

**EPA's Review under Section 303(c) of the Clean Water Act of
Revisions to Wisconsin's Administrative Code at Chapter NR 105
(WQSTS Tracking No. WI2009-302)¹**

DATE: JUL 01 2009

I. SUMMARY

A. Date of Initiation of Review: May 4, 2009

B. Submittal History:

In 1997, Wisconsin adopted revised water quality criteria as part of its rule revisions to comply with the requirements of the Great Lakes Water Quality Guidance (40 CFR 132, also known as the Great Lakes Initiative (GLI)). In 2000, EPA disapproved Wisconsin's 1997 criteria for aquatic life for copper (acute and chronic), nickel (acute and chronic), selenium (chronic), and endrin (chronic). In January 2008, Wisconsin began rulemaking to revise its rules at NR 105 to address EPA's disapproval of four aquatic life criteria and to update human health criteria where appropriate. Hearings were held on January 3, 7, and 14, 2008. Revised rules were adopted by the Wisconsin Natural Resources Board (WNRB) on June 24, 2008. The Wisconsin Assembly held hearings on August 20, 2008. The revised rules were published in the Wisconsin Administrative Register on November 30, 2008, and became effective in Wisconsin on December 1, 2008. The revised rules were certified by the Wisconsin Attorney General on December 22, 2008.

On May 4, 2009, EPA Region 5 received a letter from the Wisconsin Department of Natural Resources (WDNR) requesting approval of final revisions to Chapter NR 105 (Surface Water Quality Criteria and Secondary Values for Toxic Substances) of the Wisconsin Administrative Code (WAC).

C. Documents Submitted to EPA:

The following documents were attached to this letter for EPA's review:

- Certification by the State Attorney General's office that the revisions to WAC Chapter NR 105 were adopted in accordance with procedures under state law. (December 22, 2008)
- Notice to presiding officers that final draft rules were being submitted to the Wisconsin legislature, along with a report to the legislature describing the rule changes. (July 11, 2008)
- Order of the WNRB (WT-35-07) amending NR 105 Tables 2, 2A, 5, 6, 8 and 9 relating to surface water quality criteria.

¹ In addition to hardcopy files, this submission is documented and all electronic files are maintained in the Region 5 Water Quality Standards Tracking System (WQSTS) as submission number: WI2009-302

- WDNR’s recommendation to the WNRB for adoption of Board Order WT-35-07, revisions to chapter NR 105 (“Green sheet”) (June 2008)
- Response to Comments, 2007 WDNR Public Hearings on Proposed Revisions to Chapter NR 105.
- Final revisions to Chapter NR 105.

D. Other Supporting Documents Provided to EPA by WDNR:

On October 17, 2008, EPA received the following additional electronic documents from WDNR for EPA review:

- Spreadsheets used to calculate the revised aquatic life criteria.
- Criteria Documents explaining the derivation of the revised human health criteria.

E. Description of Action:

The State of Wisconsin adopted revisions to its water quality standards rules containing aquatic life and human health water quality criteria applicable to surface waters. The revisions consist of the following changes to Wisconsin’s rules at NR 105:

- Section 1. NR 105, Table 2, acute aquatic life criteria for total recoverable copper and total recoverable nickel;
- Section 2. NR 105, Table 2A, hardness ranges for acute aquatic life criteria for copper and nickel;
- Section 3. NR 105, Table 5, chronic aquatic life criteria for endrin and selenium;
- Section 4. NR 105, Table 6, chronic aquatic life criteria for total recoverable copper and nickel;
- Section 5. NR 105, Table 8, Human threshold criteria for antimony, cadmium, chlorobenzene, total chromium, chromium +3, chromium +6, total cyanide, 1,2-dichlorobenzene, ethylbenzene, hexachlorocyclopentadiene, and toluene; and,
- Section 9. NR 105, Table 9, Human cancer criteria for arsenic, 3,3’-dichlorobenzidine, and 1,3-dichloropropene.

F. Basis of Action:

Wisconsin’s revisions of the aquatic life criteria for copper, nickel, endrin, and selenium are in response to EPA’s formal disapproval in October 2000 of these criteria as part of EPA’s action on revisions to Wisconsin’s rules taken in accord with the GLI. Wisconsin also adopted the human health criteria revisions in this rule in response to EPA’s update of human health criteria after Wisconsin adopted its criteria in 1997.

Wisconsin’s revisions to its water quality criteria at NR 105 do not affect Wisconsin’s designated uses. Wisconsin use designations are defined in Chapter NR 102.04(3) of the WAC. Based on these definitions, aquatic life designated uses of “Cold Water communities”, “Warm Water Sport Fish communities”, and Warm Water Forage Fish communities” are consistent with the requirement of Section 101(a)(2) of the CWA for the protection and propagation of fish,

shellfish, and wildlife. “Limited Forage Fish” does not meet this requirement because these surface waters are capable of supporting only a “limited community of forage fish and other aquatic life”, based on” limited capacity and naturally poor water quality or habitat”(WAC, Chapter NR 102.04(3)(d)). In addition, “Limited Aquatic Life” also does not meet this requirement because these surface waters are capable of supporting only a “limited community of aquatic life,” based on “severely limited capacity and naturally poor water quality or habitat” (WAC Chapter NR 102.04(3)(e)). Under Wisconsin’s water quality standards, criteria for individual pollutants to protect aquatic life may vary by designated use class based on the different methods used to calculate the criteria for each use class.

Wisconsin’s revisions also do not affect the methods used by Wisconsin to derive criteria and values. Wisconsin’s methods for deriving criteria and values for aquatic life and human health were adopted in 1997 and approved by EPA in 2000. Wisconsin’s approved methods for calculating criteria and values to protect aquatic life are found in Wisconsin’s water quality standards at NR 105.05 (acute) and NR 105.06 (chronic). These methods were used by Wisconsin in the derivation of the revised aquatic life criteria submitted by Wisconsin.

Wisconsin’s approved methods for calculating criteria and values to protect human health from non-cancer health effects are found at NR 105.08 and from cancer at NR 105.09. These methods were used by Wisconsin in the derivation of the revised criteria for the protection of human health submitted by Wisconsin.

WAC Chapter NR 105.08(3) (for non-carcinogens) and NR 105.09(3) (for carcinogens) state that human health criteria for each substance may be different for each surface water use classification, due to the lipid value of the representative fish for each surface water use classification, and whether or not the water is a source of drinking water. For each pollutant, five human health categories have been developed:

- Cold Water Fish Plus Public Water Supply
- Cold Water Fish only
- Warm Water Plus Public Water Supply
- Warm Water Sport and Forage Fish
- Limited Aquatic Life Communities

II. AREAS AFFECTED and ENVIRONMENTAL IMPACTS

A. Area Affected:

These criteria revisions are applicable State-wide.

B. Environmental Impacts:

1. Aquatic life

The revisions to Wisconsin's aquatic life criteria improve the protection of aquatic organisms in Wisconsin surface waters by addressing errors in the calculation of the aquatic life criteria for copper, nickel, endrin, and selenium.

2. Human health

The revisions to Wisconsin's human health criteria improve the protection of human health by updating criteria to reflect the changes in EPA's recommendations for the criteria that were revised.

III. EPA's REVIEW of WISCONSIN'S REVISED RULES

A. EPA's Authority Under Section 303(c)(2) of the CWA

Water quality standards requirements of CWA sections 101(a)(2) and 303(c)(2) are implemented through federal regulations contained in 40 CFR 131; water quality standards requirements of CWA section 118, specific to waters of the Great Lakes System, are implemented through federal regulations contained in 40 CFR 132. Federal regulations at 40 CFR 131.21 require EPA to review and approve or disapprove new or revised state-adopted water quality standards. In making this determination, EPA must consider the following requirements of 40 CFR 131.5:

- whether state-adopted uses are consistent with CWA requirements;
- whether the state has adopted criteria protective of the designated uses;
- whether the state has followed legal procedures for revising its standards;
- whether state standards are based on appropriate technical and scientific data and analyses; and
- whether the state submission includes certain basic elements as specified in 40 CFR 131.6.

Section 101(a)(2) of the CWA specifies that designated uses "provide for the protection and propagation of fish, shellfish, and wildlife and provide for recreation in and on the water." Section 303(c)(2) of the CWA requires that standards shall protect the public health and shall take into consideration their use and value for public water supplies, propagation of fish and wildlife, recreational, agricultural, industrial, and navigational purposes.

EPA is required to review and approve or disapprove new and revised water quality standards submitted by States and Tribes. Possible EPA actions include:

- **Approval** (where EPA has concluded that approval of certain revisions will have no effect on listed species, or is otherwise not subject to ESA consultation, or where consultation has concluded),

- **Approval subject to ESA consultation** (where EPA has concluded that certain revisions may effect listed species (including beneficial effects) , but consultation has not concluded),
- **Disapproval** (where EPA has concluded that certain revisions do not meet the requirements of the CWA or federal regulations and guidance), and
- **No EPA action** (where EPA has concluded that certain revisions are not revisions to the State's or Tribe's WQS and, therefore, do not need to be reviewed under section 303(c) of the CWA.

Consistent with federal regulations at 40 CFR 131.21, new or revised water quality standards do not become effective for CWA purposes until they are approved by EPA.

B. Public Participation, Comments, and Issues Raised on Wisconsin's Draft Rules

1. Public Participation Process

In October 2007, WNRB authorized WDNR to hold public hearings for the proposed amendments to the water quality criteria discussed in this document. In December 2007, WNRB requested public comments on proposed amendments to the water quality criteria discussed above. In January 2008, WDNR held three public hearings on the proposed amendments to obtain comment as well as written public comments after the hearings. Written comments were accepted by WDNR until February 14, 2008.

2. Summary of Public Comments on the Draft Rules and WDNR responses

The WDNR received comments on the proposed revisions to the water quality criteria in NR 105 from three organizations:

- Midwest Environmental Advocates commented that the proposed 5 µg/L chronic selenium criterion for aquatic life should also apply to waters classified as Warm Water Forage Fish. WDNR revised the selenium criterion for Warm Water Forage Fish to 5 µg/L in response.
- Municipal Environmental Group commented that the proposed aquatic life criteria for copper and the proposed human health criteria for arsenic will require municipal wastewater treatment plants to seek more variances from water quality standards. The commenter requested streamlined variance language for copper and arsenic. WDNR replied that there are no data to support the need for increased variances for arsenic. WDNR also replied that it is possible that about 12 municipalities would be seeking variances from the revised copper criteria. WDNR did not propose any rule changes based on these concerns over the copper criteria, and stated that the small number of affected facilities can use either non-variance options to meet the criteria, or use the existing variance language in State statutes.
- Georgia-Pacific Corporation commented that the proposed rule should contain criteria for copper based on the Biotic Ligand Model published by EPA in 2007. WDNR replied that the State considers the Biotic Ligand Model to be a site-

specific modification to existing criterion, and has not been required by EPA to revise the copper criteria to incorporate the use of this model. Wisconsin allows the use of the model by the state or any interested party on a site-specific basis. WDNR did not propose any rule changes based on this comment.

3. Summary of EPA Comments on the Draft Rules and WDNR Responses

On February 14, 2008, EPA Region 5 provided comments to WDNR on the proposed amendments. These comments are summarized below:

a. **EPA comments on Wisconsin's aquatic life criteria (NR 105 Tables 2, 2A, 5 and 6) and Wisconsin's responses**

- **Comment:** Identification of an error in the calculation of the aquatic life criteria for endrin and acknowledgement of a commitment by WDNR staff to correct this error in the final rules. **Response:** Corrected in the final rules.
- **Comment:** Description of documentation that needed to be provided to EPA with the final rule. **Response:** WDNR provided documentation with its submittal of the final rule.
- **Comment:** Reference to staff discussions, and the need for continued discussions, of the absence of proposed chronic selenium criteria for waters with the designated uses of Warm Water Forage Fish and Limited Forage Fish communities. **Response:** WDNR included in the final rule selenium criteria for Warm Water Forage Fish and Limited Forage Fish, as well as Limited Aquatic Life communities.
- **Comment:** Reference to staff discussions of the issue of revising aquatic life criteria for cadmium in a future rulemaking. **Response:** No response needed.

b. **EPA comments on Wisconsin's human health criteria (NR 105 Tables 8 and 9) and Wisconsin's responses**

- **Comment:** Identification of an error in the calculation of the criterion for ethylbenzene, and acknowledgement of a commitment by WDNR staff to correct the error in the final rule. **Response:** WDNR corrected the error in the calculation of the human health criterion for ethylbenzene in the final rule.
- **Comment:** Description of documentation that needed to be provided to EPA with the final rule. **Response:** WDNR provided documentation with its submittal of the final rule.

C. EPA’s Review of Wisconsin’s Final Rules

1. Review of Wisconsin’s Submittal for Completeness

Regulatory Requirement:	Wisconsin Rule Submittal:
Use designations consistent with the provisions of section 101(a)(2) and 303(c)(2) of the Act (40 CFR 131.6(a))	The revisions to NR 105 are to water quality criteria only and do not affect the designated uses of Wisconsin surface waters. Wisconsin’s designated uses for surface waters are found in NR 102.04(3).
Methods used and analyses conducted to support WQS revisions (40 CFR 131.6(b))	The documentation provided by Wisconsin in support of the revisions to NR 105 and considered by EPA in reviewing this submittal is identified above under “Submittal History.”
Water quality criteria sufficient to protect the designated uses of Wisconsin surface waters (40 CFR 131.6(c))	A detailed discussion of each revised criterion and EPA’s action on that criterion is provided below. To summarize, EPA is approving the revised aquatic life criteria for copper (acute and chronic, all use classes), nickel (acute and chronic, all use classes), endrin (chronic, all use classes), and selenium (chronic, all use classes except limited forage fish). EPA is approving all of Wisconsin’s revised human health criteria for all designated use classes: Antimony (non-cancer), Cadmium (non-cancer), Chromium (III) (non-cancer), Chromium (VI) (non-cancer), Chromium (total) (non-cancer); Cyanide (non-cancer), Ethylbenzene (non-cancer), Hexachlorocyclopentadiene (non-cancer), Chlorobenzene (non-cancer), 1,2-dichlorobenzene (non-cancer), Toluene (non-cancer), Arsenic (cancer), 3,3-dichlorobenzidine (cancer), and 1,3-dichloropropene (cancer). EPA is deferring action on Wisconsin’s revised chronic selenium criterion for Wisconsin’s limited forage fish use classification pending completion of EPA’s revisions of the 304(a) recommended criterion for chronic selenium for aquatic life protection.
An antidegradation policy consistent with §131.12 (40 CFR 131.6(d))	Not applicable. This submittal does not include revisions to Wisconsin’s antidegradation policy.
Certification by the State 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))	Wisconsin’s Attorney General certified the revisions to NR 106 by a letter dated December 22, 2008.

Regulatory Requirement:	Wisconsin Rule Submittal:
General information which will aid the Agency in determining the adequacy of the scientific basis of the standards which do not include uses specified in section 101(a)(2) of the Act as well as information on general policies applicable to State standards which their application and implementation. (40 CFR 131.6(f))	The documentation provided by Wisconsin in support of the revisions to NR 105 and considered by EPA in reviewing this submittal is identified above under "Submittal History."

Conclusion: For the reasons provided above, Wisconsin's May 4, 2009, submittal of revisions to NR 105 is administratively complete, consistent with the requirements of 40 CFR 131.6.

2. Review of Wisconsin's Final Rule Revisions for Consistency with the CWA and Federal Regulations and Guidance

a. Revisions to Wisconsin's aquatic life criteria (NR 105 Tables 2, 2A, 5 and 6)

ACUTE COPPER CRITERIA, NR 105, Table 2

Description: In 2000, EPA disapproved revised copper criteria submitted by Wisconsin in 1997 because Wisconsin made mathematical errors that resulted in copper criteria equations that were not consistent with 40 CFR Part 132. The following table lists Wisconsin's revised criteria equations, and includes the EPA copper criteria equation for comparison. An equation is used to derive copper acute and chronic criteria values, as copper toxicity is hardness-dependent.

Acute Criteria Equation:

EPA Criteria Maximum Concentration (µg/L)	Wisconsin Acute Toxicity Criteria (all surface water classifications) (µg/L)
CMC= $\exp(0.9422 \cdot \ln(\text{hardness})) - 1.700$	ATC= $\exp(0.9436 \cdot \ln(\text{hardness})) - 1.6036$

Review of Wisconsin's revised criterion: The equation used by Wisconsin for calculation of acute aquatic life criteria for copper is slightly different from the EPA equation (slightly less stringent). 40 CFR Part 132 contains the EPA equation, which is applicable to all waters within the Great Lakes Basin. In 1995, EPA updated its CWA 304(a) national criteria guidance to include the same equation, applicable to all waters outside the Great Lakes Basin.

The difference between EPA's and Wisconsin's intercept in the copper equation is due to the elimination of one of the most sensitive genera from the criteria calculation (northern pikeminnow, genus *Ptychocheilus*) and inclusion of additional data for three species. It is scientifically defensible for Wisconsin to eliminate the *Ptychocheilus* data because *Ptychocheilus*

is not native to Wisconsin and it is not a surrogate for other Wisconsin taxa that are not represented in the data set. The northern pikeminnow is a type of minnow, and other minnows (fathead, *Pimephales promelas* and bluntnose, *Pimephales notatus*) are well-represented in the copper data set and are found in Wisconsin. Wisconsin's slope of 0.9436 is slightly different from EPA's 1985 slope due to Wisconsin's inclusion of additional data on three species (*Daphnia magna*, rainbow trout, and bluegill). EPA included these data in the 1995 criteria update, but did not recalculate the slope used in the 1985 copper criteria document.

Wisconsin's method for deriving the acute copper criteria equation is an acceptable site-specific modification of EPA's criteria, consistent with Wisconsin's methods for deriving criteria (Chapter NR 105 of Wisconsin's Administrative Code.). Therefore this equation is consistent with Section 101(a) (2) and 303(c)(2) of the CWA, and 40 CFR Part 131 and 132.

Approval of a state's WQS is a federal action requiring consultation under section 7(a)(2) of the ESA. The 2001 memorandum of agreement between EPA and the Services established a framework where EPA's national consultation on all recommended 304(a) criteria would provide section 7 coverage for Regional approvals of state water quality criteria where the state criteria are at least as stringent as EPA's. EPA may proceed with an approval action pending conclusion of the national consultation assuming that section 7(d) is not violated. This is documented in a separate memorandum to the record. Since the state's copper criteria and derivation are slightly less stringent (due to state-specific differences) than the national criteria but are unlikely to have any significant additional impact on listed species, the Region and FWS will have to determine if any additional consultation is required following the results of the national consultation.

Conclusions: (1) Wisconsin's revised criterion is consistent with CWA and federal regulations and guidance, (2) ESA consultation is required, and (3) ESA consultation will be deferred to the national consultation.

CHRONIC COPPER CRITERIA, NR 105, Table 6

Description: The following table lists Wisconsin's revised chronic criteria equation, and includes the EPA chronic copper criteria equation for comparison.

Chronic Criteria Equation:

EPA Criterion Continuous Concentration (µg/L)	Wisconsin Chronic Toxicity Criteria (all surface water classifications) (µg/L)
CCC= exp (0.8545*ln((hardness)) – 1.702)	CTC=exp(0.8557*ln((hardness)) – 1.6036

Review of Wisconsin's revised criteria: The equation used by Wisconsin for calculation of chronic aquatic life criteria for copper results in a value that is slightly less stringent than the value that would generated using EPA's criterion equation at a given hardness. 40 CFR Part 132 contains the EPA equation, which is applicable to all waters within the Great Lakes Basin. In 1995, EPA updated its CWA 304(a) national criteria guidance to include the same equation, applicable to all waters outside the Great Lakes basin.

The difference between EPA's and Wisconsin's intercept in the copper equation is due primarily to the elimination of one of the most sensitive genera from the criteria calculation (northern pikeminnow, genus *Ptychocheilus*), which is not native to Wisconsin. It is scientifically defensible for Wisconsin to eliminate a non-native species which is not a surrogate for taxon that are underrepresented in the data set. The northern pikeminnow is a type of minnow, and other minnows (fathead and bluntnose) are well-represented in the copper data set. In addition, Wisconsin's slope of 0.8557 is slightly different from EPA's 1985 slope due to Wisconsin's inclusion of some additional data on three species (*Daphnia magna*, rainbow trout, and bluegill). EPA included these data in the 1995 criteria update, but did not recalculate the slope used in the 1985 copper criteria guidance document.

Wisconsin's method for deriving the chronic copper criteria equation is scientifically defensible and consistent with Wisconsin's approved methods for deriving criteria (Chapter NR 105 of Wisconsin's Administrative Code.)

Approval of a state's WQS is a federal action requiring consultation under section 7(a)(2) of the ESA. The 2001 memorandum of agreement between EPA and the Services established a framework where EPA's national consultation on all recommended 304(a) criteria would provide section 7 coverage for Regional approvals of state water quality criteria where the state criteria are at least as stringent as EPA's. EPA may proceed with an approval action pending conclusion of the national consultation assuming that section 7(d) is not violated. This is documented in a separate memorandum to the record. Since the state's copper criteria and derivation are slightly less stringent than the national criteria and will have no additional impact on listed species, the Region and FWS will have to determine if any additional consultation is required following the results of the national consultation.

Conclusions: (1) Wisconsin's revised criterion is consistent with CWA and Federal regulations and guidance, (2) ESA consultation is required, and (3) ESA consultation will be deferred to the national consultation.

ACUTE NICKEL CRITERIA, NR 105, Table 2

Description: Wisconsin's previously submitted (1997) acute and chronic nickel criteria equations were disapproved by EPA in 2000 because Wisconsin made mathematical errors that resulted in nickel criteria equations that were not consistent with 40 CFR Part 132. The following table lists Wisconsin's revised criteria equations, and includes the EPA nickel criteria equation for comparison. An equation is used to derive nickel acute and chronic criteria values, as nickel toxicity is hardness-dependent.

Acute Criteria Equation:

EPA Criteria Maximum Concentration (µg/L)	Wisconsin Acute Toxicity Criteria (all surface water classifications) (µg/L)
CMC= $\exp(0.846 * \ln(\text{hardness})) + 2.255$	ATC= $\exp(0.846 * \ln(\text{hardness})) + 2.255$

Review of Wisconsin’s revised criteria: The equation used by Wisconsin for calculation of acute aquatic life criteria for nickel is identical to that contained in the Great Lakes Water Quality Guidance, 40 CFR Part 132 as well as EPA’s CWA 304(a) national criteria guidance. Therefore, Wisconsin’s equation for calculating acute aquatic life criteria is consistent with section 101(a)(2) and 303 (c)(2) of the CWA and 40 CFR Part 131 and 132.

Approval of a state's WQS is a federal action requiring consultation under section 7(a)(2) of the ESA. The 2001 memorandum of agreement between EPA and the Services established a framework where EPA's national consultation on all recommended 304(a) criteria would provide section 7 coverage for Regional approvals of state water quality criteria where the state criteria are at least as stringent as EPA's. EPA may proceed with an approval action pending conclusion of the national consultation assuming that section 7(d) is not violated. This is documented in a separate memorandum to the record.

Conclusions: (1) Wisconsin’s revised criterion is consistent with CWA and federal regulations and guidance, (2) ESA consultation is required, and (3) ESA consultation will be deferred to the national consultation.

CHRONIC NICKEL CRITERIA, NR 105 , Table 6

Description: Wisconsin has adopted two chronic nickel equations: one for Cold Water, Warm Water Sportfish, Warm Water Forage Fish, and Limited Forage Fish water classifications, and another for Limited Aquatic Life classification. The following table lists Wisconsin’s revised chronic criteria equations, and includes the EPA chronic nickel criteria equation for comparison.

Chronic Criteria Equation:

EPA Criterion Continuous Concentration (µg/L)	Wisconsin Chronic Toxicity Criteria (µg/L): Cold Water, Warmwater Sportfish, Warmwater Forage, and Limited Forage Fish	Wisconsin Chronic Toxicity Criteria (µg/L) – Limited Aquatic Life classifications
CCC= $\exp(0.846 \cdot \ln(\text{hardness})) + 0.0584$	CTC= $\exp(0.846 \cdot \ln(\text{hardness})) + 0.0591$	CTC= $\exp(0.846 \cdot \ln(\text{hardness})) + 0.4004$

Review of Wisconsin’s revised criteria: The equation used by Wisconsin for calculation of chronic criteria for Cold Water, Warm Water Sportfish, Warm Water Forage Fish, and Limited Forage Fish classifications is slightly less stringent than EPA’s 304(a) recommendation. This difference is due to Wisconsin’s use of a slightly different intercept, and acute-chronic ratio for the *Cladoceran* test data. EPA has reviewed the data used by Wisconsin and Wisconsin’s derivation of the criterion equation and determined that it is scientifically defensible. In addition, the equation for the Limited Aquatic Life classification has a different value for the intercept because of the elimination of fathead minnow. Fathead minnow was not included because waters designated as Limited Aquatic Life are not expected to have a fish community.

40 CFR Part 132 contains EPA's chronic nickel aquatic life equation, which is applicable to all waters within the Great Lakes Basin. In 1995, EPA updated its CWA 304(a) guidance to include the same equation applicable to all waters outside the Great Lakes Basin. For the Cold Water, Warm Water Sportfish, Warm Water Forage Fish, and Limited Forage Fish water classifications, the difference between Wisconsin's equation and EPA's equation is scientifically defensible, and is therefore consistent with Section 101(a)(2) and 303(c)(2) of the CWA, and 40 CFR Part 131 and 132. For the Limited Aquatic Life water classification, the elimination of a non-resident species is an appropriate site-specific modification of EPA's criteria. Therefore, Wisconsin's Limited Aquatic Life equation is consistent with section 101(a) (2) and 303(c) (2) of the CWA, and 40 CFR Part 131 and 132.

Approval of a state's WQS is a federal action requiring consultation under section 7(a)(2) of the ESA. The 2001 memorandum of agreement between EPA and the Services established a framework where EPA's national consultation on all recommended 304(a) criteria would provide section 7 coverage for Regional approvals of state water quality criteria where the state criteria are at least as stringent as EPA's. EPA may proceed with an approval action pending conclusion of the national consultation assuming that section 7(d) is not violated. This is documented in a separate memorandum to the record. Since the state's chronic nickel criteria and derivation are slightly less stringent (due to state-specific differences) than the national criteria but are unlikely to have any significant additional impact on listed species, the Region and FWS will have to determine if any additional consultation is required following the results of the national consultation.

Conclusions: (1) Wisconsin's revised criterion is consistent with CWA and Federal regulations and guidance, (2) ESA consultation is required, and (3) ESA consultation will be deferred to the national consultation.

CHRONIC ENDRIN CRITERIA, NR 105, Table 5

Description: Wisconsin's previously-submitted (1997) chronic endrin criteria were disapproved by EPA in 2000 because certain toxicological data were omitted from the State's calculation. That omission resulted in criteria that were not consistent with 40 CFR Part 132. Wisconsin's revised criteria include these data. The following table lists Wisconsin's revised criteria, along with EPA's chronic endrin criterion for comparison.

Chronic Criteria:

EPA Criterion Continuous Concentration (µg/L)	Wisconsin Chronic Toxicity Criteria - Cold Water, and Warmwater Sport Fish (µg/L)	Wisconsin Chronic Toxicity Criteria – Limited Forage Fish, and Limited Aquatic Life (µg/L)
0.036	0.036	0.050

Review of Wisconsin's revised criteria: Wisconsin's criterion for Cold Water and Warm Water Sportfish is identical to EPA's criterion in 40 CFR Part 132. In 1995, EPA updated its CWA 304(a) national criteria guidance to include the same chronic endrin criterion. Therefore,

this criterion is consistent with section 101(a)(2) and 303(c)(2) of the CWA, and 40 CFR Parts 131 and 132.

Wisconsin's criteria for Limited Aquatic Life and Limited Forage Fish waters are less stringent than EPA's 304(a) recommendation. The difference is due to the fact that three of the four most sensitive genera used to calculate EPA's criterion do not exist in Limited Aquatic Life and Limited Forage Fish waters. These are *Perca* (yellow perch), *Lepomis* (bluegill), and *Micropterus* (largemouth bass.) Instead, Wisconsin used the following genera for the endrin criteria calculation for Limited Forage Fish waters: *Pteronarcys* (stonefly), which was also used by EPA; *Cyprinus* (carp); *Piemphales* (fathead minnow); and *Pteronarcella* (stonefly). When the fathead minnow was removed for the Limited Aquatic Life calculation, the resulting calculated criterion was more stringent than the calculated criterion for Limited Forage Fish waters. Under Wisconsin's rules, when this occurs, the Limited Aquatic Life criterion can be set equal to the Limited Forage Fish criterion if the species used to calculate the Limited Aquatic Life criterion are already included in the database used to calculate the Limited Forage Fish criterion. Therefore, Wisconsin set the Limited Aquatic Life criterion for endrin equal to the Limited Forage Fish criterion.

Wisconsin's method for deriving the chronic endrin criterion for Limited Aquatic Life and Limited Forage Fish waters is an acceptable site-specific modification of EPA's criterion, consistent with Wisconsin's methods for deriving criteria (Chapter NR 105 of Wisconsin's Administrative Code.) Therefore, this criterion is consistent with section 101(a) (2) and 303(c)(2) of the CWA, and 40 CFR Parts 131 and 132.

Approval of a state's WQS is a federal action requiring consultation under section 7(a)(2) of the ESA. The 2001 memorandum of agreement between EPA and the Services established a framework where EPA's national consultation on all recommended 304(a) criteria would provide section 7 coverage for Regional approvals of state water quality criteria where the state criteria are at least as stringent as EPA's. EPA may proceed with an approval action pending conclusion of the national consultation assuming that section 7(d) is not violated. This is documented in a separate memorandum to the record.

Conclusions: (1) Wisconsin's revised criterion is consistent with CWA and federal regulations and guidance, (2) ESA consultation is required, and (3) ESA consultation will be deferred to the national consultation.

CHRONIC SELENIUM CRITERIA NR 105, Table 5

Description: Wisconsin's revised chronic selenium criteria are listed in the following table:

Revised Selenium chronic aquatic life criteria:

Cold water (µg/L)	Warmwater sportfish (µg/L)	Warmwater forage fish (µg/L)	Limited Forage Fish (µg/L)	Limited Aquatic Life (µg/L)
5.0	5.0	5.0	46.5	46.5

Review of Wisconsin's revised criteria: Wisconsin's selenium criteria for Cold Water, Warm Water Sportfish, and Warm Water Forage Fish are identical to EPA's selenium criteria in Part 132, and consistent with requirements for criteria development under Part 131. Therefore, these criteria are consistent with section 101(a) (2) and 303(c) (2) of the CWA, and 40 CFR Part 132 and 131.

Wisconsin did not use EPA's chronic aquatic life selenium criterion $\mu\text{g/L}$ for Limited Aquatic Life waters. Wisconsin's basis for this decision is that Limited Aquatic Life waters only support an invertebrate community, and EPA's recommended criterion was based on observed effects of selenium on sportfish (bluegills) in field studies (Belews Lake, North Carolina, and others). Instead, Wisconsin recalculated a criterion for Limited Aquatic Life waters based on toxicity studies listed in EPA's 1987 selenium aquatic life criteria document (selenite, +4). Wisconsin's value of $46.5 \mu\text{g/L}$ is slightly different than EPA's calculated criterion of $44.72 \mu\text{g/L}$, because Wisconsin eliminated two saltwater species used for EPA's calculation.

Wisconsin's chronic aquatic life selenium criterion of $46.5 \mu\text{g/L}$ for LAL waters is consistent with for the protection of aquatic life in Limited Aquatic Life waters, for the following reasons:

- Two of the three freshwater studies used to calculate the criterion, in accord with the 1985 Guidelines, were done on invertebrates (*Daphnia magna* and *Daphnia pulex*).
- Wisconsin followed their State procedures for deriving aquatic life criteria, using these toxicity studies (NR 105).
- Current literature on selenium states: "The most important aspect of selenium residues in aquatic food chains is not direct toxicity to the organisms themselves, but rather the dietary source of selenium they provide to fish and wildlife species that feed on them."² In the case of Limited Aquatic Life waters, there are no fish to feed on the invertebrates, and there is currently no information available to determine effects on wildlife from eating these organisms.
- No new studies have been conducted with invertebrates that would provide a scientific basis to refute the 1987 invertebrate toxicity studies reported in EPA's 1987 selenium criteria document.

Wisconsin did not adopt EPA's chronic aquatic life selenium criterion of $5 \mu\text{g/L}$ for Limited Forage Fish waters. Wisconsin's basis for not adopting EPA's recommendation is that Limited Forage Fish waters only support forage fish and invertebrates, and EPA's recommended criterion was based on observed effects of selenium on sportfish (bluegills) in field studies (Belews Lake, North Carolina, and others). Instead, Wisconsin calculated a chronic selenium criterion for Limited Forage Fish waters based on toxicity studies listed in EPA's 1987 selenium aquatic life criteria document (selenite, +4).

EPA did not use the laboratory toxicity studies as the final basis for the recommended national selenium criterion of $5 \mu\text{g/L}$ because these studies were based on water column-only exposure to selenium. Given the available data showing the importance of dietary exposure, EPA's criteria recommendations are based on field studies that account for bioaccumulation through the food

² Lemly, 2002. "Selenium Assessment in Aquatic Ecosystems: A Guide for Hazard Evaluation." Springer Series on Environmental Management. Page 23.

chain as the main route of exposure (Belews Lake, North Carolina, and others). The available data indicate that the primary route of exposure to all fish species is dietary. Consequently, a water column exposure-based criterion, such as that adopted by Wisconsin for Limited Forage Fish waters may not protect aquatic life uses of these waters.

Use of the 1987 toxicity studies as the basis for an aquatic life selenium criterion does not account for toxicity due to food chain exposure and consequently does not protect this aquatic life use. These studies are based on water column-only exposure to selenium. Current scientific literature strongly supports the consensus that most of the selenium in fish tissue results from selenium in the diet rather than the water.³ Therefore, Wisconsin's selenium criterion for Limited Forage Fish waters under-estimates exposure of fish to selenium, and could allow accumulation of selenium in fish tissue to levels that result in chronic impacts on fish.

EPA's national selenium criterion is currently under review. EPA will act on Wisconsin's Limited Forage Fish chronic selenium criterion for waters outside the Great Lakes Basin once EPA finalizes its aquatic life criteria recommendations for selenium. EPA's new selenium criteria guidance document is scheduled to be finalized in February 2010.

Approval of a state's WQS is a federal action requiring consultation under section 7(a)(2) of the ESA. The 2001 memorandum of agreement between EPA and the Services established a framework where EPA's national consultation on all recommended 304(a) criteria would provide section 7 coverage for Regional approvals of state water quality criteria where the state criteria are at least as stringent as EPA's. EPA may proceed with an approval action pending conclusion of the national consultation assuming that section 7(d) is not violated. This is documented in a separate memorandum to the record.

Conclusions: (1) Wisconsin's revised criteria for use classes coldwater, warm water sportfish, warm water forage fish, and limited aquatic life are consistent with the CWA and federal regulations and guidance, (2) ESA consultation is required, (3) ESA consultation will be deferred to the national consultation, and (4) Wisconsin's criterion for the use class limited forage fish is inconsistent with the available scientific literature on chronic selenium toxicity to fish, however, since EPA's 304(a) recommendation is currently undergoing revision, any action on selenium will wait until EPA's national review is concluded.

HARDNESS RANGES FOR ACUTE AQUATIC LIFE CRITERIA FOR COPPER AND NICKEL, NR 105, TABLE 2A

Description: Table 2A identifies the range of hardness values over which acute criteria that are hardness dependent apply. The range is a function of the hardness range of the toxicity data available from the literature. The revised ranges are as follows.

Substance	Previous Hardness Range (ppm)	Revised Hardness Range (ppm)
Copper	14-427	13 – 495
Nickel	19-157	13 - 268

³ Lemly, 2002. Page 23.

Review of Wisconsin's revised criteria: Wisconsin added new data to the copper and nickel data sets to correct the previous errors made when Wisconsin calculated copper and nickel criteria in 1997. Wisconsin revised Table 2A of NR 105 to expand the hardness ranges for the acute copper and nickel criteria to reflect the addition of the new data to the toxicity data sets for these substances. This is consistent with Wisconsin's approved procedures for calculating aquatic life water quality criteria ((NR 105 .05 (3), and NR 105.06 (4)). These revisions are appropriate and consistent with section 101(a) (2) and 303(c) (2) of the CWA, and 40 CFR Part 132 and 131.

Approval of a state's WQS is a federal action requiring consultation under section 7(a)(2) of the ESA. The 2001 memorandum of agreement between EPA and the Services established a framework where EPA's national consultation on all recommended 304(a) criteria would provide section 7 coverage for Regional approvals of state water quality criteria where the state criteria are at least as stringent as EPA's. EPA may proceed with an approval action pending conclusion of the national consultation assuming that section 7(d) is not violated. This is documented in a separate memorandum to the record. Since the state's copper criteria and derivation are slightly less stringent than the national criteria but are unlikely to have any significant additional impact on listed species, the Region and FWS will have to determine if any additional consultation is required following the results of the national consultation.

Conclusions: (1) Wisconsin's revised criterion ranges are consistent with CWA and federal regulations and guidance, (2) ESA consultation is required, and (3) ESA consultation will be deferred to the national consultation.

b. Revisions to Wisconsin's criteria to protect human health

1. Basis for Review of Wisconsin's Revised Human Health Criteria

As discussed above, Wisconsin adopted methods for deriving human health criteria in 1997 that EPA approved in 2000. These methods specify the process Wisconsin must follow in calculating a criterion to protect humans from adverse health effects due to exposure to toxicants through consumption of contaminated aquatic organisms, contaminated water, or both. The methods divide potential adverse health effect into two groups, non-cancer (threshold) health effect, and cancer (non threshold) health effect. Wisconsin's human health methods were developed to be as protective as the human health methods published by EPA in the Great Lakes Water Quality Guidance (40 CFR 132, Appendix B (bioaccumulation factors) and Appendix C (human health criteria)). Given Wisconsin's system of designated uses, there is the potential for multiple criteria for each human toxicant to account for cancer and non-cancer endpoints, differences in the bioaccumulation potential of a pollutant in different types of fish in different aquatic communities and whether or not a specific water body is used as a public water supply (see table below).

Potential Human Health Cancer and Non-cancer Criteria for Each Toxicant

Fish Tissue Exposure Route	Water Exposure Route	
	Public Water Supply	Non Public Water Supply
Cold Water Community	X	X
Warm Water Communities (Sport and Forage Fish)	X	X
Limited Aquatic Life (fish species not present)	NA	X

EPA reviewed the methods adopted by Wisconsin and found that Wisconsin's methods for deriving bioaccumulation factors and human health criteria were as protective as the corresponding methods published by EPA at 40 CFR 132.

In 2000, EPA published a revised human health methodology. There are differences between the approved methods used by Wisconsin and EPA's current national methodology for deriving human health criteria. The differences are described in the following table:

Comparison of EPA's and Wisconsin's Human Health Criteria Methodology Equations, Variables, and Exposure Assumptions.

EPA	Wisconsin	Comments
<p>Equations for calculating human cancer criteria</p> <p>40 CFR 132 Appendix C (III)(C)(2)</p> $HCV = \frac{RAD \times BW}{WC + [(FC_{TL3} \times BAF_{HH}^{TL3}) + (FC_{TL4} \times BAF_{HLA}^{HLA})]}$ <p>2000 HH Methodology (Equation 1-2)</p> $AWQC = RSD \times \left[\frac{BW}{DI + \sum_{i=2}^4 FI_i \times BAF_i} \right]$	<p>Chapter NR 105.09</p> $HCC = \frac{RAD \times 70kg}{W_H + (F_H \times BAF)}$	<p>EPA & WI ARE DIFFERENT</p> <p>The Wisconsin equation differs from both EPA equations in that Wisconsin derives a single BAF input based on the type of aquatic community (coldwater, warmwater, limited) that incorporates information on trophic levels and lipid content into a single value. This approach was approved by EPA in 2000 when EPA reviewed the rules adopted by Wisconsin under 40 CFR 132. This difference does not vary with individual pollutants and is not considered in the review of the criteria for specific pollutants below.</p> <p>Differences between human health criteria developed using the Wisconsin method and either the GL method or the 2000 HH methodology are most often attributable to the risk level selected, the fish consumption assumed, the method used to calculate the BAF, the assumed lipid content of the fish consumed, and the calculations for determining the freely dissolved fraction of the pollutant. The impact of these differences on calculation of criteria is discussed in greater detail below.</p> <p>MCL are used by Wisconsin if the MCL is less than calculated HCC.</p>
<p>RAD = Risk Associated Dose = RSD (Risk Specific Dose)</p> $RAD = \frac{CancerRisk}{q1^*}$ <p>Where q1* = cancer potency factor</p> <p>BW = Body Weight = 70 kg</p>	<p>RAD = Risk Associated Dose</p> <p>Wisconsin used a 1x10⁻⁵ risk level for all of their criteria calculations.</p> <p>70 kg = default average human body weight.</p>	<p>EPA & WI ARE EQUIVALENT. Published national HH criteria recommendations are calculated are based on 10⁻⁶ risk. EPA guidance allows states to select risk levels for cancer criteria between 1x10⁻⁵ and 1x 10⁻⁶. All other inputs being equal, criteria calculated by Wisconsin will be one order of magnitude less stringent than those calculated based on a risk level of 1x 10⁻⁶.</p> <p>EPA & WI ARE EQUIVALENT. Both use the default average weight of 70 kg.</p>

EPA	Wisconsin	Comments
<p>WC = Water Consumption = DI (Drinking Water Intake) = 2 liters/day</p>	<p>W_H = Average per capita water consumption = 2 L/d for surface water used as PWSs and 0.01 L/d for recreational activities.</p>	<p>EPA & WI ARE EQUIVALENT. When calculating HH criteria for non PWS waters, Wisconsin includes a small amount of water consumption for incidental intake.</p>
<p>FC = Fish Consumption, GLI Values: FC_{TL3} = mean consumption of trophic level 3 regionally caught freshwater fish = 0.0036 kg/day. FC_{TL4} = mean consumption of trophic level 4 regionally caught freshwater fish = 0.0114 kg/day. FI = Fish Intake, 2000 Methodology Values: Default FI rate = 0.0175 kg/day FI_2 = 0.0038 kg/day FI_3 = 0.0080 kg/day FI_4 = 0.0057 kg/day</p>	<p>F_H = Average per capita daily consumption of sport-caught fish = 0.02 kg/day.</p>	<p>EPA & WI FISH CONSUMPTION ASSUMPTIONS ARE DIFFERENT; WI ASSUMES GREATER FISH CONSUMPTION. The Wisconsin value is state-specific and has the effect of making criteria calculated using Wisconsin's method more stringent than those calculated using the GL method or the 2000 HH method. This difference does not vary with individual pollutants and is not considered in the review of the criteria for specific pollutants below.</p>
<p>Formulas for calculating BAFs</p>		
<p>BAF = Bioaccumulation Factor</p>	<p>BAF = Bioaccumulation Factor</p>	<p>EPA & WI ARE DIFFERENT The Wisconsin BAF is calculated from a baseline BAF using the methodology in 40 CFR 132 Appendix B. The baseline BAF is based on the concentration of freely dissolved substances in the ambient water to facilitate extrapolation from one water to another.</p>
<p>$BAF_{(TLn)} = [(baselineBAF_{fd})_{TLn} \times (f_1)_{TLn} + 1] \times (f_{fd})$</p>	<p>For warm water communities: $BAF = [baselineBAF](0.013) + 1](f_{fd})$ For cold water communities: $BAF = [baselineBAF](0.044) + 1](f_{fd})$</p>	<p>EPA & WI ARE EQUIVALENT. EPA and Wisconsin use the same equations except for different variable inputs as explained below.</p>
<p>$(f_1)_{TLn}$ = lipid fraction of aquatic species consumed at trophic level "n". National default values are: $(f_1)_{TL2} = 0.019$ $(f_1)_{TL3} = 0.026$ $(f_1)_{TL4} = 0.030$</p>	<p>Where: 0.013 and 0.044 are the fraction lipid values for warm and cold water fish and aquatic life communities, respectively.</p>	<p>EPA & WI ARE DIFFERENT The lipid fraction used for national criteria calculations are derived using national default values for different trophic levels. The Wisconsin lipid fractions are derived from state-specific warm and cold water aquatic life species present in Wisconsin. Wisconsin's lipid value for waters designated coldwater influences the criterion to be more stringent than either EPA method, the lipid value for waters designated warmwater will cause the resulting criterion to be less</p>

EPA	Wisconsin	Comments
<p>f_{fd} = Fraction of the total chemical in water that is freely dissolved.</p> $f_{fd} = \frac{1}{1+(DOC)(0.08)(Kow)+(POC)(Kow)}$ <p>Where: DOC = 0.0000029 kg/L POC = 0.0000005 kg/L</p>	<p>f_{fd} = fraction of the chemical in the water that is freely dissolved.</p> $f_{fd} = \frac{1}{1+(DOC)(0.1)(Kow)+(POC)(Kow)}$ <p>Where: DOC = 0.000002 kg/L POC = 0.0000004 kg/L</p>	<p>stringent. This difference does not vary with individual pollutants and is not considered in the review of the criteria for specific pollutants below.</p> <p>EPA & WI ARE DIFFERENT</p> <p>Multiplying factor in denominator. The equations are identical except that the multiplication factor of 0.10 was changed to 0.08 in the 2000 Methodology. The effect of the change in the multiplier on resulting criteria is negligible. This difference does not vary with individual pollutants and is not considered in the review of the criteria for specific pollutants below.</p> <p>POC and DOC. The Wisconsin POC and DOC values are taken directly from 40CFR132. These values changed in the 2000 Methodology to 0.0000005 kg/L (POC) and 0.0000029 kg/L (DOC). The effect of the differences in POC and DOC on the resulting criteria are negligible. This difference does not vary with individual pollutants and is not considered in the review of the criteria for specific pollutants below.</p>
<p>The baseline BAF is derived using one of four methods listed in 40 CFR 132 Appendix B(IV) and the 2000 Methodology in order from most preferred to least preferred:</p> <ol style="list-style-type: none"> 1. A measured baseline BAF for an organic or inorganic chemical derived from a field study of acceptable quality. 2. A predicted baseline BAF for an organic chemical derived using field-measured BSAFs of acceptable quality. 3. A predicted baseline BAF for an organic or inorganic chemical derived from a BCF measured in a laboratory study of acceptable quality and a FCM. 4. A predicted baseline BAF for an organic or inorganic chemical derived from a K_{ow} of acceptable quality and a FCM. <p>Selection of the method for deriving a baseline BAF depends upon the data available. The method selected for deriving a baseline BAF can vary by pollutant and can account for differences between EPA's published criteria recommendations and those adopted by Wisconsin.</p>		
<p>Method 1: A measured baseline BAF derived from a field study of acceptable quality.</p>		
		<p>The human health criteria published in 40 CFR 132 were calculated based on this method using field data from the Great Lakes.</p>
<p>Method 2: A predicted baseline BAF derived using field-measured BSAFs of acceptable quality.</p>		
		<p>Have not found examples where this method was used by Wisconsin.</p>

EPA	Wisconsin	Comments
<p>Method 3: A predicted baseline BAF derived from a BCF measured in a laboratory study of acceptable quality and a FCM.</p>		
$BaselineBAF_i^{fd} = (FCM) \left[\frac{MeasuredBCF_T^i}{f_{fd}} \right] \left[\frac{1}{f_i} \right]$ <p>Where: <i>BaselineBAF_i^{fd}</i> = BAF expressed on a freely dissolved and lipid-normalized basis for a given trophic level. FCM = The food chain multiplier for the appropriate trophic level <i>MeasuredBCF_Tⁱ</i> = BCF based on total concentration in tissue and water. <i>f_i</i> = Fraction of the tissue that is lipid. <i>f_{fd}</i> = Fraction of the total chemical in the test water that is freely dissolved.</p>	$BaselineBAF = (FCM) \left[\frac{MeasuredBCF_T^i}{f_{fd}} \right] \left[\frac{1}{f_i} \right]$	<p>EPA & WI ARE DIFFERENT EPA and Wisconsin use the same equation but with slightly different inputs. EPA's values for the FCM can be found in Table 5-1 of the 2000 Methodology. Wisconsin used Table B-1 of 40 CFR 132. There are some slight differences in the multipliers between these tables, but none to cause any significant difference in the final criteria values. There are also differences in calculation of the fraction freely dissolved as discussed above (i.e., different POC and DOC values).</p>
<p>Method 4: A predicted baseline BAF derived from a <i>K_{ow}</i> of acceptable quality and a FCM</p>		
$BaselineBAF_i^{fd} = (FCM) \times (K_{ow})$ <p>Where: <i>BaselineBAF_i^{fd}</i> = BAF expressed on a freely dissolved and lipid-normalized basis for a given trophic level. FCM = The food chain multiplier for the appropriate trophic level <i>K_{ow}</i> = Octanol-water partition coefficient</p>	$BaselineBAF = (FCM) \times (K_{ow})$	<p>EPA & WI ARE DIFFERENT EPA and Wisconsin use the same equation but with slightly different inputs. EPA's values for the FCM can be found in Table 5-1 of the 2000 Methodology. Wisconsin used Table B-1 of 40 CFR 132. There are some slight differences in the multipliers between these tables, but none to cause any significant difference in the final criteria values.</p>
<p>Equations for calculating human non cancer criteria</p>		
<p>40 CFR 132 Appendix C (III)(C)(2)</p>	<p>Chapter NR 105.08(4)(a)</p>	<p>EPA & WI ARE DIFFERENT The Wisconsin equation differs from both EPA equations in that Wisconsin derives a single BAF input based on the type of aquatic community (coldwater, warmwater,</p>

EPA	Wisconsin	Comments
$HNV = \frac{ADE \times BW \times RSC}{WC + [(FC_{TL3} \times BAF_{TL3}^{HH}) + (FC_{TL4} \times BAF_{TL4}^{HH})]}$ <p>2000 HH Methodology (Equation 1-1)</p> $AWQC = RfD \times RSC \times \left[\frac{BW}{DI + \sum_{i=2}^4 (FI_i \times BAF_i)} \right]$	$HTC = \frac{ADE \times 70kg \times RSC}{W_H + (F_H \times BAF)}$	<p>limited) that incorporates information on trophic levels and lipid content into a single value. This approach was approved by EPA in 2000 when EPA reviewed the rules adopted by Wisconsin under 40 CFR 132. This difference does not vary with individual pollutants and is not considered in the review of the criteria for specific pollutants below.</p> <p>Differences between human health criteria developed using the Wisconsin method and either the GL method or the 2000 HH methodology are most often attributable to the fish consumption assumed, the method used to calculate the BAF, the assumed lipid content of the fish consumed, and the calculations for determining the freely dissolved fraction of the pollutant. The impact of these differences on calculation of criteria is discussed in greater detail below.</p>

EPA has reviewed the differences between Wisconsin's methods and EPA's national human health methods. Based on this review, EPA considers Wisconsin's methods for deriving human health criteria adequate to protect the health of Wisconsin residents. EPA also considers criteria derived consistent with these methods to be sufficient for CWA purposes to protect the health of residents of Wisconsin. Systemic differences between Wisconsin's method and EPA's methods that affect all criteria are differences in fish consumption rates, differences in the assumed trophic level of fish consumed, and differences in the risk level for carcinogens. Criteria for specific pollutants may also be impacted by source of the toxicity data used to derive the criterion (acceptable daily exposure (ADE) for non-carcinogens, or cancer potency factor (q1*) for carcinogens), the value selected for the relative source contribution and by the method used to calculate a bioaccumulation factor and the source of the data used to calculate the bioaccumulation factor.

Wisconsin submitted to EPA summary sheets for each substance, which included the calculations used to develop the revised criteria. These calculations were reviewed for accuracy and compliance with Wisconsin's approved methodologies for human health criteria calculations (NR 105.08 and 105.09). In addition, the criteria were compared to EPA's 304(a) national criteria guidance, as well as EPA's human health criteria in 40 CFR Part 132.6, Table 3, for waters of the Great Lakes system.

The exception is for the Limited Aquatic Life category. Wisconsin's "Limited Aquatic Life" category was not compared to any EPA criteria, as EPA does not have this criteria category. This category eliminates all fish data, and human exposure is limited to incidental ingestion of small amounts of water due to contact with the water. This rulemaking does not concern the actual classification of specific waters as Limited Aquatic Life. Therefore, EPA's review of human health criteria for Limited Aquatic Life waters was limited to whether or not the criterion would protect human health given the type of exposure expected in Limited Aquatic Life waters.

2. Wisconsin's revisions to non-cancer human health criteria in Section 5. NR 105, Table 8

ANTIMONY

Description: The following table presents Wisconsin's revised antimony criteria in comparison to EPA's GLI and national 304(a) criteria.

	Coldwater AL		Warmwater AL		Limited Aquatic Life (no fish consumption, incidental water exposure only)
	PWS	Non PWS	PWS	Non PWS	
WI	5.6 µg/L	373.3 µg/L	5.6 µg/L	373.3 µg/L	1120 µg/L
EPA GLI	No published value	No published value	No published value	No published value	No published value
EPA 304(a)	5.6 µg/L	640 µg/L	5.6 µg/L	640 µg/L	No published value

Specific inputs to criteria derivation:

	WI	EPA GLI	EPA 304(a)
ADE (source)	4 x 10 ⁻⁴ (IRIS, 1991)	4 x 10 ⁻⁴ (IRIS, 1991)	4 x 10 ⁻⁴ (IRIS, 1991)
RSC (source)	0.4 (EPA, 2002)	No published value	0.4 (EPA, 2002)
Baseline BAF (method, source)	0 (method 3, EPA, 1993)	No published value	Not updated: old BCF retained.

Review of Wisconsin's revised criteria: The ADE and RSC inputs to Wisconsin's revised antimony criterion are identical to those used by EPA in 2002. Wisconsin's public water supply criterion for all aquatic life use classes is identical to EPA's current criterion recommendation. Wisconsin's criteria for non public water supply waters are more stringent than EPA's corresponding recommendation due to Wisconsin's use of a higher fish consumption level in calculating human health criteria.

Conclusion: Wisconsin's revised criteria for antimony at Section 5. NR 105, Table 8, are consistent with the CWA and Federal regulations and guidance.

CADMIUM

Description: The following table presents Wisconsin's revised cadmium criteria in comparison to EPA's GLI and national 304(a) criteria.

	Coldwater AL		Warmwater AL		Limited Aquatic Life (no fish consumption, incidental water exposure only)
	PWS	Non PWS	PWS	Non PWS	
WI	4.4 µg/L	370µg/L	4.4µg/L	370 µg/L	880 µg/L
EPA GLI	No published value	No published value	No published value	No published value	No published value
EPA 304(a)	Refer to MCL (5.0 µg/L)	Refer to MCL (5.0 µg/L)	Refer to MCL (5.0 µg/L)	Refer to MCL (5.0 µg/L)	No published value

Specific inputs to criteria derivation:

	WI	EPA GLI	EPA 304(a)
ADE (source)	5×10^{-4} mg/Kg/d (IRIS, 1991)		Criteria references the MCL
RSC (source)	0.25 (EPA, 2002)	No published value	
Baseline BAF (method, source)	0.69 (method 3, EPA, 1993)	No published value	

Review of Wisconsin's revised criteria: Wisconsin calculated revised criteria for cadmium in response to EPA's update of the MCL. Wisconsin used the most updated RSC for the criteria calculation. Wisconsin's criteria for waters with public water supply use are more stringent than the MCL. Wisconsin's criteria for the other use designations were calculated in a manner consistent with Wisconsin's approved methods.

Conclusion: Wisconsin's revised criteria for cadmium at Section 5. NR 105, Table 8, are consistent with the CWA and federal regulations and guidance.

CHLOROBENZENE

Description: The following table presents Wisconsin's revised chlorobenzene criteria in comparison to EPA's GLI and national 304(a) criteria.

	Coldwater AL		Warmwater AL		Limited Aquatic Life (no fish consumption, incidental water exposure only)
	PWS	Non PWS	PWS	Non PWS	
WI	104.1 µg/L	399.5 µg/L	126 µg/L	1209.5 µg/L	28,000 µg/L
EPA GLI	470 µg/L	3200 µg/L	470 µg/L	3200 µg/L	No published value
EPA 304(a)	130 µg/L	1600 µg/L	130 µg/L	1600 µg/L	No published value

Specific inputs to criteria derivation:

	WI	EPA GLI	EPA 304(a)
ADE (source)	2×10^{-2} (IRIS, 1993)	1.95×10^{-2}	2×10^{-2} (IRIS, 1993)
RSC (source)	0.20 (EPA, FR. Vol 68, No. 250,12/31/ 2003)	0.8	0.20 (EPA, FR. Vol 68, No. 250,12/31/ 2003)
Baseline BAF (method)	Warmwater – 775.3; Coldwater – 762.4 (method 4, EPA, 1995)	Final BAF _{TL3} = 15 Final BAF _{TL4} = 24	Not updated; old BCF retained.
Baseline BAF source	EPA, 1993	EPA, 1995b	

Review of Wisconsin's revised criteria: Wisconsin used the most updated RSC in its criteria calculations. Wisconsin's public water supply criteria for all aquatic life use classes are more stringent than EPA's current criteria recommendations due to Wisconsin's use of a higher fish consumption level and calculation of BAFs according to Wisconsin's approved procedures. Wisconsin's criteria for non-public water supplies are more stringent than EPA's current criteria recommendations due to Wisconsin's use of a higher fish consumption level and calculation of BAFs according to Wisconsin's approved procedures.

Conclusion: Wisconsin's revised criteria for chlorobenzene at Section 5. NR 105, Table 8, are consistent with the CWA and federal regulations and guidance.

TOTAL CHROMIUM

Description: The following table presents Wisconsin's revised total chromium criteria in comparison to EPA's GLI and national 304(a) criteria.

	Coldwater AL		Warmwater AL		Limited Aquatic Life (no fish consumption, incidental water exposure only)
	PWS	Non PWS	PWS	Non PWS	
WI	100 µg/L	No published value	100µg/L	No published value	No published value
EPA GLI	No published value	No published value	No published value	No published value	No published value
EPA 304(a)	Refer to MCL (100 µg/L)	No published value	Refer to MCL (100 µg/L)	No published value	No published value

Specific inputs to criteria derivation:

	WI	EPA GLI	EPA 304(a)
ADE (source)	No calculation – reference to MCL of 100 µg/L (EPA)	No published value	No calculated criteria; referral to the MCL
RSC (source)		No published value	
Baseline BAF (method, source)		No published value	

Review of Wisconsin's revised criteria: Wisconsin has adopted EPA's MCL for total chromium as the criteria value for public water supply uses.

Conclusion: Wisconsin's revised criteria for total chromium at Section 5. NR 105, Table 8, are consistent with the CWA and federal regulations and guidance.

CHROMIUM (+3)

Description: The following table presents Wisconsin's revised chromium (+3) criteria in comparison to EPA's GLI and national 304(a) criteria.

	Coldwater AL		Warmwater AL		Limited Aquatic Life (no fish consumption, incidental water exposure only)
	PWS	Non PWS	PWS	Non PWS	
WI	41,750 µg/L	3,818,000 µg/L	41,750 µg/L	3,818,000 µg/L	8,400,000 µg/L
EPA GLI	No published value	No published value	No published value	No published value	No published value
EPA 304(a)	Refer to MCL for total chromium (100 µg/L)	No published value	Refer to MCL for total chromium (100 µg/L)	No published value	No published value

Specific input to criteria derivation:

	WI	EPA GLI	EPA 304(a)
ADE (source)	1.5 (IRIS, 1998)	No published value	No calculation –referral to MCL for total chromium
RSC (source)	0.80 (Ch NR 105 default value, 1997)	No published value	
Baseline BAF (method)	0.60 (method 3, 1995)	No published value	
Baseline BAF source	EPA, 1993		

Review of Wisconsin's revised criteria: Wisconsin chose to calculate criteria for chromium (+3), rather than adopt the MCL for total chromium. Wisconsin used the most updated ADE in its criteria calculations. All calculations were completed in accord with Wisconsin's approved procedures.

Conclusion: Wisconsin's revised criteria for chromium (+3) at Section 5. NR 105, Table 8, are consistent with the CWA and Federal regulations and guidance.

CHROMIUM (+6)

Description: The following table presents Wisconsin's revised chromium (+6) criteria in comparison to EPA's GLI and national 304(a) criteria.

	Coldwater AL		Warmwater AL		Limited Aquatic Life (no fish consumption, incidental water exposure only)
	PWS	Non PWS	PWS	Non PWS	
WI	83.5 µg/L	7,636 µg/L	83.5 µg/L	7,636 µg/L	16,800 µg/L
EPA GLI	No published value	No published value	No published value	No published value	No published value
EPA 304(a)	Refer to MCL for total chromium (100 µg/L)	No published value	Refer to MCL for total chromium (100 µg/L)	No published value	No published value

Specific input to criteria derivation:

	WI	EPA GLI	EPA 304(a)
ADE (source)	3×10^{-3} (IRIS,1998)	No published value	
RSC (source)	0.80 (Ch NR 105 default value, 1997)	No published value	
Baseline BAF (method)	0.60 (method 3, 1995)	No published value	
Baseline BAF source	EPA, 1993		

Review of Wisconsin's revised criteria: Wisconsin chose to calculate criteria for chromium (+6), rather than adopt the MCL for total chromium. Wisconsin used the most updated ADE in its criteria calculations. All calculations were completed in accord with Wisconsin's approved procedures.

Conclusion: Wisconsin's revised criteria for chromium (+6) at Section 5. NR 105, Table 8, are consistent with the CWA and Federal regulations and guidance.

TOTAL CYANIDE

Description: The following table presents Wisconsin's revised total cyanide criteria in comparison to EPA's GLI and national 304(a) criteria.

	Coldwater AL		Warmwater AL		Limited Aquatic Life (no fish consumption, incidental water exposure only)
	PWS	Non PWS	PWS	Non PWS	
WI	138.6 µg/L	9300 µg/L	138.6 µg/L	9300 µg/L	28.000 µg/L
EPA GLI	600 µg/L	48,000 µg/L	600 µg/L	48,000 µg/L	No published value
EPA 304(a)	140 µg/L	140 µg/L	140 µg/L	140 µg/L	No published value

Specific input to criteria derivation:

	WI	EPA GLI	EPA 304(a)
ADE (source)	2×10^{-2} (IRIS, 1993)	2.16×10^{-2}	2×10^{-2} (IRIS, 1993)
RSC (source)	0.20 (EPA, FR Vol.68, No. 250, 12/31/2003)	0.8	0.20
Baseline BAF (method)	1 (Default)	Final $BAF_{TL3} = 1$ Final $BAF_{TL4} = 1$	Not updated: old BCF retained
Baseline BAF (source)	EPA GLI Technical Support Document, 1995)	EPA, 1995b	

Review of Wisconsin's revised criteria: Wisconsin's public water supply criteria for all aquatic life use classes are slightly more stringent than EPA's current criteria recommendations due to Wisconsin's use of a higher fish consumption level. Wisconsin's criteria for non-public water supplies are less stringent than EPA's current criteria. Wisconsin chose to calculate criteria for non-public water supplies in accord with Wisconsin's approved procedures, using EPA's updated RSC. EPA has adopted the same criteria for "Fish + Water" and "Fish Only" as prudent public health policy (FR, Vo. 68, Issue 250, 12/31/03).

Conclusion: Wisconsin's revised criteria for total cyanide at Section 5. NR 105, Table 8, are consistent with the CWA and federal regulations and guidance. Wisconsin has the discretion to use its approved procedures to calculate criteria, and is not required to adopt EPA's policy of using public water supply criteria for cyanide for non-public water supplies.

1,2-DICHLOROBENZENE

Description: The following table presents Wisconsin's revised 1,2-Dichlorobenzene criteria in comparison to EPA's GLI and national 304(a) criteria.

	Coldwater AL		Warmwater AL		Limited Aquatic Life (no fish consumption, incidental water exposure only)
	PWS	Non PWS	PWS	Non PWS	
WI	273 µg/L	481 µg/L	446 µg/L	1509 µg/L	126,000 µg/L
EPA GLI	No published value	No published value	No published value	No published value	No published value
EPA 304(a)	420 µg/L	1300 µg/L	420 µg/L	1300 µg/L	No published value

Specific input to criteria derivation:

	WI	EPA GLI	EPA 304(a)
ADE (source)	9 × 10 ⁻² (IRIS, 1991)	No published value	9 × 10 ⁻² (IRIS, 1991)
RSC (source)	0.20 (EPA, FR Vol.68. No. 250,12/31/2003)	No published value	0.20 (EPA, FR Vol.68. No. 250,12/31/2003)
Baseline BAF (method)	Warmwater -3097; Coldwater – 2944 (method 3, 1995)	No published value	Not updated: old BCF retained
Baseline BAF (source)	EPA, 1993		

Review of Wisconsin's revised criteria: Wisconsin used the most updated RSC in its criteria calculations. Wisconsin's criteria for cold water public and non-public water supplies are more stringent than EPA's current criteria recommendations due to the use of higher fish consumption rates, and the use of Wisconsin's approved methods for calculating coldwater BAFs. Wisconsin's criteria for warmwater public and non-public water supplies are less stringent than EPA's current criteria recommendations due to the use of Wisconsin's approved methods for calculating warmwater BAFs.

Conclusion: Wisconsin's revised criteria for 1,2-Dichlorobenzene at Section 5. NR 105, Table 8, are consistent with the CWA and federal regulations and guidance.

ETHYLBENZENE

Description: The following table presents Wisconsin's revised ethylbenzene criteria in comparison to EPA's GLI and national 304(a) criteria.

	Coldwater AL		Warmwater AL		Limited Aquatic Life (no fish consumption, incidental water exposure only)
	PWS	Non PWS	PWS	Non PWS	
WI	410 µg/L	931 µg/L	567 µg/L	2920 µg/L	140,000 µg/L
EPA GLI	No published value	No published value	No published value	No published value	No published value
EPA 304(a)	530 µg/L	2100 µg/L	530 µg/L	2100 µg/L	No published value

Specific input to criteria derivation:

	WI	EPA GLI	EPA 304(a)
ADE (source)	1 × 10 ⁻¹ (IRIS, 1991)	No published value	1 × 10 ⁻¹ (IRIS, 1991)
RSC (source)	0.20 (EPA, FR Vol.68. No. 250,12/31/2003)	No published value	0.20 (EPA, FR Vol.68. No. 250,12/31/2003)
Baseline BAF (method)	Warmwater – 1,729.3; Coldwater – 1,674.5 (method 4, EPA 1995)	No published value	Not updated: old BCF retained.
Baseline BAF (source)	EPA, 1993		

Review of Wisconsin's revised criteria: Wisconsin used the most updated RSC in its criteria calculations. Wisconsin's criteria for cold water public and non-public water supplies are more stringent than EPA's current criteria recommendations due to the use of higher fish consumption rates, and the use of Wisconsin's approved methods for calculating coldwater BAFs.

Wisconsin's criteria for warmwater public and non-public water supplies are less stringent than EPA's current criteria recommendations due to the use of Wisconsin's approved methods for calculating warmwater BAFs.

Conclusion: Wisconsin's revised criteria for ethylbenzene at Section 5. NR 105, Table 8, are consistent with the CWA and Federal regulations and guidance.

HEXACHLOROCYCLOPENTADIENE

Description: The following table presents Wisconsin's revised hexachlorocyclopentadiene criteria in comparison to EPA's GLI and national 304(a) criteria.

	Coldwater AL		Warmwater AL		Limited Aquatic Life (no fish consumption, incidental water exposure only)
	PWS	Non PWS	PWS	Non PWS	
WI	25.6 µg/L	65.3 µg/L	34.7	195 µg/L	8,400 µg/L
EPA GLI	No published value	No published value	No published value	No published value	No published value
EPA 304(a)	µg/L	µg/L	µg/L	µg/L	No published value

Specific input to criteria derivation:

	WI	EPA GLI	EPA 304(a)
ADE (source)	6×10^{-3} (IRIS, 2001)	No published value	6×10^{-3}
RSC (source)	0.20 (EPA, FR Vol.68. No. 250,12/31/2003)	No published value	0.20
Baseline BAF (method)	Warmwater – 1,603.7; Coldwater -1,483 (Method 3, 1995)	No published value	Not updated; Old BCF retained
Baseline BAF (source)	EPA, 1993		

Review of Wisconsin's revised criteria: Wisconsin used the most updated RSC and ADE in its criteria calculations. Wisconsin's public water supply criteria for all aquatic life use classes are more stringent than EPA's current criteria recommendations due to Wisconsin's use of a higher fish consumption level and calculation of BAFs according to Wisconsin's approved procedures. Wisconsin's criteria for non-public water supplies are more stringent than EPA's current criteria recommendations due to Wisconsin's use of a higher fish consumption level and calculation of BAFs according to Wisconsin's approved procedures.

Conclusion: Wisconsin's revised criteria for hexachlorocyclopentadiene at Section 5. NR 105, Table 8, are consistent with the CWA and federal regulations and guidance.

TOLUENE

Description: The following table presents Wisconsin's revised toluene criteria in comparison to EPA's GLI and national 304(a) criteria.

	Coldwater AL		Warmwater AL		Limited Aquatic Life (no fish consumption, incidental water exposure only)
	PWS	Non PWS	PWS	Non PWS	
WI	1,000 µg/L	5201 µg/L	1,000µg/L	15,359 µg/L	280,000 µg/L
EPA GLI	5600 µg/L	51000 µg/L	5600 µg/L	51000 µg/L	No published value
EPA 304(a)	1300 µg/L	15,000 µg/L	1300 µg/L	15,000 µg/L	No published value

Specific input to criteria derivation:

	WI	EPA GLI	EPA 304(a)
ADE (source)	2×10^{-1} (IRIS, 1994)	2.23×10^{-1}	2×10^{-1} (IRIS, 1994)
RSC (source)	0.20 (EPA, FR Vol.68. No. 250,12/31/2003)	0.8	0.20 (EPA, FR Vol.68. No. 250,12/31/2003)
Baseline BAF (method)	Warmwater – 585.8; Coldwater – 577.7 (method 4, EPA, 1995)	Final BAF _{TL3} = 11 Final BAF _{TL4} = 17	Not used; old BCF retained
Baseline BAF (source)	EPA, 1993	EPA, 1995b	

Review of Wisconsin's revised criteria: Wisconsin used the most updated RSC in its criteria calculations. Wisconsin's rules ((NR 105.08(4)(b)) require the use of the MCL as water quality criteria for public water supply receiving waters when the MCL is lower than the criteria. Wisconsin calculated toluene values for public water supplies that were above the MCL, so the MCL was used for PWS classifications. The MCL is more stringent than EPA's 304(a) criteria recommendations. Wisconsin criterion for cold water non-public water supplies is more stringent than EPA's 304(a) criteria recommendations due to the use of higher fish consumption rates, and the use of cold water BAFs, in accord with Wisconsin's approved procedures. Wisconsin's criterion for warmwater non-public water supplies is less stringent than EPA's 304(a) criteria recommendations due to the use of warmwater BAFs, in accord with Wisconsin's approved procedures.

Conclusion: Wisconsin's revised criteria for toluene at Section 5. NR 105, Table 8, are consistent with the CWA and federal regulations and guidance.

3. Wisconsin's revisions to cancer human health criteria in Section 9. NR 105, Table 9

ARSENIC

Description: The following table presents Wisconsin's revised arsenic criteria in comparison to EPA's GLI and national 304(a) criteria.

	Coldwater AL		Warmwater AL		Limited Aquatic Life (no fish consumption, incidental water exposure only)
	PWS	Non PWS	PWS	Non PWS	
WI	0.20 ug/l	13.3 ug/l	0.20 ug/l	13.3 ug/l	40
EPA GLI	No published value	No published value	No published value	No published value	No published value
EPA 304(a)	0.018 ug/l	0.14 ug/l	0.018 ug/l	0.14 ug/l	No published value

Specific input to criteria derivation:

	WI	EPA GLI	EPA 304(a)
Oral Slope Factor (source)	.1.75×10 ⁰ (EP Human Health Criteria Calculation Matrix, 2002)	No published value	Check HQ message
Baseline BAF (method)	1 (method 3, EPA, 1995)		No BAF used; Old BCF of 44 retained.
Baseline BAF (source)	EPA, 1993.		

Review of Wisconsin's revised criteria: Wisconsin used the most updated oral slope factor in its criteria calculations. All of Wisconsin's criteria are less stringent than EPA's current criteria recommendations due to the use of a different risk level (10^{-5}), and the use of Wisconsin's approved methods for calculating BAFs.

Conclusion: Wisconsin's revised criteria for arsenic at Section 5. NR 105, Table 9, are consistent with the CWA and federal regulations and guidance.

3,3'-DICHLOROBENZIDINE

Description: The following table presents Wisconsin's revised 3,3-Dichlorobenzidine criteria in comparison to EPA's GLI and national 304(a) criteria.

	Coldwater AL		Warmwater AL		Limited Aquatic Life (no fish consumption, incidental water exposure only)
	PWS	Non PWS	PWS	Non PWS	
WI	0.3 ug/l	0.40 ug/l	0.5 ug/l	1.3 ug/l	140 ug/l
EPA GLI	No published value	No published value	No published value	No published value	No published value
EPA 304(a)	0.021 ug/l	0.028 ug/l	0.021 ug/l	0.028 ug/l	No published value

Specific inputs to criteria derivation:

	WI	EPA GLI	EPA 304(a)
Oral Slope Factor (source)	4.5×10^{-1} (IRIS, 1993)	No published value	4.5×10^{-1} (IRIS, 1993)
Baseline BAF (method)	Warmwater – 4097.6; Coldwater – 3800.4 (method 4, EPA, 1005)		No BAF; old BCF of 312 retained
Baseline BAF (source)	EPA, 1993		

Review of Wisconsin's revised criteria: Wisconsin had already used the most recent inputs for its previous criteria calculation, but noticed that a minor calculation error had occurred in the previous criteria calculation (use of trophic level 4 FCM for warmwater.) (Note; EPA's 2002 criteria update only changed the fish intake to 17.5 g/d, and Wisconsin uses a State-specific fish intake of 20 g/d.) Wisconsin's criteria are all less stringent than EPA's current criteria recommendations due to the use of a different risk level (10^{-5}), and the use of Wisconsin's approved methods for calculating BAFs.

Conclusion: Wisconsin's revised criteria for 3,3-Dichlorobenzidine at Section 5. NR 105, Table 9, are consistent with the CWA and Federal regulations and guidance.

1,3-DICHLOROPROPENE

Description: The following table presents Wisconsin's revised 1,3-Dichloropropene criteria in comparison to EPA's GLI and national 304(a) criteria.

	Coldwater AL		Warmwater AL		Limited Aquatic Life (no fish consumption, incidental water exposure only)
	PWS	Non PWS	PWS	Non PWS	
WI	3.4 ug/l	108 ug/l	3.4 ug/l	173 ug/l	700 ug/l
EPA GLI	No published value	No published value	No published value	No published value	No published value
EPA 304(a)	0.34 ug/l	21 ug/l	0.34 ug/l	21 ug/l	No published value

Specific inputs to criteria derivation:

	WI	EPA GLI	EPA 304(a)
Oral Slope Factor (source)	$.1 \times 10^{-1}$ (IRIS, 2000)	No published value	$.1 \times 10^{-1}$ (IRIS, 2000)
Baseline BAF (method)	Warmwater – 40: Coldwater - 39.8 (method 4, EPA, 1995)		No BAF used; Old BCF of 1.9 retained.
Baseline BAF (source)	CHEMFATE Database, which references SRC 1988		

Review of Wisconsin's revised criteria: Wisconsin used the most updated oral slope factor in its criteria calculations. Wisconsin's criteria are all less stringent than EPA's current criteria recommendations due to the use of a different risk level (10^{-5}). If EPA's national criteria recommendations were calculated using the same risk level as Wisconsin (10^{-5}), then Wisconsin's criteria for public water supplies would be equal to EPA's national criteria. Wisconsin's criteria for non-public water supplies would be more stringent than EPA's national criteria, due to the use of Wisconsin's approved methods for calculating BAFs.

Conclusion: Wisconsin's revised criteria for 1,3-Dichloropropene at Section 5. NR 105, Table 9, are consistent with the CWA and federal regulations and guidance.

IV. DOCUMENTS CONSIDERED BY EPA

In addition to the CWA federal regulations at 40 CFR Parts 131 and 132, other Federal guidance (the primary documents are listed below), and EPA's Water Quality Standards Handbook (EPA 823-B-94-005a, August 1994), the following list includes some of the other submission-specific references that were considered.

Lemly, 2002, "Selenium Assessment in Aquatic Ecosystems: A Guide for Hazard Evaluation", Springer Series on Environmental Management.

U.S. EPA, 1985. *Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and their Uses*. National Technical Information Service PB85-227049. 1985.

U.S. EPA, 1986. *Quality Criteria for Water (the "Gold Book") Office of Water Regulations and Standards*, EPA 440-5-86-001. USGPO #955-002-00000-8.

U.S. EPA, 1993. Comparison and Rank of Proposed Human Health Bioaccumulation Factors for the Great Lakes Initiative. EPA-822-R-93-010. August 1993.

U.S. EPA, 1995a. *Final Water Quality Guidance for the Great Lakes System*. Fed. Reg. Vol. 60, No. 56, pages 15365-15425. March 23, 1995.

U.S. EPA, 1995b. *Great Lakes Water Quality Initiative Criteria Documents for the Protection of Human Health*. EPA-820-B-95-006. March 1995.

U.S. EPA, 1996. 1995 Updates: Water Quality Criteria Documents for the Protection of Aquatic Life in Ambient Water. EPA-820-B-96-001. September 1996.

U.S. EPA, 2000. Letter to WDNR, June 13, 2000 Approving Certain Provisions of Wisconsin's 1997 Rule Revisions.

U.S. EPA, 2000. *Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health (2000)*. EPA-822-B-00-004, October 2000.

U.S. EPA, 2001. *Memorandum of Agreement between EPA, Fish and Wildlife Service, and National Marine Fisheries Service Regarding Enhanced Coordination under the Clean Water Act and Endangered Species Act*.

U.S. EPA, 2002. National Recommended Water Quality Criteria 2002: Human Health Criteria Calculation Matrix. EPA-822-R-02-012. November 2002.

V. ENDANGERED SPECIES ACT REQUIREMENTS

On August 7, 2008, EPA initiated consultation with a letter to the Green Bay Wisconsin Field Office of the FWS requesting an updated list of threatened and endangered species and designated critical habitat. EPA conducted subsequent discussions with FWS staff on specific species (especially regarding mussels and the Hine's emerald dragonfly) and criteria. Since EPA initiated, but did not conclude consultation, any approval actions made by EPA on aquatic life criteria are made subject to the conclusion of ESA consultation.

Regarding the adoption of aquatic life criteria for copper (acute and chronic), nickel (acute and chronic), endrin (chronic) and selenium (chronic except for Limited Forage Fish waters since no action is being taken on this criterion as discussed above), Wisconsin adopted values that are essentially equal to or more stringent than EPA's national criteria recommendations. Accordingly, Region 5 is deferring consultation on these criteria to the National Consultation on EPA's CWA Section 304(a) National Aquatic Life Water Quality Criteria Recommendations to determine if they are protective of Federally-listed species, as agreed to by U.S. EPA and the U.S. Fish and Wildlife Service U.S. FWS). (*Memorandum of Agreement between the Environmental Protection Agency, Fish and Wildlife Service and National Marine Fisheries Service Regarding Enhanced Coordination under the Clean Water Act and Endangered Species Act*, February, 2001.)

EPA's action on the submitted new or revised human health criteria do not require consultation under the ESA since EPA lacks discretion to alter its approval based on effects on listed species. The CWA requires human health criteria to be protective of human health endpoints and based upon a human response to stressors, and limits EPA to consideration of human health related impacts in acting on such standards.

EPA's determination regarding all ESA issues associated with EPA's action on the submitted WQS revisions by Wisconsin have been documented in a memo to the record.