Form 1100-001
(R 2/07)

NATURAL RESOURCES BOARD AGENDA ITEM

Item No. 3.A.3

SUBJECT: Adoption of Board Order DG-18-07, revisions to NR 140 relating to groundwater quality standards

FOR: AUGUST 2007 **BOARD MEETING**

TO BE PRESENTED BY: Michael D. Lemcke - DG/2

SUMMARY:

Amendments are being proposed to Wisconsin Administrative Code Chapter NR 140, Groundwater Quality. Ch. NR 140, Wis. Adm. Code, establishes Wisconsin state groundwater quality standards for substances of public health or welfare concern. Amendments to NR 140 are proposed to add groundwater quality standards for a substance of public health concern, alachlor ethane sulfonic acid (alachlor-ESA).

Wisconsin's groundwater law, State Statute Chapter 160 was created in May of 1984. This statute requires that the Department develop groundwater quality standards for substances detected in, or having a reasonable probability of entering, the groundwater resources of the state. NR 140 was adopted by the Natural Resources Board in 1985 to comply with ch. 160, Stats. In accordance with the provisions of ch. 160, Stats., amendments to NR 140 groundwater quality standards are based on recommendations received from the Department of Health and Family Services (DHFS).

The only known controversy associated with these amendments to NR 140 relates to the groundwater standard recommendations developed by DHFS. Comments have been received by the Department questioning DHFS' application of the statutory process used to develop their recommendations for alachlor-ESA groundwater quality standards.

The Board has approved amendments to NR 140 in the past to add and revise groundwater quality standards, and to clarify rule language. There are currently groundwater quality standards for 122 substances of public health concern, 8 substances of public welfare concern and 15 indicator parameters in NR 140.

RECOMMENDATION: Adopt Board Order DG-18-07, revisions to NR 140 relating to groundwater quality standards

LIST OF ATTACHED MATERIALS:

No	☐	Fiscal Estimate Required	Yes	☑	Attached
No	☑	Environmental Assessment or Impact Statement Required	Yes	☐	Attached
No	☐	Background Memo	Yes	☑	Attached

APPROVED:

/S/ — 7/17/07

Bureau Director, — Date

/S/ — 7/17/07

Administrator, — Date

/S/ — 7/27/07

Secretary, Scott Hassett — Date

cc: Laurie J. Ross - AD/5
Jill Jonas - DG/2
Carol Turner - LS/5
Mike Lemcke - DG/2
Mike Scott - LS/5

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: **July 13, 2007** FILE REF: NR 140

TO: **Natural Resources Board**

FROM: **Scott Hassett - AD/5**

SUBJECT: **Recommendation for adoption of proposed amendments to ch. NR 140, Wis. Adm. Code (Groundwater Quality)**

1. Why rule is being proposed

Amendments are being proposed to Wisconsin Administrative Code Chapter NR 140, Groundwater Quality. Chapter NR 140, Wis. Adm. Code, establishes Wisconsin state groundwater quality standards for substances of public health and welfare concern. Amendments to NR 140 are proposed to add groundwater quality standards for a substance of public health concern, alachlor ethane sulfonic acid (alachlor-ESA).

Wisconsin's groundwater law, State Statute Chapter 160, was created in May of 1984, as part of the 1983 Wisconsin Act 410. NR 140 was adopted by the Natural Resources Board in 1985 to comply with ch. 160, Stats. Chapter 160, Stats., requires the Department to develop groundwater quality standards for substances detected in, or having a reasonable probability of entering, the groundwater resources of the state. Alachlor-ESA has been detected in Wisconsin in a significant number of water supply wells.

Alachlor-ESA is a degradation product of the broadleaf herbicide alachlor. Alachlor has been used in Wisconsin primarily on corn and soybean crops. Alachlor-ESA was detected in approximately 28% of the private water supply wells tested in a 2000/2001 Wisconsin Department of Agriculture and Consumer Protection (DATCP) statewide groundwater sampling survey. In a 1999/2000 DATCP groundwater sampling survey of wells known or suspected to be impacted by agricultural chemicals, alachlor-ESA was detected in 91% of private water supply wells tested and 48% of the municipal water supply wells tested.

NR 140 establishes groundwater quality standards at two levels, enforcement standard (ES) and preventive action limit (PAL). In accordance with ch. 160, Stats., health based ES groundwater quality standards are established based on recommendations developed by the Department of Health and Family Services (DHFS). PAL groundwater quality standards for substances of public health concern are set at either 20% of the concentration of the established ES, or at 10% of the concentration of the established ES if the substance has carcinogenic, mutagenic or teratogenic properties or interactive effects.

These proposed amendments to NR 140, to establish state groundwater standards for alachlor-ESA, are based on recommendations received from DHFS. Because no federal number, as defined by statute, or health based reference dose (acceptable daily intake level) has been established for alachlor-ESA, DHFS developed their recommendations for an alachlor-ESA ES using the applicable methodology in s. 160.13, Stats. DHFS has recommended an alachlor-ESA ES of 20 micrograms per liter (μg/L), and a PAL, set at 20% of the recommended ES, of 4 μg/L.

The Natural Resources Board has approved amendments to NR 140 in: 1988, 1990, 1991, 1993, 1995, 1996, 1998, 1999, 2003 and 2006. These amendments were made to add and revise groundwater quality standards

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and to clarify rule language. There are currently groundwater quality standards for 122 substances of public health concern, 8 substances of public welfare concern and 15 indicator parameters in NR 140.

2. Summary of the rule

New NR 140 public health based groundwater quality standards are proposed for alachlor-ESA, a degradation product of the broadleaf herbicide alachlor. DHFS has recommended an ES of 20 μg/L and a PAL of 4 μg/L for alachlor-ESA. A concentration of 20 μg/L has been used as an interim health advisory level for alachlor-ESA in Wisconsin since 1993.

Amendments to NR 140 are proposed to add groundwater quality standards for alachlor-ESA, as indicated below:

	Current Standards (in μg/L)		Proposed Standards (in μg/L)	
Substance	ES	PAL	ES	PAL
Alachlor-ESA	no standard	no standard	**20**	**4**

3. How proposal affects existing policy

The proposed amendments to NR 140 continue the existing policy of protecting Wisconsin's groundwater in accordance with ch. 160, Stats. Groundwater quality standards for an additional substance would be added to the current groundwater standards for 130 substances of public health or welfare concern. The addition of groundwater quality standards for a new substance will not affect how regulatory programs respond to ES and PAL exceedances for substances listed in NR 140.

NR 140 was initially adopted by the Natural Resources Board in 1985 to comply with ch. 160, Stats. The code originally established groundwater quality standards for 36 substances of public health concern and 10 substances of public welfare concern, and it created a framework for implementation of the standards by the Department. The Board has periodically approved amendments to NR 140 to add standards for additional substances and to clarify the rule language.

4. Hearing Synopsis

In March of 2007, the Natural Resources Board authorized the Department to hold public hearings and solicit comments on the proposed amendments to NR 140. A public hearing was held on May 11, 2007, in Madison, Wisconsin. One member of the public attended the hearing and signed a hearing appearance slip “in opposition” to the proposed amendments. No oral comments were presented at the public hearing.

5. Summary of Written Public Comments

Written comments on the proposed rule revisions were accepted through May 18, 2007. Correspondence was received by the Department expressing comments on the proposed NR 140 amendments. A total of four comment letters/memos were received by the Department:

1) a memo, dated 5/14/2007, from the Alachlor ESA Coalition

2) a letter, dated 5/17/2007, from the Wisconsin Crop Production Association
3) a letter, dated 5/16/2007, from the Monsanto Company
4) a letter, dated 5/18/2007, from the Wisconsin Farmers Union

The Department received written comments both in opposition to, and in support of, the proposed NR 140 alachlor-ESA groundwater quality standards.

Comments received in opposition to the proposed groundwater quality standards for alachlor ESA focused on the methodology used by DHFS to develop their ES groundwater standard recommendation. Because no federal number (federal drinking water standard, suggested no adverse response level or cancer risk level) or Wisconsin state drinking water standard has been established for alachlor-ESA, DHFS, in accordance with Wisconsin's groundwater law, used the methodology specified in ss. 160.07 and 160.13, Stats., to develop it's recommended alachlor-ESA ES.

Use of the s. 160.13, Stats., methodology to develop a NR 140 ES recommendation requires DHFS to determine a no-observable-effect level (NOEL) for alachlor-ESA, and a "suitable" uncertainty factor that the NOEL can be divided by to calculate a reference dose (RfD)/acceptable daily intake (ADI) value. The calculated RfD/ADI is then used to develop a recommended enforcement standard. The majority of the comments received in opposition to the proposed alachlor-ESA groundwater standards challenged DHFS' determination of an alachlor-ESA NOEL, and the uncertainty factor used in the RfD/ADI calculations.

DHFS reviewed relevant toxicological studies and determined an alachlor-ESA NOEL from the results of a 1993 91-day rat study of the toxicity of alachlor-ESA administered in drinking water. Different opinions have been expressed on the selection of a NOEL from the results of this study. Comments were received suggesting that an alternative NOEL from the 1993 rat study be used by DHFS to develop their recommended alachlor-ESA enforcement standard. The Monsanto Company, the manufacturer of alachlor, initiated a new (2003) 90-day rat study of the toxicity of alachlor-ESA administered in food. Comments were received suggesting that the results of this study be used, instead of the results of the 1993 drinking water study, as the basis for an alachlor-ESA ES recommendation.

The enforcement standard development methodology in s. 160.13, Stats., requires DHFS to determine a suitable uncertainty factor to be used in the calculation of a recommended enforcement standard. DHFS is required to consider a number of specific factors, listed in the statute, when establishing a suitable uncertainty factor. Comments were received questioning DHFS' determination of the uncertainty factor used to develop their recommended alachlor-ESA enforcement standard and suggesting that a different uncertainty factor would be more appropriate.

In determining the uncertainty factor used to calculate their alachlor-ESA ES recommendation DHFS included a factor for "data gaps, including lack of a carcinogenicity study for the metabolite of a potentially carcinogenic parent compound". Comments were received questioning use of this specific factor in determining the uncertainty factor to be used in development of an alachlor-ESA ES recommendation. Commenters suggested that DHFS reconsider use of this factor based on the current EPA alachlor cancer classification.

Because of concerns with DHFS' determination of the NOEL and uncertainty factor used to develop their recommended alachlor-ESA ES, commenters suggested that an independent panel conduct a peer review of the studies and methodology used by DHFS to develop their recommended standard.

Commenters also asked that a “trigger” be placed in the rule that would automatically/immediately revise alachlor-ESA groundwater quality standards as soon as a health advisory level or reference dose (acceptable daily intake) for alachlor-ESA was established by the U.S. Environmental Protection Agency.

Comments were received generally supporting the protection of groundwater resources in Wisconsin. Comments were also made supporting the proposed groundwater standards for alachlor-ESA and stating that farm family health is critical to the health of Wisconsin's rural economy.

A separate Response to Public Comments (Attachment 1) provides responses to comments received on the proposed NR 140 amendments. DHFS has provided responses to comments received related to their development of groundwater standard recommendations for alachlor-ESA (Attachment 2). DHFS has also updated the scientific support documentation that was prepared for their alachlor-ESA groundwater standard recommendations (Attachment 3).

6. Environmental Analysis

Section NR 150.03, Wis. Adm. Code, (Environmental Analysis and Review Procedures for Department Actions) describes the appropriate categories for various proposed Departmental actions. The Department has determined that this rule proposal is a Type III action. Type III actions normally do not have the potential to cause significant environmental effects, normally do not significantly affect energy usage and normally do not involve unresolved conflicts in the use of available resources. This rule proposal is not expected to cause any of these effects. In accordance with s. 150.20, Wis. Adm. Code, Type III actions do not require an environmental assessment (EA) or environmental impact statement (EIS).

7. Small Business Regulatory Flexibility Analysis

The Department does not believe that the proposed rule will have a significant economic impact on a substantial number of small businesses. The compliance and reporting requirements in NR 140 are not changed by the proposed amendments. If a groundwater quality standard is exceeded, the owner or operator of a facility, practice or activity, including any small business, must report the violation to the appropriate regulatory agency. The proposed amendments to NR 140 would add one new substance that a facility may have to monitor for, and report exceedances of, if sampled levels attain or exceed proposed standards.

Chapter 160, Stats., requires establishment of both design and performance standards. Individual regulatory programs (DATCP, COMM, DNR-Waste Management, DNR-Watershed Management, etc.) establish design and operational standards in their program rules. Performance standards (groundwater quality standards) are contained in NR 140. Chapter 160, Stats., does not allow for less stringent schedules, deadlines or reporting requirements, or for exemptions to remedial action, when a groundwater quality standard is attained or exceeded, based on the size of the business causing the contamination.

There would be adverse impacts on public health, welfare, safety and the environment if small businesses were not required to meet regulatory reporting requirements and implement remedial responses. The more quickly contamination can be evaluated and responses initiated , the less likely that public health, safety and welfare will be adversely affected. If small businesses were exempt from these requirements groundwater contamination would continue unabated at least until the Department could appropriate

sufficient resources to undertake this work. The delay, or possibility that nothing would be done, would lead to adverse impacts on public health, welfare, safety and the environment.

The type of small businesses that are typically impacted by NR 140 include dry cleaners, small manufacturers, agricultural cooperatives, farmers, underground storage tank owners, small solid waste disposal facilities, small wastewater treatment operations, as well as others. In effect, any small business that has an authorized or unauthorized discharge of a substance exceeding the health or welfare groundwater quality standards listed in NR 140 is responsible for responding to the release consistent with the requirements of NR 140.

With the proposed amendments to NR 140 there would be new groundwater quality standards for one new substance. The new groundwater standards would be used, along with existing NR 140 standards, to establish system and facility design standards, for compliance purposes, and as clean up goals in the event of a spill or unpermitted discharge. If remedial action or other response is necessary, the individual programs which regulate the facility, practice or activity would determine the appropriate level of clean-up required. As the cost of remedial options varies, the cost of remediation of groundwater contamination for small businesses will vary, depending on the complexity of the site, the contamination at the facility, practice or activity, and the federal and state laws being used to guide the remedial action.

The new substance for which groundwater quality standards are proposed has been detected in groundwater in Wisconsin. The adoption of state groundwater quality standards that can be used for design, compliance and clean-up activity purposes might aid small businesses in number of ways. Groundwater standards provide specifications for facility and activity design and management, as well as inform a business whether or not substance concentrations detected in groundwater exceed levels determined to be protective of public health and welfare. If concentrations of a substance in a potential drinking water source are elevated and remediation is required, established groundwater quality standards let a small business know when clean-up efforts are completed. When substances are detected in groundwater for which a NR 140 standard does not exist, the Department may require clean-up of groundwater "to the extent practicable". This may result in overly conservative clean-up depending upon the actual toxicity of the substance detected.

Attachments:

Attachment 1	RESPONSE TO PUBLIC COMMENTS
Attachment 2	June 2007 DHFS responses to comments on Alachlor-ESA groundwater quality standard recommendations (titled: *Recommendations for Groundwater Enforcement Standard and Preventive Action Limit for Alachlor-ESA Summary of Comments*)
Attachment 3	June 2007 DHFS Scientific Support Document for Alachlor-ESA groundwater quality standard recommendations [titled: *Scientific Support Documentation for Groundwater Enforcement Standard and Preventive Action Limit for Ethane Sulfonic Acid metabolite of Alachlor (Alachlor-ESA)*]

Attachment #1

RESPONSE TO PUBLIC COMMENTS
July 13, 2007

Revisions to ch. NR 140, Wis. Adm. Code, to amend
NR 140.10 Table 1 and Appendix 1, relating to groundwater quality standards for Alachlor-ESA

Natural Resources Board Order No. DG-18-07

Introduction

In March of 2007, the Natural Resources Board (NRB) authorized the Department to hold public hearings and solicit comments on proposed revisions to Ch. NR 140, "Groundwater Quality", that would establish new state groundwater quality standards for alachlor ethane sulfonic acid (alachlor-ESA).

A public hearing on proposed revisions to NR 140 was held on Friday May 11, 2007. One person attended the hearing. That hearing attendee did not present oral comments, but did register "in opposition" to the proposed NR 140 revisions.

Written comments on the proposed rule revisions were accepted through May 18, 2007. Correspondence was received by the Department expressing comments on the proposed NR 140 revisions. A total of four comment letters/memos were received by the Department:

1) a memo, dated 5/14/2007, from the Alachlor ESA Coalition [submitted attached to 5/17/2007 e-mail (from Ms. Amy Winters, President, Capitol Strategies, LLC)]
2) a letter, dated 5/17/2007, from the Wisconsin Crop Production Association [submitted attached to 5/17/2007 e-mail (from Mr. Mike Turner, Executive Director, Wisconsin Crop Production Association); copy of letter also submitted via conventional mail]
3) a letter, dated 5/16/2007, from the Monsanto Company [submitted attached to 5/18/2007 e-mail (from Ms. Amy Winters, President, Capitol Strategies, LLC and Monsanto Contract Lobbyist)]
4) a letter, dated 5/18/2007, from the Wisconsin Farmers Union [submitted via fax on 5/18/2007]

The following acronyms and abbreviations are used to identify commenting organizations below:

AEC	Alachlor ESA Coalition
WCPA	Wisconsin Crop Production Association
MON	Monsanto Company
WFU	Wisconsin Farmers Union

The majority of comments that were received by the Department on this rule relate to DHFS' development of recommendations for alachlor-ESA groundwater quality standards. A copy of comments received by the Department were forwarded to DHFS for their review and response. DHFS has prepared a document with responses to comments related to their development of alachlor-ESA groundwater standard recommendations. This document is attached to the NRB Agenda Item (Green Sheet) background memo as Attachment 2. DHFS has also revised its alachlor-ESA scientific support documentation. The revised DHFS scientific support documentation is attached to the NRB Agenda Item background memo as Attachment 3.

Below are responses to comments received by the Department on the proposed rule, with DHFS responses (from their response to comments document) referenced as appropriate. Comments related to rule language clarity, grammar, punctuation and use of plain language were also received from the Wisconsin Legislative Council Rules Clearinghouse.

I. Written comments received on proposed ch. NR 140, Wis. Adm. Code, revisions:

1. **Comment:** (AEC) "As we have previously stated during the CR 02-095 rule review, we fully support Wisconsin's goal of protecting groundwater resources and ensuring the safety of drinking water and have no objection to the establishment of a scientifically sound, health-based groundwater quality standard. We only ask that the state ensure that sound science is being utilized in establishing this standard and that the state is ensuring the accuracy, integrity, objectivity, and consistency of the data that is being used to prepare the rule as required by the Data Quality Act (State statute 227.14 2m)."

   Response: *The Department is proposing that the groundwater quality standard recommendations developed by the Wisconsin Department of Health and Family Services (DHFS) for alachlor-ESA be adopted in ch. NR 140, Wis. Adm. Code. As required under Wisconsin's groundwater law, DHFS followed the methodology in s. 160.13, Stats., in developing it's recommendation for an alachlor-ESA groundwater quality enforcement standard.*

   Section 227.14(2m), Stats., addresses the quality of data used in the preparation and analysis of a proposed rule. The scientific data that DHFS used in developing their recommendation for an alachlor-ESA groundwater quality enforcement standard were primarily the results of toxicology studies funded by the Monsanto Company, the manufacturer of alachlor. The standard recommended by DHFS is based on the results of valid scientific studies, and the methodology used to develop it is specified in state statute. There is no reason to believe that the accuracy, integrity, objectivity or consistency of the data used by DHFS in developing its alachlor-ESA enforcement standard recommendation is in question.

2. **Comment:** (AEC, MON) "... believe that the DHFS recommendations are at odds with the scientific evidence and are therefore erroneous in two key respects: (1) DHFS's conclusions regarding the toxicity of alachlor ESA, particularly DHFS' determination of a No Observable Effect Level (NOEL) ignore recent study results; (2) DHFS did not select an appropriate uncertainty factor for use in calculating an Enforcement Standard. In both instances, DHFS' conclusions are at odds with and considerably more conservative than those of USEPA and other federal, state, and international regulatory agencies. The net effect of these two decisions by DHFS is a proposed Enforcement Standard (20ppb) that is at least 30-fold, and perhaps over 100-fold, more restrictive than would have been set had the DHFS followed EPA's guidance for conducting risk assessments and setting water quality standards or utilized EPA's conclusions regarding the toxicity of alachlor and alachlor ESA."

   Response: *DHFS has reviewed comments related to the NOEL and uncertainty factor used to develop its recommendation for an alachlor-ESA groundwater quality enforcement standard. DHFS has provided responses to comments related to the NOEL and uncertainty factor it utilized - see DHFS (NRB Agenda Item background memo - Attachment 2) response to comments: A, B, D, E & G.*

3. **Comment:** (AEC) "DHFS has justified the additional 10-fold uncertainty factor on the basis of the carcinogenicity of the parent alachlor. However, contrary to DHFS' justification, alachlor is NOT classified by EPA as a "probable human carcinogen". In 1997, following review of extensive mechanistic information and evaluation by the Science Advisory Panel, the EPA re-classified alachlor as "likely to be a human carcinogen at high doses, but not likely at low doses." The scientific justification for this reclassification was clearly outlined in the RED [*Dec. 1998 EPA Reregistration Eligibility Decision (RED) Alachlor*]."

Response: *DHFS has reviewed comments related to the uncertainty factor used to develop its recommendation for an alachlor-ESA groundwater quality enforcement standard. DHFS has provided responses to comments related to the uncertainty factor it utilized - see DHFS (NRB Agenda Item background memo - Attachment 2) response to comments: B, C & F.*

4. **Comment:** (AEC, MON) "The March 2006 EPA Cumulative Risk Assessment for Chloroacetanilides was also not utilized in establishing the proposed standard. The assessment summarizes the latest EPA cancer risk assessment for combined residues from alachlor and acetochlor in food and water. 2 key elements in this assessment are: (1). The ESA and OXA metabolites were not included in the cancer risk assessment. As stated in the third paragraph on page 19, "These compounds [the metabolites] ... are not included in this cumulative risk assessment because extensive data are available (USEPA 2004b) to show that these compounds show a different toxicological profile than the respective parents and do not contribute to the development of nasal olfactory epithelium tumors in rats." (2). The EPA did NOT apply any additional safety factor for carcinogenicity, even though both alachlor and acetochlor are known to be carcinogenic to rats. As indicated at the top of pages 5 and 30, the Agency considers a Margin of Exposure greater than 100 to be outside their "level of concern" (LOC) for the tumors produced by these chemicals. This is equivalent to utilizing a total uncertainty factor (UF) of 100, based on two values of 10 each to account for interspecies and intraspecies differences. No additional uncertainty factor was applied due to concerns about carcinogenicity. This is clearly in contrast to the WI approach of adding an extra 10X due to the DHFS/DNR “concern” about potential carcinogenicity of alachlor ESA."

   Response: *DHFS has reviewed the March 2006 EPA Cumulative Risk Assessment for Chloroacetanilides document and has provided a response to comments related to this document - see DHFS (NRB Agenda Item background memo - Attachment 2) response to comments G.*

5. **Comment:** (AEC) "... we believe that the proposed rule/groundwater standard is not based on sound science and will needlessly alarm Wisconsin residents. It will also set an irresponsible precedent for the groundwater standard process and potentially unnecessarily tap into limited financial resources for remediation efforts."

   Response: *The alachlor-ESA groundwater quality standards recommended by DHFS were developed using the appropriate methodology specified in Wisconsin's groundwater law, ch. 160, Stats. The scientific data used in developing the recommendations were primarily the results of toxicology studies funded by the Monsanto Company, the manufacturer of alachlor. The standard recommended by DHFS is based on the results of valid scientific studies, and the methodology used to develop it is specified in state statute. There is no reason to believe that the data or methodology used by DHFS is in question. The alachlor-ESA enforcement standard recommended by DHFS is consistent with past standards, and is based on review and consideration of the best science available.*

6. **Comment:** (AEC, WCPA) ... ask that "DNR/DHFS reconsider its recommendation of 20 ppb and propose a more reasonable and science based alternative as is required under section 227.14 (2m) of the Wisconsin State Statutes."

   Response: *This comment is somewhat vague and confusing. Section 227.14(2m), Stats., addresses the quality of data used in the preparation and analysis of a proposed rule. The comment presented is related to the 20 part per billion (ppb)/milligram per liter (µg/L) alachlor-ESA groundwater quality enforcement standard recommendation developed by DHFS. As required under Wisconsin's groundwater law, DHFS followed the methodology in s. 160.13, Stats., in developing it's recommendation for an alachlor-ESA groundwater quality enforcement standard.*

The comment appears to suggest that the 20 μg/L enforcement standard recommendation developed by DHFS is unreasonable and not science based. In developing their recommendation DHFS followed the applicable methodology specified in Wisconsin's groundwater law, ch. 160, Stats. The scientific data used in developing the recommendation were primarily the results of toxicology studies funded by the Monsanto Company, the manufacturer of alachlor. The standard recommended by DHFS is based on the results of valid scientific studies, and the methodology used to develop it is specified in state statute. There is no reason to believe that the accuracy, integrity, objectivity or consistency of the data used by DHFS in developing its alachlor-ESA enforcement standard recommendation is in question. The alachlor-ESA enforcement standard recommended by DHFS is reasonable, consistent with past standards, and is based on the best science available.

7. **Comment:** (AEC, WCPA) ... ask that DNR/DHFS conduct "an unbiased independent scientific peer review of the proposed groundwater standard for alachlor ESA".

   (MON) "Monsanto requests that prior to taking final rulemaking action DNR convene an independent, scientific review panel to conduct an external unbiased scientific peer review of the toxicology data on alachlor ESA, and of the methodology used and conclusions drawn by DHFS."

   Response: *The recommendation for an alachlor-ESA groundwater quality enforcement standard was developed by DHFS in accordance with the methodology specified in s. 160.13, Stats. This methodology is applicable in cases where no federal number or state drinking water standard has been established for a substance. DHFS is required by state statute to utilize this methodology, and it has consistently been employed by DHFS in the past to establish state groundwater quality standards.*

   There is no provision in ch. 160, Stats., for peer review of state groundwater standard recommendations developed by DHFS. DHFS' recommendation for an alachlor-ESA groundwater quality enforcement standard of 20 μg/L was established in accordance with the applicable provisions of ch. 160, Stats., and it is consistent with past development of state groundwater quality standards. There is no justification for requiring a peer review of the scientific studies and methodology used by DHFS to develop their recommended standard.

8. **Comment:** (AEC, WCPA, MON) ... ask that a “trigger” be placed in the rule that would automatically/immediately revise the groundwater standard and PAL as soon as a health advisory level or reference dose (acceptable daily intake) for Alachlor-ESA is established by the federal environmental protection agency.

   Response: *Ch. 160 Stats. directs that Wisconsin state groundwater enforcement standards are generally established based on "federal numbers" which represent EPA consensus risk-based values such as maximum contaminant levels, cancer potency factors and health-based reference doses. However, the statute directs that groundwater standard recommendations are initiated at DHFS to ensure their adequacy and appropriateness for a particular compound. The imposition of a trigger that would bypass the authority of DHFS to review and recommend appropriate ES and PAL values would represent a violation of the statute. Wisconsin groundwater quality standards are routinely adjusted to reflect new or revised federal guidance. A "trigger", as proposed in the comments, would not conform with Wisconsin law and, as revisions to state groundwater standards are now routinely made, is not necessary.*

9. **Comment:** (MON) "Monsanto fully supports Wisconsin’s goal of protecting groundwater resources and ensuring the safety of drinking water and has no objection to the establishment of scientifically sound, health-based groundwater quality standards. However, we strongly oppose the proposal to

establish a 20 ppb Enforcement Standard and 4 ppb Preventive Action Limit for alachlor ESA as it is not based on sound science nor is it consistent with standard scientific or regulatory practices. It also conflicts with the conclusions of other state, federal and international regulatory agencies."

Response: *The Wisconsin state groundwater quality standards proposed for alachlor-ESA are based on recommendations developed by DHFS. These recommendations were developed in accordance with methodologies specified in state statute. DHFS considered all available, applicable scientific information related to the toxicology of alachlor-ESA when it developed its recommendations. No federal or international standards or health advisory levels have been established for alachlor-ESA.*

At least two states, Minnesota and North Carolina, have established health based guidance levels for alachlor-ESA. The health based guidance level (Health Based Value) established for alachlor-ESA in Minnesota is 40 μg/L. The health based guidance level (recommended Interim Maximum Allowable Concentration) established in North Carolina for total alachlor plus its metabolites (including alachlor-ESA) is 0.4 μg/L. The health based groundwater quality standards for alachlor-ESA recommended by DHFS are not inconsistent with the health advisory levels established in these states.

10. **Comment:** (MON) "The state clearly needs to take appropriate caution to ensure public health, however, erroneous decisions by DHFS, if adopted, may unnecessarily alarm Wisconsin residents about the safety of their drinking water supplies and could have a significant impact on Wisconsin's agricultural industry. It also sets an irresponsible precedent for establishing groundwater standards in Wisconsin."

    Response: *The Department is charged with establishing state groundwater quality standards for substances detected in, or having a reasonable probability of entering, the groundwater resources of the state. Water supply well sampling, done by the Wisconsin Department of Agriculture, Trade and Consumer Protection, has shown alachlor-ESA to be one of the most commonly detected pesticide related compounds in Wisconsin groundwater. Alachlor-ESA has been found in approximately 28% of the water supply wells tested in alachlor use areas.*

    In order to provide adequate safeguards for public health and welfare, state groundwater law clearly justifies development of state groundwater standards for alachlor-ESA. Chapter 160, Stats., establishes a strict process for generating and promulgating state groundwater quality standards that ensures that these standards are based on sound science, and that available, pertinent information is considered in their development This statutory process has been followed in the development of the proposed state groundwater quality standards for alachlor-ESA .

11. **Comment:** (MON) "... belief that DHFS did not ensure the accuracy, integrity, objectivity and consistency of the data underpinning its recommendations. We believe an objective review of the data, consistent with the State's Data Quality statute, will show that DHFS 1) misinterpreted a key study concerning the toxicity of alachlor ESA, 2) disregarded the results of a follow-up study that was specifically designed and conducted to address DHFS' concerns, 3) did not utilize U.S. Environmental Protection Agency (EPA) conclusions concerning the toxicity of alachlor and alachlor ESA; and 4) did not follow standard scientific and regulatory practices or EPA guidelines with regard to selection of a suitable uncertainty factor."

    Response: *Section 227.14(2m), Stats., addresses the quality of data used in the preparation and analysis of a proposed rule. The scientific data used by DHFS in developing its recommendation for an alachlor-ESA enforcement standard were primarily the results of toxicology studies funded by the Monsanto Company. The standard recommended by DHFS is based on the results of valid scientific*

studies, and the methodology used to develop it is specified in state statute. There is no reason to believe that the accuracy, integrity, objectivity or consistency of the data used by DHFS in developing its alachlor-ESA enforcement standard recommendation is in question.

12. **Comment:** (MON) "Monsanto provided extensive scientific and legal comments on this proposal during the public hearing process on CR02-095. As DNR's Response to Public Comments on CR02-095 document shows, many of our comments were supported by other agricultural interests, through public testimony and written comments. We are disappointed to see that these comments had no impact on the proposal. DHFS' recommendations for the Enforcement Standard and Preventive Action Limit remain unchanged. We also note that many of these comments appear to have been summarily dismissed without sufficient rationale. Monsanto's September 2002 written comments (attached) also detailed the many ways in which the procedures followed by DHFS in developing its recommendation fail to comply with the requirements of Chapter 160, the state groundwater law. We ask that those comments be reconsidered/utilized in the review/reassessment of CR07-034".

    Response: *DHFS has received a copy of all comments that were sent to the Department related to this rule. DHFS has reviewed those comments and has provided responses to comments related to their development of recommendations for alachlor-ESA groundwater quality standards - see DHFS response to comments document (NRB Agenda Item background memo - Attachment 2). DHFS has also revised the scientific support documentation that details the development of its alachlor-ESA groundwater standard recommendations - see DHFS June 2007 alachlor-ESA scientific support documentation (NRB Agenda Item background memo - Attachment 3).*

13. **Comment:** (MON) "DHFS has concluded that the NOEL for the 1993 rat study conducted with alachlor ESA was 20 mg/kg/day. This value is almost 10-fold lower than the NOEL (182 mg/kg/day) determined for the same study by USEPA and by the European Union. DHFS has now acknowledged the USEPA conclusion, but justified its conclusion on the basis of the "criteria specified in Ch. 160" See September 2005 Green Sheet Attachment 2, DHFS responses [*to comments received on Natural Resources Board Order No. DG-37-02*] #1, 8 and 21 (attached). It appears that DHFS is referring to section 160.13(c), which defines the term NOEL. However, this definition is essentially the same as that used by USEPA as well as other regulatory agencies and toxicologists throughout the world, and does not justify DHFS' decision to ignore USEPA's conclusion."

    Response: *DHFS has reviewed comments related to the NOEL used to develop its recommendation for an alachlor-ESA groundwater quality enforcement standard. DHFS has provided responses to comments related to the NOEL it utilized - see DHFS (NRB Agenda Item background memo - Attachment 2) response to comments: A & E.*

14. **Comment:** (MON) "DHFS previously justified its NOEL decision on the basis of statistics (see November 2001 draft Recommendation, included as Attachment B to Monsanto's September 20, 2002 written comments). However, as discussed in Monsanto's written comments of September 20, 2002, that position conflicted with a previous DHFS statement that statistical significance was not intended to be used as the sole determinant of whether or not a finding is biologically significant or meaningful. The reference to statistical significance has now been dropped from DHFS' August 2005 Scientific Support Documentation for Cycle 8 Revisions of NR 140.10 (2005 DHFS Recommendation) but DHFS' conclusion regarding the NOEL remains the same. DHFS provides no alternative explanation in either the 2005 DHFS Recommendation or in DHFS' Response To Public Comments other than to assert that the conclusion results from "application of the criteria in Ch. 160"."

Response: *DHFS has reviewed comments related to the NOEL used to develop its recommendation for an alachlor-ESA groundwater quality enforcement standard. DHFS has provided responses to comments related to the NOEL it utilized - see DHFS (NRB Agenda Item background memo - Attachment 2) response to comments: A & E.*

15. **Comment:** (MON) "... DHFS appears to consider suspect the fact that USEPA has revised its conclusions about the 1993 study. Monsanto believes these concerns are unwarranted. USEPA revised its conclusions after receipt of additional information and further scientific input and review. This is not an unusual occurrence. In addition, the final USEPA conclusions regarding the NOEL for this study were included in the alachlor Reregistration Eligibility Decision (RED) document that was published in 1998 following both internal USEPA peer review and a standard public comment period. DHFS had previously been in contact with USEPA about this study and any further concerns should have been expressed at that time."

    Response: *DHFS has reviewed comments related to the NOEL used to develop its recommendation for an alachlor-ESA groundwater quality enforcement standard. DHFS has provided responses to comments related to the NOEL it utilized - see DHFS (NRB Agenda Item background memo - Attachment 2) response to comments: A & E.*

16. **Comment:** (MON) "In 2002, following a series of meetings with and at the suggestion of DHFS, Monsanto initiated a new 90-day rat study with alachlor ESA (at a cost of approximately $200,000), in an attempt to resolve this issue. The results of the 2003 study clearly demonstrated that alachlor ESA is markedly (10- to 40-fold) less toxic than believed by DHFS. DHFS has acknowledged this marked difference but has chosen to ignore the new results and to continue to base their calculations only on their original conclusions from the 1993 study. DHFS justifies this decision (2005 DHFS Recommendation, page 5) on the basis that alachlor ESA was administered via the drinking water in the first study and via the diet in the second study. However, dietary administration was utilized in the second study to avoid the water palatability problem that greatly complicated the interpretation of the results in the first study. It is highly unlikely that this difference in methodology, which was discussed with and agreed to by DHFS prior to study initiation, would have had a significant impact on the study results. Furthermore, results from studies conducted via dietary administration have been used by state, national and international authorities to establish numerous groundwater standards, including the overwhelming majority of those for pesticides (including alachlor)."

    Response: *DHFS has reviewed and considered the results of all available scientific studies related to the toxicity of alachlor-ESA. These studies included the new Monsanto initiated 90-day rat study [A 90-day oral (diet) toxicity study of MON 5775 in rats, conducted by WIL Research Laboratories] - see DHFS June 2007 alachlor-ESA scientific support documentation (NRB Agenda Item background memo - Attachment 3).*

17. **Comment:** (MON) "DHFS' utilization of a 10,000-fold uncertainty factor differs greatly from the 1000-fold uncertainty factor used for alachlor ESA in the alachlor RED and thus violates 160.13(2)(b) which requires DHFS to utilize available information from USEPA. Please also see our September 2002 comments for detailed explanation of the specific deficiencies."

    Response: *DHFS has reviewed comments related to the uncertainty factor used to develop its recommendation for an alachlor-ESA groundwater quality enforcement standard. DHFS has provided responses to comments related to the uncertainty factor it utilized - see DHFS (NRB Agenda Item background memo - Attachment 2) response to comments: B, C & D.*

18. **Comment:** (MON) "Contrary to the statement on page viii of the 2005 DHFS Recommendation, uncertainty factors of 10,000 are not typically used, even in cases where the data are limited or there are some unresolved concerns. EPA's general guidance is that uncertainty factors greater than 3000 should not be used in establishing standards because they are "too uncertain." (e.g., EPA Office of Drinking Water, 2000)."

    Response: *DHFS has reviewed comments related to the uncertainty factor used to develop its recommendation for an alachlor-ESA groundwater quality enforcement standard. DHFS has provided responses to comments related to the uncertainty factor it utilized - see DHFS (NRB Agenda Item background memo - Attachment 2) response to comments D.*

19. **Comment:** (MON) "DHFS's response to the above two comments [*Monsanto comments on Natural Resources Board Order No. DG-37-02 related to DHFS' use of a 10,000-fold uncertainty factor*] (DHFS Responses #6 and 10) is only that they are "required to employ the methodology outlined in Ch. 160 for deriving uncertainty factors". The methodology provided in Ch. 160 does not justify this decision. Section 160.13 lists the types of information that should be considered when determining a suitable uncertainty factor; it does not provide any guidance as to what the magnitude of such a factor should be."

    Response: *Chapter 160 does not provide guidance on the magnitude of the uncertainty factor used in the calculation of an acceptable daily intake/RfD. Section 160.13(2)(b)3, Stats., lists the types of information that must be considered in establishing a suitable uncertainty factor. This information was considered by DHFS in establishing a suitable uncertainty factor to be used to calculate an acceptable daily intake/RfD value for alachlor-ESA - see DHFS June 2007 alachlor-ESA scientific support documentation (NRB Agenda Item background memo - Attachment 3)*

20. **Comment:** (MON) "The use of an additional ten-fold uncertainty factor to account for DHFS' concern about possible carcinogenicity of alachlor ESA is contrary to a specific recommendation made to DHFS by USEPA in 1994, and ignores the USEPA conclusion that "alachlor ESA is unlikely to be carcinogenic" (alachlor RED, 1998), a conclusion that DHFS agreed to in a 2001 meeting. It is also contrary to the policies expressed in the USEPA Guidelines for Carcinogen Risk Assessment (USEPA, 2005). In fact, there are numerous examples of USEPA Category B2 (Probable) or C (Possible) carcinogens for which no additional uncertainty factor has been applied."

    Response: *DHFS has reviewed comments related to the uncertainty factor used to develop its recommendation for an alachlor-ESA groundwater quality enforcement standard. DHFS has provided responses to comments related to the uncertainty factor it utilized - see DHFS (NRB Agenda Item background memo - Attachment 2) response to comments: B, C & F.*

21. **Comment:** (MON) "DHFS either does not fully understand or does not accept USEPA's revised cancer classification for alachlor. This classification was changed in late 1997 following extensive peer review of the data by numerous senior scientists at USEPA, as well as the USEPA Science Advisory Panel. This classification now represents the official USEPA regulatory position. However, the 2005 DHFS Recommendation as well as DHFS' Response #9 [*to comments received on Natural Resources Board Order No. DG-37-02*] continues to rely on the outdated, B2 (Probable Human Carcinogen) classification that was assigned in 1986."

    Response: *DHFS has reviewed comments related to the uncertainty factor used to develop its recommendation for an alachlor-ESA groundwater quality enforcement standard. DHFS has provided responses to comments related to the uncertainty factor it utilized -see DHFS (NRB Agenda Item background memo - Attachment 2) response to comments F.*

22. **Comment:** (MON) "DHFS continues to rely on highly misleading and outdated examples as precedent for use of a 10,000-fold uncertainty factor (DHFS Responses #5 and 23 [*to comments received on Natural Resources Board Order No. DG-37-02*]). All four examples cited in the 2005 DHFS Recommendation were based on decisions prior to the USEPA policy decision in the year 2000 that uncertainty factors greater than 3000 should not be employed. More importantly, the unusually large uncertainty factor DHFS utilized for these chemicals was based either on the fact that a NOEL for the chemicals had not been determined or because the chemicals were classified by the USEPA as a Probable (B2) and/or Possible (C) human carcinogens. Neither of these situations applies to alachlor ESA."

    Response: *DHFS has reviewed comments related to the uncertainty factor used to develop its recommendation for an alachlor-ESA groundwater quality enforcement standard. DHFS has provided responses to comments related to the uncertainty factor it utilized - see DHFS (NRB Agenda Item background memo - Attachment 2) response to comments: D & F.*

23. **Comment:** (MON) "In addition to not addressing any of the factual issues raised about the four examples, DHFS' Response #23 *[to comments received on Natural Resources Board Order No. DG-37-02*] erroneously states that Monsanto claims "EPA has no RfDs with a UF of 10,000 based on a subchronic LOAEL". This is incorrect. Monsanto commented that the only examples in which USEPA applied a 10,000-fold uncertainty factor in determining the RfD were a few chemicals for which a subchronic NOEL could not be determined and a subchronic LOEAL had to be used instead. As previously explained, this is not the situation for alachlor ESA. USEPA has established numerous RfD's based on subchronic toxicity studies and uncertainty factors of 1000 or 3000."

    Response: *Thank you for clarification of Monsanto's position on this issue.*

24. **Comment:** (MON) "Comments at September 5th 2006 DNR Board Meeting by Dr. Anderson - Dr. Anderson, Department of Health and Family Services, stated that "The rats who were fed this [Alachlor ESA] in their drinking water suffered from anemia." and that "……Monsanto argues that anemia is not a serious enough affect [sic] to base the standard on." Monsanto has never argued that anemia is not a serious health effect or that it shouldn't be used to establish health-based standards. Rather, Monsanto disagrees with the DHFS/DNR conclusion that alachlor ESA caused anemia in rats, especially at the dose levels cited by DHFS. The DHFS conclusion is also in contrast to the conclusions of the USEPA and EU, both of which concluded that the slight numerical differences cited by DHFS were not biologically relevant and/or were not caused by alachlor ESA. This conclusion is further supported by the clear lack of anemia in a repeat study conducted at the request of DHFS with even higher dose levels of alachlor ESA."

    Response: *Thank you for clarification of Monsanto's position on this issue.*

25. **Comment:** (MON) "In addition, the rule background statement that current levels of alachlor ESA in WI groundwater would lead to adverse impacts on public health is in contrast to the following statement by USEPA: "Chronic dietary risk from alachlor from food containing residues of alachlor and from consumption of water containing residues of alachlor per se and/or residues of alachlor ESA is not of concern." By their overly conservative proposal, DHFS/DNR will create a false public health concern and trigger unnecessary mitigation expenses that will have no meaningful impact on public health."

Response: *The (Feb. 26, 2007) rule background memo statement that refers to "adverse impacts" (page 4, second paragraph) is a discussion of adverse impacts on public health, welfare, safety and the environment that would result if small businesses were not required to meet the regulatory requirements (reporting, remedial response) of Wisconsin's groundwater law, ch. 160, Stats. The rule background memo does not state that current levels of alachlor ESA in WI groundwater would lead to adverse impacts on public health.*

26. **Comment:** (WFU) " Wisconsin Farmers Union supports the DHFS groundwater standard for alachlor ESA as proposed. The standard was developed as required in the Wisconsin Groundwater Protection law, just as it has been for more than 100 other chemicals. It uses the best science available and has been 15 years in the making. Farm family health is critical to the health of Wisconsin's rural economy and our well waters are important."

    Response: *Thank you for the comment supporting the proposed groundwater quality standards for alachlor-ESA. See DHFS (NRB Agenda Item background memo - Attachment 2) response to comments H.*

II. Wisconsin Legislative Council Rules Clearinghouse comments:

Comment: Comments were received from the Wisconsin Legislative Council Rules Clearinghouse related to rule language clarity, grammar, punctuation and use of plain language.

Response: *The rule language was revised to address the Rules Clearinghouse comments.*

Attachment #2

Recommendation for Groundwater Enforcement Standard and Preventive Action Limit for Alachlor-ESA

Summary of Comments
June, 2007

A. DHFS' conclusions regarding the NOEL for alachlor-ESA are in direct conflict with the conclusions of the U.S. EPA and the European Commission.

In the most recent opinion of EPA's Office of Pesticide Programs about the toxicity of alachlor-ESA, it was concluded that the effects observed at the middle dose of 200 mg/kg/day in the 1993 subchronic toxicity study were "minor, generally not dose-related, and not biologically meaningful." In reviewing the data provided by Monsanto from this study in accordance with the criteria established in Ch. 160 Stats., DHFS continues to find that the effects observed at the 200 mg/kg/day dose level constitute a lowest observed effect level (LOEL) and an appropriate endpoint for deriving an enforcement standard and preventive action limit for this compound.

B. DHFS' use of an uncertainty factor of 10,000 is flawed and unsupportable, and does not meet the criteria in Stats. 160.13(2)(b)3. The use of an additional UF for concern about possible carcinogenic potential is inappropriate since the acceptable daily intake is typically based only on non-cancer endpoints and is not intended to address carcinogenic risk, which should be evaluated separately.

As in the case of several compounds for which enforcement standards have been recommended by DHFS and ultimately adopted, uncertainty and suspicion about carcinogenic activity has been addressed by inclusion of an uncertainty factor where one was deemed necessary to protect public health. In this case, no suitable data exist on which to evaluate the carcinogenic potency of alachlor-ESA in a quantitative way.

C. DHFS' assessment ignores the substantial body of evidence that demonstrates that alachlor ESA is less toxic than parent alachlor and is unlikely to be carcinogenic.

DHFS is recommending an enforcement standard for alachlor-ESA that is ten times higher than the corresponding enforcement standard for alachlor. While the database for alachlor-ESA is not robust enough to warrant a reduction of the uncertainty factor, DHFS finds the data sufficient to derive a separate standard for alachor-ESA rather than to recommend that it be regulated in tandem with its parent compound at the more restrictive ES level of 2 μg/L.

D. ***DHFS ignores substantial regulatory precedent for utilizing uncertainty factors of 1000 to 3000 when establishing an ADI or RfD based on a NOEL from a subchronic toxicity study. No appropriate regulatory precedent exists for applying an uncertainty factor of 10,000 in this situation.***

The background document lists several compounds for which uncertainty factors of 10,000 have been incorporated into recommendations for enforcement standards. As described in Monsanto's comments on the proposed rule, DHFS has only rarely made recommendations that incorporate such a large uncertainty factor. Each of the previous cases where DHFS has employed a UF of 10,000 has been for a compound for which there was a reasonable amount of data about the health effects related to exposure, but there were specific data gaps that required the use of a larger uncertainty factor. The known carcinogenic potential of alachlor and the absence of data on the carcinogenicity of a closely-related degradate of alachlor represents a uniquely troubling gap in the database that, in the view of DHFS, requires that particular caution be taken in regulation.

E. ***DHFS fails to consider the most recent and scientifically available information, including its current opinion on the establishment of a NOEL for alachlor-ESA.***

As described in the background document, DHFS' application of the criteria in Ch. 160 yields a different no-observed-effect level (NOEL) than was determined by EPA in the most recent of the three opinions offered by their Office of Pesticide Programs.

F. ***DHFS fails to recognize EPA's classification of alachlor under its new cancer classification system and its conclusion that alachlor is unlikely to be carcinogenic at low doses.***

EPA has proposed revisions to the system by which it classifies carcinogens. At the same time, EPA has maintained its maximum contaminant limit goal (MCLG) of zero for alachlor, a value reserved for compounds that are considered by EPA to be carcinogenic. As such, it is concluded that EPA's current regulatory position about the carcinogenicity of alachlor as a drinking water contaminant reflects sufficient concern to warrant classification as a carcinogen. Alachlor is listed as a B2 carcinogen in EPA's 2006 table of drinking water standards and health advisories. Revised cancer descriptors based on its new approach to cancer classifications are provided in this table for several compounds. However, no such revision is noted for alachlor.

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A reference to the opinion of EPA's Office of Pesticide Programs that alachlor is unlikely to be carcinogenic at low doses is included in the background document. No guidance is provided, however, to determine the threshold at which a dose is to be considered 'low'. Opinions such as this may ultimately

be considered in a revision of how alachlor is regulated by EPA as a drinking water contaminant. Giving such a finding priority over an existing EPA drinking water regulation would, however, be premature.

G. DHFS has not considered all available studies on alachlor-ESA, including EPA's recently-published "Cumulative Risk from Chloroacetanilide Pesticides".

DHFS staff were not aware of the publication of this document until May of 2007, and a reference to the document has been added to the background document. This document summarizes the findings of a screening-level cumulative risk assessment of the chloroacetanilide pesticides developed based on the common carcinogenic mechanism observed between alachlor, acetochlor and butachlor. While the document itself was published in 2006, the references to alachlor ESA are not based on new data or a new degradate-specific assessment of relative toxicity. As such, none of the data gaps referenced by DHFS in developing an uncertainty factor have been reduced, and no corresponding modification to the DHFS recommendation is warranted.

H. The proposed standard for alachlor-ESA was developed as required by the applicable statute, and serves to ensure the protection of the health of farm familes.

DHFS acknowledges and appreciates the support expressed in this comment.

Attachment #3

SCIENTIFIC SUPPORT DOCUMENTATION

FOR GROUNDWATER ENFORCEMENT STANDARD AND

PREVENTIVE ACTION LIMIT RECOMMENDATIONS

FOR ETHANE SULFONIC ACID METABOLITE OF ALACHLOR

(ALACHLOR-ESA)

Prepared by:

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Division of Public Health

June 2007

ETHANE SULFONIC ACID METABOLITE OF ALACHLOR (ALACHLOR-ESA)

Introduction

Alachlor-ESA is a metabolite of the herbicide alachlor. Alachlor is a broadleaf preemergent acetanilide herbicide used widely on corn and soybeans in Wisconsin.

Chemical Profile

Chemical Name: Alachlor, ethane sulfonic acid metabolite
Molecular Formula: $C_{13}H_{20}SNO_5$
Molecular Weight: 302.37
Synonyms: MON 5775
2',6'-diethyl-N-methoxymethyl-2-sulfoacetanilide, sodium salt
2-[2,6-diethylphenyl (methoxymethyl) amino]-2-oxoethane sulfonic acid, sodium salt

Occurrence

Alachlor-ESA has been detected in groundwater and surface waters in Wisconsin and elsewhere in the Midwest. In a 1994 study of acetochlor and related herbicides in 12 Midwestern states, alachlor-ESA was found in each of 104 surface water samples at median concentrations of 0.80 µg/L (pre-application) and 5.2 µg/L (post-application).[1] Alachlor-ESA was detected in 65.8% of groundwater samples at a median concentration of 0.28 µg/L.

Human Exposure

In a 1994 Wisconsin survey of private wells considered at risk for contamination, alachlor-ESA was detected in 206 of 293 samples. Observed concentrations ranged from 1.1 to 26.7 µg/L (average = 4.9 µg/L).[2] Alachlor was detected in only 12 of these 293 samples.

In 2000, the Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP) conducted a survey of chloroacetanilide herbicides and their degradates in monitoring wells, private drinking water wells and municipal wells considered at risk for herbicide contamination.[3] The survey yielded the following results:

Well Type	*Wells Sampled*	*Wells with Detects*	*Percent w/Detects*	*Average Detect (µg/L)*	*Highest Detect (µg/L)*
Monitoring Wells	27	22	81	4.7	33
Private DW Wells	22	20	91	3.5	9.0
Municipal Wells	23	11	48	1.9	4.4

In a separate Wisconsin survey, 336 private water supplies selected in a random, stratified fashion were sampled for atrazine, alachlor and other herbicides as well as their degradates. Alachlor-ESA was detected in 27.8% of surveyed wells, and was detected in a higher percentage of wells than any other contaminant. The mean observed concentration of alachlor-ESA was 1.0 µg/L, with the highest concentration observed at 14.8 µg/L.[4]

Toxicity

Acute

An acute oral LD_{50} of greater than 6000 mg/kg was observed for alachlor-ESA in rats.[5]

Subchronic

Two oral subchronic rat studies have been conducted on the toxicity of alachor-ESA.

In a 91-day study, alachlor-ESA was administered to male and female Fischer F-344 rats (10 per sex per dose level) in drinking water at doses of 0, 20, 182 or 1002 mg/kg/day.[6,7] Effects observed in the study included changes in physical appearance of test animals, decreased body weight, ophthalmic effects and alterations in clinical chemistry and hematological measures.

- *Physical appearance*. Increased incidence was reported versus controls for the following endpoints at all dose levels: decreased activity, rapid/shallow breathing, few feces, feces small in size, dehydration, urine staining, emaciation, hunched posture, rough coat, unkempt appearance, dark material/stain on pads of forelimb, around eyes, mouth and nose, clear and red ocular discharge, and hair loss around eyes.

- *Decreased body weight*. Female rats in the lowest dose group showed a statistically significant decrease in body weight relative to controls on days 22 through 85 of the study, although food and water intakes were similar. Similarly, body weights in the high-dose group were significantly lower on days 8 through 91. Body weights for mid-dose females were lower as well. Two-sample t tests conducted by the Wisconsin Department of Health and Social Services (now DHFS) showed significant differences between the body weights of controls and animals in each of the three dose groups ($p = 0.016$, 0.044 & <0.001, respectively).[8]

- *Ophthalmic changes*. Both dacryoadenitis (inflammation of the lacrimal gland) and chorioretinopathy (lesions on the retina and/or chorion) were observed with increased frequency in exposed animals versus controls. In laboratory studies assessing the toxicity of alachlor, ocular lesions and molting of retinal pigmentation (described as *uveal degeneration syndrome*) have been seen in Long-Evans rats.[5] Because the Fischer 344 rat has an unpigmented eye, the full range of alachlor-related ocular effects could not be assessed in this experiment.

- *Clinical chemistry indices*. Low-dose females had a statistically significant decrease in levels of aspartate aminotransferase relative to controls ($p<0.01$). Low- and mid-dose females also had significantly lower levels of potassium ($p<0.05$) and calcium ($p<0.01$). Effects were not consistent at higher dose levels.

- *Hematological effects*. Male rats in the middle dose group had a statistically significant decrease in erythrocyte counts ($p < 0.05$). This finding was more pronounced ($p < 0.01$) in test animals at the highest dose. Hematocrit values and hemoglobin levels, both of which were significantly lower at the high dose vs. controls ($p < 0.05$), were moderately lower than controls at the mid-dose, consistent with a dose-response relationship. Bilibubin, a by-product of the breakdown of hemoglobin, was increased at statistically-significant levels in both mid-dose and high-dose animals.

In a more recent 90-day study, alachlor-ESA was administered to three groups of Cr1:CD(SD)IGS BR rats in the diet at dosage levels of 3000, 6000 and 12,000 ppm (209, 422 and 857 mg/kg/day, respectively).[9] Observed effects included changes in sensory observations, testis weight, serum chemistry and hematological effects.

- *Sensory observations*. Unresponsiveness to touch response was measured in control and test animals. The mean number of times animals had no reaction to the touch response was increased in males in the high-dose group ($p<0.05$). No dose-related change was observed in other sensory observations such as tail pinch response, startle response and approach response.

- *Organ weights*. Relative testis weight was found to be increased in low-dose males ($p<0.05$). No corresponding increase was seen in mid-dose and high-dose males, and no increase in absolute testis weight was observed.

- *Serum chemistry*. Mean triglyceride levels were significantly lower in high-dose males when compared to controls ($p<0.05$). There were no significant changes in triglyceride levels among the low-dose and mid-dose groups.

- *Hematological effects*. Mean absolute and relative reticulocyte counts were elevated in both mid-dose and high-dose males ($p<0.05$). These values were also elevated in low-dose males, but the increase at this dose level was not statistically significant.

Chronic

No data on the chronic toxicity of alachlor-ESA are available.

Carcinogenicity

No data from long-term carcinogenicity studies are available for alachlor-ESA.

In oral feeding studies, alachlor has been shown to cause tumors in nasal epithelium, stomach and thyroid. Among the primary metabolites of alachlor of concern for nasal tumors is 2-chloro-*N*-(2,6-diethylphenyl)acetamide (CDEPA), which can be metabolized to 2,6-diethylaniline (DEA). DEA can be oxidized to form a diethylbenzoquinone imine (DEBQI), which binds to cellular protein, leading to cell death. Ensuing regenerative cell proliferation has been hypothesized by EPA to lead to neoplasia through fixation of spontaneous mutations.[5] The mechanism by which rats and humans form the DEBQI metabolite is similar.[10]

Alachlor-ESA has been demonstrated to show less affinity for accumulation in nasal turbinates than alachlor.[11] A 91-day study failed to show nasal cell proliferation following administration of alachlor-ESA at a dose level of 157 mg/kg/day.[12] A separate 91-day study showed no apparent fundic mucosal atrophy upon exposure to alachlor-ESA, an effect which precedes cell proliferation and stomach tumors upon alachlor exposure.[13] Cell proliferation in the stomach resulting from alachlor-ESA exposure was described by the investigators as minimal.

Mutagenicity

Chromosomal effects of alachlor-ESA were evaluated in the mouse micronucleus test. Single oral doses of 500, 1000 or 2000 mg/kg alachlor-ESA were administered to five male CD-1 mice by gavage.[5,7] Animals were sacrificed at 24 or 48 hours after administration. Bone marrow cells

were harvested and examined for the presence of micronucleated polychromatic erythrocytes. No treatment-related increase was observed in the frequency of polychromatic erythrocytes with micronuclei. A range of other tests have failed to demonstrate any substantive mutagenic potential for alachlor-ESA.[14,15]

Reproductive and Developmental Toxicity

Single doses of alachlor-ESA in doses of 0, 150, 400 and 1000 mg/kg/day in corn oil were administered by gavage to bred female rats (25 at each dose level) on gestational days 6 through 15.[5,7] Animals were euthanized on gestational day 20 and examined for uterine and ovarian abnormalities. Fetuses were sexed, weighed and examined for gross developmental abnormalities. Rales were observed in some dams at the highest dose, and body weight of mid-dose pups was decreased relative to controls ($p < 0.05$). No treatment-related changes were observed between test and control animals in food consumption or organ weight among dams or fetuses, and no increase in external, visceral or skeletal variations or malformations were seen in fetuses.

Interactive Effects

No data on interactive effects of alachlor-ESA are available.

Environmental Fate

Atmospheric

The vapor pressure of alachlor-ESA has not been determined. Given its chemical similarity to alachlor (vapor pressure = 2.2×10^{-5} mm Hg), the volatility of alachlor-ESA is likely to be relatively low.

Terrestrial

In a study of the behavior of alachlor and metolachlor and their metabolites in soil following a single application, alachlor-ESA was found to penetrate more deeply in soil than its parent compound. In the upper 15 cm of soil, alachlor-ESA concentrations reached peak levels at 9 to 10 weeks after application at 60% of parent concentration. Conversely, alachlor-ESA concentrations were more than 10 times greater than alachlor at depths of 60 to 75 cm after six weeks.[16]

Aquatic

Alachlor-ESA was found to be very mobile in studies conducted with Sable silty clay loam soils and Sarpy sandy loam soils mixed and equilibrated with calcium chloride.[5] Alachlor-ESA is highly persistent in surface water, with long-term declines in surface water concentration attributed more directly to dilution than degradation.[17]

Analytical Methods

Alachlor-ESA can be quantified in water samples by high-performance liquid chromatography / mass spectrometry. This method yields detection limits as low as 0.10 μg/L.[18]

U.S. EPA Regulatory Position

	Alachlor-ESA	Alachlor
EPA MCL & MCLG:	None	2 μg/L (MCL), 0 μg/L (MCLG)
EPA Reference Dose:	None	0.01 mg/kg/day
EPA Reference Concentration:	None	None
EPA Lifetime Health Advisory:	None	None
EPA Carcinogenicity Classification:	No classification	B2, probable human carcinogen[19]

EPA Office of Pesticide Program (OPP) Reviews

In its 1998 Reregistration Eligibility Document (RED) for alachlor, the hematological effects observed at the middle and high doses in the 91-day subchronic oral study for alachlor-ESA were acknowledged to be of statistical significance, but were described as "minor, mostly not dose related and…not considered to be biologically relevant, especially in the absence of any organ or tissue pathology".[5] In addressing the development of a reference dose for alachlor-ESA, two alternative methods with default assumptions were offered: (1) the use of the RfD for alachlor of 0.01 mg/kg/day, which is based on observations of hemolytic anemia and hemosiderosis at various organ sites in a one-year study in dogs, and (2) a value based on the agency's NOEL and an uncertainty factor of 1000 to account for "interspecies extrapolation, intraspecies variability and a lack of a complete database". In the RED, alachlor is described as "likely to be a human carcinogen at high doses but not likely at low doses". No quantitative benchmark is provided to distinguish between 'high doses' and 'low doses'. Alachlor-ESA is described in the RED as "unlikely to be carcinogenic".

In 2006, OPP published a screening-level cumulative risk assessment for chloroacetanilide pesticides.[20] The document sought to characterize risks from exposure to acetochlor and alachlor in food and water based on their designation by OPP as a "common mechanism group." This designation was based on their common mode of action for the production of tumors of the nasal olfactory epithelium in rats. In the document, OPP declined to include alachlor-ESA or other degradates of alachlor and acetochlor in its risk assessment, stating that the ethane sulfonic acid and oxanilic acid degradates of alachlor and acetochlor show a different toxicological profile than their parent compounds and do not contribute to the nasal epithelial tumors on which the designation of a common mechanism group was based.

Recommendations and Conclusions for Alachlor-ESA

Ch. 160 Stats. defines a "no-observable-effect-level" (NOEL) as "that level of intake of a substance which, when administered to a group of humans or experimental animals, does not produce any of the effects observed or measured at any higher level of intake and produces no significant difference between the test groups and an unexposed control group of humans or animals maintained under identical conditions". In reviewing the available data on alachlor-ESA, the two subchronic studies represent the best available data on which to identify a NOEL. The results from these studies show a marked difference in observed toxicity, which may be due to differences in the route of exposure. Test compound was administered in drinking water in the 1993 study, was administered with food in the 2003 study. Given that the route of exposure in the older study matches that of concern for a groundwater enforcement standard, and the sharp difference in observed toxicity between the two studies, it is appropriate to give deference to the 1993 study as a better representation of the toxicity of alachlor-ESA in drinking water than the more recent subchronic. Therefore, based on Ch. 160 Stats. and our analysis of data from studies

of the subchronic toxicity of alachlor-ESA, the hematological findings in the study by Siglin *et al* at the dose of 182 mg/kg/day constitute the lowest level at which effects are observed, thereby establishing a no-observed-effect-level (NOEL) of 20 mg/kg/day.

In establishing an uncertainty factor, DHFS is directed in Ch. 160 Stats. to consider a range of factors, including the quality and quantity of available data, potential interactions with environmental chemicals and known chronic or subchronic effects of exposure to similar or related compounds. In the case of alachlor-ESA, the lack of data on chronic or carcinogenic effects and the frequency with which alachlor-ESA is found in drinking water with alachlor, metolachlor and acetochlor and other degradates of these chloroacetanilide herbicides, require special consideration.

Based on these considerations, an uncertainty factor of 10,000* (10 for interspecies variability, 10 for intraspecies variability, 10 for use of a subchronic study and 10 for data gaps, including lack of a carcinogenicity study for the metabolite of a potentially carcinogenic parent compound) is applied.

$$\frac{(20\ \text{mg/kg/day})\ (10\ \text{kg})}{(1\ \text{L/day})\ (10{,}000)} = 0.02\ \text{mg/L}\ (20\ \mu\text{g/L})$$

In accordance with Chapter 160 of Wis. Stats., the Department of Health and Family Services recommends adoption of a groundwater enforcement standard and preventive action limit for alachlor-ESA as follows:

Recommended enforcement standard:	20 μg/L**
Recommended preventive action limit factor:	20%
Recommended preventive action limit:	4 μg/L

*Uncertainty factors of 10,000 have been previously used in developing groundwater enforcement standards for methyl-tert-butyl ether and n-hexane; they have also been used by EPA in establishing the MCLs for lindane and styrene that were adopted as Wisconsin groundwater enforcement standards.
**Corresponds to an acceptable daily intake value of 20 μg/day.

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Wisconsin Department of Administration
Division of Executive Budget and Finance
DOA-2048 (R10/2000)

Fiscal Estimate — 2007 Session

☒ Original ☐ Updated	LRB Number	Amendment Number if Applicable
☐ Corrected ☐ Supplemental	Bill Number	Administrative Rule Number NR 140, Wis. Adm. Code

Subject

Amendments to ch. NR 140, Wis. Adm. Code (Groundwater Quality)

Fiscal Effect

State: ☒ No State Fiscal Effect
☐ Indeterminate

Check columns below only if bill makes a direct appropriation or affects a sum sufficient appropriation.

☐ Increase Existing Appropriation ☐ Increase Existing Revenues
☐ Decrease Existing Appropriation ☐ Decrease Existing Revenues
☐ Create New Appropriation

☐ Increase Costs — May be possible to absorb within agency's budget.
☐ Yes ☐ No

☐ Decrease Costs

Local: ☒ No Local Government Costs
☐ Indeterminate

1. ☐ Increase Costs
☐ Permissive ☐ Mandatory
2. ☐ Decrease Costs
☐ Permissive ☐ Mandatory
3. ☐ Increase Revenues
☐ Permissive ☐ Mandatory
4. ☐ Decrease Revenues
☐ Permissive ☐ Mandatory
5. Types of Local Governmental Units Affected:
☐ Towns ☐ Villages ☐ Cities
☐ Counties ☐ Others _____
☐ School Districts ☐ WTCS Districts

Fund Sources Affected

☐ GPR ☐ FED ☐ PRO ☐ PRS ☐ SEG ☐ SEG-S

Affected Chapter 20 Appropriations

Assumptions Used in Arriving at Fiscal Estimate

SUMMARY OF RULE - Chapter NR 140, Wis. Adm. Code, establishes Wisconsin state groundwater quality standards and creates a framework for implementing those standards in compliance with Wis. Stat. Ch. 160. These proposed amendments to NR 140 add a new enforcement standard (ES) and preventive action limit (PAL) for Alachlor ethane sulfonic acid (Alachlor-ESA). In accordance with Wis. Stat. Ch. 160, these proposed amendments to NR 140 groundwater quality standards are based on recommendations from the Department of Health and Family Services (DHFS).

Chapter NR 140 currently contains groundwater standards for 122 substances of public health concern, 8 substances of public welfare concern and 15 indicator parameters. The proposed groundwater standards would apply to all regulated facilities, practices and activities which may impact groundwater quality. Regulated facilities, practices and activities, which are sources of the substances for which groundwater standards are proposed, are, for the most part, likely sources of substances for which groundwater standards already exist. Consequently, there should be few cases where the proposed standards would be exceeded where existing standards are not currently being exceeded. Thus, the Department does not anticipate significant additional costs to the regulated community associated with establishing these NR 140 standards. Also, any additional monitoring costs to the regulated community should be minimal, and the workload of state regulatory agencies should not change substantially.

FISCAL IMPACT - Although additional monitoring costs may be imposed upon the state or local government entities that are within the regulated community, the extent of such monitoring and any costs associated with it--while too speculative to quantify at this time--are not expected to be significant. Thus, the Department believes it is unlikely that there will be additional costs to state and local governments resulting from adopting these groundwater standards.

Long-Range Fiscal Implications

None.

Prepared By:	Telephone No.	Agency
Joe Polasek	266-2794	Department of Natural Resources
Authorized Signature	**Telephone No.**	**Date (mm/dd/ccyy)**
	266-2794	

Fiscal Estimate — 2007 Session

Page 2 Assumptions Narrative Continued

LRB Number	Amendment Number if Applicable
Bill Number	Administrative Rule Number

Assumptions Used in Arriving at Fiscal Estimate – Continued

Wisconsin Department of Administration
Division of Executive Budget and Finance
DOA-2047 (R10/2000)

Fiscal Estimate Worksheet — 2007 Session

Detailed Estimate of Annual Fiscal Effect

☒ Original	☐ Updated	LRB Number	Amendment Number if Applicable
☐ Corrected	☐ Supplemental	Bill Number	Administrative Rule Number NR 140, Wis. Adm. Code

Subject

Amendments to ch. NR 140, Wis. Adm. Code (Groundwater Quality)

One-time Costs or Revenue Impacts for State and/or Local Government (do not include in annualized fiscal effect):

None

Annualized Costs:	Annualized Fiscal Impact on State Funds from:	
A. State Costs by Category	Increased Costs	Decreased Costs
State Operations — Salaries and Fringes	$	$ -
(FTE Position Changes)	(FTE)	(- FTE)
State Operations — Other Costs		-
Local Assistance		-
Aids to Individuals or Organizations		-
Total State Costs by Category	$	$ -
B. State Costs by Source of Funds	Increased Costs	Decreased Costs
GPR	$	$ -
FED		-
PRO/PRS		-
SEG/SEG-S		-
State Revenues — Complete this only when proposal will increase or decrease state revenues (e.g., tax increase, decrease in license fee, etc.)	Increased Revenue	Decreased Revenue
GPR Taxes	$	$ -
GPR Earned		-
FED		-
PRO/PRS		-
SEG/SEG-S		-
Total State Revenues	$	$ -

Net Annualized Fiscal Impact

	State	Local
Net Change in Costs	$	$
Net Change in Revenues	$	$

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Authorized Signature	Telephone No. 266-2794	Date (mm/dd/ccyy)

ORDER OF THE STATE OF WISCONSIN
NATURAL RESOURCES BOARD
AMENDING RULES

The Wisconsin Natural Resources Board proposes an order to amend NR 140.10 Table 1 and Appendix 1, relating to groundwater quality standards	DG-18-07

Analysis Prepared by the Department of Natural Resources

1. Statutes interpreted: In promulgating this rule, ss. 281.12(1), 281.15, 281.19(1) and 299.11, Stats., and ch. 160, Stats., have been interpreted as authorizing the department to modify and create rules relating to development of numerical groundwater quality standards.

2. Statutory authority: Sections 281.12(1), 281.15, 281.19(1) and 299.11, Stats., and ch. 160, Stats.

3. Explanation of agency authority to promulgate the proposed rules under the statutory authority: Section 281.12(1), Stats., grants the Department the authority to carry out planning, management and regulatory programs necessary to protect, maintain and improve the quality and management of the waters of the state, ground and surface, public and private. Section 281.15, Stats., states that the Department shall promulgate rules setting standards of water quality, applicable to the waters of the state, that protect the public interest, including the protection of public health and welfare, and the present and prospective future use of such waters for public and private water systems. Section 281.19(1), Stats., grants the Department the authority to issue general orders and adopt rules applicable throughout the state for the construction, installation, use and operation of practicable and available systems, methods and means for preventing and abating pollution of the waters of the state.

In accordance with ch. 160, Stats., the reliability of sampling data is to be considered when determining the range of responses that a regulatory agency may take, or require, to address attainment or exceedance of a state groundwater quality standard at an applicable "point of standard application". Section 299.11, Stats., authorizes the Department, in conjunction with the Department of Agriculture Trade and Consumer Protection, to establish uniform minimum criteria for laboratories certified to conduct water analysis testing, and to establish accepted methodologies to be followed in conducting tests and sampling protocols and documentation procedures to be followed when collecting water samples for testing.

Chapter 160, Stats., establishes an administrative process for developing numerical state groundwater quality standards to be used as criteria for the protection of public health and welfare by all state groundwater regulatory programs. Chapter 160, Stats., directs the Department to use this administrative process to establish numeric groundwater quality standards for substances of public health or welfare concern, found in, or having a reasonable probability of being detected in, the groundwater resources of the state.

4. Related statute or rule: Chapter 280, Stats., authorizes the Department to prescribe, publish and enforce minimum standards and rules to be pursued in the obtaining of pure drinking water for human consumption. Chapter NR 809, Wis. Adm. Code, establishes minimum state drinking water standards for the protection of public health safety and welfare. This administrative code contains numeric water quality protection standards applicable to public water supply systems in Wisconsin. Wisconsin state

drinking water standards, applicable to public drinking water systems, have not yet been established for alachlor ethane sulfonic acid (alachlor-ESA).

5. Plain language analysis of the proposed rule: Chapter 160, Stats., requires the Department to develop numerical groundwater quality standards, consisting of enforcement standards and preventive action limits. Chapter NR 140, Wis. Adm. Code, establishes groundwater standards and creates a framework for implementation of the standards by the Department. The proposed amendments to NR 140 would add groundwater quality standards for one additional substance. In accordance with ch. 160, Stats., amendments to NR 140 groundwater quality standards are based on recommendations from the Department of Health and Family Services. New public health related groundwater quality standards are proposed for alachlor ethane sulfonic acid (alachlor-ESA).

6. Summary of and preliminary comparison with any existing or proposed federal regulation: The United States Environmental Protection Agency (US EPA) establishes health based drinking water maximum contaminant levels (MCLs) and health advisory levels (HALs). Federal MCLs are established based on scientific risk assessments and, in some cases, economic and technological considerations. Federal HALs are developed based on established reference doses (RfDs). No federal MCL, HAL or RfD has yet been established for alachlor-ESA. Alachlor-ESA is currently on the US EPA Contaminant Candidate List (CCL). The CCL is the US EPA's list of unregulated contaminants which may require national drinking water regulation in the future.

7. Comparison of similar rules in adjacent states (Minnesota, Iowa, Illinois and Michigan): The proposed amendments to NR 140 would add numeric groundwater quality standards for alachlor-ESA. The groundwater quality standards contained in NR 140 are used in Wisconsin by state regulatory agencies as state groundwater protection standards. These standards are used as contamination site cleanup levels, design and management criteria for regulated activities and as minimum public health and welfare protection standards for contaminants in groundwater.

The states surrounding Wisconsin - Minnesota, Michigan, Illinois and Iowa, also use groundwater protection standards in their regulation of practices and activities that may impact the quality of groundwater resources. Some of the states surrounding Wisconsin have promulgated individual state groundwater protection standards and some utilize established federal standards (federal drinking water maximum contaminant levels, lifetime health advisory levels and established cancer risk levels) as their state groundwater protection standards.

Groundwater protection quality standards are usually developed based on health risk assessments. States are often required to follow state specific health risk assessment methodologies when establishing groundwater protection quality standards. States may use state specific health risk assessment factors and procedures in calculating and developing their groundwater protection standards. This use of different health risk assessment factors, procedures and methodologies has lead to the establishment of differing state groundwater protection standard levels for the same substance. For example, the groundwater protection quality standard for naphthalene used by the states surrounding Wisconsin varies by state - the standard used in Minnesota is 300 micrograms per liter (μg/L), the standard used in Michigan is 520 μg/L and the standard used in Iowa and Wisconsin is 100 μg/L, the federal lifetime health advisory level.

The state of Minnesota has established state groundwater protection "Health Risk Limits" (HRLs) under Minnesota Statutes Section 103H.201. There is no established Minnesota state HRL for alachlor-ESA. The Minnesota Department of Health has calculated "Health Based Values" (HBVs) for some groundwater contaminants. Minnesota HBVs are not standards that have been promulgated by rule but are calculated concentrations that may be used as advisory levels by Minnesota state groundwater and environmental protection programs. Minnesota has established a HBV for alachlor-ESA at 40 μg/L.

The state of Michigan has established state groundwater protection quality standards. Michigan "Drinking Water Criteria and Risk Based Screening Levels (RBSLs)" are Michigan state groundwater protection standards authorized in accordance with Michigan's Natural Resources and Environmental Protection Act, 1994 PA 451 (NREPA). There is no established Michigan Drinking Water Criteria or RBSL for alachlor-ESA.

The state of Illinois has established state groundwater quality standards for "potable resource groundwater". Illinois Groundwater Quality Standards are state groundwater protection standards promulgated in Illinois 35 Ill. Adm. Code 620 environmental protection regulations. No Illinois state "Groundwater Quality Standards for Class I: Potable Resource Groundwater" have been established for alachlor-ESA. The state of Illinois also has established "Groundwater Cleanup Objectives". Illinois Groundwater Cleanup Objectives include both Illinois state Groundwater Quality Standards and Human Threshold Toxicant Advisory Concentrations (HTTACs) established in 35 Ill. Adm. Code 620. No Illinois HTTAC has been established for alachlor-ESA.

The state of Iowa has not established specific state groundwater protection standards. In accordance with Iowa Environmental Protection Regulations 567 IAC Chapter 133, Iowa uses established federal lifetime health advisory levels (HALs), negligible risk levels for carcinogens (NRLs) or drinking water maximum contaminant levels (MCLs) as "Action Levels" in their regulation of practices and activities that may adversely impact groundwater quality. No federal HAL, NRL or MCL has yet been established for alachlor-ESA.

8. Summary of the factual data and analytical methodologies that the agency used in support of the proposed rule and how any related findings support the regulatory approach chosen for the proposed rule: In accordance with s. 160.07, Stats., the Department is required, for substances of public health concern, to propose rules establishing recommendations from the Department of Health and Family Services (DHFS) as groundwater quality enforcement standards. In accordance with s. 160.15, Stats., the Department is required to establish by rule a preventive action limit for each substance for which an enforcement standard is established.

The DHFS has provided the Department, in a June 2007 document titled *Scientific Support Documentation for Groundwater Enforcement Standard and Preventive Action Limit Recommendations for Ethane Sulfonic Acid Metabolite of Alachlor (Alachlor-ESA)*, its recommendations for state groundwater quality standards for alachlor-ESA. In developing their recommendations for state groundwater quality enforcement standards for alachlor-ESA, DHFS followed the applicable analytical methodologies required under ss. 160.07 and 160.13, Stats.

The Department has proposed rules establishing the DHFS enforcement standard recommendation for alachlor-ESA as a NR 140 state groundwater quality enforcement standard. The Department has proposed rules establishing a NR 140 state groundwater quality preventive action limit for alachlor-ESA in accordance with s. 160.15(1), Stats.

9. Any analysis and supporting documentation that the agency used in support of the agency's determination of the rule's effect on small business under s. 227.114, Stats., or that was used when the agency prepared an economic impact report: In its determination of the effect of this proposed rule on small businesses the Department used analysis and supporting documentation that included information from the United States Department of Agriculture - National Agricultural Statistics Service (NASS), the University of Wisconsin (UW) - Department of Agronomy and the Wisconsin Department of Agriculture Trade and Consumer Protection (DATCP). Information used from the United States Department of Agriculture NASS included agricultural chemical usage reports from 1992 to 2005

and data from the NASS Agricultural Chemical Use Database. Information used from the UW Department of Agronomy included the UW Extension 2006 Herbicide Price List. Information used from DATCP included results from the agency's well sampling and pesticide registration databases.

10. Effects on small business, including how the rule will be enforced: The Department has determined that this rule order will not have a significant economic impact on small businesses. Chapter NR 140 currently contains groundwater standards for 122 substances of public health concern, 8 substances of public welfare concern and 15 indicator parameters. The proposed groundwater standard revisions would apply to all regulated facilities, practices and activities which may impact groundwater quality.

The enforcement of Wisconsin state groundwater quality standards is done by state regulatory agencies through their groundwater protection programs. State regulatory agencies, in exercising their statutory powers and duties, establish groundwater protection regulations that assure that regulated facilities and activities will not cause state groundwater quality standards to be exceeded. A state regulatory agency may establish specific design and management criteria to ensure that regulated facilities, practices and activities will not cause the concentration of a substance in groundwater, affected by a regulated facility, practice or activity, to exceed state groundwater quality enforcement standards or preventive action limits at applicable "point of standards application" locations.

Regulated facilities, practices and activities, which are sources of the substances for which groundwater standards are proposed are, for the most part, likely sources of substances for which groundwater standards already exist. Consequently, there will likely be few cases where the proposed standards will be exceeded where existing standards are not currently being exceeded. Additional monitoring costs may be imposed upon regulated facilities, practices and activities, but the extent of such monitoring and any costs associated with it, while too speculative to quantify, are not expected to be significant.

The proposed revisions to state groundwater quality standards include new standards for alachlor-ESA, a degradation product of the herbicide alachlor. Alachlor has been used in Wisconsin mainly on field and sweet corn crops. Data on agricultural chemical use in Wisconsin indicates that the use of alachlor on corn crops has decreased significantly over the past 15 years. A check of alachlor containing corn herbicide products registered for use on sweet corn in Wisconsin shows that there are currently limited availability and options for alachlor containing products to be used on sweet corn in the state.

Use of alachlor as an herbicide on field corn crops has decreased significantly. Usage of alachlor on field corn in 1992 was reported to have been 2,358,000 lbs., or on an estimated 30% of the state field corn acreage (NASS *Crop Production 1992 Summary and Agricultural Chemical Usage Survey* report). Since 1992 alachlor use in Wisconsin has steadily decreased. Alachlor use in Wisconsin in 2003 was reported at 172,000 lbs., or on an estimated 3% of state field corn acreage (NASS *Agricultural Chemical Usage 2003 Field Crops Summary* report). No alachlor use was reported on Wisconsin field corn in 2005 (NASS *Agricultural Chemical Usage 2005 Field Crops Summary* report), the latest year for which field corn crop chemical use data is available.

Alachlor has also been used in Wisconsin as an herbicide on sweet corn. Use of alachlor on sweet corn in Wisconsin has also declined and currently there is limited availability and options for alachlor containing products to be used on sweet corn. Usage of alachlor on sweet corn for processing in 1994 was reported to have been 145,000 lbs., or on an estimated 45% of the state sweet corn for processing acreage (NASS *Vegetables - 1994 Summary and Agricultural Chemical Usage Survey* report). In 2004, the latest year for which vegetable crop chemical use data is available, alachlor use on sweet corn for processing was reported to have been 48,300 lbs., or on an estimated 29% of the state sweet corn for processing acreage (NASS *Agricultural Chemical Usage 2004 Vegetables Summary* report).

Usage of alachlor on sweet corn for fresh market in 1994 was reported to have been 5,900 lbs., or on an estimated 44% of the state sweet corn for fresh market acreage (NASS *Vegetables - 1994 Summary and Agricultural Chemical Usage Survey* report). In 2002 alachlor use on sweet corn for fresh market was reported to have been 1,900 lbs., or on an estimated 11% of the state sweet corn for processing acreage (NASS *Agricultural Chemical Usage 2002 Vegetables Summary* report). In 2004, the latest year for which vegetable crop chemical use data is available, no alachlor use on sweet corn for fresh market was reported (NASS *Agricultural Chemical Usage 2004 Vegetables Summary* report).

There are a number of corn herbicide products available to farmers in Wisconsin. Corn herbicide products containing alachlor are marketed in Wisconsin for use via preplant incorporated (PPI) or pre-emergence (Pre) application. The University of Wisconsin (UW) Department of Agronomy *Herbicide Price List, 2006* (UW Extension 2007 *Pest Management in Wisconsin Field Crops* bulletin, Appendix Table 3) contains price per acre estimates for PPI/Pre herbicide products for use on corn crops. PPI/Pre herbicide products for use on corn crops are listed in the 2006 Herbicide Price List in the $14.55 to $18.98 (per acre) range for application at coarse soil application rates, and in the $19.36 to $23.33 (per acre) range for application at medium soil application rates. Lariat and Micro-Tech, PPI/Pre corn herbicide products that contain alachlor, are listed on the 2006 Herbicide Price List. Lariat is listed at $14.05 (per acre), for application at coarse soil application rates, and $21.07 (per acre) for application at medium soil application rates. Micro-Tech is listed at $13.50 (per acre) for application at coarse soil application rates, and $16.88 (per acre) for application at medium soil application rates.

Results from the Department of Agriculture Trade and Consumer protection (DATCP) well sampling database, through January of 2007, showed that approximately 17% of water supply wells tested (historically, 243 of 1,464) have been above the proposed alachlor-ESA groundwater quality preventive action limit of 4 μg/L. The DATCP well sampling database also shows that, through January 2007, approximately 1% of water supply wells tested (historically, 13 of 1,464) have been above the proposed alachlor-ESA groundwater quality enforcement standard level of 20 μg/L.

Because few water supply wells have tested above proposed alachlor-ESA groundwater standards, and as use of alachlor has decreased in Wisconsin to relatively low levels, and because available alachlor herbicide products are priced comparably to other corn herbicide products, the Department has determined that any management practice restrictions that might be placed on alachlor to prevent exceedances of state groundwater quality standards for alachlor-ESA, are unlikely to have a significant economic impact on Wisconsin corn growers.

11. Agency Contact Person: William Phelps, Wisconsin Dept. of Natural Resources, Bureau of Drinking Water & Groundwater, 101 S. Webster St., Madison, WI, 73707-7921; (608) 267-7619; William.Phelps@Wisconsin.gov.

SECTION 1. NR 140.10, Table 1 is amended to read:

Table 1
Public Health Groundwater Quality Standards

Substance[1]	**Enforcement Standard (micrograms per liter − except as noted)**	**Preventive Action Limit (micrograms per liter − except as noted)**
Acetone	1000	200
Alachlor	2	0.2
Alachlor ethane sulfonic acid (Alachlor-ESA)	20	4

Aldicarb	10	2
Antimony	6	1.2
Anthracene	3000	600
Arsenic	10	1
Asbestos	7 million fibers per liter (MFL)	0.7 MFL
Atrazine, total chlorinated residues	3[2]	0.3[2]
Bacteria, Total Coliform	0[3]	0[3]
Barium	2 milligrams/liter (mg/l)	0.4 mg/l
Bentazon	300	60
Benzene	5	0.5
Benzo(b)fluoranthene	0.2	0.02
Benzo(a)pyrene	0.2	0.02
Beryllium	4	0.4
Boron	960	190
Bromodichloromethane	0.6	0.06
Bromoform	4.4	0.44
Bromomethane	10	1
Butylate	400	80
Cadmium	5	0.5
Carbaryl	960	192
Carbofuran	40	8
Carbon disulfide	1000	200
Carbon tetrachloride	5	0.5
Chloramben	150	30
Chlordane	2	0.2
Chloroethane	400	80
Chloroform	6	0.6
Chloromethane	3	0.3
Chromium	100	10
Chrysene	0.2	0.02
Cobalt	40	8
Copper	1300	130
Cyanazine	1	0.1
Cyanide	200	40
Dacthal	70	14
1,2−Dibromoethane (EDB)	0.05	0.005
Dibromochloromethane	60	6
1,2−Dibromo−3−chloropropane (DBCP)	0.2	0.02
Dibutyl phthalate	100	20
Dicamba	300	60
1,2−Dichlorobenzene	600	60
1,3−Dichlorobenzene	1250	125
1,4−Dichlorobenzene	75	15
Dichlorodifluoromethane	1000	200
1,1−Dichloroethane	850	85
1,2−Dichloroethane	5	0.5
1,1−Dichloroethylene	7	0.7
1,2−Dichloroethylene (cis)	70	7
1,2−Dichloroethylene (trans)	100	20
2,4−Dichlorophenoxyacetic Acid (2,4−D)	70	7
1,2−Dichloropropane	5	0.5
1,3−Dichloropropene (cis/trans)	0.2	0.02
Di (2−ethylhexyl) phthalate	6	0.6
Dimethoate	2	0.4
2,4−Dinitrotoluene	0.05	0.005
2,6−Dinitrotoluene	0.05	0.005
Dinoseb	7	1.4
Dioxin (2, 3, 7, 8−TCDD)	0.00003	0.000003
Endrin	2	0.4
EPTC	250	50
Ethylbenzene	700	140
Ethylene glycol	7 mg/l	0.7 mg/l

Fluoranthene	400	80
Fluorene	400	80
Fluoride	4 mg/l	0.8 mg/l
Fluorotrichloromethane	3490	698
Formaldehyde	1000	100
Heptachlor	0.4	0.04
Heptachlor epoxide	0.2	0.02
Hexachlorobenzene	1	0.1
N−Hexane	600	120
Hydrogen sulfide	30	6
Lead	15	1.5
Lindane	0.2	0.02
Mercury	2	0.2
Methanol	5000	1000
Methoxychlor	40	4
Methylene chloride	5	0.5
Methyl ethyl ketone (MEK)	460	90
Methyl isobutyl ketone (MIBK)	500	50
Methyl tert−butyl ether (MTBE)	60	12
Metolachlor	15	1.5
Metribuzin	250	50
Molybdenum	40	8
Monochlorobenzene	100	20
Naphthalene	100	10
Nickel	100	20
Nitrate (as N)	10 mg/l	2 mg/l
Nitrate + Nitrite (as N)	10 mg/l	2 mg/l
Nitrite (as N)	1 mg/1	0.2 mg/l
N−Nitrosodiphenylamine	7	0.7
Pentachlorophenol (PCP)	1	0.1
Phenol	6 mg/1	1.2 mg/1
Picloram	500	100
Polychlorinated biphenyls (PCBs)	0.03	0.003
Prometon	90	18
Pyrene	250	50
Pyridine	10	2
Selenium	50	10
Silver	50	10
Simazine	4	0.4
Styrene	100	10
1,1,1,2−Tetrachloroethane	70	7
1,1,2,2−Tetrachloroethane	0.2	0.02
Tetrachloroethylene	5	0.5
Tetrahydrofuran	50	10
Thallium	2	0.4
Toluene	1 mg/l	0.2 mg/l
Toxaphene	3	0.3
1,2,4−Trichlorobenzene	70	14
1,1,1−Trichloroethane	200	40
1,1,2−Trichloroethane	5	0.5
Trichloroethylene (TCE)	5	0.5
2,4,5−Trichlorophenoxy−propionic acid (2,4,5−TP)	50	5
1,2,3−Trichloropropane	60	12
Trifluralin	7.5	0.75
Trimethylbenzenes (1,2,4− and 1,3,5− combined)	480	96
Vanadium	30	6
Vinyl chloride	0.2	0.02
Xylene[4]	10 mg/l	1 mg/l

[1] Appendix I contains Chemical Abstract Service (CAS) registry numbers, common synonyms and trade names for most substances listed in Table 1.

[2] Total chlorinated atrazine residues includes parent compound and the following metabolites of health concern: 2−chloro−4−amino−6−isopropylamino−s−triazine (formerly deethylatrazine), 2−chloro−4−amino−6−ethylamino−s−triazine (formerly deisopropylatrazine) and 2−chloro−4,6−diamino−s−triazine (formerly diaminoatrazine).

[3] Total coliform bacteria may not be present in any 100 ml sample using either the membrane filter (MF) technique, the presence−absence (P−A) coliform test, the minimal medium ONPG−MUG (MMO−MUG) test or not present in any 10 ml portion of the 10−tube multiple tube fermentation (MTF) technique.

[4] Xylene includes meta−, ortho−, and para−xylene combined. The preventive action limit has been set at a concentration that is intended to address taste and odor concerns associated with this substance.

SECTION 2. Appendix 1 to Table 1 is amended to read:

CHAPTER NR 140
APPENDIX I TO TABLE 1
PUBLIC HEALTH GROUNDWATER QUALITY STANDARDS

Substance	**CAS RN[1]**	**Common synonyms/*Tradename*[2]**
Acetone	67−64−1	*Propanone*
Alachlor	15972−60−8	*Lasso*
Alachlor ethane sulfonic acid (Alachlor-ESA)		Alachlor Ethane Sulfonate, MON 5775
Aldicarb	116−06−3	*Temik*
Anthracene	120−12−7	Para−naphthalene
Asbestos	12001−29−5	
Bentazon	25057−89−0	*Basagran*
Benzene	71−43−2	
Benzo(b)fluoranthene	205−99−2	B(b)F,3,4−Benzofluoranthene
Benzo(a)pyrene	50−32−8	BaP, B(a)P
Boron	7440−42−8	
Bromodichloromethane	75−27−4	Dichlorobromomethane, BDCM
Bromoform	75−25−2	Tribromomethane
Bromomethane	74−83−9	Methyl bromide
Butylate	2008−41−5	S−ethyl di−isobutylthiocarbamate, *Sutan+*
Carbaryl	63−25−2	*Sevin*
Carbofuran	1563−66−2	*Furadan*
Carbon disulfide	75−15−0	Carbon bisulfide
Carbon tetrachloride	56−23−5	Tetrachloromethane, Perchloroethane
Chloramben	133−90−4	
Chlordane	57−74−9	
Chloroethane	75−00−3	Ethyl chloride, Monochloroethane
Chloroform	67−66−3	Trichloromethane
Chloromethane	74−87−3	Methyl chloride
Chrysene	218−01−9	1,2−Benzphenanthrene
Cobalt	7440−48−4	
Cyanazine	21725−46−2	*Bladex* , 2−chloro−4−ethylamino−6−nitriloisopropylamino−s−triazine
Cyanide	57−12−5	
Dacthal	1861−32−1	DPCA, Chlorothal, *Dacthalor*, 1,4−benzene-dicarboxylic acid
Dibromochloromethane	124−48−1	Chlorodibromomethane, DBCM
1,2−Dibromo−3−chloropropane	96−12−8	DBCP, Dibromochloropropane
1,2−Dibromoethane	106−93−4	EDB, Ethylene dibromide, Dibromoethane
Dibutyl phthalate	84−74−2	DP, Di−*n*−butyl phthalate, *n*−Butyl phthalate
Dicamba	1918−00−9	*Banvel*
1,2−Dichlorobenzene	95−50−1	o−Dichlorobenzene, o−DCB
1,3−Dichlorobenzene	541−73−1	m−Dichlorobenzene, m−DCB
1,4−Dichlorobenzene	106−46−7	p−Dichlorobenzene, p−DCB
Dichlorodifluoromethane	75−71−8	*Freon 12*
1,1,−Dichloroethane	75−34−3	Ethylidine chloride
1,2−Dichloroethane	107−06−2	1,2−DCA, Ethylene dichloride
1,1−Dichloroethylene	75−35−4	1,1−DCE, 1,1−Dichloroethene, Vinylidene chloride

1,2−Dichloroethylene (cis)	156−59−2	cis−Dichloroethylene, 1,2−Dichloroethene (cis)
1,2−Dichloroethylene (trans)	156−60−5	trans−1,2−Dichloroethylene
2,4−Dichlorophenoxyacetic acid	94−75−7 2,4−D	
1,2−Dichloropropane	78−87−5	Propylene dichloride
1,3−Dichloropropene (cis/trans)[3]		*Telone*, DCP, Dichloropropylene
Di(2−ethylhexyl) phthalate	117−81−7	DEHP, Bis(2−ethylhexyl) phthalate, 1,2−Benzenedicarboxylic acid, Bis (2−ethyl-hexyl)ester
Dimethoate	60−51−5	
2,4−Dinitrotoluene	121−14−2	2,4−DNT, 1−methyl−2,4−dinitrobenzene
2,6−Dinitrotoluene	606−20−2	2,6−DNT, 2−methyl−1,3−dinitrobenzene
Dinoseb	88−85−7	2−(1−methylpropyl)−4,6−dinitrophenol
Dioxin	1746−01−6	2,3,7,8−TCDD,2,3,7,8−Tetrachlorodibenzo−p−dioxin
Endrin	72−20−8	
EPTC	759−94−4	*Eptam*, *Eradicane*
Ethylbenzene	100−41−4	Phenylethane, EB
Ethylene glycol	107−21−1	
Fluoranthene	206−44−0	Benzo(jk)fluorene
Fluorene	86−73−7	2,3−Benzidine, Diphenylenemethane
Fluoride	16984−48−8	
Fluorotrichloromethane	75−69−4	*Freon11*, Trichlorofluoromethane
Formaldehyde	50−00−0	
Heptachlor	76−44−8	*Velsicol*
Heptachlor epoxide	1024−57−3	
Hexachlorobenzene	118−74−1	Perchlorobenzene, *Granox*
N−Hexane	110−54−3	Hexane, Skellysolve B
Hydrogen sulfide	7783−06−4	Dihydrogen sulfide
Lindane	58−89−9	
Mercury	7439−97−6	
Methanol	67−56−1	Methyl alcohol, Wood alcohol
Methoxychlor	72−43−5	
Methylene chloride	75−09−2	Dichloromethane, Methylene dichloride
Methyl ethyl ketone	78−93−3	MEK, 2−Butanone
Methyl isobutyl ketone	108−10−1	MIBK, 4−Methyl−2−pentanone, Isopropylacetone, *Hexone*
Methyl tert−butyl ether	1634−04−4	MTBE, 2−Methoxy−2−methyl−propane, tert−Butyl methyl ether
Metolachlor	51218−45−2	*Dual*, *Bicep*, *Milocep*
Metribuzin	21087−64−9	Sencor, Lexone
Molybdenum	7439−98−7	
Monochlorobenzene	108−90−7	Chlorobenzene
Naphthalene	91−20−3	
N−Nitrosodiphenylamine	86−30−6	NDPA
Pentachlorophenol	87−86−5	PCP, Pentachlorohydroxybenzene
Phenol	108−95−2	
Picloram	1918−02−1	*Tordon*, 4−amino−3,5,6−trichloropicolinic acid
Polychlorinated biphenyls[4]		PCBs
Prometon	1610−18−0	*Pramitol*, *Prometone*
Pyrene	129−00−0	Benzo(def)phenanthrene
Pyridine	110−86−1	Azabenzene
Simazine	122−34−9	*Princep*, 2−chloro−4,6−diethylamino−s−triazine
Styrene	100−42−5	Ethenylbenzene, Vinylbenzene
1,1,1,2−Tetrachlorethane	630−20−6	1,1,1,2−TCA
1,1,2,2,−Tetrachloroethane	79−34−5	1,1,2,2−TCA
Tetrachloroethylene	127−18−4	Perchloroethylene, PERC, Tetrachloroethene
Tetrahydrofuran	109−99−9	THF
Toluene	108−88−3	Methylbenzene

Toxaphene	8001−35−2	
1,2,4−Trichlorobenzene	120−82−1	
1,1,1−Trichloroethane	71−55−6	Methyl chloroform
1,1,2−Trichloroethane	79−00−5	1,1,2−TCA, Vinyl trichloride
Trichloroethylene	79−01−6	TCE, Chloroethene
2,4,5−Trichlorophenoxy−propionic acid	93−72−1	2,4,5−TP,*Silvex*
1,2,3−Trichloropropane	96−18−4	1,2,3−TCP, Glycerol trichlorohyrin
Trifluralin	1582−09−8	*Treflan*
1,2,4−Trimethylbenzene	95−63−6	
1,3,5−Trimethylbenzene	108−67−8	
Vanadium	7440−62−2	
Vinyl chloride	75−01−4	VC, Chloroethene
Xylene[5]		

[1] Chemical Abstracts Service (CAS) registry numbers are unique numbers assigned to a chemical substance. The CAS registry numbers were published by the U.S. Environmental Protection Agency in 40 CFR Part 264, Appendix IV

[2] Common synonyms include those widely used in government regulations, scientific publications, commerce and the general public. A trade name, also known as the proprietary name, is the specific, registered name given by a manufacturer to a product. Trade names are listed in *italics.* Common synonyms and trade names should be cross−referenced with CAS registry number to ensure the correct substance is identified.

[3] This is a combined chemical substance which includes cis 1,3−Dichloropropene (CAS RN 10061−01−5) and trans 1,3−Dichloropropene (CAS RN 10061−02−6).

[4] Polychlorinated biphenyls (CAS RN 1336−36−3); this category contains congener chemicals (same molecular composition, different molecular structure and formula), including constituents of Aroclor−1016 (CAS RN12674−11−2), Aroclor−1221 (CAS RN 11104−28−2), Aroclor−1232 (CAS RN 11141−16−5), Aroclor−1242 (CAS RN 53469−21−9), Aroclor−1248 (CAS RN 12672−29−6), Aroclor−1254 (CAS RN 11097−69−1), and Aroclor−1260 (CAS RN 11096−82−5).

[5] Xylene (CAS RN 1330−20−7) refers to a mixture of three isomers, meta−xylene (CAS RN 108−38−3), ortho−xylene (CAS RN 95−47−6), and para−xylene (CAS RN 106−42−3)

The foregoing rules were approved and adopted by the State of Wisconsin Natural Resources Board on _____.

The rules shall take effect on the first day of the month following publication in the Wisconsin administrative register as provided in s. 227.22(2)(intro.), Stats.

Dated at Madison, Wisconsin _____

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

By _____
Scott Hassett, Secretary

(SEAL)