

ILLINOIS POLLUTION CONTROL BOARD
January 25, 1990

IN THE MATTER OF:)
)
AMENDMENTS TO TITLE 35,) R88-21, DOCKET A
SUBTITLE C (TOXICS CONTROL))

ADOPTED RULE) FINAL ORDER

OPINION AND ORDER OF THE BOARD (by R. C. Flemal)

This matter comes before the Board upon a regulatory proposal filed August 5, 1988 by the Illinois Environmental Protection Agency ("Agency"). The purpose of the proposal is to make additions to and to amend the Board's regulations for the control of toxic substances in surface waters. This proceeding has been expedited pursuant to the procedures of Section 28.2 of the Illinois Environmental Protection Act ("Act") (Ill. Rev. Stat. ch. 111½, par. 1001 et seq.).

The amendments are reflective of the mandate of Section 303(c)(2)(B) the Federal Clean Water Act ("CWA") (33 U.S.C 1251 et seq.), as well as advances in the sciences of toxicology and chemical detection. The policy underlying the amendments is that the waters of Illinois must not be impacted by toxic substances in toxic amounts.

Implementation of this policy in the instant rules is achieved by two basic refinements of the previous regulations. The first consists of refining the value of the numeric standards found at 302.208 to bring them into agreement with the best available current knowledge. The second consists of providing a detailed, specific set of directives and procedures, found at 302.210 and 302.Subpart F, which are used to define what constitutes a toxic amount for those substances for which numeric toxicity criteria are not provided.

Beyond the amendments required to bring these two basic refinements to fruition, the instant rules contain a variety of additional amendments which are required to bring the rest of the Board's water regulations into conformity with the basic refinements. Among the principal of these is refinement of the Allowed Mixing concept at Section 301.102.

PROCEDURAL HISTORY

This matter contains an involved procedural history, commensurate with the breadth of issues involved and the interest

and concern thereby generated. In this section the Board reviews the salient aspects of this history.

Pre-Hearing Conferences

Subsequent to the August 5, 1988 filing of the Agency's initial proposal (Exh. 27), the Board, upon motion by the Agency and the Illinois Environmental Regulatory Group ("IERG"), directed that a pre-hearing conference be held on September 28, 1988 pursuant to the procedures of Section 27(e) of the Act. On October 6, 1988, the Board entered an order directing the Hearing Officer to schedule a second pre-hearing conference to address drafting issues and conformance with the requirements of the Administrative Procedure Act ("APA"). A second pre-hearing conference was accordingly held October 14, 1988. As a result of discussions concerning modifications necessary to meet the technical drafting requirements of the APA, on October 28, 1989 Board staff issued and served upon the notice list, an edited draft of the Agency's proposal "solely intended to aid the Agency in drafting the proposal", accompanied by an explanatory memorandum (Exh. 77). The memorandum noted incorporation by reference and vagueness problems as being of particular concern to the Board.

Pre-First Notice Hearings

Seven days of hearing, at which 77 exhibits were generated, were held prior to the Board's First Notice action. These hearings were held on November 18, and December 6 and 7, 1988, and February 16 and 17, and June 13 and 14, 1989. A synopsis of the testimony received at each of these hearings was presented in the Board's First Notice Opinion¹, p. 5-9, and will not be repeated here.

Revisions of Agency Proposal

The original Agency proposal experienced various revisions based upon activities prior to First Notice. These proposals have been entered into the record as Exhibit 29 (original proposal), Exhibit 43 (revised proposal dated February 9, 1989), and Public Comment #8 (revised proposal dated August 9, 1989). The principal revision accompanied the February 9, 1989 version, in which the Agency added to its proposal, at the Board's suggestion, the procedures used for deriving criteria as now represented by 302.Subpart F. Previously, these procedures had been proposed as Agency policy rather than as a Board regulation.

¹ Full citation: In the Matter of: Proposed Amendments to Title 35, Subtitle C (Toxics Control), R88-21, August 31, 1989.

Pre-First Notice Public Comments

Pre-First Notice Public Comments ("PC") were received from the following persons: Pfizer Pigments, Inc. (PC #1); Sanitary District of Rockford (PC #2-4); Metropolitan Waste Reclamation District of Greater Chicago (PC #5); Illinois and National Wildlife Federations ("IWF/NWF") (PC #6); Amerock Corporation ("Amerock") (PC #7); the Agency (PC #8, #9); Illinois Steel Group ("Steel Group") (PC #10); Village of Sauget ("Sauget") (PC #11); and IERG (PC #12). These comments provided information and insights employed by the Board in formulating its First Notice proposal.

Determination of Federal Requirement

Section 28.2 of the Act establishes expedited requirements for federally required rules. Among other things, Section 28.2 establishes a procedure for Agency certification that rules are federally required. On January 13, the Hearing Officer entered an Order directing the Agency to file a Section 28.2 formal certification. This certification was filed with the Board on February 10, 1989.

EcIS

On January 5, 1989, the Board adopted RES 89-1, In the Matter of: Application of Procedural Amendments of P.A. 85-1048 to Newly Filed and Pending Regulatory Proceedings. In that Resolution, the Board addressed the significant procedural changes in the Act enacted in SB 1834, P.A. 85-1048, effective January 1, 1989. The Board determined that SB 1834 would in some measure apply to proceedings filed before its effective date, citing McQueen v. Conner, 385 Ill. 455, 459 N.E. 2d 435, 437 (1943) and Nelson v. Miller, 11 Ill. 2d 378, 143 N.E. 2d 673 (1977). The Board noted that Section 27(a) of the Act, as amended by SB 1834, allows and requires the Board, rather than the Illinois Department of Energy and Natural Resources ("DENR") to determine whether an economic impact study is to be performed. For pre-1989 filings, the Board construed SB 1834 "as providing that any final conclusion reached by DENR prior to December 31, 1989 regarding the need for an EcIS is conclusive in that proceeding" (RES 89-1 at 2). As DENR had notified the Board of its decision to conduct an EcIS by letter filed December 21, 1988, the Board has made no EcIS determination in this proceeding.

On August 9, 1989 DENR filed a first-installment EcIS titled "Analysis of Proposed Revisions to Subtitle C Toxics Control Program: Pollution Control Board Docket R88-21. Hearing Copy" (Exh. 82). On November 2, 1989 DENR, filed a supplemental EcIS document titled: "Analysis of Cost Relating to Proposed Revisions

to Toxics Control Program: Pollution Control Board Docket R88-21" (Exh. 96). This document was updated and submitted as Exhibit 108. On November 17, 1989 DENR provided further economic analysis within PC #24.

Pre-First Notice Timetable

By Hearing Officer Order of July 12, 1989, the Board's projected timetable was set forth, and an August 9, 1989 date set for submission of any written comments which participants wished to have fully considered by the Board prior to adoption of a proposal for First Notice. Assuming the applicability of a February 4, 1990 adoption deadline, the Order noted that to allow time for the running of each of the APA's 45-day First Notice and 45-day Second Notice periods, Board action on a First Notice proposal was necessary in the last week in August or the first week in September, and on a Second Notice proposal in the last week in November or the first week in December to allow for final adoption of a proposal on or before January 25, 1990 and receipt by the Secretary of State of the final rule by early February, 1990.

First Notice

The Board by separate Opinion and Order adopted a modified version of the Agency's proposal for First Notice on August 31, 1989. First Notice publication occurred at 13 Ill. Reg. 14152 September 15, 1989. On September 28, 1989 the Board issued a Supplemental First Notice Opinion expanding upon certain matters related to the First Notice Order.

The rule proposed for First Notice contained many format, as well as some substantive, modifications of the Agency's then current proposal (August 9, 1989 version). The formatting modifications will not be reiterated here; for a full summary, the interested person is directed to the First Notice Opinion, p. 22-34.

Among substantive modifications made by the Board at First Notice were additions of incorporations of reference and severability sections, modifications to definitions, and modifications of the mixing rule (see First Notice Opinion at p. 25-34).

Post-First Notice Hearings

Subsequent to First Notice seven additional days (September 18-19, October 2-3, and November 6-8) of public hearings were held. The interested person is directed to Second Notice Opinion, p. 3, for a synopsis of the content of these hearings. Collectively, the seven post-First Notice hearings produced 44 additional exhibits, Exh. 78 through Exh. 121.

JCAR Preliminary Review

On October 25, 1989 the Joint Committee on Administrative Rules of the Illinois General Assembly ("JCAR") filed a response to the Board request for preliminary review of the instant proposal. The JCAR response was accepted into the Record as Exh. 122 in the Second Notice Opinion at p. 3. Additionally, by letters of October 25 and 30, 1989 the Board sought and received expedited preliminary review from JCAR of incorporations by reference materials.

Post-First Notice Public Comments

Twenty-one Public Comments were filed during the First Notice Comment period, filed respectively by the Steel Group (PC #13, #26, #30), Sauget (PC #14, #27), Amerock (PC #15, #31), the Administrative Code Division of the Illinois Office of the Secretary of State ("Code Division") (PC #16), IWF/NWF (PC #17, #18), the Illinois Department of Commerce and Community Affairs (PC #19, #21), the Agency (PC #20, #25, #33), Wildman, Harrold, Allen & Dixon (PC #22), United States Environmental Protection Agency ("USEPA") (PC #23), DENR (PC #24), Outboard Marine Corporation (PC #28, #32), and IERG (PC #29).

Second Notice and Docket-Splitting

On December 6, 1989 the Board, by separate Opinion and Order, adopted a modified proposal for Second Notice. Also, the Board on that date split the docket into R88-21(A) and R88-21(B), with the former containing the substantive materials previously adopted for First Notice and the latter containing certain subsidiary matters and matters which had not been previously first-noticed, but which the Board believes may be necessary to conform the Board's overall water regulations with the instant rules. R88-21(B) has subsequently been on its own track, and will not be further reviewed herein.

JCAR Second Notice Review

On January 10, 1990 JCAR issued Certifications of No Objection to Parts 301, 305, and 309. However, JCAR recommends² certain alterations based on its review of the Second Notice

² JCAR's comments are contained in letters to the Board dated December 21 and 22, 1989; these are hereby entered into the record as Exhibits 123 and 124, respectively. The Board responded to the JCAR comments by letters dated December 28 and 29, 1989; these are hereby entered into the record as Exhibits 124 and 125, respectively.

Proposal. These alterations improve the clarity of the rule without altering its substance; accordingly, the Board agrees to make the alterations. A complete description of the alterations follows in a later section of this Opinion.

JCAR Objection and Board Response

On January 10, 1990 JCAR voted an objection to Part 302 of the instant rules. Pursuant to Section 7.06(c) of the APA the Board may (1) modify the proposed rule to meet JCAR's objection, (2) withdraw the proposed rule in its entirety, or (3) refuse to modify or withdraw the proposed rule. On this date, January 25, 1990, the Board adopted a Resolution (Res 90-1, R89-21(A)) setting forth its reasons for pursuing option (3). The interested person is directed to the Resolution for a full exposition of the Board's position. The Resolution is hereby incorporated by reference as if fully set forth herein.

MANDATE OF THE CWA

Required Action

Section 101(a)(3) of the CWA states as a national policy objective that the discharge of toxic pollutants in toxic amounts shall be prohibited. Section 303(c)(2)(B) of the Water Quality Act of 1987 provides that states "shall adopt criteria for all toxic pollutants listed pursuant to Section 307(a)(1) ... as necessary to support such designated uses. ... Such criteria shall be specific numerical criteria for such toxic pollutants. Where such numerical criteria are not available ... such states shall adopt criteria based on biological monitoring or assessment methods consistent with information published pursuant to section 304(a)(8)." (33 U.S.C. §303(c)(2)(B)).

In conjunction with the above-quoted provisions, the USEPA published a guidance document (Exn. 46) to aid states in adopting regulations consistent with the requirements of federal law. This document sets forth the following three options by which states may meet the requirements of Section 303(c)(2)(B):

- 1) Adopt statewide numeric water quality standards for all EPA criteria for section 307(a) toxic pollutants regardless of whether the pollutants are known to be present;
- 2) Adopt specific numeric water quality standards for section 307(a) toxic pollutants as necessary to support designated uses where such pollutants are discharged or are present in the affected waters and could reasonably be expected to interfere with designated uses;

- 3) Adopt a procedure to be applied to a narrative water quality criterion. This procedure shall be used by the State in calculating derived numeric criteria, which criteria shall be used for all purposes under section 303(c) of the CWA. Such criteria need to be developed for section 307(a) toxic pollutants, as necessary to support designated uses, where these pollutants are discharged or present in the affected waters and could reasonably be expected to interfere with designated uses.

Today's rules conform to the second and third options quoted above.

Adoption Date

The Agency interprets that federal law mandates adoption of the instant regulations (or at least an equivalent regulation pursuant to Section 303(c)(2)(B) of the CWA) no later than February 4, 1990 (Exh. 44). The Steel Group has questioned the accuracy of the deadline and suggests that Illinois is not required to adopt water toxic regulations pursuant to the CWA until October of 1990 (R2.³ at 432; PC #10). According to the Steel Group, the 1972 amendments to the CWA require each state's water pollution agency to review water quality standards once every three years beginning with the effective date of the 1972 amendments on October 18, 1972. Consequently, Illinois would have conducted its most recent review in October of 1987. Therefore, the Steel Group argues that the instant regulations need not be adopted until October 18, 1990.

By Hearing Officer Order of July 21, 1989, a letter dated July 13, 1989 to the Agency from USEPA was entered as Exhibit 75. This letter reasserts the position of USEPA stated at hearing that the deadline date for adoption of water toxic regulations is February 4, 1990 (Exh. 75). The USEPA's position as to the deadline imposed under federal law is entitled to deference. Therefore, the Board views February 4, 1990 as the deadline for adoption of the instant regulations.

³ Page numbers of the transcribed hearing record are consecutively numbered for the hearings held on November 18, 1989 through February 17, 1989. Page numbering was reset to zero with the June 13, 1989 hearing record and continued consecutively thereafter to the termination of hearings on November 8, 1989. As cited to herein, the first numbered set is referred to as "R1. at ___" and the second set as "R2. at ___".

Federal Requirement of Specific Rules

A subsidiary issue concerns what the specific portions of the instant regulations are federally required under the CWA. The Agency has certified that both the specific numeric standards of Section 302.208 and the narrative standard of Section 302.210 are federally required (Exh. 44). The Agency asserts that Section 303(c)(2)(b) of the Water Quality Act of 1987 coupled with the stated policy objective set forth in Section 101(a)(3) of the CWA prohibiting "the discharge of toxic pollutants in toxic amounts" support its certification of the proposal as being federally required.

The Steel Group has responded in detail to the Agency's position on this issue (PC #10 at 10-19). The Steel Group asserts that the narrative standard is not federally required and that the requirements of the CWA may be satisfied by adopting specific numeric criteria for priority pollutants of concern to Illinois pursuant to option two of the USEPA guidance document (Exh. 46). The Steel Group opines that, according to the guidance document, the narrative standard may be used as a supplement to options one and two, but that it is not required. Moreover, the Steel Group argues that even when a narrative standard is used it is limited to "toxic pollutants 'the discharge or presence of which in affected waters could reasonably be expected to interfere with those designated uses adopted by the State, as necessary to support such designated use', 33 U.S.C. §1313(c)(2)(B)" (PC #10 at 11). The Steel Group contends that the Agency's proposal goes beyond this federal requirement by regulating non-priority pollutants. Lastly, the Steel Group disputes the Agency's reliance upon the policy objective of Section 101(a)(3) of the CWA as a basis for asserting that the instant regulations are federally required.

Consistent with its position that the narrative standard portion of the Agency's proposal is not federally required, the Steel Group suggested that the Board split the docket in this matter. The Steel Group proposed that the Board proceed only with adoption of the specific numeric standards set forth in Section 302.208 and postpone action on the narrative standard.

The Board disagrees with the Steel Group's contention that the regulations proposed by the Agency are not federally required. The Steel Group's interpretation of the USEPA guidance document is inconsistent with USEPA's stated position on whether it views the Agency's proposed regulations as being required by federal law.

Section 303(c)(2)(B) of the Water Quality Act of 1987 requires that where numeric standards are not available, states "shall adopt criteria based on biological monitoring or assessment methods consistent with information published pursuant

to Section 304(a)(8)" (33 U.S.C. §1313(c)(1)(B)). Only where a state expects that a pollutant will not interfere with the designated use is the state excused from deriving a numeric standard for that pollutant (Exh. 46 at 3). However, nothing in the Act restricts the right of a state to adopt numeric criteria for any pollutant not listed in Section 307(a)(1) (Exh. 46 at 5).

The USEPA specifically opines that "an effective State water quality standards program should include both the chemical specific ... and narrative approaches" (Exh. 46 at 2). By supplementing option two with option three, "a State would have formally adopted numeric criteria for those toxic pollutants of frequent occurrence ... and would also have a sound and predictable method to develop additional numeric criteria as needed. This combination of options provides a complete regulatory scheme". (Exh. 46 at 10). Where option 2 is supplemented with option 3, states must provide an opportunity for public participation (Exh. 46 at 10). Additionally, states must adopt a "specific procedure to be applied to narrative water quality criteria" (Id).

Furthermore, USEPA reiterated this position in a correspondence dated July 3, 1989 from Kenneth A. Fenner, Chief of the Water Quality Branch, USEPA Region V, to James B. Park, Manager of the Agency's Division of Water Pollution Control (Exh. 75). This letter provides that "the statutory commitments for toxic provisions in State rules go beyond simply adopting numeric criteria" (Exh. 75). Rather, a complete regulatory scheme includes both formally adopted numeric criteria for toxic pollutants of frequent occurrence and sound and predictable methods to develop additional criteria as needed (Exh. 75). Furthermore, the "adoption of numeric criteria does not subrogate the necessity of a narrative policy: [S]uch a policy is needed to insure waters of the State are protected from toxicity when numeric criteria may not be sufficient to provide such protection" (Exh. 75).

Section 28.2(b) of the Act provides that "[w]henever a required rule is needed, the Board shall adopt a rule which fully meets the applicable federal law." The USEPA has made clear that it interprets the CWA as mandating that Illinois adopt water toxic regulations no later than February 4, 1990 (Exh. 75). The only regulations received by the Board propose both the adoption of specific numeric standards for known toxic pollutants and a narrative standard for newly discovered toxic substances. The Board finds general agreement with the analysis of the mandate of the CWA as articulated by the Agency and the USEPA. Accordingly, we conclude that the regulations as proposed by the Agency and modified herein are federally required.

DISCUSSION OF ADOPTED RULES

The instant amendments both add to and amend the Board's existing water quality regulations found at 35 Ill. Adm. Code: Subtitle C (35 Ill. Adm. Parts 301 through 309). In this section the Board will review the major components of the amendments and the rationale for them. This discussion is conveniently made in four parts: (1) essentially conforming amendments made in 35 Ill. Adm. Code 301.106 through 302.101, 302.103, 302.203, and 305.102 through 309.103; (2) amendments to the allowed mixing concept found at 35 Ill. Adm. Code 302.102; (3) amendments to the General Use Water Quality Standards found at 35 Ill. Adm. Code 302.208; and (4) amendments to the narrative prohibition against toxicity found at 35 Ill. Adm. Code 303.210 and 302.Subpart F. The following discussion will visit these four parts in turn.

Essentially Conforming Amendments

Various amendments have been necessary to bring collateral portions of the Board water quality regulations into conformity with the substantive amendments regarding toxic substances. These are as follows:

Section 301.106 Incorporations by Reference

Section 301.106 is a new Section added to accommodate incorporations by reference. The references in today's amendments pertain solely to the instant subject matter. However, Section 301.106 is designed such that it can house incorporations by reference made in association with any future amendments within Subtitle C.

Section 301.107 Severability

Perhaps due to oversight, Subtitle C has not previously contained a severability clause. Such is added here in Section 301.107. It is applicable to the whole of Subtitle C. This addition is made to conform Subtitle C to general regulatory drafting practice.

The Steel Group has recommended that the severability clause be stricken (PC #26 at 14-15). The Steel Group contends that the clause "does not appear to be mandated by any law or regulation" from which the Steel Group concludes that the clause is "unnecessary" and "inappropriate" (*Id.*). The Board finds both the contention and conclusion faulty.

The Board is mandated under Title VII of the Act to promulgate regulations necessary to meet the purposes of the Act. The Board finds that the purposes of the Act would be thwarted if, through the Board's failure to affirmatively assert

otherwise, a judgment of invalidity of one part caused the invalidity of additional parts or of the whole of the Board's water regulations. The Board therefore believes that a general severability clause is appropriate. Judgement as to whether it is also necessary cannot be made until its purpose is put to test, and it accomplishes its purpose within that test.

Section 301.108 Adjusted Standards

Section 301.108 is a new Section which states the statutory language at Section 28.1(a) of the Act regarding adjusted standards. It is arguable whether it is necessary to repeat statutory language within the body of the Board rules. Nevertheless, the Board deems that it is advisable to do so in this instance. Substantial discussion has arisen in the context of the instant proposal regarding how the adjusted standard procedure interplays with the amended rules. Since the adjusted standard is a new procedure before the Board, it is likely that similar questions will also arise in other, future proceedings and perhaps during USEPA review. The Board believes that inclusion within Subtitle C of the statutory description of the adjusted standards procedure offers a reasonable prospect of addressing some of these current and future questions.

Section 302.100 Definitions

Section 302.100 is a new Section containing definitions used in Part 302. The definitions in today's amendments pertain solely to the instant subject matter. The definitions are for "acute toxicity", "adverse effect", "chronic toxicity", "criterion", "hardness", "mixing zone", "total residual chlorine (TRC)", "toxic substance", and "zone of initial dilution (ZID)".

Notable among these is the definition of "criterion". This term has a special sense as used within Part 302, which is "a numerical concentration of one or more toxic substances derived in accordance with the procedures in Subpart F [of Part 302] which, if not exceeded, would assure compliance with the narrative toxicity standard of Section 301.210". The definition thus establishes that there is a presumption that, if a criterion is met, there is no violation of the prohibition against toxicity for that substance or combination of substances for which the criterion has been determined.

Several of these definitions have undergone evolution at First and Second Notices. The interested person is directed to the First and Second Notice Opinions, at pages 25-6 and 23-4, respectively, for a discussion of the nature and reason for the changes.

Section 302.101 Scope and Applicability

Various amendments have been made to the directory to Part 302 found at Section 302.101. All of the amendments are of a conforming nature. These include updating the format of internal references to conform to current Code Division practice and the addition of a citation to the new procedures of Subpart F.

Section 302.103 Stream Flows

This Section contains a conforming amendment which deletes the specific citation to temperature (PC #8 at 10).

Section 302.203 Offensive Conditions

This Section contains amendments intending to both clarify and conform the Section to the remaining amendments.

IERG has requested that the Board delete the last sentence of Section 302.203, which disallows the use of mixing as a method for compliance with the "Offensive Conditions" prohibition listed in the preceding sentence (R2. at 1148-9). This the Board declines to do. The Board believes that mixing is a concept not applicable to some of the "Offensive Conditions", such as sludge or bottom deposits, floating debris, and plant or algal growth, since these are not subject to mixing in the sense associated with dissolved contaminants. For the other listed "Offensive Conditions" the Board finds that the water quality standard of 302.203 is no more restrictive than the effluent standard found at 35 Ill. Adm. Code 304.106⁴. Since mixing has been allowable pursuant to 302.102 only when "a water quality standard is more restrictive than its corresponding effluent standard", the Board views mixing as never having been an acceptable method of compliance with the "Offensive Conditions" prohibition. The Board does not see any persuasive argument why this policy should now be generally reversed.

Section 305.102 Reporting Requirements

This Section contains amendments which implement the Agency's ability to acquire biological monitoring data for discharges where toxicity may be at issue.

⁴ Section 304.106 reads: In addition to the other requirements of this Part, no effluent shall contain settleable solids, floating debris, visible oil, grease, scum or sludge solids. Color, odor and turbidity must be reduced to below obvious levels.

Section 309.103 Application (NPDES) - General

This Section contains amendments which implement the Agency's ability to require and acquire toxicity information as part of an application for an NPDES permit. Certain additional amendments are involved which conform the Section to current Code Division standards for citation to regulations external to the instant Section (see Second Notice Opinion at 35).

Allowed Mixing, Mixing Zones and ZIDs - Section 302.102

Today's rules affirm a long-standing tenet of Illinois environmental law. That tenet is that a discharger unable to comply with the requirement of not causing or contribution to water quality violations found at 35 Ill. Adm. Code 304.105, after making every effort to fulfill the obligations of the discharger (see discussion below) and given the limits imposed by the nature of the receiving water body and the character of the outfall(s), is entitled to use a limited portion of the receiving body of water to effect mixing of the effluent with the receiving water. Within this limited portion of the receiving body of water, the discharger is excused from compliance with 304.105. This is the "allowed mixing concept", which is developed principally in Section 302.102.

A significant portion of both testimony and public comment has focused on Section 302.102. In part this interest reflects inadequacies in the construction of prior Section 302.102. In part, it also reflects the limited extent to which prior Section 302.102 has been applied, and hence given "body" through interpretation and case law.

Accordingly, the Board at both First and Second Notice gave substantial consideration to the concept of allowed mixing, both in terms of exploring the principles underlying allow mixing and in honing the language of Section 302.102 in such manner as to have it fully reflect those principles (see First Notice Opinion at p. 26-9; Second Notice Opinion at p. 5-12, 24-6). In the following sections, the Board expresses its final analysis regarding these matters.

Obligations of the Discharger and Allowed Mixing

As a precondition of allowed mixing, is to be recognized that all dischargers must first comply with all effluent standards specified in the Board's effluent regulations, 35 Ill. Adm. Code Part 304. Included in these effluent regulations are not only a number of specific maximum concentration limits, but also a requirement to do the best job of treating an effluent before discharge. In particular, it is specified at Section 304.102 that:

[I]t shall be the obligation of any person discharging contaminants of any kind to the waters of the state to provide the best degree of treatment of wastewater consistent with technological feasibility, economic reasonableness and sound engineering judgement. (emphasis added)

It is thereby only in the special circumstance where further treatment is not technologically feasible, economically reasonable and in accord with sound engineering judgement, and where the effluent standards are being met, and where the discharger would nevertheless still potentially cause or contribute to the violation of a water quality standard, that the issue of in-stream (or lake) mixing should even arise. If, in fact, our current effluent regulations are sound -- and we see no reason to believe otherwise -- and if our current effluent regulations are being generally adhered to -- which likewise we see no reason to doubt -- there should be no great demand on in-stream mixing. We believe that this analysis is borne out by the limited degree to which in-stream mixing is currently invoked. Moreover, the obligations stated above constitute the status quo circumstance, which we do not see as being changed under today's rule. On this basis we view as misplaced the fear of those persons who believe that today's amendments will savage the State's waters by allowing massive new in-stream mixing. Similarly, we view as misplaced the perception of others that today's amendments will cause mayhem on large numbers of dischargers for whom in-stream mixing constitutes an avenue of last resort.

Today's allowed mixing rule accordingly makes explicit statement within subsection (a) of the obligation of the discharger.

Limitations on Waters Within Which Mixing is Allowed

Subsection (b) contains various strictures on the nature of allowed mixing. Some of the provisions of this subsection are previously existing provisions which have been moved into this subsection for the purpose of organizational clarity; others are new provisions designed to more fully define the conditions under which mixing is allowed. The following table serves as a key to the origin of the essential elements of the various portions of the subsection:

Section 302.102(b)(1)	Agency Proposal
" (b)(2)	Agency Proposal
" (b)(3)	Agency Proposal
" (b)(4)	Agency Proposal
" (b)(5)	Agency Proposal
" (b)(6)	Previous 302.102(c)
" (b)(7)	Previous 302.102(c)

"	(b)(8)	Previous 302.102(c), ammended
"	(b)(9)	Added by Board
"	(b)(10)	Previous 302.102(a)
"	(b)(11)	Previous 302.102(a)
"	(b)(12)	Agency Proposal

A principal provision of subsection (b), taken as a whole, is that the volume of waters used for allowed mixing must be as small as is practical, such as to limit impact on aquatic life, human health, and recreation. Further, it is incumbent upon any discharger desirous of taking advantage of the allowed mixing provision to assure that there is in place all reasonable engineering structures and treatment methods as are necessary to reduce the volume of waters needed for allowed mixing. It is to be further noted that the restrictions of subsection (b) could, in special circumstances, limit allowed mixing to such a small size that its existence becomes academic. An example would be where a discharge is to a public access area or into a natural feature vital to the well being of aquatic life.

Subsection (b)(1) is built on the premise advanced by the Agency, with which the Board concurs, that the waters within which mixing is allowed should be no greater than would be required to accommodate an optimally-designed outfall structure. The burden of providing the most efficient mixing should be on the discharger. If the discharger chooses to provide for less than the optimum mixing, the discharger should not be able to claim a greater volume of waters for allowed mixing as a result. Accordingly, subsection (b)(1) limits allowed mixing to that portion of the receiving water which would be needed to accommodate an optimally-designed discharge configuration.

Subsections (b)(2) through (b)(5) set out various prohibitions regarding the nature of allowed mixing with respect to aquatic habitats and water use areas. Among these are requirements that allowed mixing must not cause the occlusion of tributary stream entrances or restrict movement of aquatic life into or out of the tributary; must not occur in waters adjacent to bathing beaches, bank fishing areas, and boat ramps and other types of public access areas; must not occur in waters which contain important aquatic life habitat or natural features vital to the well being of aquatic life; and must not occur in waters containing points of water withdrawal for public and food processing water or irrigation, or watering areas accessed by wild life or domestic animals. Each of these prohibitions is intended to assure that the environmental impact of allowed mixing is minimized.

Subsections (b)(6), b(7), (b)(8), b(10), and b(11) are essentially drawn from previous subsections (a) and (c). They are collected and reorganized here for the purpose of bringing

all of the limitations on allowed mixing into the single new subsection (b).

Subsection b(8) has also had the provision added that mixing is not allowed in waters with a zero 7Q10 (7-day low flow which occurs one in ten years), and subsection b(9) has been added stating that mixing is not allowed for any constituent for which the water quality standard is already violated. In both cases these are explicit statements of rational interpretations of allowed mixing. The concept of allowed mixing presumes that there is something to "mix with" the effluent and something to "dilute" the effluent to a safe level. These mixing and diluting concepts will simply never come into play where : (1) the receiving stream has no flow, or, (2) the water quality standard at issue is already violated in the receiving water.

Subsection (b)(12) contains the provision that no water within which mixing is allowed may encompass a surface area greater than 26 acres. Substantial controversy has surrounded this issue, with the principal opposition view being that there is no need to place an upper bound (26 acres or otherwise) on the size of waters within which mixing is allowed. The Board nevertheless believes that there must be some upper limit to the size of mixing zones. A mixing zone is, after all, a portion of a water body where less than optimum water quality is allowed based upon the striking of a balance between the costs of environmental control and the quality of the environment. Accordingly, there must also be some upper limit to the waters within which mixing is allowed where the balance runs so contrary to the interests of the environment, and hence the very purpose of the Environmental Protection Act, that a line has to be drawn. The Board believes that the 26-acre upper limit is an appropriate place to maintain⁵ that line in a rule of general applicability. The vast majority of discharges in Illinois should be readily able to accommodate to this limit. The few who may believe that a larger limit is necessary and justified for their particular circumstances are, as always, free to plead their case before the Board in an adjusted standard or site-specific proceeding.

The Board notes that there were three sentences of a general philosophical nature in previous subsection (a) which are today deleted from that subsection. These are the sentences:

⁵ 26 acres is equal to "the area of a circle with a radius of 183 m (600 feet)", which is the size limitation imposed in prior Section 301.102(a). Hence, today's rule does not provide for an area limitation different than that which already exists in Board rules.

"The size of the mixing zone cannot be uniformly prescribed."

"The governing principle is that the proportion of any body of water or segment thereof within mixing zones must be quite small if the water quality standards are to have any meaning."

"This principle shall be applied on a case-by-case basis to ensure that neither any individual source nor the aggregate of sources cause excessive zones to exceed the standards."

In deleting these sentences the Board is in no way intending to imply repudiation of the ideas they express. To the contrary, the Board believes that the ideas contained therein remain fundamental underpinnings for applying and allowing mixing. Nevertheless, the sentences are deleted because, although acceptable under prior Illinois administrative law standards, they are not likely acceptable today. Additionally, the Board believes that the essence of these sentences has been retained within the general prescriptions of subsection (b).

Physical Mixing and Allowed Mixing

It is elemental that mixing occurs when effluents are discharged into a receiving body. This is the physical reality of mixing. To the extent that such mixing occurs over some volume of the receiving water body, there is also an inherent, physical "zone of mixing" wherein the two fluids experience commingling. A "zone of mixing" is thus a physical reality associated with all mixing effluents.

This "zone of mixing", however, is not necessarily equivalent to the volume of waters within which mixing is regulatorily allowed. As noted above, mixing is allowable only when specific conditions of both the discharger and the water body are met. Moreover, the portion of the water body within which mixing is allowed is determined not solely by the bounds of the "zone of mixing", but also by strictures associated with the nature of the receiving body of water, the nature of the outfall(s), and the maximum size associated with mixing zones, pursuant to subsection 302.102(b).

Mixing Zone as Regulatory Construct

Today's rules better distinguish between waters within which mixing is allowed on principle, and the formal regulatory construct of a "mixing zone". As used in both the prior and current rule, the term "mixing zone" refers to a formal regulatory construct. In today's rule, the mechanisms by which mixing zones are established are fleshed out.

The specification that a mixing zone is a regulatory construct is not a departure from the prior allowed mixing policy. This is apparent from a plain reading of prior 302.102. Prior 302.102 is replete with language specifying that a mixing zone takes on form only after a variety of determinations have been made. Examples include (emphases added):

[The] principle [that the proportion of any body of water or segment thereof within mixing zones must be quite small] shall be applied on a case-by-case basis...

Single sources of effluents which have more than one outfall shall be limited to a total mixing area not larger....

In determining the size of the mixing zone for any discharge, the following must be considered: ...

... the mixing zone shall be so designed as to assure
...

It is perhaps inartful construction that in all of these instances the passive-voice verb forms are used. Nevertheless, there is a clearly implied set of actions which must be completed to give effect to a mixing zone. It is the need for these actions which distinguishes the physical "zone of mixing" from the regulatory construct which is a mixing zone.

Although the concept of the mixing zone as regulatory construct is therefore not new today, the manner in which the Board makes that specification is provided in a modified, and hopefully clearer form. Among other matters, we intentionally refrain from use of passive voice constructions. Additionally, within subsections (d) and (f) we purposely specify the persons responsible for making the various decisions which effectuate a mixing zone. One such person is the NPDES permit applicant, who may ask for the recognition of a mixing zone; alternatively, the Agency may require a NPDES applicant to address mixing pursuant to 35 Ill. Adm. Code 309. A second is the Agency, which is charged with reviewing the application pursuant to its responsibilities as permitter. The third is the Board, which stands in an appellate posture pursuant to its charges under the Act to resolve disputes between permit applicants and the Agency. The Board views none of this role-designation as being new, but rather as explicit identification in the instant context of the roles assigned under the Act in all similar circumstances.

Mixing Zones in NPDES Permits

An aspect of the instant amendments which is new under the instant rule is the specification at subsection (d) that an NPDES permit may include a mixing zone as a permit condition. The Board's purpose here is, in part, to afford a mixing zone determination the same panoply of procedures and safeguards employed under the NPDES permitting system. Any effluent discharger who may desire the establishment of a mixing zone is, in general, also required to hold an NPDES permit. Therefore, the joining of the two procedures provides for a single system within which both the regulated and regulating persons can function. Moreover, there exists a well-developed and tested set of procedures and practices for the application, granting, and review of NPDES permits. The Board therefore believes that joining the mixing zone determination to the NPDES permitting process offers a significant administrative economy for all.

A second reason for linking mixing zones with NPDES permits is that the most common reason why a discharger is likely to want a mixing zone is that the existence of a mixing zone affords the discharger the prospect of lessened effluent limits in its NPDES permit. Mixing zones and NPDES permits therefore have an inevitable natural linkage which entreats their administrative association.

Aside from their natural association and aside from the procedural advantages gained by linking the mixing zone determination with the NPDES permitting process, the Board has additional purposes for making this linkage. One such purpose is to provide a directive to the Agency specifying that mixing zones are valid elements of NPDES permits. A second is to require the Agency's consideration of mixing zones under their statutory obligation as NPDES permit issuer pursuant to Section 39(b) of the Act.

The Board is aware of concerns that occasions may arise where, for one reason or another, a mixing zone determination might not be wanted within the context of an NPDES application (e.g., R2. at 470-3). Although the Board believes that most of these concerns may be misplaced, the Board is not unmindful that any process, particularly a new process such as the one before us now, may require later tuning if concrete examples of problems arise. The Board will stand ready, as always, to entertain modifications of the instant rules if and when such problems are brought to us. Moreover, although the Board does not speak for the Agency in such matters, the Board can at least note that the Agency has attested to its desire to assist applicants during the formative phases of making mixing zone determinations (R2. at 452).

Given this intimate association of mixing zones with NPDES permits, the Board speculates as to whether it might not have been advisable to present the whole mixing zone concept within Part 309 (NPDES Permits) rather than Part 302 (Water Quality Standards). However, as noted at Second Notice (Second Notice Opinion at 9), the Board sees no functional impairment occasioned by the instant placement, but rather only an arguable organizational awkwardness.

Allowed Mixing Outside of the Context of an NPDES Permit

The association of mixing zones with NPDES permits raises the question regarding whether any allowances may ever be made for mixing of effluents which either are not NPDES-permitted or do not contain a mixing zone as a condition within an NPDES permit (e.g., Exh. 109 at 5). The Board intends that the answer be yes. The Board believes that allowed mixing outside of the context of NPDES permits is a basic tenet of the Board's existing rules, and sees nothing in the instant record which warrants departure from this tenet at this time.

The Board also believes, that as a practical matter, the mixing zone issue should not need to be visited in every NPDES permit. Mixing zone demonstrations can be expensive (PC #31 at 1) and time-consuming, both for the applicant and the Agency. As well, many dischargers will not require mixing to comply with water quality standards. Thus, the whole process of establishing a mixing zone should be undertaken only where there is reasonable grounds to believe that the effort will lead to better protection for the environment, the discharger, or both. The Board believes that this can only happen where discretion is available to both the Agency and the discharger to pursue mixing zones demonstrations as either of these persons sees fit. The Board believes that this discretion would be compromised or even lost if the only prospect for allowed mixing occurred in the context of an NPDES permit.

Several of today's amendments are intended to give expression to our intent that affirmation within an NPDES permit is not a necessary condition to allowed mixing. These include the addition of "Allowed Mixing" to the title of Section 302.102 and the absence of any reference to mixing zones or NPDES permits within the general applicability statement of subsection (a) or the limiting conditions specified in subsection (b).

We nevertheless again emphasize that allowed mixing must always occur only as a last resort when there is not otherwise a tenable alternative for the discharger. Moreover, whenever anyone invokes allowed mixing as a method of compliance with water quality standards absent an NPDES-recognized mixing zone, the Board intends that there be a heavy burden of proof on that person to show that the portion, area, and volume of the

receiving water used for mixing is no less restrictive than would have occurred with an NPDES mixing zone. For this reason we today explicitly state this burden of proof in Section 302.102(j).

We further believe that a decision regarding a mixing zone made in the NPDES context must be given controlling status. A discharger must abide by an NPDES decision (with the protections afforded by its due-process provisions), and should not be allowed multiple "bites at the apple" by later invoking some other interpretation of allowed mixing. Similarly, an action should not be brought alleging violation of allowed mixing for waters in which mixing is expressly allowed in an NPDES permit. Therefore, we explicitly state at Section 302.102(h) and (i) that a decision made regarding allowed mixing in a NPDES permit shall control for the duration of that permit.

Allowed Mixing's Applicability to Effluents

Under previous Section 302.102 allowed mixing applied only to the mixing of effluents, as is apparent in the plain reading of the first sentence of prior Section 302.102(a) (i.e., "... opportunity shall be allowed for the mixture of an effluent with its receiving water..."). "Effluent", in turn, is defined at Section 301.275 as:

Any wastewater discharge, directly or indirectly, to the waters of the State or to any storm sewer, and the runoff from land used for the disposition of wastewater or sludges, but does not otherwise include nonpoint source discharges such as runoff from land or any livestock management facility or livestock wastehandling facility subject to regulation under Subtitle E.

Under previous regulations, therefore, allowed mixing was available only to dischargers of effluent as defined in 301.275. Today's rule does not alter this concept.

The ZID

Today's amendments add a new concept to allowed mixing, the concept of the Zone of Initial Dilution or ZID. The purpose of a ZID is to make allowance for the special circumstance where it is not possible or reasonable to achieve acute toxicity standards at "end of pipe", but where these standards can be achieved after immediate and rapid dispersion of the effluent. Accordingly, a ZID is by definition at Section 301.101 "a portion a mixing zone within which acute toxicity standards need not be met". Further, pursuant to Section 302.102(e), a ZID is limited to waters within which effluent dispersion is immediate and rapid.

Because a ZID is a component of a mixing zone, it, like a mixing zone, does not exist until it has been formally recognized by the Agency as an NPDES permit condition pursuant to subsection (e). Moreover, such rights as may flow from the existence of a ZID do not exist until the ZID itself has been established as an NPDES permit condition. This circumstance is effectuated by the provision at Section 302.102(c) that acute water quality standards must be met within all waters of the state unless the Agency has recognized a ZID pursuant to 302.102(e).

In determining that a ZID is available only when specifically identified in an NPDES permit, the Board takes recognition that a ZID is a volume of the waters of the state within which acute toxicity is allowed. The Board views the existence of acute toxicity as a drastic circumstance which cannot be allowed without careful and considerate review of the special and individual circumstances which might warrant its allowance. The Board believes that anything less would be contrary to the elemental principles enunciated in Section 2 and 11 of the Act.

In various early drafts of the ZID provision of Section 302.102 there were present several limitations which the Board does not today adopt. As regards these, the Board notes:

- 1) The condition that a ZID be "proportional to the width of the receiving body of water" is not included. This condition is vague to the point of fault (R2. at 160-2, 1514-5). Moreover, the Board believes that it is redundant of several of the conditions in subsection (b), which apply to ZIDs by virtue of ZIDs being components of mixing zones.
- 2) The 1,000 square-foot limitation on ZID size is not included. Such limitation has been reasonably shown to be arbitrary (R2. at 173, 268, 302-305, 329-47, 353, 1155-6, 1275, 1493, 1512-3), and hence not justifiable. While the Board does not intend that ZIDs be unlimited in size, it does believe that the proscriptions of subsection (b), combined with the definitional provisions of a ZID, are sufficient to provide practical size limits.
- 3) The condition that a ZID "shall not cause actual impairment of the aquatic environment" has been deleted as redundant of subsection (b).

Allowed Mixing for Other Than Toxic Constituents

This record has focused largely on toxic constituents. Nevertheless, the issue has been raised (e.g., R2. at 741-3) as to whether the allowed mixing provisions of Section 302.102 apply

to other than the toxic constituents identified in Sections 302.208 and 302.210. The Board intends that the allowed mixing provisions do generally apply to all the water quality standards within Part 302. The notable exception is that the concept of a ZID does apply only to toxic constituents, as is explicit in the definition of a ZID (i.e., it is a portion of waters within which water quality standards for acute toxicity do not apply).

Dimensions of Allowed Mixing

A final question has been whether the waters within mixing is allowed have the dimensions of an area (L^2) or of a volume (L^3). The dimensions are those of a volume. This is implicit pursuant to subsections (b)(8) and (b)(11) of Section 302.102. Subsection (b)(8) specifies that allowed mixing may not contain more than 25% of the cross-sectional area of a stream. This subsection thus set limits on size (breadth and depth) in the plane perpendicular to stream flow. Subsection (b)(11), in turn, specifies that the total surface area involved in allowed mixing may not exceed 26 acres. This subsection thus sets limits on size (breadth and length) in the horizontal plane. Read together, the two subsections specify a three-dimensional volume within which mixing is allowed.

Numeric General Use Water Quality Standards - Section 302.208

Section 302.208, along with Section 302.210, contains the heart of today's adopted rules. Section 302.208 contains parameters for which numeric water quality standards are adopted. Section 302.210 extends the prohibition against toxicity to the larger universe of toxic substances.

Acute versus Chronic Standards

A principal feature of the instant amendments is a "two-number standard system" to replace the existing "single-number approach" for certain chemical constituents. This "two-number standard system" utilizes an acute standard ("AS") and a chronic standard ("CS"). This approach is meritorious because it addresses both acute effects caused by high-dose, short-term exposure to a pollutant, and chronic effects produced by low-dose, long-term constant exposure.

As applied in the Section 302.208 amendments, the AS may not be exceeded in any sample, and the CS may not be exceeded by the average of no fewer than four samples collected over a period of at least four days. In the special case where mixing is allowed, the AS may not be exceeded except within a ZID, and the CS may not be exceeded outside of the waters within which mixing is allowed.

Comparison of New versus Previous Standards

The General Use Water Quality Standards adopted today fall into one of five categories. The first category consists of chemical constituents for which the previous standard is replaced by standards for both acute and chronic toxicity, and which are based on the ambient hardness of the water. The chemical constituents are cadmium, trivalent chromium, copper, and lead. For each of these chemical constituents toxicity has been demonstrated to be dependent on hardness (Exh. 5, 7, 9 and 11), and accordingly the standard is defined as a function of the ambient hardness.

In order to compare the previous versus adopted standards for chemical constituents in this first category, it is necessary to specify ranges of hardness. In the following table the range of hardnesses used to show the possible range of values assumed by the standards is 27 mg/l to 2500 mg/l. This apparently represents the extremes of hardnesses ever recorded in Illinois streams (Exh. 82 at 2-11). In the following comparison, all standards are expressed in micrograms per liter (ug/l) and the range of the AS and CS adopted standards are shown for the extremes of recorded hardness (Id. at 2-11 to 2-13):

	<u>Cd</u>	<u>Cr(+3)</u>	<u>Cu</u>	<u>Pb</u>
Previous Standard	50	1000	20	100
Adopted Standard:				
AS (range)	2.2-50	594-24,640	5.2-375	15-100
CS (range)	0.4-14	71-2937	3.9-188	n.a.

The equations adopted for the trivalent chromium, copper, and lead acute and chronic standards and for the cadmium chronic standard are the equations recommended by the USEPA in the corresponding Ambient Water Quality Criteria documents (Exh. 5, 7, 9, and 11). The equation adopted for the cadmium acute standard is identical to the equation recommended by the USEPA in the cadmium criteria document (Exh. 5), except for the "A" term. As the Agency notes, the cadmium criterion in that document is intended to protect rainbow trout. The Agency does not believe that it is necessary to apply this standard in Illinois General Use Waters (R2. at 529). Accordingly, the Agency has determined an equation for calculating a cadmium AS which is appropriate for Illinois (Id.). It is this modified equation, with the "A" term differing from that in the criterion document, which is today adopted.

The second category consists of chemical constituents for which the previous single-valued standard is replaced by standards for acute and/or chronic toxicity. These consist of arsenic, hexavalent chromium, cyanide, and mercury. The comparative standards, expressed in micrograms per liter (ug/l), are as follows:

	<u>As</u>	<u>Cr(+6)</u>	<u>CN</u>	<u>Hg</u>
Previous Standard	1000	50	25	0.5
Adopted Standard:				
AS	360	16	22	0.5
CS	190	11	5.2	n.a.

It is to be noted that the cyanide standard as adopted is also changed with respect to analytical method, as reflected in a change in STORET number. The previous cyanide standard was for total cyanide (STORET 00720), whereas the cyanide standards adopted today are for weak acid dissociable cyanide (STORET number 00718). The acceptance of this change is based upon recommendations from both the Agency (PC #8 at pars. 27-25) and Sauget (R2. at 309-11).

The third category consists of a single chemical constituent, total residual chlorine ("TRC"), for which a toxicity standard is today specified for the first time. The adopted limits are 19 ug/l as an AS and 11 ug/l as a CS. These limits are in accord with USEPA recommendations for TRC (Exh. 6).

The fourth category consists of those chemical constituents for which no change in the existing standard is adopted, as found in subsection (e)⁶. These chemical constituents are:

Barium	Phenols
Boron	Selenium
Chloride	Silver
Fluoride	Sulfate
Manganese	Total Dissolved Solids
Nickel	Zinc

The final category contains only the parameter total iron, which is today deleted. This deletion is based upon a record which demonstrates that total iron is an inappropriate parameter

⁶ The Board notes that as an administrative device the actual procedure followed for these constituents has been to repeal them and then to immediately readopt them in their previous form. This procedure has been required by the reformatting necessary to accommodate other portions of Section 302.208. It is to be emphasized that no substantive changes are intended to flow from this device. In particular, the Board intends no change, nor does the record justify any change, in the standards for those constituents found in new subsection (e).

for establishing water quality (R2. at 196-201, 696-7, 740)⁷.

Narrative Standard for Other Toxic Substances -
Section 302.210 and 302.Subpart F

Organization of Section 302.210 and Subpart F

Section 302.210 sets out the basic narrative prohibition against toxic substances in toxic amounts and establishes rules for implementing this prohibition. Subpart F (Sections 302.601 through 302.669), in turn, sets out the procedures by which quantitative evaluations of what constitutes a toxic amount must be made.

The basic prohibition is stated in the introductory portion of Section 302.210. The introductory portion also explicitly states that the toxicity referenced includes toxicity to humans, animals, plants, and aquatic life generally. It further specifies that numeric standards already adopted by the Board have precedent over any criteria numbers which might otherwise be calculated pursuant to Section 302.210.

Sections 302.210(a) through (e) specify how toxicity criteria are to be determined. Specifically, toxicity criteria are to be determined pursuant to the procedures of Subpart F. It is further specified that when this is validly and correctly done, the concentration so determined shall be deemed to be constitute the toxic amount. Subsection (f) lays out the scope of application of criteria, and the framework within which their use may be challenged.

Subpart F sets out the procedures to be applied in determining toxicity criteria under the various possible scenarios of interest. For example, Sections 302.612 through 302.621 set out procedures to be used when acute aquatic toxicity is of interest, Section 302.633 sets out procedures to be used when toxicity to wild and domestic animals is of interest, and Sections 302.648 through 302.657 set out procedures to be used when interest is in a substance which is a human nonthreshold toxicant, etc. Given the large number of possible scenarios of interest, Subpart F is accordingly lengthy.

⁷ In the collateral proceeding, R88-21(B), a proposal to add a dissolved iron standard to both the General Use and Public and Food Processing Water Supply Standards is being entertained.

The Place and Purpose of a Narrative Toxicity Prohibition

The Board's General Use Water Quality Standards have always contained a general prohibition against the occurrence of toxic substances in water of the State, with such prohibition expressed as a narrative standard. The purpose of the narrative standard is to assure that toxic contaminants are not present, even if no specific numeric standard for the contaminant in question has been adopted by the Board. Specifically, it had been stated at 35 Ill. Adm. Code 302.203 that:

Waters of the State shall be free from ... matter of other than natural origin in concentrations or combinations toxic or harmful to human, animal, plant or aquatic life.

Additionally, at 35 Ill. Adm. Code 302.210 it was stated:

Any substance toxic to aquatic life shall not exceed one-tenth of the 96-hour median tolerance limit (96 hr. TLM) for native fish or essential fish food organisms...

Today's adopted rules retain this fundamental prohibition against toxicity, but substantially develop it in a manner consistent with the CWA requirements. Simply put, the purpose of today's action is to more firmly assure that there shall be no toxic substances present in toxic amounts with the waters of the State.

Defining the "Toxic Amount"

There is no apparent disagreement over the fundamental prohibition against toxic substances in toxic amounts. Rather, the dispute that exists is over the definition of what constitutes a "toxic amount". For many substances, particularly the common toxic substances, it is known to very good levels of approximation what constitutes a toxic amount. This level of certainty is exemplified by the substances for which today we adopt, or have previously adopted, specific numeric standards in Section 302.208.

If all contaminants could be treated as are those in Section 302.208, the instant amendments would constitute a straight-forward exercise. However, this is not the case. The problem is that there are many substances for which we cannot identify with much precision what constitutes a "toxic amount". In fact, the down-side is that we cannot do this for the great majority of toxic substances; the many necessary studies simply have not yet been done, and in many cases the toxic nature of substances themselves may not have been identified or the toxic substance may not even have been yet manufactured. The up-side is that

these substances tend to be rare and hence the chance of encountering them in the environment is small.

The Agency has proposed, and we accept, what we believe to be an innovative and constructive approach to defining what constitutes a "toxic amount" for those substances for which we cannot yet realistically specify a numeric standard. The approach consists of setting up a tight series of procedures and directives by which the best currently-available toxicity information is used to approximate that numeric criterion which might eventually evolve into a standard as more and better data accumulate.

This approach has several advantages. Among these are that it is not necessary to propose numbers for substances which may not be encountered in Illinois waters, thus warding off a substantial, unproductive effort.

Additionally, the narrative standard approach allows for rapid reaction against a substance not previously present, existent or recognized as being toxic. Environmental control history is replete with examples of new needs and new technologies causing the development, and entry into the environment, of new substances. Moreover, the toxicity of some of these substances has not been recognized until long after their appearance in the environment. It is perhaps one of the major shortcomings of environmental control that it has, not uncommonly, been sluggish in responding to the appearance of new toxic substances. Today's amendments will not do away with the time necessary to respond to new pollutants, but it can substantially shorten that time. Under the instant amendments, whenever it is recognized that a new substance offers a threat, the Agency would have the ability to immediately react to whatever sources may be responsible and to work with that source in eliminating the threat.

Another principal advantage of the instant amendments is that they greatly reduce the potential for lending unwarranted credence to unreasonable numeric standards. The history of environmental control clearly tells us that determination of the appropriate standard for most substances does not come easily. Rather, large amounts of data must be accumulated and extensive study must be undertaken before the obvious numeric standard, if ever, is revealed. This condition, however, cannot be an excuse for the environmental decisionmaker to defer action until certainty is achieved. The art of the environmental decisionmaker is, in fact and in no small measure, knowing when and how to act in the face of less than complete certainty. This is not to say that even the most artful of the environmental decisionmakers is always correct. To the contrary, it is quite common that later research shows that numeric standards have been incorrectly set, thus requiring that standards be continuously

reassessed in light of the most recent scientific information. But the reassessment process is also slow; work loads are heavy and crises cause the diversion of attention. Moreover, once graced with a numeric limit, a standard takes on a distinct life of its own, and the most difficult stumbling block to honing an existing numeric standard tends to be the very prior existence of the standard. It is certain that there are standards on today's books which are outmoded, outdated, and not justifiable under knowledge presently in existence. The General Use Water Quality Standard for total iron, today deleted from Section 302.208 (see above), constitutes an excellent example.

The approach adopted here reduces the likelihood of outdated and outmoded standards by deferring formulation of the numeric standard until more of the pertinent information is available. At the same time, today's amendments allow the Agency to utilize the best currently-available information to interpret the fundamental policy of "no toxic substance in toxic amounts".

This policy, to be sure, is not without its disadvantages, and these must be understood. Among them is that the regulated community may find some discomfort with not being able to immediately access a complete list identifying what specific numeric level of a toxic substance is likely to constitute a violation of the prohibition against toxicity. We note, however, that this is also true for most toxic substances under current prohibitions against toxicity. We do believe that today's approach can go a long way toward easing any discomfort by spelling out in great detail the procedures by which criteria which define a "toxic amount" can be determined by anyone. Thus, any person may determine what constitutes a "toxic amount", even for substances not yet considered by the Agency as regulator. Moreover, the regulated community need not be reminded that it has due process rights, plus several routes of appeal to the Board, should it find disagreement with the manner in which the procedures herein are interpreted or applied.

A second disadvantage is that which accompanies any pioneering effort. There are no extensive track records developed by other regulatory agencies upon which we might look for guidance in ironing out those glitches, small or otherwise, which innovation inevitably carries. This disadvantage, however, certainly must not be viewed as fatal, less we make no progress.

"Criterion" Versus "Standard"

There is a distinction to be noted between a water quality standard, as exemplified by the numeric limitations stated at Section 302.208, and a criterion, as referenced in Section 302.210 and calculated pursuant to 302.Subpart F. A standard is a rule adopted by the Board, after notice is given and written and oral comments and testimony are received, pursuant to Title

VII of the Act and Sections 5, 5.01, 5.02 or 5.03 of the APA. As defined in Section 3.09 of the APA, a rule means "each agency statement of general applicability that implements, applies, interprets or prescribes law or policy".

In contrast, a criterion, as that word is used herein and even though it is a number derived by the Agency pursuant to the rules adopted by the Board in 302.Subpart F, cannot be considered to be a statement of general applicability. Criteria will be derived by the Agency in the course of the NPDES permitting and other site-specific situations, and applied on a case-by-case basis, taking into account the nature of the waterbody of interest. USEPA has recently stated:

Water quality criteria express water quality objectives for protecting aquatic life and human health and for meeting a defined level of water quality protection. Where a discharge has a reasonable potential to cause or contribute to an excursion above a water quality criterion, [NPDES permit] effluent limitations are necessary to ensure that water quality standards will always be met. (Exh. 61 at 54 Fed. Reg. 23872).

Once a standard has been established by Board regulations, and it has withstood any appeals, the validity of that number itself cannot be subsequently challenged in a contested case setting. However, an Agency calculated criterion can. Because criteria numbers will be generated without the benefit of statewide public participation, and because application of the Subpart F procedures necessarily require the use of assumptions and professional judgment about which reasonable experts may disagree, the validity and correctness of application of a criterion must be reviewable by the Board on a case-by-case basis when the criterion is applied to a particular situation. Where the Agency believes that any criterion which it may derive in a particular case should appropriately be given statewide applicability, the Agency can and should propose pursuant to Title VII of the Act addition of that criterion to the list of numeric water quality standards contained in Section 302.208.

Criteria and Agency APA Rulemaking

At various stages in this proceeding the question has been asked as to whether individual toxicity criterion determinations might or should be made by the Agency in an APA rulemaking (e.g., PC #20 at 11-13). This is not the Board's intent. In addition to the observations above, the Board notes that if criteria were to be adopted by the Agency as APA rules, such criteria would not be reviewable by the Board. The Act does not provide for appeal of Agency rules to the Board; the Administrative Review Act dictates that such appeals would be heard in the circuit court.

Additionally, the Board doubts its ability to grant variances or adjusted standards from Agency rules. In short, use of the APA process would result in Agency action which would escape any review or alteration by the Board, a situation which the Board cannot allow to occur. This would amount to a gross abdication and unlawful subdelegation of the Board's duties to "determine, define and implement environmental control standards" (Act at Section 5).

Sequential Challenge Opportunities

The USEPA has expressed concern that the instant rules at Section 302.210(f) not provide sequential opportunities for any given person to challenge any single criterion (PC #23). The Board shares this concern. We do not intend today to create an opportunity for new sequential challenges within a single action. Moreover, we do not intend to provide for any challenge rights which are not already expressly provided for under Illinois law. The Agency correctly observes that the challenge rights enunciated within subsection (f) are the standard challenge rights under Illinois law:

The criteria will serve as the basis for the water quality protection program which includes NPDES permit, non-point source management programs and pollution remediation programs. In any of these forums, provision ... exists for a party to challenge the accuracy with which the Agency adheres to the Board's established procedures (Subpart F) in criteria derivation. During the NPDES permit issuance process, public notice and appeal provisions protect the interests of the permittee. In an Agency enforcement proceeding for violation of the narrative standard, the Agency must support the allegations with proof that the narrative standard was exceeded and that any criteria utilized in this context were properly derived consistent with the Board's Subpart F procedures. Thus, this program relies on the same legal framework and functional elements of existing [water quality protection programs]. (PC #20 at 3-4).

Nevertheless, the Board believes that the issue of sequential challenges is best explicitly addressed in subsection (f). Accordingly, the subsection explicitly states that only one opportunity to contest a given criterion is given to any one person. That criterion may be challenged only at the time it is first applied to a person, whether that be in an NPDES permit appeal or enforcement action; failure to make such challenge at the first opportunity constitutes a waiver of any challenge.

Burden of Proof

USEPA has been critical of its perception of the burden of proof imposed on the Agency (PC #23). Were criteria designed to be promulgated by the Agency as APA rules (see above), the Board would agree that any question of burden of proof would be inappropriate, since the Agency would have been required to justify criteria and accept public comment during the rulemaking process, and a 35-day appeal period would be provided by the law during which persons could challenge the criteria. Given that the Agency will not be promulgating criteria as APA rules, the only mechanism available to the Board to guarantee due process is to allow challenge to be made to criteria at the time they are applied. The Board agrees that this will place some administrative burden on the Agency, in that the Agency may need to persuade the Board of the validity of any one criterion in several permit appeals and enforcement actions in which it may be applied. However, the Board notes, as also does the Agency (PC #20 at 3-4), that this administrative burden is explicit under Illinois law. Moreover, the Board notes that the Agency can minimize such burden by proposing to the Board that any given criterion be adopted as a Section 302.208 numeric water quality standard. Upon adoption by the Board, the Agency would be freed from any additional burden of proof regarding the standard.

Since there are special nuances associated with the burden of proof in permit appeals, this matter is expressly addressed in subsection (f)(2). Among the provisions of subsection (f)(2) is the requirement that the Agency include in its permit appeal record all information on which it has relied in developing and applying criteria in a permit. Also included is the burden of proof language Section 40 of the Act, and the note that there is no presumption in favor of the general correctness and validity of the application of criteria. This is consistent with the general case law which has developed in the permit appeal area, in which no presumption of validity attaches to Agency permitting decisions. While the burden remains on the permittee to demonstrate that a criterion-based condition is not necessary to accomplish the "no toxic substances in toxic amounts" requirement of Section 302.210(a), the Agency must "go forward" with information supporting its inclusion of a permit condition based on a criterion. This is no departure from existing practice, wherein challenged permit conditions are stricken if the record contains no or insufficient information supporting their inclusion.

Purpose and Utility of Subpart F

Subpart F lays out procedures to be used to calculate criteria for those chemical substances for which numeric standards do not exist. It cannot be disputed that there are instances where it is necessary to be able to determine the

concentration at which toxic substances not otherwise supplied with numeric standards are toxic. Such instances arise at any time it becomes necessary to estimate what constitutes the "toxic amount" in the fundamental prohibition of "no toxic substances in toxic amounts". Such instances include, but are not necessarily limited to, the establishment of permit limits in the NPDES permitting process.

The purpose of Subpart F is to provide some order and framework within which these estimations can be made. It is intended to provide directive to the Agency as to what it must and must not include when it does such estimations. It is also intended to let the regulated community know what the Agency can and cannot consider when it does such estimations. Moreover, it is intended to let any person, from the regulated community or otherwise, know what this Board views as permissible procedures for estimating the toxic concentration of any chemical. In short, the purpose of Subpart F is to provide an out-in-the-open set of procedures for estimating toxicity.

It is equally important to note what Subpart F is not intended to be. In particular, it is not intended to be an NPDES permitting manual, as some would apparently wish it to be. It does not, for example, specify the detailed procedures the Agency must use in translating an estimation of toxicity into an NPDES permit limit. This and similar matters are within the purview of the Agency as the State authority responsible for awarding NPDES permits. The Board can only accept the word, and past actions, of the Agency that it intends to fully comply with its NPDES role, including the compilation of such "manuals" and permit writers guides as may be necessary (R2. at 1207; PC #25 at 8-9).

This perspective notwithstanding, there would still appear to be some who would question whether Subpart F accomplishes its purposes. The Board believes that at least a part of this doubt is based on commentators' less-than-complete or authoritative review of Subpart F. Among the remaining, the principal doubt appears to flow from the perspective that Subpart F contains some elements of choice about which reasonable experts might be expected to differ. The Board agrees that some such elements are present in Subpart F, but nonetheless believes that they are minor, perhaps inevitable, and are neither of the frequency of occurrence nor of the magnitude to significantly influence the utility of Subpart F.

Subpart F follows well-accepted procedures used in toxicological assessment. Toxicological assessment is, however, not without its inherent uncertainties. It is a science much burdened by complex, interrelated phenomena that now and into any foreseeable future has to be expected to present instances where reasonable experts are going to disagree (e.g., Exh. 117 at 2). However, most emphatically this situation must not provide excuse

for us to set aside that wealth of "accepted" toxicological principle which can so usefully instruct us towards the proper economic, social, and environmental management we are charged to pursue. In its simplest fashion, part and parcel of using toxicological assessment is the acceptance of its occasional wart, including that reasonable experts may sometimes disagree.

It has not in fact been demonstrated within this record, even allowing that experts may sometimes disagree, that such incidents are likely to occur other than rarely. It has also not been demonstrated that, should experts disagree, any result which would flow from their disagreement would necessarily lead to different regulatory results. In any event, the Board again emphasizes that it stands ready to resolve such disputes if and when they are brought before it.

In sum, the Board believes that Subpart F has a necessary and well-defined purpose. It believes that, as constructed, Subpart F incorporates the best pertinent procedures of toxicological assessment. It also believes that Subpart F has utility in achieving its purpose.

Alleged Unlawful Delegation of Rulemaking Authority

Concerns have been raised that the Subpart F procedures for deriving narrative criteria constitute an improper subdelegation of the Board's rulemaking authority to the Agency. (e.g., R1. at 224, 296-97, 539, 554-59, 933; R2. at 66-67, 74, 94-101, 110, 115-16; PC #11 at 3-9; PC #10 at 21-24). Pursuant to Subpart F, the Agency calculates various "water quality criteria" based upon a detailed series of procedures for those new substances which are not limited by a specific numeric standard. The question arises whether this procedure constitutes an improper delegation of the Board's rulemaking authority because the Agency rather than the Board "derives" the numeric criteria.

This question misses, among other matters, the essential distinction between a standard and a criterion. The standard here is "no toxic substances in toxic amounts." Criteria derived by the Agency under the narrative standard procedure merely operate as a means of refining the measure of "toxic amount" for a given substances or combination of substances.

The Board recognizes its sole authority under the Illinois Environmental Protection Act to promulgate regulations (Ill. Rev. Stat. 1987, ch. 111 $\frac{1}{2}$, pars. 1005 and 1027). As proposed by the Agency and modified by the Board, criteria derived under the narrative standard procedures do not rise to the level of standards (see above). The Board does not view the Subpart F procedures as constituting an improper delegation of its rule-making authority to the Agency.

Criteria in Enforcement Actions

The narrative criteria indeed have a special limited role in an enforcement action brought pursuant to Title VIII of the Act. Exceeding a criterion does not in and of itself constitute a violation of the "no toxicity standard". Viewed in terms of a possible enforcement action for violation of a general water quality standard, the person bringing the action would be required to prove that a respondent violated the standard of no toxicity. Where alleged violation of the toxicity standard is based upon an alleged excursion of a criterion, the person bringing the enforcement action has the burden of going forward with proof and of persuasion regarding the validity and correctness of application of the criterion.

Respondent may defend against the application of such a criterion by challenging whether the complainant properly followed the procedures of Subpart F, as well as challenging the data relied upon by the complainant in calculating the numeric criterion. The complainant would be required to justify its procedures, particularly in those instances where unusual species or extreme exposure times were relied upon.

Notice of Criterion Determinations

In the normal course, criteria will be developed by the Agency during its review of an NPDES permit application, based in part on data supplied by the individual discharger. Once developed, however, criteria might thereafter be applied in permitting and enforcement situations involving persons who had no opportunity to provide input into the criteria derivation process. To ameliorate this situation, the Board requires the Agency to notify the public by publication of notice in the Illinois Register, and also to maintain records sufficient to support appropriate challenge to any criterion. These requirements are found at Section 302.669.

When viewed in the context of an enforcement action, the enforcement notice (Ill. Rev. Stat. 1987, ch. 111 $\frac{1}{2}$, par. 1031(d)) which requires the Agency to inform a person of the charges alleged prior to issuing a complaint, may serve as a form of notice by identifying the criterion allegedly exceeded. The opportunity for public participation is provided at the enforcement hearing.

ECONOMIC CONSIDERATIONS

Estimations

Obtaining estimates of the costs associated with the instant rule has proven difficult beyond that normally encountered in

making environmental economic impact analyses. Principal compounding factors include: (1) determining marginal costs of the instant rule; (2) uncertainty as to the effects of exception procedures; (3) inability to determine the most effective compliance methods; and (4) uncertainty about the number of affected facilities.

Marginal costs are difficult to estimate because a number of facilities are arguably out of compliance with current water quality standards, effluent regulations, and/or pretreatment requirements. If these facilities were in compliance with these existing regulations, at least some of them would not require additional actions to come into compliance with the provisions of the instant rule. However, it is uncertain, short of doing site-specific analyses of each, as to how many such facilities there are.

Three exception procedures are of particular importance. The first is the chlorination exception found at Section 304.121(b), the second is the proposed exception for intermittent chlorination at proposed Section 304.221 (see Docket B), and the third is the allowed mixing provisions found at 302.102. Among the facilities which would be out of compliance as a consequence of adoption of the instant rule, the largest number are probably facilities which would be out of compliance with the total residual chlorine standard of 302.208 (Exh. 107; PC #24 at 3). However, those facilities which qualify for the 304.102(b) exception can comply with the TRC standard by the simple, no-cost expedient of ceasing to chlorinate (PC #25 at 2-5). Similarly, those facilities which qualify for the intermittent chlorination exception, mostly within the steam electric category, would incur no compliance costs related to the TRC parameter. Lastly, those facilities which qualify for allowed mixing may require no action to remain in compliance.

Estimation of the proper control strategies is compounded by the wide differences among potentially-affected facilities and facility-types, plus the certainty that the chemicals of concern will differ among facilities; again, a definitive answer would be available only through a site-specific analysis of each facility. It is likely that some facilities would have to use add-on controls to meet the requirements of the instant rule. Others, however, are likely to be able to comply by making relatively minor, low-cost adjustments within their current methods of operation (Exh. 96 at 4-8). Still others are likely to be able to comply via pre-treatment options at no direct cost (PC #25 at 6-7).

Lastly, there is uncertainty which arises concerning the number of potentially affected facilities. This uncertainty is of two types: uncertainty related to projected performance of facilities, and uncertainty related to presence of regulated

substances in Illinois effluents in general. In the first context, it is uncertain whether past discharge records are a significant predictor of future ability to comply with the proposed regulations. As the Agency points out, a single past-exceedance of one of the proposed standards is not evidence of a need for remediation, given that the "quality, reliability and representativeness of individual measurements must receive some consideration in formulating reasonable assumptions before any remediation is warranted" (PC. #25 at 6). The Agency adds that a single value exceeding a standard could be the result of analytical error or a unique event that is non-representative, and that the Agency "[c]ertainly ... would not impose additional treatment on a discharger with such an information base" (Id.).

The second context within which there is uncertainty regarding the number of affected facilities relates to inadequate data on the number of potentially regulated substances, and to what degree these might occur in Illinois discharges. The data base is simply not available to say that there are "x" number of facilities which discharge substance "y" in such a manner as to cause toxicity in Illinois waters, let alone to identify the various "y" substances which may exist. This condition relates to the fact that Section 302.210 is intended to cover all toxic substances capable of causing toxicity in Illinois waters. No-one knows either the identity or number of all such substances. It is only known that when they are recognized to be toxic and to occur in toxic amounts, action to control them below toxic amounts must be undertaken.

DENR Cost Analysis

In spite of the inherent problems associated with doing a cost analysis in the instant arena, as noted above, DENR has taken on the difficult task of attempting to quantify the costs of the proposed rule. The DENR analysis is of limited scope. It only addresses costs related to compliance with the arsenic, cadmium, TRC, chromium, cyanide, and lead water quality standards of Section 302.208, and then only as "major"⁸ facilities might need to comply with these standards.

Within these limitations, however, the DENR analysis consists of "worst-case" conditions, in that it assumes that (1) one past occurrence of an exceedance warrants remediation, and (2) all remediations will be via add-on control systems. Within this framework, DENR presents three scenarios wherein there is no

⁸ A "major" facility is any facility named on a list negotiated between the Agency and the USEPA (R2. at 890-1). At present there are approximately 275 "major" facilities in Illinois (R2. at 1063).

allowed mixing, 5% of available flow is allowed for mixing, and 25% of available flow is allowed for mixing. DENR initially estimates the total costs of these three scenarios, over a 30-year period, to be \$778.4 million, \$598.1 million, and \$514.7 million, respectively⁹ (PC #24 at 4).

These costs include full compliance with current regulations and permit limitations, and hence are not marginal costs related to the instant rule. DENR estimates the costs necessary to comply with current permit limitations to be \$478.4 million over a 30-year period, applicable to all three mixing scenarios. If this figure is subtracted from each of the above figures, the marginal costs within the three scenarios are \$300 million, \$119.7 million, and \$36.3 million, respectively, over a 30-year period (PC #24 at 5).

Similarly, if recognition of the Section 304.211 chlorination exemption is made, DENR estimates that the total costs would be reduced by \$63.7, \$56.4, and \$53.5 million over 30 years for the three mixing scenarios, respectively (PC #24 at Table 19A, 20A, and 21A). Margin costs for the instant rule become, in turn, \$280.6, \$108.4, and \$27.1 million over 30 years, respectively.

The Board believes the weight given to these "worst case" figures must be tempered with consideration of the assumption of universal use of add-on controls, and the degree to which the add-on control assumption inflates the estimated costs. This assumption seems to cause particular difficulties with the costs assigned to municipal dischargers. A municipal discharger would not obviously use add-on treatment systems to address a metals problem. Metals in municipal discharges, with rare exception, derive from a few industrial sources tributary to the municipal treatment works. If a municipal works needs to reduce its metals output, it would not logically attempt to do so after these sources have mixed with other in-coming wastestreams, but rather prior to mixing. It is simply not sensible to combine influent streams, and then have to treat the whole, when the offending smaller portion can be addressed directly at lesser cost. Moreover, the Board's pretreatment regulations provide a regulatory mechanism wherein the municipal discharger can bring about this type of program.

⁹ The Board notes that the cost figures cited herein are different from the figures originally offered by DENR in Exh. 96. DENR revised its cost estimates based upon comments at hearing and has presented these revised cost estimates in PC #24. It is these latest, PC #24 figures, which are herein cited. The Board appreciates the extensive effort DENR has made to prepare the revised figures in time for their consideration herein.

The Agency takes something of the same view regarding costs assigned to municipal dischargers, from which it concludes that "[t]he extreme costs reported for removal technology and sludge disposal at municipal treatment plants should be removed in their entirety from the impact statement" (PC #25 at 7). The Board is uncertain as to what the total effect of removing the municipal costs from the DENR estimates would be, since at least some fraction of the costs would seemingly have to be shifted to the tributary industrial dischargers. However, the Board does note that add-on metals treatment costs attributed to municipal treatment works range from 63.4% of the total estimated costs in the no-mixing scenario to 75.7% of the total estimated costs in the 25% mixing scenario (PC #24 at Tables 19A, 20A, and 21A).

Steel Group Estimated Costs

The Steel Group estimates costs to its five facilities which discharge to Illinois waterways to be approximately \$19 million per facility (PC #30 at 13-14). This figure includes sludge disposal costs over a thirty year period. It does not include costs to mills which discharge to POTWs or costs for compliance with the narrative standard of Section 302.208 (Id.).

The Steel Group's figures contrast with DENR's estimated 30-year \$5.25 million average total cost per primary metals facility (PC #24 at Tables 19A, 20A, and 21A). Additionally, approximately half of the DENR estimated cost is for compliance with current regulations (Id. at Table 22A), rather than for compliance with the instant rule.

Benefits

DENR opines that, given the time frame of the instant rule, it was not possible for DENR to conduct a formal, rigorous study of environmental benefits of the instant rule (PC #24 at 23). In lieu thereof DENR conducted a spatial analysis to identify the areas of the State mostly likely to benefit from adoption of the proposed rules (Id. at 24-36 and Figures 1-12). On this basis, DENR finds that waterways in most of the stream basins of Illinois are impacted by at least one toxic pollutant, and thus that benefits from reduction in discharges of toxic pollutants would occur in most stream basins (Id.).

DENR has further reviewed the degree to which Illinois waterways are impacted by various categories of toxic pollutants. From this analysis DENR concludes that toxic metals, priority organics, and pesticides impact 6.2%, 2.2%, and 0.9% of Illinois' stream miles, respectively (Exh. 82 at 3-5). Similarly, DENR concludes that 12.3%, 2.8%, and 7.9% of Illinois' acreage in inland lakes is impacted by toxic metals, priority organics, and pesticides, respectively (Id. at 306). One benefit

to be derived from effective toxics control would be to eliminate the toxic impact in all of these waters.

Conclusion

The Board is charged under the Act to take into account the technical feasibility and economic reasonableness of all regulatory proposals before it (Act at Section 27(a)). Compliance with the proposed regulations can be achieved with existing technology (e.g., Exh. 108). Therefore, the substantive issue before the Board is solely whether implementation of the instant rule is economically reasonable.

The Board has considered the various cost and benefit analyses presented in the record, as noted above. From this record it is reasonable to conclude that implementation of toxics control will have costs ranging upwards of several million dollars per year now and into the foreseeable future. Expected benefits include an improved aquatic environment and a benefit to human health through reduced presence of toxic substances in the human environment. Given this balance, the Board concludes that the instant rule, will not be economically unreasonable.

While the Board's conclusion are not driven by potential USEPA action, if the instant rule is not adopted by the State, then the USEPA will impose a similar, but not necessarily identical, program. Thus, another view of the question before this Board is whether the instant rule is economically reasonable when compared to the alternative of a USEPA-imposed program.

The USEPA has not specified the details of the program it would impose upon Illinois if Illinois fails to adopt its own program. While one can speculate that the economic difference may be minimal, the Board has focused primarily on the record in this proceeding as the basis for its economic conclusions. However, given the relatively little latitude afforded by the CWA, it is unlikely that either the costs or benefits associated with any alternative program would differ substantially from those associated with the instant rule. Any program will have to cause the elimination of toxic substances in toxic amounts in Illinois waters. Whether this is done as a result of a Board mandate or a USEPA mandate should not change in significant measure the number of dischargers who are required to take corrective action. Neither should it affect the basic methods and costs of compliance (capital, operating, and sludge management costs), nor the environmental benefits.

AMENDMENTS MADE IN RESPONSE TO JCAR RECOMMENDATIONS

As noted previously (see p. 5), JCAR recommends certain alterations to the Second Notice proposal intended to improve the

overall clarity of the instant rules (Exh. 123, 124). Following are the changes which are made in response to JCAR. In each case, language which has been added to the language of Second Notice is underlined, and language which has been deleted from the language of Second Notice is struck-through.

Section 302.102(b)(6)

... configured as to assure a ~~reasonable~~ zone of passage ...

Section 302.102(b)(9)

... where the water quality standard for the constituent ~~is~~ question is already ...

Section 302.102(e)

...For the purposes of this subsection, "immediate" dispersion means an effluent's merging with receiving waters without delay in time after its discharge and within close proximity of the end of the discharge pipe, so as to minimize the length of exposure time of aquatic life to undiluted effluent, and "rapid" dispersion means an effluent's ~~quick~~ merging with receiving waters so as to minimize the length of exposure time of aquatic life to undiluted effluent. ...

Section 302.615(h)

If a resident or indigenous species, whose presence is necessary to maintain the sustain commercial, or recreational activities, or ecological diversity of the prevent disruptions of the waterbody's ecosystem, including but not limited to loss of species integrity or a shift to a biotic community dominated by pollution-tolerant species, will not be protected by the calculated FAV, then the EC-50 or LC-50 for that species is used as the FAV.

Section 302.618

If data are available to show that a relationship exists between a water quality characteristic (WQC) and acute toxicity to two or more species, an Acute Aquatic Toxicity Criterion (AATC) can shall be calculated. ...

Section 302.627

- a) A chemical-specific Chronic Aquatic Toxicity Criterion (CATC) is calculated using procedures specified in subsections (b) ~~and (e)~~ when chronic toxicity data are available for at least five species from five different North American genera of freshwater organisms, including representatives from the following taxa:

- 1) Representatives of two families in the Class Osteichthyes (Bony Fishes).
 - 2) The family Daphnidae.
 - 3) A benthic aquatic macroinvertebrate.
 - 4) An alga (96-hour test) or a vascular aquatic plant.
- b) No change
- c) If data are not available to meet the requirements of subsection (a), a CATC is calculated by dividing the FAV by the highest acute-chronic ratio obtained from at least one fish and one invertebrate species. The acute-chronic ratio for a species equals the acute toxicity concentration from data considered under Sections 302.612 through 302.618, divided by the chronic toxicity concentration from data calculated under Section 302.627 subsections (a) and (b), subject to the following conditions:
- 1) If the toxicity of a substance is related to any water quality parameter characteristic (WQC), the acute-chronic ratio must be based on acute and chronic toxicity data obtained from organisms exposed to test water with similar, if not identical, values of these water quality parameters WQC values that are representative of the WQC values of the waterbody under consideration. Preference under this subsection must be given to data from acute and chronic tests done by the same author or in the same reference in order to increase the likelihood of comparable test conditions.
 - 2) No change
 - 3) No change
 - 4) No change
- d) 5) If acute and chronic ratios toxicity data are unavailable to determine an acute-chronic ratio for at least two North American freshwater species, the CATC must be calculated by dividing the FAV by a factor a ratio of 25 shall be used.
- ed) If a resident or indigenous species, whose presence is necessary to maintain the sustain commercial, or recreational activities, or ecological diversity of the

prevent disruptions of the waterbody's ecosystem, including but not limited to loss of species integrity or a shift to a biotic community dominated by pollution-tolerant species, will not be protected by the calculated CATC, then the MATC for that species is used as the CATC.

Section 302.633(b)

... one-tenth of the LOEL ~~may~~ shall be substituted for the NOAEL.

Section 302.651

... HNCs are derived for those toxic substances for which any exposure, regardless of extent, carries some risk of damage as specified in subsections (a) and (b). ~~Most substances regulated under this Section cause cancer (carcinogen) or mutations (mutagen). However, other deleterious effects may be identified in the future.~~

Section 302.663(b)(5)

... A Bioconcentration Factor calculated using dry tissue weight ~~may~~ shall be converted ...

Section 302.663(c)

If the Kow is not available from laboratory testing, it ~~may~~ shall be calculated ...

Section 305.102(a)

... information concerning the biological impact of the discharge as specified by the Agency, pursuant to Section 39 of the Act; ...

Section 309.103(a)(3)

In addition to the above application forms, the Agency may require, pursuant to Section 39 of the Act, the installation, use, maintenance and reporting of results from monitoring equipment and methods, including biological monitoring. The Agency may require, pursuant to Section 39 of the Act, effluent toxicity testing to show compliance with 35 Ill. Adm. Code 302.621 and 302.630. If this toxicity testing shows the effluent to be toxic, the Agency may require further testing and identification of the toxicant(s) pursuant to 35 Ill. Adm. Code 302.210(a).

ORDER

The Clerk of the Board is directed to submit the following adopted rule to the Secretary of State for final notice.

TITLE 35: ENVIRONMENTAL PROTECTION
SUBTITLE C: WATER POLLUTION
CHAPTER I: POLLUTION CONTROL BOARD

PART 301
INTRODUCTION

Section	
301.101	Authority
301.102	Policy
301.103	Repeals
301.104	Analytical Testing
301.105	References to Other Sections
301.106	<u>Incorporations by Reference</u>
301.107	<u>Severability</u>
301.108	<u>Adjusted Standards</u>
301.200	Definitions
301.205	Act
301.210	Administrator
301.215	Agency
301.220	Aquatic Life
301.225	Artificial Cooling Lake
301.230	Basin
301.235	Board
301.240	CWA
301.245	Calumet River System
301.250	Chicago River System
301.255	Combined Sewer
301.260	Combined Sewer Service Area
301.265	Construction
301.270	Dilution Ratio
301.275	Effluent
301.280	Hearing Board
301.285	Industrial Wastes
301.290	Institute
301.295	Interstate Waters
301.300	Intrastate Waters
301.305	Land Runoff
301.310	Marine Toilet
301.315	Modification
301.320	New Source
301.325	NPDES
301.330	Other Wastes
301.335	Person
301.340	Pollutant
301.345	Population Equivalent
301.350	Pretreatment Works

301.355	Primary Contact
301.360	Public and Food Processing Water Supply
301.365	Publicly Owned Treatment Works
301.370	Publicly Regulated Treatment Works
301.375	Sanitary Sewer
301.380	Secondary Contact
301.385	Sewage
301.390	Sewer
301.395	Sludge
301.400	Standard of Performance
301.405	STORET
301.410	Storm Sewer
301.415	Treatment Works
301.420	Underground Waters
301.425	Wastewater
301.430	Wastewater Source
301.435	Watercraft
301.440	Waters
APPENDIX A	References to Previous Rules

AUTHORITY: Implementing Section 13 and authorized by Section 27 of the Environmental Protection Act (Ill. Rev. Stat. 1987, ch. 111 1/2, pars. 1013 and 1027).

SOURCE: Filed with the Secretary of State January 1, 1978; amended at 3 Ill. Reg. 25, p. 190, effective June 21, 1979; amended at 5 Ill. Reg. 6384, effective May 28, 1981; codified at 6 Ill. Reg. 7818; amended in R88-1 at 13 Ill. Reg. 5984, effective April 18, 1989; amended in R88-21(A) at Ill. Reg. , effective

Note: Capitalization denotes statutory language

Section 301.106 Incorporations by Reference

a) Abbreviations. The following abbreviated names are used for materials incorporated by reference:

"ASTM" means American Society for Testing and Materials

"GPO" means Superintendent of Documents, U.S. Government Printing Office

"NTIS" means National Technical Information Service

"Standard Methods" means "Standard Methods for the Examination of Water and Wastewater", available from the American Public Health Association

"USEPA" means United States Environmental Protection Agency

b) The Board incorporates the following publications by reference:

American Public Health Association et al., 1015 Fifteenth Street, N.W., Washington, D.C. 20005

Standard Methods for the Examination of Water and Wastewater, 16th Edition, 1985

ASTM. American Society for Testing and Materials, 1976 Race Street, Philadelphia, PA 19013 (215) 299-5400

ASTM Standard E 724-80 "Standard Practice for Conducting Static Acute Toxicity Tests with Larvae of Four Species of Bivalve Molluscs", approved 1980.

ASTM Standard E 729-80 "Standard Practice for Conducting Static Acute Toxicity Tests with Fishes, Macroinvertebrates, and Amphibians", approved 1980.

ASTM Standard E 857-81 "Standard Practice for Conducting Subacute Dietary Toxicity Tests with Avian Species", approved 1981.

ASTM Standard E 1023-84 "Standard Guide for Assessing the Hazard of a Material to Aquatic Organisms and Their Uses", approved 1984.

ASTM Standard E 1103-86 "Method for Determining Subchronic Dermal Toxicity", approved 1986.

ASTM Standard E 1147-87 "Standard Test Method for Partition Coefficient (n-Octanol/Water) Estimation by Liquid Chromatography", approved February 27, 1987

ASTM Standard E 1192-88 "Standard Guide for Conducting Acute Toxicity Tests on Aqueous Effluents with Fishes, Macroinvertebrates and Amphibians", approved 1988.

ASTM Standard E 1193-87 "Standard Guide for Conducting Renewal Life-Cycle Toxicity Tests with Daphnia Magna", approved 1987.

ASTM Standard E 1241-88 "Standard Guide for Conducting Early Life-Stage Toxicity Tests with Fishes", approved 1988.

ASTM Standard E 1242-88 "Standard Practice for Using Octanol-Water Partition Coefficients to Estimate Median Lethal Concentrations for Fish due to Narcosis", approved 1988.

ASTM Standard E 4429-84 "Standard Practice for Conducting Static Acute Toxicity Tests on Wastewaters with Daphnia", approved 1984.

NTIS. National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161 (703) 487-4600

SIDES: STORET Input Data Editing System, January, 1973, Document Number PB-227 052/8

Water Quality Data Base Management Systems, February, 1984, Document Number AD-P004 768/8

USEPA. United States Environmental Protection Agency, Office of Health and Environmental Assessment, Washington, D.C. 20460

Mutagenicity and Carcinogenicity Assessment for 1,3-Butadiene, September, 1985, Document Number EPA/600/8-85/004A

c) The Board incorporates the following federal regulations by reference:

40 CFR 136 (1988)

40 CFR 141 (1988)

40 CFR 302.4 (1988)

d) This Section incorporates no future editions or amendments.

Section 301.107 Severability

If any provision of this Subtitle is adjudged invalid, or if the application thereof to any person or in any circumstance is adjudged invalid, such invalidity shall not affect the validity of this Subtitle as a whole, or any Part, Subpart, Section, subsection, sentence or clause thereof not adjudged invalid.

Section 301.108 Adjusted Standards

a) AFTER ADOPTING A REGULATION OF GENERAL APPLICABILITY, THE BOARD MAY GRANT, IN A SUBSEQUENT ADJUDICATORY

DETERMINATION, AN ADJUSTED STANDARD FOR PERSONS WHO CAN JUSTIFY SUCH AN ADJUSTMENT CONSISTENT WITH SUBSECTION (a) OF SECTION 27 OF THE ILLINOIS ENVIRONMENTAL PROTECTION ACT. IN GRANTING SUCH ADJUSTED STANDARDS, THE BOARD MAY IMPOSE SUCH CONDITIONS AS MAY BE NECESSARY TO ACCOMPLISH THE PURPOSES OF THE ILLINOIS ENVIRONMENTAL PROTECTION ACT. THE RULE-MAKING PROVISIONS OF THE ILLINOIS ADMINISTRATIVE PROCEDURE ACT (Ill. Rev. Stat. 1987, ch. 127, par. 1001 et seq) AND TITLE VII OF THE ENVIRONMENTAL PROTECTION ACT SHALL NOT APPLY TO SUCH SUBSEQUENT DETERMINATIONS. (Section 28.1(a) of the Act)

b) IN ADOPTING A RULE OF GENERAL APPLICABILITY, THE BOARD MAY SPECIFY THE LEVEL OF JUSTIFICATION REQUIRED OF A PETITIONER FOR AN ADJUSTED STANDARD CONSISTENT WITH THIS SECTION. (Section 28.1(b) of the Act)

c) IF A REGULATION OF GENERAL APPLICABILITY DOES NOT SPECIFY A LEVEL OF JUSTIFICATION REQUIRED OF A PETITIONER TO QUALIFY FOR AN ADJUSTED STANDARD, THE BOARD MAY GRANT INDIVIDUAL ADJUSTED STANDARDS WHENEVER THE BOARD DETERMINES UPON ADEQUATE PROOF BY PETITIONER, THAT:

- 1) FACTORS RELATING TO THAT PETITIONER ARE SUBSTANTIALLY AND SIGNIFICANTLY DIFFERENT FROM THE FACTORS RELIED UPON BY THE BOARD IN ADOPTING THE GENERAL REGULATION APPLICABLE TO THAT PETITIONER;
- 2) THE EXISTENCE OF THOSE FACTORS JUSTIFIES AN ADJUSTED STANDARD;
- 3) THE REQUESTED STANDARD WILL NOT RESULT IN ENVIRONMENTAL OR HEALTH EFFECTS SUBSTANTIALLY AND SIGNIFICANTLY MORE ADVERSE THAN THE EFFECTS CONSIDERED BY THE BOARD IN ADOPTING THE RULE OF GENERAL APPLICABILITY; AND
- 4) THE ADJUSTED STANDARD IS CONSISTENT WITH ANY APPLICABLE FEDERAL LAW.

(Section 28.1(c) of the Act)

TITLE 35: ENVIRONMENTAL PROTECTION
SUBTITLE C: WATER POLLUTION
CHAPTER I: POLLUTION CONTROL BOARD

PART 302
WATER QUALITY STANDARDS

SUBPART A: GENERAL WATER QUALITY PROVISIONS

Section	
302.100	Definitions
302.101	Scope and Applicability
302.102	Allowed Mixing, Mixing Zones and ZIDs
302.103	Stream Flows
302.104	Main River Temperatures
302.105	Nondegradation

SUBPART B: GENERAL USE WATER QUALITY STANDARDS

Section	
302.201	Scope and Applicability
302.202	Purpose
302.203	Unnatural Sludge <u>Offensive Conditions</u>
302.204	pH
302.205	Phosphorus
302.206	Dissolved Oxygen
302.207	Radioactivity
302.208	<u>Numeric Standards for Chemical Constituents</u>
302.209	Fecal Coliform
302.210	Substances Toxic to Aquatic Life <u>Other Toxic Substances</u>
302.211	Temperature
302.212	Ammonia Nitrogen and Un-ionized Ammonia

SUBPART C: PUBLIC AND FOOD PROCESSING WATER SUPPLY STANDARDS

Section	
302.301	Scope and Applicability
302.302	Algicide Permits
302.303	Finished Water Standards
302.304	Chemical Constituents
302.305	Other Contaminants
302.306	Fecal Coliform

SUBPART D: SECONDARY CONTACT AND INDIGENOUS AQUATIC LIFE
STANDARDS

Section	
302.401	Scope and Applicability
302.402	Purpose
302.403	Unnatural Sludge
302.404	pH
302.405	Dissolved Oxygen
302.406	Fecal Coliform (Repealed)
302.407	Chemical Constituents
302.408	Temperature
302.409	Cyanide
302.410	Substances Toxic to Aquatic Life

SUBPART E: LAKE MICHIGAN WATER QUALITY STANDARDS

Section	
302.501	Scope and Applicability
302.502	Dissolved Oxygen
302.503	pH
302.504	Chemical Constituents
302.505	Fecal Coliform
302.506	Temperature
302.507	Existing Sources on January 1, 1971
302.508	Sources under Construction But Not in Operation on January 1, 1971
302.509	Other Sources

SUBPART F: PROCEDURES FOR DETERMINING WATER QUALITY CRITERIA

<u>Section</u>	
<u>302.601</u>	<u>Scope and Applicability</u>
<u>302.603</u>	<u>Definitions</u>
<u>302.604</u>	<u>Mathematical Abbreviations</u>
<u>302.606</u>	<u>Data Requirements</u>
<u>302.612</u>	<u>Determining the Acute Aquatic Toxicity Criterion for an Individual Substance - General Procedures</u>
<u>302.615</u>	<u>Determining the Acute Aquatic Toxicity Criterion - Toxicity Independent of Water Chemistry</u>
<u>302.618</u>	<u>Determining the Acute Aquatic Toxicity Criterion - Toxicity Dependent on Water Chemistry</u>
<u>302.621</u>	<u>Determining the Acute Aquatic Toxicity Criterion - Procedures for Combinations of Substances</u>
<u>302.627</u>	<u>Determining the Chronic Aquatic Toxicity Criterion for an Individual Substance - General Procedures</u>
<u>302.630</u>	<u>Determining the Chronic Aquatic Toxicity Criterion - Procedure for Combination of Substances</u>
<u>302.633</u>	<u>The Wild and Domestic Animal Protection Criterion</u>
<u>302.642</u>	<u>The Human Threshold Criterion</u>
<u>302.645</u>	<u>Determining the Acceptable Daily Intake</u>
<u>302.648</u>	<u>Determining the Human Threshold Criterion</u>
<u>302.651</u>	<u>The Human Nonthreshold Criterion</u>
<u>302.654</u>	<u>Determining the Risk Associated Intake</u>
<u>302.657</u>	<u>Determining the Human Nonthreshold Criterion</u>
<u>302.658</u>	<u>Stream Flow for Application of Human Nonthreshold Criterion</u>
<u>302.660</u>	<u>Bioconcentration Factor</u>
<u>302.663</u>	<u>Determination of Bioconcentration Factor</u>
<u>302.666</u>	<u>Utilizing the Bioconcentration Factor</u>
<u>302.669</u>	<u>Listing of Derived Criteria</u>

APPENDIX A References to Previous Rules

APPENDIX B Sources of Codified Sections

AUTHORITY: Implementing Section 13 and authorized by Section 27 of the Environmental Protection Act (Ill. Rev. Stat. 1987, ch. 111 1/2, pars. 1013 and 1027).

SOURCE: Filed with the Secretary of State January 1, 1978; amended at 2 Ill. Reg. 44, p. 151, effective November 2, 1978; amended at 3 Ill. Reg. 20, p. 95, effective May 17, 1979; amended at 3 Ill. Reg. 25, p. 190, effective June 21, 1979; codified at 6 Ill. Reg. 7818, effective June 22, 1982; amended at 6 Ill. Reg. 11161, effective September 7, 1982; amended at 6 Ill. Reg. 13750, effective October 26, 1982; amended at 8 Ill. Reg. 1629, effective January 18, 1984; peremptory amendments at 10 Ill. Reg. 461, effective December 23, 1985; amended in R87-27 at 12 Ill. Reg. 9911, effective May 27, 1988; amended in R85-29 at 12 Ill. Reg. 12082, effective July 11, 1988; amended in R88-1 at 13 Ill. Reg. 5998, effective April 18, 1989; amended in R88-21(A) at Ill. Reg. , effective

SUBPART A: GENERAL WATER QUALITY PROVISIONS

Section 302.100 Definitions

Unless otherwise specified, the definitions of the Environmental Protection Act (Ill. Rev. Stat. 1987, ch. 111 1/2, par. 1001 et seq.) and 35 Ill. Adm. Code 301 apply to this Part. As used in this Part, each of the following definitions has the specified meaning.

"Acute Toxicity" means the capacity of any substance or combination of substances to cause mortality or other adverse effects in an organism resulting from a single or short-term exposure to the substance.

"Adverse Effect" means any gross or overt effect on an organism, including but not limited to reversible histopathological damage, severe convulsions, irreversible functional impairment and lethality, as well as any non-overt effect on an organism resulting in functional impairment or pathological lesions which may affect the performance of the whole organism, or which reduces an organism's ability to respond to an additional challenge.

"Chronic Toxicity" means the capacity of any substance or combination of substances to cause injurious or debilitating effects in an organism which result from exposure for a time period representing a substantial portion of the natural life cycle of that organism, including but not limited to the growth phase, the reproductive phases or such critical portions of the natural life cycle of that organism.

"Criterion" means the numerical concentration of one or more toxic substances derived in accordance with the procedures in Subpart F which, if not exceeded, would

assure compliance with the narrative toxicity standard of Section 302.210.

"Hardness" means a water quality parameter or characteristic consisting of the sum of calcium and magnesium concentrations expressed in terms of equivalent milligrams per liter as calcium carbonate. Hardness is measured in accordance with methods specified in 40 CFR 136, incorporated by reference in 35 Ill. Adm. Code 301.106.

"Mixing Zone" means a portion of the waters of the State identified as a region within which mixing is allowed pursuant to Section 302.102(d).

"Total Residual Chlorine" or "TRC" means those substances which include combined and uncombined forms of both chlorine and bromine and which are expressed, by convention, as an equivalent concentration of molecular chlorine. TRC is measured in accordance with methods specified in 40 CFR 136, incorporated by reference in 35 Ill. Adm. Code 301.106.

"Toxic Substance" means a chemical substance which causes adverse effects in humans, or in aquatic or terrestrial animal or plant life. Toxic substances include, but are not limited to those substances listed in 40 CFR 302.4, incorporated by reference in 35 Ill. Adm. Code 301.106, or any "chemical substance" as defined by the Illinois Chemical Safety Act (Ill. Rev. Stat. 1987, ch. 111 $\frac{1}{2}$, par. 951 et seq.)

"ZID" or "Zone of Initial Dilution" means a portion of a mixing zone, identified pursuant to Section 302.102(e), within which acute toxicity standards need not be met.

Section 302.101 Scope and Applicability

- a) ~~Part 302~~ This Part contains schedules of water quality standards which are applicable throughout the State as designated in ~~Part 35~~ Ill. Adm. Code 303. Site specific water quality standards are found with the water use designations in ~~Part 35~~ Ill. Adm. Code 303.
- b) Subpart B contains general use water quality standards which must be met in waters of the State for which there is no specific designation (~~Section 35~~ Ill. Adm. Code 303.201).
- c) Subpart C contains the public and food processing water supply standards. These are cumulative with Subpart B and must be met by all designated waters at the point at

- which water is drawn for treatment and distribution as a potable supply or for food processing (Section 35 Ill. Adm. Code 303.202).
- d) Subpart D contains the secondary contact and indigenous aquatic life standards. These standards must be met only by certain waters designated in Section 35 Ill. Adm. Code 303.204 and 303.441.
 - e) Subpart E contains the Lake Michigan water quality standards. These are cumulative with the Subpart B and C standards and must be met by the waters of Lake Michigan and such other waters as may be designated in Part 35 Ill Adm. Code 303 (Section 35 Ill. Adm. Code 303.443).
 - f) Subpart F contains the procedures for determining each of the criteria designated in Section 302.210.
 - f)g) Unless the contrary is clearly indicated, all references to "Parts" or "Sections" are to Ill. Adm. Code, Title 35: Environmental Protection. For example, "Part 309" is 35 Ill. Adm. Code 309, and "Section 309.101" is 35 Ill. Adm. Code 309.101.

Section 302.102 Allowed Mixing, Mixing Zones and ZIDs

- a) In the application of this Chapter, whenever a water quality standard is more restrictive than its corresponding effluent standard, or where there is no corresponding effluent standard specified at 35 Ill. Adm. Code 304, then an opportunity shall be allowed for the compliance with 35 Ill. Adm. Code 304.105 by mixture of an effluent with its receiving waters, provided the discharger has made every effort to comply with the requirements of 35 Ill. Adm. Code 304.102. Water quality standards must be met at every point outside of the mixing zone. The size of the mixing zone cannot be uniformly prescribed. The governing principle is that the proportion of any body of water or segment thereof within mixing zones must be quite small if the water quality standards are to have any meaning. This principle shall be applied on a case-by-case basis to ensure that neither any individual source nor the aggregate of sources shall cause excessive zones to exceed the standards. The water quality standards must be met in the bulk of the body of water, and no body of water may be used totally as a mixing zone for a single outfall or combination of outfalls. Moreover, except as otherwise provided in this Chapter, no single mixing zone shall exceed the area of a circle with a radius of 183 m (600 feet). Single sources of effluents which

have more than one outfall shall be limited to a total mixing area no larger than that allowable if a single outfall were used.

- b) In determining the size of the mixing zone for any discharge, the following must be considered: The portion, volume and area of any receiving waters within which mixing is allowed pursuant to subsection (a) shall be limited by the following:
- 1) The character of the body of water, Mixing must be confined in an area or volume of the receiving water no larger than the area or volume which would result after incorporation of outfall design measures to attain optimal mixing efficiency of effluent and receiving waters. Such measures may include, but are not limited to, use of diffusers and engineered location and configuration of discharge points.
 - 2) the present and anticipated future use of the body of water, Mixing is not allowed in waters which include a tributary stream entrance if such mixing occludes the tributary mouth or otherwise restricts the movement of aquatic life into or out of the tributary.
 - 3) the present and anticipated water quality of the body of water, Mixing is not allowed in waters adjacent to bathing beaches, bank fishing areas, boat ramps or dockages or any other public access area.
 - 4) the effect of the discharge on the present and anticipated future water quality, Mixing is not allowed in waters containing mussel beds, endangered species habitat, fish spawning areas, areas of important aquatic life habitat, or any other natural features vital to the well being of aquatic life in such a manner that the maintenance of aquatic life in the body of water as a whole would be adversely affected.
 - 5) the dilution ratio, and Mixing is not allowed in waters which contain intake structures of public or food processing water supplies, points of withdrawal of water for irrigation, or watering areas accessed by wild or domestic animals.
 - 6) the nature of the contaminant. Mixing must allow for a zone of passage for aquatic life in which water quality standards are met.

- 7) The area and volume in which mixing occurs, alone or in combination with other areas and volumes of mixing, must not intersect any area or volume of any body of water in such a manner that the maintenance of aquatic life in the body of water as a whole would be adversely affected.
 - 8) The area and volume in which mixing occurs, alone or in combination with other areas and volumes of mixing, must not contain more than 25% of the cross-sectional area or volume of flow of a stream except for those streams where the dilution ratio is less than 3:1. Mixing is not allowed in receiving waters which have a zero minimum seven day low flow which occurs once in ten years.
 - 9) No mixing is allowed where the water quality standard for the constituent in question is already violated in the receiving water.
 - 10) No body of water may be used totally for mixing of a single outfall or combination of outfalls.
 - 11) Single sources of effluents which have more than one outfall shall be limited to a total area and volume of mixing no larger than that allowable if a single outfall were used.
 - 12) The area and volume in which mixing occurs must be as small as is practicable under the limitations prescribed in this subsection, and in no circumstances may the mixing encompass a surface area larger than 26 acres.
- c) In addition to the above, the mixing zone shall be so designed as to assure a reasonable zone of passage for aquatic life in which the water quality standards are met. The mixing zone shall not intersect any area of any such waters in such a manner that the maintenance of aquatic life in the body of water as a whole would be adversely affected, nor shall any mixing zone contain more than 25% of the cross-sectional area or volume of flow of a stream except for those streams where the dilution ratio is less than 3:1. All water quality standards of this Part must be met at every point outside of the area and volume of the receiving water within which mixing is allowed. The acute toxicity standards of Sections 302.208 and 302.210 must be met within the area and volume within which mixing is allowed, except as provided in subsection (e).

- d) Pursuant to the procedures of Section 39 of the Act and 35 Ill. Adm. Code 309, a person may apply to the Agency to include as a condition in an NPDES permit formal definition of the area and volume of the waters of the State within which mixing is allowed for the NPDES discharge in question. Such formally defined area and volume of allowed mixing shall constitute a "mixing zone" for the purposes of 35 Ill. Adm. Code: Subtitle C. Upon proof by the applicant that a proposed mixing zone conforms with the requirements of Section 39 of the Act, this Section and any additional limitations as may be imposed by the Clean Water Act (CWA) (33 U.S.C 1251 et seq.), the Act or Board regulations, the Agency shall, pursuant to Section 39(b) of the Act, include within the NPDES permit a condition defining the mixing zone.
- e) Pursuant to the procedures of Section 39 of the Act and 35 Ill. Adm. Code 309, a person may apply to the Agency to include as a condition in an NPDES permit a ZID as a component portion of a mixing zone. Such ZID shall, at a minimum, be limited to waters within which effluent dispersion is immediate and rapid. For the purposes of this subsection, "immediate" dispersion means an effluent's merging with receiving waters without delay in time after its discharge and within close proximity of the end of the discharge pipe, so as to minimize the length of exposure time of aquatic life to undiluted effluent, and "rapid" dispersion means an effluent's merging with receiving waters so as to minimize the length of exposure time of aquatic life to undiluted effluent. Upon proof by the applicant that a proposed ZID conforms with the requirements of Section 39 of the Act and this Section, the Agency shall, pursuant to Section 39(b) of the Act, include within the NPDES permit a condition defining the ZID.
- f) Pursuant to Section 39 of the Act and 35 Ill. Adm. Code 309.103, an applicant for an NPDES permit shall submit data to allow the Agency to determine that the nature of any mixing zone or mixing zone in combination with a ZID conforms with the requirements of Section 39 of the Act and of this Section. A permittee may appeal Agency determinations concerning a mixing zone or ZID pursuant to the procedures of Section 40 of the Act and 35 Ill. Adm. Code 309.181.
- g) Where a mixing zone is defined in an NPDES permit, the waters within that mixing zone, for the duration of that NPDES permit, shall constitute the sole waters within which mixing is allowed for the permitted discharge. It shall not be a defense in any action brought pursuant to

35 Ill. Adm. Code 304.105 that the area and volume of waters within which mixing may be allowed pursuant to subsection (b) is less restrictive than the area or volume or waters encompassed in the mixing zone.

h) Where a mixing zone is explicitly denied in a NPDES permit, no waters may be used for mixing by the discharge to which the NPDES permit applies, all other provisions of this Section notwithstanding.

i) Where an NPDES permit is silent on the matter of a mixing zone, or where no NPDES permit is in effect, the burden of proof shall be on the discharger to demonstrate compliance with this Section in any action brought pursuant to 35 Ill. Adm. Code 304.105.

Section 302.103 Stream Flows

Except as otherwise provided in this Chapter with respect to temperature, the water quality standards in this Part shall apply at all times except during periods when flows are less than the average minimum seven day low flow which occurs once in ten years.

SUBPART B: GENERAL USE WATER QUALITY STANDARDS

Section 302.203 ~~Unnatural Sludge~~Offensive Conditions

Waters of the State shall be free from ~~unnatural~~ sludge or bottom deposits, floating debris, visible oil, odor, ~~unnatural~~ plant or algal growth, ~~unnatural~~ color or turbidity of other than natural origin, or matter of other than natural origin in concentrations or combinations toxic or harmful to human, plant or aquatic life. The allowed mixing provisions of Section 302.102 shall not be used to comply with the provisions of this Section.

Section 302.208 Numeric Standards for Chemical Constituents

The following levels of chemical constituents shall not be exceeded:

<u>CONSTITUENT</u>	<u>STORET NUMBER</u>	<u>CONCENTRATION (mg/l)</u>
Arsenic (total)	01002	1.0
Barium (total)	01007	5.0
Boron (total)	01022	1.0
Cadmium (total)	01027	0.05
Chloride	00940	500.
Chromium (total hexavalent)	01032	0.05
Chromium (total trivalent)	01033	1.0
Copper (total)	01042	0.02

Cyanide	00720	0.025
Fluoride	00951	1.4
Iron (total)	01045	1.0
Lead (total)	01051	0.1
Manganese (total)	01055	1.0
Mercury (total)	71900	0.0005
Nickel (total)	01067	1.0
Phenols	32730	0.1
Selenium (total)	01147	1.0
Silver (total)	01077	0.005
Sulfate	00945	500.
Total Dissolved Solids	70300	1000.
Zinc	01092	1.0

- a) The acute standard (AS) for the chemical constituents listed in subsection (d) shall not be exceeded at any time except as provided in subsection (c).
- b) The chronic standard (CS) for the chemical constituents listed in subsection (d) shall not be exceeded by the arithmetic average of at least four consecutive samples collected over any period of at least four days, except as provided in subsection (c). The samples used to demonstrate compliance or lack of compliance with a CS must be collected in a manner which assures an average representative of the sampling period.
- c) In waters where mixing is allowed pursuant to Section 302.102, the following apply:
 - 1) The AS shall not be exceeded in any waters except for those waters for which the Agency has approved a ZID pursuant to Section 302.102;
 - 2) The CS shall not be exceeded outside of waters in which mixing is allowed pursuant to Section 302.102.

d)

<u>Constituent</u>	<u>STORET Number</u>	<u>AS (ug/L)</u>	<u>CS (ug/L)</u>
<u>Arsenic (total)</u>	<u>01002</u>	<u>360</u>	<u>190</u>
<u>Cadmium (total)</u>	<u>01027</u>	<u>exp[A + Bln(H)], but not to exceed 50 ug/L, where A = -2.918 and B = 1.128</u>	<u>exp[A + Bln(H)], where A = -3.490 and B = 0.7852</u>

<u>Chromium</u> (total hexavalent)	<u>01032</u>	<u>16</u>	<u>11</u>
<u>Chromium</u> (total trivalent)	<u>01033</u>	<u>exp[A + Bln(H)], where A = 3.688 and B = 0.8190</u>	<u>exp[A + Bln(H)], where A = 1.561 and B = 0.8190</u>
<u>Copper</u> (total)	<u>01042</u>	<u>exp[A + Bln(H)], where A = -1.464 and B = 0.9422</u>	<u>exp[A + Bln(H)], where A = -1.465 and B = 0.8545</u>
<u>Cyanide</u>	<u>00718</u>	<u>22</u>	<u>5.2</u>
<u>Lead</u> (total)	<u>01051</u>	<u>exp[A + Bln(H)], but not to exceed 100 ug/L, where A = -1.460 and B = 1.273</u>	<u>Not Applied</u>
<u>Mercury</u>	<u>71900</u>	<u>0.5</u>	<u>Not Applied</u>
<u>TRC</u>	<u>50060</u>	<u>19</u>	<u>11</u>

where: ug/L = microgram per liter,

exp[x] = base of natural logarithms
raised to the x-power, and

ln(H) = natural logarithm of Hardness
(STORET 00900).

e) Concentrations of the following chemical constituents
shall not be exceeded except in waters for which mixing
is allowed pursuant to Section 302.102.

<u>Constituent</u>	<u>Units</u>	<u>STORET Number</u>	<u>Standard</u>
<u>Barium (total)</u>	<u>mg/L</u>	<u>01007</u>	<u>5.0</u>
<u>Boron (total)</u>	<u>mg/L</u>	<u>01022</u>	<u>1.0</u>
<u>Chloride (total)</u>	<u>mg/L</u>	<u>00940</u>	<u>500.</u>
<u>Fluoride</u>	<u>mg/L</u>	<u>00951</u>	<u>1.4</u>
<u>Manganese (total)</u>	<u>mg/L</u>	<u>01055</u>	<u>1.0</u>
<u>Nickel (total)</u>	<u>mg/L</u>	<u>01067</u>	<u>1.0</u>
<u>Phenols</u>	<u>mg/L</u>	<u>32730</u>	<u>0.1</u>
<u>Selenium (total)</u>	<u>mg/L</u>	<u>01147</u>	<u>1.0</u>
<u>Silver (total)</u>	<u>ug/L</u>	<u>01077</u>	<u>5.0</u>
<u>Sulfate</u>	<u>mg/L</u>	<u>00945</u>	<u>500.</u>

<u>Total Dissolved Solids</u>	<u>mg/L</u>	<u>70300</u>	<u>1000.</u>
<u>Zinc (total)</u>	<u>mg/L</u>	<u>01092</u>	<u>1.0</u>

where: mg/L = milligram per liter and
ug/L = microgram per liter

Section 302.210 Substances Toxic to Aquatic Life Other Toxic Substances

Any substance toxic to aquatic life shall not exceed one-tenth of the 96-hour median tolerance limit (96-hr. TLM) for native fish or essential fish food organisms, except for

Waters of the State shall be free from any substances or combination of substances in concentrations toxic or harmful to human health, or to animal, plant or aquatic life. Individual chemical substances or parameters for which numeric standards are specified in this Subpart are not subject to this Section.

- a) Any substance or combination of substances shall be deemed to be toxic or harmful to aquatic life if present in concentrations that exceed the following:
 - 1) An Acute Aquatic Toxicity Criterion (AATC) validly derived and correctly applied pursuant to procedures set forth in Sections 302.612 through 302.618 or in Section 302.621; or
 - 2) A Chronic Aquatic Toxicity Criterion (CATC) validly derived and correctly applied pursuant to procedures set forth in Sections 302.627 or 302.630.

- b) Any substance or combination of substances shall be deemed to be toxic or harmful to wild or domestic animal life if present in concentrations that exceed any Wild and Domestic Animal Protection Criterion (WDAPC) validly derived and correctly applied pursuant to Section 302.633.

- c) Any substance or combination of substances shall be deemed to be toxic or harmful to human health if present in concentrations that exceed criteria, validly derived and correctly applied, based on either of the following:
 - 1) Disease or functional impairment due to a physiological mechanism for which there is a threshold dose below which no damage occurs calculated pursuant to Sections 302.642 through 302.648 (Human Threshold Criterion); or

- 2) Disease or functional impairment due to a physiological mechanism for which any dose may cause some risk of damage calculated pursuant to Sections 302.651 through 302.658 (Human Nonthreshold Criterion).

- d) The most stringent criterion of subsections (a), (b), and (c) shall apply at all points outside of any waters within which mixing is allowed pursuant to Section 302.102. In addition, the AATC derived pursuant to subsection (a)(1) shall apply in all waters except that it shall not apply within a ZID that is prescribed in accordance with Section 302.102.

- e) The procedures of Subpart F set forth minimum data requirements, appropriate test protocols and data assessment methods for establishing criteria pursuant to subsections (a), (b), and (c). No other procedures may be used to establish such criteria unless approved by the Board in a rulemaking or adjusted standards proceeding pursuant to Title VII of the Act. The validity and applicability of the Subpart F procedures may not be challenged in any proceeding brought pursuant to Titles VIII or X of the Act, although the validity and correctness of application of the numeric criteria derived pursuant to Subpart F may be challenged in such proceedings pursuant to subsection (f).

- f)
 - 1) A permittee may challenge the validity and correctness of application of a criterion derived by the Agency pursuant to this Section only at the time such criterion is first applied in an NPDES permit pursuant to 35 Ill. Adm. Code 309.152 or in an action pursuant to Title VIII of the Act for violation of the toxicity water quality standard. Failure of a person to challenge the validity of a criterion at the time of its first application shall constitute a waiver of such challenge in any subsequent proceeding involving application of the criterion to that person.

 - 2) Consistent with subsection (f)(1), if a criterion is included as, or is used to derive, a condition of an NPDES discharge permit, a permittee may challenge the criterion in a permit appeal pursuant to Section 40 of the Act and 35 Ill. Adm. Code 309.181. In any such action, the Agency shall include in the record all information upon which it has relied in developing and applying the criterion, whether such information was developed by the Agency or submitted by the Petitioner. THE

BURDEN OF PROOF SHALL BE ON THE PETITIONER TO DEMONSTRATE THAT THE CRITERION-BASED CONDITION IS NOT NECESSARY TO ACCOMPLISH THE PURPOSES OF SUBSECTION (a) (Section 40(a)(1) of the Act), but there is no presumption in favor of the general validity and correctness of the application of the criterion as reflected in the challenged condition.

- 3) Consistent with subsection (f)(1), in an action where alleged violation of the toxicity water quality standard is based on alleged excursion of a criterion, the person bringing such action shall have the burdens of going forward with proof and of persuasion regarding the general validity and correctness of application of the criterion.
- g) Subsections (a) through (e) do not apply to USEPA registered pesticides approved for aquatic application and applied pursuant to the following conditions:
- a1) Application shall be made in strict accordance with label directions;
- b2) Applicator shall be properly certified under the provisions of the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. 135 et seq. (1972));
- e3) Applications of aquatic pesticides must be in accordance with the laws, regulations and guidelines of all State and federal agencies authorized by law to regulate, use or supervise pesticide applications, among which are is included the Illinois Department of Agriculture and the Illinois Department of Public Health pursuant to Ill. Rev. Stat. 1979 ch. 5, pars. 256 through 267; and the Department of Energy and Natural Resources pursuant to Section 3 of "AN ACT in relation to natural resources, research, data collection and environmental studies", Ill. Rev. Stat. 1979~~87~~ ch. 96 1/2, par. 7403.
- d4) No aquatic pesticide shall be applied to waters affecting public or food processing water supplies unless a permit to apply the pesticide has been obtained from the Agency. All permits shall be issued so as not to cause a violation of the Act or of any of the Board's rules or regulations. To aid applicators in determining their responsibilities under this subsection, a list of waters affecting public water supplies will be published and maintained by the Agency's Division of Public Water Supplies.

SUBPART F: PROCEDURES FOR DETERMINING
WATER QUALITY CRITERIA

Section 302.601 Scope and Applicability

This Subpart contains the procedures for determining the water quality criteria set forth in Section 302.210(a), (b) and (c).

Section 302.603 Definitions

As used in this Subpart, the following terms shall have the meanings specified.

"Bioconcentration" means an increase in concentration of a chemical and its metabolites in an organism (or specified tissues thereof) relative to the concentration of the chemical in the ambient water acquired through contact with the water alone.

"Carcinogen" means a chemical which causes an increased incidence of benign or malignant neoplasms, or a statistically significant decrease in latency period between exposure and onset of neoplasms in at least one mammalian species or man through epidemiological or clinical studies.

"EC-50" means the concentration of a substance or effluent which causes a given effect to 50% of the exposed organisms in a given time period.

"LC-50" means the concentration of a toxic substance or effluent which is lethal to 50% of the exposed organisms in a given time period.

"LOAEL" or "Lowest Observable Adverse Effect Level" means the lowest tested concentration of a chemical or substance which produces a statistically significant increase in frequency or severity of non-overt adverse effects between the exposed population and its appropriate control.

"MATC" or "Maximum Acceptable Toxicant Concentration" means the value obtained by calculating the geometric mean of the lower and upper chronic limits from a chronic test. A lower chronic limit is the highest tested concentration which did not cause the occurrence of a specified adverse effect. An upper chronic limit is the lowest tested concentration which did cause the occurrence of a specified adverse effect and above which all tested concentrations caused such an occurrence.

"NOAEL" or "No Observable Adverse Effect Level" means the highest tested concentration of a chemical or substance which does not produce a statistically significant increase in frequency or severity of non-overt adverse effects between the exposed population and its appropriate control.

"Resident or Indigenous Species" means species which currently live a substantial portion of their lifecycle or reproduce in a given body of water, or which are native species whose historical range includes a given body of water.

Section 302.604 Mathematical Abbreviations

The following mathematical abbreviations have been used in this Subpart:

<u>exp x</u>	<u>base of the natural logarithm, e, raised to x-power</u>
<u>ln x</u>	<u>natural logarithm of x</u>
<u>log x</u>	<u>logarithm to the base 10 of x</u>
<u>A**B</u>	<u>A raised to the B-power</u>
<u>SUM(x)</u>	<u>summation of the values of x</u>

Section 302.606 Data Requirements

The Agency shall review, for validity, applicability and completeness, data used in calculating criteria. To the extent available, and to the extent not otherwise specified, testing procedures, selection of test species and other aspects of data acquisition must be according to methods published by USEPA or nationally recognized standards organizations, including but not limited to those methods found in "Standard Methods", incorporated by reference in 35 Ill. Adm. Code 301.106, or approved by the American Society for Testing and Materials as incorporated by reference in 35 Ill. Adm. Code 301.106.

Section 302.612 Determining the Acute Aquatic Toxicity Criterion for an Individual Substance - General Procedures

- a) A chemical specific Acute Aquatic Toxicity Criterion (AATC) is calculated using procedures specified in Sections 302.615 and 302.681 if acute toxicity data are available for at least five (5) resident or indigenous species from five (5) different North American genera of freshwater organisms including representatives of the following taxa:
- 1) Representatives of two families in the Class Osteichthyes (Bony Fishes).

- 2) The family Daphnidae.
 - 3) A benthic aquatic macroinvertebrate.
 - 4) A vascular aquatic plant or a third family in the Phylum Chordata which may be from the Class Osteichthyes.
- b) If data are not available for resident or indigenous species, data for non-resident species may be used if the non-resident species is of the same family or genus and has a similar habitat and environmental tolerance. The procedures of Section 302.615 must be used to obtain an AATC for individual substances whose toxicity is unaffected by ambient water quality characteristics. The procedures of Section 302.618 must be used if the toxicity of a substance is dependent upon some other water quality characteristic.
- c) If data are not available that meet the requirements of subsection (a), an AATC is calculated by obtaining at least one EC-50 or LC-50 value from both a daphnid species and either fathead minnow or bluegill. If there are data available for any other North American freshwater species, they must also be included. An AATC is calculated by dividing the lowest Species Mean Acute Value (SMAV), as determined according to Section 302.615, by 10.

Section 302.615 Determining the Acute Aquatic Toxicity Criterion - Toxicity Independent of Water Chemistry

If the acute toxicity of the chemical has not been shown to be related to a water quality characteristic, including but not limited to, hardness, pH, temperature, etc., the AATC is calculated by using the procedures below.

- a) For each species for which more than one acute value is available, the Species Mean Acute Value (SMAV) is calculated as the geometric mean of the acute values from all tests.
- b) For each genus for which one or more SMAVs are available, the Genus Mean Acute Value (GMAV) is calculated as the geometric mean of the SMAVs available for the genus.
- c) The GMAVs are ordered from high to low.

- d) Ranks (R) are assigned to the GMAVs from "1" for the lowest to "N" for the highest. If two or more GMAVs are identical, successive ranks are arbitrarily assigned.
- e) The cumulative probability, P, is calculated for each GMAV as $R/(N + 1)$.
- f) The GMAVs to be used in the calculations of subsection (g) must be those with cumulative probabilities closest to 0.05. If there are less than 59 GMAVs in the total data set, the values utilized must be the lowest obtained through the ranking procedures of subsections (c) and (d). "T" is the number of GMAV's which are to be used in the calculations of subsection (g). T is equal to 4 when the data set includes at least one representative from each of the five taxa in Section 302.612 and a representative from each of the three taxa listed below. T is equal to 3 when the data includes at least one representative from each of the five taxa in Section 302.612 and from one or two of the taxa listed below. T is equal to 2 when the data set meets the minimum requirements of Section 302.612 but does not include representatives from any of the three taxa listed below. When toxicity data on any of the three taxa listed below are available, they must be used along with the minimum data required pursuant to Section 302.612.
- 1) A benthic crustacean, unless such was used pursuant to Section 302.612(a)(3), in which case an insect must be utilized.
 - 2) A member of a phylum not used in subsections (a), (b) or f(1).
 - 3) An insect from an order not already represented.
- g) Using the GMAVs and T-value identified pursuant to subsection (f) and the Ps calculated pursuant to subsection (e), the Final Acute Value (FAV) and the AATC are calculated as:

$$\text{FAV} = \exp(A) \text{ and}$$

$$\text{AATC} = \text{FAV}/2$$

Where:

$$A = L + 0.2236 S;$$

$$L = [\text{SUM}(\ln \text{GMAV}) - S(\text{SUM}(P^{*}0.5))]/T; \text{ and}$$

$$S = \frac{[\sum(\ln \text{GMAV})^{**2}) - ((\sum(\ln \text{GMAV}))^{**2})/T]}{[\sum(P) - ((\sum(P^{**0.5}))^{**2})/T]}^{**0.5}.$$

- h) If a resident or indigenous species, whose presence is necessary to sustain commercial or recreational activities, or prevent disruptions of the waterbody's ecosystem, including but not limited to loss of species diversity or a shift to a biotic community dominated by pollution-tolerant species, will not be protected by the calculated FAV, then the EC-50 or LC-50 for that species is used as the FAV.

Section 302.618 Determining the Acute Aquatic Toxicity Criterion - Toxicity Dependent on Water Chemistry

If data are available to show that a relationship exists between a water quality characteristic (WQC) and acute toxicity to two or more species, an Acute Aquatic Toxicity Criterion (AATC) shall be calculated. The best documented relationship is that between the water quality characteristic, hardness and acute toxicity of metals. Although this relationship between hardness and acute toxicity is typically non-linear, it can be linearized by a logarithmic transformation (i.e. for any variable, K, f(K) = logarithm of K) of the variables and plotting the logarithm of hardness against the logarithm of acute toxicity. Similarly, relationships between acute toxicity and other water quality characteristics, such as pH or temperature, may require a transformation, including no transformation (i.e. for any variable, K, f(K) = K) for one or both variables to obtain least squares linear regression of the transformed acute toxicity values on the transformed values of the water quality characteristic. An AATC is calculated using the following procedures.

- a) For each species for which acute toxicity values are available at two or more different values of the water quality characteristic, a linear least squares regression of the transformed acute toxicity (TAT) values on the transformed water quality characteristic (TWQC) values is performed to obtain the slope of the line describing the relationship.
- b) Each of the slopes determined pursuant to subsection (a) is evaluated as to whether or not it is statistically valid, taking into account the range and number of tested values of the water quality characteristic and the degree of agreement within and between species. If slopes are not available for at least one fish and one invertebrate species, or if the available slopes are too dissimilar, or if too few data are available to define the relationship between acute toxicity and the water

quality characteristic, then the AATC must be calculated using the procedures in Section 302.615.

- c) Normalize the TAT values for each species by subtracting W, the arithmetic mean of the TAT values of a species from each of the TAT values used in the determination of the mean, such that the arithmetic mean of the normalized TAT values for each species individually or for any combination of species is zero (0.0).
- d) Normalize the TWQC values for each species using X, the arithmetic mean of the TWQC values of a species, in the same manner as in subsection (c).
- e) Group all the normalized data by treating them as if they were from a single species and perform a least squares linear regression of all the normalized TAT values on the corresponding normalized TWQC values to obtain the pooled acute slope, V.
- f) For each species, the graphical intercept representing the species TAT intercept, f(Y), at a specific selected value, Z, of the WQC is calculated using the equation:

$$f(Y) = W - V(X - g(Z))$$

Where:

f() is the transformation used to convert acute toxicity values to TAT values;

Y is the species acute toxicity intercept or species acute intercept;

W is the arithmetic mean of the TAT values as specified in subsection (c);

V is the pooled acute slope as specified in subsection (e);

X is the arithmetic mean of the TWQC values as specified in subsection (d);

g() is the transformation used to convert the WQC values to TWQC values; and

Z is a selected value of the WQC.

- g) For each species, determine the species acute intercept, Y, by carrying out an inverse transformation of the species TAT value, f(Y). For example, in the case of a logarithmic transformation, Y = antilogarithm of (f(Y));

or in the case where no transformation is used, $Y = f(Y)$.

- h) The Final Acute Intercept (FAI) is derived by using the species acute intercepts, obtained from subsection (g), in accordance with the procedures described in Section 302.615(b) through (g), with the word "value" replaced by the word "intercept". Note that in this procedure geometric means and natural logarithms are always used.
- i) The Aquatic Acute Intercept (AAI) is obtained by dividing the FAI by two.
- j) The AATC at any value of the WQC, denoted by WQCx, is calculated using the terms defined in subsection (f) and the equation:

$$\text{AATC} = \exp[V(g(\text{WQCx}) - g(Z)) + f(\text{AAI})].$$

Section 302.621 Determining the Acute Aquatic Toxicity Criterion - Procedure for Combinations of Substances

An AATC for any combination of substances (including effluent mixtures) must be determined by the following toxicity testing procedures:

- a) Not more than 50% of test organisms from the most sensitive species tested may exhibit mortality or immobility after a 48-hour test for invertebrate or a 96-hour test for fishes.
- b) Three resident or indigenous species of ecologically diverse taxa must be tested initially. If resident or indigenous species are not available for testing, non-resident species may be used if the non-resident species is of the same family or genus and has a similar habitat and environmental tolerance.

Section 302.627 Determining the Chronic Aquatic Toxicity Criterion for an Individual Substance - General Procedures

- a) A chemical-specific Chronic Aquatic Toxicity Criterion (CATC) is calculated using procedures specified in subsection (b) when chronic toxicity data are available for at least five species from five different North American genera of freshwater organisms, including representatives from the following taxa:
 - 1) Representatives of two families in the Class Osteichthyes (Bony Fishes).

- 2) The family Daphnidae.
 - 3) A benthic aquatic macroinvertebrate.
 - 4) An alga (96-hour test) or a vascular aquatic plant.
- b) A CATC is derived in the same manner as the FAV in Sections 302.615 or 302.618 by substituting CATC for FAV or FAI, chronic for acute, MATC for LC-50, SMCV (Species Mean Chronic Value) for SMAV, and GMCV (Genus Mean Chronic Value) for GMAV.
- c) If data are not available to meet the requirements of subsection (a), a CATC is calculated by dividing the FAV by the highest acute-chronic ratio obtained from at least one fish and one invertebrate species. The acute-chronic ratio for a species equals the acute toxicity concentration from data considered under Sections 302.612 through 302.618, divided by the chronic toxicity concentration from data calculated under subsections (a) and (b) subject to the following conditions:
- 1) If the toxicity of a substance is related to any water quality characteristic (WQC), the acute-chronic ratio must be based on acute and chronic toxicity data obtained from organisms exposed to test water with WQC values that are representative of the WQC values of the waterbody under consideration. Preference under this subsection must be given to data from acute and chronic tests done by the same author or in the same reference in order to increase the likelihood of comparable test conditions.
 - 2) If the toxicity of a substance is unrelated to water quality parameters, the acute-chronic ratio may be derived from any acute and chronic test on a species regardless of the similarity in values of those water quality parameters. Preference under this subsection must be given to data from acute and chronic tests done on the same organisms or their descendants.
 - 3) If there is more than one acute-chronic ratio for a species, a geometric mean of the ratio is calculated, corrected for the relationship of toxicity to water quality parameters.
 - 4) If the acute and chronic toxicity data indicate that the acute-chronic ratio varies with changes in

water quality parameters, the acute-chronic ratio used over specified values of the water quality parameters must be based on the ratios at water quality parameter values closest to those specified.

- 5) If acute and chronic toxicity data are unavailable to determine an acute-chronic ratio for at least two North American freshwater species, a ratio of 25 shall be used.
- d) If a resident or indigenous species whose presence is necessary to sustain commercial or recreational activities, or prevent disruptions of the waterbody's ecosystem, including but not limited to loss of species diversity or a shift to a biotic community dominated by pollution-tolerant species, will not be protected by the calculated CATC, then the MATC for that species is used as the CATC.

Section 302.630 Determining the Chronic Aquatic Toxicity Criterion - Procedure for Combinations of Substances

A CATC for any combination of substances (including effluent mixtures) may be determined by toxicity testing procedures pursuant to the following:

- a) No combination of substances may exceed concentrations greater than a NOAEL as determined for the most sensitive of the species tested.
- b) Three resident or indigenous species of ecologically diverse taxa must be tested initially. If resident or indigenous species are not available for testing, non-resident species may be used if the non-resident species is of the same family or genus and has a similar habitat and environmental tolerance.

Section 302.633 The Wild and Domestic Animal Protection Criterion

The Wild and Domestic Animal Protection Criterion (WDAPC) is the concentration of a substance which if not exceeded protects Illinois wild and domestic animals from adverse effects, such as functional impairment or pathological lesions, resulting from ingestion of surface waters of the State and from ingestion of aquatic organisms taken from surface waters of the State.

- a) For those substances for which a NOAEL has been derived from studies of mammalian or avian species exposed to the substance via oral routes including gavage, the

lowest NOAEL among species must be used in calculating the WDAPC. Additional considerations in selecting NOAEL include:

- 1) If the NOAEL is given in milligrams of toxicant per liter of water consumed (mg/L), prior to calculating the WDAPC, the NOAEL must be multiplied by the daily average volume of water consumed by the test animals in liters per day (L/d) and divided by the average weight of the test animals in kilograms (kg).
 - 2) If the NOAEL is given in milligrams of toxicant per kilogram of food consumed (mg/kg), prior to calculating the WDAPC, the NOAEL must be multiplied by the average amount of food in kilograms consumed daily by the test animals (kg/d) and divided by the average weight of the test animals in kilograms (kg).
 - 3) If the animals used in a study were not exposed to the toxicant each day of the test period, the NOAEL must be multiplied by the ratio of days of exposure to the total days in the test period.
 - 4) If more than one NOAEL is available for the same animal species, the geometric mean of the NOAELs must be used to calculate the WDAPC.
- b) For those substances for which a NOAEL is not available but the lowest observed adverse effect level (LOAEL) has been derived from studies of animal species exposed to the substance via oral routes including gavage, one-tenth of the LOAEL shall be substituted for the NOAEL.
- c) The LOAEL must be selected in the same manner as that specified for the NOAEL in subsection (a).
- d) The WDAPC, measured in milligrams per liter (mg/L), is calculated according to the equation:

$$\text{WDAPC} = [0.1 \text{ NOAEL} \times \text{Wt}] / [\text{W} + (\text{F} \times \text{BCF})]$$

Where:

NOAEL is derived from mammalian or avian studies as specified in subsection (a) and (b), and is measured in units of milligrams of substance per kilogram of body weight per day (mg/kg-d);

Wt = Average weight in kilograms (kg) of the test animals;

W = Average daily volume of water in liters consumed per day (L/d) by the test animals;

F = Average daily amount of food consumed by the test animals in kilograms (kg/d);

BCF = Aquatic life Bioconcentration Factor with units of liter per kilogram (L/kg), as derived in Sections 302.660 through 302.666; and

The 0.1 represents an uncertainty factor to account for species variability.

- e) If no studies pertaining to the toxic substance in question can be found by the Agency, no criterion can be determined.

Section 302.642 The Human Threshold Criterion

The Human Threshold Criterion (HTC) of a substance is that concentration or level of a substance at which humans are protected from adverse effects resulting from incidental exposure to, or ingestion of, surface waters of the State and from ingestion of aquatic organisms taken from surface waters of the State. HTCs are derived for those toxic substances for which there exists a threshold dosage or concentration below which no adverse effect or response is likely to occur.

Section 302.645 Determining the Acceptable Daily Intake

The Acceptable Daily Intake (ADI) is the maximum amount of a substance which, if ingested daily for a lifetime, results in no adverse effects to humans. Subsections (a) through (e) list, in the order of preference, methods for determining the acceptable daily intake.

- a) The lowest of the following ADI values:
- 1) For those substances which are listed with a maximum contaminant level in 40 CFR 141, incorporated by reference in 35 Ill. Adm. Code 301.106, or in 35 Ill. Adm. Code 611, the ADI equals the product of multiplying the maximum contaminant level given in milligrams per liter (mg/L) by 2 liters per day (L/d).
 - 2) For those substances which are listed with a

maximum allowable concentration standard in 35 Ill. Adm. Code: Subtitle F, the acceptable daily intake equals the product of multiplying the public health enforcement standard given in milligrams per liter (mg/L) by 2 liters per day (L/d).

- b) For those substances for which a no observed adverse effect level (NOAEL-H) for humans exposed to the substance in drinking water has been derived, the acceptable daily intake equals the product of multiplying one-tenth of the NOAEL-H given in milligrams of toxicant per liter of water consumed (mg/L) by 2 liters per day (L/d). The lowest NOAEL-H must be used in the calculation of the acceptable daily intake.
- c) For those substances for which the lowest observed adverse effect level (LOAEL-H) for humans exposed to the substance in drinking water has been derived, one-hundredth of the LOAEL-H may be substituted for the NOAEL-H in subsection (b).
- d) For those substances for which a no observed adverse effect level (NOAEL-A) has been derived from studies of mammalian test species exposed to the substance via oral routes including gavage, the acceptable daily intake equals the product of multiplying 1/100 of the NOAEL-A given in milligrams toxicant per day per kilogram of test species weight (mg/kg-d) by the average weight of an adult human of 70 kilograms (kg). The lowest NOAEL-A among animal species must be used in the calculation of the acceptable daily intake. Additional considerations in selecting the NOAEL-A include:
- 1) If the NOAEL-A is given in milligrams of toxicant per liter of water consumed (mg/L) then, prior to calculating the acceptable daily intake, the NOAEL-A must be multiplied by the daily average volume of water consumed by the mammalian test species in liters per day (L/d) and divided by the average weight of the mammalian test species in kilograms (kg).
 - 2) If the NOAEL-A is given in milligrams of toxicant per kilogram of food consumed (mg/kg), prior to calculating the acceptable daily intake the NOAEL-A must be multiplied by the average amount in kilograms of food consumed daily by the mammalian test species (kg/d) and divided by the average weight of the mammalian test species in kilograms (kg).
 - 3) If the mammalian test species were not exposed to

the toxicant each day of the test period, the NOAEL-A must be multiplied by the ratio of days of exposure to the total days of the test period.

- 4) If more than one NOAEL-A is available for the same mammalian test species, the geometric mean of the NOAEL-As must be used.
- e) For those substances for which a NOAEL-A is not available but the lowest observed adverse effect level (LOAEL-A) has been derived from studies of mammalian test species exposed to the substance via oral routes including gavage, one-tenth of the LOAEL-A may be substituted for the NOAEL-A in subsection (d). The LOAEL-A must be selected in the same manner as that specified for the NOAEL-A in subsection (d).
- f) If no studies pertaining to the toxic substance in question can be found by the Agency, no criterion can be determined.

Section 302.648 Determining the Human Threshold Criterion

The HTC is calculated according to the equation:

$$\text{HTC} = \text{ADI} / [W + (F \times \text{BCF})]$$

Where:

HTC = Human health protection criterion in milligrams per liter (mg/L);

ADI = Acceptable daily intake of substance in milligrams per day (mg/d) as specified in Section 302.645;

W = Per capita daily water consumption equal to 2 liters per day (L/d) for surface waters at the point of intake of a public or food processing water supply, or equal to 0.01 liters per day (L/d) which represents incidental exposure through contact or ingestion of small volumes of water while swimming or during other recreational activities for areas which are determined to be public access areas pursuant to Section 302.201(b)(3), or 0.001 liters per day (L/d) for other General Use waters;

F = Assumed daily fish consumption in the United States equal to 0.020 kilograms per day (kg/d); and

BCF = Aquatic organism Bioconcentration Factor with units of liter per kilogram (L/kg) as derived in Sections 302.660 through 302.666.

Section 302.651 The Human Nonthreshold Criterion

The Human Nonthreshold Criterion (HNC) of a substance is that concentration or level of a substance at which humans are protected from an unreasonable risk of disease caused by a nonthreshold toxic mechanism as a result of incidental exposure to or ingestion of surface waters of the State and from ingestion of aquatic organisms taken from surface waters of the State. HNCs are derived for those toxic substances for which any exposure, regardless of extent, carries some risk of damage as specified in subsections (a) and (b).

- a) For single substances, a risk level of one in one million (1 in 1,000,000) shall be allowed (i.e., considered acceptable) for the purposes of determination of an HNC.
- b) For mixtures of substances, an additive risk level of one in one hundred thousand (1 in 100,000) shall be allowed (i.e., considered acceptable) for the purposes of determination of an HNC.

Section 302.654 Determining the Risk Associated Intake

The Risk Associated Intake (RAI) is the maximum amount of a substance which if ingested daily for a lifetime is expected to result in the risk of one additional case of human cancer in a population of one million. Where more than one carcinogenic chemical is present, the RAI shall be based on an allowed additive risk of one additional case of cancer in a population of one hundred thousand. The RAI must be derived as specified in subsections (a) through (c).

- a) For those substances for which a human epidemiologic study has been performed, the RAI equals the product of the dose from exposure in units of milligrams toxicant per kilogram body weight per day (mg/kg-d) that results in a 70-year lifetime cancer probability of one in one million, times the average weight of an adult human of 70 kilograms (kg). The resulting RAI is expressed in milligrams toxicant per day (mg/d). If more than one human epidemiologic study is available, the lowest exposure level resulting in a 70-year lifetime probability of cancer equal to a ratio of one in one hundred thousand must be used in calculating the RAI.
- b) In the absence of an epidemiologic study, for those toxic substances for which a carcinogenic potency factor (CPF) has been derived from studies of mammalian test species the risk associated intake is calculated from the equation:

$$\text{RAI} = \text{K/CPF}$$

Where:

RAI = Risk associated intake in milligrams per day (mg/d);

K = A constant consisting of the product of the average weight of an adult human, assumed to be 70 kg, and the allowed cancer risk level of one in one million (1/1,000,000); and

CPF = Carcinogenic Potency Factor is the risk of one additional cancer per unit dose from exposure. The CPF is expressed in units of inverse milligrams per kilogram-day (1/mg/kg-d) as derived in subsections (b)(1) through (b)(7).

- 1) Only those studies which fulfill the data requirement criteria of Section 302.606 shall be used in calculating the CPF.
- 2) The linear non-threshold dose-response relationship developed in the same manner as in the USEPA document "Mutagenicity and Carcinogenicity Assessment of 1,3-butadiene", incorporated by reference in 35 Ill. Adm. Code 301.106, shall be used in obtaining the unit risk, defined as the 95th percentile upper bound risk of one additional cancer resulting from a life time exposure to a unit concentration of the substance being considered. The CPF shall be estimated from the unit risk in accordance with subsection (b)(7). In calculating a CPF, the Agency must review alternate scientifically valid protocols if so requested.
- 3) If in a study of a single species more than one type of tumor is induced by exposure to the toxic substance, the highest of the CPFs is used.
- 4) If two or more studies vary in either species, strain or sex of the test animal, or in tumor type, the highest CPF is used.
- 5) If more than one tumor of the same type is found in some of the test animals, these should be pooled so that the dose response relationship is dose versus number of tumors per animal. The potency estimate for this dose response relationship is used if it is higher than estimates resulting from other

methods.

- 6) If two or more studies are identical regarding species, strain and sex of the test animal, and tumor type, the highest of the CPFs is used.
 - 7) Calculation of an equivalent dose between animal species and humans using a surface area conversion, and conversion of units of exposure to dose in milligrams of toxicant per kilogram of body weight per day (mg/kg-d) must be performed as specified in the USEPA document "Mutagenicity and Carcinogenicity Assessment of 1,3-butadiene", incorporated by reference in 35 Ill. Adm. Code 301.106.
- c) If both a human epidemiologic study and a study of mammalian test species are available for use in subsections (a) and (b), the risk associated intake is determined as follows:
- 1) When the human epidemiologic study provides evidence of a carcinogenic effect on humans, the RAI is calculated from the human epidemiology study as specified in subsection (a).
 - 2) When the mammalian study provides evidence of a carcinogenic effect on humans, but the human epidemiologic study does not, a cancer risk to humans is assumed and the risk associated intake is calculated as specified in subsection (b).

Section 302.657 Determining the Human Nonthreshold Criterion

The HNC is calculated according to the equation:

$$\text{HNC} = \text{RAI} / [\text{W} + (\text{F} \times \text{BCF})]$$

Where:

HNC = Human Nonthreshold Protection Criterion in milligrams per liter (mg/L);

RAI = Risk Associated Intake of a substance in milligrams per day (mg/d) which is associated with a lifetime cancer risk level equal to a ratio of one to 1,000,000 as derived in Section 302.654;

W = Per capita daily water consumption equal to 2 liters per day (L/d) for surface waters at the point of intake of a public or food processing water supply, or equal to 0.01 liters per day (L/d) which represents incidental

exposure through contact or ingestion of small volumes of water while swimming or during other recreational activities for areas which are determined to be public access areas pursuant to Section 302.201(b)(3), or 0.001 liters per day (L/d) for other General Use waters;

F = Assumed daily fish consumption in the United States equal to 0.020 kilograms per day (kg/d); and

BCF = Aquatic Life Bioconcentration Factor with units of liter per kilogram (L/kg) as derived in Section 302.663.

Section 302.658 Stream Flow for Application of Human Nonthreshold Criterion

The HNC shall apply at all times except during periods when flows are less than the harmonic mean flow (Q_{hm}), as determined by:

$$Q_{hm} = N / \text{SUM}(1/Q_i)$$

Where:

Q_{hm} = harmonic mean flow,

N = number of daily values for stream flows, and

Q_i = daily streamflow value on day i.

Section 302.660 Bioconcentration Factor

A Bioconcentration Factor is used to relate substance residue in aquatic organisms to the concentration of the substance in the waters in which the organisms reside.

Section 302.663 Determination of Bioconcentration Factors

A Bioconcentration Factor equals the concentration of a substance in all or part of an aquatic organism in milligrams per kilogram of wet tissue weight (mg/kg), divided by the concentration of the substance in the water to which the organism is exposed in milligrams of the substance per liter of water (mg/L).

- a) The Bioconcentration Factor is calculated from a field study if the following conditions are met:
 - 1) Data are available to show that the concentration of the substance in the water to which the organism was exposed remained constant over the range of territory inhabited by the organism and for a period of time exceeding 28 days;
 - 2) Competing mechanisms for removal of the substance

from solution did not affect the bioavailability of the substance; and

3) The concentration of the substance to which the organism was exposed is less than the lowest concentration causing any adverse effects on the organism.

b) In the absence of a field-derived Bioconcentration Factor, the Bioconcentration Factor is calculated from a laboratory test if the following conditions are met:

1) The Bioconcentration Factor was calculated from measured concentrations of the toxic substance in the test solution;

2) The laboratory test was of sufficient duration to have reached steady-state which is defined as a less than 10 percent change in the calculated Bioconcentration Factor over a 2-day period or 16 percent of the test duration whichever is longer. In the absence of a laboratory test which has reached steady-state, the Bioconcentration Factor may be calculated from a laboratory test with a duration greater than 28 days if more than one test is available for the same species of organism;

3) The concentration of the toxic substance to which the test organism was exposed is less than the lowest concentration causing any adverse effects on the organism;

4) If more than one Bioconcentration Factor for the same species is available, the geometric mean of the Bioconcentration Factors is used; and

5) The Bioconcentration Factor is calculated on a wet tissue weight basis. A Bioconcentration Factor calculated using dry tissue weight shall be converted to a wet tissue weight basis by multiplying the dry weight bioconcentration value by 0.1 for plankton and by 0.2 for individual species of fishes and invertebrates.

c) In the absence of any Bioconcentration Factors measured from field studies as specified in subsection (a) or laboratory studies which have reached steady-state as specified in subsection (b), the Bioconcentration Factor is calculated according to the equation:

$$\log BCF = A + B \log Kow$$

Where:

BCF = Bioconcentration Factor;

Kow = The octanol/water partition coefficient measured as specified in ASTM E 1147, incorporated by reference in 35 Ill. Adm. Code 301.106 (If the Kow is not available from laboratory testing, it shall be calculated from structure-activity relationships or available regression equations.); and

The constants A = -0.23 and B = 0.76 shall be used unless a change in the value of the constants is requested (The Agency shall honor requests for changes only if such changes are accompanied by scientifically valid supporting data.).

Section 302.666 Utilizing the Bioconcentration Factor

The Bioconcentration Factor derived in Section 302.663 is used to calculate water quality criteria for a substance as specified below:

- a) When calculating a WDAPC as described in Section 302.633, the geometric mean of all available steady-state whole body Bioconcentration Factors for fish and shellfish species which constitutes or represents a portion of the diet of indigenous wild and domestic animal species is used. Additional considerations in deriving a Bioconcentration Factor include:
 - 1) An edible portion Bioconcentration Factor is converted to a whole body Bioconcentration Factor for a fish or shellfish species by multiplying the edible portion Bioconcentration Factor by the ratio of the percent lipid in the whole body to the percent lipid in the edible portion of the same species.
 - 2) A Bioconcentration Factor calculated as described in Section 302.663(c) is converted to a whole body Bioconcentration Factor by multiplying the calculated Bioconcentration Factor by the ratio of the percent lipid in the whole body to 7.6.
- b) When calculating either a human threshold criterion or a human nonthreshold criterion as described in Sections 302.642 through 302.648 and Sections 302.651 through 302.657, respectively, the geometric mean of all

available edible portion Bioconcentration Factors for fish and shellfish species consumed by humans is used. Additional considerations in deriving a Bioconcentration Factor include:

- 1) Edible portions include:
 - A) Decapods -- muscle tissue.
 - B) Bivalve molluscs -- total living tissue.
 - C) Scaled fishes -- boneless, scaleless filets including skin except for bloater chubs in which the edible portion is the whole body excluding head, scales and visera.
 - D) Smooth-skinned fishes -- boneless, skinless filets.
- 2) A whole body Bioconcentration Factor is converted to an edible portion Bioconcentration Factor by multiplying the whole body Bioconcentration Factor of a species by the ratio of the percent lipid in the edible portion to the percent lipid in the whole body of the same species.
- 3) A Bioconcentration Factor calculated as described in Section 302.663 is converted to an edible portion Bioconcentration Factor by multiplying the calculated Bioconcentration Factor by the ratio of the percent lipid in the edible portion to 7.6.

Section 302.669 Listing of Derived Criteria

- a) The Agency shall develop and maintain a listing of toxicity criteria pursuant to this Subpart. This list shall be made available to the public and updated periodically but no less frequently than quarterly, and shall be published when updated in the Illinois Register.
- b) A criterion published pursuant to subsection (a) may be proposed to the Board for adoption as a numeric water quality standard.
- c) The Agency shall maintain for inspection all information including, but not limited to, assumptions, toxicity data and calculations used in the derivation of any toxicity criterion listed pursuant to subsection (a) until adopted by the Board as a water quality standard.

TITLE 35: ENVIRONMENTAL PROTECTION
SUBTITLE C: WATER POLLUTION
CHAPTER I: POLLUTION CONTROL BOARD

PART 305
MONITORING AND REPORTING

Section
305.101 Preamble
305.102 Reporting Requirements
305.103 Effluent Measurement

APPENDIX A References to Previous Rules

AUTHORITY: Implementing Section 13 and authorized by Section 27 of the Environmental Protection Act (Ill. Rev. Stat. 1987, ch. 111 ½, pars. 1013 and 1027).

SOURCE: Filed with the Secretary of State January 1, 1978; amended at 3 Ill. Reg. 25, p. 190, effective June 21, 1979; codified at 6 Ill. Reg. 7818; amended at 8 Ill. Reg. 1600, effective January 18, 1984; amended in R88-1 at 13 Ill. Reg. 5989, effective April 18, 1989; amended in R88-21(A) at Ill. Reg. , effective

Section 305.102 Reporting Requirements

- a) Every person within this State operating a pretreatment works, treatment works, or wastewater source shall submit operating reports to the Agency at a frequency to be determined by the Agency. "Agency" means the Illinois Environmental Protection Agency. Such reports shall contain information regarding the quantity of influent and of effluent discharged, of wastes bypassed and of combined sewer overflows; the concentrations of those physical, chemical, bacteriological and radiological parameters which shall be specified by the Agency; information concerning the biological impact of the discharge as specified by the Agency, pursuant to Section 39 of the Act; and any additional information the Agency may reasonably require. This reporting requirement for pretreatment works shall only apply to those pretreatment works which are required to have a pretreatment permit or authorization to discharge pursuant to 35 Ill. Adm. Code 310.

- 1) Discharge toxic pollutants, as defined in Section 502(13) of the Clean Water Act, or pollutants which may interfere with the treatment process, into the receiving treatment works or are subject to regulations promulgated under Section 307 of the Clean Water Act (CWA); (33 U.S.C. 1251 et seq.); or

- 2) Discharge 15% or more of the total hydraulic flow received by the treatment works; or
 - 3) Discharge 15% or more of the total biological loading received by the treatment works as measured by 5-day biochemical oxygen demand.
- b) Every holder of an NPDES (National Pollutant Discharge Elimination System) permit is required to comply with the monitoring, sampling, recording and reporting requirements set forth in the permit and this Chapter.
 - c) Compliance with the reporting requirements of 35 Ill. Adm. Code 310 satisfies this reporting requirement.

TITLE 35 ENVIRONMENTAL PROTECTION
SUBTITLE C: WATER POLLUTION
CHAPTER I: POLLUTION CONTROL BOARD

PART 309
PERMITS

SUBPART A: NPDES PERMITS

Section	
309.101	Preamble
309.102	NPDES Permit Required
309.103	Application - General
309.104	Renewal
309.105	Authority to Deny NPDES Permits
309.106	Access to Facilities and Further Information
309.107	Distribution of Applications
309.108	Tentative Determination and Draft Permit
309.109	Public Notice
309.110	Contents of Public Notice of Application
309.111	Combined Notices
309.112	Agency Action After Comment Period
309.113	Fact Sheets
309.114	Notice to Other Governmental Agencies
309.115	Public Hearings on NPDES Permit Applications
309.116	Notice of Agency Hearing
309.117	Agency Hearing
309.118	Agency Hearing File
309.119	Agency Action After Hearing
309.141	Terms and Conditions of NPDES Permits
309.142	Water Quality Standards and Waste Load Allocation
309.143	Effluent Limitations
309.144	Federal New Source Standards of Performance
309.145	Duration of Permits
309.146	Authority to Establish Recording, Reporting, Monitoring and Sampling Requirements
309.147	Authority to Apply Entry and Inspection Requirements
309.148	Schedules of Compliance
309.149	Authority to Require Notice of Introduction of Pollutants into Publicly Owned Treatment Works
309.150	Authority to Ensure Compliance by Industrial Users with Sections 204(b), 307 and 308 of the Clean Water Act
309.151	Maintenance and Equipment
309.152	Toxic Pollutants
309.153	Deep Well Disposal of Pollutants (Repealed)
309.154	Authorization to Construct
309.155	Sewage Sludge Disposal
309.156	Total Dissolved Solids Reporting and Monitoring
309.181	Appeal of Final Agency Action on a Permit Application
309.182	Authority to Modify, Suspend or Revoke Permits
309.183	Revision of Schedule of Compliance
309.184	Permit Modification Pursuant to Variance
309.185	Public Access to Information
309.191	Effective Date

SUBPART B: OTHER PERMITS

Section	
309.201	Preamble
309.202	Construction Permits
309.203	Operating Permits; New or Modified Sources
309.204	Operating Permits; Existing Sources
309.205	Joint Construction and Operating Permits
309.206	Experimental Permits
309.207	Former Permits (Repealed)
309.208	Permits for Sites Receiving Sludge for Land Application
309.221	Applications - Contents
309.222	Applications - Signatures and Authorizations
309.223	Applications - Registered or Certified Mail
309.224	Applications - Time to Apply
309.225	Applications - Filing and Final Action by Agency
309.241	Standards for Issuance
309.242	Duration of Permits Issued Under Subpart B
309.243	Conditions
309.244	Appeals from Conditions in Permits
309.261	Permit No Defense
309.262	Design, Operation and Maintenance Criteria
309.263	Modification of Permits
309.264	Permit Revocation
309.265	Approval of Federal Permits
309.266	Procedures
309.281	Effective Date
309.282	Severability

APPENDIX A References to Previous Rules

AUTHORITY: Implementing Sections 13 and 13.3 and authorized by Section 27 of the Environmental Protection Act (Ill. Rev. Stat. 1987, ch. 111 $\frac{1}{2}$, pars. 1013, 1013.3 and 1027).

SOURCE: Adopted in R71-14, at 4 PCB 3, March 7, 1972; amended in R73-11, 12, at 14 PCB 661, December 5, 1974, at 16 PCB 511, April 24, 1975, and at 28 PCB 509, December 20, 1977; amended in R73-11, 12, at 29 PCB 477, at 2 Ill. Reg. 16, p. 20, effective April 20, 1978; amended in R79-13, at 39 PCB 263, at 4 Ill. Reg. 34, p. 159, effective August 7, 1980; amended in R77-12B, at 41 PCB 369, at 5 Ill. Reg. 6384, effective May 28, 1981; amended in R76-21, at 44 PCB 203, at 6 Ill. Reg. 563, effective December 24, 1981; codified 6 Ill. Reg. 7818; amended in R82-5, 10, at 54 PCB 411, at 8 Ill. Reg. 1612, effective January 18, 1984; amended in R86-44 at 12 Ill. Reg. 2495 effective January 13, 1988; amended in R88-1 at 13 Ill. Reg. 5993, effective April 18, 1989; amended in R88-21(A) at Ill. Reg. effective

SUBPART A: NPDES PERMITS

Section 309.103 Application - General

a) Application Forms

- 1) An applicant for an National Pollution Discharge Elimination System (NPDES) Permit shall file an application, in accordance with Section 309.223 hereof, on forms provided by the Illinois Environmental Protection Agency (Agency). Such forms shall comprise the NPDES application forms promulgated by the U.S. Environmental Protection Agency for the type of discharge for which an NPDES Permit is being sought and such additional information as the Agency may reasonably require in order to determine that the discharge or proposed discharge will be in compliance with applicable state and federal requirements.
- 2) In addition to the above application forms, the Agency may require the submission of plans and specifications for treatment works and summaries of design criteria.
- 3) In addition to the above application forms, the Agency may require, pursuant to Section 39 of the Act, the installation, use, maintenance and reporting of results from monitoring equipment and methods, including biological monitoring. The Agency may require, pursuant to Section 39 of the Act, effluent toxicity testing to show compliance with 35 Ill. Adm. Code 302.621 and 302.630. If this toxicity testing shows the effluent to be toxic, the Agency may require further testing and identification of the toxicant(s) pursuant to 35 Ill. Adm. Code 302.210(a).

b) Animal Waste Facilities

An applicant for an NPDES Permit in connection with the operation of an animal waste facility shall complete, sign, and submit an NPDES application in accordance with the provisions of Part 35 Ill. Adm. Code 500 et seq.

c) Mining Activities

- 1) If, as defined by Section 35 Ill. Adm. Code 402.101, mining activities are to be carried out on a facility for which an NPDES Permit is held or required, the applicant must submit a permit application as required by Section 35 Ill. Adm.

Code 403.103, 403.104 and 405.104. If the facility will have a discharge other than a mine discharge or non-point source mine discharge as defined by Section 35 Ill. Adm. Code 402.101, the applicant shall also submit an NPDES Permit application in accordance with Section 309.223 on forms supplied by the Agency.

- 2) As provided by Section 35 Ill. Adm. Code 403.101, except to the extent contradicted in 35 Ill. Adm. Code: Subtitle D, Chapter I, the rules contained in this Subpart A of 35 Ill. Adm. Code 309 apply to 35 Ill Adm. Code: Subtitle D, Chapter I NPDES Permits.
- 3) As provided by Section 35 Ill. Adm. Code 406.100, except to the extent provided in 35 Ill. Adm. Code: Subtitle D, Chapter I, the effluent and water quality standards of Parts 35 Ill. Adm. Code 302, 303 and 304 are inapplicable to mine discharges and non-point source mine discharges.

d) New Discharges

Any person whose discharge will begin after the effective date of this Subpart A or any person having an NPDES Permit issued by the U.S. Environmental Protection Agency for an existing discharge which will substantially change in nature, or increase in volume or frequency, must apply for an NPDES Permit either:

- 1) No later than 180 days in advance of the date on which such NPDES Permit will be required; or
- 2) In sufficient time prior to the anticipated commencement of the discharge to insure compliance with the requirements of Section 306 of the Clean Water Act (CWA) (33 U.S.C. 1251 et seq.), or with any applicable zoning or siting requirements established pursuant to Section 208(b)(2)(C) of the CWA, and any other applicable water quality standards and applicable effluent standards and limitations.

e) Signatures

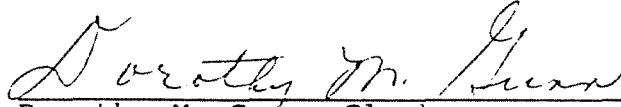
An application submitted by a corporation shall be signed by a principal executive officer of at least the level of vice president, or his duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge described in the application form

originates. In the case of a partnership or a sole proprietorship, the application shall be signed by a general partner or the proprietor, respectively. In the case of a publicly owned facility, the application shall be signed by either the principal executive officer, ranking elected official, or other duly authorized employee.

IT IS SO ORDERED

Board Members J.D. Dumelle and M. Nardulli dissent; Board Member J.T. Meyer concurs.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above Opinion and Order was adopted on the 25th day of January, 1990, by a vote of 5-2.



Dorothy M. Gunn, Clerk
Illinois Pollution Control Board