved)	$WER(e^{(0.819 [\ln(\text{hardness})+3.688])}) \times 0.316$	$WER(e^{(0.8190 [\ln(\text{hardness})+1.561])}) \times 0.860$	$WER(e^{(0.819 [\ln(\text{hardness})+3.7256])}) \times 0.316$	$WER(e^{(0.819 [\ln(\text{hardness})+0.6848])}) \times 0.860$	2 nd Notice proposed acute criterion is less stringent than current criterion; proposed chronic criterion is more stringent than current criterion. Proposed criteria are NRWQC. 2nd Notice proposed for preliminary adoption
Chromium (VI) (Dissolved)	$WER(16) \times 0.982$	$WER(11) \times 0.962$	$WER(16) \times 0.982$	$WER(11) \times 0.962$	Current criteria will be retained
Copper (Dissolved)	$WER(e^{(0.9422 [\ln(\text{hardness})-1.464])}) \times 0.960$	$WER(e^{(0.8545 [\ln(\text{hardness})-1.465])}) \times 0.960$	$WER(e^{(0.9422 [\ln(\text{hardness})-1.700])}) \times 0.960$	$WER(e^{(0.8545 [\ln(\text{hardness})-1.702])}) \times 0.960$	2 nd Notice proposed criteria are current criteria for waters within the Great Lake System, are more stringent than current criteria, but not NRWQC. Current criteria will be retained
Lead (Dissolved)	$WER(e^{(1.273 [\ln(\text{hardness})-1.460])}) \times 1.46203-[(\ln \text{hardness})(0.145712)]$	$WER(e^{(1.273 [\ln(\text{hardness})-4.705])}) \times 1.46203-[(\ln \text{hardness})(0.145712)]$	$WER(e^{(1.273 [\ln(\text{hardness})-1.055])}) \times 1.46203-[(\ln \text{hardness})(0.145712)]$	$WER(e^{(1.273 [\ln(\text{hardness})-3.557])}) \times 1.46203-[(\ln \text{hardness})(0.145712)]$	2 nd Notice criteria are less stringent than the current criteria but are not NRWQC. Current criteria are NRWQC. Current criteria will be retained

NRWQC: USEPA National Recommended Water Quality Criteria at Section 304(a) of the Clean Water Act.

¹ For those metals expressed in terms of dissolved metal in the water column, aquatic life criteria are expressed as a dissolved concentration and are calculated using the water-effect ratio (WER) and the specified conversion factor (CF). The AAC and CAC for dissolved metal are calculated by multiplying the WER by the criterion value or formula and then by the appropriate conversion factor. A value of one (1) must be used for the WER unless an alternate value is established under 327 IAC 2-1-8.9. The equation for this calculation is shown on the table. The equations can be used to calculate numeric criteria at any water hardness up to 400 mg/L CaCO₃. The criteria at a water hardness of 400 mg/L CaCO₃ are used for water hardnesses above 400 mg/L CaCO₃. The term “ln(hardness)” is the natural log of hardness.

Table 1: Water quality criteria for the protection of aquatic life for surface waters outside of the Great Lakes System.

Metal ¹	Current Aquatic Life Criteria (µg/L)		2 nd Notice Proposed Aquatic Life Criteria (µg/L)		Aquatic Life Criteria Proposed for Preliminary Adoption
	Acute	Chronic	Acute	Chronic	
Mercury (Total Recoverable)	2.4	0.012	2.4	0.012	Current criteria will be retained
Mercury (Dissolved)	No current criterion	No current criterion	No proposed criterion	No proposed criterion	No dissolved mercury criteria will be proposed for preliminary adoption.
Nickel (Dissolved)	$\text{WER} (e^{(0.8460 [\ln(\text{hardness})+3.3612])}) \times$ 0.998	$\text{WER}(e^{(0.8460 [\ln(\text{hardness})]+1.1645)}) \times$ 0.997	$\text{WER} (e^{(0.846 [\ln(\text{hardness})]+2.255)}) \times$ 0.998	$\text{WER} (e^{(0.846 [\ln(\text{hardness})]+0.0584)}) \times$ 0.997	2 nd Notice proposed criteria are more stringent than current criteria and are NRWQC. 2nd Notice proposed for preliminary adoption
Selenium (Total Dissolved Recoverable)	130 (Total Recoverable)	35 (Total Recoverable)	No USEPA recommendation for acute criterion	<u>Fish tissue (mg/kg dw)</u> Egg-ovary: 15.1 Whole body: 8.5 Muscle: 11.3 <u>Water column (µg/L)</u> Lotic (flowing): 3.1 Lentic (still): 1.5 Intermittent: varies	Proposed removal of acute criterion in 1 st Notice unchanged. Proposed 2 nd Notice chronic criterion is 2016 NRWQC and includes numeric fish tissue and water column criterion elements. Water column criterion elements are more stringent than current criterion. 2nd Notice criterion elements proposed for preliminary adoption. IDEM will also propose site-specific criterion elements for waters where neither sturgeon nor paddlefish occur.

NRWQC: USEPA National Recommended Water Quality Criteria at Section 304(a) of the Clean Water Act.

¹ For those metals expressed in terms of dissolved metal in the water column, aquatic life criteria are expressed as a dissolved concentration and are calculated using the water-effect ratio (WER) and the specified conversion factor (CF). The AAC and CAC for dissolved metal are calculated by multiplying the WER by the criterion value or formula and then by the appropriate conversion factor. A value of one (1) must be used for the WER unless an alternate value is established under 327 IAC 2-1-8.9. The equation for this calculation is shown on the table. The equations can be used to calculate numeric criteria at any water hardness up to 400 mg/L CaCO₃. The criteria at a water hardness of 400 mg/L CaCO₃ are used for water hardnesses above 400 mg/L CaCO₃. The term “ln (hardness)” is the natural log of hardness.

Table 1: Water quality criteria for the protection of aquatic life for surface waters outside of the Great Lakes System.

Metal ¹	Current Aquatic Life Criteria (µg/L)		2 nd Notice Proposed Aquatic Life Criteria (µg/L)		Aquatic Life Criteria Proposed for Preliminary Adoption
	Acute	Chronic	Acute	Chronic	
Silver (Dissolved)	$WER (e^{(1.72 [\ln(\text{hardness})] - 6.52)} / 2) \times 0.85$	No current criterion	$WER (e^{(1.72 [\ln(\text{hardness})] - 6.59)} \times 0.85$	No NRWQC for chronic criterion	$WER(e^{(1.72 [\ln(\text{hardness})] - 6.59)} / 2) \times 0.85$ 2nd Notice proposed acute criterion equation divided by two (2) is NRWQC, is more stringent than current criterion and is proposed for preliminary adoption
Zinc (Dissolved)	$WER (e^{(0.8473 [\ln(\text{hardness})] + 0.8604)}) \times 0.978$	$WER (e^{(0.8473 [\ln(\text{hardness})] + 0.7614)}) \times 0.986$	$WER (e^{(0.8473 [\ln(\text{hardness})] + 0.884)}) \times 0.978$	$WER (e^{(0.8473 [\ln(\text{hardness})] + 0.884)}) \times 0.986$	Proposed criteria are less stringent than current criteria and are NRWQC. 2nd Notice proposed for preliminary adoption

NRWQC: USEPA National Recommended Water Quality Criteria at Section 304(a) of the Clean Water Act.

¹ For those metals expressed in terms of dissolved metal in the water column, aquatic life criteria are expressed as a dissolved concentration and are calculated using the water-effect ratio (WER) and the specified conversion factor (CF). The AAC and CAC for dissolved metal are calculated by multiplying the WER by the criterion value or formula and then by the appropriate conversion factor. A value of one (1) must be used for the WER unless an alternate value is established under 327 IAC 2-1-8.9. The equation for this calculation is shown on the table. The equations can be used to calculate numeric criteria at any water hardness up to 400 mg/L CaCO₃. The criteria at a water hardness of 400 mg/L CaCO₃ are used for water hardnesses above 400 mg/L CaCO₃. The term “ln(hardness)” is the natural log of hardness.

Table 1a: Calculated aquatic life criteria values for dissolved metals at a hardness of 100 mg/L for surface waters outside of the Great Lakes System. Criteria for metals at other hardness values may be calculated per the equations in Table 1.

Metal	Current Aquatic Life Criteria (µg/L)		2 nd Notice Proposed Aquatic Life Criteria (µg/L)		Aquatic Life Criteria Proposed for Preliminary Adoption (µg/L)	
	Acute	Chronic	Acute	Chronic	Acute	Chronic
Cadmium	3.7 Less stringent than 2 nd Notice proposed criterion	1.0 Less stringent than 2 nd Notice proposed criterion	1.8 More stringent than current criterion	0.72 More stringent than current criterion	1.8 2 nd Notice more stringent than current criterion	0.72 2 nd Notice more stringent than current criterion
Chromium (III)	550 More stringent than 2 nd Notice proposed criterion	180 Less stringent than 2 nd Notice proposed criterion	570 Less stringent than current criterion	74 More stringent than current criterion	570 2 nd Notice less stringent than current criterion	74 2 nd Notice more stringent than current criterion
Copper	17 Less stringent than 2 nd Notice proposed criterion	11 Less stringent than 2 nd Notice proposed criterion	13 More stringent than current criterion	9 More stringent than current criterion	17 Current criterion	11 Current criterion
Lead	65 More stringent than 2 nd Notice proposed criterion	2.5 More stringent than 2 nd Notice proposed criterion	102 Less stringent than current criterion	5 Less stringent than current criterion	65 Current criterion	2.5 Current criterion

Table 1a: Calculated aquatic life criteria values for dissolved metals at a hardness of 100 mg/L for surface waters outside of the Great Lakes System. Criteria for metals at other hardness values may be calculated per the equations in Table 1.

Metal	Current Aquatic Life Criteria (µg/L)		2 nd Notice Proposed Aquatic Life Criteria (µg/L)		Aquatic Life Criteria Proposed for Preliminary Adoption (µg/L)	
	Acute	Chronic	Acute	Chronic	Acute	Chronic
Nickel	1400 Less stringent than 2 nd Notice proposed criterion	160 Less stringent than 2 nd Notice proposed criterion	470 More stringent than current criterion	52 More stringent than current criterion	470 2 nd Notice more stringent than current criterion	52 2 nd Notice more stringent than current criterion
Silver	1.7 More stringent than 2 nd Notice proposed criterion	No current criterion	3.2 Less stringent than current criterion	No current criterion	1.6 More stringent than current criterion and 2 nd Notice, but is NRWQC	No current criterion
Zinc	110 More stringent than 2 nd Notice proposed criterion	100 More stringent than 2 nd Notice proposed criterion	120 Less stringent than current criterion	120 Less stringent than current criterion	120 2 nd Notice less stringent than current criterion	120 2 nd Notice less stringent than current criterion

Table 2: Water quality criteria for the protection of aquatic life for surface waters within the Great Lakes System.

Metal ¹	Current Aquatic Life Criteria (µg/L)		2 nd Notice Proposed Aquatic Life Criteria (µg/L)		Aquatic Life Criteria Proposed for Preliminary Adoption
	Acute	Chronic	Acute	Chronic	
Aluminum (Total Recoverable)	No current criterion	No current criterion	$WER(e^{(1.3695 [\ln(\text{hardness})]+1.8308)})$	$WER(e^{(1.3695 [\ln(\text{hardness})]+0.9161)})$	USEPA published NRWQC for aluminum in 2018; the criteria are based on bioavailability of total recoverable aluminum and are calculated based on the interaction of aluminum with pH, DOC and hardness. 2 nd Notice proposed criteria are not equivalent to NRWQC. IDEM will consider adopting NRWQC in a future rulemaking. No aluminum criteria proposed for preliminary adoption.
Arsenic (Dissolved)	WER(339.8) X 1.000	WER(147.9) X 1.000	WER(340) X 1.000	WER(150) X 1.000	2 nd Notice proposed criteria are rounded to two significant figures, are for Total Arsenic instead of Arsenic III, and are NRWQC. 2nd Notice proposed for preliminary adoption
Cadmium (Dissolved)	$WER(e^{(1.128 [\ln(\text{hardness})]-3.6867)}) \times 1.136672 - [(\ln \text{hardness})(0.041838)]$	$WER(e^{(0.7852 [\ln(\text{hardness})]-2.715)}) \times 1.101672 - [(\ln \text{hardness})(0.041838)]$	$WER(e^{(0.9789 [\ln(\text{hardness})]-3.866)}) \times 1.136672 - [(\ln \text{hardness})(0.041838)]$	$WER(e^{(0.7977 [\ln(\text{hardness})]-3.909)}) \times 1.101672 - [(\ln \text{hardness})(0.041838)]$	2 nd Notice proposed criteria are 2016 NRWQC and are more stringent than current criteria. 2nd Notice proposed for preliminary adoption

NRWQC: USEPA National Recommended Water Quality Criteria at Section 304(a) of the Clean Water Act.

¹ For those metals expressed in terms of dissolved metal in the water column, aquatic life criteria are expressed as a dissolved concentration and are calculated using the water-effect ratio (WER) and the specified conversion factor (CF). The AAC and CAC for dissolved metal are calculated by multiplying the WER by the criterion value or formula and then by the appropriate conversion factor. A value of one (1) must be used for the WER unless an alternate value is established under 327 IAC 2-1-8.9. The equation for this calculation is shown on the table. The equations can be used to calculate numeric criteria at any water hardness up to 400 mg/L CaCO₃. The criteria at a water hardness of 400 mg/L CaCO₃ are used for water hardnesses above 400 mg/L CaCO₃. The term “ln(hardness)” is the natural log of hardness.

Table 2: Water quality criteria for the protection of aquatic life for surface waters within the Great Lakes System.

Metal ¹	Current Aquatic Life Criteria (µg/L)		2 nd Notice Proposed Aquatic Life Criteria (µg/L)		Aquatic Life Criteria Proposed for Preliminary Adoption
	Acute	Chronic	Acute	Chronic	
Chromium (VI) (Dissolved)	WER(16.02) X 0.982	WER(10.98) X 0.962	WER(16) X 0.982	WER(11) X 0.962	2 nd Notice proposed criteria rounded to 2 significant digits and are NRWQC. 2nd Notice proposed for preliminary adoption
Lead (Dissolved)	No current criterion	No current criterion	$WER(e^{(1.273 \ln(\text{hardness}) - 1.055)}) \times 1.46203 - [(\ln \text{hardness})(0.145712)]$	$WER(e^{(1.273 \ln(\text{hardness}) - 3.557)}) \times 1.46203 - [(\ln \text{hardness})(0.145712)]$	2 nd Notice proposed criteria are less stringent than the NRWQC. NRWQC proposed for preliminary adoption
Selenium (Total Dissolved Recoverable)	No current criterion	5 X 0.922	No USEPA recommendation for acute criterion	<u>Fish tissue (mg/kg dw)</u> Egg-ovary: 15.1 Whole body: 8.5 Muscle: 11.3 <u>Water column (µg/L)</u> Lotic (flowing): 3.1 Lentic (still): 1.5 Intermittent: varies	Proposed 2 nd Notice chronic criterion is 2016 NRWQC and includes numeric fish tissue and water column criterion elements. Water column criterion elements are more stringent than current criteria. 2nd Notice proposed for preliminary adoption

NRWQC: USEPA National Recommended Water Quality Criteria at Section 304(a) of the Clean Water Act.

¹ For those metals expressed in terms of dissolved metal in the water column, aquatic life criteria are expressed as a dissolved concentration and are calculated using the water-effect ratio (WER) and the specified conversion factor (CF). The AAC and CAC for dissolved metal are calculated by multiplying the WER by the criterion value or formula and then by the appropriate conversion factor. A value of one (1) must be used for the WER unless an alternate value is established under 327 IAC 2-1-8.9. The equation for this calculation is shown on the table. The equations can be used to calculate numeric criteria at any water hardness up to 400 mg/L CaCO₃. The criteria at a water hardness of 400 mg/L CaCO₃ are used for water hardnesses above 400 mg/L CaCO₃. The term “ln(hardness)” is the natural log of hardness.

Table 2a: Calculated values for dissolved metals at a hardness of 100 mg/L for surface waters within the Great Lakes System. Criteria for metals at other hardness values may be calculated per the equations in Table 2.

Metal	Current Aquatic Life Criteria (µg/L)		2 nd Notice Proposed Aquatic Life Criteria (µg/L)		Aquatic Life Criteria Proposed for Preliminary Adoption (µg/L)	
	Acute	Chronic	Acute	Chronic	Acute	Chronic
Cadmium	4.3 Less stringent than 2 nd Notice proposed criterion	2.2 Less stringent than 2 nd Notice proposed criterion	1.8 More stringent than current criterion	0.72 More stringent than current criterion	1.8 2 nd Notice more stringent than current criterion	0.72 2 nd Notice more stringent than current criterion
Lead	No current criterion	No current criterion	102	5	65 Less stringent than 2 nd Notice proposed criterion, but is NRWQC	2.5 Less stringent than 2 nd Notice proposed criterion, but is NRWQC

NRWQC: USEPA National Recommended Water Quality Criteria at Section 304(a) of the Clean Water Act.

Table 3: Water quality criteria for the protection of human health for surface waters outside of the Great Lakes System.¹

Metal	Current Human Health Criteria for Consumption of Water + Organism (µg/L)	Current Human Health Criteria for Consumption of Organism Only (µg/L)	2 nd Notice Proposed Human Health Criteria for Consumption of Water + Organism (µg/L)	2 nd Notice Proposed Human Health Criteria for Consumption of Organism Only (µg/L)	Human Health Criteria Proposed for Preliminary Adoption
Antimony	146	45,000	5.6	640	Proposed criteria are current NRWQC and are more stringent than current criteria. 2nd Notice proposed for preliminary adoption
Arsenic (III)	0.022	0.175	Proposed to remove criterion	Proposed to remove criterion	2 nd Notice proposed to remove criteria Current arsenic (III) criteria will be retained
Beryllium	0.068	1.17	Proposed removal of criterion: no NRWQC	Proposed removal of criterion: no NRWQC	No NRWQC; criteria will be removed from 327 IAC 2-1-7 (Table 6-4) of draft rule
Cadmium	10	No current criterion	Proposed removal of criterion: no NRWQC	Proposed removal of criterion: no NRWQC	No NRWQC; criterion will be removed from 327 IAC 2-1-7 (Table 6-4) of draft rule
Chromium (III)	170,000	3,433,000	Proposed removal of criterion: no NRWQC	Proposed removal of criterion: no NRWQC	No NRWQC; criteria will be removed from 327 IAC 2-1-7 (Table 6-4) of draft rule

NRWQC: USEPA National Recommended Water Quality Criteria at Section 304(a) of the Clean Water Act.

¹In the current rule, these criteria are at 327 IAC 2-1-6(a)(3), Table 6-1, “Surface Water Quality Criteria for Specific Substances.” In the draft rule for preliminary adoption, these criteria are at 327 IAC 2-1-6(a)(7), Table 6-4 “Surface Water Quality Criteria for the Protection of Human Health.”

Table 3: Water quality criteria for the protection of human health for waters outside of the Great Lakes System.¹

Metal	Current Human Health Criteria for the Consumption of Water + Organism (µg/L)	Current Human Health Criteria for the Consumption of Organism Only (µg/L)	2nd Notice Proposed Human Health Criteria for Consumption of Water + Organism (µg/L)	2nd Notice Proposed Human Health Criteria for Consumption of Organism Only (µg/L)	Human Health Criteria Proposed for Preliminary Adoption
Chromium (VI)	50	No current criterion	Proposed removal of criterion: no NRWQC	No current criterion	No NRWQC; criterion will be removed from 327 IAC 2-1-6 (Table 6-1)
Copper	No current criterion	No current criterion	1,300	No proposed national criterion	2 nd Notice proposed criterion is the current NRWQC 2nd Notice proposed for preliminary adoption
Lead	50	No current criterion	Proposed removal of criterion: no NRWQC	No current criterion or NRWQC	No NRWQC; criterion will be removed from 327 IAC 2-1-7 (Table 6-4) of draft rule
Manganese	No current criterion	No current criterion	No proposed criterion	No proposed criterion	Removed from First Notice table since proposed criteria were not based on human health effects. No proposed criterion for preliminary adoption
Mercury	0.14	0.15	0.14	0.15	Current criteria to be retained.
Methylmercury	No current criterion	No current criterion	No proposed criterion	No proposed criterion	Removed from 1 st Notice table, will be considered for a future rulemaking No proposed criteria for preliminary adoption

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¹In the current rule, these criteria are at 327 IAC 2-1-6(a)(3), Table 6-1, “Surface Water Quality Criteria for Specific Substances.” In the draft rule for preliminary adoption, these criteria are at 327 IAC 2-1-6(a)(7), Table 6-4 “Surface Water Quality Criteria for the Protection of Human Health.”

Table 3: Water quality criteria for the protection of human health for waters outside of the Great Lakes System.¹

Metal	Current Human Health Criteria for the Consumption of Water + Organism (µg/L)	Current Human Health Criteria for the Consumption of Organism Only (µg/L)	2 nd Notice Proposed Human Health Criteria for Consumption of Water + Organism (µg/L)	2 nd Notice Proposed Human Health Criteria for Consumption of Organism Only (µg/L)	Human Health Criteria Proposed for Preliminary Adoption
Nickel	13.4	100	610	4,600	Proposed criteria are NRWQC, and are less stringent than current criteria. 2nd Notice proposed for preliminary adoption
Selenium	10	No current criterion	170	4,200	Proposed criteria are NRWQC, and are less stringent than current criterion. 2nd Notice proposed for preliminary adoption
Silver	50	No current criterion	Proposed removal of criterion: no NRWQC	No current criterion or NRWQC	No NRWQC; criterion will be removed from 327 IAC 2-1-7 (Table 6-4) of draft rule
Thallium	13	48	13	48	Current criteria to be retained. Criteria proposed in First Notice will be deleted since EPA has removed RfD value from IRIS assessment. Current criteria to be retained
Zinc	No current criterion	No current criterion	7,400	26,000	Proposed criteria are NRWQC 2nd Notice proposed for preliminary adoption

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¹In the current rule, these criteria are at 327 IAC 2-1-6(a)(3), Table 6-1, “Surface Water Quality Criteria for Specific Substances.” In the draft rule for preliminary adoption, these criteria are at 327 IAC 2-1-6(a)(7), Table 6-4 “Surface Water Quality Criteria for the Protection of Human Health.”