State of Iowa

Iowa Administrative Code Supplement

Biweekly
October 18, 2000

KATHLEEN K. BATES
ADMINISTRATIVE CODE EDITOR

STEPHANIE A. HOFF
ASSISTANT EDITOR

PUBLISHED BY THE
STATE OF IOWA
UNDER AUTHORITY OF IOWA CODE SECTION 17A.6

The Iowa Administrative Code Supplement is published biweekly pursuant to Iowa Code section 17A.6. The Supplement contains replacement pages to be inserted in the loose-leaf Iowa Administrative Code (IAC) according to instructions included with each Supplement. The replacement pages incorporate rule changes which have been adopted by the agencies and filed with the Administrative Rules Coordinator as provided in Iowa Code sections 7.17 and 17A.4 to 17A.6. To determine the specific changes in the rules, refer to the Iowa Administrative Bulletin bearing the same publication date.

In addition to the changes adopted by agencies, the replacement pages may reflect objection to a rule or a portion of a rule filed by the Administrative Rules Review Committee (ARRC), the Governor, or the Attorney General pursuant to Iowa Code section 17A.4(4); an effective date delay imposed by the ARRC pursuant to section 17A.4(5) or 17A.8(9); rescission of a rule by the Governor pursuant to section 17A.4(6); or nullification of a rule by the General Assembly pursuant to Article III, section 40, of the Constitution of the State of Iowa.

The Supplement may also contain replacement pages for the IAC Index and for the preliminary sections of the IAC: General Information about the IAC, Chapter 17A of the Code of Iowa, Style and Format of Rules, Table of Rules Implementing Statutes, and Uniform Rules on Agency Procedure.

INSTRUCTIONS

FOR UPDATING THE

IOWA ADMINISTRATIVE CODE

Agency names and numbers in the first column below correspond to the divider tabs in the IAC binders. Obsolete pages of the IAC are listed in the "Remove Old Pages" column. New and replacement pages included in this Supplement are listed in the "Insert New Pages" column. Carefully remove and insert pages as directed.

Editor's telephone: (515)281-3355 or (515)281-8157
Fax: (515)281-4424

UPDATING INSTRUCTIONS
October 18, 2000, Biweekly Supplement
[Previous Supplement dated 10/4/00]

	Remove Old Pages*	Insert New Pages
First Volume—General Information (Gray Tab)	p. 1, 2 p. 5, 6 p. 9, 10	p. 1, 2 p. 5, 6 p. 9, 10
CORRECTIONS DEPARTMENT[201]	Analysis, p. 1, 2 Ch 20, p. 25, 26	Analysis, p. 1, 2 Ch 20, p. 25—Ch 20, p. 27
ECONOMIC DEVELOPMENT, IOWA DEPARTMENT OF[261]	Analysis, p. 3—Analysis, p. 6 Ch 41, p. 3, 4 Ch 57, p. 1—Ch 57, p. 6	Analysis, p. 3—Analysis, p. 6 Ch 41, p. 3—Ch 42, p. 2 Ch 57, p. 1—Ch 57, p. 7
College Student Aid Commission[283]	Analysis, p. 1—Analysis, p. 3 Ch 18, p. 3—Ch 20, p. 2	Analysis, p. 1—Analysis, p. 3 Ch 18, p. 3—Ch 21, p. 1
Racing and Gaming Commission[491]	Analysis, p. 3, 4 Ch 8, p. 23, 24 Ch 8, p. 37, 38 Ch 10, p. 1—Ch 10, p. 34	Analysis, p. 3, 4 Ch 8, p. 23, 24 Ch 8, p. 37, 38 Ch 10, p. 1—Ch 10, p. 35
Environmental Protection Commission[567]	Analysis, p. 3—Analysis, p. 6 Ch 40, p. 1—Ch 41, p. 4 Ch 41, p. 7—Ch 41, p. 18 Ch 41, p. 25—Ch 41, p. 30 Ch 41, p. 35—Ch 42, p. 4	Analysis, p. 3—Analysis, p. 6 Ch 40, p. 1—Ch 41, p. 4 Ch 41, p. 7—Ch 41, p. 18 Ch 41, p. 25—Ch 41, p. 30a Ch 41, p. 35—Ch 42, p. 4

*These pages may be archived for tracing the history of a rule.

	Remove Old Pages*	Insert New Pages
Environmental Protection Commission[567] (Cont'd)	Ch 42, p. 7—Ch 43, p. 6 Ch 43, p. 9—Ch 43, p. 28 Ch 61, p. 1—Ch 61, p. 139 Ch 83, p. 1—Ch 83, p. 14 Ch 135, p. 66a Ch 135, p. 81	Ch 42, p. 7—Ch 43, p. 6 Ch 43, p. 9—Ch 43, p. 49 Ch 61, p. 1—Ch 61, p. 121 Ch 83, p. 1—Ch 83, p. 13 Ch 135, p. 66a Ch 135, p. 81
Professional Licensure Division[645]	Analysis, p. 9, 10 Ch 141, p. 5—Ch 141, p. 8 Ch 143, p. 1—Ch 143, p. 6	Analysis, p. 9, 10 Ch 141, p. 5—Ch 141, p. 8 Ch 143, p. 1—Ch 143, p. 7
Medical Examiners Board[653]	Analysis, p. 1—Analysis, p. 3 Ch 10, p. 9, 10 Ch 21, p. 1	Analysis, p. 1—Analysis, p. 3 Ch 10, p. 9—Ch 10, p. 11 Ch 21, p. 1, 2
Labor Services Division[875]	Analysis, p. 5, 6 Analysis, p. 9, 10 Ch 77, p. 1—Ch 82, p. 5 Ch 150, p. 5, 6	Analysis, p. 5, 6 Analysis, p. 9, 10 Ch 77, p. 1, 2 Ch 150, p. 5—Ch 155, p. 4
Index Volume	"L" Tab, p. 1-37	"L" Tab, p. 1-37

*These pages may be archived for tracing the history of a rule.

SUBSCRIPTION INFORMATION

Iowa Administrative Code

The Iowa Administrative Code and Supplements are sold in complete sets and by subscription basis only. Annual subscriptions for the Supplement (replacement pages) expire on June 30 of each year.

Prices for the Iowa Administrative Code and its Supplements are as follows:

Iowa Administrative Code — $1,210.31 plus $72.62 sales tax
(Price includes 22 volumes of rules and index, plus a one-year subscription to the Iowa Administrative Code Supplement and the Iowa Administrative Bulletin.)

Iowa Administrative Code Supplement — $425.61 plus $25.54 sales tax
(Subscription expires June 30, 2001.)

Iowa Administrative Bulletin

The Iowa Administrative Bulletin may be purchased by subscription or single copy. Subscriptions expire on June 30 of each year.

July 1, 2000, to June 30, 2001 $264.00 plus $15.84 sales tax

Direct all inquires about subscriptions to:

Customer Service Center
Department of General Services
Hoover State Office Building, Level A
Des Moines, Iowa 50319
Telephone: (515)242-5120

INTRODUCTION

The philosophy and mechanics of the Iowa rule-making process are set out in Iowa Code sections 17A.1 through 17A.8, with additional provisions found in Iowa Code sections 2B.1, 2B.5, 2B.13, 2B.21, 3.6, 7.17, and 25B.6.

The information which follows is intended to serve as a guide for rule making.

Inquiries may be directed to:

Iowa Administrative Code Division
Grimes State Office Building, First Floor
Des Moines, Iowa 50319

Telephone: (515)281-3355; 281-8157

Fax: (515)281-4424

ADMINISTRATIVE RULES COORDINATOR

Iowa Code sections 7.17, 17A.5, 17A.6

The Administrative Rules Coordinator (ARC) is a position established within the Governor's office. The responsibility of the coordinator is to receive all notices and filings made pursuant to the rule-making provisions of the Iowa Administrative Procedure Act (Iowa Code chapter 17A).

Other duties include the following:

1. Establish, in consultation with the Administrative Code Editor, the uniform style and form by which an agency prepares and submits a document; return agency filings not in compliance and review all submitted rules for proper style and form.

2. Prescribe a uniform numbering system for rules.

3. Assign an ARC Identification Number to each rule-making document submitted by an agency for publication in the Iowa Administrative Bulletin.

4. Require a specific form to be attached to each rule-making document. Sample forms are reproduced in "Style and Form" herein following the Red Tab.

Notice of Intended Action	Form A
Adopted Rule	Form B
Emergency	Form C

5. Direct the Administrative Code Editor to publish the Iowa Administrative Code (IAC) Supplement and the Iowa Administrative Bulletin (IAB). The ARC receives all proposed and adopted rules. These documents are logged in and forwarded to the Editor for publication in the Iowa Administrative Bulletin and Iowa Administrative Code Supplement.

6. Maintain a permanent register of the rules and be the depository for all rules submitted after July 1, 1978. Prior to that time, the Secretary of State was the official depository.

7. Make legal recommendations to the Governor regarding power of objection and rescission of any adopted rule.

8. Provide technical assistance to agencies as they draft rules.

9. Serve as the Governor's ex officio representative to the Administrative Rules Review Committee.

Inquiries may be directed to Brian Gentry, Capitol, Room 11, Des Moines, Iowa 50319. Telephone (515)281-0208; fax (515)281-6611.

IOWA ADMINISTRATIVE CODE EDITOR

Iowa Code chapters 2B and 17A

The Administrative Code Editor, appointed by the Director of the Legislative Service Bureau subject to the approval of the Legislative Council, has the primary responsibility for the technical editing, preparation and publishing of the Iowa Administrative Code (IAC) and the Iowa Administrative Bulletin (IAB) with the assistance of the Administrative Code Division, the Administrative Rules Coordinator and the Printing Division of the Department of General Services. The Administrative Code Division also edits and publishes the Iowa Court Rules and the State Roster and provides assistance to agencies with respect to style and format.

The Administrative Code Editor or a designee serves as Secretary to the Administrative Rules Review Committee (ARRC), prepares minutes of ARRC meetings and works with the Committee Counsel in preparation of meeting agenda.

Inquiries may be directed to Kathleen Bates, Administrative Code Editor, Grimes State Office Building, First Floor, Des Moines, Iowa 50319. Telephone (515)281-3355; fax 281-4424.

ATTORNEY GENERAL

Iowa Code sections 13.2, 17A.4(2), 17A.4(4)

The Attorney General's duties which may affect rule making include the following:

1. Advise state agencies concerning legal issues raised during rule making. State agencies may seek legal advice concerning procedure, statutory authority, and substantive legal questions.

2. Render opinions on questions of law. Attorney General's opinions provide a source of law to guide public officers. In the event that litigation develops, issued opinions receive respectful consideration by the courts.

3. Object to emergency rules which are adopted without notice or comment or which are made effective immediately. If the Attorney General objects on this basis, the rule ceases to be effective 180 days after the filing of the objection. [17A.4(2)]

4. Object to any rule on the ground that it is unreasonable, arbitrary or capricious, or beyond the agency's authority. An objection on this ground shifts the burden to the agency to establish that the rule is valid, and the agency will be liable for attorneys' fees and costs if the rule is found invalid on judicial review. [17A.4(4)]

5. Defend agency rules when challenged on judicial review.

COMMITTEE RULES OF PROCEDURE

PROCEDURE FOR ADMINISTRATIVE RULES REVIEW COMMITTEE MEETINGS

CHAPTER 1
RULES OF PROCEDURE

1.1(17A) Organization and operation.

1.1(1) *Membership.* The Administrative Rules Review Committee consists of ten members, five from the House of Representatives and five from the Senate.

1.1(2) *Staff.* The Committee has two staff persons. The legal counsel is located in the Capitol, Room 116A, Des Moines, Iowa 50319, telephone (515)281-3084.

The Committee secretary is located in the Grimes State Office Building, First Floor, Des Moines, Iowa 50319, telephone (515)281-3355.

1.1(3) *Quorum.* A quorum of the Committee consists of six members. Except as specifically provided by law, a majority vote of the entire Committee is required to take any action.

1.1(4) *Special meetings.* The Chair or Co-chair may call special meetings, giving at least four days' notice of that meeting. The Chair or Co-chair shall call a special meeting on the written request of two or more Committee members.

1.1(5) *Agenda of meetings.* An agenda shall be prepared for each meeting and is available at the Committee staff office in the Capitol or from the secretary. Each agency whose rules are scheduled for review by the Committee shall be provided with a copy of the agenda. The agency is then responsible to have a representative present at the meeting, unless attendance is waived by the Committee.

1.1(6) *Oral presentation.* Any Committee member may request, on behalf of the Committee, that an agency schedule an opportunity for oral presentation on a proposed rule.

1.1(7) *Motions.* Motions do not require seconds and may be made by any member of the Committee. If any member requests a roll call motion, the ayes and nays shall be recorded.

1.1(8) *Procedure.* In cases not covered by these rules, Mason's Manual of Legislative Procedure shall govern.

1.1(9) *Minutes.* The secretary is responsible for the taking of minutes of each meeting. When approved by the Committee, these minutes are public information and constitute the only official record of Committee proceedings. Tape recordings used to prepare the minutes are available only with the approval of the Chair or Co-chair. A charge based on actual cost, as determined by the Chair or Co-chair, shall be imposed to obtain a copy of a tape or minutes. The tape or minutes are available only after the minutes have been approved by the Committee.

1.2(17A) Committee actions.

1.2(1) *Objections.* An objection voted by the Committee shall be certified either by the Chair or Co-chair.

1.2(2) *Session delay.* Pursuant to the authority of Iowa Code section 17A.8(9), the Committee may, by two-thirds vote, delay the effective date of a rule until the adjournment of the next regular session of the General Assembly. Before imposing a delay, the Committee may, upon request by the affected agency, instead impose a 70-day delay, pursuant to Iowa Code section 17A.4(5), to allow the affected agency an opportunity to submit oral or written comments in support of the rule. These comments shall be considered by the Committee at a subsequent meeting within the 70-day period. The Committee may then take any action authorized by law.

1.2(3) *Rescission of earlier actions.* The Committee may at any time review earlier actions it has taken and may modify, rescind or reconsider that action. Any modification or rescission shall follow the same procedure required for the original action.

1.2(4) *General referrals and session delays.* The committee may periodically review the disposition of any rule referred to the General Assembly pursuant to Iowa Code sections 17A.8(7) or (9). A standing committee shall review a rule which has been referred pursuant to these sections by Friday of the week prior to the first legislative funnel. The standing committee may sponsor a joint resolution to disapprove of the rule or take any other action authorized by law. The standing committee shall inform the administrative rules review committee of any committee decision taken concerning the rule, within five legislative days.

1.3(17A) Substantive rules. In examining and evaluating rules, the Committee has developed a number of informal policies. These policies are set out below.

1.3(1) *Changes in the text between a Notice of Intended Action and Adopted rule.* The Committee will object to any adopted rule in which the text of that rule has been so changed from the Notice of Intended Action that interested persons did not have adequate notice of the actual rule adopted by the agency. This determination will be based on the following factors:

a. The extent to which an individual concerned with the adopted rule should have understood that the proposed rule could have affected their interests;

b. The extent to which the subject matter or issues involved in the adopted rule differed from those of the proposed rule; and

c. The extent to which the effects of the adopted rule differed from the effects that would have occurred if the proposed rule had been adopted.

1.3(2) *Quorum requirements and related matters.* Iowa Code section 17A.2 specifically establishes a quorum requirement, for boards and commissions, of not less than two-thirds of the entire membership, unless otherwise provided by statute. In addition to this requirement, the Committee insists that any action taken by a board or commission be based on a majority vote of the entire board or commission. The Committee will object or take other action on any rule that allows board or commission action based on a majority of those present and voting.

1.3(3) *Criteria for awards or grants.* Numerous state programs provide grants, loans or other types of awards. To ensure impartial evaluations for all applicants, the Committee insists that the criteria for making the awards be set out in administrative rules in full detail. If an agency chooses to use a point system to award different weights to different criteria, that point system must also be set out as part of the rules.

1.3(4) *Adoption of materials by reference.* If a rule adopts an Iowa statute or an Iowa administrative rule by reference, that adoption includes all subsequent amendments to that statute or rule. Any other material adopted by reference cannot include subsequent amendments and the citation must include a date certain identifying either the effective date or publication date of the material.

Adopted July 8, 1975; amended January 13, 1976; June 13, 1978;
November 9, 1982; November 9, 1983; November 4, 1987
[Filed 5/21/91, Notice 1/23/91—published 6/12/91, effective 7/17/91]
[Filed emergency 7/24/91—published 8/7/91, effective 7/24/91]
[Filed emergency 8/22/91—published 9/4/91, effective 8/22/91]
[Amended ARRC meeting 8/20/97—published 9/10/97]

CORRECTIONS DEPARTMENT[201]

Rules transferred from Social Services Department[770] to Department of Corrections[291]; see 1983 Iowa Acts, chapter 96. Rules transferred from agency number [291] to [201] to conform with the 1986 reorganization numbering scheme in general, IAC Supp. 3/20/91.

Note: Iowa Code chapter 246 renumbered as chapter 904 and 247 renumbered as chapter 913 in 1993 Iowa Code.

h. Rule 20.8(904)—Guests of institution. This rule is not applicable since this rule has no impact on the violator program.

i. Rule 20.9(904)—Donations. This rule is not applicable since this rule has no impact on the violator program.

j. Rule 20.11(904,910)—Restitution. This rule will be temporarily suspended while offenders are in the program. Restitution plans will be maintained, and the plan of payment will be reinstated upon release from the program.

k. Rule 20.12(904)—Furloughs. This rule will only apply in family emergency situations in accordance with 20.12(5)*"a"* and 20.12(6)*"a,"* although the criteria for eligibility are waived, and these furloughs will only be granted at the discretion of the warden/superintendent or designee with approval of the regional deputy director.

l. Rule 20.13(904)—Board of parole interviews. This rule is not applicable since this rule has no impact on the violator program.

m. Rule 20.15(910A)—Victim notification. This rule will not apply to the violator program.

n. Rule 20.17(904)—Institutional community placement. This rule will not apply to the violator program.

20.18(9) Good conduct time.

a. Iowa Code chapter 903A will not apply to probationers and parolees.

b. Iowa Code chapter 903A will apply to work releasees in accordance with work release policies and procedures.

20.18(10) Clothing, transportation, and release moneys. The provisions of Iowa Code section 906.9 will not apply to violator programs.

20.18(11) Any exceptions to these rules must be specifically approved by the warden/superintendent or designee.

This rule is intended to implement Iowa Code section 904.207.

201—20.19 Reserved.

201—20.20(904) Offender telephone commissions.

20.20(1) *Definitions.*

"Corrections board" means the department of corrections board.

"Deputy director of administration" means the person responsible for budgeting and planning.

"Director" means the chief executive officer of the department of corrections.

"Regional deputy director" means the person responsible for regional operation of both institution and community corrections services in either the eastern or western portions of Iowa.

"Warden/superintendent" means the chief executive officer of the institution or correctional facility.

20.20(2) *Deposit of funds.* The department of corrections shall deposit and account for all telephone commissions in a clearing account within central office. The deputy director of administration will determine commissions generated by each institution, based on a report from the vendor, for deposit in the institution's offender telephone rebate fund.

20.20(3) *Request for funds.* Each warden/superintendent will determine recurring needs and special projects and submit a written proposal to the respective regional deputy director of institutions for all expenditures and encumbrances.

20.20(4) *Review and approval of expenditures.* The regional deputy director of operations and the deputy director of administration will review the proposals for a quarterly presentation by the director to the corrections board for approval. All expenditures and encumbrances shall require prior approval from the corrections board and the respective regional deputy director of operations. Institutions shall not be allowed to encumber or expend funds without approval. Revenues generated by telephone commissions at each institution shall be used to determine the availability of funds for each project.

20.20(5) *Permitted expenditures.* The director shall advance to the corrections board for approval only projects that benefit offenders. Expenditures may include, but are not limited to, projects that provide educational, vocational or recreational services or projects, or work or treatment programs for offenders. Expenditures may also be used to initiate new programs, services, or projects. Institutions shall give spending priority to programs, services, and projects that promote the health and welfare of offenders.

This rule is intended to implement Iowa Code section 904.508A.

[Filed 9/25/81, Notice 10/29/80—published 10/14/81, effective 11/18/81]
[Filed emergency 10/23/81—published 11/11/81, effective 10/23/81]
[Filed 10/23/81, Notice 9/2/81—published 11/11/81, effective 12/16/81]
[Filed 4/5/82, Notice 1/20/82—published 4/28/82, effective 6/2/82]
[Filed 4/29/82, Notice 3/17/82—published 5/26/82, effective 6/30/82]
[Filed emergency 6/15/82—published 7/7/82, effective 7/1/82]
[Filed emergency 10/29/82—published 11/24/82, effective 10/29/82]
[Filed 1/14/83, Notice 11/10/82—published 2/2/83, effective 3/9/83]
[Filed emergency 6/17/83—published 7/6/83, effective 7/1/83]
[Filed emergency 8/29/83—published 9/14/83, effective 10/1/83]
[Filed emergency 9/9/83—published 9/28/83, effective 10/1/83]
[Filed 11/18/83, Notice 9/28/83—published 12/7/83, effective 1/11/84]
[Filed 2/24/84, Notice 1/4/84—published 3/14/84, effective 4/18/84]
[Filed 5/4/84, Notice 2/15/84—published 5/23/84, effective 6/27/84]
[Filed emergency 6/8/84—published 7/4/84, effective 6/8/84]
[Filed 7/24/84, Notice 4/25/84—published 8/15/84, effective 9/19/84]
[Filed 9/21/84, Notice 7/4/84—published 10/10/84, effective 11/14/84]
[Filed emergency 11/16/84—published 12/5/84, effective 11/16/84]
[Filed 4/4/85, Notice 10/24/84—published 4/24/85, effective 5/29/85]
[Filed 4/19/85, Notice 2/13/85—published 5/8/85, effective 6/12/85]
[Filed emergency 6/28/85—published 7/17/85, effective 7/1/85]
[Filed 9/20/85, Notice 7/31/85—published 10/9/85, effective 11/13/85]
[Filed emergency 7/11/86—published 7/30/86, effective 7/11/86]
[Filed 2/6/87, Notice 12/31/86—published 2/25/87, effective 4/1/87]
[Filed emergency 9/30/88—published 10/19/88, effective 9/30/88]
[Filed emergency 12/9/88—published 12/28/88, effective 12/9/88]
[Filed 3/31/89, Notice 12/28/88—published 4/19/89, effective 5/24/89]
[Filed emergency 7/21/89—published 8/9/89, effective 7/21/89]
[Filed 8/3/90, Notice 2/21/90—published 8/22/90, effective 9/26/90]
[Filed emergency 9/14/90—published 10/3/90, effective 9/26/90]
[Filed emergency 9/28/90—published 10/17/90, effective 9/28/90]
[Filed emergency 2/20/91—published 3/20/91, effective 2/20/91]
[Filed 1/31/92, Notice 10/2/91—published 2/19/92, effective 3/27/92]
[Filed 7/17/92, Notice 2/19/92—published 8/5/92, effective 9/9/92]
[Filed 10/23/92, Notice 5/27/92—published 11/11/92, effective 12/16/92]
[Filed 2/26/93, Notice 9/16/92—published 3/17/93, effective 4/21/93]
[Filed 2/26/93, Notice 12/23/92—published 3/17/93, effective 4/21/93]
[Filed 6/21/93, Notice 2/17/93—published 7/7/93, effective 8/11/93]
[Filed 10/21/94, Notice 8/17/94—published 11/9/94, effective 12/14/94]
[Filed emergency 7/14/95—published 8/2/95, effective 7/14/95]
[Filed 3/7/97, Notice 1/29/97—published 3/26/97, effective 4/30/97]
[Filed emergency 5/22/97—published 6/18/97, effective 5/22/97]
[Filed emergency 6/30/97—published 7/30/97, effective 6/30/97]

[Filed emergency 7/25/97—published 8/13/97, effective 7/25/97]
[Filed 12/12/97, Notice 8/13/97—published 12/31/97, effective 2/4/98]◊
[Filed 10/16/98, Notice 7/29/98—published 11/4/98, effective 12/9/98]
[Filed emergency 11/4/99—published 12/1/99, effective 11/4/99]
[Filed 7/21/00, Notice 5/3/00—published 8/9/00, effective 9/13/00]
[Filed 9/28/00, Notice 6/28/00—published 10/18/00, effective 11/22/00]

◊ Two ARCs

CHAPTERS 31 to 36
Reserved

CHAPTER 37
CITY DEVELOPMENT BOARD
37.1(368) Expenses, annual report and rules
37.2(17A) Forms

CHAPTER 38
IOWA INTERGOVERNMENTAL REVIEW SYSTEM
38.1(7A) Purpose
38.2(7A) Definitions
38.3(7A) Activities of the state clearinghouse
38.4(7A) Areawide clearinghouses
38.5(7A,28E,473A) Designation
38.6(7A) Review procedures—federal financial assistance
38.7(7A) Housing programs
38.8(7A) Direct development
38.9(7A) Board of regents
38.10(7A) Internal process
38.11(7A,68A) Information

CHAPTER 39
IOWA MAIN STREET PROGRAM
39.1(75GA,ch1201) Purpose
39.2(75GA,ch1201) Definitions
39.3(75GA,ch1201) Program administration
39.4(75GA,ch1201) Eligible applicants
39.5(75GA,ch1201) Funding
39.6(75GA,ch1201) Selection
39.7(75GA,ch1201) Selection criteria
39.8(75GA,ch1201) Financial management
39.9(75GA,ch1201) Performance reviews
39.10(75GA,ch1201) Noncompliance
39.11(75GA,ch1201) Forms

CHAPTER 40
Reserved

CHAPTER 41
RURAL/COMMUNITY PLANNING AND DEVELOPMENT FUND
41.1(78GA,HF745) Purpose
41.2(78GA,HF745) Program eligibility
41.3(78GA,HF745) General policies for applications
41.4(78GA,HF745) Application procedures
41.5(78GA,HF745) Application contents
41.6(78GA,HF745) Review process
41.7(78GA,HF745) Award process
41.8(78GA,HF745) Program management
41.9(15) Performance reviews

CHAPTER 42
RURAL RESOURCE COORDINATION PROGRAMS FOR FIRE SERVICES
42.1(78GA,SF2428,SF2453) Purpose
42.2(78GA,SF2428,SF2453) Program eligibility
42.3(78GA,SF2428,SF2453) Award limits
42.4(78GA,SF2428,SF2453) Eligible uses of funds
42.5(78GA,SF2428,SF2453) Application procedures
42.6(78GA,SF2428,SF2453) Application review
42.7(78GA,SF2428,SF2453) Disbursement of funds

CHAPTER 43
MAIN STREET LINKED INVESTMENTS LOAN PROGRAM
43.1(12) Purpose
43.2(12) Definitions
43.3(12) Eligibility
43.4(12) Main street linked investments design review committee
43.5(12) Main street linked investments design review board
43.6(12) Procedure

CHAPTER 44
COG ASSISTANCE
44.1(99E) Purpose
44.2(99E) Definitions
44.3(99E) Eligibility
44.4(99E) Eligible activities
44.5(99E) Application procedure
44.6(99E) Grant awards
44.7(99E) Funding
44.8(99E) Financial management standards
44.9(99E) Record keeping and retention
44.10(99E) Progress reports
44.11(99E) Noncompliance
44.12(99E) Grant closeouts
44.13(99E) Compliance with state laws and regulations

CHAPTER 45
HOUSING ASSESSMENT AND ACTION PLANNING PROGRAM
45.1(76GA,HF512) Purpose
45.2(76GA,HF512) Eligible applicants
45.3(76GA,HF512) Population guidelines
45.4(76GA,HF512) Definitions
45.5(76GA,HF512) Project awards

CHAPTER 55
TARGETED SMALL BUSINESS FINANCIAL ASSISTANCE PROGRAM

CHAPTER 56
ENTREPRENEURS WITH DISABILITIES PROGRAM

CHAPTER 57
VALUE-ADDED AGRICULTURAL PRODUCTS AND PROCESSES FINANCIAL ASSISTANCE PROGRAM (VAAPFAP)

CHAPTER 58
NEW JOBS AND INCOME PROGRAM

CHAPTER 59
ENTERPRISE ZONES

CHAPTER 60
ENTREPRENEURIAL VENTURES ASSISTANCE PROGRAM

41.6(2) *Scoring.* The scoring system has a maximum of 700 points.

a. Economic or community enhancement impact to the area. 150 points possible.

b. Capacity of the applicant to sustain, implement or reach stated objectives. 150 points possible.

c. Demonstrated networking, cooperation and partnerships with other entities, organizations, and local governments. 150 points possible.

d. Local effort. 100 points possible.

e. Creativity and innovation of the proposed project. 75 points possible.

f. Evidence of local planning. 75 points possible.

261—41.7(78GA,HF745) Award process. Recommendations by the committee for funding will be forwarded to the director of the department for final decisions. Applicants will be notified in writing after the final decisions on grants are made.

41.7(1) Expenses eligible for reimbursement may include but are not limited to the following:

a. Coordinating staff for the governmental units or community groups participating in the project.

b. Feasibility studies or implementation of a locally developed study or plan.

c. Educational/training materials, supplies, postage necessary to the outcome of the project.

d. Travel expenses of the local coordinator, if hired through a participating governmental unit.

e. Direct purchase of consultative or technical assistance services.

f. In-state conference, workshop or seminar fees necessary to the outcome of the project for staff or volunteers directly involved in the project.

g. Travel expenses to visit other sites or locations in state necessary to the outcome of the project for staff or volunteers directly involved in the project.

41.7(2) Expenses ineligible for reimbursement may include but are not limited to the following:

a. Purchase of land, buildings or improvements thereon.

b. Expenses for development of sites and facilities.

c. Expenses for equipment, materials, supplies, telephones, and faxes related to the project.

d. Expenses for studies or plans that are routinely developed as a part of city or county function or operation, such as development of comprehensive planning documents, community builder plans, master plans or engineering studies of water, sewer, streets/roads, parks, unless a new or innovative approach is used such as a city/county joint planning process for land use, service provision or other collaborative actions.

261—41.8(78GA,HF745) Program management.

41.8(1) Record keeping. Financial records, supporting documents, statistical records and all other records pertinent to the project shall be retained by the recipient of funds for a period of three years after the contract expiration date.

41.8(2) A contract will be negotiated with the successful applicant which includes, but is not limited to, the terms for disbursement of funds and responsibilities.

41.8(3) Representatives of the department and state auditors shall have access to all books, accounts and documents belonging to or in use by the grantee pertaining to the receipt of assistance under this program.

41.8(4) All contracts under this program are subject to audit.

261—41.9(15) Performance reviews.

41.9(1) Applicants will be required to submit performance reports to the department. The report will assess progress on the goals and project activities. Some projects may require the completion of a final product (such as a manual), study or report to be submitted to the department before final payment is made. Performance reports may be quarterly or semiannual and, for some projects, may be required for a period of time after contract period expires.

41.9(2) The department may perform field visits as deemed necessary.

These rules are intended to implement 1999 Iowa Acts, House File 745, section 1(3)*"c."*

[Filed 9/16/99, Notice 8/11/99—published 10/6/99, effective 11/10/99]

CHAPTER 42
RURAL RESOURCE COORDINATION PROGRAMS FOR FIRE SERVICES

261—42.1(78GA,SF2428,SF2453) Purpose. This chapter includes provisions for two programs: Response 2020 and dry hydrant grant program. The purpose of Response 2020 is to assist fire and emergency response departments in the planning, assessment and evaluation of local emergency response services and to support systems to improve service delivery though financial and technical assistance. During fiscal year 2001, up to $200,000 of funding is available to support rural dry hydrant demonstration projects across the state.

261—42.2(78GA,SF2428,SF2453) Program eligibility. Cities, counties, and councils of government may apply on behalf of fire and emergency response departments for these funds. Resource conservation and development councils may apply for dry hydrant funds only. Requests for funding under the dry hydrant program must be made by a consortium of fire departments in order to be considered.

261—42.3(78GA,SF2428,SF2453) Award limits.

42.3(1) For Response 2020 projects, the maximum grant award shall not exceed $15,000 over a period not to exceed one year.

42.3(2) For the dry hydrant grant program, the maximum grant award shall be $15,000 per each applicant region. A maximum of $2,500 per dry hydrant may be requested.

a. The award amount for dry hydrant projects shall be used for the following activities including, but not limited to: approved training and education in site selection, hydrant location and water acquisition; and the proper use, installation and maintenance of the hydrants.

b. Fire departments requesting funding must obtain a certification of training in dry hydrants from the State of Iowa Community Fire Service Institute or another approved training entity. The review committee established in rule 42.6(78GA,SF2428,SF2453) must approve any training entity other than the State of Iowa Community Fire Service Institute proposed for use under this program.

42.3(3) All applicants must provide 25 percent match for the project. Match may be cash, in-kind services or a combination of the two.

261—42.4(78GA,SF2428,SF2453) Eligible uses of funds.

42.4(1) Eligible uses of funds for the Response 2020 program include, but are not limited to:

a. Procurement of consultants to assist in planning and assessment.

b. Payment for the costs associated with technical assistance.

c. Purchase of materials necessary to complete an eligible project.

42.4(2) Dry hydrant grant program. Eligible uses of funds for the dry hydrant grant program include: purchase of dry hydrant equipment, installation, training and education on the use of dry hydrants.

261—42.5(78GA,SF2428,SF2453) Application procedures. Applications will be requested at least annually on a date to be determined by the Iowa department of economic development based on availability of funds. Applications must be submitted on forms prescribed by and available from the Iowa department of economic development. Forms may be obtained by contacting the Iowa Department of Economic Development, Division of Community and Rural Development, 200 East Grand, Des Moines, Iowa 50309, or by calling (515)242-4711.

42.5(1) Application contents shall include, but are not limited to: summary of project, description of geographic area served, information about each service included in the project area, financial information (such as organization budget, tax levies, volunteer staff, and paid personnel).

42.5(2) Application materials must be postmarked by midnight on the established due date. No faxed materials will be accepted.

261—42.6(78GA,SF2428,SF2453) Application review. Applications will be reviewed by a team of no fewer than five members selected from the following organizations: Iowa department of economic development, Iowa Fireman's Association, state fire marshal, Iowa Fire Chiefs Association, Iowa State University Extension, Iowa League of Cities, Iowa Association of Counties, Institute of Public Affairs—University of Iowa, Iowa department of public health.

42.6(1) *Scoring criteria for proposals.* Applications will be ranked on the following criteria:

a. Demonstrated need in a given area. Identify proposed service area and show that the area is serviceable by the departments in the area - 125 points possible.

b. Evidence of cooperation and collaboration among neighboring departments - 125 points possible.

c. Evidence of local financial and volunteer commitment to the project - 50 points possible.

d. Evidence of capacity of applicant to implement any resulting action plan - 100 points possible.

e. Completeness of application with all necessary attachments included - 50 points possible.

42.6(2) *Additional information needed for dry hydrant grant program.* Before an application under the dry hydrant grant program will be reviewed and scored using the criteria in subrule 42.6(1), the following threshold requirements shall be met:

a. Identification of proposed service area and evidence that it is serviceable by applicant organizations.

b. Evidence of availability of suitable, accessible water source in proposed project area.

c. Demonstrated cooperation and participation among applicant departments and other affected entities within the project area.

261—42.7(78GA,SF2428,SF2453) Disbursement of funds. Upon the execution of a contract between the award recipient and the Iowa department of economic development, recipients may request funds on a reimbursement basis for funds awarded under the Response 2020 program. For funds awarded to dry hydrant projects, 50 percent of the funds may be paid in advance of completed work activities subject to approval by the department of revenue and finance. Remaining funds will be paid by the Iowa department of economic development upon receipt of the following: certification of training, proof of installation, and submission of a work plan to maintain the dry hydrants.

These rules are intended to implement Iowa Code section 15.108(30) and 2000 Iowa Acts, Senate File 2453, section 4, subsection 3, and 2000 Iowa Acts, Senate File 2428, section 1, subsection 3, paragraph *"c."*

[Filed 9/25/00, Notice 8/9/00—published 10/18/00, effective 11/22/00]

CHAPTER 57
VALUE-ADDED AGRICULTURAL PRODUCTS AND PROCESSES FINANCIAL ASSISTANCE PROGRAM (VAAPFAP)

[Prior to 7/19/95, see 261—Ch 29]

261—57.1(15E) Purpose. The purpose of this program is to encourage the increased utilization of agricultural commodities produced in this state. The program shall assist in efforts to revitalize rural regions of this state by committing resources to provide financial assistance to new or existing value-added production facilities.

261—57.2(15E) Definitions.

"Agricultural products advisory council" means the council composed of five members appointed by the secretary of agriculture and five members appointed by the director of the department of economic development who are experienced in marketing or exporting agricultural commodities or products, financing the export of agricultural commodities or products, or adding value to and the processing of agricultural products as further described in Iowa Code section 15.203.

"Agriculture" means the science, art, and business of cultivating the soil, producing crops and raising livestock.

"Committee" means the renewable fuels and coproducts advisory committee established pursuant to Iowa Code section 159A.4.

"Coordinator" means the administrative head of the office of renewable fuels and coproducts appointed by the department of agriculture and land stewardship as provided in Iowa Code section 159A.3.

"Coproduct" means a product other than a renewable fuel which at least in part is derived from the processing of agricultural commodities and which may include corn gluten feed, distillers grain, solubles, a feed supplement, or can be used as livestock feed.

"Department" or *"IDED"* means the Iowa department of economic development.

"Farming" means the cultivation of land for the production of agricultural crops, the raising of poultry, the production of eggs, the production of milk, the production of fruit or other horticultural crops, grazing or the production of livestock. Farming shall not include the production of timber, forest products, nursery products, or sod; and farming shall not include a contract where a processor or distributor of farm products or supplies provides spraying, harvesting or other farm services.

"Fund" means the renewable fuels and coproducts fund established pursuant to Iowa Code section 159A.7.

"Innovative" means a new or different agricultural product or a method of processing agricultural products which is an improvement over traditional methods in a new, different, or unusual way.

"Livestock production operations" means the production, feeding and marketing of livestock, poultry and aquaculture. This includes, but is not limited to, beef and dairy cattle, swine, sheep, goat, poultry, turkey and equine operations. It also includes nontraditional agricultural operations such as ostrich, fallow deer, rabbit, fish and other aquaculture.

"Loan" means an award of assistance with the requirement that the award be repaid with term, interest rate, and other conditions specified as part of the award. A deferred loan is one for which the payment of principal, interest, or both, is not required for some specified period. A forgivable loan is one for which repayment is eliminated in part or entirely if the borrower satisfies specified conditions.

"Loan guarantee" means a guarantee of all or part of a loan made by a commercial lender. Payment of all or a portion of the loan guarantee will occur if the business defaults on its repayment of the loan, provided that the lender has exhausted customary legal remedies in an attempt to secure repayment from the borrower. Customary legal remedies include, but are not limited to, collateral recovery and disposition, foreclosure proceedings, payment from a personal or corporate guarantee.

"Office" means the office of renewable fuels and coproducts created pursuant to Iowa Code section 159A.3.

"Person" means individual, corporation, limited liability company, government or governmental subdivision or agency, business trust, estate, trust, partnership or association, or any other legal entity.

"Renewable fuel" means an energy source at least in part derived from an organic compound, capable of powering machinery, including an engine or power plant. A renewable fuel includes but is not limited to ethanol-blended or soydiesel fuel.

"Renewable fuels and coproducts activities" means either of the following:

1. The research, development, production, promotion, marketing, or consumption of renewable fuels and coproducts.
2. The research, development, transfer, or use of technologies which directly or indirectly increases the supply or demand of renewable fuels and coproducts.

"Rural region" means any geographic area which is predominantly rural in nature, that is, having a relatively low population density and where agriculture is the predominant economic activity.

"Soydiesel fuel" means a fuel made of processed soybean oil which is mixed with diesel fuel, the mixture being a minimum of 20 percent processed soybean oil.

"VAAPFAP" means the value-added agricultural products and processes financial assistance program.

"Value-added product" means a product, which through a series of activities or processes, can be sold at a higher price than its original purchase price.

261—57.3(15E) General eligibility. A person is eligible to apply for assistance under this program if the following requirements are met:

1. The existing or proposed facility is located in this state.
2. The person applies to the department of economic development in a manner and according to procedures required by the department.
3. The person submits a business plan which demonstrates managerial and technical expertise.

261—57.4(15E) Program components and eligibility requirements.

57.4(1) *Program components.* There will be three components to the VAAPFAP program. The first component relates to operations which are involved in the development of new and innovative products or processes related to agriculture and is referred to as the "Innovative Agricultural Products and Processes Component." The second component relates to renewable fuel production facilities and is referred to as the "Renewable Fuel Component." The third component relates to the encouragement and creation of business partnerships or networks working on ideas for new agricultural products or processes and is referred to as the "Project Creation Component." Funds available for project awards will be allocated on the basis of 40 percent (component 1), 40 percent (component 2), and 20 percent (component 3) until the end of the third quarter of the state fiscal year, after which no restrictions would apply.

57.4(2) *Innovative agricultural products and processes component.* An application based on this component shall be considered if either of the following apply:

a. The business will produce a product derived from an agricultural commodity, if the product is not commonly produced in Iowa from an agricultural commodity; or

b. The business will utilize a process to produce a product derived from an agricultural commodity, if the process is not commonly used in Iowa to produce the product.

c. For purposes of this section, a product is "not commonly produced" and a process is "not commonly used" if the product or process is not usually, generally, or ordinarily produced or processed in Iowa.

57.4(3) *Renewable fuel component.* Applications for renewable fuel and ethanol production shall be considered by the department for funding. Applications based on ethanol fuel production must meet the following criteria to be considered for funding:

a. All fermentation, distillation, and dehydration of the ethanol occurs at the proposed facility.

b. The ethanol produced at the proposed facility is at least 190 proof and is denatured. However, if the facility markets the ethanol for further refining, the facility must demonstrate that the refiner produces at least 190 proof ethanol from the ethanol purchased from the facility.

57.4(4) *Project development assistance.* The department, at its discretion, may also provide funding for project development related to proposed projects under this program. Project development assistance could be for the purpose of assisting in departmental evaluation of proposals, or could be one of the proposed activities in a funding request whose further project development could reasonably be expected to lead to a VAAPFAP-eligible commercial enterprise. Feasibility studies and basic research are not eligible for assistance under this program.

57.4(5) *Project creation assistance.* This component is for projects that eventually could be eligible for funding within the other VAAPFAP components. Periodically, a request for proposal (RFP) will be issued based on strategic initiatives developed by the department in consultation with relevant agricultural groups and advisors. The RFP will describe the desired outcome of the proposed effort. The desired outcome could be a new and innovative product, new processing or marketing techniques, or new forms of business operation or collaboration. These efforts could include:

a. Projects that can show need for special financial assistance to engage participation of expertise needed from sources external to the business sponsor of the project.

b. Endeavors where there is a need for financial assistance to plan and organize business consortia or joint ventures among firms or to support costs of special services to be acquired from university or other sources.

c. Situations where there is a need to provide matching funds to businesses to enter competition for federal research and development grants.

261—57.5(15E) Ineligible projects.

57.5(1) The department shall not provide financial assistance to support a value-added production facility if the facility or a person owning a controlling interest in the facility has demonstrated, within the most recent consecutive three-year period prior to application, a continuous and flagrant disregard for the health and safety of its employees or the quality of the environment. Violations of environmental protection statutes, rules or regulations shall be reported for the most recent five-year period prior to application. Evidence of such disregard shall include a history of serious or uncorrected violations of state or federal law protecting occupational health and safety or the environment, including but not limited to serious or uncorrected violations of occupational safety and health standards enforced by the division of labor services of the department of employment services pursuant to Iowa Code chapter 84A, or rules enforced by the environmental protection division of the department of natural resources pursuant to Iowa Code chapter 455B.

57.5(2) The department shall not approve an application for assistance under this program to refinance an existing loan.

57.5(3) The department shall not directly award financial assistance to support an activity directly related to farming as defined in Iowa Code section 9H.1, including the establishment or operation of a livestock production operation, regardless of whether the activity is related to a renewable fuel production facility.

57.5(4) An applicant may not receive more than one award under this program for a single project. However, previously funded projects may receive an additional award(s) if the applicant demonstrates that the funding is to be used for a significant expansion of the project, a new project, or a project which results from previous project development assistance.

57.5(5) The department shall not approve an application for assistance in which VAAPFAP funding would constitute more than 50 percent of the total project costs.

261—57.6(15E) Awards.

57.6(1) *Form.* Financial assistance awarded under this program may be in the form of a loan, forgivable loan, deferred loan, grant, production incentive payment, or a combination thereof. The department shall not award more than 25 percent of the amount allocated to the value-added agricultural products and processes financial assistance fund during any state fiscal year to support a single person. The department may finance any size of facility. However, the department shall reserve up to 50 percent of the total amount allocated to the fund, for purposes of assisting persons requiring $100,000 or less in financial assistance. The amount shall be reserved until the end of the third quarter of the state fiscal year and may then become available for other projects.

57.6(2) *Amount.*

a. Grants, forgivable loans, and loans shall be awarded on the basis of the following:

Total Amount of Award	Loan %	Grant or Forgivable Loan %
$0 to 20,000	0%	100%
$20,001 to 150,000	50%	50%
$150,001 to 250,000	60%	40%
$250,001 to 350,000	70%	30%
$350,001 to 450,000	80%	20%
$450,001 and above	100%	0%

b. The department reserves the right to provide a higher percentage of loan than indicated above. A higher percentage of grant or forgivable loan may be provided if the business can support its request with documentation that the project would not be able to proceed without a higher ratio of grant or forgivable loan funds or if the project is a strategic initiative established according to subrule 57.4(5).

57.6(3) *Loan rate and terms.* Rescinded IAB 10/18/00, effective 11/22/00.

261—57.7(15E) Application procedure. Application materials may be obtained from the IDED Bureau of Business Finance, 200 East Grand Avenue, Des Moines, Iowa 50309, telephone (515)242-4819. A comprehensive business plan must accompany the application and shall include at least the following:

1. Marketing plan for the project;
2. Project budget and status of alternative financing (if applicable);
3. Production operations;
4. Management structure;
5. Personnel needs;
6. Description of product, process or practice;
7. Status of product/service development; and
8. Patent status (if applicable).

261—57.8(15E) Review process. Subject to availability of funds, applications are reviewed and rated by IDED staff on an ongoing basis. Applications will be reviewed by staff for completeness and eligibility. If additional information is required, the applicant shall be provided with notice, in writing, to submit additional information. The department may refer an application to the coordinator for further feasibility studies if deemed necessary, if the applicant had previously consulted with the coordinator in completion of the application. Notice of such referral shall simultaneously be mailed to the applicant. The IDED staff may refer viable applications for project development assistance. The applicant shall then have three weeks from the date of the IDED letter to submit the requested information. Applications will also be reviewed by the agricultural products advisory council on a regular basis. Recommendations from the IDED staff will be submitted to the director of the department for final approval, denial or deferral. Applicants shall be notified in writing within one week following the department's final action.

The department reserves the right to informally consult with external resources to assist in the evaluation of projects or to contract with outside consultants for the same purpose in an amount not to exceed $20,000 per project.

261—57.9(15E) Deferral process. If all additional information requested is received within the three-week time frame, the application will be considered as soon as practicable thereafter. If information is not received in a timely manner, consideration will be delayed. If the department's request for additional information is not answered within 60 days of the date of the request, the application will be denied.

261—57.10(15E) Evaluation and rating criteria. The IDED staff shall evaluate and rank applications based on the following criteria:

57.10(1) For the innovative products and processes component:

a. Feasibility. The feasibility of the existing or proposed facility, process, or operation to remain a viable enterprise (0-25 pts.). Rating factors for this criterion include, but are not limited to, the following: initial capitalization, project budget, financial projections, marketing analysis, marketing plan, management team, and production plan. In order to be eligible for funding, proposals must score at least 15 points on this rating factor.

b. New or innovative. The degree to which the proposed product or process is new and innovative. This includes, but is not limited to, consideration of the degree to which the product or process is commonly produced or commonly used within the state (0-25 pts.). In order to be eligible for funding, proposals must score at least 15 points on this rating factor.

c. Utilization. The degree to which the facility will add value to and increase the utilization of agricultural commodities produced in this state (0-25 pts.). In order to be eligible for funding, proposals must score at least 15 points on this rating factor.

d. The extent to which the existing or proposed facility is located in a rural region of the state (0-10 pts.).

e. The proportion of local match to be contributed to the project (0-5 pts.).

f. The level of need of the region where the existing facility is or the proposed facility is to be located (0-5 pts.). More points are awarded to those projects which exhibit greater need as measured by factors including, but not limited to, the following: regional unemployment rate, poverty level, or other measures of regional fiscal distress.

g. The degree to which the facility produces a coproduct which is marketed in the same locality as the facility (0-5 pts.).

A minimum score of 65 points is needed for a project to be recommended for funding.

57.10(2) For the renewable fuels component:

a. The department shall give priority to supporting proposed renewable fuel production facilities which directly support livestock production operations. The highest priority shall be provided to a renewable fuel production facility which produces coproducts which are used to produce livestock raised in the same locality as the production facility.

b. All renewable fuels projects will be rated based on the following:

(1) Feasibility (0-35 pts.).
(2) Increased utilization (0-35 pts.).
(3) Coproduct local market (0-10 pts.).
(4) Level of need (0-10 pts.).
(5) Rural region (0-5 pts.).
(6) Local match (0-5 pts.).

All those projects scoring 65 points or higher will be recommended for funding if sufficient funds are available. If insufficient funds are available, those projects rating 65 or higher and qualifying as "highest priority" projects under paragraph *"a"* of this subrule will be recommended prior to those which do not qualify as "highest priority" projects.

c. If the department has two or more proposals which are otherwise equal, a preference shall be given to those proposals in which the livestock operation:

(1) Is located in an agricultural area as provided in Iowa Code chapter 352, and

(2) Is located in close proximity to and is an integral part of the renewable fuel production facility. However, the owner of the facility is not required to hold an interest in the land on which the livestock are produced. The livestock may be produced under the terms of a contract, in which a person regularly engaged in livestock production provides for the care and feeding of the livestock on behalf of the facility's owner.

In ranking projects according to this paragraph "*c,*" subparagraphs (1) and (2) above, first preference will be given to projects which meet both subparagraphs. Second preference will be given to projects that meet either subparagraph (1) or (2), and third preference will be given to those projects meeting neither criteria.

57.10(3) For the project creation assistance component:

a. Any person is eligible to apply except educational or research institutions. However, educational and research institutions may be a partner to an eligible applicant.

b. The evaluation process will focus on the application of new technology and knowledge to agricultural processing and will be based upon the degree to which:

(1) The resulting business has potential to increase the utilization of agricultural commodities in Iowa; and

(2) The resulting business increases value-added economic activities (for example, facilities or employment) within the state of Iowa.

261—57.11(15E) Negotiation and award. The department reserves the right to negotiate the amount, term, interest rate, and other conditions of the loan or grant prior to the award, subject to rule 261—57.6(15E).

261—57.12(15E) Award process. Upon approval by the director, the applicant business will receive an award letter which shall state the amount of award, conditions of the award, any security agreements, and the amount of monthly loan repayments, if applicable.

261—57.13(15E) Contract. Following notification of award, a contract will be prepared for execution between the applicant business owner and IDED. Business owners are subject to credit checks at this time. If judgments, federal tax liens, or state liens are found and not remedied within the time period required by the department, funding may be denied. After execution of the contract, the business owner may request disbursement of funds on the form(s) prescribed by IDED.

261—57.14(15E) Administration.

57.14(1) *Access to records.* The department, at any and all reasonable times, during the term of the agreement with the business may enter the business during the course of, or following, the completion of the project for any purpose arising from the performance of the contracted project. The business shall make all books, papers, records and accounts of the company open and available for inspection and audit by the department or its representatives at any and all reasonable times.

57.14(2) *Waiver.* The department may waive or vary particular provisions of these rules to conform to requirements of the federal government in connection with a loan with respect to which federal assistance, insurance, or guaranty is sought, provided the waiver does not conflict with applicable state laws.

57.14(3) *Repayment of loans.* Payments are due on the first day of each month that payments are due. Late fees may be charged for payments received after the tenth day following the due date.

261—57.15(15E) Default. When a loan is in default for a period of 60 days, the department may notify the office of the attorney general and recommend appropriate action or refer the account to other collection procedures deemed appropriate by the department.

These rules are intended to implement Iowa Code sections 15E.111 and 15E.112.

[Filed emergency 8/17/90 after Notice 7/11/90—published 9/5/90, effective 8/17/90]
[Filed emergency 8/19/94 after Notice 7/6/94—published 9/14/94, effective 8/19/94]
[Filed 6/26/95, Notice 5/10/95—published 7/19/95, effective 8/23/95]
[Filed 8/21/95, Notice 6/7/95—published 9/13/95, effective 10/18/95]
[Filed 8/23/96, Notice 3/13/96—published 9/11/96, effective 10/16/96]
[Filed 9/25/00, Notice 8/9/00—published 10/18/00, effective 11/22/00]

COLLEGE STUDENT AID COMMISSION[283]

[Prior to 8/10/88, see College Aid Commission[245]]

283—18.15(261) Restrictions. A student who is in default on a Stafford Loan, SLS Loan, or a Perkins/National Direct/National Defense Student Loan or who owes a repayment on any Title IV grant assistance or state award shall be ineligible for assistance under the Iowa work-study program. Eligibility for state aid may be reinstated upon payment in full of the delinquent obligation or by commission ruling on the basis of adequate extenuating evidence presented in an appeal under the procedure set forth in 283—Chapter 5.

This rule is intended to implement Iowa Code section 261.15.

[Filed emergency 8/13/87—published 9/9/87, effective 8/21/87]
[Filed 1/15/88, Notice 9/9/87—published 2/10/88, effective 3/16/88]
[Filed 7/22/88, Notice 3/9/88—published 8/10/88, effective 9/14/88]
[Filed 11/29/89, Notice 10/4/89—published 12/27/89, effective 1/31/90]
[Filed 1/29/91, Notice 12/12/90—published 2/20/91, effective 3/27/91]
[Filed 9/13/91, Notice 7/24/91—published 10/2/91, effective 11/6/91]
[Filed 9/25/92, Notice 8/5/92—published 10/14/92, effective 11/18/92]
[Filed 1/20/95, Notice 10/12/94—published 2/15/95, effective 3/22/95]
[Filed 1/20/95, Notice 12/7/94—published 2/15/95, effective 3/22/95]
[Filed 10/3/95, Notice 8/16/95—published 10/25/95, effective 11/29/95]

CHAPTER 19
ACCELERATED CAREER EDUCATION GRANT PROGRAM

283—19.1(261) ACE grants. Educational grants based on financial need may be awarded to Iowa residents enrolled in accelerated career education (ACE) programs, approved by the Iowa department of economic development, at Iowa community colleges.

19.1(1) *Student financial need.*

a. Financial need shall be evaluated annually on the basis of a confidential financial statement, filed on forms designated by the commission, which must be received by the processing agency by the priority date specified in the application instructions.

b. Financial need is defined as the difference between total program expenses at the community college the student plans to attend and the estimated amount of family resources available for college, as determined by the commission. Need determination will include evaluation of all student financial aid received by the student including, but not limited to, federal Pell Grants, Iowa vocational-technical tuition grants, and institutional awards.

19.1(2) *Student eligibility.*

a. A recipient must be an Iowa resident. A student who is determined to be in the state primarily for educational purposes shall be considered a nonresident. The commission will make final residency determinations using criteria developed for all state-funded scholarship and grant programs.

b. A recipient must be enrolled in an accelerated career education program, approved by the Iowa department of economic development, leading to a certificate, diploma, associate of science degree, or associate of applied science degree in accordance with the provisions of Iowa Code chapter 260G.

c. A recipient must be a full-time student as defined by the college unless the financial aid administrator recommends an award to a part-time student based on federal professional judgment criteria as authorized in the federal Higher Education Act of 1965, as amended.

d. A recipient may receive moneys under this program for not more than 150 percent of the length of time required for a full-time student to complete the accelerated career education program.

e. A recipient must meet and maintain the academic eligibility requirements established by the community college.

f. A recipient may receive no more than the amount specified by Iowa law or the amount of the student's established financial need, whichever is less.

19.1(3) *Priority for grants.* Industries and occupations with high levels of shortages of workers based on the level of statewide need for skills and occupations will be identified by the Iowa department of economic development and the workforce development department. The commission will award grants based on the level of need for the identified skills and occupations for which technical workers are in the highest demand as defined by the Iowa department of economic development and the workforce development department.

Applicants who apply by the priority date specified in the application and who are enrolled in designated educational programs will be ranked in order of need, and awards will be granted to those who demonstrate need from highest need to lowest need, insofar as funds permit.

19.1(4) *Award notification.* Grant recipients will be notified of the awards by community college officials. Community college officials are responsible for verifying eligibility and coordinating other aid to ensure compliance with student eligibility requirements and allowable award amounts. Community college officials will report changes of student eligibility to the commission.

19.1(5) *Maximum annual award.* For purposes of this program, a student must be enrolled four quarters or two semesters plus a summer session to receive the maximum annual award.

19.1(6) *Award transfers and adjustments.* Recipients are responsible for promptly notifying the appropriate community college officials of changes in enrollment or financial situation. Community college officials will make necessary changes and notify the commission.

19.1(7) *Restrictions.* A student who is in default on a Stafford Loan, an SLS Loan, or a Perkins/National Direct/National Defense Student Loan or who owes a repayment on any Title IV grant assistance or state award shall be ineligible for accelerated career education grants. Eligibility for state aid may be reinstated upon payment in full of the delinquent obligation or by commission ruling on the basis of adequate extenuating evidence presented in an appeal under the procedures set forth in 283—Chapter 5.

This rule is intended to implement 2000 Iowa Acts, Senate File 2439, section 8.

[Filed 9/29/00, Notice 8/9/00—published 10/18/00, effective 11/22/00]

CHAPTER 20
IOWA NATIONAL GUARD EDUCATIONAL ASSISTANCE PROGRAM

283—20.1(261) Educational assistance to Iowa national guard members for undergraduate studies at eligible Iowa institutions. The adjutant general shall determine eligibility requirements and select program recipients, and the decision of the adjutant general is final.

20.1(1) *Guard member eligibility.* A recipient must:

a. Be a resident of Iowa, as defined by the adjutant general of Iowa, and a member of an Iowa army or air national guard unit throughout each term for which the member has applied for benefits.

b. Have satisfactorily completed required guard training.

c. Have maintained satisfactory performance of guard duty.

d. Have applied to the adjutant general of Iowa for program eligibility.

e. Be pursuing a certificate or undergraduate degree program at an eligible Iowa college or university and maintain satisfactory academic progress.

f. Provide notice of national guard status to the college or university at the time of registration.

20.1(2) *Institutional eligibility.* Guard members attending the following categories of Iowa colleges and universities are eligible to receive moneys from this program:

a. Institutions accredited by the North Central Association of Colleges and Secondary Schools.

b. State-supported area community colleges accredited by the state department of education.

20.1(3) *Award notification.* A guard member is notified of eligibility by the adjutant general of Iowa. The adjutant general will notify the Iowa college student aid commission (commission) of all eligible members. The commission will notify the Iowa colleges and universities of guard members' eligibility.

20.1(4) *Award limitations.* Awards may be used for educational assistance including tuition and fees; room and board; books, supplies, transportation and personal expenses; dependent care; and disability-related expenses. Individual award amounts shall be determined by the adjutant general and shall be neither less than an amount equal to 50 percent of the resident tuition rate established for students attending regent institutions nor exceed the amount of the resident tuition rate established for students attending regent institutions.

20.1(5) *Restrictions.*

a. A guard member may use benefits only for undergraduate educational assistance.

b. A guard member who has met the educational requirements for a baccalaureate degree is not eligible for benefits.

c. A qualified full-time student may receive tuition aid benefits for no more than eight semesters of undergraduate study or the quarter or trimester equivalent. A qualified part-time student may receive tuition aid benefits for no more than 16 semesters of undergraduate study or the quarter or trimester equivalent.

20.1(6) *Verification and compliance.*

a. The adjutant general will notify the commission of all eligible guard members. Changes in member eligibility will be sent to the commission within 30 days of the change.

b. The commission will notify eligible Iowa colleges and universities of guard members' eligibility.

c. The commission will coordinate the collection and dissemination of eligibility and enrollment information received from the adjutant general and the colleges and universities.

d. The institution's financial aid administrator will be responsible for completing necessary academic progress and enrollment verifications and for coordinating other aid to ensure compliance with student eligibility requirements and allowable award amounts. The colleges and universities will report changes of students' enrollment to the commission within 30 days after the last day of the enrollment period.

This rule is intended to implement Iowa Code section 261.21.

[Filed 6/20/97, Notice 4/9/97—published 7/16/97, effective 8/20/97]
[Filed 8/20/99, Notice 6/16/99—published 9/8/99, effective 10/13/99]

CHAPTER 21
APPROVAL OF POSTSECONDARY SCHOOLS

283—21.1(78GA,SF2248) Approval criteria. The college student aid commission shall approve applicant schools that:

1. Are accredited by an agency recognized by the United States Department of Education or its successor agency.
2. Are approved for operation by the appropriate state agencies in all other states in which the schools operate or maintain a presence.
3. Are not subject to a limitation, suspension or termination order issued by the United States Department of Education or its successor agency.
4. Are free of sanctions from the schools' accrediting agencies and appropriate state agencies in all other states in which the schools operate or maintain a presence.
5. Enroll students in Iowa or employ Iowa faculty.
6. Comply with Iowa Code section 261B.7 limiting the use of references to the secretary of state, state of Iowa, or college student aid commission in promotional material.
7. Comply with the requirements of Iowa Code section 261.9(1)*"e"* to *"h."*
8. File annual reports that the commission requires from all Iowa colleges and universities.

This rule is intended to implement Iowa Code chapter 261B as amended by 2000 Iowa Acts, Senate File 2248.

[Filed 9/29/00, Notice 8/9/00—published 10/18/00, effective 11/22/00]

g. Should a betting interest in the second half of the quinella double be scratched prior to the close of wagering on the first quinella double contest, all money wagered on combinations including the scratched betting interest shall be deducted from the quinella double pool and refunded.

h. Should a betting interest in the second half of the quinella double be scratched after the close of wagering on the first quinella double contest, all wagers combining the winning combination in the first contest with a combination including the scratched betting interest in the second contest shall be allocated a consolation payoff. In calculating the consolation payoff, the net quinella double pool shall be divided by the total amount wagered on the winning combination in the first contest and an unbroken consolation price obtained. The unbroken consolation price is multiplied by the dollar value of wagers on the winning combination in the first contest combined with a combination including the scratched betting interest in the second contest to obtain the consolation payoff. Breakage is not declared in this calculation. The consolation payoff is deducted from the net quinella double pool before calculation and distribution of the winning quinella double payoff. In the event of a dead heat involving separate betting interests, the net quinella double pool shall be distributed as a profit split.

i. If either of the quinella double contests is canceled prior to the first quinella double contest, or the first quinella double contest is declared "no contest," the entire quinella double pool shall be refunded on quinella double wagers for those contests.

j. If the second quinella double contest is canceled or declared "no contest" after the conclusion of the first quinella double contest, the net quinella double pool shall be distributed as a single-price pool to wagers selecting the winning combination in the first quinella double contest. If there are no wagers selecting the winning combination in the first quinella double contest, the entire quinella double pool shall be refunded on quinella double wagers for those contests.

8.3(11) *Exacta pools.*

a. The exacta requires selection of the first two finishers, in their exact order, for a single contest.

b. The net exacta pool shall be distributed to winning wagers in the following precedence, based upon the official order of finish:

(1) If contestants of a coupled entry or mutuel field finish as the first two finishers, as a single-price pool to those selecting the coupled entry or mutuel field combined with the next separate betting interest in the official order of finish; otherwise

(2) As a single-price pool to those whose combination finished in correct sequence as the first two betting interests; but if there are no such wagers, then

(3) As a profit split to those whose combination included either the first-place betting interest to finish first or the second-place betting interest to finish second; but if there are no such wagers on one of those two finishers, then

(4) As a single-price pool to those whose combination included the one covered betting interest to finish first or second in the correct sequence; but if there are no such wagers, then

(5) The entire pool shall be refunded on exacta wagers for that contest.

c. If there is a dead heat for first involving:

(1) Contestants representing the same betting interest, the exacta pool shall be distributed as a single-price pool to those selecting the coupled entry or mutuel field combined with the next separate betting interest in the official order of finish.

(2) Contestants representing two or more betting interests, the exacta pool shall be distributed as a profit split.

d. If there is a dead heat for second involving contestants representing the same betting interest, the exacta pool shall be distributed as if no dead heat occurred.

e. If there is a dead heat for second involving contestants representing two or more betting interests, the exacta pool shall be distributed to ticket holders in the following precedence, based upon the official order of finish:

(1) As a profit split to those combining the first-place betting interest with any of the betting interests involved in the dead heat for second; but if there is only one covered combination, then

(2) As a single-price pool to those combining the first-place betting interest with the one covered betting interest involved in the dead heat for second; but if there are no such wagers, then

(3) As a profit split to those wagers correctly selecting the winner for first place and those wagers selecting any of the dead-heated betting interests for second place; but if there are no such wagers, then

(4) The entire pool shall be refunded on exacta wagers for that contest.

8.3(12) *Trifecta pools.*

a. The trifecta requires selection of the first three finishers, in their exact order, for a single contest.

b. The net trifecta pool shall be distributed to winning wagers in the following precedence, based upon the official order of finish:

(1) As a single-price pool to those whose combination finished in correct sequence as the first three betting interests; but if there are no such wagers, then

(2) As a single-price pool to those whose combination included, in correct sequence, the first two betting interests; but if there are no such wagers, then

(3) As a single-price pool to those whose combination correctly selected the first-place betting interest only; but if there are no such wagers, then

(4) The entire pool shall be refunded on trifecta wagers for that contest.

c. If less than three betting interests finish and the contest is declared official, payoffs will be made based upon the order of finish of those betting interests completing the contest. The balance of any selection beyond the number of betting interests completing the contest shall be ignored.

d. If there is a dead heat for first involving:

(1) Contestants representing three or more betting interests, all of the wagering combinations selecting three or more betting interests which correspond with any of the betting interests involved in the dead heat shall share in a profit split.

(2) Contestants representing two betting interests, both of the wagering combinations selecting the two dead-heated betting interests, irrespective of order, along with the third-place betting interest shall share in a profit split.

e. If there is a dead heat for second, all of the combinations correctly selecting the winner combined with any of the betting interests involved in the dead heat for second shall share in a profit split.

f. If there is a dead heat for third, all wagering combinations correctly selecting the first two finishers, in correct sequence, along with any of the betting interests involved in the dead heat for third shall share in a profit split.

g. Coupled entries and mutuel fields shall be allowed in trifecta contests.

h. Rescinded IAB 10/18/00, effective 11/22/00.

8.3(13) *Superfecta pools.*

a. The superfecta requires selection of the first four finishers, in their exact order, for a single contest.

b. The net superfecta pool shall be distributed to winning wagers in the following precedence, based upon the official order of finish:

(1) As a single-price pool to those whose combination finished in correct sequence as the first four betting interests; but if there are no such wagers, then

(2) As a single-price pool to those whose combination included, in correct sequence, the first three betting interests; but if there are no such wagers, then

(3) As a single-price pool to those whose combination included, in correct sequence, the first two betting interests; but if there are no such wagers, then

8.5(3) *Host state participation in merged pools.*

a. With the prior approval of the commission representative, an association licensed to conduct pari-mutuel wagering may determine that one or more of its contests be utilized for pari-mutuel wagering at guest facilities in other states and may also determine that pari-mutuel pools in guest states be combined with corresponding wagering pools established by it as the host association or comparable wagering pools established by two or more states.

b. When takeout rates in the merged pool are identical, the net-price calculation shall be the method by which the differing takeout rates are applied.

c. Rules of racing established for races held in this state shall also apply to interstate common pools unless the commission representative shall specifically determine otherwise.

d. The commission representative shall approve agreements made between the association and other participants in interstate common pools governing the distribution of breakage between the jurisdictions.

e. Any contract for interstate common pools entered into by the association shall contain a provision to the effect that if, for any reason, it becomes impossible to successfully merge the bets placed in another state into the interstate common pool formed by the association or if, for any reason, the commission representative or association determines that attempting to effect transfer of pool data from the guest state may endanger the association's wagering pool, the association shall have no liability for any measure taken which may result in the guest's wagers not being accepted into the pool.

8.5(4) *Takeout rates in interstate common pools.*

a. With the prior approval of the commission representative, an association wishing to participate in an interstate common pool may change its takeout rate so as to achieve a common takeout rate with all other participants in the interstate common pool.

b. An association wishing to participate in an interstate common pool may request that the commission representative approve a methodology whereby host association and guest association states with different takeout rates for corresponding pari-mutuel pools may effectively and equitably combine wagers from the different states into an interstate common pool.

These rules are intended to implement Iowa Code chapter 99D.

[Filed 4/5/85, Notice 2/27/85—published 4/24/85, effective 5/29/85]
[Filed emergency 9/4/85—published 9/25/85, effective 9/4/85]
[Filed emergency 2/27/86—published 3/26/86, effective 2/27/86]
[Filed emergency 4/14/86—published 5/7/86, effective 4/15/86]
[Filed emergency 10/20/86—published 11/19/86, effective 10/20/86]
[Filed 10/20/86, Notice 7/30/86—published 11/19/86, effective 12/24/86]
[Filed emergency 12/23/86—published 1/14/87, effective 1/14/87]
[Filed emergency 1/15/87—published 2/11/87, effective 2/6/87]
[Filed 3/6/87, Notice 1/14/87—published 3/25/87, effective 4/29/87]
[Filed 6/11/87, Notice 4/8/87—published 7/1/87, effective 8/6/87]
[Filed 10/23/87, Notice 9/9/87—published 11/18/87, effective 12/23/87]
[Filed 11/18/87, Notice 10/7/87—published 12/16/87, effective 1/20/88]
[Filed emergency 2/17/88—published 3/9/88, effective 2/17/88]
[Filed emergency 4/11/88 after Notice 2/10/88—published 5/4/88, effective 4/11/88]
[Filed 4/11/88, Notice 2/10/88—published 5/4/88, effective 6/8/88]
[Filed 5/13/88, Notice 3/9/88—published 6/1/88, effective 7/6/88]
[Filed 11/4/88, Notice 9/21/88—published 11/30/88, effective 1/4/89]
[Filed emergency 12/19/88—published 1/11/89, effective 12/23/88]
[Filed 2/17/89, Notice 1/11/89—published 3/8/89, effective 4/12/89]

[Filed 2/16/90, Notice 12/27/89—published 3/7/90, effective 4/11/90]
[Filed emergency 4/6/90—published 5/2/90, effective 4/6/90]
[Filed 5/21/90, Notice 4/4/90—published 6/13/90, effective 7/18/90]
[Filed 2/15/91, Notice 1/9/91—published 3/6/91, effective 4/10/91]
[Filed 12/6/91, Notice 10/16/91—published 12/25/91, effective 1/29/92]
[Filed emergency 3/27/92—published 4/15/92, effective 3/27/92]
[Filed 5/22/92, Notice 4/15/92—published 6/10/92, effective 7/15/92]
[Filed emergency 3/22/93—published 4/14/93, effective 3/30/93]
[Filed 3/22/93, Notice 1/6/93—published 4/14/93, effective 5/19/93]
[Filed 5/20/94, Notice 3/30/94—published 6/8/94, effective 7/13/94]
[Filed 7/22/94, Notice 6/8/94—published 8/17/94, effective 9/21/94]
[Filed 4/21/00, Notice 2/9/00—published 5/17/00, effective 6/21/00]
[Filed 8/18/00, Notice 7/12/00—published 9/6/00, effective 10/11/00]
[Filed 9/18/00, Notice 8/9/00—published 10/18/00, effective 11/22/00]

CHAPTER 10
THOROUGHBRED AND QUARTER HORSE RACING

491—10.1(99D) Terms defined. As used in the rules, unless the context otherwise requires, the following definitions apply:

"Age" means the age of a horse reckoned from the first day of January of the year of foaling.

"Allowance race" means an overnight race for which eligibility and weight to be carried are determined according to specified conditions that include age, sex, earnings, and number of wins.

"Also eligible" means:

1. A number of eligible horses, properly entered, which were not drawn for inclusion in a race but which become eligible according to preference or lot when an entry is scratched prior to the scratch time deadline; or

2. The next preferred nonqualifier for the finals or consolation from a set of elimination trials that will become eligible in the event a finalist is scratched by the stewards for a rule violation or is otherwise eligible if written race conditions permit.

"Appeal" means a request for the commission or its designee to investigate, consider, and review any decisions or rulings of stewards.

"Arrears" means all moneys owed by a licensee, including subscriptions, jockey fees, forfeitures, and any default incident to these rules.

"Authorized agent" means a person licensed by the commission and appointed by a written instrument, signed and acknowledged before a notary public by the owner on whose behalf the agent will act.

"Bleeder" means a horse that hemorrhages from within the respiratory tract during a race, within one and one-half hours postrace, during exercise or within one and one-half hours of exercise.

"Bleeder list" means a tabulation of all bleeders to be maintained by the commission.

"Chemist" means any official racing chemist designated by the commission.

"Claiming race" means a race which includes a condition that any horse starting the race may be claimed and purchased by any licensed owner, or person(s) approved by the commission for an owner's license, for an amount specified in the conditions for that race by the racing secretary.

"Commission" means the racing and gaming commission.

"Conditions" means qualifications that determine a horse's eligibility to be entered in a race.

"Contest" means a competitive racing event on which pari-mutuel wagering is conducted.

"Coupled entry" means two or more contestants in a contest that are treated as a single betting interest for pari-mutuel wagering purposes. (See also "Entry.")

"Day" means a 24-hour period ending at midnight.

"Dead heat" means when the noses of two or more horses reach the finish line of a race at the same time.

"Declaration" means the act of withdrawing an entered horse from a race prior to the closing of entries.

"Detention barn" means the barn designated for the collection from horses of test samples under the supervision of the commission veterinarian; also the barn assigned by the commission to a horse on the bleeder list, for occupancy as a prerequisite for receiving bleeder medication.

"Entry" means a horse made eligible to run in a race; or two or more horses, entered in the same race, which have common ties of ownership, lease, or training. (See also "Coupled entry.")

"Facility" means an entity licensed by the commission to conduct pari-mutuel wagering or gaming operations in Iowa.

"Facility grounds" means all real property utilized by the facility in the conduct of its race meeting, including the racetrack, grandstand, concession stands, offices, barns, stable area, employee housing facilities, parking lots, and any other areas under the jurisdiction of the commission.

"Field or mutuel field" means a group of two or more horses upon which a single bet may be placed. A mutuel field is required when the number of horses starting in a race exceeds the capacity of the track totalizator. The highest numbered horse within the totalizator capacity and all the higher-numbered horses following are then grouped together in the mutuel field.

"Foreign substances" means all substances except those that exist naturally in the untreated horse at normal physiological concentration.

"Forfeit" means money due from a licensee because of an error, fault, neglect of duty, breach of contract, or penalty imposed by the stewards or the commission.

"Handicap" means a race in which the weights to be carried by the horses are assigned by the racing secretary or handicapper for the purpose of equalizing the chances of winning for all horses entered.

"Horse" means any equine (including equine designated as a mare, filly, stallion, colt, ridgeling, or gelding) registered for racing; specifically, an entire male 5 years of age and older.

"Hypodermic injection" means any injection into or under the skin or mucosa, including intradermal injection, subcutaneous injection, submucosal injection, intramuscular injection, intravenous injection, intra-arterial injection, intra-articular injection, intrabursal injection, and intraocular (intraconjunctival) injection.

"Inquiry" means an investigation by the stewards of potential interference in a contest prior to declaring the result of said contest official.

"Jockey" means a professional rider licensed to ride in races.

"Licensee" means any person or entity licensed by the commission to engage in racing or related regulated activity.

"Maiden race" means a contest restricted to nonwinners.

"Meet/meeting" means the specified period and dates each year during which a facility is authorized by the commission to conduct pari-mutuel wagering on horse racing.

"Month" means a calendar month.

"Nomination" means the naming of a horse to a certain race or series of races generally accompanied by payment of a prescribed fee.

"Nominator" means the person or entity in whose name a horse is nominated for a race or series of races.

"Objection" means:

1. A written complaint made to the stewards concerning a horse entered in a race and filed not later than two hours prior to the scheduled post time of the first race on the day in which the questioned horse is entered; or
2. A verbal claim of foul in a race lodged by the horse's jockey, trainer, owner, or the owner's authorized agent before the race is declared official.

"Official starter" means the official responsible for dispatching the horses for a race.

"Official time" means the elapsed time from the moment the first horse crosses the starting point until the first horse crosses the finish line.

"Overnight race" means a race for which entries close 96 hours, or less, before the time set for the first race of the day on which the race is to be run.

"Owner" means a person or entity that holds any title, right or interest, whole or partial, in a horse, including the lessee and lessor of a horse.

"Paddock" means an enclosure in which horses scheduled to compete in a contest are saddled prior to racing.

"Performance" means a schedule of 9 to 11 races per day unless otherwise authorized by the commission.

"Post position" means the preassigned position from which a horse will leave the starting gate.

"Post time" means the scheduled starting time for a contest.

"Prize" means the combined total of any cash, premium, trophy, and object of value awarded to the owners of horses according to order of finish in a race.

"Purse" means the total cash amount for which a race is contested.

"Purse race" means a race for money or other prize to which the owners of horses entered do not contribute money toward its purse and for which entries close less than 96 hours prior to its running.

"Race" means a running contest between horses ridden by jockeys for a purse, prize, or other reward run at a facility in the presence of the stewards of the meeting. This includes purse races, overnight races and stakes races.

"Recognized meeting" means any meeting with regularly scheduled races for horses on the flat in a jurisdiction having reciprocal relations with this state and the commission for the mutual enforcement of rulings relating to horse racing.

"Rules" means the rules promulgated by the commission to regulate the conduct of horse racing.

"Scratch" means the act of withdrawing an entered horse from a contest after the closing of entries.

"Scratch time" means the deadline set by the facility for withdrawal of entries from a scheduled performance.

"Smoke" means the procedure of reviewing entries for correctness, eligibility, weight allowances, and medications.

"Stakes race" means a contest in which nomination, entry, and starting fees contribute to the purse.

"Starter" means a horse that becomes an actual contestant in a race by virtue of the starting gate opening in front of it upon dispatch by the official starter.

"Steward" means a duly appointed racing official with powers and duties specified by rules.

"Subscription" means moneys paid for nomination, entry, eligibility, or starting of a horse in a stakes race.

"Test level" means the concentration of a foreign substance found in the test sample.

"Test sample" means any bodily substance including, but not limited to, blood or urine taken from a horse under the supervision of the commission veterinarian and as prescribed by the commission for the purpose of analysis.

"Totalizator" means the system used for recording, calculating, and disseminating information about ticket sales, wagers, odds, and payoff prices to patrons at a pari-mutuel wagering facility.

"Veterinarian" means a veterinarian holding a current unrestricted license issued by the state of Iowa veterinary regulatory authority and licensed by the commission.

"Winner" means the horse whose nose reaches the finish line first or is placed first through disqualification by the stewards.

"Year" means a calendar year.

491—10.2(99D) Facilities' responsibilities.

10.2(1) *Stalls.* The facility shall ensure that racing animals are stabled in individual box stalls; that the stables and immediate surrounding area are maintained in approved sanitary condition at all times; that satisfactory drainage is provided; and that manure and other refuse are kept in separate boxes or containers at locations distant from living quarters and promptly and properly removed.

10.2(2) *Paddocks and equipment.* The facility shall ensure that paddocks, starting gates, and other equipment subject to contact by different animals are kept in a clean condition and free of dangerous surfaces.

10.2(3) *Receiving barn and stalls.* Each facility shall provide a conveniently located receiving barn or stalls for the use of horses arriving during the meeting. The barn shall have adequate stable room and facilities, hot and cold water, and stall bedding. The facility shall employ attendants to operate and maintain the receiving barn or stalls in a clean and healthy condition.

10.2(4) *Fire protection.* The facility shall develop and implement a program for fire prevention on facility grounds in accordance with applicable state fire codes. The facility shall instruct employees working on facility grounds in procedures for fire prevention and evacuation. The facility shall, in accordance with state fire codes, prohibit the following:

a. Smoking in horse stalls, feed and tack rooms, and in the alleyways.

b. Sleeping in feed rooms or stalls.

c. Open fires and oil- or gasoline-burning lanterns or lamps in the stable area.

d. Leaving any electrical appliance unattended or in unsafe proximity to walls, beds, or furnishings.

e. Keeping flammable materials, including cleaning fluids or solvents, in the stable area.

f. Locking a stall which is occupied by a horse.

The facility shall post a notice in the stable area which lists the prohibitions outlined in 10.2(4)*"a"* to *"f"* above.

10.2(5) *Starting gate.*

a. During racing hours a facility shall provide at least two operable padded starting gates that have been approved by the commission.

b. During designated training hours a facility shall make at least one starting gate and qualified starting gate employee available for schooling.

c. If a race is started at a place other than in a chute, the facility shall provide and maintain in good operating condition backup equipment for moving the starting gate. The backup equipment must be immediately available to replace the primary moving equipment in the event of failure.

10.2(6) *Distance markers.*

a. A facility shall provide and maintain starting point markers and distance poles in a size and position that can be clearly seen from the steward's stand.

b. The starting point markers and distance poles must be marked as follows:

1/4 poles	red and white horizontal stripes
1/8 poles	green and white horizontal stripes
1/16 poles	black and white horizontal stripes
220 yards	green and white
250 yards	blue
300 yards	yellow
330 yards	black and white
350 yards	red
400 yards	black
440 yards	red and white
550 yards	black and white horizontal stripes
660 yards	green and white horizontal stripes
770 yards	black and white horizontal stripes
870 yards	blue and white horizontal stripes

10.2(7) *Detention enclosure.* Each facility shall maintain a detention enclosure for use by the commission for securing samples of urine, saliva, blood, or other bodily substances or tissues for chemical analysis from horses who have run in a race. The enclosure shall include a wash rack, commission veterinarian office, a walking ring, at least four stalls, workroom for the sample collectors with hot and cold running water, and glass observation windows for viewing of the horses from the office and workroom. An owner, trainer, or designated representative licensed by the commission shall be with a horse in the detention barn at all times.

10.2(8) *Ambulance.* A facility shall maintain, on the grounds during every day that its track is open for racing or exercising, an ambulance for humans and an ambulance for horses, equipped according to prevailing standards and staffed by medical doctors, paramedics, or other personnel trained to operate them. When an ambulance is used for transfer of a horse or patient to medical facilities, a replacement ambulance must be furnished by the facility to comply with this rule.

10.2(9) *Helmets and vests.* A facility shall not allow any person to exercise any horse on facility grounds unless that person is wearing a protective helmet and safety vest of a type approved by the commission.

10.2(10) *Racetrack.*

a. The surface of a racetrack, including cushion, subsurface, and base, must be designed, constructed, and maintained to provide for the safety of the jockeys and racing animals.

b. Distances to be run shall be measured from the starting line at a distance three feet out from the inside rail.

c. A facility shall provide an adequate drainage system for the racetrack.

d. A facility shall provide adequate equipment and personnel to maintain the track surface in a safe training and racing condition. The facility shall provide backup equipment for maintaining the track surface. A facility that conducts races on a turf track shall:

(1) Maintain an adequate stockpile of growing medium; and

(2) Provide a system capable of adequately watering the entire turf course evenly.

e. Rails.

(1) Racetracks, including turf tracks, shall have inside and outside rails, including gap rails, designed, constructed, and maintained to provide for the safety of jockeys and horses. The design and construction of rails must be approved by the commission prior to the first race meeting at the track.

(2) The top of the rail must be at least 38 inches but not more than 44 inches above the top of the cushion. The inside rail shall have no less than a 24-inch overhang with a continuous smooth cover.

(3) All rails must be constructed of materials designed to withstand the impact of a horse running at a gallop.

10.2(11) *Patrol films or videotapes.* Each facility shall provide:

a. A videotaping system approved by the commission. Cameras must be located to provide clear panoramic and head-on views of each race. Separate monitors, which simultaneously display the images received from each camera and are capable of simultaneously displaying a synchronized view of the recordings of each race for review, shall be provided in the stewards' stand. The location and construction of video towers must be approved by the commission.

b. One camera, designated by the commission, to videotape the prerace loading of all horses into the starting gate and to continue to videotape them until the field is dispatched by the starter.

c. One camera, designated by the commission, to videotape the apparent winner of each race from the finish line until the horse has returned, the jockey has dismounted, and the equipment has been removed from the horse.

d. At the discretion of the stewards, video camera operators to videotape the activities of any horses or persons handling horses prior to, during, or following a race.

e. That races run on an oval track be recorded by at least three video cameras. Races run on a straight course must be recorded by at least two video cameras.

f. Upon request to the commission, without cost, a copy of a videotape of a race.

g. Videotapes recorded prior to, during, and following each race maintained by the facility for not less than six months after the end of the race meeting, or such other period as may be requested by the stewards or the commission.

h. A viewing room in which, on approval by the stewards, an owner, trainer, jockey, or other interested individual may view a videotape recording of a race.

i. Following any race in which there is an inquiry or objection, the videotaped replays of the incident in question which were utilized by the stewards in making their decision. The licensee shall display to the public these videotaped replays on designated monitors.

10.2(12) *Communications.*

a. Each facility shall provide and maintain in good working order a communication system between:

(1) The stewards' stand;

(2) The racing office;

(3) The tote room;

(4) The jockeys' room;

(5) The paddock;

(6) The test barn;

(7) The starting gate;

(8) The weigh-in scale;
(9) The video camera locations;
(10) The clocker's stand;
(11) The racing veterinarian;
(12) The track announcer;
(13) The location of the ambulances (equine and human); and
(14) Other locations and persons designated by the commission.

b. A facility shall provide and maintain a public address system capable of clearly transmitting announcements to the patrons and to the stable area.

491—10.3(99D) Facility policies. It shall be the affirmative responsibility and continuing duty of each occupational licensee to follow and comply with the facility policies as published in literature distributed by the facility or posted in a conspicuous location.

491—10.4(99D) Racing officials.

10.4(1) *General description.* Every facility conducting a race meeting shall appoint at least the following officials:

a. One of the members of a three-member board of stewards;
b. Racing secretary;
c. Assistant racing secretary;
d. Paddock judge;
e. Horse identifier;
f. Clerk of the course;
g. Starter;
h. Clocker/timer;
i. Three placing judges;
j. Jockey room custodian;
k. Mutuel manager;
l. Clerk of scales;
m. Minimum of two outriders;
n. Horsemen's bookkeeper;
o. Any other person designated by the commission.

10.4(2) *Officials' prohibited activities.* No racing official or racing official's assistant(s) listed in 10.4(1) while serving in that capacity during any meeting may engage in any of the following:

a. Enter into a business or employment that would be a conflict of interest, interfere with, or conflict with the proper discharge of duties including a business that does business with a facility or a business issued a concession operator's license;
b. Participate in the sale, purchase, or ownership of any horse racing at the meeting;
c. Be involved in any way in the purchase or sale of any contract on any jockey racing at the meeting;
d. Sell or solicit horse insurance on any horse racing at the meeting, or any other business sales or solicitation not a part of the official's duties;
e. Wager on the outcome of any race under the jurisdiction of the commission;
f. Accept or receive money or anything of value for the official's assistance in connection with the official's duties;
g. Consume or be under the influence of alcohol or any prohibited substance while performing official duties.

10.4(3) *Single official appointment.* No official appointed to any meeting, except placing judges, may hold more than one official position listed in 10.4(1) unless, in the determination of the stewards or commission, the holding of more than one appointment would not subject the official to a conflict of interest or duties in the two appointments.

10.4(4) *Stewards.* (For practice and procedure before the stewards and the commission, see 491—Chapter 4.)

a. General authority.

(1) General. The board of stewards for each racing meet shall be responsible to the commission for the conduct of the racing meet in accordance with the laws of this state and the rules adopted by the commission. The stewards shall have authority to regulate and to resolve conflicts or disputes between all other racing officials, licensees, and those persons addressed by 491—paragraph 4.6(5)*"e,"* which are reasonably related to the conduct of a race or races and to discipline violators of these rules in accordance with the provisions of these rules.

(2) Period of authority. The stewards' authority as set forth in this subrule shall commence 30 days prior to the beginning of each racing meet and shall terminate 30 days after the end of each racing meet or with the completion of their business pertaining to the meeting.

(3) Attendance. All three stewards shall be present in the stand during the running of each race.

(4) Appointment of substitute. Should any steward be absent at race time, the state steward(s) shall appoint a deputy for the absent steward. If any deputy steward is appointed, the commission shall be notified immediately by the stewards.

(5) Initiate action. The stewards shall take notice of questionable conduct or rule violations, with or without complaint, and shall initiate investigations promptly and render a decision on every objection and every complaint made to them.

(6) General enforcement provisions. Stewards shall enforce the laws of Iowa and the rules of the commission. The laws of Iowa and the rules of racing apply equally during periods of racing. They supersede the conditions of a race and the regulations of a racing meet and, in matters pertaining to racing, the orders of the stewards supersede the orders of the officers of the facility. The decision of the stewards as to the extent of a disqualification of any horse in any race shall be final for purposes of distribution of the pari-mutuel pool.

b. Other powers and authority.

(1) The stewards shall have the power to interpret the rules and to decide all questions not specifically covered by them.

(2) All questions within their authority shall be determined by a majority of the stewards.

(3) The stewards shall have control over and access to all areas of the facility grounds.

(4) The stewards shall have the authority to determine all questions arising with reference to entries and racing. Persons entering horses to run at licensed facilities agree in so doing to accept the decision of the stewards on any questions relating to a race or racing. The stewards, in their sole discretion, are authorized to determine whether two or more individuals or entities are operating as a single financial interest or as separate financial interests. In making this determination, the stewards shall consider all relevant information including, but not limited to, the following:

1. Whether the parties pay bills from and deposit receipts in the same accounts.
2. Whether the parties share resources such as employees, feed, supplies, veterinary and farrier services, exercise and pony riders, tack, and equipment.
3. Whether the parties switch horses or owner/trainer for no apparent reason, other than to avoid restrictions of being treated as a single interest.
4. Whether the parties engage in separate racing operations in other jurisdictions.
5. Whether the parties have claimed horses, or transferred claimed horses after the fact, for the other's benefit.
6. If owners, whether one owner is paying the expenses for horses not in the owner's name as owner.
7. If trainers, whether the relationship between the parties is more consistent with that of a trainer and assistant trainer.

(5) The stewards shall have the authority to discipline, for violation of the rules, any person subject to their control and, in their discretion, to impose fines or suspensions or both for infractions.

(6) The stewards shall have the authority to order the exclusion or ejection from all premises and enclosures of the facility any person who is disqualified for corrupt practices on any race course in any country.

(7) The stewards shall have the authority to call for proof that a horse is itself not disqualified in any respect, or nominated by, or, wholly or in part, the property of, a disqualified person. In default of proof being given to their satisfaction, the stewards may declare the horse disqualified.

(8) The stewards shall have the authority at any time to order an examination of any horse entered for a race or which has run in a race.

(9) In order to maintain necessary safety and health conditions and to protect the public confidence in horse racing as a sport, the stewards have the authority to authorize a person(s) on their behalf to enter into or upon the buildings, barns, motor vehicles, trailers, or other places within the grounds of a facility, to examine same, and to inspect and examine the person, personal property, and effects of any person within such place, and to seize any illegal articles or any items as evidence found.

(10) The stewards shall maintain a log of all infractions of the rules and of all rulings of the stewards upon matters coming before them during the race meet.

(11) The state stewards must give prior approval for any person other than the commissioners or commission representative to be allowed in the stewards' stand.

c. Emergency authority.

(1) Substitute officials. When in an emergency, any official is unable to discharge the official's duties, the stewards may approve the appointment of a substitute and shall report it immediately to the commission.

(2) Substitute jockeys. The stewards have the authority, in an emergency, to place a substitute jockey on any horse in the event the trainer does not do so. Before using that authority, the stewards shall in good faith attempt to inform the trainer of the emergency and to afford the trainer the opportunity to appoint a substitute jockey. If the trainer cannot be contacted, or if the trainer is contacted but fails to appoint a substitute jockey and inform the stewards of the substitution by 30 minutes prior to post time, then the stewards may appoint under this rule.

(3) Substitute trainer. The stewards have the authority in an emergency to designate a substitute trainer for any horse.

(4) Excuse horse. In case of accident or injury to a horse or any other emergency deemed by the stewards before the start of any race, the stewards may excuse the horse from starting.

(5) Exercise authority. No licensee may exercise a horse on the track between races unless upon the approval of the stewards.

(6) Nonstarter. At the discretion of the stewards, any horse(s) precluded from having a fair start may be declared a nonstarter, and any wagers involving said horse(s) may be ordered refunded.

d. Investigations and decisions.

(1) Investigations. The stewards may, upon direction of the commission, conduct inquiries and shall recommend to the commission the issuance of subpoenas to compel the attendance of witnesses and the production of reports, books, papers, and documents for any inquiry. The commission stewards have the power to administer oaths and examine witnesses. The stewards shall submit a written report to the commission of every such inquiry made by them.

(2) Form reversal. The stewards shall take notice of any marked reversal of form by any horse and shall conduct an inquiry of the horse's owner, trainer, or other persons connected with the horse including any person found to have contributed to the deliberate restraint or impediment of a horse in order to cause it not to win or finish as near as possible to first.

(3) Fouls.

1. Extent of disqualification. Upon any claim of foul submitted to them, the stewards shall determine the extent of any disqualification and place any horse found to be disqualified behind others in the race with which it interfered or may place the offending horse last in the race. The stewards at their discretion may determine if there was sufficient interference or intimidation to affect the outcome of the race and take the appropriate actions thereafter.

2. Coupled entry. When a horse is disqualified under 10.4(4)"*d*"(3)"1" and that horse was a part of a coupled entry and, in the opinion of the stewards, the act which led to the disqualification served to unduly benefit the other part of the coupled entry, the stewards may disqualify the other part of the entry.

3. Jockey guilty of foul. The stewards may discipline any jockey whose horse has been disqualified as a result of a foul committed during the running of a race.

(4) Protests and complaints. The stewards shall investigate promptly and render a decision in every protest and complaint made to them. They shall keep a record of all protests and complaints and any rulings made by the stewards and shall file reports daily with the commission.

1. Involving fraud. Protests involving fraud may be made by any person at any time. The protest must be made to the stewards.

2. Not involving fraud. Protests, except those involving fraud, may be filed only by the owner of a horse, authorized agent, trainer, or the jockey of the horse in the race over which the protest is made. The protest must be made to the clerk of scales, the stewards, or a person designated by the stewards before the race is declared official. If the placement of the starting gate is in error, no protest may be made, unless entered prior to the start of the race.

3. Protest to clerk of scales. A jockey who intends to enter a protest following the running of any race, and before the race is declared official, shall notify the clerk of scales, or a person designated by the stewards, of this intention immediately upon the arrival of the jockey at the scales.

4. Prize money of protested horse. During the time of determination of a protest, any money or prize won by a horse protested or otherwise affected by the outcome of the race shall be paid to and held by the horsemen's bookkeeper until the protest is decided.

5. Protest in writing. A protest, other than one arising out of the actual running of a race, must be in writing, signed by the complainant, and filed with the stewards not later than one hour before post time of the race out of which the protest arises.

6. Frivolous protests. No person shall make a frivolous protest nor may any person withdraw a protest without the permission of the stewards.

10.4(5) *Racing secretary.*

a. General authority. The racing secretary is responsible for setting the conditions for each race of the meeting, regulating the nomination of entries, determining the amounts of purses and to whom they are due, and recording of race results. The racing secretary shall permit no person other than licensed racing officials to enter the racing secretary's office or work areas until such time as all entries are closed, drawn, and smoked. Exceptions to this rule must be approved by the stewards.

b. Conditions. The racing secretary shall establish the conditions and eligibility for entering the races of the meeting and cause them to be published to owners, trainers, and the commission. Corrections to the conditions must be made within 24 hours of publication.

c. Posting of entries. Upon the closing of entries each day, the racing secretary shall post a list of entries in a conspicuous location in the office of the racing secretary and shall furnish that list to local newspaper, radio, and television stations.

d. Stakes and entrance money records. The secretary shall be caretaker of the permanent records of all stakes, entrance moneys, and arrears paid or due in a race meeting and shall keep permanent records of the results of each race of the meeting.

e. Record of racing. The racing secretary shall, no later than the day following each race, attach or endorse on the registration certificate of each horse winning in any race the fact of that winning performance and the distance, date of the race, and the type or conditions of the race.

f. Naming/engaging of riders. Riders must be named at the time of entry or no later than scratch time. Before naming any rider, the trainer, owner, or other person authorized must first engage the services of the rider and state on the entry or to the clerk of scales whether it is a first or second call. Riders properly engaged must fulfill their engagements as required in 10.5(2)*"l."*

g. Handicapping. The racing secretary, or a handicapper assigned by the racing secretary, shall assign the weight to be carried by each horse in a handicap when weights are not stated in the condition of the race:

(1) Scale of weights for age. The scale of weights for age hereinafter listed shall be carried when conditions of races do not otherwise specify:

Distance	Age	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Two Years	X	X	X	X	X	X	X	105	108	111	114	114
HALF	Three Years	117	117	119	119	121	123	125	126	127	128	129	129
MILE	Four Years	130	130	130	130	130	130	130	130	130	130	130	130
	Five Years and Up	130	130	130	130	130	130	130	130	130	130	130	130
	Two Years	X	X	X	X	X	X	X	102	105	108	111	111
SIX	Three Years	114	114	117	117	119	121	123	125	126	127	128	128
FURLONGS	Four Years	129	129	130	130	130	130	130	130	130	130	130	130
	Five Years and Up	130	130	130	130	130	130	130	130	130	130	130	130
	Two Years	X	X	X	X	X	X	X	X	96	99	102	102
ONE	Three Years	107	107	111	111	113	115	117	119	121	122	123	123
MILE	Four Years	127	127	128	128	127	126	126	126	126	126	126	126
	Five Years and Up	128	128	128	128	127	126	126	126	126	126	126	126
	Two Years	X	X	X	X	X	X	X	X	X	X	X	X
MILE AND	Three Years	101	101	107	107	111	113	116	118	120	121	122	122
A QUARTER	Four Years	125	125	127	127	127	126	126	126	126	126	126	126
	Five Years and Up	127	127	127	127	127	126	126	126	126	126	126	126
	Two Years	X	X	X	X	X	X	X	X	X	X	X	X
MILE AND	Three Years	98	98	104	104	108	111	114	117	119	121	122	122
A HALF	Four Years	124	124	126	126	126	126	126	126	126	126	126	126
	Five Years and Up	126	126	126	126	126	126	126	126	126	126	126	126

	Two Years	X	X	X	X	X	X	X	X	X	X	X	X
TWO MILES	Three Years	96	96	102	102	106	109	112	114	117	119	120	120
	Four Years	124	124	126	126	126	126	126	125	125	124	124	124
	Five Years and Up	126	126	126	126	126	126	126	125	125	124	124	124

(2) Weights listed.

1. In races of intermediate lengths, the weights for the shorter distance shall be carried.
2. In a race exclusively for two-year-olds, the weight shall be 122 pounds.
3. In a race exclusively for three-year-olds or four-year-olds, the weight shall be 126 pounds.

(3) Minimum weight.

1. Thoroughbreds. In all overnight races for two-year-olds, three-year-olds, or four-year-olds and older, the minimum weight shall be 112 pounds, subject to sex and apprentice allowance. This rule shall not apply to handicaps or to races written for three-year-olds and older.

2. Quarter horse and mixed races. In all overnight races for two-year-olds, the weight shall be 120 pounds; for three-year-olds, the weight shall be 122 pounds; and for four-year-olds and older, the weight shall be 124 pounds.

3. Quarter horse and mixed races. In qualifying for a speed index, standard weight shall be 120 pounds. Should any horse carry less than this amount in a race, one-tenth of a second will be added to the official time for each four pounds or fraction thereof less than 120 pounds.

(4) Sex allowances. For thoroughbred racing only, sex allowances are obligatory. In all races except stakes, handicaps, and races where the conditions expressly state to the contrary, two-year-old fillies are allowed three pounds; mares three years old and older are allowed five pounds before September 1 and three pounds thereafter. Sex allowances are not applicable for quarter horse or mixed races.

h. Penalties not cumulative. Penalties and weight allowances are not cumulative unless so declared in the conditions of a race by the racing secretary.

i. Winnings.

(1) All inclusive. For the purpose of the setting of conditions by the racing secretary, winnings shall be considered to include all moneys and prizes won up to the time of the start of a race, including those races outside the United States. Foreign winnings shall be determined on the basis of the normal rate of exchange prevailing on the day of the win.

(2) Winnings considered from January 1. Winnings during the year shall be reckoned by the racing secretary from the preceding January 1.

(3) Winner of a certain sum. "Winner of a certain sum" means the winner of a single race of that sum, unless otherwise expressed in the condition book by the racing secretary. In determining the net value to the winner of any race, the sums contributed by its owner or nominator shall be deducted from the amount won. In all stakes races, the winnings shall be computed on the value of the gross earnings.

(4) Winner's award. Unless the conditions of a race provide otherwise, the entrance money, starting and subscription fees, and other contributions shall go to the winner of the race. If for any reason a race is not run, those entrance, starting, and subscription fees shall be returned to the nominators.

j. Cancellation of a race. The racing secretary has the authority to withdraw, cancel, or change any race which has not been closed. In the event the canceled race is a stakes race, all subscriptions and fees paid in connection with the race shall be refunded.

k. Coggins test. The racing secretary shall ensure that all horses have a current negative Coggins test. The racing secretary shall report all expired certificates to the stewards.

l. Registrations and supporting documents. The racing secretary shall be responsible for receiving, inspecting, and safeguarding all registrations and supporting documents submitted by the trainer while the horses are located on facility grounds. Upon notification from a trainer of an alteration of the sex of a horse, the racing secretary shall note such alteration on the certificate of registration. Disclosure is made for the benefit of the public and all documents pertaining to the ownership or lease of a horse filed with the racing secretary shall be available for public inspection.

10.4(6) *Paddock judge.*

a. General authority. The paddock judge shall:

(1) Supervise the assembly of horses in the paddock no later than 15 minutes before the scheduled post time for each race;

(2) Maintain a written record of all equipment, inspect all equipment of each horse saddled, and report any change thereof to the stewards;

(3) Prohibit any change of equipment without the approval of the stewards;

(4) Ensure that the saddling of all horses is orderly, open to public view, free from public interference, and that horses are mounted at the same time and leave the paddock for the post in proper sequence;

(5) Supervise paddock schooling of all horses approved for such by the stewards;

(6) Report to the stewards any observed cruelty to a horse; and

(7) Ensure that only properly authorized persons are permitted in the paddock.

b. Paddock judge's list.

(1) The paddock judge shall maintain a list of horses which shall not be entered in a race because of poor or inconsistent behavior in the paddock that endangers the health or safety of other participants in racing.

(2) At the end of each day, the paddock judge shall provide a copy of the list to the stewards.

(3) To be removed from the paddock judge's list, a horse must be schooled in the paddock and demonstrate to the satisfaction of the paddock judge and the stewards that the horse is capable of performing safely in the paddock.

10.4(7) *Horse identifier.* The horse identifier shall:

a. When required, ensure the safekeeping of registration certificates and racing permits for horses stabled or racing on facility grounds;

b. Inspect documents of ownership, eligibility, registration, or breeding necessary to ensure the proper identification of each horse scheduled to compete at a race meeting;

c. Examine every starter in the paddock for sex, color, markings, and lip tattoo for comparison with its registration certificate to verify the horse's identity;

d. Supervise the tattooing or branding for identification of any horse located on facility grounds; and

e. Report to the stewards any horse not properly identified or whose registration certificate is not in conformity with these rules.

10.4(8) *Starter.*

a. General authority. The starter shall:

(1) Have complete jurisdiction over the starting gate, the starting of horses, and the authority to give orders not in conflict with the rules as may be required to ensure all participants an equal opportunity to a fair start;

(2) Appoint and supervise assistant starters who have demonstrated they are adequately trained to safely handle horses in the starting gate. In emergency situations, the starter may appoint qualified individuals to act as substitute assistant starters;

(3) Assign the starting gate stall positions to assistant starters and notify the assistant starters of their respective stall positions more than ten minutes before post time for the race;

(4) Assess the ability of each person applying for a jockey's license in breaking from the starting gate and working a horse in the company of other horses, and make said assessment known to the stewards; and

(5) Load horses into the gate in any order deemed necessary to ensure a safe and fair start.

b. Assistant starters. With respect to an official race, the assistant starters shall not:

(1) Handle or take charge of any horse in the starting gate without the expressed permission of the starter;

(2) Impede the start of a race;

(3) Apply a whip or other device, with the exception of steward-approved tongs, to assist in loading a horse into the starting gate;

(4) Slap, boot, or otherwise dispatch a horse from the starting gate;

(5) Strike or use abusive language to a jockey; or

(6) Accept or solicit any gratuity or payment other than their regular salary, directly or indirectly, for services in starting a race.

c. Starter's list. No horse shall be permitted to start in a race unless approval is given by the starter. The starter shall maintain a starter's list of all horses which are ineligible to be entered in any race because of poor or inconsistent behavior or performance in the starting gate. Any horse on the starter's list shall be refused entry until the horse has demonstrated to the starter that it has been satisfactorily schooled in the gate and can be removed from the starter's list. Schooling shall be under the direct supervision of the starter.

10.4(9) *Timer/clocker.*

a. General authority—timer.

(1) The timer shall accurately record the official time.

(2) At the end of a race, the timer shall post the official running time on the infield totalizator board on instruction by the stewards.

(3) At a facility equipped with an appropriate infield totalizator board, the timer shall post the quarter times (splits) for thoroughbred races in fractions as a race is being run. For quarter horse races, the timer shall post the official times in hundredths of a second.

(4) For backup purposes, the timer shall also use a stopwatch to time all races. In time trials, the timer shall ensure that at least two stopwatches are used by the stewards or their representatives.

(5) The timer shall maintain, and make available for inspection by the stewards or the commission on request, a written record of fractional and finish times of each race.

b. General authority—clocker.

(1) The clocker shall be present during training hours at each track on facility grounds which is open for training to identify each horse working out and to accurately record the distances and times of each horse's workout.

(2) Each day, the clocker shall prepare a list of workouts that includes the name of each horse which worked along with the distance and time of each horse's workout.

(3) At the conclusion of training hours, the clocker shall deliver a copy of the list of workouts to the stewards and the racing secretary.

10.4(10) *Placing judges.*

a. General authority. The placing judges shall determine the order of finish in a race as the horses pass the finish line and, with the approval of the stewards, may display the results on the totalizator board.

b. Photo finish.

(1) In the event the placing judges or the stewards request a photo of the finish, the photo finish sign shall be posted on the totalizator board.

(2) Following their review of the photo finish film strip, the placing judges shall, with the approval of the stewards, determine the exact order of finish for all horses participating in the race, and shall immediately post the numbers of the first four finishers on the totalizator board.

(3) In the event a photo was requested, the placing judges shall cause a photographic print of said finish to be produced. The finish photograph shall, when needed, be used by the placing judges as an aid in determining the correct order of finish.

(4) Upon determination of the correct order of finish of a race in which the placing judges have utilized a photographic print to determine the first four finishers, the placing judges shall cause prints of said photograph to be displayed publicly in the grandstand and clubhouse areas of the facility.

c. Dead heats.

(1) In the event the placing judges determine that two or more horses finished the race simultaneously and cannot be separated as to their order of finish, a dead heat shall, with the approval of the stewards, be declared.

(2) In the event one or more of the first four finishers of a race are involved in a dead heat, the placing judges shall post the dead heat sign on the totalizator board and cause the numbers of the horse or horses involved to blink on the totalizator board.

10.4(11) *Jockey room custodian.* The jockey room custodian shall:

a. Supervise the conduct of the jockeys and their attendants while they are in the jockey room;

b. Keep the jockey room clean and safe for all jockeys;

c. Ensure all jockeys are in the correct colors before leaving the jockey room to prepare for mounting their horses;

d. Keep a daily film list as dictated by the stewards and have it displayed in plain view for all jockeys;

e. Keep a daily program displayed in plain view for the jockeys;

f. Keep unauthorized persons out of the jockey room;

g. Report to the stewards any unusual occurrences in the jockey room;

h. Assist the clerk of scales as required;

i. Supervise the care and storage of racing colors; and

j. Assign to each jockey a locker, capable of being locked, for the use of storing the jockey's clothing, equipment, and personal effects.

10.4(12) *Mutuel manager.* The mutuel manager is responsible for the operation of the mutuel department. The mutuel manager shall ensure that any delays in the running of official races caused by totalizator malfunctions are reported to the stewards. The mutuel manager shall submit a written report on any delay when requested by the state steward.

10.4(13) *Clerk of scales.* The clerk of scales shall:

a. Verify the presence of all jockeys in the jockey room at the appointed time;

b. Verify that each jockey has a current jockey's license issued by the commission;

c. Verify the correct weight of each jockey at the time of weighing out and weighing in and report any discrepancies to the stewards immediately;

d. Oversee the security of the jockey room including the conduct of the jockeys and their attendants;

e. Record all required data on the scale sheet and submit that data to the horsemen's bookkeeper at the end of each race day;

f. Maintain the record of applicable winning races on all apprentice certificates at the meeting;

g. Release apprentice jockey certificates, upon the jockey's departure or upon the conclusion of the race meet; and

h. Assume the duties of the jockey room custodian in the absence of such employee.

10.4(14) *Outrider.*

a. The facility shall appoint a minimum of two outriders on the main track for each race of a performance and during workouts. The facility shall appoint one outrider on the training track during all workouts. The outriders must be neat in appearance, wear approved helmets with the chin straps securely fastened, and wear approved safety vests while on the main track or training track.

b. The outriders shall:

(1) Accompany the field of horses from the paddock to the post;

(2) Ensure the post parade is conducted in an orderly manner, with all jockeys and pony riders conducting themselves in a manner in conformity with the best interests of racing as determined by the board of stewards;

(3) Assist jockeys with unruly horses;

(4) Render assistance when requested by a jockey;

(5) Be present during morning workouts to assist exercise riders as required by regulations;

(6) Promptly report to the stewards any unusual conduct which occurs while performing the duties of an outrider;

(7) Ensure individuals using the track(s) are appropriately licensed; and

(8) Promptly report jockey objections to the stewards after the finish of each race.

10.4(15) *Horsemen's bookkeeper.*

a. General authority. The horsemen's bookkeeper shall maintain the records and accounts and perform the duties described herein and maintain such other records and accounts and perform such other duties as the facility and commission may prescribe.

b. Records.

(1) The records shall include the name, mailing address, social security number or federal tax identification number, and the state or country of residence of each horse owner, trainer, or jockey participating at the race meeting who has funds due or on deposit in the horsemen's account.

(2) The records shall include a file of all required statements of partnerships, syndicates, corporations, assignments of interest, lease agreements, and registrations of authorized agents.

(3) All records of the horsemen's bookkeeper shall be kept separate and apart from the records of the facility.

(4) All records of the horsemen's bookkeeper including records of accounts and moneys and funds kept on deposit are subject to inspection by the commission at any time.

c. Moneys and funds on account.

(1) All moneys and funds on account with the horsemen's bookkeeper shall be maintained:

1. Separate and apart from moneys and funds of the facility;

2. In a trust account designated as "horsemen's trust account"; and

3. In an account insured by the Federal Deposit Insurance Corporation or the Federal Savings and Loan Insurance Corporation.

(2) The horsemen's bookkeeper shall be bonded.

d. Payment of purses.

(1) The horsemen's bookkeeper shall receive, maintain, and disburse the purses of each race and all stakes, entrance money, jockey fees, purchase money in claiming races, all applicable taxes, and other moneys that properly come into the horsemen's bookkeeper's possession in accordance with the provisions of commission rules.

(2) The horsemen's bookkeeper may accept moneys due, belonging to other organizations or recognized meetings, provided prompt return is made to the organization to which the money is due.

(3) The horsemen's bookkeeper shall disburse the purse of each race and all stakes, entrance money, jockey fees, purchase money in claiming races, and all applicable taxes, upon request, within 48 hours of receipt of notification that all tests with respect to such races have cleared the drug testing laboratory (commission chemist) as reported by the stewards. Minimum jockey mount fees may be disbursed prior to notification that the tests have cleared the testing laboratory.

(4) Absent a prior request, the horsemen's bookkeeper shall disburse moneys to the persons entitled to receive same within 15 days after the last race day of the race meeting, including purses for official races, provided that all tests with respect to such races have cleared the drug testing laboratory as reported by the stewards, and provided further that no protest or appeal has been filed with the stewards or the commission.

(5) In the event a protest or appeal has been filed with the stewards or the commission, the horsemen's bookkeeper shall disburse the purse within 48 hours of receipt of dismissal or a final nonappealable order disposing of such protest or appeal.

e. No portion of purse money other than jockey fees shall be deducted by the facility for itself or for another, unless so requested in writing by the person to whom purse moneys are payable or the person's duly authorized representative. The horsemen's bookkeeper shall mail to each owner a duplicate of each record of all deposits, withdrawals, or transfers of funds affecting the owner's racing account at the close of each race meeting.

10.4(16) *Patrol judges.*

a. General authority. A facility may employ patrol judges who shall observe the running of the race and report information concerning the running of the race to the stewards.

b. Duty stations. Each patrol judge shall have a duty station assigned by the stewards.

10.4(17) *Commission veterinarians.*

a. The veterinarians shall advise the commission and the stewards on all veterinary matters.

b. The commission veterinarians shall have supervision and control of the detention barn for the collection of test samples for the testing of horses for prohibited medication as provided in Iowa Code sections 99D.23(2) and 99D.25(9). The commission may employ persons to assist the commission veterinarians in maintaining the detention barn area and collecting test samples.

c. The commission veterinarians shall not buy or sell any horse under their supervision; wager on a race under their supervision; or be licensed to participate in racing in any other capacity.

d. The stewards or commission veterinarians may request any horse entered in a race to undergo an examination on the day of the race to determine the general fitness of the horse for racing. During the examination, all bandages shall be removed by the groom upon request and the horse may be exercised outside the stall to permit the examiner to determine the condition of the horse's legs and feet. The examining veterinarian shall report any unsoundness in a horse to the stewards.

e. A commission veterinarian shall inspect all of the horses in a race at the starting gate and after the finish of a race shall observe the horses upon their leaving the track.

f. The commission veterinarian shall place any horse determined to be sick or too unsafe, unsound, or unfit to race on a veterinarian's list that shall be posted in a conspicuous place available to all owners, trainers, and officials.

g. A horse placed on the veterinarian's list, bleeders exempt, may be allowed to enter only after it has been removed from the list by the commission veterinarian. Requests for the removal of any horse from the veterinarian's list will be accepted only after three calendar days from the placing of the horse on the veterinarian's list have elapsed. Removal from the list will be at the discretion of the commission veterinarian who may require satisfactory workouts or examinations to adequately demonstrate that the problem that caused the horse to be placed on the list has been rectified.

h. The commission veterinarians shall supervise and ensure that the administration of lasix and phenylbutazone is in compliance with Iowa Code section 99D.25A.

i. The commission veterinarians shall, in accordance with Iowa Code section 99D.25A, be present at all postmortem examinations on all horses which have expired or been euthanized on facility grounds.

j. The commission veterinarian or commission representative shall take receipt of veterinary reports as required by Iowa Code section 99D.25(10).

491—10.5(99D) Trainer, jockey, and jockey agent responsibilities.

10.5(1) *Trainer.*

a. Responsibility. The trainer is responsible for:

(1) The condition of horses entered in an official workout or race and, in the absence of substantial evidence to the contrary, for the presence of any prohibited drug, medication or other substance, including permitted medication in excess of the maximum allowable level, in such horses, regardless of the acts of third parties. A positive test for a prohibited drug, medication, or substance, including permitted medication in excess of the maximum allowable level, as reported by a commission-approved laboratory, is prima facie evidence of a violation of this rule or Iowa Code chapter 99D.

(2) Preventing the administration of any drug, medication, or other prohibited substance that may cause a violation of these rules.

(3) Any violation of rules regarding a claimed horse's participation in the race in which the trainer's horse is claimed.

(4) The condition and contents of stalls, tack rooms, feed rooms, sleeping rooms, and other areas which have been assigned to the trainer by the facility and maintaining the assigned stable area in a clean, neat, and sanitary condition at all times.

(5) Ensuring that fire prevention rules are strictly observed in the assigned stable area.

(6) Providing a list to the commission of the trainer's employees in any area under the jurisdiction of the commission. The list shall include each employee's name, occupation, social security number, and occupational license number. The commission shall be notified by the trainer, in writing, within 24 hours of any change.

(7) The proper identity, custody, care, health, condition, and safety of horses in the trainer's charge.

(8) Disclosure to the racing secretary of the true and entire ownership of each horse in the trainer's care, custody, or control. Any change in ownership shall be reported immediately to, and approved by, the stewards and recorded by the racing secretary. The disclosure, together with all written agreements and affidavits setting out oral agreements pertaining to the ownership for or rights in and to a horse, shall be attached to the registration certificate for the horse and filed with the racing secretary.

(9) Training all horses owned wholly or in part by the trainer which are participating at the race meeting.

(10) Registering with the racing secretary each horse in the trainer's charge within 24 hours of the horse's arrival on facility grounds.

(11) Ensuring that, at the time of arrival at the facility, each horse in the trainer's care is accompanied by a valid health certificate which shall be filed with the racing secretary.

(12) Having each horse in the trainer's care that is racing or stabled on facility grounds tested for equine infectious anemia (EIA) in accordance with state law and for filing evidence of such negative test results with the racing secretary. The test must have been conducted within the previous 12 months and must be repeated upon expiration. The certificate must be attached to the foal certificate.

(13) Using the services of those veterinarians licensed by the commission to attend horses that are on facility grounds.

(14) Immediately reporting the alteration of the sex of a horse in the trainer's care to the horse identifier and the racing secretary.

(15) Promptly reporting to the racing secretary and the commission veterinarian any horse on which a posterior digital neurectomy (heel nerving) has been performed and ensuring that such fact is designated on its certificate of registration. See Iowa Code subsections 99D.25(1) to 99D.25(3).

(16) Promptly reporting to the stewards and the commission veterinarian the serious illness of any horse in the trainer's charge.

(17) Promptly reporting the death of any horse in the trainer's care on facility grounds to the stewards, owner, and the commission veterinarian and complying with Iowa Code subsection 99D.25(5) governing postmortem examination.

(18) Maintaining a knowledge of the medication record and status of all horses in the trainer's care.

(19) Immediately reporting to the stewards and the commission veterinarian if the trainer knows, or has cause to believe, that a horse in the trainer's custody, care, or control has received any prohibited drugs or medication.

(20) Representing an owner in making entries and scratches and in all other matters pertaining to racing.

(21) Eligibility of horses entered and weight or other allowance claimed.

(22) Ensuring the fitness of a horse to perform creditably at the distance entered.

(23) Ensuring that the trainer's horses are properly shod, bandaged, and equipped.

(24) Presenting the trainer's horse in the paddock at least 20 minutes before post time or at a time otherwise appointed before the race in which the horse is entered.

(25) Personally attending to the trainer's horses in the paddock and supervising the saddling thereof, unless excused by the stewards.

(26) Instructing the jockey to give the jockey's best effort during a race and instructing the jockey that each horse shall be ridden to win.

(27) Attending the collection of a urine or blood sample from the horse in the trainer's charge or delegating a licensed employee or the owner of the horse to do so.

(28) Notifying horse owners upon the revocation or suspension of the trainer's license. Upon application by the owner, the stewards may approve the transfer of such horses to the care of another licensed trainer and, upon such approved transfer, such horses may be entered to race.

b. Restrictions on wagering. A trainer with a horse(s) entered in a race shall be allowed to wager only on that horse(s) or that horse(s) in combination with other horses.

c. Assistant trainers.

(1) Upon the demonstration of a valid need, a trainer may employ an assistant trainer as approved by the stewards. The assistant trainer shall be licensed prior to acting in such capacity on behalf of the trainer.

(2) Qualifications for obtaining an assistant trainer's license shall be prescribed by the stewards and the commission and may include requirements set forth in 491—Chapter 6.

(3) An assistant trainer may substitute for and shall assume the same duties, responsibilities and restrictions as are imposed on the licensed trainer, in which case the trainer shall be jointly responsible for the assistant trainer's compliance with the rules.

d. Substitute trainers.

(1) A trainer absent for more than five days from responsibility as a licensed trainer, or on a day in which the trainer has a horse in a race, shall obtain another licensed trainer to substitute.

(2) A substitute trainer shall accept responsibility for the horses in writing and shall be approved by the stewards.

(3) A substitute trainer and the absent trainer shall be jointly responsible as absolute insurers of the condition of their horses entered in an official workout or race.

10.5(2) *Jockey.*

a. Responsibility.

(1) A jockey shall give a best effort during a race, and each horse shall be ridden to win.

(2) A jockey shall not have a valet attendant except one provided and compensated by the facility.

(3) No person other than the licensed contract employer or a licensed jockey agent may make riding engagements for a rider, except that a jockey not represented by a jockey agent may make the jockey's own riding engagements.

(4) A jockey shall have no more than one jockey agent.

(5) No revocation of a jockey agent's authority is effective until the jockey notifies the stewards in writing of the revocation of the jockey agent's authority.

(6) A jockey shall promptly report objections to the outrider(s) following the finish of the race.

b. Jockey betting. A jockey shall be allowed to wager only on a race in which the jockey is riding. A jockey shall be allowed to wager only if:

(1) The owner or trainer of the horse that the jockey is riding makes the wager for the jockey;

(2) The jockey only wagers on the jockey's own mount to win or finish first in combination with other horses in multiple-type wagers; and

(3) Records of such wagers are kept and available for presentation upon request by the stewards.

c. Jockey's spouse. A jockey shall not compete in any race against a horse that is trained or owned by the jockey's spouse.

d. Jockey mount fees. In the absence of a specific contract or special agreement, the following jockey mount fees apply:

Purse	Winning Mount	2nd Place	3rd Place	Unplaced
$599 and under	$33	$33	$33	$33
$600 to $699	36	33	33	33
$700 to $1,499	10% Win Purse	33	33	33
$1,500 to $1,999	10% Win Purse	35	33	33
$2,000 to $3,499	10% Win Purse	45	40	38
$3,500 to $4,999	10% Win Purse	55	45	40
$5,000 to $9,999	10% Win Purse	65	50	45
$10,000 to $14,999	10% Win Purse	5% Place Purse	5% Show Purse	50
$15,000 to $24,999	10% Win Purse	5% Place Purse	5% Show Purse	55
$25,000 to $49,999	10% Win Purse	5% Place Purse	5% Show Purse	65
$50,000 to $99,999	10% Win Purse	5% Place Purse	5% Show Purse	80
$100,000 and up	10% Win Purse	5% Place Purse	5% Show Purse	105

e. Entitlement. Any apprentice or contract rider shall be entitled to the regular jockey fees, except when riding a horse owned in part or solely by the contract holder. An interest in the winnings only (such as trainer's percent) shall not constitute ownership.

f. Fee earned. A jockey's fee shall be considered earned when the jockey is weighed out by the clerk of scales. The fee shall not be considered earned when injury to the horse or rider is not involved and jockeys, of their own free will, take themselves off their mounts. Any conditions or considerations not covered by the above shall be at the discretion of the stewards.

g. Multiple engagements. If any owner or trainer engages two or more jockeys for the same race, the owner or trainer shall be required to pay each of the jockeys whether the jockeys ride in the race or not.

h. Dead heats. Jockeys finishing a race in a dead heat shall divide equally the totals they individually would have received had one jockey won the race alone. The owners of the horses finishing in the dead heat shall pay equal shares of the jockey fees.

i. Apprentices subject to jockey rules. Unless excepted under these rules, apprentices are subject to all rules governing jockeys and racing.

j. Conduct.

(1) Clothing and appearance. A jockey shall wear the colors furnished by the owner or facility with the number on the saddlecloth corresponding to the number given in the racing program. A jockey shall maintain a neat and clean appearance while engaged in duties on facility grounds and shall wear a clean jockey costume, cap, helmet (approved by commission), a jacket of silk or waterproof fabric, breeches, and top boots.

(2) Competing against contractor. No jockey may ride in any race against a starting horse belonging to the jockey's contract employer unless the jockey's mount and the contract employer's horse are both trained by the same trainer.

(3) Confined to jockey room. Jockeys engaged to ride a race shall report to the jockey room on the day of the race at the time designated by facility officials. The jockeys shall then report their engagements and any overweight to the clerk of scales. Thereafter, they shall not leave the jockey room, except by permission of the stewards, until all of their riding engagements of the day have been fulfilled. Once riders have fulfilled their riding engagements for the day and have left the jockeys' quarters, they shall not be readmitted to the jockeys' quarters until after the entire racing program for that day has been completed, except upon permission of the stewards. Jockeys are not allowed to communicate with anyone but the trainer or agent while in the room during the performance except with approval of stewards. On these occasions, they should be accompanied by a security guard.

(4) Whip prohibited. Jockeys may not use a whip on a two-year-old horse before April 1 of each year, nor shall a jockey or other person engage in excessive or indiscriminate whipping of any horse at any time.

(5) Spurs prohibited. Jockeys shall not use spurs.

(6) Possessing drugs or devices. Jockeys shall not have in their care, control, or custody any drugs, prohibited substances, or electrical or mechanical device that could affect a horse's racing performance.

k. Jockey effort. A jockey shall exert every effort to ride the horse to the finish in the best and fastest run of which the horse is capable. No jockey shall ease up or coast to a finish, without adequate cause, even if the horse has no apparent chance to win prize money.

l. Duty to fulfill engagements. Jockeys shall fulfill their duly scheduled riding engagements, unless excused by the stewards. Jockeys shall not be forced to ride a horse they believe to be unsound or over a racing strip they believe to be unsafe. If the stewards find a jockey's refusal to fulfill a riding engagement is based on personal belief unwarranted by the facts and circumstances, the jockey may be subject to disciplinary action. Jockeys shall be responsible to their agent for any engagements previously secured by the agent.

m. Riding interference.

(1) When the way is clear in a race, a horse may be ridden to any part of the course; but if any horse swerves, or is ridden to either side, so as to interfere with, impede, or intimidate any other horse, it is a foul.

(2) The offending horse may be disqualified if, in the opinion of the stewards, the foul altered the finish of the race, regardless of whether the foul was accidental, willful, or the result of careless riding.

(3) If the stewards determine the foul was intentional, or due to careless riding, the jockey shall be held responsible.

(4) In a straightaway race, every horse must maintain position as nearly as possible in the lane in which it started. If a horse is ridden, drifts, or swerves out of its lane in such a manner that it interferes with, impedes, or intimidates another horse, it is a foul and may result in the disqualification of the offending horse.

n. Jostling. Jockeys shall not jostle another horse or jockey. Jockeys shall not strike another horse or jockey or ride so carelessly as to cause injury or possible injury to another horse in the race.

o. Partial fault/third-party interference. If a horse or jockey interferes with or jostles another horse, the aggressor may be disqualified, unless the interfered or jostled horse or jockey was partly at fault or the infraction was wholly caused by the fault of some other horse or jockey.

p. Careless riding. A jockey shall not ride carelessly or willfully permit the mount to interfere with, intimidate, or impede any other horse in the race. A jockey shall not strike at another horse or jockey so as to impede, interfere with, or injure the other horse or jockey. If a jockey rides in a manner contrary to this rule, the horse may be disqualified; or the jockey may be fined, suspended, or otherwise disciplined; or other penalties may apply.

q. Jockey weighed out.

(1) Jockeys must be weighed for their assigned horse not more than 30 minutes before the time fixed for the race.

(2) A jockey's weight shall include the jockey's clothing, boots, saddle and its attachments. A safety vest shall be mandatory, shall weigh no more than two pounds, and shall be designed to provide shock-absorbing protection to the upper body of at least a rating of five as defined by the British Equestrian Trade Association.

(3) All other equipment shall be excluded from the weight.

r. Overweight limited. No jockey may weigh more than two pounds or, in the case of inclement weather, four pounds over the weight the horse is assigned to carry unless with consent of the owner or trainer and unless the jockey has declared the amount of overweight to the clerk of scales at least 45 minutes before the time of the race. However, a horse shall not carry more than seven pounds overweight, except in inclement weather when nine pounds shall be allowed. The overweight shall be publicly announced and posted in a conspicuous place both prior to the first race of the day and before the running of the race.

(1) Weigh in. Upon completion of a race, jockeys shall ride promptly to the winner's circle and dismount. Jockeys riding the first four finishers, or at the discretion of the stewards a greater number, shall present themselves to the clerk of scales to be weighed in. If a jockey is prevented from riding the mount to the winner's circle because of accident or illness either to the jockey or the horse, the jockey may walk or be carried to the scales unless excused by the stewards.

(2) Unsaddling. Jockeys, upon completion of a race, must return to the winner's circle and unsaddle their own horse, unless excused by the stewards.

(3) Removing horse's equipment. No person except the valet attendant for each mount is permitted to assist the jockey in removing the horse's equipment that is included in the jockey's weight, unless the stewards permit otherwise. To weigh in, jockeys shall carry to the scales all pieces of equipment with which they weighed out. Thereafter they may hand the equipment to the valet attendant.

(4) Underweight. When any horse places first, second, or third in a race, or is coupled in any form of multiple exotic wagering, and thereafter the horse's jockey is weighed in short by more than two pounds of the weight of which the jockey was weighed out, the mount may be disqualified and all purse moneys forfeited.

(5) Overweight. If the jockey is overweight, the mount may be disqualified and all purse moneys forfeited.

s. Contracts.

(1) Jockey contracts. A jockey may contract with an owner or trainer to furnish jockey services whenever the owner shall require; and, in that event, a jockey shall not ride or agree to ride in any race for any other person without the consent of the owner or trainer to whom the jockey is under contract.

(2) Apprentice contracts and transfers.

1. Owners or trainers and apprentices who are parties to contracts for apprentice jockey services shall file a copy of the contract with the commission, upon forms approved by the commission, and shall, upon any transfer, assignment, or amendment of the contract, immediately furnish a copy to the commission.

2. An apprentice jockey may not ride for a licensed owner or agent unless with the consent of the apprentice's contract employer.

(3) Contract condition. No person other than an owner, trainer, jockey agent, or authorized agent of an owner in good standing shall make engagements for an apprentice jockey or jockey. Jockeys not represented by an agent may make their own engagements.

t. Jockey fines and forfeitures. Jockeys shall pay any fine or forfeiture from their own funds within 48 hours of the imposition of the fine or at a time deemed proper by the stewards. No other person shall pay jockey fines or forfeitures for the jockey.

u. Competing claims. Whenever two or more licensees claim the services of one jockey for a race, first call shall have priority and any dispute shall be resolved by the stewards.

v. Jockey suspension.

(1) Offenses involving fraud. Suspension of a licensee for an offense involving fraud or deception in racing shall begin immediately after the ruling unless otherwise ordered by the stewards or commission.

(2) Offenses not involving fraud. Suspension for an offense not involving fraud or deception in racing shall begin on the third day after the ruling or at the stewards' discretion.

(3) Withdrawal of appeal. Withdrawal by the appellant of a notice of appeal filed with the commission, whenever imposition of the disciplinary action has been stayed or enjoined pending a final decision by the commission, shall be deemed a frivolous appeal and referred to the commission for further disciplinary action in the event the appellant fails to show good cause to the stewards why the withdrawal should not be deemed frivolous.

(4) Riding suspensions of ten days or less and participating in designated races. The stewards appointed for a race meeting shall immediately, prior to the commencement of that meeting, designate the stakes, futurities, futurity trials, or other races in which a jockey will be permitted to compete, notwithstanding the fact that such jockey is technically under suspension for ten days or less for a riding infraction at the time the designated race is to be run.

1. Official rulings for riding suspensions of ten days or less shall state: "The term of this suspension shall not prohibit participation in designated races."

2. A listing of the designated races shall be posted in the jockey room and any other such location deemed appropriate by the stewards.

3. A suspended jockey must be named at time of entry to participate in any designated race.

4. A day in which a jockey participated in one designated race while on suspension shall count as a suspension day. Designated trials for a futurity shall be considered as one race.

10.5(3) *Jockey agent.*

a. Responsibilities.

(1) A jockey agent shall not make or assist in making engagements for a jockey other than the jockeys the agent is licensed to represent.

(2) A jockey agent shall file written proof of all agencies and changes of agencies with the stewards.

(3) A jockey agent shall notify the stewards, in writing, prior to withdrawing from representation of a jockey and shall submit to the stewards a list of any unfulfilled engagements made for the jockey.

(4) All persons permitted to make riding engagements shall maintain current and accurate records of all engagements made. Such records shall be subject to examination by the stewards at any time.

b. Prohibited areas. A jockey agent is prohibited from entering the jockey room, winner's circle, racing strip, paddock, or saddling enclosure during the hours of racing, unless permitted by the stewards.

c. A jockey agent shall not be permitted to withdraw from the representation of any jockey unless written notice to the stewards has been provided.

491—10.6(99D) Conduct of races.

10.6(1) Horses ineligible. Any horse ineligible to be entered for a race, or ineligible to start in any race, which competes in that race may be disqualified and the stewards may discipline the persons responsible for the horse competing in that race.

a. A horse is ineligible to enter a race when:

(1) The nominator has failed to identify the horse which is being entered for the first time, by name, color, sex, age, and the names of sire and dam as registered.

(2) A horse has been knowingly entered or raced in any jurisdiction under a different name, with an altered registration certificate, or altered lip tattoo by a person having lawful custody or control of the horse for the purpose of deceiving any facility or regulatory agency.

(3) A horse has been allowed to enter or start by a person having lawful custody or control of the horse who participated in or assisted in the entry or racing of some other horse under the name of the horse in question.

(4) A horse is wholly or partially owned by a disqualified person or a horse is under the direct or indirect management of a disqualified person.

(5) A horse is wholly or partially owned by the spouse of a disqualified person or a horse is under the direct or indirect management of the spouse of a disqualified person. In such cases, a presumption which may be rebutted is that the disqualified person and spouse constitute a single financial entity with respect to the horse.

(6) A horse is owned in whole or in part by an undisclosed person or interest.

(7) A horse has been nerved by surgical neurectomy.

(8) A horse has been trachea-tubed to artificially assist breathing.

(9) A horse has impaired eyesight in both eyes.

(10) A horse appears on the starter's list, stewards' list, paddock list, or veterinarian's list, notwithstanding a horse appearing on the veterinarian's list as a "bleeder."

(11) A horse is barred from racing in any racing jurisdiction.

b. A horse is ineligible to start a race when:

(1) The horse is not stabled on the grounds of the facility by the time designated by the stewards.

(2) The horse's breed registration certificate is not on file with the racing secretary, or horse identifier, except in the case of a quarter horse where the racing secretary has submitted the certificate to the breed registry for correction. The stewards may, in their discretion, waive the requirement in nonclaiming races provided the horse is otherwise properly identified.

(3) The horse is not fully identified by an official tattoo on the inside of the upper lip.

(4) A horse is brought to the paddock and is not in the care of and saddled by a currently licensed trainer or assistant trainer.

(5) No current negative Coggins test or current negative equine infectious anemia test certificate is attached to the horse's registration certificate.

(6) The stakes or entrance money for the horse has not been paid.

(7) The horse appears on the starter's list, stewards' list, paddock list, or veterinarian's list.

(8) The horse is a first-time starter not approved by the starter and does not have a minimum of two published workouts.

(9) Within the past calendar year, the horse has started in a race that has not been reported in a nationally published monthly chartbook, unless, at least 48 hours prior to entry, the owner of the horse provides to the racing secretary performance records which show the place and date of the race, distance, weight carried, amount carried, and the horse's finishing position and time.

(10) In a stakes race, a horse has been transferred with its engagements, unless prior to the start, the fact of transfer of the horse and its engagements has been filed with the racing secretary.

(11) A horse is subject to a lien which has not been approved by the stewards and filed with the horsemen's bookkeeper.

(12) A horse is subject to a lease not filed with the stewards.

(13) A horse is not in sound racing condition.

(14) A horse has been blocked with alcohol or injected with any other foreign substance or drug to desensitize the nerves of the leg.

(15) A horse appears on the veterinarian's list as a "bleeder."

10.6(2) Entries.

a. The facility shall provide forms for making entries and declarations with the racing secretary. Entries and declarations shall be in writing, or by telephone or fax subsequently confirmed in writing by the owner, trainer, or authorized agent. When any entrant or nominator claims failure or error in the receipt by a facility of any entry or declaration, the entrant or nominator may be required to submit evidence within a reasonable time of the filing of the entry or the declaration.

b. Upon the closing of entries the racing secretary shall promptly compile a list of entries and cause it to be conspicuously posted.

c. Coupling.

(1) Entry coupling. When one owner or lessee enters more than one horse in the same race, the horses shall be coupled as an entry. Horses shall be regarded as having a common owner when an owner of one horse, either as an individual, a licensed member of a partnership, or a licensed shareholder of a corporation has an aggregate commonality of ownership of 10 percent interest in another horse, either as an individual, a licensed member of a partnership, or a licensed shareholder of a corporation.

(2) Coupled entry limitations on owner. No more than two horses coupled by a common ownership or trainer shall be entered in an overnight race.

(3) Coupling of entries by stewards. The stewards may couple as a single entry any horses which, in the determination of the stewards, are connected by common ownership, common lessee, the same trainer, or when the stewards determine that coupling is necessary in the interest of the regulation of the pari-mutuel wagering industry or is necessary to ensure the public's confidence in racing.

(4) Exclusion of single interest. Horses having the same owner, lessee, or trainer shall not be permitted to enter or start if the effect would deprive a single interest from starting in overnight races.

d. Splitting of a race. If a race is canceled and declared off for insufficient entries, the facility may split the list of entries for any other overnight race to provide an additional race to replace the one canceled. The racing secretary shall by lot divide the entries of the race so split into two different races.

e. Entry weight. Owners, trainers, or any other duly authorized person who enters a horse for a race shall ensure that the entry is correct and accurate as to the weight allowances available and claimed for the horse under the conditions set for the race. After a horse is entered and has been assigned a weight to carry in the race, the assignment of weight shall not be changed except in the case of error.

f. Horses run once daily. No horse shall be entered for more than one race on the same day on which pari-mutuel wagering is conducted.

g. Foreign entries. For the purposes of determining eligibility, weight assignments, or allowances for horses imported from a foreign nation, the racing secretary shall take into account the "Pattern Race Book" published jointly by the Irish Turf Club, The Jockey Club of Great Britain, and the Société d'Encouragement.

h. Weight conversions. For the purpose of determining eligibility, weight assignments, or allowances for horses imported from a foreign nation, the racing secretary shall convert metric distances to English measures by reference to the following scale:

1 sixteenth = 100 meters
1 furlong = 200 meters
1 mile = 1600 meters

i. Name. The "name" of a horse means the name reflected on the certificate of registration, racing permit, or temporary racing permit issued by The Jockey Club. Imported horses shall have a suffix, enclosed by brackets, added to their registered names showing the country of foaling. This suffix is derived from the international code of suffixes and constitutes part of the horse's registered name. The registered names and suffixes, where applicable, shall be printed in the official program.

j. Bona fide entry. No person shall enter or attempt to enter a horse for a race unless that entry is a bona fide entry, made with the intention that the horse is to compete in the race for which the horse was entered.

k. Registration certificate to reflect correct ownership. Every Jockey Club foal certificate or American Quarter Horse Association registration certificate filed with the facility and its racing secretary to establish the eligibility of a horse to be entered for any race shall accurately reflect the correct and true ownership of the horse. The name of the owner that is printed on the official program for the horse shall conform to the ownership as declared on the certificate of registration or eligibility certificate unless a stable name has been registered with the commission for the owner or ownership.

10.6(3) Sweepstakes entries.

a. Entry and withdrawal. The entry of a horse in a sweepstakes is a subscription to the sweepstakes. Before the time of closing, any entry or subscription may be altered or withdrawn.

b. Entrance money. Entrance money shall be paid by the nominator to a race. In the event of the death of the horse or a mistake made in the entry of an otherwise eligible horse, the nominator subscriber shall continue to be obligated for any stakes, and the entrance money shall not be returned.

c. Quarter horse scratches and qualifiers unable to participate in finals. If a horse should be scratched from the time trial finals, the horse's owner will not be eligible for a refund of the fees paid. If a horse that qualified for the final should be unable to enter due to racing soundness, or scratched for any reason other than a positive drug test report or a rule violation, the horse shall be deemed to have earned and the owner will receive last place money. If more than one horse should be unable to enter due to racing soundness, or scratched for any reason other than a positive drug test report or a rule violation, then those purse moneys shall be added together and divided equally among the horse owners.

10.6(4) Closing of entries.

a. Overnight entries. Entries for overnight racing shall be closed at 10 a.m. by the racing secretary, unless a later closing is established by the racing secretary or unless approved by the stewards.

b. Sweepstakes entries. If an hour for closing is designated, entries and declarations for sweepstakes cannot be received thereafter. However, if a time for closing is not designated, entries and declarations may be mailed or faxed until midnight of the day of closing, if they are received in time to comply with all other conditions of the race. In the absence of notice to the contrary, entries and declarations for sweepstakes that close during or on the day preceding a race meeting shall close at the office of the racing secretary in accordance with any requirements the secretary shall make. Closing for sweepstakes not during race meetings shall be at the office of the facility.

c. Exception. Nominations for stakes races shall not close nor shall any eligibility payment be due on a day in which the United States Postal Service is not operating.

10.6(5) Prohibited entries.

a. Entry by disqualified person. An entry made by a disqualified person or the entry of a disqualified horse shall be void. Any money paid for the entry shall be returned, if the disqualification is disclosed at least 45 minutes before post time for the race. Otherwise, the entry money shall be paid to the winner.

b. Limited partner entry prohibited. No person other than a managing partner of a limited partnership or a person authorized by the managing partner may enter a horse owned by that partnership.

c. Altering entries prohibited. No alteration shall be made in any entry after the closing of entries, but the stewards may permit the correction of an error in an entry.

d. Limitation on overnight entries. If the number of entries to any purse or overnight race is in excess of the number of horses that may be accommodated due to the size of the track, the starters for the race and their post positions shall be determined by lot conducted in public by the racing secretary.

e. Stake race entry limit. In a stake race, the number of horses which may compete shall be limited only by the number of horses nominated and entered. In any case, the facility's lawful race conditions shall govern.

f. Stewards' denial of entry. The stewards may, after notice to the entrant, subscriber, or nominator, deny entry of any horse to a race if the stewards determine the entry to be in violation of these rules or the laws of this state or to be contrary to the interests of the commission in the regulation of parimutuel wagering or to public confidence in racing.

10.6(6) Preferences and eligibles.

a. Also eligible. A list of not more than eight names may be drawn from entries filed in excess of positions available in the race. These names shall be listed as "also eligible" to be used as entries if originally entered horses are withdrawn. Any owner, trainer, or authorized agent who has entered a horse listed as an "also eligible" and who does not wish to start shall file a scratch card with the secretary not later than the scratch time designated for that race.

b. Preference system. A system using dates or stars shall be used to determine preference for horses being entered in races. The system being used will be at the option of the racing secretary and approved by the stewards. A preference list will be kept current by the racing secretary and posted in a place readily available to horsemen.

c. Disputed decision. When the decision of a race is in dispute, all horses involved in the dispute, with respect to the winner's credit or earnings, shall be liable to all weights or conditions attached to the winning of that race until a winner has been finally adjudged.

10.6(7) Post positions. Post positions shall be determined by the racing secretary publicly and by lot. Post positions shall be drawn from "also eligible" entries at scratch time. In all races, horses drawn into the race from the "also eligible" list shall take the outside post positions.

10.6(8) Scratch; declaring out.

a. Notification to the secretary. No horse shall be considered scratched, declared out, or withdrawn from a race until the owner, agent, or other authorized person has given notice in writing to the racing secretary before the time set by the facility as scratch time. All scratches must be approved by the stewards.

b. Declaration irrevocable. Scratching or the declaration of a horse out of an engagement for a race is irrevocable.

c. Limitation on scratches. No horse shall be permitted to be scratched from a race if the horses remaining in the race number fewer than ten, unless the stewards permit a lesser number. When the number of requests to scratch would, if granted, leave a field of fewer than ten, the stewards shall determine by lot which entrants may be scratched and permitted to withdraw from the race.

d. Scratch time. Unless otherwise set by the stewards, scratch time shall be:

(1) Stakes races. Scratch time shall be at least 45 minutes before post time.

(2) Other races. Scratch time shall be no later than 10 a.m. of the day of the race.

10.6(9) Workouts.

a. When required. No horse shall be allowed to start unless the horse has raced in an official race or has an approved official timed workout satisfactory to the stewards. A horse that has not started for a period of 60 days or more shall be ineligible to race until it has completed a published workout satisfactory to the stewards prior to the day of the race in which entered. The workout must have occurred within the previous 30 days. First-time starters must have at least two published workouts and be approved from the gate by the starter.

b. Identification. The timer or the stewards may require licensees to identify a horse in their care being worked. The owner, trainer, or jockey may be required to identify the distance the horse is to be worked and the point on the track where the workout will start.

c. Information dissemination. If the stewards approve the timed workout so as to permit the horse to run in a race, they shall make it mandatory that this information be furnished to the public in advance of the race including, but not limited to, the following means:

(1) Announcement over the facility's public address system;

(2) Transmission on the facility's message board;

(3) Posting in designated conspicuous places in the racing enclosure; and

(4) Exhibit on track TV monitors at certain intervals if the track has closed circuit TV. If the workout is published prior to the race in either the Daily Racing Form or the track program, then it shall not be necessary to make the announcements set forth above.

d. Restrictions. No horse shall be taken onto the track for training or a workout except during hours designated by the facility.

10.6(10) Equipment.

a. Whip and bridle limitations. Unless permitted by the stewards, no whip or substitute for a whip shall exceed one pound or 30 inches and no bridle shall exceed two pounds.

b. Equipment change. No licensee may change the equipment used on a horse from that used in the horse's last race, unless with permission of the stewards. No licensee may add blinkers to a horse's equipment or discontinue their use without the prior approval of the starter and the stewards. In the paddock prior to a race, a horse's tongue may be tied down with clean bandages, clean gauze, or with a tongue strap.

10.6(11) Racing numbers.

a. Number display. Each horse in a race shall carry a conspicuous saddle cloth number corresponding to the official number given that horse on the official program.

b. Coupled entries. In the case of a coupled or other entry that includes more than one horse, each horse in the entry shall carry the same number, with a different distinguishing letter following the number. As an example, two horses in the same entry shall be entered as 1 and 1-A.

c. Field horses. In a combined field of horses, each horse in the field shall carry a separate number.

10.6(12) Valuation of purse money. The amount of purse money earned is credited in United States currency and there shall be no appeal for any loss on the exchange rate at the time of transfer from United States currency to that of another country.

10.6(13) Dead heats.

a. When two horses run a dead heat for first place, all purses or prizes to which first and second horses would have been entitled shall be divided equally between them; and this applies in dividing all purses or prizes whatever the number of horses running a dead heat and whatever places for which the dead heat is run.

b. In the event of a dead-heat finish for second place and thereafter, when an objection to the winner of the race is sustained, the horses in the dead heat shall be considered to have run a dead heat for first place.

c. If a prize includes a cup, plate, or other indivisible prize, owners shall draw lots for the prize in the presence of at least two stewards.

10.6(14) The facility shall not make distribution of any purses until given clearance of chemical tests by the state steward.

10.6(15) Purse money presumption. The fact that purse money has been distributed prior to the issuance of a laboratory report shall not be deemed a finding that no chemical substance has been administered, in violation of these rules, to the horse earning the purse money.

10.6(16) Equine infectious anemia (EIA) test.

a. Certificate required. No horse shall be allowed to start or be stabled on the grounds of the facility unless a valid negative Coggins test or other laboratory-approved negative EIA test certificate is on file with the racing secretary.

b. Trainer responsibility. In the event of claims, sales, or transfers, it shall be the responsibility of the new trainer to ascertain the validity of the certificate for the horse within 24 hours. If the certificate is either unavailable or invalid, the previous trainer shall be responsible for any reasonable cost associated with obtaining a negative EIA laboratory certificate.

c. Positive test reports. Whenever any owner or trainer is furnished a positive Coggins test or positive EIA test result, the horse shall be removed by the owner or trainer from facility grounds or approved farms within 24 hours of actual notice to the owner or trainer of the infection.

10.6(17) Race procedures.

a. Full weight. Each horse shall carry the full weight assigned for that race from the paddock to the starting point, and shall parade past the stewards' stand, unless excused by the stewards.

b. Touching and dismounting prohibited. After the horses enter the track, jockeys may not dismount or entrust their horse to the care of an attendant unless due to an accident occurring to the jockey, the horse, or the equipment, and then only with the prior consent of the starter. During any delay during which a jockey is permitted to dismount, all other jockeys may dismount and their horses may be attended by others. After the horses enter the track, only the hands of the jockey, the starter, the assistant starter, the commission veterinarian, an outrider on a lead pony, or persons approved by the stewards may touch the horse before the start of the race.

c. Jockey injury. If a jockey is seriously injured on the way to the post, the horse shall be returned to the paddock, a replacement jockey obtained, and both the injured jockey and the replacement jockey will be paid by the owner.

d. Twelve-minute parade limit. After entering the track, all horses shall proceed to the starting post in not more than 12 minutes unless approved by the stewards. After passing the stewards' stand in parade, the horses may break formation and proceed to the post in any manner. Once at the post, the horses shall be started without unnecessary delay. All horses must participate in the parade carrying their weight and equipment from the paddock to the starting post, and any horse failing to do so may be disqualified by the stewards. No lead pony leading a horse in the parade shall obstruct the public's view of the horse being led except with permission of the stewards.

e. Striking a horse prohibited. In assisting the start of a race, no person other than the jockey, starter, assistant starter, or veterinarian shall strike a horse or use any other means to assist the start.

f. Loading of horses. Horses will be loaded into the starting gate in numerical order or in any other fair and consistent manner determined by the starter and approved by the stewards.

g. Delays prohibited. No person shall obstruct or delay the movement of a horse to the starting post.

10.6(18) Claiming races.

a. Eligibility.

(1) Registered to race or open claim. No person may file a claim for any horse unless the person:

1. Is a licensed owner at the meeting who either has foal paper(s) registered with the racing secretary's office or has started a horse at the meeting. A temporary horse owner's license is not valid for claiming purposes; or

2. Is a licensed authorized agent, authorized to claim for an owner eligible to claim; or

3. Has a valid open claim certificate. Any person not licensed as an owner, or a licensed authorized agent for the account of the same, or a licensed owner not having foal paper(s) registered with the racing secretary's office or who has not started a horse at the meeting may request an open claim certificate from the commission. The person must submit a completed application for a prospective owner's license to the commission. The applicant must have the name of the trainer licensed by the commission who will be responsible for the claim tours. A nonrefundable fee must accompany the application along with any financial information requested by the commission. The names of the prospective owners shall be prominently displayed in the offices of the commission and the racing secretary. The application will be processed by the commission; and when the open claim certificate is exercised, an owner's license will be issued.

(2) One stable claim. No stable that consists of horses owned by more than one person and which has a single trainer may submit more than one claim in any race. An authorized agent may submit only one claim in any race regardless of the number of owners represented.

b. Procedure for claiming. To make a claim for a horse, an eligible person shall:

(1) Deposit to the person's account with the horsemen's bookkeeper the full claiming price and applicable taxes as established by the racing secretary's conditions.

(2) File in a locked claim box maintained for that purpose by the stewards the claim filled out completely in writing and with sufficient accuracy to identify the claim on forms provided by the facility at least ten minutes before the time of the race.

c. Claim box.

(1) The claim box shall be approved by the commission and kept locked until ten minutes prior to the start of the race, when it shall be presented to the stewards or their representatives for opening and publication of the claims.

(2) The claim box shall also include a time clock which automatically stamps the time on the claim envelope prior to its being dropped in the box.

(3) No official of a facility shall give any information as to the filing of claims therein until after the race has been run.

d. Claim irrevocable. After a claim has been filed in the claim box, it shall not be withdrawn.

e. Multiple claims on single horses. If more than one claim is filed on a horse, the successful claim shall be determined by lot conducted by the stewards or their representatives.

f. Successful claims; later races.

(1) Sale or transfer. No successful claimant may sell or transfer a horse, except in a claiming race, for a period of 30 days from the date of claim.

(2) Eligibility price. A horse that is declared the official winner in the race in which it is claimed may not start in a race in which the claiming price is less than the amount for which it was claimed. After the first start back or 30 days, whichever occurs first, a horse may start for any claiming price. A horse which is not the official winner in the race in which it is claimed may start for any claiming price. This provision shall not apply to starter handicaps in which the weight to be carried is assigned by the handicapper. No right, title, or interest for any claimed horse shall be sold or transferred except in a claiming race for a period of 30 days following the date of claiming. The day claimed shall not count, but the following calendar day shall be the first day.

(3) Racing elsewhere. A horse that was claimed under these rules may not participate at a race meeting other than that at which it was claimed until the end of the meeting, except with written permission of the stewards. This limitation shall not apply to stakes races.

(4) Same management. A claimed horse shall not remain in the same stable or under the control or management of its former owner.

(5) When a horse is claimed out of a claiming race, the horse's engagements are included.

g. Transfer after claim.

(1) Forms. Upon a successful claim, the stewards shall issue in triplicate, upon forms approved by the commission, an authorization of transfer of the horse from the original owner to the claimant. Copies of the transfer authorization shall be forwarded to and maintained by the commission, the stewards, and the racing secretary. No claimed horse shall be delivered by the original owner to the successful claimant until authorized by the stewards. Every horse claimed shall race for the account of the original owner, but title to the horse shall be transferred to the claimant from the time the horse becomes a starter. The successful claimant shall become the owner of the horse at the time of starting, regardless of whether it is alive or dead, sound or unsound, or injured during the race or after it. The original trainer of the claimed horse shall be responsible for the postrace test results.

(2) Other jurisdiction rules. The commission will recognize and be governed by the rules of any other jurisdiction regulating title and claiming races when ownership of a horse is transferred or affected by a claiming race conducted in that other jurisdiction.

(3) Determination of sex and age. The claimant shall be responsible for determining the age and sex of the horse claimed notwithstanding any designation of sex and age appearing in the program or in any racing publication. In the event of a spayed mare, the (s) for spayed should appear next to the mare's name on the program. If it does not and the claimant finds that the mare is in fact spayed, claimant may then return the mare for full refund of the claiming price.

(4) Affidavit by claimant. The stewards may, if they determine it necessary, require any claimant to execute a sworn statement that the claimant is claiming the horse for the claimant's own account or as an authorized agent for a principal and not for any other person.

(5) Delivery required. No person shall refuse to deliver a properly claimed horse to the successful claimant. The claimed horse shall be disqualified from entering any race until delivery is made to the claimant.

(6) Obstructing rules of claiming. No person or licensee shall obstruct or interfere with another person or licensee in claiming any horse or enter into any agreement with another to subvert or defeat the object and procedures of a claiming race, or attempt to prevent any horse entered from being claimed.

h. Elimination of stable. An owner whose stable has been eliminated by claiming may claim for the remainder of the meeting at which eliminated or for 30 racing days, whichever is longer. With the permission of the stewards, stables eliminated by fire or other casualty may claim under this rule.

i. Deceptive claim. The stewards may cancel and disallow any claim within 24 hours after a race if they determine that a claim was made upon the basis of a lease, sale, or entry of a horse made for the purpose of fraudulently obtaining the privilege of making a claim. In the event of a disallowance, the stewards may further order the return of a horse to its original owner and the return of all claim moneys.

j. Protest of claim. A protest to any claim must be filed with the stewards before noon of the day following the date of the race in which the horse was claimed. Nonracing days are excluded from this rule.

491—10.7(99D) Medication and administration, sample collection, chemists, and practicing veterinarian.

10.7(1) *Medication and administration.*

a. No horse, while participating in a race, shall carry in its body any medication, drug, foreign substance, or metabolic derivative thereof, which is a narcotic or which could serve as a local anesthetic or tranquilizer or which could stimulate or depress the circulatory, respiratory, or central nervous system of a horse, thereby affecting its speed.

b. Also prohibited are any drugs or foreign substances that might mask or screen the presence of the prohibited drugs, or prevent or delay testing procedures.

c. Proof of detection by the commission chemist of the presence of a medication, drug, foreign substance, or metabolic derivative thereof, prohibited by paragraph *"a"* or *"b,"* in a saliva, urine, or blood sample duly taken under the supervision of the commission veterinarian from a horse immediately prior to or promptly after running in a race shall be prima facie evidence that the horse was administered, with the intent that it would carry or that it did carry in its body while running in a race, prohibited medication, drug, or foreign substance in violation of this rule.

d. Administration or possession of drugs.

(1) No person shall administer, cause to be administered, or participate or attempt to participate in any way in the administration of any medication, drug, foreign substance, or treatment by any route to a horse registered for racing on the day of the race prior to the race in which the horse is entered.

(2) No person except a veterinarian shall have in the person's possession any prescription drug. However, a person may possess a noninjectable prescription drug for animal use if:

1. The person actually possesses, within the racetrack enclosure, documentary evidence that a prescription has been issued to said person for such a prescription drug.

2. The prescription contains a specific dosage for the particular horse or horses to be treated by the prescription drug.

3. The horse or horses named in the prescription are then in said person's care within the racetrack enclosure.

(3) No veterinarian or any other person shall have in their possession or administer to any horse within any racetrack enclosure any chemical substance which:

1. Has not been approved for use on equines by the Food and Drug Administration pursuant to the Federal Food, Drug, and Cosmetic Act, 21 U.S.C. Section 301 et seq., and implementing regulations, without the prior written approval from a commission veterinarian, after consulting with the board of stewards.

2. Is on any of the schedules of controlled substances as prepared by the Attorney General of the United States pursuant to 21 U.S.C. Sections 811 and 812, without the prior written approval from a commission veterinarian after consultation with the board of stewards. The commission veterinarian shall not give such approval unless the person seeking the approval can produce evidence in recognized veterinary journals or by recognized equine experts that such chemical substance has a beneficial therapeutic use in horses.

(4) No veterinarian or any other person shall dispense, sell, or furnish any feed supplement, tonic, veterinary preparation, medication, or any substance that can be administered or applied to a horse by any route, to any person within the grounds of the facility unless there is a label specifying the name of the substance dispensed, the name of the dispensing person, the name of the horse or horses for which the substance is dispensed, the purpose for which said substance is dispensed, the dispensing veterinarian's recommendations for withdrawal before racing (if applicable), and the name of the person to whom dispensed, or is otherwise labeled as required by law.

(5) No person shall have in the person's possession or in areas under said person's responsibility on facility grounds any feed supplement, tonic, veterinary preparation, medication, or any substance that can be administered or applied to a horse by any route unless it complies with the labeling requirements in 10.7(1)*"d"*(4).

e. Any person found to have administered, or caused, participated in, or attempted to participate in any way in the administration of a medication, drug, or foreign substance that caused or could have caused a violation of this rule shall be subject to disciplinary action.

f. The owner, trainer, groom, or any other person having charge, custody, or care of the horse is obligated to protect the horse properly and guard it against the administration or attempted administration of a substance in violation of this rule. If the stewards find that any person has failed to show proper protection and guarding of the horse, or if the stewards find that any owner, lessee, or trainer is guilty of negligence, they shall impose punishment and take other action they deem proper under any of the rules including referral to the commission.

g. In order for a horse to be placed on the bleeder list in Iowa through reciprocity, that horse must be certified as a bleeder in another state or jurisdiction. A certified bleeder is a horse that has raced with lasix in another state or jurisdiction in compliance with the laws governing lasix in that state or jurisdiction.

10.7(2) *Sample collection.*

a. Urine, blood, and other specimens shall be taken and tested from any horse that the stewards, commission veterinarian, or the commission's representatives may designate. Tests are to be under the supervision of the commission. The samples shall be collected by the commission veterinarian or other person or persons the commission may designate. Each sample shall be marked or numbered and bear information essential to its proper analysis; but the identity of the horse from which the sample was taken or the identity of its owners or trainer shall not be revealed to the official chemist or the staff of the chemist. The container of each sample shall be sealed as soon as the sample is placed therein.

b. A facility shall have a detention barn under the supervision of the commission veterinarian for the purpose of collecting body fluid samples for any tests required by the commission. The building, location, arrangement, furnishings, and facilities including refrigeration and hot and cold running water must be approved by the commission. A security guard, approved by the commission, must be in attendance at each access to the detention barn during the hours designated by the commission.

c. No unauthorized person shall be admitted at any time to the building or the area utilized for the purpose of collecting the required body fluid samples or the area designated for the retention of horses pending the obtaining of body fluid samples.

d. During the taking of samples from a horse, the owner, responsible trainer, or a representative designated by the owner or trainer may be present and witness the taking of the sample and so signify in writing. Failure to be present and witness the collection of the samples constitutes a waiver by the owner, trainer, or representative of any objections to the source and documentation of the sample.

e. The commission veterinarian, the board of stewards, agents of the division of criminal investigation, or commission representative may take samples of any medicine or other materials suspected of containing improper medication, drugs, or other substance which could affect the racing condition of a horse in a race, which may be found in barns or elsewhere on facility grounds or in the possession of any person connected with racing, and the same shall be delivered to the official chemist for analysis.

f. Nothing in these rules shall be construed to prevent:

(1) Any horse in any race from being subjected by the order of a steward or the commission veterinarian to tests of body fluid samples for the purpose of determining the presence of any foreign substance.

(2) The state steward or the commission veterinarian from authorizing the splitting of any sample.

(3) The commission or commission veterinarian from requiring body fluid samples to be stored in a frozen state for future analysis.

g. Before leaving the racing surface, the trainer shall ascertain the testing status of the horse under the trainer's care from the commission veterinarian or designated detention barn representative.

10.7(3) *Chemists.*

a. The commission shall employ one or more chemists or contract with one or more qualified chemical laboratories to determine by chemical testing and analysis of body fluid samples whether a foreign substance, medication, drug or metabolic derivative thereof is present.

b. All body fluid samples taken by or under direction of the commission veterinarian or commission representative shall be delivered to the laboratory of the official chemist for analysis.

c. The commission chemist shall be responsible for safeguarding and testing each sample delivered to the laboratory by the commission veterinarian.

d. The commission chemist shall conduct individual tests on each sample, screening them for prohibited substances, and conducting other tests to detect and identify any suspected prohibited substance or metabolic derivative thereof with specificity. Pooling of samples shall be permitted only with the knowledge and approval of the commission.

e. Upon the finding of a test negative for prohibited substances, the remaining portions of the sample may be discarded. Upon the finding of tests suspicious or positive for prohibited substances, the tests shall be reconfirmed, and the remaining portion, if available, of the sample shall be preserved and protected for two years following close of meet.

f. The commission chemist shall submit to the commission a written report as to each sample tested, indicating by sample tag identification number, whether the sample was tested negative or positive for prohibited substances. The commission chemist shall report test findings to no person other than the administrator or commission representative, with the exception of notifying the state stewards of all positive tests.

g. In the event the commission chemist should find a sample suspicious for a prohibited medication, additional time for test analysis and confirmation may be requested.

h. In reporting to the state steward a finding of a test positive for a prohibited substance, the commission chemist shall present documentary or demonstrative evidence acceptable in the scientific community and admissible in court in support of the professional opinion as to the positive finding.

i. No action shall be taken by the state steward until an official report signed by the chemist properly identifying the medication, drug, or other substance as well as the horse from which the sample was taken has been received.

j. The cost of the testing and analysis shall be paid by the commission to the official chemist. The commission shall then be reimbursed by each facility on a per-sample basis so that each facility shall bear only its proportion of the total cost of testing and analysis. The commission may first receive payment from funds provided in Iowa Code chapter 99D, if available.

10.7(4) *Practicing veterinarian.*

a. Prohibited acts.

(1) Ownership. A licensed veterinarian practicing at any meeting is prohibited from possessing any ownership, directly or indirectly, in any racing animal racing during the meeting.

(2) Wagering. Veterinarians licensed by the commission as veterinarians are prohibited from placing any wager of money or other thing of value directly or indirectly on the outcome of any race conducted at the meeting at which the veterinarian is furnishing professional service.

(3) Prohibition of furnishing injectable materials. No veterinarian shall within the facility grounds furnish, sell, or loan any hypodermic syringe, needle, or other injection device, or any drug, narcotic, or prohibited substance to any other person unless with written permission of the stewards.

b. The use of other than single-use disposable syringes and infusion tubes on facility grounds is prohibited. Whenever a veterinarian has used a hypodermic needle or syringe, the veterinarian shall destroy the needle and syringe and remove the needle and syringe from the facility grounds.

c. Veterinarians must submit daily to the commission veterinarian on a prescribed form a report of all medications and other substances which the veterinarian prescribed, administered, or dispensed for racing animals registered at the current race meeting as provided in Iowa Code section 99D.25(10). Reports shall be submitted in a manner and at a time determined by the commission veterinarian not later than the day following the treatments being reported. Reports shall include the racing animal, trainer, medication or other substance, dosage or quantity, route of administration, date and time administered, dispensed, or prescribed.

d. Within 20 minutes following the administration of lasix, the veterinarian must deliver to the commission veterinarian or commission representative a signed affidavit certifying information regarding the treatment of the horse. The statement must include, at a minimum, the name of the practicing veterinarian, the tattoo number of the horse, the location of the barn and stall where the treatment occurred, the race number of the horse, the name of the trainer, and the time that the lasix was administered. Lasix shall only be administered in a dose level of 250 milligrams.

e. Each veterinarian shall report immediately to the commission veterinarian any illness presenting unusual or unknown symptoms in a racing animal entrusted into the veterinarian's care.

f. Practicing veterinarians may have employees working under their direct supervision licensed as "veterinary assistants" or "veterinary technicians." Activities of these employees shall not include direct treatment or diagnosis of any racing animal. A practicing veterinarian must be present if an employee is to have access to injection devices or injectables.

g. Equine dentistry is considered a function of veterinary practice by the Iowa veterinary practice Act. Any dental procedures performed at the facility must be performed by a licensed veterinarian or a licensed veterinary assistant.

These rules are intended to implement Iowa Code chapter 99D.

[Filed 11/4/88, Notice 8/10/88—published 11/30/88, effective 1/4/89]*
[Filed emergency 12/19/88—published 1/11/89, effective 12/23/88]
[Filed emergency 1/19/89—published 2/8/89, effective 1/20/89]
[Filed 2/17/89, Notice 1/11/89—published 3/8/89, effective 4/12/89]
[Filed 3/15/89, Notice 2/8/89—published 4/5/89, effective 5/10/89]
[Filed emergency 6/23/89—published 7/12/89, effective 6/23/89]
[Filed 9/26/89, Notice 7/12/89—published 10/18/89, effective 11/22/89]
[Filed 2/16/90, Notice 12/27/89—published 3/7/90, effective 4/11/90]
[Filed emergency 5/21/90—published 6/13/90, effective 5/21/90]
[Filed 8/2/90, Notice 6/13/90—published 8/22/90, effective 9/26/90]
[Filed 2/15/91, Notice 1/9/91—published 3/6/91, effective 4/10/91]
[Filed 12/6/91, Notice 10/16/91—published 12/25/91, effective 1/29/92]
[Filed 9/11/92, Notice 7/22/92—published 9/30/92, effective 11/4/92]
[Filed 10/30/92, Notice 9/16/92—published 11/25/92, effective 1/6/93]
[Filed emergency 3/2/93—published 3/31/93, effective 3/2/93]
[Filed 3/2/93, Notice 1/6/93—published 3/31/93, effective 5/5/93]
[Filed emergency 3/22/93—published 4/14/93, effective 3/22/93]◊
[Filed emergency 4/19/93—published 5/12/93, effective 4/19/93]
[Filed 4/19/93, Notice 3/3/93—published 5/12/93, effective 6/16/93]
[Filed 5/21/93, Notice 4/14/93—published 6/9/93, effective 7/14/93]
[Filed 7/23/93, Notice 5/12/93—published 8/18/93, effective 9/22/93]
[Filed 10/21/93, Notice 8/18/93—published 11/10/93, effective 12/15/93]
[Filed 5/20/94, Notice 3/30/94—published 6/8/94, effective 7/13/94]
[Filed 7/22/94, Notice 6/8/94—published 8/17/94, effective 9/21/94]
[Filed emergency 6/15/95—published 7/5/95, effective 6/15/95]
[Filed 8/21/95, Notice 7/5/95—published 9/13/95, effective 10/18/95]
[Filed emergency 3/8/96—published 3/27/96, effective 3/8/96]
[Filed 4/19/96, Notice 2/14/96—published 5/8/96, effective 6/12/96]
[Filed emergency 5/22/96—published 6/19/96, effective 5/22/96]
[Filed 8/19/96, Notice 6/19/96—published 9/11/96, effective 10/16/96]**
[Filed 1/17/97, Notice 11/6/96—published 2/12/97, effective 3/19/97]
[Filed 4/10/97, Notice 2/12/97—published 5/7/97, effective 6/11/97]
[Filed 8/22/97, Notice 7/16/97—published 9/10/97, effective 10/15/97]
[Filed 3/6/98, Notice 12/17/97—published 3/25/98, effective 4/29/98]
[Filed emergency 4/17/98—published 5/6/98, effective 4/20/98]
[Filed 6/19/98, Notice 5/6/98—published 7/15/98, effective 8/19/98]
[Filed 11/23/98, Notice 10/7/98—published 12/16/98, effective 1/20/99]
[Filed 1/21/99, Notice 12/16/98—published 2/10/99, effective 3/17/99]

*Effective date (1/4/89) of 10.4(14), 10.4(19)"*b*" and 10.6 delayed by the Administrative Rules Review Committee until January 9, 1989, at its December 13, 1988, meeting; effective date of January 4, 1989, delayed seventy days by this Committee at its January 5, 1989, meeting. Effective date delay lifted by the Committee at its February 13, 1989, meeting.

**Effective date of 10.6(2)"*g*"(3) second paragraph delayed until adjournment of the 1997 Session of the General Assembly by the Administrative Rules Review Committee at its meeting held October 8, 1996.

◊Two ARCs

[Filed 1/20/00, Notice 11/17/99—published 2/9/00, effective 3/15/00]
[Filed 1/20/00, Notice 12/15/99—published 2/9/00, effective 3/15/00]
[Filed 7/20/00, Notice 6/14/00—published 8/9/00, effective 9/13/00]
[Filed 8/18/00, Notice 7/12/00—published 9/6/00, effective 10/11/00]
[Filed 9/18/00, Notice 8/9/00—published 10/18/00, effective 11/22/00]

CHAPTER 11
APPLICATION FOR TAX CREDIT BY HORSE RACING LICENSEES
Rescinded IAB 8/17/94, effective 9/21/94

CHAPTER 12
SIMULCASTING
Rescinded IAB 9/6/00, effective 10/11/00

CHAPTER 13
OCCUPATIONAL AND VENDOR LICENSING
[This chapter is intended to incorporate all the licensing rules from 491—Chapters 7, 9, 10 and 22 into one chapter]
[Prior to 11/19/86, Racing Commission[693]]
[Prior to 11/18/87, Racing and Gaming Division[195]]
[491—Chapters 20 to 25, relating to Games of Skill, Chance, Raffles and Bingo, transferred to 481—Chapters 100 to 105, 6/14/89 IAB]
Rescinded IAB 9/6/00, effective 10/11/00

CHAPTERS 14 to 17
Reserved

CHAPTER 18
PRACTICE AND PROCEDURE BEFORE THE DEPARTMENT OF INSPECTIONS AND APPEALS DIVISION OF RACING AND GAMING
[Prior to 11/18/87, Racing and Gaming Division[195]]
Rescinded IAB 12/25/91, effective 1/29/92

CHAPTER 19
PROCEDURE FOR RULE MAKING
[Prior to 11/18/87, see Racing and Gaming Division[195]]
Rescinded IAB 12/25/91, effective 1/29/92

CHAPTER 20
APPLICATION PROCESS FOR EXCURSION BOATS AND RACETRACK ENCLOSURE GAMING LICENSE
[491—Chapters 20 to 25, relating to Games of Skill, Chance, Raffles and Bingo, transferred to 481—Chapters 100 to 105, 6/14/89 IAB]
Rescinded IAB 8/9/00, effective 9/13/00

CHAPTER 21
CRITERIA FOR GRANTING AN EXCURSION BOAT AND RACETRACK ENCLOSURE GAMING LICENSE
[491—Chapters 20 to 25, relating to Games of Skill, Chance, Raffles and Bingo, transferred to 481—Chapters 100 to 105, 6/14/89 IAB]
Rescinded IAB 8/9/00, effective 9/13/00

DIVISION B
DRINKING WATER

CHAPTER 40
SCOPE OF DIVISION—DEFINITIONS—FORMS—RULES OF PRACTICE

[Prior to 12/3/86, Water, Air and Waste Management [900]]

567—40.1(455B) Scope of division. The department conducts the public water supply program, provides grants to counties, and establishes minimum standards for the construction of private water supply systems. The public water supply program includes the following: the establishment of drinking water standards, including maximum contaminant levels, treatment techniques, action levels, monitoring, viability assessment, consumer confidence reporting, public notice requirements, public water supply system operator certification standards, environmental drinking water laboratory certification program, and a state revolving loan program consistent with the federal Safe Drinking Water Act, and the establishment of construction standards. The construction, modification and operation of any public water supply system requires a specific permit from the department. Certain construction permits are issued upon certification by a registered professional engineer that a project meets standards, and in certain instances permits are issued by local authorities pursuant to 567—Chapter 9. Private water supplies are regulated by local boards of health.

Chapter 40 includes rules of practice, including designation of forms, applicable to the public in the department's administration of the subject matter of this division.

Chapter 41 contains the drinking water standards and specific monitoring requirements for the public water supply program.

Chapter 42 contains the public notification, public education, consumer confidence reporting, and record-keeping requirements for the public water supply program.

Chapter 43 contains specific design, construction, fee, operating, and operation permit requirements for the public water supply program.

Chapter 44 contains the drinking water state revolving fund program for the public water supply program.

Chapter 47 contains provisions for county grants for creating programs for (1) the testing of private water supply wells, (2) rehabilitation of private wells, and (3) the proper closure of private, abandoned wells within the jurisdiction of the county. Chapter 39 contains requirements for the proper closure or abandonment of wells.

Chapter 49 provides minimum standards for construction of private water wells, and private well construction permits may be issued by local county authorities pursuant to 567—Chapter 38.

Chapter 55 contains the provisions for public water supply aquifer storage and recovery.

Chapter 81 contains the provisions for the certification of public water supply system operators.

Chapter 83 contains the provisions for the certification of laboratories to provide environmental testing of drinking water supplies.

567—40.2(455B) Definitions.

"Act" means the Safe Drinking Water Act as amended (42 U.S.C. 300f et seq.).

"Action level" is the concentration of lead or copper in water which determines, in some cases, the treatment requirements that a water system is required to complete.

"Acute health effect" means the health effect of a contaminant which is an immediate rather than a long-term risk to health.

"Animal confinement" means a lot, yard, corral, or similar structure in which the concentration of livestock or poultry is such that a vegetative cover is not maintained.

"Animal pasturage" means a fenced area where vegetative cover is maintained and in which animals are enclosed.

"Animal waste" means animal wastes consisting of excreta, leachings, feed losses, litter, washwaters or other associated wastes.

"Animal waste stockpiles" means the stacking, composting or containment of animal wastes.

"Animal waste storage basin or lagoon" means a fully or partially excavated or diked earthen structure used for containing animal waste, including earthen sideslopes or floor.

"Animal waste storage tank" means a completely fabricated structure, with or without a cover, either formed in place or transported to the site, used for containing animal wastes.

"Antisiphon device" means a device which will prevent back siphonage by means of a relief valve which automatically opens to the atmosphere, preventing the creation of subatmospheric pressure within a pipe, thereby preventing water from reversing its flow.

"Backflow" means the flow of water or other liquids, mixtures, or substances into the distribution system of a potable water supply from any source other than its permitted source.

"Backflow preventer" is a device or means to prevent backflow into a potable water system.

"Back siphon" means the flowing back of used, contaminated, or polluted water, from a plumbing fixture or vessel as a result of negative or subatmospheric pressure within the distribution system.

"Best available technology" or *"BAT"* means the best technology, treatment techniques, or other means which the state finds, after examination, for efficacy under field conditions and not solely under laboratory conditions, are available (taking cost into consideration).

"Cistern" means a tank in which rainwater from roof drains is stored.

"Coagulation" means a process using coagulation chemicals and mixing by which colloidal and suspended materials are destabilized and agglomerated into flocs.

"Community water system (CWS)" means a public water supply system which has at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.

"Compliance cycle" means the nine-year (calendar year) cycle during which public water systems must monitor. Each compliance cycle consists of three three-year compliance periods. The first calendar year cycle begins January 1, 1993, and ends December 31, 2001; the second begins January 1, 2002, and ends December 31, 2010; the third begins January 1, 2011, and ends December 31, 2019, and continues every nine years thereafter.

"Compliance period" means a three-year (calendar year) period within a compliance cycle. Each compliance cycle has three three-year compliance periods. Within the first compliance cycle, the first compliance period runs from January 1, 1993, to December 31, 1995; the second from January 1, 1996, to December 31, 1998; the third from January 1, 1999, to December 31, 2001, and continues every three years thereafter.

"Composite correction program (CCP)" is a systematic, comprehensive procedure that identifies and corrects the unique combination of factors, in the areas of design, operation, maintenance, and administration, that limit the performance of a filtration plant. The CCP is comprised of two elements: comprehensive performance evaluation, which is the evaluation phase, and comprehensive technical assistance, which is the performance improvement phase.

"Comprehensive performance evaluation (CPE)" is a thorough review and analysis of a treatment plant's performance-based capabilities and associated administrative, operation and maintenance practices. CPE is conducted to identify factors that may be adversely impacting a plant's capability to achieve compliance and emphasizes approaches that can be implemented without significant capital improvements. For purposes of compliance with surface water or influenced groundwater treatment plant requirements pursuant to 567—Chapters 41 and 43, the comprehensive performance evaluation must consist of at least the following components: assessment of plant performance; evaluation of major unit processes; identification and prioritization of performance limiting factors; assessment of the applicability of comprehensive technical assistance; and preparation of a CPE report.

"Comprehensive technical assistance (CTA)" is the performance improvement phase of the composite correction plan that is implemented if the comprehensive performance evaluation results indicate improved performance potential by a filtration plant, in which the system must identify and systematically address plant-specific factors.

"Confluent growth" means a continuous bacterial growth covering the entire filtration area of a membrane filter, or a portion thereof, in which bacterial colonies are not discrete.

"Consecutive public water supply" means an active public water supply which purchases or obtains all or a portion of its water from another, separate public water supply.

"Contaminant" means any physical, chemical, biological, or radiological substance or matter in water.

"Conventional filtration treatment" means a series of processes including coagulation, flocculation, sedimentation, and filtration resulting in substantial particulate removal.

"Corrosion inhibitor" means a substance capable of reducing the corrosivity of water toward metal plumbing materials, especially lead and copper, by forming a protective film on the interior surface of those materials.

"Corrosive water" means a water which due to its physical and chemical characteristics may cause leaching or dissolving of the constituents of the transporting system in which it is contained.

"Cross connection" means any actual or potential connection between a potable water supply and any other source or system through which it is possible to introduce into the potable system any used water, industrial fluid, gas, or other substance other than the intended potable water with which the system is supplied.

"Customers" in consumer confidence reports are defined as billing units or service connections to which water is delivered by a community water system.

"Deep well" means a well located and constructed in such a manner that there is a continuous layer of low permeability soil or rock at least 5 feet thick located at least 25 feet below the normal ground surface and above the aquifer from which water is to be drawn.

"Department" means the Iowa department of natural resources, which has jurisdiction over all nontribal public water systems in Iowa.

"Diatomaceous earth filtration" means a process resulting in substantial particulate removal in which (1) a precoat cake of diatomaceous earth filter media is deposited on a support membrane (septum), and (2) while the water is filtered by passing through the cake on the septum, additional filter media known as body feed is continuously added to the feed water to maintain the permeability of the filter cake.

"Direct filtration" means a series of processes including coagulation and filtration but excluding sedimentation resulting in substantial particulate removal.

"Director" means the director of the Iowa department of natural resources or a designee.

"Disinfectant" means any oxidant, including but not limited to chlorine, chlorine dioxide, chloramines, and ozone added to water in any part of the treatment process or distribution process, that is intended to kill or inactivate pathogenic microorganisms.

"Disinfection" means a process which inactivates pathogenic organisms in water by chemical oxidants or equivalent agents.

"Disinfection profile" is a summary of daily *Giardia lamblia* inactivation through the treatment plant. The procedure for developing a disinfection profile is contained in 567—paragraph 43.9(2)*"b."*

"Dose equivalent" means the product of the absorbed dose from ionizing radiation and such factors as account for differences in biological effectiveness due to the type of radiation and its distribution in the body as specified by the International Commission on Radiological Units and Measurements (ICRU).

"Drinking water state revolving fund (DWSRF)" means the department-administered fund intended to develop drinking water revolving loans to help finance drinking water infrastructure improvements, source water protection, system technical assistance, and other activities intended to encourage and facilitate public water supply system rule compliance and public health protection established by Iowa Code sections 455B.291 to 455B.299.

"Effective corrosion inhibitor residual" means a concentration of corrosion inhibitor sufficient to form a passivating film on the interior walls of a pipe.

"Enhanced coagulation" means the addition of sufficient coagulant for improved removal of disinfection byproduct precursors by conventional filtration treatment.

"Enhanced softening" means the improved removal of disinfection byproduct precursors by precipitative softening.

"Filter profile" is a graphical representation of individual filter performance, based on continuous turbidity measurements or total particle counts versus time for an entire filter run, from startup to backwash inclusively, that includes an assessment of filter performance while another filter is being backwashed.

"Filtration" means a process for removing particulate matter from water by passage through a porous media.

"First draw sample" means a one-liter sample of tap water, collected in accordance with 567—paragraph 41.4(1)*"c"* that has been standing in plumbing pipes at least six hours and is collected without flushing the tap.

"Flocculation" means a process to enhance agglomeration or collection of smaller floc particles into larger, more easily settleable particles through gentle stirring by hydraulic or mechanical means.

"GAC10" means granular activated carbon filter beds with an empty-bed contact time of ten minutes based on average daily flow and a carbon reactivation frequency of every 180 days.

"Gross alpha particle activity" means the total radioactivity due to alpha particle emission as inferred from measurements on a dry sample.

"Gross beta particle activity" means the total radioactivity due to beta particle emission as inferred from measurements on a dry sample.

"Haloacetic acids (HAA5)" means the sum of the concentrations in milligrams per liter of the haloacetic acid compounds (monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid), rounded to two significant figures after addition.

"Halogen" means one of the chemical elements chlorine, bromine or iodine.

"Health advisory (HA)" means a group of levels set by EPA below which no harmful health effect is expected from a given contaminant in drinking water. The HAs used by the department are listed in the most current edition of the EPA "Drinking Water Regulations and Health Advisories" bulletin. The lifetime HA is the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects over a lifetime of exposure, with a margin of safety. The long-term HA is the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects up to approximately seven years (10 percent of an individual's lifetime of exposure), with a margin of safety.

"Human consumption" means water used as part of or in connection with drinking; washing; food processing or incidental to commercial food preparation, such as: water used in beverages or other food items; ice used in drinks or in salad bars; water for washing of vegetables or other food items; water used for washing dishes; pans or utensils used in food preparation or service; water used for cleanup and washing of food preparation or service areas; water for bathing, showering, hand washing, or oral hygiene purposes. Human consumption does not include: water for production of packaged or bulk food products regulated by other state or federal regulatory agencies, such as livestock slaughtering or bottled or canned food and beverages; cooling water; industrial or commercial wash waters used for nonfood products; irrigation water; water used in toilets or urinals.

"Impoundment" means a reservoir, pond, or lake in which surface water is retained for a period of time, ranging from several months upward, created by constructing a barrier across a watercourse and used for storage, regulation or control of water.

"Influenced groundwater (IGW)" means groundwater which is under the direct or indirect influence of surface water, as determined by the presence of (1) significant occurrence of insects or other macroorganisms, algae or large-size pathogens such as *Giardia lamblia* or *Cryptosporidium*; or (2) significant and relatively rapid shifts in water characteristics such as turbidity (particulate content), temperature, conductivity, or pH which correlate to climatological or surface water conditions, or other parameters as specified in 567—43.5(455B).

"Initial compliance period" means the first full three-year compliance period of a compliance cycle.

"Large water system" means a water system that serves more than 50,000 persons.

"Lead free" when used with respect to solder and flux, refers to solders and flux containing not more than 0.2 percent lead; and, when used with respect to pipes and pipe fittings, refers to pipes and pipe fittings containing not more than 8.0 percent lead.

"Lead service line" means a service line made of lead which connects the water main to the building inlet and any lead pigtail, gooseneck, or other fitting which is connected to such lead line. A lead gooseneck is not considered a lead service line unless it exceeds 10 feet.

"Legionella" means a genus of bacteria, some species of which have caused a type of pneumonia called legionnaires' disease.

"Maintenance" means the replacement of equipment or materials that are necessary to maintain the operation of the public water supply system but do not alter capacity, water quality or treatment method or effectiveness.

"Man-made beta particle and photon emitters" means all radionuclides emitting beta particles or photons or both listed in Maximum Permissible Body Burdens and Maximum Permissible Concentration of Radionuclides in Air or Water for Occupational Exposure, NBS Handbook 69, except the daughter products of thorium-232, uranium-235 and uranium-238.

"Maximum contaminant level" means the maximum permissible level of a contaminant in water which is delivered to any user of a public water system.

"Maximum contaminant level goal (MCLG)" means the maximum level of a contaminant in drinking water at which no known or anticipated adverse effect on the health of persons would occur, and which allows an adequate margin of safety. MCLGs are nonenforceable health goals.

"Maximum residual disinfectant level (MRDL)" means a level of a disinfectant added for water treatment that may not be exceeded at the consumer's tap without an unacceptable possibility of adverse health effects.

"Maximum residual disinfectant level goal (MRDLG)" means the maximum level of a disinfectant added for water treatment at which no known or anticipated adverse effect on the health of persons would occur, and which allows an adequate margin of safety.

"Maximum total trihalomethane potential (MTP)" means the maximum concentration of total trihalomethanes produced in a given water containing a disinfectant residual after seven days at a temperature of 25 degrees Celsius or above.

"Medium-size water system" means a water system that serves greater than 3,300 and less than or equal to 50,000 persons.

"Nonacute health effect" means the health effect of a contaminant which is a long-term rather than immediate risk to health.

"Noncommunity water system" means a public water system that is not a community water system. A noncommunity water system is either a "transient noncommunity water system (TNC)" or a "nontransient noncommunity water system (NTNC)."

"Nontransient noncommunity water system" or *"NTNC"* means a public water system other than a community water system which regularly serves at least 25 of the same persons four hours or more per day, for four or more days per week, for 26 or more weeks per year. Examples of NTNCs are schools, day-care centers, factories, offices and other public water systems which provide water to a fixed population of 25 or more people. In addition, other service areas, such as hotels, resorts, hospitals and restaurants, are considered as NTNCs if they employ 25 or more people and are open for 26 or more weeks of the year.

"Optimal corrosion control treatment" means the corrosion control treatment that minimizes the lead and copper concentrations at users' taps while ensuring that the treatment does not cause the water system to violate any drinking water standards (567—Chapters 40 to 43).

"Performance evaluation sample" means a reference sample provided to a laboratory for the purpose of demonstrating that a laboratory can successfully analyze the sample within limits of performance specified by the department. The true value of the concentration of the reference material is unknown to the laboratory at the time of analysis.

"Picocurie (pCi)" means that quantity of radioactive material producing 2.22 nuclear transformations per minute.

"Point of disinfectant application" is the point where the disinfectant is applied and water downstream of that point is not subject to recontamination by surface water runoff.

"Point-of-entry treatment device" is a treatment device applied to the drinking water entering a house or building for the purpose of reducing contaminants in the drinking water distributed throughout the house or building.

"Point-of-use treatment device" is a treatment device applied to a single or multiple taps used for the purpose of reducing contaminants in drinking water at those taps, but is not intended to treat all of the water in the facility.

"Population served" means the total number of persons served by a public water supply that provides water intended for human consumption. For municipalities which serve only the population within their incorporated boundaries, it is the last official U.S. census population (or officially amended census population). For all other community public water supply systems, it is either the actual population counted which is verifiable by the department, or population as calculated by multiplying the number of service connections by an occupancy factor of 2.5 persons per service connection. For municipalities which also serve outside their incorporated boundaries, the served population must be added to the official census population determined either by verifiable count or by the 2.5 persons per service connection occupancy factor. For nontransient noncommunity (NTNC) and transient noncommunity (TNC) systems, it is the average number of daily employees plus the average number of other persons served such as customers or visitors during the peak month of the year regardless if each person actually uses the water for human consumption. Where a system provides water to another public water supply system (consecutive public water supply system) which is required to have an operation permit, the population of the recipient water supply shall not be counted as a part of the water system providing the water. Community and nontransient noncommunity public water supply systems will pay their operation permit fees based upon the population served.

"Privy" means a structure used for the deposition of human body wastes.

"Project" includes the planning, design, construction, alteration or extension of any public water supply system but does not include the maintenance of a system.

"Public water supply system control" is defined as one of the following forms of authority over a service line: authority to set standards for construction, repair, or maintenance of the service line; authority to replace, repair, or maintain the service line; or ownership of the line. Contaminants added to the water under circumstances controlled by the water consumer or user, with the exception of those contaminants resulting from the corrosion of piping and plumbing caused by water quality, are excluded from this definition of control.

"Public water supply system (PWS)" means a system for the provision to the public of water for human consumption through pipes or other constructed conveyances, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year. Such term includes: any collection, treatment, storage, and distribution facilities under control of the operator of such system and used primarily in connection with such system; and any collection or pretreatment storage facilities not under such control which are used primarily in connection with such system. Such term does not include any "special irrigation district." A public water system is either a "community water system" or a "noncommunity water system."

"Regional water system" means a public water supply system in which the projected number of service connections in at least 50 percent of the length of the distribution system does not average more than eight service connections per linear mile of water main.

"Rem" means the unit of dose equivalent from ionizing radiation to the total body or any internal organ or organ system. A "millirem" (mrem) is 1/1000 of a rem.

"Repeat compliance period" means any subsequent compliance period after the initial compliance period.

"Residual disinfectant concentration" ("C" in CT calculations) means the concentration of disinfectant measured in mg/l in a representative sample of water.

"Sanitary sewer pipe" means a sewer complying with the department's standards for sewer construction.

"Sanitary survey" means a review and on-site inspection conducted by the department of the water source, facilities, equipment, operation and maintenance and records of a public water supply system for the purpose of evaluating the adequacy of such source, facilities, equipment, operation and maintenance for producing and distributing safe drinking water and identifying improvements necessary to maintain or improve drinking water quality.

"Sedimentation" means a water treatment process for removal of solid particles from a suspension before filtration by gravity or separation.

"Septic tank" means a watertight tank which receives sewage.

"Service connections" means the total number of active and inactive service lines originating from a water distribution main for the purpose of delivering water intended for human consumption. For municipalities, rural water districts, mobile home parks, housing developments, and similar facilities, this includes, but is not limited to, occupied and unoccupied residences and buildings, provided that there is a service line connected to the water main (or another service line), and running onto the property. For rental properties which are separate public water supply systems, this includes, but is not limited to, the number of rental units such as apartments. Connections to a system that delivers water by a constructed conveyance other than a pipe are excluded from the definition, if:

1. The water is used exclusively for purposes other than human consumption;
2. The department determines that alternative water to achieve the equivalent level of public health protection provided by the applicable national primary drinking water regulation is provided for human consumption; or
3. The department determines that the water provided for human consumption is centrally treated or treated at the point of entry by the provider, a pass-through entity, or the user to achieve the equivalent level of protection provided by the applicable national primary drinking water regulations.

"Service line sample" means a one-liter sample of water, collected in accordance with 567—paragraph 41.4(1)*"c"* for the purpose of determining the concentration of lead and copper which has been standing for at least six hours in a service line.

"Shallow well" means a well located and constructed in such a manner that there is not a continuous layer of low permeability soil or rock (or equivalent retarding mechanism acceptable to the department) at least 5 feet thick, the top of which is located at least 25 feet below the normal ground surface and above the aquifer from which water is to be drawn.

"Single-family structure" means a building constructed as a single-family residence that is currently used as either a residence or a place of business.

"Slow sand filtration" means a process involving passage of raw water through a bed of sand at low velocity (generally less than 0.4 m/h (0.02 ft/min)) resulting in substantial particulate removal by physical and biological mechanisms.

"Small water system" means a water system that serves 3,300 persons or fewer.

"Special irrigation district" means an irrigation district in existence prior to May 18, 1994, that provides primarily agricultural service through a piped water system with only incidental residential or similar use where the system or the residential or similar users of the system comply with numbered paragraphs "2" and "3" in the definition of "service connections."

"Standard methods" means "Standard Methods for the Examination of Water and Wastewater," American Public Health Association, 1015 15th Street N.W., Washington, DC 20005.

"Standard sample" means the aliquot of finished drinking water that is examined for the presence of coliform bacteria.

"Standard specifications" means specifications submitted to the department for use as a reference in reviewing future plans for proposed water main construction.

"Supplier of water" means any person who owns or operates a public water supply system.

"Surface water" means all water which is open to the atmosphere and subject to surface runoff.

"SUVA" means Specific Ultraviolet Absorption at 254 nanometers (nm), an indicator of the humic content of water. It is a calculated parameter obtained by dividing a sample's ultraviolet absorption at a wavelength of 254 nm (in m^{-1}) by its concentration of dissolved organic carbon (in mg/L).

"Ten States Standards" means the "Recommended Standards for Water Works," 1997 edition as adopted by the Great Lakes—Upper Mississippi River Board of State Sanitary Engineers.

"Too numerous to count" means that the total number of bacterial colonies exceeds 200 on a 47-mm diameter membrane filter used for coliform detection.

"Total organic carbon (TOC)" means total organic carbon in milligrams per liter, measured using heat, oxygen, ultraviolet irradiation, chemical oxidants, or combinations of these oxidants that convert organic carbon to carbon dioxide, rounded to two significant figures.

"Total trihalomethanes (TTHM)" means the sum of the concentration in milligrams per liter of the trihalomethane compounds trichloromethane (chloroform), dibromochloromethane, bromodichloromethane and tribromomethane (bromoform), rounded to two significant figures.

"Transient noncommunity water system (TNC)" means a noncommunity water system that does not regularly serve at least 25 of the same persons over six months per calendar year.

"Trihalomethane (THM)" means one of the family of organic compounds, named as derivatives of methane, wherein three of the four hydrogen atoms in methane are each substituted by a halogen atom in the molecular structure.

"Unregulated contaminant" means a contaminant for which no MCL has been set, but which does have monitoring requirements set in 567—subrule 41.11(2).

"Virus" means a virus of fecal origin which is infectious to humans by waterborne transmission.

"Waterborne disease outbreak" means the significant occurrence of acute infectious illness, epidemiologically associated with the ingestion of water from a public water system which is deficient in treatment, as determined by the Iowa department of public health.

"Water distribution system" means that portion of the water supply system in which water is conveyed from the water treatment plant or other supply point to the premises of the consumer, including any storage facilities and pumping stations.

"Water main pipe" means a water main complying with the department's standards for water main construction.

567—40.3(17A,455B) Forms. The following forms are used by the public to apply for department approvals and to report on activities related to the public water supply program of the department. All forms may be obtained from the Environmental Protection Division, Administrative Support Station, Department of Natural Resources, Henry A. Wallace Building, 502 East Ninth Street, Des Moines, Iowa 50319-0034. Properly completed application forms shall be submitted to the Water Supply Section, Environmental Protection Division. Water Supply System Monthly and Other Operation Reporting forms shall be submitted to the appropriate field office (see 567—subrule 42.4(3)). Properly completed laboratory forms (reference 567—Chapter 83) shall be submitted to the University Hygienic Laboratory or as otherwise designated by the department.

40.3(1) *Construction permit application forms.* Schedules "1a" through "16d" are required.

Schedule No.	Name of Form	Form Number
"1a"	General Information	542-3178
"lb"	Certification of Project Design	542-3174
"2a"	Water Mains, General	542-3030
"2b"	Water Mains, Specifications	542-3031
"3a"	Water System, Preliminary Data	542-3032
"3b"	Water Quality Data	542-3029
"3c"	Surface Water Quality Data	542-3028
"4"	Site Selection	542-3078
"5a"	Well Construction	542-1005
"5b"	Well Appurtenances	542-3026
"5c"	Well Profile	542-1006
"5d"	Surface Water Supply	542-3139
"6a"	Distribution Water Storage Facilities	542-3140
"6b"	Distribution Pumping Station	542-3141
"7"	Schematic Flow Diagram	542-3142
"8"	Aeration	542-3143
"9"	Clarification/Sedimentation	542-3144
"10"	Suspended Solids Contact	542-3145
"11"	Cation Exchange Softening	542-3146
"12"	Filters	542-3147
"13a"	Chemical Addition	542-3141
"13b"	Dry Chemical Addition	542-3130
"13c"	Gas Chlorination	542-3131
"13d"	Fluoridation	542-3132
"13e"	Sampling and Tests	542-3133
"14"	Pumping Station	542-3134
"15"	Process Water Storage Facilities	542-3135
"16a"	Wastewater, General	542-3136
"16b"	Waste Treatment Ponds	542-3137
"16c"	Filtration and Mechanical	542-3138
"16d"	Discharge to Sewer	542-3103

40.3(2) *Operation permit application forms.*

a. Form 13-1 — community water supply

b. Form 13-2 — noncommunity water supply

40.3(3) *Water supply reporting forms.*

a. Form 14 — plant operation 542-3104

b. Form 15 — analyses by certified laboratories

(1) Individual bacterial analysis reporting — Form 15-la 542-3195

(2) Summary bacterial analysis reporting — Form 15-lb 542-3196

(3) Chemical analysis reporting — Form 15-2 542-3166

(4) Corrosivity analysis reporting — Form 15-3 542-3193

40.3(4) *Laboratory certification application forms.* Reserved.

567—40.4(17A,455B) Public water supply construction permit application procedures.

40.4(1) *General procedures.* Applications for written approval from the department for any new construction or for reconstruction pursuant to 567—Chapter 41 shall consist of complete plans and specifications and appropriate water supply construction permit application schedules. Upon review, the department will issue a construction permit for approval of a project if the review shows that the project meets all departmental design standards in accordance with 567—Chapter 43. Approval of a project which does not meet all department design standards will be denied unless a variance as provided by 567—paragraph 43.3(2)*"c"* is granted. A variance may be requested at the time plans and specifications are submitted or after the design discrepancy is pointed out to the applicant.

The department may review submitted project plans and specifications and provide comments and recommendations to the applicant. Departmental comments and recommendations are advisory, except when departmental review determines that a facility does not comply with the plans or specifications as approved by the department or comply with the design standards pursuant to the criteria for certification of project design. The owner of the system must correct the deficiency in a timely manner as set forth by the department.

40.4(2) *Public water sources and below-ground level water storage facilities—site survey.* For public water sources and for below-ground level finished water storage facilities, a site survey and approval must be made by the department. The manner and procedures for applying for and processing a site survey are the same as in 40.4(1) except that the following information must be submitted by the applicant's engineer.

a. A preliminary engineering report or a cover letter which contains a brief description of the proposed source or storage facility and assurance that the project is in conformance with the long-range planning of the area.

b. Completed Schedule 1a — General Information

c. Completed Schedule 4 — Water Supply Facility Site Selection

d. A detailed map showing all potential sources of contamination (see 567—Chapter 43, Table A) within:

(1) 1,000 feet of a proposed well location. The scale shall not be smaller than 1 inch = 200 feet.

(2) 200 feet of a proposed below-ground level finished water storage facility.

(3) 2,500 feet from a proposed surface water source and a plat showing all facilities more than 2,500 feet from an impoundment (within the drainage area) that may be potential sources of contamination. The scale shall not be smaller than 1 inch = 660 feet.

(4) Six miles upstream of a proposed river intake.

40.4(3) *Modifications of an approved water supply construction project.* Persons seeking to make modifications to a water supply construction project after receiving a prior construction permit from the department shall submit an addendum to plans and specifications, a change order or revised plans and specifications at least 30 days prior to planned construction. The department shall review the submitted material within 30 days of submission and shall issue a supplemental permit if the proposed modifications meet departmental standards.

40.4(4) *Certification of project design.* A permit shall be issued for the construction, installation or modification of a public water supply system or part of a system or for a water supply distribution system extension if a qualified, registered engineer certifies that the plans and specifications comply with federal and state laws and regulations or that a variance to standards has been granted by the department. Refer to Schedule 1b.

567—40.5(17A,455B) Public water supply operation permit application procedures. A person requesting a water supply operation permit pursuant to 567—43.2(455B) must complete the appropriate application form, which will be provided by the department. Upon receipt of a completed application, the department will review the application and, if approved, will prepare and issue a water supply operation permit or draft permit, as applicable, and transmit it to the applicant. An annual operation fee pursuant to 567—subrule 43.2(1) is due by September 1 of each year. A permit or renewal will be denied when the applicant does not meet one or more requirements for issuance or renewal of this permit. An operation permit may be denied for any of the following reasons: system failed to pay the operation fee; system is not viable; system is not in compliance with the applicable maximum contaminant levels, treatment techniques, or action levels; system is in significant noncompliance with the provisions of 567—Chapter 41, 42, or 43.

567—40.6(455B) Drinking water state revolving fund loan application procedures. A person requesting a drinking water state revolving fund loan pursuant to 567—44.7(455B) must complete the appropriate application form, which will be provided by the department. The department will review the application package pursuant to 567—44.9(455B). Eligible projects will be ranked according to priority, with the highest-ranked projects receiving funding priority.

567—40.7(455B) Viability assessment procedures. A person required to complete a viability assessment pursuant to 567—43.8(455B) must submit the appropriate information as outlined in 567—43.8(455B) to the department. Self-assessment worksheets which can be used to prepare the viability assessment are available from the Water Supply Section, Department of Natural Resources, Henry A. Wallace Building, 502 East Ninth Street, Des Moines, Iowa 50319-0034.

These rules are intended to implement Iowa Code sections 455B.171 through 455B.188 and 455B.190 through 455B.192.

[Filed emergency 6/3/83—published 6/22/83, effective 7/1/83]
[Filed 3/22/85, Notice 9/12/84—published 4/10/85, effective 5/15/85]
[Filed emergency 8/22/86—published 9/10/86, effective 8/22/86]
[Filed emergency 11/14/86—published 12/3/86, effective 12/3/86]
[Filed 8/21/87, Notice 6/17/87—published 9/9/87, effective 10/14/87]
[Filed 4/29/88, Notice 3/9/88—published 5/18/88, effective 6/22/88]
[Filed 7/22/88, Notice 5/18/88—published 8/10/88, effective 9/14/88]
[Filed 11/26/90, Notice 6/13/90—published 12/12/90, effective 1/16/91]◊
[Filed 9/25/92, Notice 6/10/92—published 10/14/92, effective 11/18/92]
[Filed 7/30/93, Notice 5/12/93—published 8/18/93, effective 9/22/93]
[Filed 1/27/95, Notice 10/12/94—published 2/15/95, effective 3/22/95]*
[Filed emergency 8/25/95—published 9/13/95, effective 8/25/95]
[Filed 3/22/96, Notice 11/8/95—published 4/10/96, effective 5/15/96]
[Filed 7/23/99, Notice 4/7/99—published 8/11/99, effective 9/15/99]
[Filed 9/29/00, Notice 6/14/00—published 10/18/00, effective 11/22/00]

◊Two ARCs
*Effective date of definitions "Population served" and "Service connections" and rule 40.5(17A,455B) delayed until adjournment of the 1995 General Assembly by the Administrative Rules Review Committee at its meeting held March 13, 1995.

CHAPTER 41
WATER SUPPLIES

[These rules transferred from Health Department, 1971 IDR (Title II, Chs 1 and 2)]
[Prior to 7/1/83, DEQ Ch 22]
[Prior to 12/3/86, Water, Air and Waste Management[900]]

567—41.1(455B) Primary drinking water regulations—coverage. 567—Chapters 40 through 44 and 83 shall apply to each public water supply system, unless the public water supply system meets all of the following conditions:

1. Consists only of distribution and storage facilities (and does not have any collection and treatment facilities);
2. Obtains all of its water from, but is not owned or operated by, a public water supply system to which such regulations apply;
3. Does not sell water to any person; and
4. Is not a carrier which conveys passengers in interstate commerce.

567—41.2(455B) Biological maximum contaminant levels (MCL) and monitoring requirements.

41.2(1) *Coliforms, fecal coliforms and E. coli.*

a. Applicability. These rules apply to all public water supply systems.

b. Maximum contaminant levels (MCL) for total coliforms, fecal coliforms, and E. coli. The MCL is based on the presence or absence of total coliforms in a sample.

(1) Nonacute coliform bacteria MCL.

1. For a system which collects 40 samples or more per month, no more than 5.0 percent of the samples collected during a month may be total coliform-positive. A nonacute total coliform bacteria MCL violation occurs when more than 5.0 percent of routine and repeat samples collected during a month are total coliform-positive, but are not fecal coliform-positive or *E. coli*-positive.
2. For a system which collects less than 40 samples per month, no more than one sample collected during a month may be total coliform-positive. A nonacute total coliform bacteria MCL violation occurs when two or more routine and repeat samples collected during a month are total coliform-positive, but are not fecal coliform-positive or *E. coli*-positive.

(2) Acute coliform bacteria MCL. Any fecal coliform-positive repeat sample or *E. coli*-positive repeat sample, or any total coliform-positive repeat sample following a fecal coliform-positive or *E. coli*-positive routine sample constitutes a violation of the MCL for total coliforms. For purposes of the public notification requirements in 567—paragraph 42.1(1)*"b,"* this is a violation that may pose an acute risk to health.

(3) MCL compliance period. Compliance of a system with the MCL for total coliforms in 41.2(1)*"b"*(1) and (2) is based on each month in which the system is required to monitor for total coliforms.

(4) Compliance determination. Results of all routine and repeat samples not invalidated by the department or laboratory must be included in determining compliance with the MCL for total coliforms. Repeat samples must be analyzed at the same laboratory as the corresponding original routine sample(s), unless written approval for use of a different laboratory is granted by the department.

c. Monitoring requirements.

(1) Routine total coliform monitoring.

1. Public water supply systems must collect total coliform samples at sites which are representative of water throughout the distribution system according to a written sample siting plan. The plan shall be reviewed or updated by the public water supply system every two years and shall be retained on file at the facility. Major elements of the plan shall include, but are not limited to, a map of the distribution system, notation or a list of routine sample location(s) for each sample period, resample locations for each routine sample, and a log of samples taken. The plan must be made available to the department upon request and during sanitary surveys and must be revised by the system as directed by the department.

2. The public water supply system must collect samples at regular time intervals throughout the month, except that a system which uses only groundwater (except groundwater under the direct influence of surface water, as defined in 567—paragraph 43.5(1)"*b*") and serves 4,900 persons or fewer, may collect all required samples on a single day if they are taken from different sites. A system that uses only groundwater and adds a chemical disinfectant or provides water with a disinfectant must measure the residual disinfectant concentration at the same points in the distribution system and at the same time as total coliform bacteria samples are collected. A system that uses surface water or IGW must comply with the requirements specified in 567—numbered paragraph 43.5(4)"*b*"(2)"2." The system shall report the residual disinfectant concentration to the laboratory with the bacteria sample, in addition to comply with the applicable reporting requirements of 567—subrule 42.4(3).

3. Community water systems. The monitoring frequency for total coliforms for community water systems and noncommunity water systems serving schools, to include preschools and day care centers, is based on the population served by the system as listed below, until June 29, 1994. Public water systems which do not collect five or more routine samples each month must undergo an initial sanitary survey by June 29, 1994. After June 29, 1994, the monitoring frequency for systems serving less than 4,101 persons shall be a minimum of five routine samples per month unless the department determines, after completing sanitary surveys (at intervals not to exceed five years), that the monitoring frequency may continue as listed below. The monitoring frequency for regional water systems shall be as listed in 41.2(1)"*c*"(1)"4" but in no instance less than that required by the population equivalent served.

TOTAL COLIFORM MONITORING FREQUENCY FOR COMMUNITY WATER SYSTEMS AND NONCOMMUNITY (SCHOOL) WATER SYSTEMS

Population Served	Minimum Number of Samples Per Month
25 to 1,000*	1
1,001 to 2,500	2
2,501 to 3,300	3
3,301 to 4,100	4
4,101 to 4,900	5
4,901 to 5,800	6
5,801 to 6,700	7
6,701 to 7,600	8
7,601 to 8,500	9
8,501 to 12,900	10
12,901 to 17,200	15
17,201 to 21,500	20
21,501 to 25,000	25
25,001 to 33,000	30
33,001 to 41,000	40
41,001 to 50,000	50
50,001 to 59,000	60
59,001 to 70,000	70
70,001 to 83,000	80
83,001 to 96,000	90
96,001 to 130,000	100
130,001 to 220,000	120
220,001 to 320,000	150

*Includes public water supply systems which have at least 15 service connections, but serve fewer than 25 persons

320,001 to 450,000	180
450,001 to 600,000	210
600,001 to 780,000	240
780,001 to 970,000	270

4. Regional water systems. The supplier of water for a regional water system as defined in rule 567—40.2(455B) shall sample for coliform bacteria at a frequency indicated in the following chart until June 29, 1994, but in no case shall the sampling frequency for a regional water system be less than as set forth in 41.2(1)"*c*"(1)"3" based on the population equivalent served. Public water systems which do not collect five or more routine samples each month must undergo an initial sanitary survey by June 29, 1994. After June 29, 1994, the monitoring frequency of systems with less than 82 miles of pipe shall be a minimum of five routine samples per month unless the department determines, after completing sanitary surveys (at intervals not exceeding five years), that the monitoring frequency may continue as listed below. The following chart represents sampling frequency per miles of distribution system and is determined by calculating one-half the square root of the miles of pipe.

TOTAL COLIFORM MONITORING FREQUENCY FOR REGIONAL WATER SYSTEMS

Miles of Pipe	Minimum Number of Samples Per Month
0 - 9	1
10 - 25	2
26 - 49	3
50 - 81	4
82 - 121	5
122 -169	6
170 - 225	7
226 - 289	8
290 - 361	9
362 - 441	10
442 - 529	11
530 - 625	12
626 - 729	13
730 - 841	14
842 - 961	15
962 - 1,089	16
1,090 - 1,225	17
1,226 - 1,364	18
1,365 - 1,521	19
1,522 - 1,681	20
1,682 - 1,849	21
1,850 - 2,025	22
2,026 - 2,209	23
2,210 - 2,401	24
2,402 - 2,601	25
2,602 - 3,249	28
3,250 - 3,721	30
3,722 - 4,489	33
greater than 4,489	35

5. Noncommunity water systems. The monitoring frequency for total coliforms for noncommunity water systems is as listed in the four unnumbered paragraphs below until June 29, 1999. Public water systems which do not collect five or more routine samples each month must undergo an initial sanitary survey by June 29, 1999. After June 29, 1999, the minimum number of samples shall be five routine samples per month unless the department determines, after completing sanitary surveys (at intervals not exceeding five years), that the monitoring frequency may continue as listed below.

A noncommunity water system using only groundwater (except groundwater under the direct influence of surface water, as defined in 567—paragraph 43.5(1)*"b"*) and serving 1,000 persons or fewer must monitor each calendar quarter that the system provides water to the public. Systems serving more than 1,000 persons during any month must monitor at the same frequency as a like-sized community water system, as specified in 41.2(1)*"c"*(1)"3."

A noncommunity water system using surface water, in total or in part, must monitor at the same frequency as a like-sized community water system, as specified in 41.2(1)*"c"*(1)"3," regardless of the number of persons it serves.

A noncommunity water system using groundwater under the direct influence of surface water, as defined in 567—paragraph 43.5(1)*"b,"* must monitor at the same frequency as a like-sized community water system, as specified in 41.2(1)*"c"*(1)"3," regardless of the number of persons it serves. The system must begin monitoring at this frequency beginning six months after the department determines that the groundwater is under the direct influence of surface water.

A noncommunity water system serving schools or daycares must monitor at the same frequency as a like-sized community water system, as specified in 41.2(1)*"c"*(1)"3."

6. If the department, on the basis of a sanitary survey or monitoring results history, determines that some greater frequency of monitoring is more appropriate, that frequency shall be the frequency required under these regulations. This frequency shall be confirmed or changed on the basis of subsequent surveys.

7. Special purpose samples, such as those taken to determine whether disinfection practices are sufficient following pipe placement, replacement, or repair, shall not be used to determine compliance with the MCL for total coliforms in 41.2(1)*"b."* Repeat samples taken pursuant to 41.2(1)*"c"*(2) are not considered special purpose samples and must be used to determine compliance with the MCL for total coliforms in 41.2(1)*"b."*

(2) Repeat total coliform monitoring.

1. Repeat sample time limit and numbers. If a routine sample is total coliform-positive, the public water supply system must collect a set of repeat samples within 24 hours of being notified of the positive result and in no case more than 24 hours after being notified by the department. A system which collects more than one routine sample per month must collect no fewer than three repeat samples for each total coliform-positive sample found. A system which collects one routine sample per month or fewer must collect no fewer than four repeat samples for each total coliform-positive sample found. The department may extend the 24-hour limit on a case-by-case basis if the system has a logistical problem in collecting the repeat samples within 24 hours that is beyond its control. In those cases, the public water supply system must report the circumstances to the department no later than the end of the next business day after receiving the notice to repeat sample and initiate the action directed by the department. In the case of an extension, the department will specify how much time the system has to collect the repeat samples.

2. Repeat sample location(s). The system must collect at least one repeat sample from the sampling tap where the original total coliform-positive sample was taken, at least one repeat sample at a tap within five service connections upstream and at least one repeat sample at a tap within five service connections downstream of the original sampling site. If a total coliform-positive sample is at the end of the distribution system, or at the first or last service connection, the system will be required to collect the repeat samples from the original sampling site and locations only upstream or downstream.

(2) Disinfectant residual. Maintenance of a disinfectant residual throughout the distribution system;

(3) Distribution system maintenance. Proper maintenance of the distribution system including appropriate pipe replacement and repair procedures, main flushing programs, proper operation and maintenance of storage tanks and reservoirs, and continual maintenance of a minimum positive water pressure of 20 psig in all parts of the distribution system at all times; and

(4) Filtration or disinfection. Filtration and disinfection of surface water or groundwater under the direct influence of surface water in accordance with 567—43.5(455B) or disinfection of groundwater using strong oxidants such as, but not limited to, chlorine, chlorine dioxide, or ozone.

(5) Wellhead protection program. For groundwater systems, compliance with the requirements of the department's wellhead protection program.

e. Analytical methodology.

(1) Sample volume. The standard sample volume required for total coliform analysis, regardless of analytical method used, is 100 mL.

(2) Presence/absence determination. Public water supply systems shall determine the presence or absence of total coliforms. A determination of total coliform density is not required.

(3) Total coliform bacteria analytical methodology. Public water supply systems must conduct total coliform analyses in accordance with one of the analytical methods in the following table:

Organism	Methodology	Citation[1]
Total Coliforms[2]	Total Coliform Fermentation Technique[3,4,5]	9221A, B
	Total Coliform Membrane Filter Technique[6]	9222A, B, C
	Presence-Absence (P-A) Coliform Test[5,7]	9221D
	ONPG-MUG Test[8]	9223
	Colisure Test[9]	
	M*Colite Test[10]	
	m-ColiBlue24 Test[11]	

The procedures shall be done in accordance with the documents listed below. The incorporation by reference of the following documents listed in footnotes 1, 6, 8, 9, 10, and 11 was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. Copies of the documents may be obtained from the sources listed below. Information regarding obtaining these documents can be obtained from the Safe Drinking Water Hotline at (800)426-4791. Documents may be inspected at EPA's Drinking Water Docket, 401 M Street SW, Washington, DC 20460, telephone (202)260-3027; or at the Office of Federal Register, 800 North Capitol Street NW, Suite 700, Washington, DC 20408.

1 Methods 9221A, B; 9222A, B, C; 9221D; and 9223 are contained in Standard Methods for the Examination of Water and Wastewater, 18th edition, 1992, and 19th edition, 1995, American Public Health Association, 1015 Fifteenth Street NW, Washington, DC 20005. Either edition may be used.

2 The time from sample collection to initiation of the analysis may not exceed 30 hours. Systems are encouraged but not required to hold samples below 10 degrees Celsius during transit.

3 Lactose broth, as commercially available, may be used in lieu of lauryl tryptose broth, if the system conducts at least 25 parallel tests between this medium and lauryl tryptose broth using the water normally tested, and this comparison demonstrates that the false-positive rate and false-negative rate for total coliforms, using lactose broth, is less than 10 percent.

4 If inverted tubes are used to detect gas production, the media should cover these tubes at least one-half to two-thirds after the sample is added.

5 No requirement exists to run the completed phase on 10 percent of all total coliform-positive confirmed tubes.

6 MI agar also may be used. Preparation and use of MI agar is set forth in the article, "New medium for the simultaneous detection of total coliform and *Escherichia coli* in water," by Brenner, K.P., et al., 1993, Applied Environmental Microbiology 56:3534-3544. Also available from the Office of Water Resource Center (RC-4100), 401 M Street SW, Washington, DC 20460, EPA 600/J-99/225.

7 Six-times formulation strength may be used if the medium is filter-sterilized rather than autoclaved.

8 The ONPG-MUG Test is also known as the Autoanalysis Colilert System.

9 The Colisure Test may be read after an incubation time of 24 hours. A description of the Colisure Test, February 28, 1994, may be obtained from IDEXX Laboratories, Inc., One IDEXX Drive, Westbrook, ME 04092.

10 A description of the E*Colite Test, "Presence/Absence for Coliforms and *E. Coli* in Water," December 21, 1997, is available from Charm Sciences, Inc., 25 Franklin Street, Malden, MA 02148-4120.

11 A description of the m-ColiBlue24 Test, August 17, 1999, is available from the Hach Company, 100 Dayton Avenue, Ames, IA 50010.

12 The department strongly recommends that laboratories evaluate the false-positive and false-negative rates for the method(s) they use for monitoring total coliforms. It also encourages laboratories to establish false-positive and false-negative rates within their own laboratory and sample matrix (drinking water or source water) with the intent that if the method chosen has an unacceptable false-positive or false-negative rate, another method may be used. The department suggests that laboratories perform these studies on a minimum of 5 percent of all total coliform-positive samples, except for those methods for which verification/confirmation is already required, e.g., the M-Endo and LES Endo Membrane Filter Tests, Standard Total Coliform Fermentation Technique, and Presence-Absence Coliform Test. Methods for establishing false-positive and false-negative rates may be based on lactose fermentation, the rapid test for beta-galactosidase and cytochrome oxidase, multitest identification systems, or equivalent confirmation tests. False-positive and false-negative information is often available in published studies or from the manufacturer(s).

(4) Rescinded IAB 8/11/99, effective 9/15/99.

(5) Fecal coliform analytical methodology. Public water systems must conduct fecal coliform analysis in accordance with the following procedure. When the MTF Technique or presence-absence (P-A) coliform test is used to test for total coliforms, shake the lactose-positive presumptive tube or P-A bottle vigorously and transfer the growth with a sterile 3-mm loop or sterile applicator stick into brilliant green lactose bile broth and EC medium to determine the presence of total and fecal coliforms, respectively. For EPA-approved analytical methods which use a membrane filter, transfer the total coliform-positive culture by one of the following methods: remove the membrane containing the total coliform colonies from the substrate with sterile forceps and carefully curl and insert the membrane into a tube of EC medium (the laboratory may first remove a small portion of selected colonies for verification); swab the entire membrane filter surface with a sterile cotton swab and transfer the inoculum to EC medium (do not leave the cotton swab in the EC medium); or inoculate individual total coliform-positive colonies into EC medium. Gently shake the inoculated EC tubes to ensure adequate mixing and incubate in a waterbath at 44.5 (+ or -) 0.2 degrees C for 24 (+ or -) 2 hours. Gas production of any amount in the inner fermentation tube of the EC medium indicates a positive fecal coliform test. The preparation of EC medium is described in Method 9221E (paragraph 1a) in Standard Methods for the Examination of Water and Wastewater, 18th edition, 1992, and in the 19th edition, 1995; either edition may be used. Public water supply systems need only determine the presence or absence of fecal coliforms; a determination of fecal coliform density is not required.

(6) *E. coli* analytical methodology. Public water systems must conduct analysis of *Escherichia coli (E. coli)* in accordance with one of the following analytical methods:

1. EC medium supplemented with 50 micrograms per milliliter of 4-methylumbelliferyl-beta-D-glucuronide (MUG) (final concentration). EC medium is described in Standard Methods for the Examination of Water and Wastewater, 18th edition, 1992, and in the 19th edition, 1995, Method 9221E, paragraph 1a; either edition may be used. MUG may be added to EC medium before autoclaving. EC medium supplemented with 50 micrograms per milliliter of MUG is commercially available. At least 10 mL of EC medium supplemented with MUG must be used. The inner inverted fermentation tube may be omitted. The procedure for transferring a total coliform-positive culture to EC medium supplemented with MUG shall be as specified in 41.2(1)*"e"*(5) for transferring a total coliform-positive culture to EC medium. Observe fluorescence with an ultraviolet light (366 nm) in the dark after incubating tube at 44.5 plus or minus 0.2 degrees Celsius for 24 plus or minus 2 hours.

2. Nutrient agar supplemented with 100 micrograms per mL 4-methylumbelliferyl-beta-D-glucuronide (MUG) (final concentration). Nutrient agar is described in Method 9221B (paragraph 3) in Standard Methods for the Examination of Water and Wastewater, 18th edition, 1992, and in the 19th edition, 1995; either edition may be used. This test is used to determine if a total coliform-positive sample, as determined by the Membrane-Filter Technique or any other method in which a membrane filter is used, contains *E. coli*. Transfer the membrane filter containing a total coliform colony(ies) to nutrient agar supplemented with 100 micrograms per mL (final concentration) of MUG. After incubating the agar plate at 35 degrees Celsius for 4 hours, observe the colony(ies) under ultraviolet light (366 nm) in the dark for fluorescence. If fluorescence is visible, *E. coli* are present.

3. Minimal Medium ONPG-MUG (MMO-MUG) Test, as set forth in the article "National Field Evaluation of a Defined Substrate Method for the Simultaneous Detection of Total Coliforms and *Escherichia coli* from Drinking Water: Comparisons with Presence-Absence Techniques" (Edberg et al.), Applied and Environmental Microbiology, Volume 55, pp. 1003-1008, April 1989. (Note: The Autoanalysis Colilert System is an MMO-MUG test.) If the MMO-MUG Test is total coliform-positive after a 24-hour incubation, test the medium for fluorescence with a 366-nm ultraviolet light (preferably with a 6-watt lamp) in the dark. If fluorescence is observed, the sample is *E. coli*-positive. If fluorescence is questionable (cannot be definitively read) after 24 hours incubation, incubate the culture for an additional 4 hours (but not to exceed 28 hours total), and again test the medium for fluorescence. The MMO-MUG Test with hepes buffer is the only approved formulation for the detection of *E. coli*.

4. The membrane filter method with MI agar, as described in footnote 6 of the Total Coliform Methodology Table in 41.2(1)*"e"*(3).

5. E*Colite Test, as described in footnote 10 of the Total Coliform Methodology Table in 41.2(1)*"e"*(3).

6. m-ColiBlue 24 Test, as described in footnote 11 of the Total Coliform Methodology Table in 41.2(1)*"e"*(3).

(7) Optional *E. coli* analytical methodology. As an option to 41.2(1)*"e"*(6) a system with a total coliform-positive, MUG-negative, MMO-MUG Test may further analyze the culture for the presence of *E. coli* by transferring a 0.1 mL, 28-hour MMO-MUG culture to EC Medium + MUG with a pipette. The formulation and incubation conditions of EC Medium + MUG and observation of the results are described in 41.2(1)*"e"*(6).

41.2(2) *Giardia.* Reserved.

41.2(3) *Heterotrophic plate count bacteria (HPC).*

a. Applicability. All public water systems that use a surface water source or source under the direct influence of surface water must provide treatment consisting of disinfection, as specified in 567—subrule 43.5(2), and filtration treatment which complies with 567—subrule 43.5(3). The heterotrophic plate count is an alternate method to demonstrate a detectable disinfectant residual in accordance with 567—paragraph 43.5(2)*"d."*

b. Maximum contaminant levels. Reserved.

c. Monitoring requirements. Reserved.

d. BAT. Reserved.

e. Analytical methodology. Public water systems shall conduct heterotrophic plate count bacteria analysis in accordance with 567—subrule 43.5(2) and the following analytical method. Measurements for heterotrophic plate count bacteria must be conducted by a laboratory certified by the department to do such analysis, when heterotrophic plate count bacteria are being measured in lieu of a detectable residual disinfectant pursuant to 567—paragraph 43.5(2)*"d."* In addition, the time from sample collection to initiation of analysis may not exceed eight hours, and the systems must hold the samples below 10 degrees Celsius during transit to the laboratory.

(1) Method. The heterotrophic plate count shall be performed in accordance with Method 9215B Pour Plate Method, Standard Methods for the Examination of Water and Wastewater, 18th edition, 1992, and 19th edition, 1995 (either edition may be used).

(2) Reporting. The public water system shall report the results of heterotrophic plate count in accordance with 567—subparagraph 42.4(3)*"c"*(2).

41.2(4) *Macroscopic organisms and algae.*

a. Applicability. These rules apply to both community and noncommunity public water supply systems using surface water or groundwater under direct influence of surface water as defined by 567—subrule 43.5(1).

b. Maximum contaminant levels (MCLs) for macroscopic organisms and algae. Finished water shall be free of any macroscopic organisms such as plankton, worms, or cysts. The finished water algal cell count shall not exceed 500 organisms per milliliter or 10 percent of the total cells found in the raw water, whichever is greater.

c. Monitoring requirements. Reserved.

d. BAT. Reserved.

e. Analytical methodology. Measurement of the algal cells shall be in accordance with Method 10200F: Phytoplankton Counting Techniques, Standard Methods for the Examination of Water and Wastewater, 18th edition, pp. 10-13 to 10-16. Such measurement shall be required only when the department determines on the basis of complaints or otherwise that excessive algal cells may be present.

567—41.3(455B) Maximum contaminant levels (MCLs) and monitoring requirements for inorganic contaminants other than lead or copper.

41.3(1) *MCLs and other requirements for inorganic contaminants.*

a. Applicability. Maximum contaminant levels for inorganic contaminants (IOCs) specified in 41.3(1)*"b"* apply to community water systems and nontransient noncommunity water systems as specified herein. The maximum contaminant level for arsenic applies only to community water systems and nontransient noncommunity systems which primarily serve children (daycares and schools). The maximum contaminant level specified for fluoride applies only to community water systems and nontransient noncommunity systems which primarily serve children (daycares and schools). The maximum contaminant levels specified for nitrate, nitrite, and total nitrate and nitrite apply to community, nontransient noncommunity, and transient noncommunity water systems. At the discretion of the department, nitrate levels not to exceed 20 mg/L may be allowed in a noncommunity water system if the supplier of water demonstrates to the satisfaction of the department that:

(1) Such water will not be available to children under 6 months of age; and

(2) There will be continuous posting of the fact that nitrate levels exceed 10 mg/L and the potential health effects of exposure; and

(3) The following public health authorities will be notified annually of nitrate levels that exceed 10 mg/L, in addition to the reporting requirements of 567—Chapters 41 and 42: county board of health, county health department, county sanitarian, county public health administrator, and Iowa department of public health; and

(4) No adverse health effects shall result.

The requirements also contain monitoring requirements, best available technology (BAT) identification, and analytical method requirements pursuant to 41.3(1)*"c,"* and 567—paragraphs 41.3(1)*"e"* and 43.3(10)*"b,"* respectively.

b. Maximum contaminant levels for inorganic chemicals (IOCs).

(1) IOC MCLs. The following table specifies the MCLs for IOCs:

Contaminant	EPA Contaminant Code	Maximum Contaminant Level (mg/L)
Antimony	1074	0.006
Arsenic	1005	0.05
Asbestos	1094	7 million fibers/liter (longer than 10 micrometers in length)
Barium	1010	2
Beryllium	1075	0.004
Cadmium	1015	0.005
Chromium	1020	0.1
Cyanide (as free Cyanide)	1024	0.2
Fluoride*	1025	4.0
Mercury	1035	0.002
Nitrate	1040	10 (as nitrogen)
Nitrite	1041	1 (as nitrogen)
Total Nitrate and Nitrite	1038	10 (as nitrogen)
Selenium	1045	0.05
Thallium	1085	0.002

*The recommended fluoride level is 1.1 milligrams per liter or the level as calculated from "Water Fluoridation, a Manual for Engineers and Technicians" Table 2-4 published by the U.S. Department of Health and Human Services, Public Health Service (September 1986). At this optimum level in drinking water fluoride has been shown to have beneficial effects in reducing the occurrence of tooth decay.

(2) Compliance calculations. Compliance with 41.3(1)"*b*"(1) shall be determined based on the analytical result(s) obtained at each source/entry point.

1. Sampling frequencies greater than annual (e.g., monthly or quarterly). For public water supply systems which are conducting monitoring at a frequency greater than annual, compliance with the maximum contaminant levels for antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium, and thallium is determined by a running annual average at any sampling point. If the average at any sampling point is greater than the MCL, then the system is out of compliance. If any one sample would cause the annual average to be exceeded, then the system is out of compliance immediately. Any sample below the method detection limit shall be calculated at zero for the purpose of determining the annual average.

2. Sampling frequencies of annual or less. For public water supply systems which are monitoring annually, or less frequently, the system is out of compliance with the maximum contaminant levels for antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium, and thallium if the level of a contaminant at any sampling point is greater than the MCL. If a confirmation sample is required by the department, it must be collected as soon as possible from the same sampling location, but not to exceed two weeks, and the determination of compliance will be based on the average of the two samples.

3. Compliance calculations for nitrate and nitrite. Compliance with the maximum contaminant levels for nitrate and nitrite is determined based on one sample if the level of these contaminants is below the MCLs. If the level of nitrate or nitrite exceeds the MCLs in the initial sample, a confirmation sample may be required in accordance with 41.3(1)"*c*"(7)"2," and compliance shall be determined based on the average of the initial and confirmation samples.

(3) Additional requirements. The department may assign additional requirements as deemed necessary to protect the public health, including public notification requirements.

c. Inorganic chemicals—monitoring requirements.

(1) Routine IOC monitoring (excluding asbestos, nitrate, and nitrite). Community public water supply systems and nontransient noncommunity water systems shall conduct monitoring to determine compliance with the MCLs specified in 41.3(1)"*b*" in accordance with this subrule. Transient noncommunity water systems shall conduct monitoring to determine compliance with the nitrate and nitrite maximum contaminant levels in 41.3(1)"*b*" as required by 41.3(1)"*c*"(5) and (6).

(2) Department designated sampling schedules: Each public water system shall monitor at the time designated by the department during each compliance period. The monitoring protocol is as follows:

1. Groundwater sampling points. Groundwater systems shall take a minimum of one sample at every entry point to the distribution system which is representative of each well after treatment (hereafter called a source/entry point) beginning in the compliance period starting January 1, 1993. The system shall take each sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

2. Surface water sampling points. Surface water systems shall take a minimum of one sample at every entry point to the distribution system after any application of treatment or in the distribution system at a point which is representative of each source after treatment (hereafter called a source/entry point) beginning in the compliance period starting January 1, 1993. (For purposes of this paragraph, surface water systems include systems with a combination of surface and ground sources.) The system shall take each sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

3. Multiple sources. If a public water supply system draws water from more than one source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water is representative of all sources being used).

4. Composite sampling. The department may reduce the total number of samples which must be analyzed by the use of compositing. In systems serving less than or equal to 3,300 persons, composite samples from a maximum of five samples are allowed, provided that the detection limit of the method used for analysis is less than one-fifth of the MCL. Compositing of samples must be done in the laboratory. If the concentration in the composite sample is greater than or equal to one-fifth of the MCL of any inorganic chemical, then a follow-up sample must be taken within 14 days at each sampling point included in the composite. These samples must be analyzed for the contaminants which exceeded one-fifth of the MCL in the composite sample. If duplicates of the original sample taken from each sampling point used in the composite are available, the system may use these duplicates instead of resampling, provided the holding time of the duplicate samples is not exceeded. The duplicate must be analyzed and the results reported to the department within 14 days after completing analysis of the composite sample. If the population served by the system is greater than 3,300 persons, then compositing may only be permitted by the department as sampling points within a single system. In systems serving less than or equal to 3,300 persons, the department may permit compositing among different systems provided the five-sample limit is maintained. Detection limits for each inorganic contaminant analytical method are contained in 41.3(1)*"e"*(1).

(3) Asbestos routine and repeat monitoring frequency. The frequency of monitoring conducted to determine compliance with the maximum contaminant level for asbestos specified in 41.3(1)*"b"* shall be conducted as follows:

1. Initial sampling frequency. Each community and nontransient noncommunity water system is required to monitor for asbestos during the first three-year compliance period of each nine-year compliance cycle beginning in the compliance period starting January 1, 1993.

2. Sampling during waiver. If the public water supply system believes it is not vulnerable to either asbestos contamination in its source water or due to corrosion of asbestos-cement pipe, or both, it may apply for a waiver of the monitoring requirement in 41.3(1)*"c"*(3)"1." If the department grants the waiver, the system is not required to monitor.

3. Bases of an asbestos waiver. The department may grant a waiver based on a consideration of potential asbestos contamination of the water source, the use of asbestos-cement pipe for finished water distribution, and the corrosive nature of the water.

4. Effect of an asbestos waiver. A waiver remains in effect until the completion of the three-year compliance period. Systems not receiving a waiver must monitor in accordance with 41.3(1)*"c"*(3)"1."

5. Distribution system vulnerability for asbestos. A public water supply system vulnerable to asbestos contamination due solely to corrosion of asbestos-cement pipe shall take one sample at a tap served by asbestos-cement pipe and under conditions where asbestos contamination is most likely to occur.

6. Source water vulnerability for asbestos. A public water supply system vulnerable to asbestos contamination due solely to source water shall monitor in accordance with the provision of 41.3(1)*"c"*(2).

7. Combined asbestos vulnerability. A public water supply system vulnerable to asbestos contamination due both to its source water supply and corrosion of asbestos-cement pipe shall take one sample at a tap served by asbestos-cement pipe and under conditions where asbestos contamination is most likely to occur.

8. Exceedance of the asbestos MCL. A public water supply system which exceeds the maximum contaminant levels as determined in 41.3(1)*"b"* shall monitor quarterly beginning in the next quarter after the violation occurred.

9. Asbestos reliably and consistently below the MCL. The department may decrease the quarterly monitoring requirement to the frequency specified in 41.3(1)*"c"*(3)"1" provided the system is reliably and consistently below the maximum contaminant level. In no case can the department make this determination unless a groundwater system takes a minimum of two quarterly samples and a surface (or combined surface/ground) water system takes a minimum of four quarterly samples.

10. Grandfathered asbestos data. If monitoring data collected after January 1, 1990, are generally consistent with the requirements of 41.3(1)"*c*"(3), then the department may allow public water supply systems to use that data to satisfy the monitoring requirement for the initial compliance period beginning January 1, 1993.

(4) Monitoring frequency for other IOCs. The frequency of monitoring conducted to determine compliance with the maximum contaminant levels in 41.3(1)"*b*" for antimony, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium, and thallium shall be as follows:

1. IOCs sampling frequency. Groundwater systems shall take one sample at each sampling point once every three years. Surface water systems (or combined surface/groundwater systems) shall take one sample annually at each sampling point.

2. IOC sampling waiver. The public water supply system may apply for a waiver from the monitoring frequencies specified in 41.3(1)"*c*"(4)"1."

3. IOC sampling during a waiver. A condition of the waiver shall require that a public water supply system shall take a minimum of one sample while the waiver is effective. The term during which the waiver is effective shall not exceed one compliance cycle (i.e., nine years).

4. Bases of an IOC waiver and grandfathered data. The department may grant a waiver provided surface water systems have monitored annually for at least three years and groundwater systems have conducted a minimum of three rounds of monitoring. (At least one sample shall have been taken since January 1, 1990.) Both surface and groundwater systems shall demonstrate that all previous analytical results were less than the maximum contaminant level. Systems that use a new water source are not eligible for a waiver until three rounds of monitoring from the new source have been completed. Systems may be granted a waiver for monitoring of cyanide, provided that the department determines that the system is not vulnerable due to lack of any industrial source of cyanide.

5. Bases of the IOC sampling frequency during a waiver. In determining the appropriate reduced monitoring frequency, the department will consider: reported concentrations from all previous monitoring; the degree of variation in reported concentrations; and other factors which may affect contaminant concentrations such as changes in groundwater pumping rates, changes in the system's configuration, changes in the system's operating procedures, or changes in stream flows or characteristics.

6. Effect of an IOC waiver. A decision to grant a waiver shall be made in writing and shall include the basis for the determination. The determination may be initiated by the department or upon an application by the public water supply system. The public water supply system shall specify the basis for its request. The department may review and, where appropriate, revise its determination of the appropriate monitoring frequency when the system submits new monitoring data or when other data relevant to the system's appropriate monitoring frequency become available.

7. Exceedance of an IOC MCL. Public water supply systems which exceed the maximum contaminant levels as calculated in 41.3(1)"*b*" shall monitor quarterly beginning in the next quarter after the violation occurred.

8. IOCs reliably and consistently below the MCL. The department may decrease the quarterly monitoring requirement to the frequencies specified in 41.3(1)"*c*"(4)"1" and "3" provided it has determined that the public water supply system is reliably and consistently below the maximum contaminant level. In no case can the department make this determination unless a groundwater system takes a minimum of two quarterly samples and a surface water system takes a minimum of four quarterly samples.

(5) Routine and repeat monitoring frequency for nitrates. All public water supply systems (community; nontransient noncommunity; and transient noncommunity systems) shall monitor to determine compliance with the maximum contaminant level for nitrate in 41.3(1)"*b.*"

1. Initial nitrate sampling. Community and nontransient noncommunity water systems served by groundwater systems shall monitor annually beginning January 1, 1993; systems served by surface water shall monitor quarterly beginning January 1, 1993. Transient noncommunity water systems shall monitor annually beginning January 1, 1993.

2. Groundwater repeat nitrate sampling frequency. For community and noncommunity water systems, the repeat monitoring frequency for groundwater systems shall be:

- Quarterly for at least one year following any one sample in which the concentration is greater than or equal to 5.0 mg/L as N. The department may allow a groundwater system to reduce the sampling frequency to annually after four consecutive quarterly samples are reliably and consistently less than 5.0 mg/L as N.
- Monthly for at least one year following any nitrate MCL exceedance.

3. Surface water repeat nitrate sampling frequency. For community and noncommunity water systems, the department may allow a surface water system to reduce the sampling frequency to:

- Annually if all analytical results from four consecutive quarters are less than 5.0 mg/L as N.
- Quarterly for at least one year following any one sample in which the concentration is greater than or equal to 5.0 mg/L as N. The department may allow a surface water system to reduce the sampling frequency to annually after four consecutive quarterly samples are reliably and consistently less than 5.0 mg/L as N.
- Monthly for at least one year following any nitrate MCL exceedance.

4. Scheduling annual nitrate repeat samples. After the initial round of quarterly sampling is completed, each community and nontransient noncommunity system which is monitoring annually shall take subsequent samples during the quarter(s) which previously resulted in the highest analytical result.

(6) Routine and repeat monitoring frequency for nitrite. All public water supply systems (community; nontransient noncommunity; and transient noncommunity systems) shall monitor to determine compliance with the maximum contaminant level for nitrite in 41.3(1)*"b."*

1. Initial nitrite sampling. All public water systems shall take one sample at each sampling point in the compliance period beginning January 1, 1993, and ending December 31, 1995.

2. Nitrite repeat monitoring. After the initial sample, systems where an analytical result for nitrite is less than 0.5 mg/L as N shall monitor at the frequency specified by the department.

3. Nitrite increased monitoring. For community, nontransient noncommunity, and transient noncommunity water systems, the repeat monitoring frequency for any water system shall be:

- Quarterly for at least one year following any one sample in which the concentration is greater than or equal to 0.5 mg/L as N. The department may allow a system to reduce the sampling frequency to annually after determining the system is reliably and consistently less than 0.5 mg/L.
- Monthly for at least one year following any nitrite MCL exceedance.

4. Scheduling of annual nitrite repeat samples. Systems which are monitoring annually shall take each subsequent sample during the quarter(s) which previously resulted in the highest analytical result.

(7) Confirmation sampling.

1. Deadline for IOCs confirmation samples. Where the results of an analysis for antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium, or thallium indicate an exceedance of the maximum contaminant level, the department may require that one additional sample be collected as soon as possible after the initial sample was taken (but not to exceed two weeks) at the same sampling point.

2. Deadline for nitrate and nitrite confirmation samples. Where nitrate or nitrite sampling results indicate an exceedance of the maximum contaminant level and the sampling frequency is quarterly or annual, the system shall take a confirmation sample within 24 hours of the system's receipt of notification of the analytical results of the first sample. Public water supply systems unable to comply with the 24-hour sampling requirement must immediately notify the consumers served by the area served by the public water system in accordance with 567—42.1(455B) and complete an analysis of a confirmation sample within two weeks of notification of the analytical results of the first sample. Where the sampling frequency is monthly, a confirmation sample will not be used to determine compliance with the MCL.

3. Deadline for VOC and SOC confirmation samples. Where the results of an analysis for any VOC or SOC indicate an exceedance of the maximum contaminant level, the department may require that one or more additional samples be collected as soon as possible after the initial sample was taken, but not to exceed two weeks, at the same sampling point.

4. Compliance calculations and confirmation samples. If a required confirmation sample as collected within the time specified in 41.3(1)"*c*"(7)"1" is taken for any contaminant, then the results of the initial and confirmation sample shall be averaged. The resulting average shall be used to determine the system's compliance in accordance with 41.3(1)"*b.*" The department has the discretion to invalidate results of obvious sampling errors.

(8) Designation of increased sampling frequency. The department may require more frequent monitoring than specified in 41.3(1)"*c*"(3) through (6) or may require confirmation samples for positive and negative results at its discretion. Public water supply systems may apply to conduct more frequent monitoring than the minimum monitoring frequencies specified in this subrule. Any increase or decrease in monitoring under this subparagraph will be designated in an operation permit or administrative order. To increase or decrease such frequency, the department shall consider the following factors:

1. Reported concentrations from previously required monitoring,
2. The degree of variation in reported concentrations,
3. Blending or treatment processes conducted for the purpose of complying with a maximum contaminant level, treatment technique, or action level, and
4. Other factors include changes in pumping rates in groundwater supplies or significant changes in the system's configuration, operating procedures, source of water and changes in streamflows.

(9) Grandfathered data. For the initial analysis required by 41.3(1)"*c,*" data for surface waters acquired within one year prior to the effective date and data for groundwaters acquired within three years prior to the effective date of 41.3(1)"*c*" may be substituted at the discretion of the department.

d. Best available treatment technologies (BATs) for IOCs. Rescinded IAB 8/11/99, effective 9/15/99.

e. Analytical methodology.

(1) Analytical methods for IOCs. Analysis for the listed inorganic contaminants shall be conducted using the following methods, or their equivalent as determined by EPA. Criteria for analyzing arsenic, barium, beryllium, cadmium, chromium, copper, lead, nickel, selenium, sodium, and thallium with digestion or directly without digestion, and other analytical test procedures are contained in Technical Notes on Drinking Water Methods, EPA-600/R-94-173, October, 1994. This document is available from the National Technical Information Service, NTIS PB95-104766, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161. The toll-free number is (800)553-6847.

INORGANIC CONTAMINANTS ANALYTICAL METHODS

Contaminant	Methodology[15]	EPA	ASTM[3]	SM[4]	Other	Detection Limit, mg/L
Antimony	Atomic absorption; furnace			3113B		0.003
	Atomic absorption; platform	200.9[2]				0.0008[12]
	ICP-Mass spectrometry	200.8[2]				0.0004
	Atomic absorption; hydride		D3697-92			0.001
Arsenic[16]	Inductively coupled plasma	200.7[2]		3120B		
	ICP-Mass spectrometry	200.8[2]				
	Atomic absorption; platform	200.9[2]				
	Atomic absorption; furnace		D2972-93C	3113B		
	Atomic absorption; hydride		D2972-93B	3114B		
Asbestos	Transmission electron microscopy	100.1[9]				0.01 MFL
	Transmission electron microscopy	100.2[10]				
Barium	Inductively coupled plasma	200.7[2]		3120B		0.002
	ICP-Mass spectrometry	200.8[2]				
	Atomic absorption; direct			3111D		0.1
	Atomic absorption; furnace			3113B		0.002

Contaminant	Methodology[15]	EPA	ASTM [3]	SM [4]	Other	Detection Limit, mg/L
Beryllium	Inductively coupled plasma	200.7[2]		3120B		0.0003
	ICP-Mass spectrometry	200.8[2]				0.0003
	Atomic absorption; platform	200.9[2]				0.00002[12]
	Atomic absorption; furnace		D3645-93B	3113B		0.0002
Cadmium	Inductively coupled plasma	200.7[2]				0.001
	ICP-Mass spectrometry	200.8[2]				
	Atomic absorption; platform	200.9[2]				
	Atomic absorption; furnace			3113B		0.0001
Chromium	Inductively coupled plasma	200.7[2]		3120B		0.007
	ICP-Mass spectrometry	200.8[2]				
	Atomic absorption; platform	200.9[2]				
	Atomic absorption; furnace			3113B		0.001
Cyanide	Manual distillation (followed by one of the following analytical methods:)		D2036-91A	4500-CN-C		
	Spectrophotometric; amenable[14]		D2036-91B	4500-CN-G		0.02
	Spectrophotometric; manual[13]		D2036-91A	4500-CN-E	I-3300-85[5]	0.02
	Spectrophotometric; semi-automated[13]	335.4[6]				0.005
	Selective electrode[13]			4500-CN-F		0.05
Fluoride	Ion chromatography	300.0[6]	D4327-91	4110B		
	Manual distillation; colorimetric; SPADNS			4500F-B,D		
	Manual electrode		D1179-93B	4500F-C		
	Automated electrode				380-75WE[11]	
	Automated alizarin			4500F-E	129-71W[11]	
Magnesium	Atomic absorption; direct		D511-93B	3111B		
	ICP	200.7[1]		3120B		
	Complexation Titrimetric Methods		D511-93A	3500-MgE		
Mercury	Manual, cold vapor	245.1[2]	D3223-91	3112B		0.0002
	Automated, cold vapor	245.2[1]				0.0002
	ICP-Mass spectrometry	200.8[2]				
Nickel	Inductively coupled plasma	200.7[2]		3120B		0.005
	ICP-Mass spectrometry	200.8[2]				0.0005
	Atomic absorption; platform	200.9[2]				0.0006[12]
	Atomic absorption; direct			3111B		
	Atomic absorption; furnace			3113B		0.001
Nitrate	Ion chromatography	300.0[6]	D4327-91	4110B	B-1011[8]	0.01
	Automated cadmium reduction	353.2[6]	D3867-90A	4500-NO_3-F		0.05
	Ion selective electrode			4500-NO_3-D	601[7]	1
	Manual cadmium reduction		D3867-90B	4500-NO_3-E		0.01
Nitrite	Ion chromatography	300.0[6]	D4327-91	4110B	B-1011[8]	0.004
	Automated cadmium reduction	353.2[6]	D3867-90A	4500-NO_3-F		0.05
	Manual cadmium reduction		D3867-90B	4500-NO_3-E		0.01
	Spectrophotometric			4500-NO_2-B		0.01
Selenium	Atomic absorption; hydride		D3859-93A	3114B		0.002
	ICP-Mass spectrometry	200.8[2]				
	Atomic absorption; platform	200.9[2]				
	Atomic absorption; furnace		D3859-93B	3113B		0.002
Sodium	Inductively coupled plasma	200.7[2]				
	Atomic absorption; direct			3111B		
Thallium	ICP-Mass spectrometry	200.8[2]				
	Atomic absorption; platform	200.9[2]				0.0007[12]

The procedures shall be done in accordance with the documents listed below. The incorporation by reference of the following documents was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51, effective January 4, 1995. Copies of the documents may be obtained from the sources listed below. Contact the Safe Drinking Water Hotline at (800)426-4791 to obtain information about these documents. Documents may be inspected at EPA's Drinking Water Docket, 401 M Street SW, Washington, DC 20460 (telephone: (202)260-3027); or at the Office of Federal Register, 800 North Capitol Street NW, Suite 700, Washington, DC.

1 "Methods for Chemical Analysis of Water and Wastes," EPA-600/4-79-020, March 1983. Available at NTIS, PB84-128677. Also available from US EPA, EMSL, Cincinnati, OH 45268.

2 "Methods for the Determination of Metals in Environmental Samples—Supplement I," EPA-600/R-94-111, May 1994. Available at NTIS, PB94-184942.

3 Annual Book of ASTM Standards, 1994, Vols. 11.01 and 11.02, American Society for Testing and Materials (ASTM). Copies may be obtained from the American Society for Testing and Materials, 101 Barr Harbor Drive, West Conshohocken, PA 19428.

4 18th and 19th editions of Standard Methods for the Examination of Water and Wastewater, 1992 and 1995, respectively, American Public Health Association; either edition may be used. Copies may be obtained from the American Public Health Association, 1015 Fifteenth Street NW, Washington, DC 20005.

5 Techniques of Water Resources Investigation of the U.S. Geological Survey, Book 5, Chapter A-1, 3rd edition, 1989, Method I-3300-85. Available from Information Services, U.S. Geological Survey, Federal Center, Box 25286, Denver, CO 80225-0425.

6 "Methods for the Determination of Inorganic Substances in Environmental Samples," EPA-600-R-93-100, August 1993. Available at NTIS, PB94-120821.

7 The procedure shall be done in accordance with the Technical Bulletin 601, "Standard Method of Test for Nitrate in Drinking Water," July 1994, PN221890-001, Analytical Technology, Inc. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51, effective January 4, 1995. Copies may be obtained from ATI Orion, 529 Main Street, Boston, MA 02129. Copies may be inspected at EPA's Drinking Water Docket, 401 M Street SW, Washington, DC 20460; or at the Office of the Federal Register, 800 North Capitol Street NW, Suite 700, Washington, DC.

8 Method B-1011, "Waters Test Method for Determination of Nitrite/Nitrate in Water Using Single Column Ion Chromatography." Copies may be obtained from Waters Corporation, Technical Services Division, 34 Maple Street, Milford, MA 01757.

9 Method 100.1, "Analytical Method for Determination of Asbestos Fibers in Water," EPA-600/4-83-043, EPA, September 1983. Available at NTIS, PB83-260471.

10 Method 100.2, "Determination of Asbestos Structure Over 10 Microns in Length in Drinking Water," EPA-600/R-94-134, June 1994. Available at NTIS, PB94-201902.

11 Industrial Method No. 129-71W, "Fluoride in Water and Wastewater," December 1972, and Method No. 380-75WE, "Fluoride in Water and Wastewater," February 1976, Technicon Industrial Systems. Copies may be obtained from Bran & Luebbe, 1025 Busch Parkway, Buffalo Grove, IL 60089.

12 Lower MDLs are reported using stabilized temperature graphite furnace atomic absorption.

13 Screening method for total cyanides.

14 Measures "free" cyanides.

15 Because MDLs reported in EPA Methods 200.7 and 200.9 were determined using a 2X preconcentration step during sample digestion, MDLs determined when samples are analyzed by direct analysis (i.e., no sample digestion) will be higher. For direct analysis of cadmium and arsenic by Method 200.7, and arsenic by Method 3120B, sample preconcentration using pneumatic nebulization may be required to achieve lower detection limits. Preconcentration may also be required for direct analysis of antimony and thallium by Method 200.9, and antimony by Method 3113B, unless multiple in-furnace depositions are made.

16 If ultrasonic nebulization is used in the determination of arsenic by Method 200.7, 200.8, or SM 3120B, the arsenic must be in the pentavalent state to provide uniform signal response. For Methods 200.7 and 3120B, both samples and standards must be diluted in the same mixed acid matrix concentration of nitric and hydrochloric acid with the addition of 100 µL of 30 hydrogen peroxide per 100 mL of solution. For direct analysis of arsenic with Method 200.8 using ultrasonic nebulization, samples and standards must contain 1 mg/L of sodium hypochlorite.

(2) Sampling methods for IOCs. Sample collection for antimony, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, nitrate, nitrite, selenium, and thallium under this subparagraph shall be conducted using the sample preservation, container, and maximum holding time procedures specified in the table below:

SAMPLING METHODS FOR IOCs

Contaminant	Preservative[1]	Container[2]	Time[3]
Antimony	HNO_3	P or G	6 months
Asbestos	4 degrees C	P or G	48 hours for filtration[5]
Barium	HNO_3	P or G	6 months
Beryllium	HNO_3	P or G	6 months
Cadmium	HNO_3	P or G	6 months
Chromium	HNO_3	P or G	6 months
Cyanide	4 degrees C, NaOH	P or G	14 days
Fluoride	None	P or G	1 month
Mercury	HNO_3	P or G	28 days
Nickel	HNO_3	P or G	6 months
Nitrate[4]	4 degrees C	P or G	48 hours
Nitrate-Nitrite[4]	H_2SO_4	P or G	28 days
Nitrite[4]	4 degrees C	P or G	48 hours
Selenium	HNO_3	P or G	6 months
Thallium	HNO_3	P or G	6 months

1 When indicated, samples must be acidified at the time of collection to pH < 2 with concentrated acid, or adjusted with sodium hydroxide to pH > 12. Samples collected for metals analysis may be preserved by acidification at the laboratory, using a 1:1 nitric acid solution (50 percent by volume), provided the shipping time and other instructions in Section 8.3 of EPA Methods 200.7, 200.8, and 200.9 are followed. When chilling is indicated, the sample must be shipped and stored at 4 degrees C or less.

2 P: plastic, hard or soft; G: glass, hard or soft.

3 In all cases, samples should be analyzed as soon after collection as possible. Follow additional (if any) information on preservation, containers, or holding times that is specified in the method.

4 Nitrate may only be measured separate from nitrite in samples that have not been acidified. Measurement of acidified samples provides a total nitrate (sum of nitrate plus nitrite) concentration. Acidification of total nitrate (nitrate plus nitrite) samples must be done in the field at the time of sample collection.

5 Instructions for containers, preservation procedures, and holding times as specified in Method 100.2 must be adhered to for all compliance analyses, including those conducted with Method 100.1.

f. Unregulated inorganic chemicals.

ANALYTICAL METHODS FOR UNREGULATED INORGANIC CONTAMINANTS

Contaminant	EPA Contaminant Code	Methodology	EPA	ASTM[1]	SM[2]
Sulfate	1055	Ion Chromatography	300.0[3]	D4327-91	4110
		Automated Methylthymol Blue	375.2[3]		4500-SO_4-F
		Gravimetric			4500-SO_4-C,D

The procedures shall be done in accordance with the documents listed below. The incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51, effective January 4, 1995. Contact the Safe Drinking Water Hotline at (800)426-4791 to obtain information about these documents. Documents may be inspected at EPA's Drinking Water Docket, 401 M Street SW, Washington, DC 20460 (telephone: (202)260-3027); or at the Office of the Federal Register, 800 North Capitol Street NW, Suite 700, Washington, DC.

1 Annual Book of ASTM Standards, 1994, Vols. 11.01 and 11.02, American Society for Testing and Materials. Copies may be obtained from the American Society for Testing and Materials, 101 Barr Harbor Drive, West Conshohocken, PA 19428.

2 18th edition of Standard Methods for the Examination of Water and Wastewater, 1992, American Public Health Association. Copies may be obtained from the American Public Health Association, 1015 Fifteenth Street NW, Washington, DC 20005.

3 "Methods for the Determination of Inorganic Substances in Environmental Samples," EPA-600/R-93-100, August 1993. Available at NTIS, PB94-121811.

41.3(2) *Other inorganic chemical contaminants.* Reserved.

567—41.4(455B) Lead, copper, and corrosivity.

41.4(1) *Lead, copper, and corrosivity regulation by the setting of a treatment technique requirement.* The lead and copper rules do not set an MCL, although this could be changed in the future. The rules set two enforceable action levels, which trigger tap monitoring, corrosion control, source water treatment, lead service line replacement, and public education if exceeded.

a. Applicability. Unless otherwise indicated, each of the provisions of this subrule applies to community water systems and nontransient noncommunity water systems (hereinafter referred to as "water systems" or "systems").

b. Action levels.

(1) Lead action level. The lead action level is exceeded if the concentration of lead in more than 10 percent of tap water samples collected during any monitoring period conducted in accordance with 41.4(1)*"c"* is greater than 0.015 mg/L (i.e., if the "90th percentile" lead level is greater than 0.015 mg/L).

(2) Copper action level. The copper action level is exceeded if the concentration of copper in more than 10 percent of tap water samples collected during any monitoring period conducted in accordance with 41.4(1)*"c"* is greater than 1.3 mg/L (i.e., if the "90th percentile" copper level is greater than 1.3 mg/L).

(3) Calculation of 90th percentile. The 90th percentile lead and copper levels shall be computed as follows:

The results of all lead or copper samples taken during a monitoring period shall be placed in ascending order from the sample with the lowest concentration to the sample with the highest concentration. Each sampling result shall be assigned a number, ascending by single integers beginning with the number 1 for the sample with the lowest contaminant level. The number assigned to the sample with the highest contaminant level shall be equal to the total number of samples taken.

The number of samples taken during the monitoring period shall be multiplied by 0.9.

The contaminant concentration in the numbered sample yielded by this calculation is the 90th percentile contaminant level.

For water systems serving fewer than 100 people that collect five samples per monitoring period, the 90th percentile is computed by taking the average of the highest and second highest concentrations.

c. Lead and copper tap water monitoring requirements.

(1) Sample site selection.

1. General. Public water supply systems shall complete a materials evaluation of their distribution systems by the date indicated in 41.4(1)*"c"*(4) in order to identify a pool of sampling sites that meets the requirements of this subrule, and which is sufficiently large to ensure that the water system can collect the number of lead and copper tap samples required in 41.4(1)*"c"*(3). All sites from which first-draw samples are collected shall be selected from this pool of targeted sampling sites. Sampling sites may not include faucets that have point-of-use or point-of-entry treatment devices designed to remove inorganic contaminants.

2. Information sources. A public water supply system shall use the information on lead, copper and galvanized steel that it is required to collect under 41.4(1)*"f"* as part of its responsibility for the special monitoring for corrosivity characteristics when conducting a materials evaluation. When an evaluation of the information collected is insufficient to locate the requisite number of lead and copper sampling sites that meet the targeting criteria in 41.4(1)*"c"*(1), the water system shall review all plumbing codes, permits, and records in the files of the building department(s) which indicate the plumbing materials that are installed within publicly and privately owned structures connected to the distribution system; all inspections and records of the distribution system that indicate the material composition of the service connections that connect a structure to the distribution system; and all existing water quality information, which includes the results of all prior analyses of the system or individual structures connected to the system, indicating locations that may be particularly susceptible to high lead or copper concentrations. In addition, the system shall seek to collect such information where possible in the course of its normal operations (e.g., checking service line materials when reading water meters or performing maintenance activities).

1. A system shall monitor at the frequency specified below in cases where the department specifies maximum permissible source water levels under 567—subparagraph 43.7(3)*"b"*(4) or determines that the system is not required to install source water treatment under 567—subparagraph 43.7(3)*"b"*(2). A water system using only groundwater shall collect samples once during the three-year compliance period in effect when the department makes this determination. Such systems shall collect samples once during each subsequent compliance period. A public water system using surface water (or a combination of surface and groundwater) shall collect samples once during each year, the first annual monitoring period to begin on the date on which the department makes this determination.

2. A system using only groundwater is not required to conduct source water sampling for lead or copper if the system meets the action level for the specific contaminant in tap water samples during the entire source water sampling.

(5) Reduced monitoring frequency.

1. A water system using only groundwater which demonstrates that finished drinking water entering the distribution system has been maintained below the maximum permissible lead or copper concentrations specified by the department in 567—subparagraph 43.7(3)*"b"*(4) during at least three consecutive compliance periods under 41.4(1)*"e"*(4)"1" may reduce the monitoring frequency for lead or copper to once during each nine-year compliance cycle as defined in 567—40.2(455B).

2. A water system using surface water (or a combination of surface and groundwaters) which demonstrates that finished drinking water entering the distribution system has been maintained below the maximum permissible lead and copper concentrations specified by the department in 567—subparagraph 43.7(3)*"b"*(4) for at least three consecutive years may reduce the monitoring frequency in 41.4(1)*"e"*(4)"1" to once during each nine-year compliance cycle.

3. A water system that uses a new source of water is not eligible for reduced monitoring for lead or copper until concentrations in samples collected from the new source during three consecutive monitoring periods are below the maximum permissible lead and copper concentrations specified.

f. Corrosivity monitoring protocol—special monitoring for corrosivity characteristics. Suppliers of water for community public water systems shall collect samples from a representative entry point to the water distribution system for the purpose of analysis to determine the corrosivity characteristics of the water. The determination of corrosivity characteristics of water shall only include one round of sampling, except in cases where the department concludes additional monitoring is necessary due to variability of the raw water sources. Sampling requirements and approved analytical methods are as follows:

(1) Surface water systems. Systems utilizing a surface water source either in whole or in part shall collect two samples per plant for the purpose of determining the corrosivity characteristics. One of these samples is to be collected during the midwinter months and the other during midsummer.

(2) Groundwater systems. Systems utilizing groundwater sources shall collect one sample per plant or source, except systems with multiple plants that do not alter the corrosivity characteristics identified in 41.4(1)"*f*"(3) or systems served by multiple wells drawing raw water from a single aquifer may, with departmental approval, be considered one treatment plant or source when determining the number of samples required.

(3) Corrosivity characteristics analytical parameters. Determination of corrosivity characteristics of water shall include measurements of pH, calcium hardness, alkalinity, temperature, total dissolved solids (total filterable residue), and calculation of the Langelier Index. In addition, sulfate and chloride monitoring may be required by the department. At the department's discretion, the Aggressiveness Index test may be substituted for the Langelier Index test.

(4) Corrosivity indices methodology. The following methods must be used to calculate the corrosivity indices:

1. Aggressiveness Index—"ANSI/AWWA C401-93: AWWA Standard for the Selection of Asbestos Cement Pressure Pipe, 4"–16" for Water Distribution Systems," American Water Works Association, Denver, CO.
2. Langelier Index—"Standard Methods for the Examination of Water and Wastewater," 14th edition, American Public Health Association, 1015 15th Street NW, Washington, DC 20005 (1975), Method 203, pp. 61-63.

(5) Distribution system construction materials. Community and nontransient noncommunity water supply systems shall identify whether the following construction materials are present in their distribution system and report to the department:

1. Lead from piping, solder, caulking, interior lining of distribution mains, alloys, and home plumbing.
2. Copper from piping and alloys, service lines, and home plumbing.
3. Galvanized piping, service lines, and home plumbing.
4. Ferrous piping materials such as cast iron and steel.
5. Asbestos cement pipe.
6. Vinyl lined asbestos cement pipe.
7. Coal tar lined pipes and tanks.
8. Pipe with asbestos cement lining.

g. Lead, copper, and water quality parameter analytical methods.

(1) Analytical methods. Analyses for alkalinity, calcium, conductivity, orthophosphate, pH, silica, and temperature may be performed by a Grade I, II, III, or IV certified operator meeting the requirements of 567—Chapter 81, any person under the supervision of a Grade I, II, III, or IV certified operator meeting the requirements of 567—Chapter 81, or a laboratory certified by the department to perform analysis under 567—Chapter 83. Analyses under this subrule for lead and copper shall only be conducted by laboratories that have been certified by the department, pursuant to 567—Chapter 83. The following methods must be used:

LEAD, COPPER AND WATER QUALITY PARAMETER ANALYTICAL METHODS

Contaminant	EPA Contaminant Code	Methodology[9]	Reference (Method Number)			
			EPA	ASTM[3]	SM[4]	USGS[5]
Alkalinity	1927	Titrimetric		D1067-92B	2320 B	
		Electrometric titration				I-1030-85
Calcium	1919	EDTA titrimetric		D511-93A	3500-Ca D	
		Atomic absorption; direct aspiration		D511-93B	3111 B	
		Inductively-coupled plasma	200.7[2]		3120 B	
Chloride	1017	Ion chromatography	300.0[8]	D4327-91	4110B	
		Potentiometric titration			4500-Cl-D	
Conductivity	1064	Conductance		D1125-95A	2510 B	

Contaminant	EPA Contaminant Code	Methodology[9]	Reference (Method Number) EPA	ASTM[3]	SM[4]	USGS[5]
Copper[6]	1022	Atomic absorption; furnace technique		D1688-95C	3113 B	
		Atomic absorption; direct aspiration		D1688-95A	3111 B	
		Inductively-coupled plasma	200.7[2]		3120 B	
		Inductively-coupled plasma; mass spectrometry	200.8[2]			
		Atomic absorption; platform furnace	200.9[2]			
Lead[6]	1030	Atomic absorption; furnace technique		D3559-95D	3113 B	
		Inductively-coupled plasma; mass spectrometry	200.8[2]			
		Atomic absorption; platform furnace technique	200.9[2]			
		Differential pulse anodic stripping voltammatry				Method 1001[10]
pH	1925	Electrometric	150.1[1] 150.2[1]	D1293-95	4500-H+ B	
Orthophosphate (Unfiltered no digestion or hydrolysis)	1044	Colorimetric, automated, ascorbic acid	365.1[8]		4500-P F	
		Colorimetric, ascorbic acid, single reagent		D515-88A	4500-P E	
		Colorimetric, phosphomolybdate;				I-1602-85
		Automated-segmented flow				I-2601-90[8]
		Automated discrete				I-2598-85
		Ion chromatography	300.0[7]	D4327-91	4110 B	
Silica	1049	Colorimetric, molybdate blue				I-1700-85
		Automated-segmented flow				I-2700-85
		Colorimetric		D859-95		
		Molybdosilicate			4500-Si D	
		Heteropoly blue			4500-Si E	
		Automated method for molybdate-reactive silica			4500-Si F	
		Inductively-coupled plasma[6]	200.7[2]		3120 B	
Temperature	1996	Thermometric			2550 B	
Total Filterable Residue (TDS)	1930	Gravimetric			2540 C	

The procedures shall be done in accordance with the documents listed below. The incorporation by reference of the following documents was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51, effective January 4, 1995. Copies of the documents may be obtained from the sources listed below. Contact the Safe Drinking Water Hotline at (800)426-4791 to obtain information about these documents. Documents may be inspected at EPA's Drinking Water Docket, 401 M Street, SW, Washington, DC 20460 (telephone: (202)260-3027); or at the Office of Federal Register, 800 North Capitol Street NW, Suite 700, Washington, DC.

1 "Methods for Chemical Analysis of Water and Wastes," EPA-600/4-79-020, March 1983. Available at NTIS as PB84-128677. Also available at US EPA, EMSL, Cincinnati, OH.

2 "Methods for the Determination of Metals in Environmental Samples." EPA-600/4-91-010, June 1991. Available at NTIS as PB91-231498.

3 Annual Book of ASTM Standards, 1994 and 1996, Vols. 11.01 and 11.02, American Society for Testing and Materials. The previous versions of D1688-95A and D1688-95C (copper), D3559-95 (lead), D1293-95 (pH), D1125-91A (conductivity), and D859-94(silica) are also approved. These previous versions, D1688-90A, C, D3559-90D, D1293-84, D1125-91A and D859-88, respectively, are located in the Annual Book of ASTM Standards, 1994, Volume 11.01. Copies may be obtained from the American Society for Testing and Materials, 101 Barr Harbor Drive, West Conshohocken, PA 19428.

4 18th and 19th editions of Standard Methods for the Examination of Water and Wastewater, 1992 and 1995, respectively, American Public Health Association. Copies may be obtained from the American Public Health Association, 1015 Fifteenth Street NW, Washington, DC 20005.

5 Techniques of Water Resources Investigation of the U.S. Geological Survey, Book 5, Chapter A-1, 3rd ed., 1989. Available from Information Services, U.S. Geological Survey, Federal Center, Box 25286, Denver, CO 80225-0425.

6 Samples may not be filtered. Samples that contain less than 1 NTU (Nephelometric turbidity unit) and are properly preserved (concentrated nitric acid to pH < 2) may be analyzed directly (without digestion) for total metals; otherwise, digestion is required. When digestion is required, the total recoverable technique as defined in the method must be used.

7 "Methods for the Determination of Inorganic Substances in Environmental Samples," EPA/600/R-93/100, August 1993. Available at NTIS as PB94-120821.

8 "Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory—Determination of Inorganic and Organic Constituents in Water and Fluvial Sediments, Open File Report 93-125." Available at Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

9 Because MDLs reported in EPA Methods 200.7 and 200.9 were determined using a 2X preconcentration step during sample digestion, MDLs determined when samples are analyzed by direct analysis (i.e., no sample digestion) will be higher. Preconcentration may be required for direct analysis of lead by Methods 200.9, 3113B, and 3559-90D unless multiple in-furnace depositions are made.

10 The description for Method 1001 is available from Palintest, Ltd., 21 Kenton Lands Road, P.O. Box 18395, Erlanger, KY 41018; or from the Hach Company, P.O. Box 389, Loveland, CO.

(2) Certified laboratory requirements. Lead and copper analyses under this subrule shall only be conducted by laboratories that have been certified by the department and are in compliance with the requirements of 567—Chapter 83.

(3) All lead and copper levels measured between the practical quantitation limit (PQL) and method detection limit (MDL) must be either reported as measured or they can be reported as one-half the PQL specified for lead and copper in 41.4(1)*"g"*(2)"2." All levels below the lead and copper MDLs must be reported as zero.

41.4(2) *Lead, copper, and corrosivity regulation by the setting of an MCL.* Reserved.

567—41.5(455B) Organic chemicals.

41.5(1) *MCLs and other requirements for organic chemicals.* Maximum contaminant levels for three classes of organic chemical contaminants specified in 41.5(1)*"b"* apply to community water systems and nontransient noncommunity water systems as specified herein. The three referenced organic chemical classes are volatile organic chemicals (VOCs), synthetic organic chemicals (SOCs), and trihalomethanes. The requirements also contain monitoring requirements, best available technology (BAT) identification, and analytical method requirements referenced in 41.5(1)*"c,"* *"d,"* and *"f,"* respectively.

a. Applicability. The maximum contaminant levels for volatile and synthetic organic contaminants apply to community and nontransient noncommunity water systems. Compliance with the volatile and synthetic organic contaminant maximum contaminant level is calculated pursuant to 41.5(1)*"b."* The maximum contaminant level of 0.10 mg/L for total trihalomethanes (the sum of the concentrations of bromodichloromethane, tribromomethane (bromoform), dibromochloromethane, and trichloromethane (chloroform)) applies to all surface water community public water systems (CWS) serving 10,000 or more persons and all IGW CWS serving 10,000 or more persons until December 31, 2001, after which time the systems must comply with 41.6(455B). This 0.10 mg/L MCL also applies to all groundwater CWS serving 10,000 or more persons until December 31, 2003, after which time the systems must comply with 41.6(455B). Compliance with the maximum contaminant level for total trihalomethanes is calculated pursuant to 41.5(1)*"e"*(4).

b. Maximum contaminant levels (MCLs) and analytical methodology for organic compounds. The maximum contaminant levels for organic chemicals are listed in the following table. Analyses for the contaminants in this subrule shall be conducted using the following methods, or their equivalent as approved by EPA.

(1) Table:

ORGANIC CHEMICAL CONTAMINANTS, CODES, MCLS, ANALYTICAL METHODS, AND DETECTION LIMITS

Contaminant	EPA Contaminant Code	MCL (mg/L)	Methodology[1]	Detection Limit (mg/L)
Volatile Organic Chemicals (VOCs):				
Benzene	2990	0.005	502.2, 524.2	0.0005
Carbon tetrachloride	2982	0.005	502.2, 524.2, 551.1	0.0005
Chlorobenzene (mono)	2989	0.1	502.2, 524.2	0.0005
1,2-Dichlorobenzene (ortho)	2968	0.6	502.2, 524.2	0.0005
1,4-Dichlorobenzene (para)	2969	0.075	502.2, 524.2	0.0005
1,2-Dichloroethane	2980	0.005	502.2, 524.2	0.0005
1,1-Dichloroethylene	2977	0.007	502.2, 524.2	0.0005
cis-1,2-Dichloroethylene	2380	0.07	502.2, 524.2	0.0005
trans-1,2-Dichloroethylene	2979	0.1	502.2, 524.2	0.0005
Dichloromethane	2964	0.005	502.2, 524.2	0.0005
1,2-Dichloropropane	2983*	0.005	502.2, 524.2	0.0005
Ethylbenzene	2992	0.7	502.2, 524.2	0.0005
Styrene	2996	0.1	502.2, 524.2	0.0005
Tetrachloroethylene	2987	0.005	502.2, 524.2, 551.1	0.0005
Toluene	2991	1	502.2, 524.2	0.0005
1,1,1-Trichloroethane	2981	0.2	502.2, 524.2, 551.1	0.0005
Trichloroethylene	2984	0.005	502.2, 524.2, 551.1	0.0005
1,2,4-Trichlorobenzene	2378	0.07	502.2, 524.2	0.0005
1,1,2-Trichloroethane	2985	0.005	502.2, 524.2, 551.1	0.0005
Vinyl chloride	2976	0.002	502.2, 524.2	0.0005
Xylenes (total)	2955*	10	502.2, 524.2	0.0005
Synthetic Organic Chemicals (SOCs):				
Alachlor[3]	2051	0.002	505, 507, 508.1, 525.2, 551.1	0.0002
Aldicarb	2047	0.003	531.1, 6610	0.0005
Aldicarb sulfone	2044	0.002	531.1, 6610	0.0008
Aldicarb sulfoxide	2043	0.004	531.1, 6610	0.0005
Atrazine[3]	2050	0.003	505, 507, 508.1, 525.2, 551.1	0.0001
Benzo(a)pyrene	2306	0.0002	525.2, 550, 550.1	0.00002
Carbofuran	2046	0.04	531.1, 6610	0.0009
Chlordane[3]	2959	0.002	505, 508, 508.1, 525.2	0.0002
2,4-D[6] (as acids, salts, or esters)	2105	0.07	515.1, 515.2, 515.3, 555, D5317-93	0.0001
Dalapon	2031	0.2	515.1, 515.3, 552.1, 552.2	0.001

Contaminant	EPA Contaminant Code	MCL (mg/L)	Methodology[1]	Detection Limit (mg/L)
1,2-Dibromo-3-chloropropane (DBCP)	2931	0.0002	504.1, 551.1	0.00002
Di(2-ethylhexyl)adipate	2035	0.4	506, 525.2	0.0006
Di(2-ethylhexyl)phthalate	2039	0.006	506, 525.2	0.0006
Dinoseb[6]	2041	0.007	515.1, 515.2, 515.3, 555	0.0002
Diquat	2032	0.02	549.2	0.0004
Endothall	2033	0.1	548.1	0.009
Endrin[3]	2005	0.002	505, 508, 508.1, 525.2, 551.1	0.00001
Ethylene dibromide (EDB)	2946	0.00005	504.1, 551.1	0.00001
Glyphosate	2034	0.7	547, 6651	0.006
Heptachlor[3]	2065	0.0004	505, 508, 508.1, 525.2, 551.1	0.00004
Heptachlor epoxide[3]	2067	0.0002	505, 508, 508.1, 525.2, 551.1	0.00002
Hexachlorobenzene[3]	2274	0.001	505, 508, 508.1, 525.2, 551.1	0.0001
Hexachlorocyclopentadiene[3]	2042	0.05	505, 508, 508.1, 525.2, 551.1	0.0001
Lindane (gamma BHC)[3]	2010	0.0002	505, 508, 508.1, 525.2, 551.1	0.00002
Methoxychlor[3]	2015	0.04	505, 508, 508.1, 525.2, 551.1	0.0001
Oxamyl	2036	0.2	531.1, 6610	0.002
Pentachlorophenol	2326	0.001	515.1, 515.2, 515.3, 525.2, 555, D5317-93	0.00004
Picloram[3,6]	2040	0.5	515.1, 515.2, 515.3, 555, D5317-93	0.0001
Polychlorinated biphenyls[4] (as decachlorobiphenyl) (as Arochlors)[3]	2383	0.0005	508A 505, 508, 508.1, 525.2	0.0001
Simazine[3]	2037	0.004	505, 507, 508.1, 525.2, 551.1	0.00007
2,3,7,8-TCDD (dioxin)	2063	$3x10^{-8}$	1613	$5x10^{-9}$
2,4,5-TP[6] (Silvex)	2110	0.05	515.1, 515.2, 515.3, 555, D5317-93	0.0002
Toxaphene[3]	2020	0.003	505, 508, 508.1, 525.2	0.001
Total Trihalomethanes (TTHMs)[5]:				
Total Trihalomethanes (the sum of the concentrations of bromodichloromethane, dibromochloromethane, tribromomethane (bromoform), and trichloromethane (chloroform))	2950	0.10	502.2, 524.2, 551.1	

*As of January 1, 1999, the contaminant codes for the following compounds were changed from the Iowa Contaminant Code to the EPA Contaminant Code:

Contaminant	Iowa Contaminant Code (Old)	EPA Contaminant Code (New)
1,2 Dichloropropane	2325	2983
Xylenes (total)	2974	2955

[1] Analyses for the contaminants in this section shall be conducted using the following EPA methods or their equivalent as approved by EPA. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51, effective January 4, 1995. Copies may be inspected at EPA's Drinking Water Docket, 401 M Street SW, Washington, DC 20460; or at the Office of the Federal Register, 800 North Capitol Street NW, Suite 700, Washington, DC.

The following methods are available from the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161 (telephone: (800)553-6847).

Methods for the Determination of Organic Compounds in Drinking Water, EPA-600/4-88-039, December 1988, Revised July 1991 (NTIS PB91-231480): Methods 508A and 515.1.

Methods for the Determination of Organic Compounds in Drinking Water—Supplement I, EPA-600/4-90-020, July 1990 (NTIS PB91-146027): Methods 547, 550, 550.1.

Methods for the Determination of Organic Compounds in Drinking Water—Supplement II, EPA-600/R-92-129, August 1992 (NTIS PB92-207703): Methods 548.1, 552.1, 555.

Methods for the Determination of Organic Compounds in Drinking Water—Supplement III, EPA-600/R-95-131, August 1995 (NTIS PB95-261616): Methods 502.2, 504.1, 505, 506, 507, 508, 508.1, 515.2, 524.2, 525.2, 531.1, 551.1, 552.2.

Method 1613 "Tetra-through Octa-Chlorinated Dioxins and Furans by Isotope-Dilution HRGC/HRMS," EPA-821-B-94-005, October 1994 (NTIS PB95-104774).

The following American Public Health Association (APHA) documents are available from APHA, 1015 Fifteenth Street NW, Washington, DC 20005.

Supplement to the 18th edition of Standard Methods for the Examination of Water and Wastewater, 1994, or Standard Methods for the Examination of Water and Wastewater, 19th edition, 1995 (either publication may be used), APHA: Method 6610.

Standard Methods for the Examination of Water and Wastewater, 18th edition, 1992, and 19th edition, 1995 (either edition may be used), APHA: Method 6651.

The following American Society for Testing and Materials (ASTM) method is available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428.

Annual book of ASTM Standards, 1996, Vol. 11.02 (or any edition published after 1993), ASTM: D5317-93.

Methods 515.3 and 549.2 are available from U.S. EPA NERL, 26 W. Martin Luther King Drive, Cincinnati, OH 45268.

Other required analytical test procedures germane to the conduct of these analyses are contained in Technical Notes on Drinking Water Methods, EPA-600/R-94-173, October 1994 (NTIS PB95-104766).

[2] Reserved.

[3] Substitution of the detector specified in Method 505, 507, 508, or 508.1 for the purpose of achieving lower detection limits is allowed as follows. Either an electron capture or nitrogen-phosphorus detector may be used provided all regulatory requirements and quality control criteria are met.

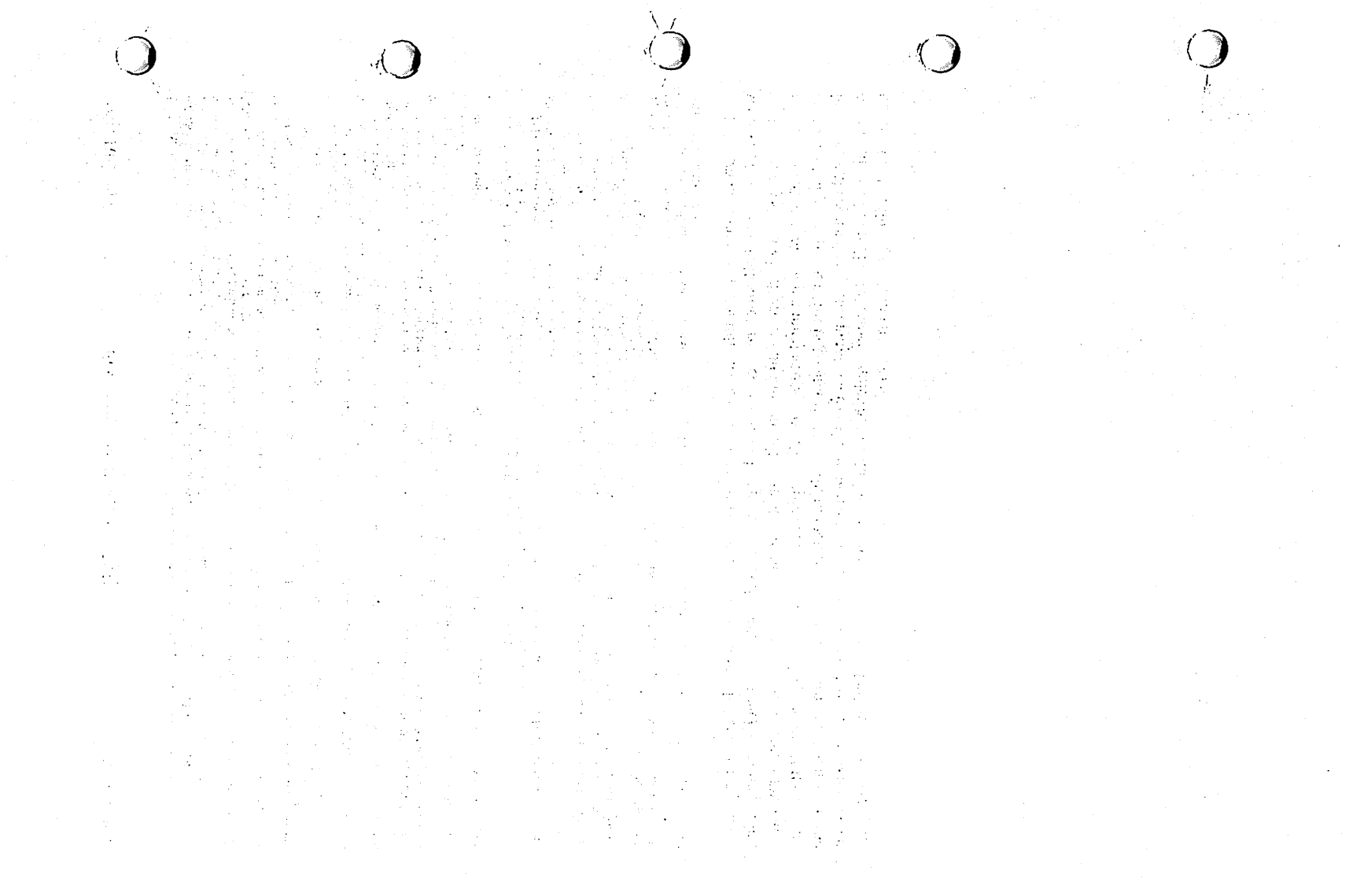
[4] PCBs are qualitatively identified as Aroclors and measured for compliance purposes as decachlorobiphenyl. Users of Method 505 may have more difficulty in achieving the required detection limits than users of Method 508. 508.1, or 525.2.

[5] The TTHM MCL for surface water or influenced groundwater CWS and NTNC systems serving over 10,000 persons will be changed to 0.080 mg/L on January 1, 2002. All remaining CWS and NTNC will be required to comply with the 0.080 mg/L MCL on January 1, 2004. See rule 41.6(455B) for additional requirements.

[6] Accurate determination of the chlorinated esters requires hydrolysis of the sample as described in EPA Methods 515.1, 515.2, 515.3, and 555, and ASTM Method D5317-93.

(2) Organic chemical compliance calculations (other than total trihalomethanes). Compliance with 41.5(1)*"b"*(1) shall be determined based on the analytical results obtained at each sampling point.

1. For systems which are conducting monitoring at a frequency greater than annual, compliance is determined by a running annual average of all samples taken at each sampling point. If the annual average of any sampling point is greater than the MCL, then the system is out of compliance. If the initial sample or a subsequent sample causes the annual average to be exceeded, then the system is out of compliance immediately. Any samples below the detection limit shall be calculated as zero for purposes of determining the annual average.



2. If duplicates of the original sample taken from each sampling point used in the composite are available, the system may use these instead of resampling, provided the holding time of the samples is not exceeded. The duplicates must be analyzed and the results reported to the department within 14 days after completing analysis of the composite sample.

3. Compositing may only be permitted by the department at sampling points within a single system, unless the population served by the system is less than 3,300 persons. In systems serving less than or equal to 3,300 persons, the department may permit compositing among different systems provided the five-sample limit is maintained.

4. Compositing samples prior to gas chromatographic analysis.

- Add 5 mL or equal larger amounts of each sample (up to five samples are allowed) to a 25-mL glass syringe. Special precautions must be made to maintain zero headspace in the syringe.
- The samples must be cooled at 4 degrees Celsius during this step to minimize volatilization losses.
- Mix well and draw out a 5-mL aliquot for analysis.
- Follow sample introduction, purging, and desorption steps described in the method.
- If less than five samples are used for compositing, a proportionately small syringe may be used.

5. Compositing samples prior to gas chromotographic/mass spectrometric analysis.

- Inject 5 mL or equal larger amounts of each aqueous sample (up to five samples are allowed) into a 25-mL purging device using the sample introduction technique described in the method.
- The total volume of the sample in the purging device must be 25 mL.
- Purge and desorb as described in the method.

6. Grandfathered organic chemical (SOC and VOC) data. The department may allow the use of monitoring data collected after January 1, 1988, for VOCs and January 1, 1990, for SOCs required under Section 1445 of the Safe Drinking Water Act for purposes of initial monitoring compliance. If the data are generally consistent with the other requirements in this subparagraph, the department may use such data (i.e., a single sample rather than four quarterly samples) to satisfy the initial monitoring requirement for the initial compliance period beginning January 1, 1993. Systems which use grandfathered samples for VOCs and did not detect any contaminants listed in 41.5(1)*"b"*(1) shall begin monitoring annually in accordance with 41.5(1)*"c"*(2) beginning January 1, 1993.

7. Increased organic chemical (SOC and VOC) monitoring. The department may increase the required monitoring frequency, where necessary, to detect variations within the system (e.g., fluctuations in concentration due to seasonal use, changes in water source, changes to treatment facilities or normal operation thereof).

8. Organic chemical (SOC and VOC) vulnerability assessment criteria. Vulnerability of each public water system shall be determined by the department based upon an assessment of the following factors.

- VOC vulnerability assessment criteria—previous monitoring results. A system will be classified vulnerable if any sample was analyzed to contain one or more contaminants listed in 41.5(1)*"b"*(1)-(VOCs) or 41.5(1)*"b"*(3) except for trihalomethanes or other demonstrated disinfection by-products.
- SOC vulnerability assessment criteria—previous monitoring results. A system will be classified vulnerable if any sample was analyzed to contain one or more contaminants listed in 41.5(1)*"b"*(2)-(SOCs) or 41.5(1)*"b"*(3) except for trihalomethanes or other demonstrated disinfection by-products.
- Proximity of surface water supplies to commercial or industrial use, disposal or storage of volatile synthetic organic chemicals. Surface waters which withdraw water directly from reservoirs are considered vulnerable if the drainage basin upgradient and within two miles of the shoreline at the maximum water level contains major transportation facilities such as primary highways or railroads or any of the contaminant sources listed in this subparagraph. Surface water supplies which withdraw water directly from flowing water courses are considered vulnerable if the drainage basin upgradient and within two miles of the water intake structure contains major transportation facilities such as primary highways or railroads or any of the contaminant sources listed in this subparagraph.

• Proximity of supplies to commercial or industrial use, disposal or storage of volatile synthetic organic chemicals. Wells that are not separated from sources of contamination by at least the following distances will be considered vulnerable.

Sources of Contamination	Shallow Wells as defined in 567—40.2(455B)	Deep Wells as defined in 567—40.2(455B)
Sanitary and industrial point discharges	400 ft	400 ft
Mechanical waste treatment plants	400 ft	200 ft
Lagoons	1,000 ft	400 ft
Chemical and storage (aboveground)	200 ft	100 ft
Chemical and mineral storage including underground storage tanks on or below ground	400 ft	200 ft
Solid waste disposal site	1,000 ft	1,000 ft

• A system is deemed to be vulnerable for a period of three years after any positive measurement of one or more contaminants listed in 41.5(1)*"b"*(3) except for trihalomethanes or other demonstrated disinfection by-products.

d. Best available technology(ies) (BATs). Rescinded IAB 8/11/99, effective 9/15/99.

e. Total trihalomethanes sampling, analytical and other requirements. The maximum contaminant level for total trihalomethanes applies to community water systems which serve a population of 10,000 or more individuals and which add a disinfectant (oxidant) to the water in any part of the treatment process. Compliance with the maximum contaminant level is calculated pursuant to 41.5(1)*"b"*(1). Total trihalomethanes is the sum of the concentrations of bromodichloromethane, dibromochloromethane, tribromomethane (bromoform) and trichloromethane (chloroform).

(1) Applicability. Community water systems which use a groundwater source, serve a population of 10,000 or more individuals, and which add disinfectant (oxidant) to the water in any part of the drinking water treatment process shall analyze for total trihalomethanes in accordance with this subrule, until December 31, 2003, after which time the systems must comply with 41.6(455B). The requirements of this subrule also apply to community water systems which use surface water or IGW in whole or in part and serve 10,000 or more persons, until December 31, 2001, after which time the systems must comply with 41.6(455B). After December 31, 2003, paragraph 41.5(1)*"e"* is no longer applicable to any Iowa public water supply.

1. For the purpose of this subrule, samples to be taken by the system shall be based on the number of treatment plants used by the system, except that multiple wells drawing water from a single aquifer may, with approval of the department, be considered as one treatment plant for determining the minimum number of samples.

2. All samples required within a calendar quarter shall be collected within a 24-hour period.

(2) General sampling requirements.

1. For all community water systems utilizing surface water sources in whole or in part, and for all community water systems utilizing only groundwater sources that have not been determined by the department to qualify for the monitoring requirements of 41.5(1)*"e"*(3), analyses for total trihalomethanes shall be performed at quarterly intervals on at least four water samples for each treatment plant used by the system. At least 25 percent of the samples shall be taken at locations within the distribution system reflecting the maximum residence time of the water in the system. The remaining 75 percent shall be taken at representative locations in the distribution system, taking into account number of persons served, different sources of water and different treatment methods employed. The results of all analyses per quarter shall be arithmetically averaged. All samples collected shall be used in the computation of the average, unless the analytical results are invalidated for technical reasons. Sampling and analyses shall be conducted in accordance with the methods listed in 41.5(1)*"e"*(5).

2. The department may allow a community water system to reduce the monitoring frequency required by 41.5(1)"*e*"(2)"1" to a minimum of one sample analyzed for TTHMs per quarter taken at a point in the distribution system reflecting the maximum residence time of the water in the system, upon a determination by the department that the data from at least one year of monitoring in accordance with 41.5(1)"*e*"(2)"1" and local conditions demonstrate that total trihalomethane concentrations will be consistently below the maximum contaminant level.

3. If at any time during which the reduced monitoring frequency prescribed under 41.5(1)"*e*"(2)"2" applies, the results from any analysis exceed 0.10 mg/L of TTHMs and such results are confirmed by at least one check sample taken promptly after such results are received, or if the system makes any significant change to its source of water or treatment program, the system shall immediately begin monitoring in accordance with the requirements of 41.5(1)"*e*"(2)"1" which monitoring shall continue for at least one year before the frequency may be reduced again. The department may increase a system's monitoring frequency above the minimum in those cases where the department determines it is necessary to detect variations of TTHM levels within the distribution system.

(3) Groundwater sampling requirements.

1. The department may allow a community water system utilizing only groundwater sources to reduce the monitoring frequency required by 41.5(1)"*e*"(2)"1" to a minimum of one sample for maximum TTHM potential per year for each treatment plant used by the system taken at a point in the distribution system reflecting maximum residence time of the water in the system. The system's monitoring frequency may only be reduced upon a determination by the department that, based upon the data submitted by the system, the system has a maximum TTHM potential of less than 0.10 mg/L and that, based upon an assessment of the local conditions of the system, the system is not likely to approach or exceed the maximum contaminant level for TTHMs. All samples collected shall be used for determining whether the system must comply with the monitoring requirements of 41.5(1)"*e*"(2), unless the analytical results are invalidated for technical reasons. Sampling and analyses shall be conducted in accordance with the methods listed in 41.5(1)"*e*"(5).

2. If at any time during which the reduced monitoring frequency prescribed under 41.5(1)"*e*"(3)"1" applies, the results from any analysis taken by the system for the maximum TTHM potential are equal to or greater than 0.10 mg/L, and such results are confirmed by at least one check sample taken promptly after such results are received, the system shall immediately begin monitoring in accordance with the requirements of 41.5(1)"*e*"(2) and such monitoring shall continue for at least one year before the frequency may be reduced again. In the event of any significant change to the system's raw water or treatment program, the system shall immediately analyze an additional sample for maximum TTHM potential taken at a point in the distribution system reflecting maximum residence time of the water in the system for the purpose of determining whether the system must comply with the monitoring requirements of 41.5(1)"*e*"(2). The department may increase monitoring frequencies above the minimum in those cases where the department determines it is necessary to detect variation of TTHM levels within the distribution system.

(4) Compliance calculation. Compliance with 41.5(1)"*b*"(3) shall be determined based on a running annual average of quarterly samples collected by the system as prescribed in 41.5(1)"*e*"(2)"1" or 41.5(1)"*e*"(2)"2." If the average of samples covering any 12-month period exceeds the maximum contaminant level, the supplier of water shall notify the public pursuant to 567—42.1(455B). Monitoring after public notification shall be at a frequency designated by the department and shall continue until a monitoring schedule as a condition to an operation permit or enforcement action shall become effective.

(5) Sampling and analytical methodology. Sampling and analyses made pursuant to this subrule shall be conducted by one of the approved total trihalomethane methods listed in 41.5(1)"*b*."

Samples for TTHM shall be dechlorinated upon collection to prevent further production of trihalomethanes, according to the procedures described in the above-referenced methods, except acidification is not required if only THMs or TTHMs are to be determined. Samples for maximum TTHM potential should not be dechlorinated or acidified, and should be held for seven days at 25 degrees Celsius (or above) prior to analysis.

(6) System modificiation. Before a community water system makes any modifications to its existing treatment process for the purposes of achieving compliance with the TTHM MCL, such system must submit and obtain department approval of a plan setting forth its proposed modification and any safeguards that it will implement to ensure that the bacteriological quality of the drinking water served by such system will not be adversely affected by such modification.

Each system shall comply with the provisions set forth in the department-approved plan. At a minimum, a department-approved plan shall require any system modifying its disinfection practice to:

1. Evaluate the water system for sanitary defects and evaluate the source for biological quality;
2. Evaluate its existing treatment practices and consider improvements that will minimize disinfectant demand and optimize finished water quality throughout the distribution system;
3. Provide baseline water quality survey data of the distribution system required by the department;
4. Conduct any additional monitoring determined by the department to be necessary to ensure continued maintenance of optimal biological quality in the finished water; and
5. Demonstrate an active disinfectant residual throughout the distribution system at all times during and after the modification.

Before a community water system makes any modifications to its existing physical treatment plant for the purpose of achieving compliance with 41.5(1)*"b"*(3), such system must obtain department approval in accordance with 567—43.3(455B).

(7) Maximum total trihalomethane potential methodology. The water sample for determination of maximum total trihalomethane potential is taken from a point in the distribution system that reflects maximum residence time. Procedures for sample collection and handling are given in the methods. No reducing agent is added to "quench" the chemical reaction producing THMs at the time of sample collection. The intent is to permit the level of THM precursors to be depleted and the concentration of THMs to be maximized for the supply being tested. Four experimental parameters affecting maximum THM production are pH, temperature, reaction time, and the presence of a disinfectant residual. These parameters are dealt with as follows:

1. Measure the disinfectant residual at the selected sampling point. Proceed only if a measurable residual is present.
2. Collect triplicate 40 mL water samples at the pH prevailing at the time of sampling and prepare a method blank according to the methods.
3. Seal and store these samples together for seven days at 25 degrees Celsius or above.
4. After this time period, open one of the sample containers and check for disinfectant residual. Absence of a disinfectant residual invalidates the sample for further analysis.
5. Once a disinfectant residual has been demonstrated, open another of the sealed samples and determine THM concentration using an approved analytical method.

f. Analytical procedures—organics.

(1) Volatile organic chemical (VOC) and synthetic organic chemical (SOC) analytical methods. Analysis for the VOC and SOC contaminants listed in 41.5(1)*"b"*(1) must be conducted using the specified EPA methods. Other analytical test procedures are contained in Technical Notes on Drinking Water Methods, EPA-600/R-94-173, October 1994, NTIS PB95-104766.

(2) PCB analytical methodology. Analysis for PCBs shall be conducted using the methods in 41.5(1)*"b"*(1) and as follows:

1. Each system which monitors for PCBs shall analyze each sample using Method 505, 508, 508.1, or 525.2. Users of Method 505 may have more difficulty in achieving the required Aroclor detection limits than users of Method 508, 508.1, or 525.2.
2. If PCBs (as one of seven Aroclors) are detected in any sample analyzed using Method 505 or 508, the system shall reanalyze the sample using Method 508A to quantitate PCBs as decachlorobiphenyl.

PCB AROCLOR DETECTION LIMITS

Aroclor	Detection Limit (mg/L)
1016	0.00008
1221	0.02
1232	0.0005
1242	0.0003
1248	0.0001
1254	0.0001
1260	0.0002

3. Compliance with the PCB MCL shall be determined based upon the quantitative results of analyses using Method 508A.

41.5(2) *Organic chemicals occurring as (nontrihalomethane) disinfection by-products.* Reserved.

567—41.6(455B) Disinfection byproducts maximum contaminant levels and monitoring requirements.

41.6(1) *Disinfection byproducts.*

a. Applicability.

(1) This rule establishes criteria under which CWS and NTNC public water supply systems that add a chemical disinfectant to the water in any part of the drinking water treatment process or which provide water that contains a chemical disinfectant must modify their practices to meet the MCLs listed in this rule and the maximum residual disinfectant levels (MRDL) and treatment technique requirements for disinfection byproduct precursors listed in 567—43.6(455B).

(2) This rule establishes criteria under which TNC public water supply systems that use chlorine dioxide as a disinfectant or oxidant must modify their practices to meet the chlorine dioxide MRDL listed in 567—paragraph 43.6(1)*"b."*

(3) Compliance dates for this rule are based upon the source water type and the population served. Systems are required to comply with this rule as follows, unless otherwise noted. The department may assign an earlier monitoring period as part of the operation permit, but compliance with the maximum contaminant level is not required until the dates stated below.

1. Surface water and IGW CWS and NTNC. CWS and NTNC systems using surface water or groundwater under the direct influence of surface water in whole or in part and which serve 10,000 or more persons must comply with this rule beginning January 1, 2002. CWS and NTNC systems serving fewer than 10,000 persons must comply with this rule beginning January 1, 2004.

2. Groundwater CWS and NTNC. CWS and NTNC systems using only groundwater not under the direct influence of surface water must comply with this rule beginning January 1, 2004.

3. TNC using chlorine dioxide. TNC systems are not required to comply with this rule.

(4) Consecutive systems. Consecutive systems that provide water containing a disinfectant or oxidant are required to comply with this rule. A consecutive system may be incorporated into the sampling plan of the supply that produces the water (the primary water supplier), provided:

1. There is a mutual signed agreement between the primary and consecutive system supplied by that primary system that states the primary system will be responsible for the compliance of its consecutive system with this rule, regardless of additional treatment by the consecutive system.

2. Beginning with the primary water supply, each successive consecutive system must also be included in the primary supply's sampling plan, so that there is no system with its own sampling plan between the primary supply and the consecutive supply covered by the primary supply's plan.

3. It is understood by the primary and all consecutive systems that, even if only one system in the sampling plan has a violation, all systems in the sampling plan will receive the violation and be required to conduct public notification.

4. The department receives a copy of the signed agreement and approves the sampling plan prior to the beginning of the compliance period.

If a mutual agreement is not possible, each system (the primary system and each consecutive system) is responsible for compliance with this rule for its specific system.

(5) Systems with multiple water sources. Systems with water sources that are used independently from each other, are not from the same source as determined by the department, or do not go through identical treatment processes are required to conduct the monitoring for the applicable disinfectants or oxidants and disinfection byproducts during operation of each source. The system must comply with this rule during the use of each water source.

b. Maximum contaminant levels for disinfection byproducts. The maximum contaminant levels (MCLs) for disinfection byproducts are as follows:

Disinfection byproduct	MCL (mg/L)
Bromate	0.010
Chlorite	1.0
Haloacetic acids (HAA5)	0.060
Total trihalomethanes (TTHM)	0.080

c. Monitoring requirements for disinfection byproducts.

(1) General requirements.

1. Systems must take all samples during normal operating conditions.

2. Systems may consider multiple wells drawing water from a single aquifer as one treatment plant for determining the minimum number of TTHM and HAA5 samples required, with department approval.

3. Failure to monitor in accordance with the monitoring plan required under 41.6(1)*"c"*(1)"6" is a monitoring violation.

4. Failure to monitor is a violation for the entire period covered by the annual average where compliance is based on a running annual average of monthly or quarterly samples or averages, and the system's failure to monitor makes it impossible to determine compliance with MCLs.

5. Systems may use only data collected under the provisions of this rule or 567—43.6(455B) to qualify for reduced monitoring.

6. Each system required to monitor under the provisions of this rule or 567—43.6(455B) must develop and implement a monitoring plan. The system must maintain the plan and make it available for inspection by the department and the general public no later than 30 days following the applicable compliance dates in 41.6(1)*"a"*(3). All systems using surface water or groundwater under the direct influence of surface water and serving more than 3,300 people must submit a copy of the monitoring plan to the department by the applicable date in 41.6(1)*"a"*(3)"1." The department may also require the plan to be submitted by any other system. After review, the department may require changes in any plan elements. The plan must include at least the following elements:

- Specific locations and schedules for collecting samples for any parameters included in this rule.
- How the system will calculate compliance with MCLs, MRDLs, and treatment techniques.
- If providing water to one or more consecutive systems, and the consecutive systems have agreed to the sampling plan by the primary supplier of the water pursuant to 41.6(1)*"a"*(4), the sampling plan of the primary water supplier must reflect the entire distribution system.

7. The department may require a monthly monitoring frequency for disinfection byproducts, which would be specified in the operation permit.

(2) Bromate. Community and nontransient noncommunity systems using ozone for disinfection or oxidation must conduct monitoring for bromate.

1. Routine monitoring. Systems must take at least one sample per month for each treatment plant in the system using ozone, collected at each source/entry point to the distribution system while the ozonation system is operating under normal conditions.

2. Reduced monitoring. The department may allow systems required to analyze for bromate to reduce monitoring from monthly to once per quarter if the system demonstrates that the average source water bromide concentration is less than 0.05 mg/L based upon representative monthly bromide measurements for one year. The system may remain on reduced bromate monitoring until the running annual average source water bromide concentration, computed quarterly, is greater than or equal to 0.05 mg/L based upon representative monthly measurements. If the running annual average source water bromide concentration is greater than or equal to 0.05 mg/L, the system must resume routine monitoring required by 41.6(1)"*c*"(2)"1."

(3) Chlorite. Community and nontransient noncommunity water systems using chlorine dioxide, for disinfection or oxidation, must conduct monitoring for chlorite.

1. Routine daily monitoring. Systems must take daily samples at the entrance to the distribution system. For any daily sample that exceeds the chlorite MCL, the system must take additional samples in the distribution system the following day at the locations required by 41.6(1)"*c*"(3)"3," which are in addition to the sample required at the entrance to the distribution system.

2. Routine monthly monitoring. Systems must take a three-sample set each month in the distribution system. The system must take one sample at each of the following locations: near the first customer, at a location representative of average residence time, and at a location reflecting maximum residence time in the distribution system. Any additional routine sampling must be conducted in the same manner (as three-sample sets, at the specified locations). The system may use the results of additional monitoring conducted in accordance with 41.6(1)"*c*"(3)"3" to meet the requirement for monitoring in this subparagraph.

3. Additional monitoring. On each day following a routine sample monitoring result that exceeds the chlorite MCL at the entrance to the distribution system, the system is required to take three chlorite distribution system samples at the following locations: as close to the first customer as possible, in a location representative of average residence time, and as close to the end of the distribution system as possible (reflecting maximum residence time in the distribution system).

4. Reduced monitoring.

- Daily chlorite monitoring at the entrance to the distribution system required by 41.6(1)"*c*"(3)"1" may not be reduced.
- The department may allow systems with monthly chlorite monitoring in the distribution system required by 41.6(1)"*c*"(3)"2" to be reduced to a requirement of 1 three-sample set per quarter after one year of monitoring where no individual chlorite sample taken in the distribution system under 41.6(1)"*c*"(3)"2" has exceeded the chlorite MCL and the system has not been required to conduct additional monitoring under 41.6(1)"*c*"(3)"3." The system may remain on the reduced monitoring schedule until either any of the three individual chlorite samples taken quarterly in the distribution system under 41.6(1)"*c*"(3)"2" exceeds the chlorite MCL or the system is required to conduct monitoring under 41.6(1)"*c*"(3)"3" of this rule, at which time the system must revert to routine monitoring.

(4) Total trihalomethanes (TTHM) and haloacetic acids (HAA5).

1. Routine monitoring. Systems must monitor at the frequency indicated in the following table:

Routine Monitoring Frequency for TTHM and HAA5

Type of System (source water type and population served)	Minimum Monitoring Frequency	Sample Location in the Distribution System
SW/IGW[3] system serving ≥10,000 persons	Four water samples per quarter per treatment plant	At least 25 percent of all samples collected each quarter at locations representing maximum residence time. Remaining samples taken at locations representative of at least average residence time in the distribution system and representing the entire distribution system, taking into account number of persons served, different sources of water, and different treatment methods.[1]
SW/IGW[3] system serving 500 - 9,999 persons	One water sample per quarter per treatment plant	Locations representing maximum residence time.[1]
SW/IGW[3] system serving <500 persons	One sample per year per treatment plant during month of warmest water temperature	Locations representing maximum residence time.[1] If the sample (or average of annual samples, if more than one sample is taken) exceeds MCL, system must increase monitoring to one sample per treatment plant per quarter, taken at a point reflecting the maximum residence time in the distribution system, until system meets reduced monitoring criteria in 41.6(1)"*c*"(4)"2," fourth unnumbered paragraph.
System using only non-IGW groundwater using chemical disinfectant and serving ≥10,000 persons	One water sample per quarter per treatment plant[2]	Locations representing maximum residence time.[1]
System using only non-IGW groundwater using chemical disinfectant and serving <10,000 persons	One sample per year per treatment plant during month of warmest water temperature	Locations representing maximum residence time.[1] If the sample (or average of annual samples, if more than one sample is taken) exceeds MCL, system must increase monitoring to one sample per treatment plant per quarter, taken at a point reflecting the maximum residence time in the distribution system, until system meets reduced monitoring criteria in 41.6(1)"*c*"(4)"2," fourth unnumbered paragraph.

1 If a system chooses to sample more frequently than the minimum required, at least 25 percent of all samples collected each quarter (including those taken in excess of the required frequency) must be taken at locations that represent the maximum residence time of the water in the distribution system. The remaining samples must be taken at locations representative of at least average residence time in the distribution system.

2 Multiple wells drawing water from a single aquifer may be considered one treatment plant for determining the minimum number of samples required, with department approval.

3 SW/IGW indicates those systems that use either surface water (SW) or groundwater under the direct influence of surface water (IGW), in whole or in part.

2. Reduced monitoring. The department may allow systems a reduced monitoring frequency, except as otherwise provided, in accordance with the following table. Source water total organic carbon (TOC) levels must be determined in accordance with 567—subparagraph 43.6(2)"*c*"(1).

Reduced Monitoring Frequency for TTHM and HAA5

If you are a . . .	And you have monitored at least one year and your . . .	You may reduce monitoring to this level
SW/IGW[1] system serving ≥10,000 persons which has a source water annual average TOC level, before any treatment, of ≤4.0 mg/L.	TTHM annual average ≤0.040 mg/L and HAA5 annual average ≤0.030 mg/L	One sample per treatment plant per quarter at distribution system location reflecting maximum residence time.
SW/IGW[1] system serving 500 - 9,999 persons that has a source water annual average TOC level, before any treatment, of ≤4.0 mg/L.	TTHM annual average ≤0.040 mg/L and HAA5 annual average ≤0.030 mg/L	One sample per treatment plant per year at distribution system location reflecting maximum residence time during month of warmest water temperature.
SW/IGW[1] system serving <500 persons	Any SW/IGW[1] system serving <500 persons may not reduce its monitoring to less than one sample per treatment plant per year.	
System using only non-IGW groundwater using chemical disinfectant and serving ≥10,000 persons	TTHM annual average ≤0.040 mg/L and HAA5 annual average ≤0.030 mg/L	One sample per treatment plant per year at distribution system location reflecting maximum residence time during month of warmest water temperature.
System using only non-IGW groundwater using chemical disinfectant and serving <10,000 persons	TTHM annual average ≤0.040 mg/L and HAA5 annual average ≤0.030 mg/L for two consecutive years; or, TTHM annual average ≤0.020 mg/L and HAA5 annual average ≤0.015 mg/L for one year.	One sample per treatment plant per three-year monitoring cycle at distribution system location reflecting maximum residence time during month of warmest water temperature, with the three-year cycle beginning on January 1 following quarter in which system qualifies for reduced monitoring.

[1] SW/IGW indicates those systems that use either surface water (SW) or groundwater under the direct influence of surface water (IGW), in whole or in part.

• Systems on a reduced monitoring schedule may remain on that reduced schedule as long as the average of all samples taken in the year (for systems which must monitor quarterly) or the result of the sample (for systems which must monitor no more frequently than annually) is less than or equal to 0.060 mg/L for TTHMs and is less than or equal to 0.045 mg/L for HAA5. Systems that do not meet these levels must resume monitoring at the frequency identified in 41.6(1)"*c*"(4)"1" in the quarter immediately following the quarter in which the system exceeds 0.060 mg/L for TTHMs and 0.045 mg/L for HAA5. For systems using only groundwater not under the direct influence of surface water and serving fewer than 10,000 persons, if either the TTHM annual average is >0.080 mg/L or the HAA5 annual average is >0.060 mg/L, the system must go to increased monitoring identified in 41.6(1)"*c*"(4)"1."

- The department may allow systems on increased monitoring to return to routine monitoring if TTHM annual average is less than or equal to 0.040 mg/L and HAA5 annual average is less than or equal to 0.030 mg/L.
- The department may return a system to routine monitoring at the department's discretion.

d. Analytical requirements for disinfection byproducts.

(1) Systems must use only the analytical method(s) specified in this paragraph, or equivalent methods as determined by EPA, to demonstrate compliance with the requirements of this rule.

(2) Systems must measure disinfection byproducts by the methods (as modified by the footnotes) listed in the following table:

Approved Methods for Disinfection Byproduct Compliance Monitoring

Methodology[2]	EPA	Standard Methods	Byproduct measured[1]			
			TTHM	HAA5	Chlorite[4]	Bromate
P&T/GC/EICD & PID	502.2[3]		X			
P&T/GC/MS	524.2		X			
LLE/GC/ECD	551.1		X			
LLE/GC/ECD		6251 B		X		
SPE/GC/ECD	552.1			X		
LLE/GC/ECD	552.2			X		
Amperometric Titration		4500-ClO_2E			X	
IC	300.0				X	
IC	300.1				X	X

The procedures shall be done in accordance with the documents listed below. The incorporation by reference of the following documents was approved by the Director of the Federal Register on February 16, 1999, in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. Copies of the documents may be obtained from the sources listed below. Information regarding obtaining these documents can be obtained from the Safe Drinking Water Hotline at (800)426-4791. Documents may be inspected at EPA's Drinking Water Docket, 401 M Street SW, Washington, DC 20460 (telephone: (202)260-3027); or at the Office of Federal Register, 800 North Capitol Street NW, Suite 700, Washington, DC.

The following method is available from the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohoken, PA 19428:

Annual Book of ASTM Standards, Volume 11.01, American Society for Testing and Materials, 1996: Method D 1253-86.

The following methods are available from the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161 (telephone: (800)553-6847):

"Determination of Inorganic Anions in Drinking Water by Ion Chromatography, Revision 1.0," EPA-600/R-98/118, 1997 (available through NTIS, PB98-169196): Method 300.1.

Methods for the Determination of Inorganic Substances in Environmental Samples, EPA-600/R-93/100, August 1993, (NTIS PB94-121811): Method 300.0.

Methods for the Determination of Organic Compounds in Drinking Water—Supplement II, EPA-600/R-92-129, August 1992 (NTIS PB92-207703): Method 552.1.

Methods for the Determination of Organic Compounds in Drinking Water—Supplement III, EPA-600/R-95-131, August 1995 (NTIS PB95-261616): Methods 502.2, 524.2, 551.1, and 552.2.

The following methods are available from the American Public Health Association, 1015 Fifteenth Street NW, Washington, DC 20005:

Standard Methods for the Examination of Water and Wastewater, 19th edition, American Public Health Association, 1995: Methods: 4500-Cl D, 4500-Cl E, 4500-Cl F, 4500-Cl G, 4500-Cl H, 4500-Cl I, 4500-ClO_2 D, 4500-ClO_2 E, 6251 B, and 5910 B.

Standard Methods for the Examination of Water and Wastewater, Supplement to the 19th edition, American Public Health Association, 1996: Methods: 5310 B, 5310 C, and 5310 D.

[1] X indicates method is approved for measuring specified disinfection byproduct.

[2] ECD = electron capture detector; EICD = electrolytic conductivity detector; GC = gas chromatography; IC = ion chromatography; LLE = liquid/liquid extraction; MS = mass spectrometer; P&T = purge and trap; PID = photoionization detector; SPE = solid phase extractor

[3] If TTHMs are the only analytes being measured in the sample, then a PID is not required.

[4] Amperometric titration may be used for routine daily monitoring of chlorite at the entrance to the distribution system, as prescribed in 41.6(1)"*c*"(3)"1." Ion chromatography must be used for routine monthly monitoring of chlorite and additional monitoring of chlorite in the distribution system, as prescribed in 41.6(1)"*c*"(3)"2" and "3."

(3) Certified laboratory requirements. Analyses under this rule for disinfection byproducts shall only be conducted by laboratories that have been certified by the department and are in compliance with the requirements of 567—Chapter 83, except as specified under 41.6(1)"*d*"(4).

(4) Daily chlorite samples at the entrance to the distribution system must be measured by a Grade II, III or IV operator meeting the requirements of 567—Chapter 81, any person under the supervision of a Grade II, III or IV operator meeting the requirements of 567—Chapter 81, or a laboratory certified by the department to perform analysis under 567—Chapter 83.

e. Compliance requirements for disinfection byproducts.

(1) General requirements.

1. When compliance is based on a running annual average of monthly or quarterly samples or averages and the system fails to monitor for TTHM, HAA5, or bromate, this failure to monitor will be treated as a monitoring violation for the entire period covered by the annual average.

2. Unless invalidated by the department, all samples taken and analyzed under the provisions of this rule must be included in determining compliance, even if that number is greater than the minimum required.

3. If, during the first year of monitoring under paragraph 41.6(1)*"c,"* any individual quarter's average will cause the running annual average of that system to exceed the MCL, the system is out of compliance at the end of that quarter.

(2) Bromate. Compliance must be based on a running annual arithmetic average, computed quarterly, of monthly samples (or, for months in which the system takes more than one sample, the average of all samples taken during the month) collected by the system as prescribed by 41.6(1)*"c"*(2). If the average of samples covering any consecutive four-quarter period exceeds the MCL, the system is in violation of the MCL and must notify the public pursuant to 567—Chapter 42, in addition to reporting to the department pursuant to 567—paragraph 42.4(3)*"d."* If a PWS fails to complete 12 consecutive months' monitoring, compliance with the MCL for the last four-quarter compliance period must be based on an average of the available data.

(3) Chlorite. Compliance must be based on an arithmetic average of each three-sample set taken in the distribution system as prescribed by 41.6(1)*"c"*(3)"1" and 41.6(1)*"c"*(3)"2." If the arithmetic average of any three-sample set exceeds the MCL, the system is in violation of the MCL and must notify the public pursuant to 567—Chapter 42, in addition to reporting to the department pursuant to 567—paragraph 42.4(3)*"d."*

(4) TTHM and HAA5.

1. For systems monitoring quarterly, compliance with MCLs in 41.6(1)*"b"* must be based on a running annual arithmetic average, computed quarterly, of quarterly arithmetic averages of all samples collected by the system as prescribed by 41.6(1)*"c"*(4).

2. For systems monitoring less frequently than quarterly, systems demonstrate MCL compliance if the average of samples taken that year under the provisions of 41.6(1)*"c"*(4) does not exceed the MCLs in 41.6(1)*"b."* If the average of these samples exceeds the MCL, the system must increase monitoring to once per quarter per treatment plant and is not in violation of the MCL until it has completed one year of quarterly monitoring, unless the result of fewer than four quarters of monitoring will cause the running annual average to exceed the MCL, in which case the system is in violation at the end of that quarter. Systems required to increase to quarterly monitoring must calculate compliance by including the sample that triggered the increased monitoring plus the following three quarters of monitoring.

3. If the running annual arithmetic average of quarterly averages covering any consecutive four-quarter period exceeds the MCL, the system is in violation of the MCL and must notify the public pursuant to 567—Chapter 42 in addition to reporting to the department pursuant to 567—paragraph 42.4(3)*"d."*

4. If a PWS fails to complete four consecutive quarters of monitoring, compliance with the MCL for the last four-quarter compliance period must be based on an average of the available data.

f. Reporting requirements for disinfection byproduct precursors. Systems required to sample quarterly or more frequently must report to the department within ten days after the end of each quarter in which samples were collected, notwithstanding the public notification provisions of 567—42.1(455B). Systems required to sample less frequently than quarterly must report to the department within ten days after the end of each monitoring period in which samples were collected. The specific reporting requirements for disinfection byproducts are listed in 567—subparagraph 42.4(3)*"d"*(2).

41.6(2) Reserved.

567—41.7(455B) Physical properties maximum contaminant levels (MCL or treatment technique requirements) and monitoring requirements. Rescinded IAB 10/18/00, effective 11/22/00.

567—41.8(455B) Radionuclides.

41.8(1) *Radium-226, radium-228, and gross alpha particle radioactivity in community water systems.* The following are the maximum contaminant levels for radium-226, radium-228, and gross alpha particle radioactivity:

	MCL
a. Combined radium-226 and radium-228	5 pCi/l
b. Gross alpha particle activity (including radium-226 but excluding radon and uranium)	15 pCi/l

41.8(2) Beta particle and photon radioactivity from man-made radionuclides in community water systems.

a. Maximum contaminant level. The average annual concentration of beta particle and photon radioactivity from man-made radionuclides in drinking water shall not produce an annual dose equivalent to the total body or any internal organ greater than 4 millirem/year.

b. MCL calculation. Except for the radionuclides listed in the table below, the concentration of man-made radionuclides causing 4 mrem total body or organ dose equivalents shall be calculated on the basis of a 2 liter per day drinking water intake using the 168-hour data listed in "Maximum Permissible Body Burdens and Maximum Permissible Concentration of Radionuclides in Air or Water for Occupational Exposure," NBS Handbook 69 as amended August 1963, U.S. Department of Commerce. If two or more radionuclides are present, the sum of their annual dose equivalent to the total body or to any organ shall not exceed 4 millirem/year.

AVERAGE ANNUAL CONCENTRATIONS ASSUMED TO PRODUCE A TOTAL BODY OR ORGAN DOSE OF 4 MREM/YR

Radionuclide	Critical Organ	pCi per liter
Strontium-90	Bone marrow	8
Tritium	Total body	20,000

567—41.9(455B) Sampling and analytical requirements for radionuclides.

41.9(1) *Analytical methods for radioactivity.*

a. Radionuclide analytical methodology. Analysis for the following contaminants shall be conducted to determine compliance with 41.8(1) in accordance with the methods in the following table, or their equivalent as determined by EPA.

RADIONUCLIDE ANALYTICAL METHODOLOGY

Contaminant	Methodology	Reference (method or page number)								
		EPA[1]	EPA[2]	EPA[3]	EPA[4]	SM[5]	ASTM[6]	USGS[7]	DOE[6]	Other
Naturally occurring:										
Gross alpha[11] & beta	Evaporation	900.0	p. 1	00-01	p. 1	302, 7110B		R-1120-76		
Gross alpha[11]	Co-precipitation			00-02		7110C				
Radium 226	Radon emanation	903.1	p. 16	Ra-04	p. 19	7500-Ra C	D 3454-91	R-1141-76	Ra-05	NY[9]
	Radiochemical	903.0	p. 13	Ra-03		304, 305, 7500-Ra B	D 2460-90	R-1140-76		
Radium 228	Radiochemical	904.0	p. 24	Ra-05	p. 19	304, 7500-Ra D		R-1142-76		NY[9] NJ[10]
Uranium[12]	Radiochemical	908.0				7500-U B				
	Fluorometric	908.1				7500-U C[13]	D 2907-91	R-1180-76 R-1181-76	U-04	
	Alpha spectrometry			00-07	p. 33	7500-U C[14]	D 3972-90	R-1182-76	U-02	
	Laser phosphorimetry						D 5174-91			
Man-made:										
Radioactive Cesium	Radiochemical	901.0	p. 4			7500-Cs B	D 2459-72	R-1111-76		
	Gamma ray spectrometry	901.1			p. 92	7120[15]	D 3649-91	R-1110-76	4.5.2.3	
Radioactive Iodine	Radiochemical	902.0	p. 6 p. 9			7500-I B 7500-I C 7500-I D	D 3649-91			
	Gamma ray spectrometry	901.1			p. 92	7120[15]	D 4785-88		4.5.2.3	
Radioactive Strontium 89, 90	Radiochemical	905.0	p. 29	Sr-04	p. 65	303, 7500-Sr B		R-1160-76	Sr-01 Sr-02	
Tritium	Liquid scintillation	906.0	p. 34	H-02	p. 87	306, 7500-3H B	D 4107-91	R-1171-76		
Gamma emitters	Gamma ray spectrometry	901.1			p. 92	7120[15]	D 3649-91	R-1110-76	4.5.2.3	
		902.0				7500-Cs B	D 4785-88			
		901.0				7500-I B				

The procedures shall be done in accordance with the documents listed below. The incorporation by reference of documents 1 through 10 was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51, effective April 4, 1997. Copies of the documents may be obtained from the sources listed below. Contact the Safe Drinking Water Hotline at (800)426-4791 to obtain information about these documents. Documents may be inspected at EPA's Drinking Water Docket, 401 M Street SW, Washington, DC 20460 (telephone (202)260-3027); or at the Office of Federal Register, 800 North Capitol Street NW, Suite 700, Washington, DC.

1 "Prescribed Procedures for Measurement of Radioactivity in Drinking Water," EPA 600/4-80-032, August 1980. Available at the US Department of Commerce, NTIS, 5285 Port Royal Road, Springfield, VA 22161 (telephone (800)553-6847) PB 80-224744.

2 "Interim Radiochemical Methodology for Drinking Water," EPA 600/4-75-008(revised), March 1976. Available at NTIS, ibid. PB 253258.

3 "Radiochemistry Procedures Manual," EPA 520/5-84-006, December 1987. Available at NTIS, ibid. PB 84-215581.

4 "Radiochemical Analytical Procedures for Analysis of Environmental Samples." March 1979. Available at NTIS, ibid. EMSL LV 053917.

5 Standard Methods for the Examination of Water and Wastewater, 13th, 17th, 18th, 19th editions, 1971, 1989, 1992, 1995. Available at American Public Health Association, 1015 Fifteenth Street NW, Washington, DC 20005. All methods are in the 17th, 18th, and 19th editions except 7500-U C Fluorimetric Uranium was discontinued after the 17th edition; 7120 Gamma Emitters is only in the 19th edition; and 302, 303, 304, 305, and 306 are only in the 13th edition.

6 Annual Book of ASTM Standards, Vol. 11.02, 1994. Available at American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428.

7 "Methods for Determination of Radioactive Substances in Water and Fluvial Sediments," Chapter A5 in Book 5 of Techniques of Water-Resources Investigations of the United States Geological Survey, 1977. Available at US Geological Survey (USGS) Information Services, Box 25286, Federal Center, Denver, CO 80225-0425.

8 "EML Procedures Manual," 27th edition, Volume 1, 1990. Available at the Environmental Measurements Laboratory, US Department of Energy (DOE), 376 Hudson Street, New York, NY 10014-3621.

9 "Determination of Ra-226 and Ra-228 (Ra-02)," January 1980, revised June 1982. Available at Radiological Sciences Institute Center for Laboratories and Research, New York State Department of Health, Empire State Plaza, Albany, NY 12201.

10 "Determination of Ra-228 in Drinking Water," August 1980. Available at State of New Jersey, Department of Environmental Protection, Division of Environmental Quality, Bureau of Radiation and Inorganic Analytical Services, 9 Ewing Street, Trenton, NJ 08625.

11 Natural uranium and thorium-230 are approved as gross alpha calibration standards for gross alpha with co-precipitation and evaporation methods; americium-241 is approved with co-precipitation methods.

12 If uranium (U) is determined by mass, a 0.67 pCi/ug of uranium conversion factor must be used. This conversion factor is based on the 1:1 activity ratio of U-234 to U-238 that is characteristic of naturally occurring uranium.

13 Standard Methods for the Examination of Water and Wastewater, 17th edition, APHA, 1989.

14 Standard Methods for the Examination of Water and Wastewater, 18th or 19th edition, APHA, 1992, 1995.

15 Standard Methods for the Examination of Water and Wastewater, 19th edition, APHA, 1995.

b. Method references for other radionuclides. When the identification and measurement of radionuclides other than those listed in 41.9(2) are required, the following references are to be used, except in cases where alternative methods have been approved in accordance with 41.12(455B).

(1) "Procedures for Radiochemical Analysis of Nuclear Reactor Aqueous Solutions," H. L. Krieger and S. Gold, EPA-R4-73-014, Environmental Protection Agency, Cincinnati, Ohio 45268 (May 1973).

(2) "HASL Procedure Manual," edited by John H. Harley. HASL 300, ERDA Health and Safety Laboratory, New York, NY (1973).

c. Radionuclide detection limits. For the purpose of monitoring radioactivity concentration in drinking water, the required sensitivity of the radioanalysis is defined in terms of a detection limit. The detection limit shall be that concentration which can be counted with a precision of plus or minus 100 percent at the confidence level (1.960 sigma where sigma is the standard deviation of the net counting rate of the sample).

(1) To determine compliance with 41.8(1)*"a,"* the detection limit shall not exceed 1 pCi/L. To determine compliance with 41.8(1)*"b,"* the detection limit shall not exceed 3 pCi/L.

(2) To determine compliance with 41.8(2), the detection limits shall not exceed the concentrations listed in the table below.

TABLE — Detection Limits for Man-Made Beta Particle and Photon Emitters

Radionuclide	Detection Limit
Tritium	1,000 pCi/L
Strontium-89	10 pCi/L
Strontium-90	2 pCi/L
Iodine-131	1 pCi/L
Cesium-134	10 pCi/L
Gross beta	4 pCi/L
Other radionuclides	1/10 of the applicable limit

d. Calculating compliance with radionuclide MCLs. To determine compliance with the maximum contaminant levels listed in 41.8(1) and 41.8(2), averages of data shall be used and shall be rounded to the same number of significant figures as the maximum contaminant level for the substance in question.

41.9(2) *Monitoring frequency for radioactivity in community water systems.*

a. Monitoring requirements for gross alpha particle activity, radium-226 and radium-228.

(1) Initial monitoring requirement and period. Initial sampling to determine compliance with 41.8(1) shall begin by June 24, 1979, and the analysis shall be completed by June 24, 1980. Compliance shall be based on the analysis of an annual composite of four consecutive quarterly samples or the average of the analyses of four samples obtained at quarterly intervals.

A gross alpha particle activity measurement may be substituted for the required radium-226 and radium-228 analysis, provided that the measured gross alpha particle activity does not exceed 5 pCi/L at a confidence level of 95 percent (1.65 sigma where sigma is the standard deviation of the net counting rate of the sample). In localities where radium-228 may be present in drinking water,radium-226 or radium-228 analyses are required when the gross alpha particle activity exceeds 2 pCi/L.

When the gross alpha particle activity exceeds 5 pCi/L, the same or an equivalent sample shall be analyzed for radium-226. If the concentration of radium-226 exceeds 3 pCi/L, the same or an equivalent sample shall be analyzed for radium-228.

(2) Data substitution for initial requirement. For the initial analysis required by 41.9(2)*"a"*(1), data acquired on or after June 24, 1976, may be substituted at the discretion of the department.

(3) Monitoring requirements. Suppliers of water shall monitor at least once every four years following the procedure required by 41.9(2)*"a"*(1). At the discretion of the department, when an annual record taken in conformance with 41.9(2)*"a"*(1) has established that the average annual concentration is less than half the maximum contaminant levels established by 41.8(1), analysis of a single sample may be substituted for the quarterly sampling procedure required by 41.9(2)*"a"*(1).

More frequent monitoring shall be conducted when requested by the department in the vicinity of mining or other operations which may contribute alpha particle radioactivity to either surface or groundwater sources of drinking water.

A supplier of water shall monitor in conformance with 41.9(2)*"a"*(1) within one year of the introduction of a new water source for a community water system. More frequent monitoring shall be conducted when requested by the department in the event of possible contamination or when changes in the distribution system or treatment processing occur which may increase the concentration of radioactivity in finished water.

A community water system using two or more sources having different concentrations of radioactivity shall monitor source water, in addition to water from a free-flowing tap, when requested by the department.

Monitoring for compliance with 41.8(1) after the initial period need not include radium-228 except when required by the department, provided that the average annual concentration of radium-228 has been assayed at least once using the quarterly sampling procedure required by 41.9(2)*"a"*(1).

Suppliers of water shall conduct annual monitoring of any community water system in which the radium-226 concentration exceeds 3 pCi/L, when requested by the department.

(4) Exceedance of the MCL. If the average annual maximum contaminant level for gross alpha particle activity or total radium as set forth in 41.8(1) is exceeded, the supplier of a community water system shall notify the public as required by 567—42.1(455B). Monitoring at quarterly intervals shall be continued until the annual average concentration no longer exceeds the maximum contaminant level or until a monitoring schedule as a condition of an operation permit or enforcement action shall become effective.

b. Monitoring requirements for man-made radioactivity in community water systems.

(1) Applicability and initial monitoring requirements. Systems using surface water sources and serving more than 100,000 persons and such other community water systems as are designated by the department shall be monitored for compliance with 41.8(2) by analysis of a composite of four consecutive quarterly samples. Compliance with 41.8(2) may be assumed without further analysis if the average annual concentration of gross beta particle activity is less than 50 pCi/L and if the average annual concentrations of tritium and strontium-90 are less than those listed in the detection limits table, provided, that if both radionuclides are present, the sum of their annual dose equivalents to bone marrow shall not exceed 4 millirem/year.

If the gross beta particle activity exceeds 50 pCi/L, an analysis of the sample must be performed to identify the major radioactive constituents present, and the appropriate organ and total body doses shall be calculated to determine compliance with 41.8(2).

Suppliers of water shall conduct additional monitoring, as requested by the department, to determine the concentration of man-made radioactivity in principal watersheds designated by the department.

At the discretion of the department, suppliers of water utilizing only groundwaters may be required to monitor for man-made radioactivity.

(2) Data substitution for initial requirement. For the initial analysis required by 41.9(2)*"b"*(1), data acquired on or after June 24, 1976, may be substituted at the discretion of the department.

(3) Monitoring requirement. After the initial analysis required by 41.9(2)*"b"*(1), suppliers of water shall monitor at least every four years following the procedure given in 41.9(2)*"b"*(2).

(4) Monitoring requirements for PWSs receiving effluent from nuclear facilities. The supplier of any community water system designated by the department as utilizing water contaminated by effluents from nuclear facilities shall initiate quarterly monitoring for gross beta particle and iodine-131 radioactivity and annual monitoring for strontium-90 and tritium.

Quarterly monitoring for gross beta particle activity shall be based on the analysis of monthly samples or the analysis of a composite of three monthly samples. The former is recommended. If the gross beta particle activity in a sample exceeds 15 pCi/L, the same or an equivalent sample shall be analyzed for strontium-89 and cesium-134. If the gross beta particle activity exceeds 50 pCi/L, an analysis of the sample must be performed to identify the major radioactive constituents present and the appropriate organ and total body doses shall be calculated to determine compliance with 41.8(2).

For iodine-131, a composite of five consecutive daily samples shall be analyzed once each quarter. As requested by the department, more frequent monitoring shall be conducted when iodine-131 is identified in the finished water.

Annual monitoring for strontium-90 and tritium shall be conducted by means of the analysis of a composite of four consecutive quarterly samples or analysis of four quarterly samples. The latter procedure is recommended.

The department may allow the substitution of environmental surveillance data taken in conjunction with a nuclear facility for direct monitoring of man-made radioactivity by the supplier of water where the department determines such data is applicable to a particular community water system.

(5) Exceedance of the MCL. If the average annual maximum contaminant level for man-made radioactivity set forth in 41.8(2) is exceeded, the operator of a community water system shall give notice to the public as required by 567—42.1(455B). Monitoring at monthly intervals shall be continued until the concentration no longer exceeds the maximum contaminant level or until a monitoring schedule as a condition of an operation permit or enforcement action becomes effective.

567—41.10(455B) Reporting, public notification and record keeping. Rescinded IAB 8/11/99, effective 9/15/99.

567—41.11(455B) Unregulated contaminant monitoring.

41.11(1) *Unregulated monitoring for organic chemicals (VOCs).*

a. Applicability. Community and nontransient noncommunity water systems shall monitor for the contaminants listed in 41.11(1)*"b."*

b. Volatile organic chemical contaminants (VOCs). Community water systems and nontransient, noncommunity water systems shall monitor for the following contaminants except as provided in 41.11(1)*"c"*(4) of this subrule:

(1) Chloroform
(2) Bromodichloromethane
(3) Chlorodibromomethane
(4) Bromoform
(5) Dibromomethane
(6) m-Dichlorobenzene
(7) 1,1-Dichloropropene
(8) 1,1-Dichloroethane
(9) 1,1,2,2-Tetrachloroethane
(10) 1,3-Dichloropropane
(11) Chloromethane
(12) Bromomethane
(13) 1,2,3-Trichloropropane
(14) 1,1,1,2-Tetrachloroethane
(15) Chloroethane
(16) 2,2-Dichloropropane
(17) o-Chlorotoluene
(18) p-Chlorotoluene
(19) Bromobenzene
(20) 1,3-Dichloropropene

c. Special organic chemical (VOC) monitoring protocol.

(1) Surface water monitoring requirements. Surface water systems shall sample at entry points to the distribution system after any application of treatment. The minimum number of samples is one year of quarterly samples per water source.

(2) Groundwater monitoring requirements. Groundwater systems shall sample at points of entry to the distribution system representative of each well after any application of treatment. The minimum number of samples is one sample per entry point of the distribution system.

(3) Confirmation samples. The department may require confirmation samples for positive or negative results.

(4) Rescinded IAB 10/18/00, effective 11/22/00.

(5) VOC discretionary compounds. Monitoring for the following list of VOC compounds is required at the discretion of the department. The requirement for a PWS to monitor for the discretionary compounds will be listed in their operation permit, issued by the department.

Bromochloromethane
n-Butylbenzene
sec-Butylbenzene
tert-Butylbenzene
Dichlorodifluoromethane
Fluorotrichloromethane
Hexachlorobutadiene
Isopropylbenzene
p-Isopropyltoluene
Naphthalene
n-Propylbenzene
1,2,3-Trichlorobenzene
1,2,4-Trimethylbenzene
1,3,5-Trimethylbenzene

(6) Small system monitoring waivers. Instead of performing the monitoring required by this subrule, a community water system or nontransient noncommunity water system serving fewer than 150 service connections may send a letter to the department stating that its system is available for sampling. The letter must be sent to the state no later than January 1, 1991. The system is not required to submit samples to a certified laboratory for analysis, unless requested to do so by the department.

(7) Repeat monitoring. All community and nontransient, noncommunity water systems shall repeat the unregulated contaminant monitoring required in this subrule no less frequently than every five years from the dates specified in 41.11(1)*"a."*

(8) Composite samples. The department may reduce the total number of samples a system must analyze by allowing the use of compositing. Composite samples from a maximum of five sampling points are allowed (for the substances in 41.11(1)*"b"* or *"c"*). Compositing of samples must be done in the laboratory and the composite sample must be analyzed within 14 days of collection. If the population served by the system is greater than 3,300 persons, then compositing may only be permitted by the department at sampling points within a single system. In systems serving less than or equal to 3,300 persons, the department may permit compositing among different systems provided the five-sample limit is maintained.

d. Analytical methods.

(1) Methodology references. Analysis under this subrule shall be conducted using the recommended methods as follows, or their equivalent as determined by the department and EPA: 502.2, "Volatile Organic Compounds in Water by Purge and Trap Gas Chromatography with Photoionization and Electrolytic Conductivity Detectors in Series," or 524.2, "Volatile Organic Compounds in Water by Purge and Trap Capillary Column Gas Chromatography/Mass Spectrometry." These methods are contained in "Methods for the Determination of Organic Compounds in Finished Drinking Water and Raw Source Water," September 1986, available from the Drinking Water Public Docket or the National Technical Information Service (NTIS), NTIS PB91-231480 and PB91-146027, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161. The toll-free number is 800-336-4700. Analysis for bromodichloromethane, bromoform, chlorodibromomethane, and chloroform also may be conducted by EPA Method 551, and analysis for 1,2,3-trichloropropane also may be conducted by EPA Method 504.1.

(2) Certified laboratory requirements. Analysis under this subrule shall only be conducted by laboratories certified under 567—Chapter 83.

41.11(2) *Inorganic and organic unregulated contaminants monitoring.*

a. Applicability. Monitoring for unregulated contaminants. Monitoring of the contaminants listed in 41.11(2)*"b"* and 41.3(1)*"f"* shall be conducted as follows:

(1) Sampling for unregulated organic contaminants. Each community and nontransient noncommunity water system shall take four consecutive quarterly samples at each source/entry point for each contaminant listed in 41.11(2)*"b"* and report the results to the department. Monitoring must be completed by December 31, 1995, and take place during the calendar quarter which is specified by the department.

(2) Sampling for unregulated inorganic contaminants. Each community and nontransient noncommunity water system shall take one sample at each source/entry point for each contaminant listed in 41.3(1)*"f"* and report the results to the department. Monitoring must be completed by December 31, 1995, using the methodology specified in 41.3(1)*"f."*

b. Unregulated organic chemical (SOC) contaminants. Systems shall monitor for the unregulated contaminants listed below, using the methods identified below and using the analytical test procedures contained within Technical Notes on Drinking Water Methods, EPA-600/R-94-173, October 1994, which is available at NTIS, PB95-104766. Method 6610 shall be followed in accordance with the Standard Methods for the Examination of Water and Wastewater, 18th edition Supplement, 1994, American Public Health Association. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51, effective January 4, 1995. Copies of methods listed in Standard Methods for the Examination of Water and Wastewater may be obtained from the American Public Health Association, 1015 Fifteenth Street NW, Washington, DC 20005. Copies may be inspected at EPA's Drinking Water Docket, 401 M Street SW, Washington, DC 20460; or at the Office of the Federal Register, 800 North Capitol Street NW, Suite 700, Washington, DC.

UNREGULATED ORGANIC CONTAMINANTS
AND METHODOLOGY

Organic Contaminants	EPA Analytical Method
Aldicarb	531.1, 6610
Aldicarb sulfone	531.1, 6610
Aldicarb sulfoxide	531.1, 6610
Aldrin	505, 508, 508.1, 525.2
Butachlor	507, 525.2
Carbaryl	531.1, 6610
Dicamba	515.1, 515.2, 555
Dieldrin	505, 508, 508.1, 525.2
3-Hydroxycarbofuran	531.1, 6610
Methomyl	531.1, 6610
Metolachlor	507, 508.1, 525.2
Metribuzin	507, 508.1, 525.2
Propachlor	507, 508.1, 525.2

c. Monitoring protocols.

(1) Groundwater sampling protocols. Groundwater systems shall take a minimum of one sample at every entry point to the distribution system which is representative of each well after treatment. Each sample must be taken at the same source/entry point unless conditions make another sampling point more representative of each source or treatment plant.

(2) Surface water sampling protocols. Surface water systems shall take a minimum of one sample at each entry point to the distribution system after treatment. Each sample must be taken at the same source/entry point unless conditions make another sampling point more representative of each source or treatment plant. For purposes of this subparagraph, surface water systems include systems with a combination of surface and ground sources.

(3) Multiple sources. If the system draws water from more than one source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water representative of all sources is being used). If a representative sample of all water sources cannot be obtained, as determined by the department, separate source/entry points with the appropriate monitoring requirements will be assigned by the department.

(4) Sampling waivers. Each community and nontransient noncommunity water system may apply to the department for a waiver from the requirements of 41.11(2)*"c"*(1) and (2).

(5) Bases of sampling waivers. The department may grant a waiver for the requirements of 41.11(2)*"a"*(1) based on the criteria specified in 41.3(455B) and 41.5(455B). The department may grant a waiver from the requirement of 41.11(2)*"a"*(2) if previous analytical results indicate contamination would not occur, provided this data was collected after January 1, 1990.

(6) Confirmation sampling. A confirmation sample for positive or negative results may be required by the department.

(7) Composite sampling. The department may reduce the total number of samples a system must analyze by allowing the use of compositing. Composite samples from a maximum of five sampling points are allowed. Compositing of samples must be done in the laboratory and the composite sample must be analyzed within 14 days of collection. If the population served by the system is greater than 3,300 persons, then compositing may only be permitted by the department at sampling points within a single system. In systems serving less than or equal to 3,300 persons, the department may permit compositing among different systems provided the five-sample limit is maintained.

(8) Small system exemptions. Instead of performing the monitoring required by this subrule, a community water system or nontransient noncommunity water system serving fewer than 150 service connections may send a letter stating that the system is available for sampling. This letter must be sent by January 1, 1994. The system shall not send such samples, unless requested to do so by the department.

41.11(3) *Special monitoring for sodium.* Suppliers of water for community public water systems shall collect and have analyzed one sample per source or plant, for the purpose of determining the sodium concentration in the distribution system. Systems utilizing multiple wells, drawing raw water from a single aquifer may, with departmental approval, be considered as one source for determining the minimum number of samples to be collected. Sampling frequency and approved analytical methods are as follows:

a. Surface water systems. Systems utilizing a surface water source, in whole or in part, shall monitor for sodium at least once annually at the entry point to the distribution system;

b. Groundwater systems. Systems utilizing groundwater sources shall monitor at least once every three years at the entry point to the distribution system;

c. Increased monitoring. Suppliers may be required to monitor more frequently where sodium levels are variable;

d. Analytical methodology. Analyses for sodium shall be performed in accordance with 41.3(1)*"e"*(1).

e. Reporting. The sodium level shall be reported to the public by at least one of the following methods:

(1) The community public water supply shall notify the appropriate local public health officials of the sodium levels by written notice by direct mail within three months. A copy of each notice required by this subrule shall be sent to the department within ten days of its issuance.

(2) In lieu of the reporting requirement of 41.11(3)*"e"*(1), the community public water supply shall include the sodium level in its annual consumer confidence report, per 567—subparagraph 42.3(3)*"c"*(1)"12."

567—41.12(455B) Alternative analytical techniques. With the written permission of this department, concurred in by the EPA, an alternative analytical technique may be employed. An alternative technique shall be acceptable only if it is substantially equivalent to the prescribed test in both precision and accuracy as it relates to the determination of compliance with any maximum contaminant level. The use of the alternative analytical technique shall not decrease the frequency of monitoring required by 41.2(455B) through 41.8(455B).

567—41.13(455B) Monitoring of interconnected public water supply systems. When a public water supply system supplies water to one or more other public water supply systems, the department may modify the monitoring requirements imposed by this part to the extent that the interconnection of the systems justifies treating them as a single system for monitoring purposes. Any modified monitoring shall be conducted pursuant to a schedule specified by the department and concurred in by the administrator of the U.S. Environmental Protection Agency.

567—41.14(455B) Department analytical results used to determine compliance. Analytical results or other information compiled by departmental staff may be used to determine compliance with the maximum contaminant levels, action levels, or treatment techniques listed in 567—Chapters 41 and 43 or for initiating remedial action with respect to these violations.

567—41.15(455B) Monitoring of other contaminants. If the department determines that other contaminants are present in a public water supply, and the contaminants are known to pose, or scientific evidence strongly suggests that they pose, a threat to human health, the supplier of water may be required to monitor for such contaminants. The supplier of water will monitor at a frequency and in a manner which will adequately identify the magnitude and extent of the contamination. The monitoring frequency and sampling location will be determined by the department. All analytical results will be obtained using approved EPA methods and all analytical results will be submitted to the department for review and evaluation. Any monitoring required under this paragraph will be incorporated into an operation permit or an order.

These rules are intended to implement Iowa Code sections 455B.171 through 455B.188 and 455B.190 through 455B.192.

[Filed prior to 7/1/52; amended 7/31/74]
[Filed 3/5/76, Notice 12/1/75—published 3/22/76, effective 4/26/76]
[Filed 2/25/77, Notice 11/17/76—published 3/23/77, effective 6/24/77]
[Filed without Notice 4/28/77—published 5/18/77, effective 6/24/77]
[Filed 7/1/77, Notice 3/23/77—published 7/27/77, effective 8/31/77]
[Filed after Notice 5/25/78, Notice 12/28/77, 5/3/78—published 6/14/78, effective 5/25/78]
[Filed 10/13/78, Notice 5/3/78—published 11/1/78, effective 12/6/78]
[Filed 2/2/79, Notice 7/26/78—published 2/21/79, effective 3/28/79]
[Filed 3/30/79, Notice 2/7/79—published 4/18/79, effective 5/23/79]
[Filed 5/11/79, Notice 2/7/79—published 5/30/79, effective 7/5/79]
[Filed 1/4/80, Notice 9/5/79—published 1/23/80, effective 2/27/80]
[Filed 6/6/80, Notice 3/19/80—published 6/25/80, effective 7/30/80]
[Filed 4/23/81, Notice 2/18/81—published 5/13/81, effective 6/17/81]
[Filed 6/18/82, Notice 4/14/82—published 7/7/82, effective 8/11/82]
[Filed emergency 6/3/83—published 6/22/83, effective 7/1/83]
[Filed 12/2/83, Notice 6/22/83—published 12/21/83, effective 1/25/84]
[Filed 3/22/85, Notice 9/12/84—published 4/10/85, effective 5/15/85]
[Filed emergency 11/14/86—published 12/3/86, effective 12/3/86]
[Filed 8/21/87, Notice 6/17/87—published 9/9/87, effective 10/14/87]
[Filed emergency 10/2/87—published 10/21/87, effective 10/14/87]
[Filed 7/22/88, Notice 5/18/88—published 8/10/88, effective 9/14/88]
[Filed 1/19/90, Notice 9/20/89—published 2/7/90, effective 3/14/90]
[Filed 11/26/90, Notice 6/13/90—published 12/12/90, effective 1/16/91]◊
[Filed 9/25/92, Notice 6/10/92—published 10/14/92, effective 11/18/92]
[Filed 7/30/93, Notice 5/12/93—published 8/18/93, effective 9/22/93]
[Filed 9/24/93, Notice 5/12/93—published 10/13/93, effective 11/17/93]*
[Filed 3/22/96, Notice 11/8/95—published 4/10/96, effective 5/15/96]
[Filed 7/23/99, Notice 4/7/99—published 8/11/99, effective 9/15/99]
[Filed 9/29/00, Notice 6/14/00—published 10/18/00, effective 11/22/00]

◊Two ARCs
*Effective date of [ARC4359A] 41.3(1)"*b*"(2)"3"; 41.3(1)"*c*"(2)"4," new sentence at end; 41.3(1)"*c*"(3)"6," "10"; 41.3(1)"*c*"(8), first sentence; 41.4(1)"*d*"(5)"4"; 41.5(1)"*a*"; 41.10(7)"*a*"(3); 41.11(2)"*a*"; 41.11(2)"*c*"(4); 41.11(2)"*c*"(5), first sentence, delayed 70 days by the Administrative Rules Review Committee at its meeting held November 9, 1993; delay lifted by the Committee December 14, 1993.

CHAPTER 42
PUBLIC NOTIFICATION, PUBLIC EDUCATION, CONSUMER CONFIDENCE REPORTS, REPORTING, AND RECORD MAINTENANCE

567—42.1(455B) Public notification. Any public water supply system which incurs a violation of any type must conduct an initial notification of the public for that violation, as required in this rule. Public water supply systems with an acute violation must follow the public notification provisions of both 42.1(1)*"a"* and *"b."*

42.1(1) *Maximum contaminant level (MCL), maximum residual disinfectant level (MRDL), treatment technique, compliance schedule, and health advisory violations.* The owner or operator of a public water supply system which fails to comply with an applicable MCL established by 567—41.2(455B) through 567—41.8(455B), maximum residual disinfectant level or disinfection byproduct precursor treatment technique established by 567—43.6(455B), treatment technique established by 567—subrule 43.3(10), fails to comply with the requirements of any compliance schedule prescribed in an operation permit, administrative order, or court order pursuant to 567—subrule 43.2(5), or fails to comply with a health advisory as determined by the department, shall notify persons served by the system as follows:

a. Distribution of public notice.

(1) Daily newspaper and mail delivery. Notice shall be given by publication in a daily newspaper of general circulation in the area served by the system as soon as possible, but in no case later than 14 days after the violation or failure, and by mail delivery (by direct mail, with the water bill, or by hand delivery) not later than 45 days after the violation or failure. The department may waive mail delivery if it determines that the owner or operator of the public water system in violation has corrected the violation or failure within the 45-day period. The department must issue the waiver in writing and within the 45-day period.

(2) Weekly newspaper and mail delivery. If the area served by a public water supply system is not served by a daily newspaper of general circulation, notice shall instead be given by publication in a weekly newspaper of general circulation serving the area and by mail delivery, not later than 45 days after the violation or failure. The department may waive mail delivery if it determines that the owner or operator of the public water system in violation has corrected the violation or failure within the 45-day period. The department must issue the waiver in writing and within the 45-day period.

(3) Separable distribution systems. If a public water system has a distribution system separable from other parts of the distribution system with no interconnections, the department may allow the system to give public notice only to the area served by that portion of the system which is out of compliance.

b. Additional acute MCL violation notification requirements (electronic media). For violations of the MCLs of contaminants or MRDLs of disinfectants that may pose an acute risk to human health, the owner or operator of a public water supply system shall, as soon as possible but in no case later than 72 hours after the violation, furnish a copy of the notice to the radio and television stations serving the area served by the public water system in addition to meeting the requirements of 42.1(1)*"a."* The following violations are acute violations:

(1) Any violations specified by the department as posing an acute risk to human health.

(2) Violation of the MCL for nitrate, nitrite, or combined nitrate and nitrite as established in 567—paragraph 41.3(1)*"b"* and determined according to 567—paragraph 41.3(1)*"c."*

(3) Violation of the MCL for total coliforms, when fecal coliforms or *E. coli* are present in the water distribution system, as specified in 567—paragraph 41.2(1)*"b"*(2).

(4) Occurrence of a waterborne disease outbreak.

(5) Violation of the MRDL for chlorine dioxide, as specified in 567—paragraph 43.6(2)*"b"* and determined according to 567—paragraph 43.6(2)*"e."*

For contaminants which pose an acute or immediate threat to public health, the department may require immediate public notification for a boil water order or where to obtain bottled water, via electronic media or door-to-door delivery of the notices.

c. Repeat MCL violation public notice requirements. Following the initial notice given under 42.1(1)*"a,"* the owner or operator of the public water supply system must give notice at least once every three months by mail delivery (by direct mail, with the water bill, or by hand delivery), for as long as the violation or failure exists.

d. Additional public notice distribution methods. The owner or operator of a community water system in an area that is not served by a daily or weekly newspaper of general circulation must, in lieu of the requirements of 42.1(1)*"a," "b,"* and *"c,"* give notice within 14 days (72 hours for an acute violation) after the violation or failure by hand delivery or by continuous posting in conspicuous places within the area served by the system. Hand delivery must be repeated every three months or posting must continue for as long as the violation or failure exists.

e. Noncommunity water system public notice distribution requirements. The owner or operator of a noncommunity water system may, in lieu of the requirements of 42.1(1)*"a," "b,"* and *"c,"* give notice within 14 days (72 hours for an acute violation) after the violation or failure by hand delivery or by continuous posting in conspicuous places within the area served by the system. Hand delivery must be repeated every three months or posting must continue for as long as the violation or failure exists.

f. Notice to new billing units. The owner or operator of a community water system must give a copy of the most recent public notice for any outstanding violation of any maximum contaminant level, health advisory, treatment technique, or compliance schedule to all billing units or new service connections prior to or at the time service begins.

42.1(2) *Other violations.*

a. Applicability. This subrule applies to all public water supply systems which incur a violation due to:

(1) Failure to perform monitoring required in 567—Chapter 41, this chapter, and 567—Chapter 43;

(2) Failure to comply with a testing procedure established in 567—Chapter 41;

(3) Failure to comply with an interim contaminant level;

(4) Detection of an unregulated contaminant that exceeds the federal health advisory and the department advises that public notification is necessary;

(5) Failure to report the required data to the department;

(6) Failure to meet the requirements of this chapter for public notification, public education, or the development and distribution of the consumer confidence report.

b. Initial notification. The public water supply system must notify, by newspaper and by mail delivery (by direct mail, with the water bill, or by hand delivery), persons served by the system within three months of the violation by the methods described in 42.1(1)*"a"* or by applicable methods described in 42.1(1)*"d"* or *"e."*

c. Repeat notification. Following the initial notice given under 42.1(2)*"b,"* the owner or operator of the public water supply system must give notice at least once every three months by mail delivery (by direct mail, with the water bill, or by hand delivery), for as long as the violation or failure exists.

42.1(3) *Notice of available information for synthetic organic chemicals.* The owner or operator of a public water supply system shall notify persons served by the system of the availability of the results of sampling conducted for synthetic organic chemicals, under 567—paragraphs 41.11(1)*"b"* and *"c,"* by including a notice in the first set of water bills issued by the system after the receipt of the results or by written notice within three months. The public water supply may use the annual consumer confidence report to comply with this requirement. For surface water supply systems, public notification is required only after the first quarter's monitoring and must include a statement that additional monitoring will be conducted for three or more quarters with the results available upon request. The owner or operator shall also provide to all new billing units or new hookups, prior to or at the time service begins, a copy of the most recent public notice for any outstanding violation of any maximum contaminant level established by 567—41.2(455B) through 567—41.8(455B), results of sampling conducted under 567—paragraphs 41.11(1)*"b"* and *"c,"* any notice of a treatment technique requirement established by 567—subrule 43.2(5) and notice of any failure to comply with the requirements of any schedule prescribed pursuant to 567—subrule 43.2(5). The notice shall provide the name and telephone number of a person to contact for information.

42.1(4) *General content of public notice.* Each notice required by this rule must provide a clear and readily understandable explanation of the violation, any potential adverse health effects, the population at risk, the steps that the public water system is taking to correct the violation, the necessity for seeking alternative water supplies, if any, and any preventive measures the consumer should take until the violation is corrected. Each notice shall be conspicuous and shall not contain unduly technical language, unduly small print, language intended to diminish the importance of the notice, or similar problems that frustrate the purpose of the notice. Each notice shall include the telephone number of the owner, operator, or designee of the public water supply system as a source of additional information concerning the notice. Where appropriate, the notice shall be multilingual.

42.1(5) *Mandatory health effects language.* When providing the information on potential adverse health effects required by 42.1(4) in notices of violations of maximum contaminant levels or treatment technique requirements, or notices of the granting or the continued existence of interim contaminant levels or compliance schedules, or notices of failure to comply with an interim contaminant level or compliance schedule, the owner or operator of the public water system shall include the language specified in Appendix A for each contaminant. (If language for a particular contaminant is not specified in Appendix A at the time notice is required and is not provided by the department, this subrule does not apply.)

42.1(6) *Operation permit compliance schedule public notice requirements.* When the director determines that a public water supply system cannot promptly comply with one or more maximum contaminant levels of 567—41.2(455B) through 41.8(455B), and that there is no immediate, unreasonable risk to the health of persons served by the system, a draft operation permit or modified permit will be formulated, which may include interim contaminant levels or a compliance schedule. Prior to issuance of a final permit, notice and opportunity for public participation must be given in accordance with this subrule. The notice shall be circulated in a manner designed to inform interested and potentially interested persons of any proposed interim contaminant level or compliance schedule.

a. Preparation of notice. The public notice shall be prepared by the department and circulated by the applicant within its geographical area as described in 42.1(1)*"a."* The public notice shall be mailed by the department to any person upon request.

b. Public comment period. The department shall provide a period of not less than 30 days following the date of the public notice during which time interested persons may submit their written views on the tentative determinations with respect to the operation permit. All written comments submitted during the 30-day comment period shall be retained by the department and considered by the director in the formulation of the director's final determination with respect to the operation permit. The period for comment may be extended at the discretion of the department.

c. Content of notice. The contents of the public notice of a proposed operation permit shall include at least the following:

(1) The name, address, and telephone number of the department.

(2) The name and address of the applicant.

(3) A statement of the department's tentative determination to issue the operation permit.

(4) A brief description of each applicant's water supply operations which necessitate the proposed permit conditions.

(5) A brief description of the procedures for the formulation of final determinations, including the 30-day comment period required by 42.1(6)*"b."*

(6) The right to request a public hearing pursuant to this paragraph and any other means by which interested persons may influence or comment upon those determinations.

(7) The address and telephone number of places at which interested persons may obtain further information, request a copy of the draft permit prepared pursuant to this paragraph, and inspect and copy the application forms and related documents.

d. Public hearings on proposed operation permits. The applicant or any interested agency, person or group of persons may request or petition for a public hearing with respect to the proposed action. Any such request shall clearly state issues and topics to be addressed at the hearing. Any such request or petition for public hearing must be filed with the director within the 30-day period prescribed in 42.1(6)*"b"* and shall indicate the interest of the party filing such request and the reasons why a hearing is warranted. The director shall hold an informal and noncontested case hearing if there is a significant public interest (including the filing of requests or petitions for such hearing) in holding such a hearing. Frivolous or insubstantial requests for hearing may be denied by the director. Instances of doubt should be resolved in favor of holding the hearing. Any hearing held pursuant to this subrule shall be held in the geographical area of the system, or other appropriate area at the discretion of the director, and may, as appropriate, consider related groups of permit applications.

e. Public notice of public hearings.

(1) Public notice of any hearing held pursuant to this paragraph shall be circulated at least as widely as the notice under 42.1(6)*"a"* at least 30 days in advance of the hearing.

(2) The contents of the public notice of any hearing held pursuant to this paragraph shall include at least the following:

1. The name, address, and telephone number of the department;
2. The name and address of each applicant whose application will be considered at the hearing;
3. A brief reference to the public notice previously issued, including identification number and date of issuance;
4. Information regarding the time and location for the hearing;
5. The purpose of the hearing;
6. A concise statement of the issues raised by the person requesting the hearing;
7. The address and telephone number of the premises where interested persons may obtain further information, request a copy of the draft operation permit or modification prepared pursuant to this paragraph, and inspect and copy the application forms and related documents; and
8. A brief description of the nature of the hearing, including the rules and procedures to be followed.

f. Decision by the director. Within 30 days after the termination of the public hearing held pursuant to this paragraph or if no public hearing is held within 30 days after the termination of the period for requesting a hearing, the director shall issue or deny the operation permit.

Have an electrician check your wiring. If grounding wires from the electrical system are attached to your pipes, corrosion may be greater. Check with a licensed electrician or your local electrical code to determine if your wiring can be grounded elsewhere. DO NOT attempt to change the wiring yourself because improper grounding can cause electrical shock and fire hazards.

(3) The steps described above will reduce the lead concentrations in your drinking water. However, if a water test indicates that the drinking water coming from your tap contains lead concentrations in excess of 15 ppb after flushing, or after we have completed our actions to minimize lead levels, then you may want to take the following additional measures:

Purchase or lease a home treatment device. Home treatment devices are limited in that each unit treats only the water that flows from the faucet to which it is connected, and all of the devices require periodic maintenance and replacement. Devices such as reverse osmosis systems or distillers can effectively remove lead from your drinking water. Some activated carbon filters may reduce lead levels at the tap. However, all lead reduction claims should be investigated. Be sure to check the actual performance of a specific home treatment device before and after installing the unit.

Purchase bottled water for drinking and cooking.

(4) You can consult a variety of sources for additional information. Your family doctor or pediatrician can perform a blood test for lead and provide you with information about the health effects of lead. State and local government agencies that can be contacted include: (insert the name of city or county department of public utilities) at (insert phone number) can provide you with information about your community's water supply, and a list of local laboratories that have been certified by EPA for testing water quality; (insert the name of city or county department that issues building permits) at (insert phone number) can provide you with information about building permit records that should contain the names of plumbing contractors that plumbed your home; and (insert the Iowa department of public health) at (insert phone number) or the (insert the name of the city or county health department) at (insert phone number) can provide you with information about the health effects of lead and how you can have your child's blood tested.

(5) The following is a list of some approved laboratories in your area that you can call to have your water tested for lead. (Insert names and phone numbers of at least two laboratories.)

42.2(3) *Content of broadcast materials.* A water system shall include the following information in all public service announcements submitted under its lead public education program to television and radio stations for broadcasting:

a. Why should everyone want to know the facts about lead and drinking water? Because unhealthy amounts of lead can enter drinking water through the plumbing in your home. That's why I urge you to do what I did. I had my water tested for (insert "free" or dollar amount per sample). You can contact the (insert the name of the city or water system) for information on testing and on simple ways to reduce your exposure to lead in drinking water.

b. To have your water tested for lead, or to get more information about this public health concern, please call (insert the phone number of the city or water system).

42.2(4) *Delivery of a public education program.*

a. In communities where a significant proportion of the population speaks a language other than English, public education materials shall be communicated in the appropriate language(s).

b. A community water system that fails to meet the lead action level on the basis of tap water samples collected in accordance with 567—paragraph 41.4(1)*"c"* shall, within 60 days:

(1) Insert notices in each customer's water utility bill containing the information in 42.2(2) along with the following alert on the water bill itself in large print: "SOME HOMES IN THIS COMMUNITY HAVE ELEVATED LEAD LEVELS IN THEIR DRINKING WATER. LEAD CAN POSE A SIGNIFICANT RISK TO YOUR HEALTH. PLEASE READ THE ENCLOSED NOTICE FOR FURTHER INFORMATION."

(2) Submit the information in 42.2(2) to the editorial departments of the major daily and weekly newspapers circulated throughout the community.

(3) Deliver pamphlets or brochures that contain the public education materials in 42.2(2) to facilities and organizations, including the following: public schools and local school boards; city or county health departments; Women, Infants, and Children and Head Start program(s) whenever available; public and private hospitals and clinics; pediatricians; family planning clinics; and local welfare agencies.

(4) Submit the public service announcement in 42.2(3) to at least five of the radio and television stations with the largest audiences that broadcast to the community served by the water system.

c. A community water system shall repeat the tasks in 42.2(4)*"b"*(1) to (3) every 12 months and the tasks in 42.2(4)*"b"*(4) every 6 months for as long as the system exceeds the lead action level.

d. Within 60 days after it exceeds the lead action level, a nontransient noncommunity water system shall deliver the public education materials in 42.2(2)*"a," "b,"* and *"d"* as follows:

(1) Post informational posters on lead in drinking water in a public place or common area in each of the buildings served by the system; and

(2) Distribute informational pamphlets or brochures on lead in drinking water to each person served by the nontransient noncommunity water system.

e. A nontransient noncommunity water system shall repeat the tasks in 42.2(4)*"c"* at least once during each calendar year in which the system exceeds the lead action level.

f. A water system may discontinue delivery of public education materials if the system has met the lead action level during the most recent six-month monitoring period conducted pursuant to 567—paragraph 41.4(1)*"c."* Such a system shall recommence public education in accordance with this subrule if it subsequently exceeds the lead action level during any monitoring period.

42.2(5) *Supplemental monitoring and notification of results.* A water system that fails to meet the lead action level on the basis of tap samples collected in accordance with 567—paragraph 41.4(1)*"c"* shall offer to sample the tap water of any customer who requests it. The system is not required to pay for collecting or analyzing the sample, nor is the system required to collect and analyze the sample itself.

42.2(6) *Special lead ban public notice.* Rescinded IAB 10/18/00, effective 11/22/00.

567—42.3(455B) Consumer confidence reports.

42.3(1) *Applicability and purpose.* This rule applies to all community public water supply systems. The purpose of this rule is to establish the minimum requirements for the content of annual reports that community water systems must deliver to their customers. These reports must contain information on the quality of the water delivered by the systems and characterize the risks (if any) from exposure to contaminants in the drinking water in an accurate and understandable manner. The department may assign public notification requirements and assess administrative penalties to any community public water supply system which fails to fulfill the requirements of this rule.

42.3(2) *Reporting frequency.*

a. Existing community water systems. Existing community water systems must deliver the first report by October 19, 1999; the second report by July 1, 2000; and subsequent reports annually by July 1 thereafter.

b. New community water systems. New community water systems must deliver their first report by July 1 of the year after their first full calendar year in operation, and annually thereafter.

c. CWS which sells water to another CWS. A community water system that sells water to another community water system must deliver the applicable information required in subrule 42.3(3) to the buyer system:

(1) No later than April 19, 1999, for the 1998 report; by April 1, 2000, for the 1999 report; and annually by April 1 thereafter, or

(2) On a date mutually agreed upon by the seller and the purchaser, and specifically included in a contract between the parties.

When a consecutive system sells water to another community water system, the seller must provide all applicable information in 42.3(3) to the CWS buying the water from them.

42.3(3) *Content of the reports.* Each annual consumer confidence report must contain the following information, at a minimum:

a. Source water identification. The report must identify the source(s) of water delivered by the community public water supply system, including the following:

(1) Type of water (e.g., surface water, groundwater, groundwater purchased from another public water supply).

(2) Commonly used name of the aquifer, reservoir, or river (if any) and location of the body (or bodies) of water.

(3) If a source water assessment has been completed, notify consumers of the availability of this information and the means to obtain it. In addition, systems are encouraged to highlight in the report significant sources of contamination in the source water area if they have readily available information. Where a system has received a source water assessment from the department, the report must include a brief summary of the system's susceptibility to potential sources of contamination, using language provided by the department or its designee, or written by the owner or operator.

b. Definitions. Each report must include the following definitions:

(1) "Maximum Contaminant Level Goal (MCLG)" means the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

(2) "Maximum Contaminant Level (MCL)" means the highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

(3) Rescinded IAB 10/18/00, effective 11/22/00.

(4) A report which contains data on a contaminant for which EPA has set a treatment technique or an action level must include one or both of the following definitions, as applicable:

1. "Treatment technique (TT)" means a required process intended to reduce the level of a contaminant in drinking water.

2. "Action level (AL)" means the concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

(5) Rescinded IAB 10/18/00, effective 11/22/00.

c. Information on detected contaminants. This paragraph specifies the requirements for information to be included in each report for contaminants subject to mandatory monitoring (except *Cryptosporidium*, which is listed in 42.3(3)*"c"*(2)). It applies to the following: contaminants subject to an MCL, action level, or treatment technique (regulated contaminants); contaminants for which monitoring is required by 567—paragraph 41.3(1)*"f,"* 567—41.11(455B), and 567—41.15(455B) (unregulated and special contaminants); and disinfection by-products or microbial contaminants for which monitoring is required by 567—Chapters 40 to 43, except as provided under 42.3(3)*"e"*(1), and which are detected in the finished water. For the purposes of this subrule, "detected" means at or above the levels prescribed by the following: inorganic contaminants in 567—subparagraph 41.3(1)*"e"*(1); volatile organic contaminants in 567—paragraph 41.5(1)*"b"*; synthetic organic contaminants in 567—paragraph 41.5(1)*"b"*; radionuclide contaminants in 567—paragraph 41.9(1)*"c"*; and other contaminants with health advisory levels, as assigned by the department.

(1) The data relating to these contaminants must be displayed in one table or in several adjacent tables. Any additional monitoring results which a community water system chooses to include in its report must be displayed separately.

1. The data must be derived from data collected to comply with departmental monitoring and analytical requirements during calendar year 1998 for the first report and subsequent calendar years thereafter. Where a system is allowed to monitor for contaminants less often than once a year, the table(s) must include the results and date of the most recent sampling and a brief statement indicating that the data presented in the report are from the most recent testing done in accordance with the regulations. No data older than five years need be included.

2. For detected regulated contaminants, which are listed in Appendix D, the table(s) must contain:

- The MCL for that contaminant, expressed as a number equal to or greater than 1.0 (as provided in Appendix C);
- The MCLG for that contaminant, expressed in the same units as the MCL;
- If there is no MCL for a detected contaminant, the table must indicate that there is a treatment technique, or specify the action level, applicable to that contaminant, and the report must include the definition for treatment technique or action level, as appropriate, specified in 42.3(3)*"b"*(4).

3. For contaminants subject to an MCL, except turbidity and total coliforms, the table must contain the highest contaminant level used to determine compliance with a primary drinking water standard and the range of detected levels, as follows:

- When compliance with the MCL is determined annually or less frequently: the highest detected level at any sampling point and the range of detected levels expressed in the same units as the MCL (such as inorganic compounds).
- When compliance with the MCL is determined by calculating a running annual average of all samples taken at a sampling point: the highest average of any of the sampling points and the range of all sampling points expressed in the same units as the MCL (such as organic compounds and radionuclides).
- When compliance with an MCL is determined on a systemwide basis by calculating a running annual average of all samples at all sampling points: the average and range of detection expressed in the same units as the MCL (such as total trihalomethane compounds).

NOTE: When rounding of results to determine compliance with the MCL is allowed by the regulations, rounding should be done prior to multiplying the results by the factor listed in Appendix C.

4. For turbidity:

- When it is reported pursuant to 567—paragraph 41.7(1)*"b"*: the highest average monthly value.
- When it is reported pursuant to 567—43.5(455B): the highest single measurement and the lowest monthly percentage of samples meeting the turbidity limits specified in 567—43.5(455B) for the filtration technology being used. The report should include an explanation of the reasons for measuring turbidity. After January 1, 2002, systems serving more than 10,000 people must report the highest single turbidity measurement and the lowest monthly percentage of samples meeting the turbidity limits specified in 567—43.9(455B) for the filtration technology being used.

5. For lead and copper: the 90th percentile value of the most recent round of sampling and the number of sampling sites exceeding the action level.

6. For total coliform:

- The highest monthly number of positive samples for systems collecting fewer than 40 samples per month; or
- The highest monthly percentage of positive samples for systems collecting at least 40 samples per month.

7. For fecal coliform:

- The total number of positive samples; and
- The likely source(s) of detected contaminants to the best of the owner's or operator's knowledge. Specific information regarding contaminants may be available in sanitary surveys and source water assessments. If the owner or operator lacks specific information on the likely contaminant source, the report must include one or more of the typical sources for that contaminant listed in Appendix D, which are most applicable to the system.

8. If a community water system distributes water to its customers from multiple hydraulically independent distribution systems that are fed by different raw water sources, the table should contain a separate column for each service area and the report should identify each separate distribution system. Alternatively, systems may produce separate reports tailored to include data for each service area.

9. The table(s) must clearly identify any data indicating MCL or TT violations, and the report must contain a clear and readily understandable explanation of the violation including:

- The length of the violation,
- The potential adverse health effects,
- Actions taken by the system to address the violation, and
- The relevant language from Appendix E to describe the potential health effects.

10. For detected unregulated contaminants for which monitoring is required, except *Cryptosporidium*, the table(s) must contain the average and range at which the contaminant was detected. The report may include a brief explanation of the reasons for monitoring for unregulated contaminants.

11. For public water supply systems which have fluoride levels greater than or equal to 2.0 mg/L and less than or equal to 4.0 mg/L, the report may contain the language listed in Appendix F, which is intended to alert families about dental problems that might affect children under nine years of age, instead of providing a separate public notification.

12. Community public water supply systems may list the most recent results of the special sodium monitoring requirement according to 567—subrule 41.11(3) in the annual report, instead of providing a separate public notification.

13. If a contaminant which does not have an MCL, TT, or AL is detected in the water, the PWS must contact the department for the specific health effects language, health advisory level, and contamination sources.

(2) If monitoring indicates that *Cryptosporidium* may be present in the source water or the finished water, or that radon may be present in the finished water, the report must include:

1. A summary of the *Cryptosporidium* monitoring results;
2. The radon monitoring results; and
3. An explanation of the significance of the results.

(3) If the system has performed additional monitoring which indicates the presence of other contaminants in the finished water, the system must report any results which may indicate a health concern. To determine if results may indicate a health concern, the community public water supply can determine if there is a current or proposed maximum contaminant level, treatment technique, action level, or health advisory by contacting the department or by calling the national Safe Drinking Water Hotline ((800)426-4791). The department considers the detection of a contaminant above a proposed MCL or health advisory to indicate possible health concerns. For such contaminants, the report should include:

1. The results of the monitoring; and
2. An explanation of the significance of the results noting the existence of a health advisory or a proposed regulation.

(4) If the system was required to comply with the federal Information Collection Rule pursuant to the Code of Federal Regulations Title 40 Part 141, it must include the results of monitoring in compliance with Sections 141.142 and 141.143. These results need only be included for five years from the date of the sample or until any of the detected contaminants become regulated and subject to routine monitoring requirements, whichever comes first.

d. Compliance with 567—Chapters 40, 41, 42, and 43. In addition to the requirements of 567—paragraph 42.3(3)"*c*"(1)"9," the report must note any violation that occurred during the year covered by the report of a requirement listed below and include a clear and readily understandable explanation of the violation, any potential adverse health effects, and the steps the system has taken to correct the violation. Note any violation of the following requirements:

(1) Monitoring and reporting of compliance data pursuant to 567—Chapters 41 and 43, which includes any contaminant with a maximum contaminant level, treatment technique, action level, or health advisory;

(2) Treatment techniques:

1. Filtration and disinfection prescribed by 567—43.5(455B). For systems which have failed to install adequate filtration or disinfection equipment or processes, or have had a failure of such equipment or processes which constitutes a violation, the report must include the following language as part of the explanation of potential adverse health effects: Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.

2. Lead and copper control requirements. For systems which fail to take one or more actions prescribed by 567—Chapters 41 to 43 pertaining to lead and copper, the report must include the applicable language of Appendix E to this chapter for lead or copper, or both.

3. Acrylamide and epichlorohydrin control technologies prescribed by 567—paragraph 41.5(1)"*b*"(3). For systems which violate the requirements of 567—paragraph 41.5(1)"*b*"(3), the report must include the relevant language from Appendix E to this chapter.

(3) Record keeping of compliance data pursuant to 567—Chapters 40 to 43;

(4) Special monitoring requirements; and

(5) Violation of the terms of operation permit compliance schedule, or an administrative order or judicial order.

e. Operation permit or administrative order with a schedule which extends the time period in which compliance must be achieved. If a system has been issued a compliance schedule with an extension for compliance, the report must contain:

(1) An explanation of the reasons for the extension;

(2) The date on which the extension was issued;

(3) A brief status report on the steps the system is taking to install treatment, find alternative sources of water, or otherwise comply with the terms of the compliance schedule; and

(4) A notice of any opportunity for public input in the review or renewal of the compliance schedule.

f. Mandatory report language for explanation of contaminant occurrence. The reports must contain a brief explanation regarding contaminants which may reasonably be expected to be found in drinking water including bottled water. This explanation may include the language of the following subparagraphs (1) to (3). Subparagraph (4) is provided as a minimal alternative to subparagraphs (1) to (3). Systems may also develop their own comparable language. The report also must include the language of 42.3(3)"*g.*"

(1) The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

(2) Contaminants that may be present in source water include:

1. Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

2. Inorganic contaminants, such as salts and metals, which can be naturally occurring or result from urban storm runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.

3. Pesticides and herbicides, which may come from a variety of sources such as agriculture, storm water runoff, and residential uses.

4. Organic chemical contaminants, including synthetic and volatile organics, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff and septic systems.

5. Radioactive contaminants, which can be naturally occurring or be the result of oil and gas production and mining activities.

(3) In order to ensure that tap water is safe to drink, the department prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. The United States Food and Drug Administration regulations establish limits for contaminants in bottled water which must provide the same protection for public heath.

(4) Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the national Safe Drinking Water Hotline ((800)426-4791).

g. Required additional health information.

(1) All systems. All reports must prominently display the following language: Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. The EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the national Safe Drinking Water Hotline ((800)426-4791).

(2) Arsenic levels greater than half the MCL (25 μg/L). A system which detects arsenic at levels above 25 μg/L, but below the MCL:

1. Must include in its report a short information statement about arsenic, using language such as: EPA is reviewing the drinking water standard for arsenic because of special concerns that it may not be stringent enough. Arsenic is a naturally occurring mineral known to cause cancer in humans at high concentrations.

2. May write its own educational statement, but only in consultation with the department.

(3) Nitrate levels greater than half the MCL (5 mg/L). A system which detects nitrate at levels above 5 mg/L, but below the MCL:

1. Must include a short informational statement about the impacts of nitrate on children using language such as: Nitrate in drinking water at levels above 10 ppm is a health risk for infants of less than six months of age. High nitrate levels in drinking water can cause blue baby syndrome. Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity. If you are caring for an infant you should ask advice from your health care provider.

2. May write its own education statement, but only in consultation with the department.

(4) Nitrite levels greater than half the MCL (0.5 mg/L). A system which detects nitrite at levels above 0.5 mg/L, but below the MCL:

1. Must include a short informational statement about the impacts of nitrite on children using language such as: Nitrite in drinking water at levels above 1 ppm is a health risk for infants of less than six months of age. High nitrite levels in drinking water can cause blue baby syndrome. If you are caring for an infant you should ask advice from your health care provider.
2. May write its own education statement, but only in consultation with the department.

(5) Lead 95th percentile levels above the action level (0.015 mg/L). Systems which detect lead above the action level in more than 5 percent (95th percentile) and up to and including 10 percent (90th percentile) of homes sampled:

1. Must include a short informational statement about the special impact of lead on children using language such as: Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels at your home may be higher than at other homes in the community as a result of materials used in your home's plumbing. If you are concerned about elevated lead levels in your home's water, you may wish to have your water tested and flush your tap for 30 seconds to 2 minutes before using tap water. Additional information is available from the Safe Drinking Water Hotline ((800)426-4791).
2. May write its own educational statement, but only in consultation with the department.

(6) Total trihalomethane (TTHM) levels above 0.080 mg/L but less than the MCL. Systems that detect TTHMs above 0.080 mg/L, but below the MCL in 567—subrule 41.5(1), as an annual average, monitored and calculated under the provisions of 567—paragraph 41.5(1)*"e,"* must include the health effects language for total trihalomethanes listed in Appendix E.

h. Additional mandatory report requirements.

(1) The report must include the telephone number of the owner, operator, or designee of the community water system as a source of additional information concerning the report.

(2) In communities with a large proportion of non-English speaking residents, as determined by the department, the report must contain information in the appropriate language(s) regarding the importance of the report or contain a telephone number or address where such residents may contact the system to obtain a translated copy of the report or assistance in the appropriate language.

(3) The report must include information (e.g., time and place of regularly scheduled board meetings) about opportunities for public participation in decisions that may affect the quality of the water.

(4) The systems may include such additional information as they deem necessary for the public education consistent with, and not detracting from, the purpose of the report.

42.3(4) *Report delivery.*

a. Required report recipients. Each community water system must mail or otherwise directly deliver one copy of the report to each customer.

(1) The system must make a good-faith effort to reach consumers who do not get water bills, using means recommended by the department. An adequate good-faith effort will be tailored to the consumers who are served by the system but are not bill-paying customers, such as renters or workers. A good-faith effort to reach consumers would include a mix of methods appropriate to the particular system such as:

1. Posting the reports on the Internet;
2. Mailing to postal patrons in metropolitan areas;
3. Advertising the availability of the report in the news media;
4. Publication in a local newspaper;
5. Posting in public places such as cafeterias or lunchrooms of public buildings;
6. Delivery of multiple copies for distribution by single-billed customers such as apartment buildings or large private employers;
7. Delivery to community organizations.

(2) No later than the date the system is required to distribute the report to its customers, each community water system must mail a copy of the report to the department, followed within three months by a certification that the report has been distributed to customers, and that the information is correct and consistent with the compliance monitoring data previously submitted to the department.

(3) No later than the date the system is required to distribute the report to its customers, each community water system must deliver the report to any other agency or clearinghouse identified by the department, such as the Iowa department of public health or county board of health.

b. Availability of report. Each community water system must make its report available to the public upon request. Each community water system serving 100,000 or more persons must post its current year's report to a publicly accessible site on the Internet.

c. Waiver from mailing requirements for systems serving fewer than 10,000 persons. All community public water supply systems with fewer than 10,000 persons served will be granted the waiver, except for those systems which have the following: one or more exceedances of a maximum contaminant level, treatment technique, action level, or health advisory; an administrative order; a court order; significant noncompliance with monitoring or reporting requirements; or an extended compliance schedule contained in the operation permit. Even though a public water supply system has been granted a mailing waiver, subparagraphs 42.3(4)*"a"*(2) to (4) and paragraph 42.3(4)*"b"* still apply to all community public water supply systems. A mailing waiver is not allowed for the report covering the year during which one of the previously listed exceptions occurred. Systems which use the mailing waiver must:

(1) Publish the reports in one or more local newspapers serving the area in which the system is located;

(2) Inform the customers that the reports will not be mailed, either in the newspapers in which the reports are published or by other means approved by the department; and

(3) Make the reports available to the public upon request.

d. Waiver from mailing requirements for systems serving 500 or fewer in population. All community public water supply systems serving 500 or fewer persons will be granted the waiver, except for those systems which have the following: one or more exceedances of a maximum contaminant level, treatment technique, action level, or health advisory; an administrative order; a court order; significant noncompliance with monitoring or reporting requirements; or an extended compliance schedule contained in the operation permit. Systems serving 500 or fewer persons which use the waiver may forego the requirements of subparagraphs 42.3(4)*"c"*(1) and (2) if they provide notice at least once per year to their customers by mail, door-to-door delivery, or by posting that the report is available upon request, in conspicuous places within the area served by the system acceptable to the department. A mailing waiver is not allowed for the report covering the year during which one of the previously listed exceptions occurred. Even though a public water supply system has been granted a mailing waiver, subparagraphs 42.3(4)*"a"*(2) to (4) and paragraph 42.3(4)*"b"* still apply to all community public water supply systems.

567—42.4(455B) Reporting.

42.4(1) *Reporting requirements other than for lead and copper.*

a. When required by the department, the supplier of water shall report to the department within ten days following a test, measurement or analysis required to be made by 567—Chapter 40, 41, 42, or 43 the results of that test, measurement or analysis in the form and manner prescribed by the department. This shall include reporting of all positive detects within the same specific analytical method.

b. Except where a different reporting period is specified in this rule or 567—Chapters 41 and 43, the supplier of water shall report to the department within 48 hours after any failure to comply with the monitoring requirements set forth in 567—Chapters 41 and 43. The supplier of water shall also notify the department within 48 hours of failure to comply with any primary drinking water regulations.

c. The public water supply system, within ten days of completion of each public notification required pursuant to 42.1(455B), shall submit to the department a representative copy of each type of notice distributed, published, posted, or made available to the persons served by the system or to the media.

42.4(2) *Lead and copper reporting requirements.* All water systems shall report all of the following information to the department in accordance with this subrule.

a. Reporting requirements for tap water monitoring for lead and copper and for water quality parameter monitoring.

(1) A water system shall report the information specified below for all tap water samples within the first ten days following the end of each applicable monitoring period specified in 567—41.4(455B) (i.e., every six months, annually, or every three years).

1. The results of all tap samples for lead and copper including the location of each site and the criteria under which the site was selected for the system's sampling pool;

2. A certification that each first draw sample collected by the water system is one liter in volume and, to the best of the collector's knowledge, has stood motionless in the service line, or in the interior plumbing of a sampling site, for at least six hours;

3. Where residents collected samples, a certification that each tap sample collected by the residents was taken after the water system informed them of proper sampling procedures specified in 567—paragraph 41.4(1)*"c"*(2)"2";

4. The 90th percentile lead and copper concentrations measured from among all lead and copper tap water samples collected during each monitoring period (calculated in accordance with 567—paragraph 41.4(1)*"b"*(3));

5. With the exception of initial tap sampling conducted pursuant to 567—paragraph 41.4(1)*"c"*(4)"1," the system shall designate any site which was not sampled during previous monitoring periods, and include an explanation of why sampling sites have changed;

6. The results of all tap samples for pH and, where applicable, alkalinity, calcium, conductivity, temperature, and orthophosphate or silica collected under 567—paragraphs 41.4(1)*"d"*(2) through (5);

7. The results of all samples collected at the entry point(s) to the distribution system for applicable water quality parameters under 567—paragraphs 41.4(1)*"d"*(2) and (5).

(2) By the applicable date in 567—paragraph 41.4(1)*"c"*(4)"1" for commencement of monitoring, each community water system which does not complete its targeted sampling pool with tier 1 sampling sites meeting the criteria in 567—paragraph 41.4(1)*"c"*(1)"3" shall send a letter justifying its selection of tier 2 and tier 3 sampling sites under 567—paragraphs 41.4(1)*"c"*(1)"4" and "5," whichever is applicable.

(3) By the applicable date in 567—paragraph 41.4(1)*"c"*(4)"1" for commencement of monitoring, each nontransient noncommunity water system which does not complete its sampling pool with tier 1 sampling sites meeting the criteria in 567—paragraph 41.4(1)*"c"*(1)"6" shall send a letter to the department justifying its selection of sampling sites under 567—paragraph 41.4(1)*"c"*(1)"7."

(4) By the applicable date in 567—paragraph 41.4(1)*"c"*(4)"1" for commencement of monitoring, each water system with lead service lines that is not able to locate the number of sites served by such lines required under 567—paragraph 41.4(1)*"c"*(1)"8" shall send a letter to the department demonstrating why it was unable to locate a sufficient number of such sites based upon the information listed in 567—paragraph 41.4(1)*"c"*(1)"2."

(5) Each water system that requests that the department reduce the number and frequency of sampling shall provide the information required under 567—paragraph 41.4(1)*"c"*(4)"4."

b. Source water monitoring reporting requirements.

(1) A water system shall report the sampling results for all source water samples collected in accordance with 567—paragraph 41.4(1)*"e"* within the first ten days following the end of each source water monitoring period (i.e., annually, per compliance period or per compliance cycle) specified in 567—paragraph 41.4(1)*"e."*

(2) With the exception of the first round of source water sampling conducted pursuant to 567—paragraph 41.4(1)*"e"*(2), the system shall specify any site which was not sampled during previous monitoring periods, and include an explanation of why the sampling point has changed.

c. Corrosion control treatment reporting requirements. By the applicable dates under 567—subrule 43.7(1), systems shall report the following information:

(1) For systems demonstrating that they have already optimized corrosion control, information required in 567—paragraph 43.7(1)*"b"*(2) or (3).

(2) For systems required to optimize corrosion control, their recommendation regarding optimal corrosion control treatment under 567—paragraph 43.7(2)*"a."*

(3) For systems required to evaluate the effectiveness of corrosion control treatments under 567—paragraph 43.7(2)*"c,"* the information required by that paragraph.

(4) For systems required to install optimal corrosion control designated by the department under 567—paragraph 43.7(2)*"d,"* a letter certifying that the system has completed installing that treatment.

d. Source water treatment reporting requirements. By the applicable dates in 567—paragraph 43.7(3)*"b"*(1), systems shall provide the following information to the department:

(1) If required under 567—paragraph 43.7(3)*"b"*(1), their recommendation regarding source water treatment;

(2) For systems required to install source water treatment under 567—paragraph 43.7(3)*"b"*(1), a letter certifying that the system has completed installing the treatment designated by this department within 24 months after the department designated the treatment.

e. Lead service line replacement reporting requirements. Systems shall report the following information to demonstrate compliance with the requirements of 567—subrule 43.7(4):

(1) Within 12 months after a system exceeds the lead action level in sampling referred to in 567—paragraph 43.7(4)*"a,"* the system shall demonstrate in writing to the department that it has conducted a materials evaluation, including the evaluation pursuant to 567—paragraph 41.4(1)*"c"*(1) to identify the initial number of lead service lines in its distribution system, and shall provide the department with the system's schedule for replacing annually at least 7 percent of the initial number of lead service lines in its distribution system.

(2) Within 12 months after a system exceeds the lead action level in sampling referred to in 567—paragraph 43.7(4)*"a"* and every 12 months thereafter, the system shall demonstrate in writing that the system has either:

1. Replaced in the previous 12 months at least 7 percent of the initial lead service lines (or a greater number of lines specified by the department under 567—paragraph 43.7(4)*"f"* in its distribution system), or

2. Conducted sampling which demonstrates that the lead concentration in all service line samples from individual line(s), taken pursuant to 567—numbered paragraph 41.4(1)*"c"*(2)"3," is less than or equal to 0.015 mg/L. In such cases, the total number of lines replaced and those lines which meet the criteria in 567—paragraph 43.7(4)*"c"* shall equal at least 7 percent of the initial number of lead lines identified under 567—paragraph 43.7(4)*"b"* or the percentage specified by the department under 567—paragraph 43.7(4)*"f."* A lead service line meeting the criteria of 567—paragraph 43.7(4)*"c"* may only be used to comply with the 7 percent criteria for a specific year, and may not be used again to calculate compliance with the 7 percent criteria in future years.

(3) The annual letter submitted to the department under 42.4(2)*"e"*(2) shall contain the following information:

1. The number of lead service lines scheduled to be replaced during the previous year of the system's replacement schedule;

2. The number and location of each lead service line replaced during the previous year of the system's replacement schedule;

3. If measured, the water lead concentration and location of each lead service line sampled, the sampling method, and the date of sampling.

(4) As soon as practicable, but in no case later than three months after a system exceeds the lead action level in sampling referred to in 567—paragraph 43.7(4)*"a,"* any system seeking to rebut the presumption that it has control over the entire lead service line pursuant to 567—paragraph 43.7(4)*"d"* shall submit a letter to the department describing the legal authority (e.g., state statutes, municipal ordinances, public service contracts or other applicable legal authority) which limits the system's control over the service lines and the extent of the system's control.

f. Public education program reporting requirements. By December 31 of each year, a water system that is subject to the public education requirements in 42.2(455B) shall submit a letter to the department demonstrating that the system has delivered the public education materials that meet the content requirements in 42.2(2) and 42.2(3) and the delivery requirements in 42.2(4). This information shall include a list of all the newspapers, radio stations, television stations, facilities and organizations to which the system delivered public education materials during the previous year. The water system shall submit the letter annually for as long as it exceeds the lead action level.

g. Reporting of additional monitoring data. A system which collects sampling data in addition to that required by 567—Chapters 41 and 43 shall report the results to the department within the first ten days following the end of the applicable monitoring period under 567—paragraphs 41.4(1)*"c," "d,"* and *"e"* during which the samples are collected.

42.4(3) *Operation and maintenance for PWS.*

a. Required records of operation.

(1) Applicability. Monthly records of operation shall be completed by all public water supplies, on forms provided by the department or on similar forms, unless a public water supply meets all of the following conditions:

1. Supplies an annual average of not more than 25,000 gpd or serves no more than an average of 250 individuals daily;

2. Is a community public water supply and does not provide any type of treatment, or is a noncommunity system (NTNC and TNC) which has only a cation-exchange softening or iron/manganese removal treatment unit, and meets the requirements of 42.4(3)*"a"*(2)"7";

3. Does not utilize either a surface water or a groundwater under the direct influence of surface water either in whole or in part as a water source.

4. Does not use a treatment technique such as blending to achieve compliance with a maximum contaminant level, treatment technique, action level, or health advisory.

The reports shall be completed as described in 42.4(3)*"a"*(2) and maintained at the facility for inspection by the department for a period of five years. For CWS and NTNC PWSs, the monthly operation report must be signed by the certified operator in direct responsible charge or the certified operator's designee. For TNC PWSs, the monthly operation report, if required by the department, must be signed by the owner or the owner's designee.

All public water supplies must also comply with the record-keeping requirements in 567—43.5(455B).

(2) Contents. Monthly operation reports shall be completed as follows:

1. Pumpage or flow. Noncommunity supplies shall measure and record the total water used each week. It is recommended that a daily measurement and recording be made. Community supplies shall measure and record daily water used. Reporting of pumpage or flow may be required in an operation permit where needed to verify MCL compliance.

2. Treatment effectiveness. Where treatment is practiced, the intended effect of the treatment shall be measured at locations and by methods which best indicate effectiveness of the treatment process. These measurements shall be made pursuant to Appendix B of this chapter. Daily monitoring is seven days a week unless otherwise specified by the department.

3. Treatment effectiveness for a primary standard. Where the raw water quality does not meet the requirements of 567—Chapters 41 and 43 and treatment is practiced for the purpose of complying with a maximum contaminant level, action level, health advisory, or treatment technique criteria, daily measurement of the primary standard constituent or an appropriate indicator constituent designated by the department shall be recorded. The department will require reporting of these results in the operation permit to verify MCL compliance.

4. Treatment effectiveness for a secondary standard. Where treatment is practiced for the purpose of achieving the recommended level of any constituent designated in the federal secondary standards, measurements shall be measured and recorded at a frequency specified in Appendix B. Daily monitoring is seven days a week unless otherwise specified by the department.

5. Chemical application. Chemicals such as fluoride, iodine, bromine and chlorine, which are potentially toxic in excessive concentration, shall be measured and recorded daily. Recording shall include the amount of chemical applied each day. Where the supplier of water is attempting to maintain a residual of the chemical throughout the system, such as chlorine, the residual in the system shall be recorded daily. The quantity of all other chemicals applied shall be measured and recorded at least once each week.

6. Static water levels and pumping water levels must be measured and recorded once per month for all groundwater sources. More or less frequent measurements may be approved by the department where historical data justifies it.

7. Noncommunity systems (NTNC and TNC) are exempt from the self-monitoring requirements for cation-exchange softening and iron/manganese removal if the treatment unit:

- Is a commercially available "off-the-shelf" unit designed for home use;
- Is self-contained, requiring only a piping connection for installation;
- Operates throughout a range of 35 to 80 psi; and
- Has not been installed for the purpose of removing a contaminant which has a maximum contaminant level, treatment technique, action level, or health advisory.

b. Chemical quality and application. Any drinking water system chemical which is added to raw, partially treated, or finished water must be suitable for the intended use in a potable water system. Effective on October 1, 2000, the chemical must be certified to meet the current American National Standards Institute/National Sanitation Foundation (ANSI/NSF) Standard 60, if such certification exists for the particular product, unless certified chemicals are not reasonably available for use, in accordance with guidelines provided by the department. If the chemical is not certified by the ANSI/NSF Standard 60 or no certification is available, the person seeking to supply or use the chemical must prove to the satisfaction of the department that the chemical is not toxic or otherwise a potential hazard in a potable public water supply system.

The supplier of water shall keep a record of all chemicals used. This record should include a clear identification of the chemical by brand or generic name and the dosage rate. When chemical treatment is applied with the intent of obtaining an in-system residual, the residuals will be monitored regularly. When chemical treatment is applied and in-system residuals are not expected, the effectiveness of the treatment will be monitored through an appropriate indicative parameter.

(1) Continuous disinfection.

1. When required. Continuous disinfection must be provided at all public water supply systems, except for the following: groundwater supplies that have no treatment facilities or have only fluoride, sodium hydroxide or soda ash addition and that meet the bacterial standards as provided in 567—41.2(455B) and do not show other actual or potential hazardous contamination by microorganisms.

2. Method. Chlorine is the preferred disinfecting agent. Chlorination may be accomplished with liquid chlorine, calcium or sodium hypochlorites or chlorine dioxide. Other disinfecting agents will be considered, provided a residual can be maintained in the distribution system, reliable application equipment is available and testing procedures for a residual are recognized in Standard Methods for the Analysis of Water and Wastewater.

3. Chlorine residual. A minimum free available chlorine residual of 0.3 mg/L or a minimum total available chlorine residual of 1.5 mg/L must be continuously maintained throughout the water distribution system, except for those points on the distribution system that terminate as dead ends or areas that represent very low use when compared to usage throughout the rest of the distribution system as determined by the department.

4. Test kit. A test kit capable of measuring free and combined chlorine residuals in increments no greater than 0.1 mg/L in the range below 0.5 mg/L, and in increments no greater than 0.2 mg/L in the range from 0.5 mg/L to 1.0 mg/L, and in increments no greater than 0.3 mg/L in the range from 1.0 mg/L to 2.0 mg/L must be provided at all chlorination facilities. The test kit must use a method of analysis that is recognized in Standard Methods for the Analysis of Water and Wastewater.

5. Leak detection, control and operator protection. A bottle of at least 56 percent ammonium hydroxide must be provided at all gas chlorination installations for leak detection. Leak repair kits must be available where ton chlorine cylinders are used.

6. Other disinfectant residuals. If an alternative disinfecting agent is approved by this department, the residual levels and type of test kit used will be assigned by the department in accordance with and based upon analytical methods contained in Standard Methods for the Analysis of Water and Wastewater.

(2) Phosphate compounds.

1. When phosphate compounds are to be added to any public water supply system which includes iron or manganese removal or ion-exchange softening, such compounds must be applied after the iron or manganese removal or ion-exchange softening treatment units, unless the director has received and approved an engineering report demonstrating the suitability for addition prior to these units in accordance with the provisions of 567—subrule 43.3(2). The department may require the discontinuance of phosphate addition where it interferes with other treatment processes, the operation of the water system or if there is a significant increase in microorganism populations associated with phosphate application.

2. The total phosphate concentration in the finished water must not exceed 10 mg/L as PO_4.

3. Chlorine shall be applied to the phosphate solution in sufficient quantity to give an initial concentration of 10 mg/L in the phosphate solution. A chlorine residual must be maintained in the phosphate solution at all times.

4. Test kits capable of measuring polyphosphate and orthophosphate in a range from 0.0 to 10.0 mg/L in increments no greater than 0.1 mg/L must be provided.

5. Continuous application or injection of phosphate compounds directly into a well is prohibited.

(3) Fluorosilicic acid. Where fluorosilicic acid (H_2SiF_6, also called hydrofluosilicic acid) is added to a public water supply, the operator shall be equipped with a fluoride test kit with a minimum range of from 0.0 to 2.0 mg/L in increments no greater than 0.1 mg/L. Distilled water and standard fluoride solutions of 0.2 mg/L and 1.0 mg/L must be provided.

c. Reporting and record-keeping requirements for systems using surface water and groundwater under the direct influence of surface water. In addition to the monitoring requirements required by 42.4(3)*"a"* and *"b,"* a public water system that uses a surface water source or a groundwater source under the direct influence of surface water must report monthly to the department the information specified in this subrule beginning June 29, 1993, or when filtration is installed, whichever is later.

(1) Turbidity measurements as required by 567—subrule 43.5(3) must be reported within ten days after the end of each month the system serves water to the public. Information that must be reported includes:

1. The total number of filtered water turbidity measurements taken during the month.

2. The number and percentage of filtered water turbidity measurements taken during the month which are less than or equal to the turbidity limits specified in 567—paragraphs 43.5(3)*"b"* through *"e"* for the filtration technology being used.

3. The date and value of any turbidity measurements taken during the month which exceed 5 NTU. If at any time the turbidity exceeds 5 NTU, the system must inform the department as soon as possible, but no later than the end of the next business day. This requirement is in addition to the monthly reporting requirement, pursuant to 567—43.5(455B).

(2) Disinfection information specified in 567—subrule 43.5(2) and 567—paragraph 42.4(3)*"b"* must be reported to the department within ten days after the end of each month the system serves water to the public. Information that must be reported includes:

1. For each day, the lowest measurement of residual disinfectant concentration in mg/L in water entering the distribution system.

2. The date and duration of each period when the residual disinfectant concentration in water entering the distribution system fell below 0.3 mg/L and when the department was notified of the occurrence. If at any time the residual falls below 0.3 mg/L in the water entering the distribution system, the system must notify the department as soon as possible, but no later than by the end of the next business day. The system also must notify the department by the end of the next business day whether or not the residual was restored to at least 0.3 mg/L within four hours. This requirement is in addition to the monthly reporting requirement, pursuant to 567—43.5(455B).

3. The information on the samples taken in the distribution system in conjunction with total coliform monitoring listed in 567—paragraph 43.5(2)*"d"* and pursuant to 567—paragraph 41.2(1)*"c."*

d. Reporting and record-keeping requirements for disinfection byproducts, disinfectants, and disinfection byproduct precursors.

(1) General requirements.

1. In addition to the monitoring requirements required by 42.4(3)*"a"* and *"b,"* a CWS or NTNC public water system that adds a chemical disinfectant to the water in any part of the drinking water treatment process or which provides water that contains a chemical disinfectant must report monthly to the department the information specified in this paragraph by the dates listed in 567—subparagraphs 41.6(1)*"a"*(3) and 43.6(1)*"a"*(3). A TNC public water system which adds chlorine dioxide as a disinfectant or oxidant must report monthly to the department the information specified in this paragraph by the dates listed in 567—numbered paragraph 43.6(1)*"a"*(3)"3."

2. Systems required to sample quarterly or more frequently must report to the department within ten days after the end of each quarter in which samples were collected, notwithstanding the public notification provisions of 567—42.1(455B). Systems required to sample less frequently than quarterly must report to the department within ten days after the end of each monitoring period in which samples were collected.

(2) Disinfection byproducts. Systems must report the information specified in the following table:

Disinfection Byproducts Reporting Table

If you are a . . .	You must report . . .
System monitoring for TTHMs and HAA5 under the requirements of 567—subparagraph 41.6(1)"*c*"(4) on a quarterly or more frequent basis	1. The number of samples taken during the last quarter. 2. The location, date, and result of each sample taken during the last quarter. 3. The arithmetic average of all samples taken in the last quarter. 4. The annual arithmetic average of the quarterly arithmetic averages for the last four quarters. 5. Whether the MCL was exceeded.
System monitoring for TTHMs and HAA5 under the requirements of 567—subparagraph 41.6(1)"*c*"(4) less frequently than quarterly, but at least annually	1. The number of samples taken during the last year. 2. The location, date, and result of each sample taken during the last monitoring period. 3. The arithmetic average of all samples taken over the last year. 4. Whether the MCL was exceeded.
System monitoring for TTHMs and HAA5 under the requirements of 567—subparagraph 41.6(1)"*c*"(4) less frequently than annually	1. The location, date, and result of the last sample taken. 2. Whether the MCL was exceeded.
System monitoring for chlorite under the requirements of 567—subparagraph 41.6(1)"*c*"(3)	1. The number of samples taken each month for the last 3 months. 2. The location, date, and result of each sample taken during the last quarter. 3. For each month in the reporting period, the arithmetic average of all samples taken in the month. 4. Whether the MCL was exceeded, and in which month it was exceeded.
System monitoring for bromate under the requirements of 567—subparagraph 41.6(1)"*c*"(2)	1. The number of samples taken during the last quarter. 2. The location, date, and result of each sample taken during the last quarter. 3. The arithmetic average of the monthly arithmetic averages of all samples taken in the last year. 4. Whether the MCL was exceeded.

(3) Disinfectants. In addition to the requirements in 567—subparagraph 41.2(1)"*c*"(2), systems must report the information specified in the following table:

Disinfectants Reporting Table

If you are a . . .	You must report . . .
System monitoring for chlorine or chloramines under the requirements of 567—numbered paragraph 43.6(1)"*c*"(1)"2."	1. The number of samples taken during each month of the last quarter. 2. The monthly arithmetic average of all samples taken in each month for the last 12 months. 3. The arithmetic average of all monthly averages for the last 12 months. 4. Whether the MRDL was exceeded.
System monitoring for chlorine dioxide under the requirements of 567—numbered paragraph 43.6(1)"*c*"(1)"3."	1. The dates, results, and locations of samples taken during the last quarter. 2. Whether the MRDL was exceeded. 3. Whether the MRDL was exceeded in any two consecutive daily samples and whether the resulting violation was acute or non-acute.

(4) Disinfection byproduct precursors and enhanced coagulation or enhanced softening. Systems must report the information specified in the following table:

Disinfection Byproduct Precursors and Enhanced Coagulation or Enhanced Softening Reporting Table

If you are a . . .	You must report . . .
System monitoring monthly or quarterly for TOC under the requirements of 567—subparagraph 43.6(1)*"c"*(2) and required to meet the enhanced coagulation or enhanced softening requirements in 567—subparagraph 43.6(3)*"b"*(2) or (3).	1. The number of paired (source water and treated water, prior to continuous disinfection) samples taken during the last quarter. 2. The location, date, and result of each paired sample and associated alkalinity taken during the last quarter. 3. For each month in the reporting period that paired samples were taken, the arithmetic average of the percent reduction of TOC for each paired sample and the required TOC percent removal. 4. Calculations for determining compliance with the TOC percent removal requirements, as provided in 567—subparagraph 43.6(3)*"c"*(1). 5. Whether the system is in compliance with the enhanced coagulation or enhanced softening percent removal requirements in 567—paragraph 43.6(3)*"b"* for the last four quarters.
System monitoring monthly or quarterly for TOC under the requirements of 567—subparagraph 43.6(1)*"c"*(2) and meeting one or more of the alternative compliance criteria in 567—subparagraph 43.6(3)*"a"*(2) or (3).	1. The alternative compliance criterion that the system is using. 2. The number of paired samples taken during the last quarter. 3. The location, date, and result of each paired sample and associated alkalinity taken during the last quarter. 4. The running annual arithmetic average based on monthly averages (or quarterly samples) of source water TOC for systems meeting a criterion in 567—numbered paragraph 43.6(3)*"a"*(2)"1" or "3" or of treated water TOC for systems meeting the criterion in 567—numbered paragraph 43.6(3)*"a"*(2)"2." 5. The running annual arithmetic average based on monthly averages (or quarterly samples) of source water SUVA for systems meeting the criterion in 567—numbered paragraph 43.6(3)*"a"*(2)"5" or of treated water SUVA for systems meeting the criterion in 43.6(3)*"a"*(2)"6." 6. The running annual average of source water alkalinity for systems meeting the criterion in 567—numbered paragraph 43.6(3)*"a"*(2)"3" and of treated water alkalinity for systems meeting the criterion in 43.6(3)*"a"*(3)"1." 7. The running annual average for both TTHM and HAA5 for systems meeting the criterion in 567—numbered paragraph 43.6(3)*"a"*(2)"3" or "4." 8. The running annual average for the amount of magnesium hardness removal (as $CaCO_3$, in mg/L) for systems meeting the criterion in 567—numbered paragraph 43.6(3)*"a"*(3)"2." 9. Whether the system is in compliance with the particular alternative compliance criterion in 567—subparagraph 43.6(3)*"a"*(2) or (3).

567—42.5(455B) Record maintenance.

42.5(1) *Record maintenance requirements.* Any owner or operator of a public water system subject to the provisions of this rule shall retain on its premises or at a convenient location near its premises the following records:

a. Analytical records.

(1) Actual laboratory reports shall be kept, or data may be transferred to tabular summaries, provided that the following information is included:

1. The date, place, and time of sampling, and the name of the person who collected the sample;
2. Identification of the sample as to whether it was a routine distribution system sample, check sample, raw or process water sample or other special purpose sample;
3. Date of analysis;
4. Laboratory and person responsible for performing analysis;
5. The analytical technique or method used; and
6. The results of the analysis.

(2) Record retention for specific analytes.

1. Bacteria. Records of bacteriological analyses made pursuant to this subrule shall be kept for not less than five years.
2. Chemical: radionuclide, inorganic compounds, organic compounds. Records of chemical analyses made pursuant to 567—Chapter 41 shall be kept for not less than ten years. Additional lead and copper requirements are listed in 42.5(1)*"b."*

b. Lead and copper record-keeping requirements. A system subject to the requirements of 42.4(2) shall retain on its premises original records of all data and analyses, reports, surveys, public education, letters, evaluations, schedules, and any other information required by 567—41.4(455B) and 567—Chapter 43. Each water system shall retain the records required by this subrule for 12 years.

c. Records of action (violation correction). Records of action taken by the system to correct violations of primary drinking water regulations (including administrative orders) shall be kept for not less than five years after the last action taken with respect to the particular violation involved.

d. Reports and correspondence relating to sanitary surveys. Copies of any written reports, summaries, or communications relating to sanitary surveys of the system conducted by the system itself, by a private consultant, or by any local, state or federal agency, shall be kept for a period of not less than ten years after completion of the sanitary survey involved.

e. Operation or construction permits. Records concerning an operation or a construction permit issued pursuant to 567—Chapter 43 to the system shall be kept for a period ending not less than ten years after the system achieves compliance with the maximum contaminant level, treatment technique, action level, or health advisory, or after the system in question completes the associated construction project.

f. Public notification. Records of public notification, including the consumer confidence report, public notification examples, and reports requiring certification of who received the public notification, must be kept for at least five years.

g. Self-monitoring requirement records. The monthly records of operation must be completed as described in 42.4(3)*"a"*(2) and maintained at the facility for inspection by the department for a period of at least five years.

42.5(2) Reserved.

These rules are intended to implement Iowa Code sections 455B.171 through 455B.188 and 455B.190 through 455B.192.

APPENDIX A:
MANDATORY HEALTH EFFECTS LANGUAGE FOR PUBLIC NOTIFICATION

Acrylamide. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that acrylamide is a health concern at certain levels of exposure. Polymers made from acrylamide are sometimes used to treat water supplies to remove particulate contaminants. Acrylamide has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. Sufficiently large doses of acrylamide are known to cause neurological injury. EPA has set the drinking water standard for acrylamide using a treatment technique to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. This treatment technique limits the amount of acrylamide in the polymer and the amount of the polymer which may be added to drinking water to remove particulates. Drinking water systems which comply with this treatment technique have little to no risk and are considered safe with respect to acrylamide.

Alachlor. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that alachlor is a health concern at certain levels of exposure. This organic chemical is a widely used pesticide. When soil and climatic conditions are favorable, alachlor may get into drinking water by runoff into surface water or by leaching into groundwater. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for alachlor at 0.002 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets this standard is associated with little to none of this risk and is considered safe with respect to alachlor.

Aldicarb. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that aldicarb is a health concern at certain levels of exposure. Aldicarb is a widely used pesticide. Under certain soil and climatic conditions (e.g., sandy soil and high rainfall), aldicarb may leach into groundwater after normal agricultural applications to crops such as potatoes or peanuts or may enter drinking water supplies as a result of surface runoff. This chemical has been shown to damage the nervous system in laboratory animals such as rats and dogs exposed to high levels. EPA has set the drinking water standard for aldicarb at 0.003 parts per million (ppm) to protect against the risk of adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to aldicarb.

Aldicarb sulfoxide. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that aldicarb sulfoxide is a health concern at certain levels of exposure. Aldicarb is a widely used pesticide. Aldicarb sulfoxide in groundwater is primarily a breakdown product of aldicarb. Under certain soil and climatic conditions (e.g., sandy soil and high rainfall), aldicarb sulfoxide may leach into groundwater after normal agricultural applications to crops such as potatoes or peanuts or may enter drinking water supplies as a result of surface runoff. This chemical has been shown to damage the nervous system in laboratory animals such as rats and dogs exposed to high levels. EPA has set the drinking water standard for aldicarb sulfoxide at 0.004 parts per million (ppm) to protect against the risk of adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to aldicarb sulfoxide.

Aldicarb sulfone. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that aldicarb sulfone is a health concern at certain levels of exposure. Aldicarb is a widely used pesticide. Aldicarb sulfone is formed from the breakdown of aldicarb and is considered for registration as a pesticide under the name aldoxycarb. Under certain soil and climatic conditions (e.g., sandy soil and high rainfall), aldicarb sulfone may leach into groundwater after normal agricultural applications to crops such as potatoes or peanuts or may enter drinking water supplies as a result of surface runoff. This chemical has been shown to damage the nervous system in laboratory animals such as rats and dogs exposed to high levels. EPA has set the drinking water standard for aldicarb sulfone at 0.002 parts per million (ppm) to protect against the risk of adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to aldicarb sulfone.

Antimony. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that antimony is a health concern at certain levels of exposure. This inorganic chemical occurs naturally in soils, groundwater and surface waters and is often used in the flame-retardant industry. It is also used in ceramics, glass, batteries, fireworks and explosives. It may get into drinking water through natural weathering of rock, industrial production, municipal waste disposal or manufacturing processes. This chemical has been shown to decrease longevity and to alter blood levels of cholesterol and glucose in laboratory animals such as rats exposed to high levels during their lifetimes. EPA has set the drinking water standard for antimony at 0.006 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to antimony.

Asbestos. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that asbestos fibers greater than 10 micrometers in length are a health concern at certain levels of exposure. Asbestos is a naturally occurring mineral. Most asbestos fibers in drinking water are less than 10 micrometers in length and occur in drinking water from natural sources and from corroded asbestos-cement pipes in the distribution system. The major uses of asbestos were in the production of cements, floor tiles, paper products, paint, and caulking; in transportation-related applications; and in the production of textiles and plastics. Asbestos was once a popular insulating and fire-retardant material. Inhalation studies have shown that various forms of asbestos have produced lung tumors in laboratory animals. The available information on the risk of developing gastrointestinal tract cancer associated with the ingestion of asbestos from drinking water is limited. Ingestion of intermediate-range chrysotile asbestos fibers greater than 10 micrometers in length is associated with causing benign tumors in male rats. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for asbestos at 7 million long fibers per liter to reduce the potential risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to asbestos.

Atrazine. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that atrazine is a health concern at certain levels of exposure. This organic chemical is a herbicide. When soil and climatic conditions are favorable, atrazine may get into drinking water by runoff into surface water or by leaching into groundwater. This chemical has been shown to affect offspring of rats and the hearts of dogs. EPA has set the drinking water standard for atrazine at 0.003 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to atrazine.

Barium. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that barium is a health concern at certain levels of exposure. This inorganic chemical occurs naturally in some aquifers that serve as sources of groundwater. It is also used in oil and gas drilling muds, automotive paints, bricks, tiles and jet fuels. It generally gets into drinking water after dissolving from naturally occurring minerals in the ground. This chemical may damage the heart and cardiovascular system and is associated with high blood pressure in laboratory animals such as rats exposed to high levels during their lifetimes. In humans, EPA believes that effects from barium on blood pressure should not occur below 2 parts per million (ppm) in drinking water. EPA has set the drinking water standard for barium at 2 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to barium.

Benzene. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that benzene is a health concern at certain levels of exposure. This chemical is used as a solvent and degreaser of metals. It is also a major component of gasoline. Drinking water contamination generally results from leaking underground gasoline and petroleum tanks or improper waste disposal. This chemical has been associated with significantly increased risks of leukemia among certain industrial workers who were exposed to relatively large amounts of this chemical during their working careers. This chemical has also been shown to cause cancer in laboratory animals when the animals are exposed at high levels over their lifetimes. Chemicals that cause increased risk of cancer among exposed industrial workers and in laboratory animals also may increase the risk of cancer in humans who are exposed at lower levels over long periods of time. EPA has set the enforceable drinking water standard for benzene at 0.005 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in humans and laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.

Benzo(a)pyrene. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that benzo(a)pyrene is a health concern at certain levels of exposure. Cigarette smoke and charbroiled meats are common sources of general exposure. The major source of benzo(a)pyrene in drinking water is the leaching from coal tar lining and sealants in water storage tanks. This chemical has been shown to cause cancer in animals such as rats and mice when the animals are exposed at high levels. EPA has set the drinking water standard for benzo(a)pyrene at 0.0002 parts per million (ppm) to protect against the risk of cancer. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to benzo(a)pyrene.

Beryllium. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that beryllium is a health concern at certain levels of exposure. This inorganic metal occurs naturally in soils, groundwater and surface waters and is often used in electrical equipment and electrical components. It generally gets into water from runoff from mining operations, discharge from processing plants and improper waste disposal. Beryllium compounds have been associated with damage to the bones and lungs and induction of cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. There is limited evidence to suggest that beryllium may pose a cancer risk via drinking water exposure. Therefore, EPA based the health assessment on noncancer effects with an extra uncertainty factor to account for possible carcinogenicity. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for beryllium at 0.004 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to beryllium.

Bromate. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that bromate is a health concern at certain levels of exposure. Bromate is formed as a byproduct of ozone disinfection of drinking water. Ozone reacts with naturally occurring bromide in the water to form bromate. Bromate has been shown to produce cancer in rats. EPA has set a drinking water standard to limit exposure to bromate.

Cadmium. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that cadmium is a health concern at certain levels of exposure. Food and the smoking of tobacco are common sources of general exposure. This inorganic metal is a contaminant in the metals used to galvanize pipe. It generally gets into water by corrosion of galvanized pipes or by improper waste disposal. This chemical has been shown to damage the kidneys in animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Some industrial workers who were exposed to relatively large amounts of this chemical during working careers also suffered damage to the kidneys. EPA has set the drinking water standard for cadmium at 0.005 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to cadmium.

Carbofuran. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that carbofuran is a health concern at certain levels of exposure. This organic chemical is a pesticide. When soil and climatic conditions are favorable, carbofuran may get into drinking water by runoff into surface water or by leaching into groundwater. This chemical has been shown to damage the nervous and reproductive systems of laboratory animals such as rats and mice exposed at high levels over their lifetimes. Some humans who were exposed to relatively large amounts of this chemical during their working careers also suffered damage to the nervous system. Effects on the nervous system are generally rapidly reversible. EPA has set the drinking water standard for carbofuran at 0.04 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to carbofuran.

Carbon tetrachloride. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that carbon tetrachloride is a health concern at certain levels of exposure. This chemical was once a popular household cleaning fluid. It generally gets into drinking water by improper waste disposal. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed at lower levels over long periods of time. EPA has set the enforceable drinking water standard for carbon tetrachloride at 0.005 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.

Chloramines. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that chloramines are a health concern at certain levels of exposure. Chloramines are added to drinking water as a disinfectant to kill bacteria and other disease-causing microorganisms and are also added to provide continuous disinfection throughout the distribution system. Disinfection is required for surface water systems. However, at high doses for extended periods of time, chloramines have been shown to affect blood and the liver in laboratory animals. EPA has set a drinking water standard for chloramines to protect against the risk of these adverse effects. Drinking water which meets this EPA standard is associated with little to none of this risk and should be considered safe with respect to chloramines.

Chlordane. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that chlordane is a health concern at certain levels of exposure. This organic chemical is a pesticide used to control termites. Chlordane is not very mobile in soils. It usually gets into drinking water after application near water supply intakes or wells. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for chlordane at 0.002 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to chlordane.

Chlorine. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that chlorine is a health concern at certain levels of exposure. Chlorine is added to drinking water as a disinfectant to kill bacteria and other disease-causing microorganisms and is also added to provide continuous disinfection throughout the distribution system. Disinfection is required for surface water systems. However, at high doses for extended periods of time, chlorine has been shown to affect blood and the liver in laboratory animals. EPA has set a drinking water standard for chlorine to protect against the risk of these adverse effects. Drinking water which meets this EPA standard is associated with little to none of this risk and should be considered safe with respect to chlorine.

Chlorine dioxide. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that chlorine dioxide is a health concern at certain levels of exposure. Chlorine dioxide is used in water treatment to kill bacteria and other disease-causing microorganisms and can be used to control tastes and odors. Disinfection is required for surface water systems. However, at high doses, chlorine dioxide-treated drinking water has been shown to affect blood in laboratory animals. Also, high levels of chlorine dioxide in drinking water given to laboratory animals have been shown to cause neurological effects on the developing nervous system. These neurodevelopmental effects may occur as a result of a short-term excessive chlorine dioxide exposure. To protect against such potentially harmful exposures, EPA requires chlorine dioxide monitoring at the treatment plant, where disinfection occurs, and at representative points in the distribution system serving water users. EPA has set a drinking water standard for chlorine dioxide to protect against the risk of these adverse effects. (Note: One of the following two paragraphs must be included with the language of the previous paragraph.)

A. Systems with a nonacute violation at the treatment plant must also include the following language: The chlorine dioxide violations reported today are the result of exceedances at the treatment facility only, and do not include violations within the distribution system serving users of this water supply. Continued compliance with chlorine dioxide levels within the distribution system minimizes the potential risk of these violations to present consumers.

B. Systems with an acute violation in the distribution system must also include the following language: The chlorine dioxide violations reported today include exceedances of the EPA standard within the distribution system serving water users. Violations of the chlorine dioxide standard within the distribution system may harm human health based on short-term exposures. Certain groups, including pregnant women, infants, and young children, may be especially susceptible to adverse effects of excessive exposure to chlorine dioxide-treated water. The purpose of this notice is to advise that such persons should consider reducing their risk of adverse effects from these chlorine dioxide violations by seeking alternate sources of water for human consumption until such exceedances are rectified. Local and state health authorities are the best sources for information concerning alternate drinking water.

Chlorite. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that chlorite is a health concern at certain levels of exposure. Chlorite is formed from the breakdown of chlorine dioxide, a drinking water disinfectant. Chlorite in drinking water has been shown to affect blood and the developing nervous system. EPA has set a drinking water standard for chlorite to protect against these effects. Drinking water which meets this standard is associated with little to none of these risks and should be considered safe with respect to chlorite.

Chromium. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that chromium is a health concern at certain levels of exposure. This inorganic metal occurs naturally in the ground and is often used in the electroplating of metals. It generally gets into water from runoff from old mining operations and improper waste disposal from plating operations. This chemical has been shown to damage the kidneys, nervous system, and the circulatory system of laboratory animals such as rats and mice when the animals are exposed at high levels. Some humans who were exposed to high levels of this chemical suffered liver and kidney damage, dermatitis and respiratory problems. EPA has set the drinking water standard for chromium at 0.1 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to chromium.

Coliforms: Fecal coliforms/*E. coli* (to be used when there is a violation of 567—subparagraph 41.2(1)*"b"*(2) or both 567—subparagraphs 41.2(1)*"b"*(1) and (2)). The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that the presence of fecal coliforms or *E. coli* is a serious health concern. Fecal coliforms and *E. coli* are generally not harmful themselves, but their presence in drinking water is serious because they usually are associated with sewage or animal wastes. The presence of these bacteria in drinking water is generally a result of a problem with water treatment or the pipes which distribute the water and indicates that the water may be contaminated with organisms that can cause disease. Disease symptoms may include diarrhea, cramps, nausea, and possibly jaundice, and associated headaches and fatigue. These symptoms, however, are not just associated with disease-causing organisms in drinking water, but also may be caused by a number of factors other than your drinking water. EPA has set an enforceable drinking water standard for fecal coliforms and *E. coli* to reduce the risk of these adverse health effects. Under this standard all drinking water samples must be free of these bacteria. Drinking water which meets this standard is associated with little or none of this risk and should be considered safe. State and local health authorities recommend that consumers take the following precautions: (to be inserted by the public water supply system, according to instructions from state or local authorities).

Coliforms: Total coliforms (to be used when there is a violation of 567—subparagraph 41.2(1)*"b"*(1) and not a violation of 567—subparagraph 41.2(1)*"b"*(2)). The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that the presence of total coliforms is a possible health concern. Total coliforms are common in the environment and are generally not harmful themselves. The presence of these bacteria in drinking water, however, generally is a result of a problem with water treatment or the pipes which distribute the water and indicates that the water may be contaminated with organisms that can cause disease. Disease symptoms may include diarrhea, cramps, nausea, and possibly jaundice, and any associated headaches and fatigue. These symptoms, however, are not just associated with disease-causing organisms in drinking water but also may be caused by a number of factors other than your drinking water. EPA has set an enforceable drinking water standard for total coliforms to reduce the risk of these adverse health effects. Under this standard, no more than 5.0 percent of the samples collected during a month can contain these bacteria, except that systems collecting fewer than 40 samples per month that have one total coliform-positive sample per month are not violating the standard. Drinking water which meets this standard is usually not associated with a health risk from disease-causing bacteria and should be considered safe.

Copper. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that copper is a health concern at certain exposure levels. Copper, a reddish-brown metal, is often used to plumb residential and commercial structures that are connected to water distribution systems. Copper contaminating drinking water as a corrosion by-product occurs as the result of the corrosion of copper pipes that remain in contact with water for a prolonged period of time. Copper is an essential nutrient, but at high doses it has been shown to cause stomach and intestinal distress, liver and kidney damage, and anemia. Persons with Wilson's disease may be at a higher risk of health effects due to copper than the general public. EPA's national primary drinking water regulation requires all public water systems to install optimal corrosion control to minimize copper contamination resulting from the corrosion of plumbing materials. Public water systems serving 50,000 people or fewer that have copper concentrations below 1.3 parts per million (ppm) in more than 90 percent of tap water samples (the EPA "action level") are not required to install or improve their treatment. Any water system that exceeds the action level must also monitor their source water to determine whether treatment to remove copper in source water is needed.

Cyanide. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that cyanide is a health concern at certain levels of exposure. This inorganic chemical is used in electroplating, steel processing, plastics, synthetic fabrics and fertilizer products. It usually gets into water as a result of improper waste disposal. This chemical has been shown to damage the spleen, brain and liver of humans fatally poisoned with cyanide. EPA has set the drinking water standard for cyanide at 0.2 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to cyanide.

2,4-D. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that 2,4-D is a health concern at certain levels of exposure. This organic chemical is used as a herbicide and to control algae in reservoirs. When soil and climatic conditions are favorable, 2,4-D may get into drinking water by runoff into surface water or by leaching into groundwater. This chemical has been shown to damage the liver and kidneys of laboratory animals such as rats exposed at high levels during their lifetimes. Some humans who were exposed to relatively large amounts of this chemical also suffered damage to the nervous system. EPA has set the drinking water standard for 2,4-D at 0.07 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to 2,4-D.

Dalapon. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that dalapon is a health concern at certain levels of exposure. This organic chemical is a widely used herbicide. It may get into drinking water after application to control grasses in crops, drainage ditches and along railroads. This chemical has been shown to cause damage to the kidneys and liver in laboratory animals when the animals are exposed to high levels over their lifetimes. EPA has set the drinking water standard for dalapon at 0.2 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to dalapon.

Dibromochloropropane (DBCP). The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that DBCP is a health concern at certain levels of exposure. This organic chemical was once a popular pesticide. When soil and climatic conditions are favorable, dibromochloropropane may get into drinking water by runoff into surface water or by leaching into groundwater. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for DBCP at 0.0002 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to DBCP.

1,2-Dichlorobenzene (ortho-Dichlorobenzene). The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that o-dichlorobenzene is a health concern at certain levels of exposure. This organic chemical is used as a solvent in the production of pesticides and dyes. It generally gets into water by improper waste disposal. This chemical has been shown to damage the liver, kidneys and the blood cells of laboratory animals such as rats and mice exposed to high levels during their lifetimes. Some industrial workers who were exposed to relatively large amounts of this chemical during working careers also suffered damage to the liver, nervous system, and circulatory system. EPA has set the drinking water standard for o-dichlorobenzene at 0.6 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to o-dichlorobenzene.

1,4-Dichlorobenzene (para-Dichlorobenzene). The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that para-dichlorobenzene is a health concern at certain levels of exposure. This chemical is a component of deodorizers, mothballs, and pesticides. It generally gets into drinking water by improper waste disposal. This chemical has been shown to cause liver and kidney damage in laboratory animals such as rats and mice when the animals are exposed to high levels over their lifetimes. Chemicals which cause adverse effects in laboratory animals also may cause adverse health effects in humans who are exposed at lower levels over long periods of time. EPA has set the enforceable drinking water standard for para-dichlorobenzene at 0.075 parts per million (ppm) to reduce the risk of these adverse health effects which have been observed in laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.

1,2-Dichloroethane. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that 1,2-dichloroethane is a health concern at certain levels of exposure. This chemical is used as a cleaning fluid for fats, oils, waxes, and resins. It generally gets into drinking water from improper waste disposal. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed at lower levels over long periods of time. EPA has set the enforceable drinking water standard for 1,2-dichloroethane at 0.005 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.

1,1-Dichloroethylene. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that 1,1-dichloroethylene is a health concern at certain levels of exposure. This chemical is used in industry and is found in drinking water as a result of the breakdown of related solvents. The solvents are used as cleaners and degreasers of metals and generally get into drinking water by improper waste disposal. This chemical has been shown to cause liver and kidney damage in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals which cause adverse effects in laboratory animals also may cause adverse health effects in humans who are exposed at lower levels over long periods of time. EPA has set the enforceable drinking water standard for 1,1-dichloroethylene at 0.007 parts per million (ppm) to reduce the risk of these adverse health effects which have been observed in laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.

cis-1,2-Dichloroethylene. The United States Environmental Protection Agency (EPA) establishes drinking water standards and has determined that cis-1,2-dichloroethylene is a health concern at certain levels of exposure. This organic chemical is used as a solvent and intermediate in chemical production. It generally gets into water by improper waste disposal. This chemical has been shown to damage the liver, nervous system, and circulatory system of laboratory animals such as rats and mice when exposed at high levels over their lifetimes. Some humans who were exposed to relatively large amounts of this chemical also suffered damage to the nervous system. EPA has set the drinking water standard for cis-1,2-dichloroethylene at 0.07 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to cis-1,2-dichloroethylene.

trans-1,2-Dichloroethylene. The United States Environmental Protection Agency (EPA) establishes drinking water standards and has determined that trans-1,2-dichloroethylene is a health concern at certain levels of exposure. This organic chemical is used as a solvent and intermediate in chemical production. It generally gets into water by improper waste disposal. This chemical has been shown to damage the liver, nervous system, and the circulatory system of laboratory animals such as rats and mice when exposed at high levels over their lifetimes. Some humans who were exposed to relatively large amounts of this chemical also suffered damage to the nervous system. EPA has set the drinking water standard for trans-1,2-dichloroethylene at 0.1 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to trans-1,2-dichloroethylene.

Dichloromethane. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that dichloromethane (methylene chloride) is a health concern at certain levels of exposure. This organic chemical is a widely used solvent. It is used in the manufacture of paint remover, as a metal degreaser and as an aerosol propellant. It generally gets into drinking water after improper discharge of waste disposal. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for dichloromethane at 0.005 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe with respect to dichloromethane.

1,2-Dichloropropane. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that 1,2-dichloropropane is a health concern at certain levels of exposure. This organic chemical is used as a solvent and pesticide. When soil and climatic conditions are favorable, 1,2-dichloropropane may get into drinking water by runoff into surface water or by leaching into groundwater. It may also get into drinking water through improper waste disposal. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for 1,2-dichloropropane at 0.005 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to 1,2-dichloropropane.

Di(2-ethylhexyl)adipate. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that di(2-ethylhexyl)adipate is a health concern at certain levels of exposure. Di(2-ethylhexyl)adipate is a widely used plasticizer in a variety of products, including synthetic rubber, food packaging materials and cosmetics. It may get into drinking water after improper waste disposal. This chemical has been shown to damage liver and testes in laboratory animals such as rats and mice exposed to high levels. EPA has set the drinking water standard for di(2-ethylhexyl)adipate at 0.4 parts per million (ppm) to protect against the risk of adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to di(2-ethylhexyl)adipate.

Di(2-ethylhexyl)phthalate. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that di(2-ethylhexyl)phthalate is a health concern at certain levels of exposure. Di(2-ethylhexyl)phthalate is a widely used plasticizer, which is primarily used in the production of polyvinyl chloride (PVC) resins. It may get into drinking water after improper waste disposal. This chemical has been shown to cause cancer in laboratory animals such as rats and mice exposed to high levels over their lifetimes. EPA has set the drinking water standard for di(2-ethylhexyl)phthalate at 0.006 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to di(2-ethylhexyl)phthalate.

Dinoseb. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that dinoseb is a health concern at certain levels of exposure. Dinoseb is a widely used pesticide and generally gets into drinking water after application on orchards, vineyards and other crops. This chemical has been shown to damage the thyroid and reproductive organs in laboratory animals such as rats exposed to high levels. EPA has set the drinking water standard for dinoseb at 0.007 parts per million (ppm) to protect against the risk of adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to dinoseb.

Diquat. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that diquat is a health concern at certain levels of exposure. This organic chemical is a herbicide used to control terrestrial and aquatic weeds. It may get into drinking water by runoff into surface water. This chemical has been shown to damage the liver, kidneys and gastrointestinal tract and causes cataract formation in laboratory animals such as dogs and rats exposed at high levels over their lifetimes. EPA has set the drinking water standard for diquat at 0.02 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to diquat.

Disinfection byproducts and treatment techniques for DBPs. The United States Environmental Protection Agency (EPA) sets drinking water standards and requires the disinfection of drinking water. However, when used in the treatment of drinking water, disinfectants react with naturally occurring organic and inorganic matter present in water to form chemicals called disinfection byproducts (DBPs). EPA has determined that a number of DBPs are a health concern at certain levels of exposure. Certain DBPs, including some trihalomethanes (THMs) and some haloacetic acids (HAAs), have been shown to cause cancer in laboratory animals. Other DBPs have been shown to affect the liver and the nervous system, and cause reproductive or developmental effects in laboratory animals. Exposure to certain DBPs may produce similar effects in people. EPA has set standards to limit exposure to THMs, HAAs, and other DBPs. Drinking water which meets the EPA standards is associated with little to none of these risks and should be considered safe with respect to the disinfection byproducts.

Endothall. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that endothall is a health concern at certain levels of exposure. This organic chemical is a herbicide used to control terrestrial and aquatic weeds. It may get into water by runoff into surface water. This chemical has been shown to damage the liver, kidneys, gastrointestinal tract and reproductive system of laboratory animals such as rats and mice exposed at high levels over their lifetimes. EPA has set the drinking water standard for endothall at 0.1 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to endothall.

Endrin. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that endrin is a health concern at certain levels of exposure. This organic chemical is a pesticide no longer registered for use in the United States. However, this chemical is persistent in treated soils and accumulates in sediments and aquatic and terrestrial biota. This chemical has been shown to cause damage to the liver, kidneys and heart in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. EPA has set the drinking water standard for endrin at 0.002 parts per million (ppm) to protect against the risk of these adverse health effects which have been observed in laboratory animals. Drinking water that meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to endrin.

Epichlorohydrin. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that epichlorohydrin is a health concern at certain levels of exposure. Polymers made from epichlorohydrin are sometimes used in the treatment of water supplies as a flocculent to remove particulates. Epichlorohydrin generally gets into drinking water by improper use of these polymers. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for epichlorohydrin using a treatment technique to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. This treatment technique limits the amount of epichlorohydrin in the polymer and the amount of the polymer which may be added to drinking water as a flocculent to remove particulates. Drinking water systems which comply with this treatment technique have little to no risk and are considered safe with respect to epichlorohydrin.

Ethylbenzene. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined ethylbenzene is a health concern at certain levels of exposure. This organic chemical is a major component of gasoline. It generally gets into water by improper waste disposal or leaking gasoline tanks. This chemical has been shown to damage the kidneys, liver, and nervous system of laboratory animals such as rats exposed to high levels during their lifetimes. EPA has set the drinking water standard for ethylbenzene at 0.7 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to ethylbenzene.

Ethylene dibromide (EDB). The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that EDB is a health concern at certain levels of exposure. This organic chemical was once a popular pesticide. When soil and climatic conditions are favorable, EDB may get into drinking water by runoff into surface water or by leaching into groundwater. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for EDB at 0.00005 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets this standard is associated with little to none of this risk and is considered safe with respect to EDB.

Fluoride. The U.S. Environmental Protection Agency requires that we send you this notice on the level of fluoride in your drinking water. The drinking water in your community has a fluoride concentration of _____ (the public water supply shall insert the compliance result which triggered notification under this subrule) milligrams per liter (mg/L).

Federal regulations require that fluoride, which occurs naturally in your water supply, not exceed a concentration of 4.0 mg/L in drinking water. This is an enforceable standard called a Maximum Contaminant Level (MCL), and it has been established to protect the public health. Exposure to drinking water levels above 4.0 mg/L for many years may result in some cases of crippling skeletal fluorosis, which is a serious bone disorder.

Federal law also requires that we notify you when monitoring indicates that the fluoride in your drinking water exceeds 2.0 mg/L. This is intended to alert families about dental problems that might affect children under nine years of age. The fluoride concentration of your water exceeds this federal guideline.

Fluoride in children's drinking water at levels of approximately 1 mg/L reduces the number of dental cavities. However, some children exposed to levels of fluoride greater than about 2.0 mg/L may develop dental fluorosis. Dental fluorosis, in its moderate and severe forms, is a brown staining or pitting of the permanent teeth.

Because dental fluorosis occurs only when developing teeth (before they erupt from the gums) are exposed to elevated fluoride levels, households without children are not expected to be affected by this level of fluoride. Families with children under the age of nine are encouraged to seek other sources of drinking water for their children to avoid the possibility of staining and pitting.

Your water supplier can lower the concentration of fluoride in your water so that you will still receive the benefits of cavity prevention while the possibility of stained and pitted teeth is minimized. Removal of fluoride may increase your water costs. Treatment systems are also commercially available for home use. Information on such systems is available at the address given below. Low fluoride bottled drinking water that would meet all standards is also commercially available.

For further information, contact ___ (the public water supply shall insert the name, address, and telephone number of a contact person at the public water system) at your water system.

Glyphosate. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that glyphosate is a health concern at certain levels of exposure. This organic chemical is a herbicide used to control grasses and weeds. It may get into drinking water by runoff into surface water. This chemical has been shown to cause damage to the liver and kidneys in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. EPA has set the drinking water standard for glyphosate at 0.7 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to glyphosate.

Heptachlor. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that heptachlor is a health concern at certain levels of exposure. This organic chemical was once a popular pesticide. When soil and climatic conditions are favorable, heptachlor may get into drinking water by runoff into surface water or by leaching into groundwater. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standards for heptachlor at 0.0004 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets this standard is associated with little to none of this risk and is considered safe with respect to heptachlor.

Heptachlor epoxide. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that heptachlor epoxide is a health concern at certain levels of exposure. This organic chemical was once a popular pesticide. When soil and climatic conditions are favorable, heptachlor epoxide may get into drinking water by runoff into surface water or by leaching into groundwater. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standards for heptachlor epoxide at 0.0002 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets this standard is associated with little to none of this risk and is considered safe with respect to heptachlor epoxide.

Hexachlorobenzene. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that hexachlorobenzene is a health concern at certain levels of exposure. This organic chemical is produced as an impurity in the manufacture of certain solvents and pesticides. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed to high levels during their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for hexachlorobenzene at 0.001 parts per million (ppm) to protect against the risk of cancer and other adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to hexachlorobenzene.

Hexachlorocyclopentadiene. The United States Environmental Protection Agency (EPA) establishes drinking water standards and has determined that hexachlorocyclopentadiene is a health concern at certain levels of exposure. This organic chemical is used as an intermediate in the manufacture of pesticides and flame retardants. It may get into water by discharge from production facilities. This chemical has been shown to damage the kidneys and the stomach of laboratory animals when exposed at high levels over their lifetimes. EPA has set the drinking water standard for hexachlorocyclopentadiene at 0.05 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to hexachlorocyclopentadiene.

Lead. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that lead is a health concern at certain exposure levels. Materials that contain lead have frequently been used in the construction of water supply distribution systems, and plumbing systems in private homes and other buildings. The most commonly found materials include service lines, pipes, brass and bronze fixtures, and solders and fluxes. Lead in these materials can contaminate drinking water as a result of the corrosion that takes place when water comes into contact with those materials. Lead can cause a variety of adverse health effects in humans. At relatively low levels of exposure, these effects may include interference with red blood cell chemistry, delays in normal physical and mental development in babies and young children, slight deficits in the attention span, hearing, and learning abilities of children, and slight increases in the blood pressure of some adults. EPA's national primary drinking water regulation requires all public water systems to optimize corrosion control to minimize lead contamination resulting from the corrosion of plumbing materials. Public water systems serving 50,000 people or fewer that have lead concentrations below 15 parts per billion (ppb) in more than 90 percent of tap water samples (the EPA "action level") have optimized their corrosion control treatment. Any water system that exceeds the action level must also monitor its source water to determine whether treatment to remove lead in source water is needed. Any water system that continues to exceed the action level after installation of corrosion control or source water treatment must eventually replace all lead service lines contributing in excess of 15 ppb of lead to drinking water. Any water system that exceeds the action level must also undertake a public education program to inform consumers of ways they can reduce their exposure to potentially high levels of lead in drinking water.

Lindane. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that lindane is a health concern at certain levels of exposure. This organic chemical is used as a pesticide. When soil and climatic conditions are favorable, lindane may get into drinking water by runoff into surface water or by leaching into groundwater. This chemical has been shown to damage the liver, kidneys, nervous system, and immune system of laboratory animals such as rats, mice and dogs exposed at high levels during their lifetimes. Some humans who were exposed to relatively large amounts of this chemical also suffered damage to the nervous system and circulatory system. EPA has established the drinking water standard for lindane at 0.0002 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to lindane.

Mercury. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that mercury is a health concern at certain levels of exposure. This inorganic metal is used in electrical equipment and some water pumps. It usually gets into water as a result of improper waste disposal. This chemical has been shown to damage the kidneys of laboratory animals such as rats when the animals are exposed at high levels over their lifetimes. EPA has set the drinking water standard for mercury at 0.002 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to mercury.

Methoxychlor. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that methoxychlor is a health concern at certain levels of exposure. This organic chemical is used as a pesticide. When soil and climatic conditions are favorable, methoxychlor may get into drinking water by runoff into surface water or by leaching into groundwater. This chemical has been shown to damage the liver, kidneys, nervous system, and reproductive system of laboratory animals such as rats exposed at high levels during their lifetimes. It has also been shown to produce growth retardation in rats. EPA has set the drinking water standard for methoxychlor at 0.04 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to methoxychlor.

Microbiological contaminants (for use when there is a violation of the treatment technique requirements for filtration and disinfection in 567—43.5(455B)). The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that the presence of microbiological contaminants is a health concern at certain levels of exposure. If water is inadequately treated, microbiological contaminants in that water may cause disease. Disease symptoms may include diarrhea, cramps, nausea, and possibly jaundice, and any associated headaches and fatigue. These symptoms, however, are not just associated with disease-causing organisms in drinking water, but also may be caused by a number of factors other than your drinking water. EPA has set enforceable requirements for treating drinking water to reduce the risk of these adverse health effects. Treatment such as filtering and disinfecting the water removes or destroys microbiological contaminants. Drinking water which is treated to meet EPA requirements is associated with little to none of this risk and should be considered safe.

Monochlorobenzene. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that monochlorobenzene is a health concern at certain levels of exposure. This organic chemical is used as a solvent. It generally gets into water by improper waste disposal. This chemical has been shown to damage the liver, kidneys and nervous system of laboratory animals such as rats and mice exposed to high levels during their lifetimes. EPA has set the drinking water standard for monochlorobenzene at 0.1 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to monochlorobenzene.

Nitrate. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that nitrate poses an acute health concern at certain levels of exposure. Nitrate is used in fertilizer and is found in sewage and wastes from humans or farm animals and generally gets into drinking water from those activities. Excessive levels of nitrate in drinking water have caused serious illness and sometimes death in infants under six months of age. The serious illness in infants is caused because nitrate is converted to nitrite in the body. Nitrite interferes with the oxygen carrying capacity of the child's blood. This is an acute disease in that symptoms can develop rapidly in infants. In most cases, health deteriorates over a period of days. Symptoms include shortness of breath and blueness of the skin. Clearly, expert medical advice should be sought immediately if these symptoms occur. The purpose of this notice is to encourage parents and other responsible parties to provide infants with an alternate source of drinking water. Local and state health authorities are the best source for information concerning alternate sources of drinking water for infants. EPA has set the drinking water standard at 10 parts per million (ppm) for nitrate to protect against the risk of these adverse effects. EPA has also set a drinking water standard for nitrite at 1 ppm. To allow for the fact that the toxicity of nitrate and nitrite is additive, EPA has also established a standard for the sum of nitrate and nitrite at 10 ppm. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to nitrate.

Nitrite. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that nitrite poses an acute health concern at certain levels of exposure. This inorganic chemical is used in fertilizers and is found in sewage and wastes from humans or farm animals and generally gets into drinking water as a result of those activities. While excessive levels of nitrite in drinking water have not been observed, other sources of nitrite have caused serious illness and sometimes death in infants under six months of age. The serious illness in infants is caused because nitrite interferes with the oxygen carrying capacity of the child's blood. This is an acute disease in that symptoms can develop rapidly. However, in most cases, health deteriorates over a period of days. Symptoms include shortness of breath and blueness of the skin. Clearly, expert medical advice should be sought immediately if these symptoms occur. The purpose of this notice is to encourage parents and other responsible parties to provide infants with an alternate source of drinking water. Local and state health authorities are the best source for information concerning alternate sources of drinking water for infants. EPA has set the drinking water standard at 1 part per million (ppm) for nitrite to protect against the risk of these adverse effects. EPA has also set a drinking water standard for nitrate (converted to nitrite in humans) at 10 ppm and for the sum of nitrate and nitrite at 10 ppm. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to nitrite.

Oxamyl. The United States Environmental Protection Agency (EPA) establishes drinking water standards and has determined that oxamyl is a health concern at certain levels of exposure. This organic chemical is used as a pesticide for the control of insects and other pests. It may get into drinking water by runoff into surface water or leaching into groundwater. This chemical has been shown to damage the kidneys of laboratory animals such as rats when exposed at high levels over their lifetimes. EPA has set the drinking water standard for oxamyl at 0.2 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to oxamyl.

Pentachlorophenol. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that pentachlorophenol is a health concern at certain levels of exposure. This organic chemical is used as a wood preservative, herbicide, disinfectant, and defoliant. It generally gets into drinking water by runoff into surface water or leaching into groundwater. This chemical has been shown to produce adverse reproductive effects and to damage the liver and kidneys of laboratory animals such as rats exposed to high levels during their lifetimes. Some humans who were exposed to relatively large amounts of this chemical also suffered damage to the liver and kidneys. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for pentachlorophenol at 0.001 parts per million (ppm) to protect against the risk of cancer or other adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to pentachlorophenol.

Picloram. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that picloram is a health concern at certain levels of exposure. This organic chemical is used as a pesticide for broadleaf weed control. It may get into drinking water by runoff into surface water or leaching into groundwater as a result of pesticide application and improper waste disposal. This chemical has been shown to cause damage to the kidneys and liver in laboratory animals such as rats when the animals are exposed at high levels over their lifetimes. EPA has set the drinking water standard for picloram at 0.5 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to picloram.

Polychlorinated biphenyls (PCBs). The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that polychlorinated biphenyls (PCBs) are a health concern at certain levels of exposure. These organic chemicals were once widely used in electrical transformers and other industrial equipment. They generally get into drinking water by improper waste disposal or leaking electrical industrial equipment. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for PCBs at 0.0005 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets this standard is associated with little to none of this risk and is considered safe with respect to PCBs.

Selenium. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that selenium is a health concern at certain high levels of exposure. Selenium is also an essential nutrient at low levels of exposure. This inorganic chemical is found naturally in food and soils and is used in electronics, photocopy operations, the manufacture of glass, chemicals, drugs, and as a fungicide and a feed additive. In humans, exposure to high levels of selenium over a long period of time has resulted in a number of adverse health effects, including a loss of feeling and control in the arms and legs. EPA has set the drinking water standard for selenium at 0.05 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to selenium.

Simazine. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that simazine is a health concern at certain levels of exposure. This organic chemical is a herbicide used to control annual grasses and broadleaf weeds. It may leach into groundwater or run off into surface water after application. This chemical may cause cancer in laboratory animals such as rats and mice exposed at high levels during their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for simazine at 0.004 parts per million (ppm) to reduce the risk of cancer or other adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to simazine.

Styrene. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that styrene is a health concern at certain levels of exposure. This organic chemical is commonly used to make plastics and is sometimes a component of resins used for drinking water treatment. Styrene may get into drinking water from improper waste disposal. This chemical has been shown to damage the liver and nervous system in laboratory animals when exposed at high levels during their lifetimes. EPA has set the drinking water standard for styrene at 0.1 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to styrene.

2,3,7,8-TCDD (Dioxin). The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that dioxin is a health concern at certain levels of exposure. This organic chemical is an impurity in the production of some pesticides. It may get into drinking water by industrial discharge of wastes. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for dioxin at 0.00000003 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe with respect to dioxin.

2,4,5-TP. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that 2,4,5-TP is a health concern at certain levels of exposure. This organic chemical is used as a herbicide. When soil and climatic conditions are favorable, 2,4,5-TP may get into drinking water by runoff into surface water or by leaching into groundwater. This chemical has been shown to damage the liver and kidneys of laboratory animals such as rats and dogs exposed to high levels during their lifetimes. Some industrial workers who were exposed to relatively large amounts of this chemical during working careers also suffered damage to the nervous system. EPA has set the drinking water standard for 2,4,5-TP at 0.05 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to 2,4,5-TP.

Tetrachloroethylene. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that tetrachloroethylene is a health concern at certain levels of exposure. This organic chemical has been a popular solvent, particularly for dry cleaning. It generally gets into drinking water by improper waste disposal. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for tetrachloroethylene at 0.005 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets this standard is associated with little to none of this risk and is considered safe with respect to tetrachloroethylene.

Thallium. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that thallium is a health concern at certain high levels of exposure. This inorganic metal is found naturally in soils and is used in electronics, pharmaceuticals, and the manufacture of glass and alloys. This chemical has been shown to damage the kidneys, liver, brain and intestines of laboratory animals when the animals are exposed at high levels over their lifetimes. EPA has set the drinking water standard for thallium at 0.002 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to thallium.

Toluene. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that toluene is a health concern at certain levels of exposure. This organic chemical is used as a solvent and in the manufacture of gasoline for airplanes. It generally gets into water by improper waste disposal or leaking underground storage tanks. This chemical has been shown to damage the kidneys, nervous system, and circulatory system of laboratory animals such as rats and mice exposed to high levels during their lifetimes. Some industrial workers who were exposed to relatively large amounts of this chemical during working careers also suffered damage to the liver, kidneys and nervous system. EPA has set the drinking water standard for toluene at 1 part per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to toluene.

Toxaphene. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that toxaphene is a health concern at certain levels of exposure. This organic chemical was once a pesticide widely used on cotton, corn, soybeans, pineapples and other crops. When soil and climatic conditions are favorable, toxaphene may get into drinking water by runoff into surface water or by leaching into groundwater. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for toxaphene at 0.003 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets this standard is associated with little to none of this risk and is considered safe with respect to toxaphene.

1,2,4-Trichlorobenzene. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that 1,2,4-trichlorobenzene is a health concern at certain levels of exposure. This organic chemical is used as a dye carrier and as a precursor in herbicide manufacture. It generally gets into drinking water by discharges from industrial activities. This chemical has been shown to cause damage to several organs, including the adrenal glands. EPA has set the drinking water standard for 1,2,4-trichlorobenzene at 0.07 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to 1,2,4-trichlorobenzene.

1,1,1-Trichloroethane. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that 1,1,1-trichloroethane is a health concern at certain levels of exposure. This chemical is used as a cleaner and degreaser of metals. It generally gets into drinking water by improper waste disposal. This chemical has been shown to damage the liver, nervous system, and circulatory system of laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Some industrial workers who were exposed to relatively large amounts of this chemical during their working careers also suffered damage to the liver, nervous system, and circulatory system. Chemicals which cause adverse effects among exposed industrial workers and in laboratory animals also may cause adverse health effects in humans who are exposed at lower levels over long periods of time. EPA has set the enforceable drinking water standard for 1,1,1-trichloroethane at 0.2 parts per million (ppm) to protect against the risk of these adverse health effects which have been observed in humans and laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.

1,1,2-Trichloroethane. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that 1,1,2-trichloroethane is a health concern at certain levels of exposure. This organic chemical is an intermediate in the production of 1,1-dichloroethylene. It generally gets into water by industrial discharge of wastes. This chemical has been shown to damage the kidneys and liver of laboratory animals such as rats exposed to high levels during their lifetimes. EPA has set the drinking water standard for 1,1,2-trichloroethane at 0.005 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to 1,1,2-trichloro-ethane.

Trichloroethylene. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that trichloroethylene is a health concern at certain levels of exposure. This chemical is a common metal-cleaning and dry-cleaning fluid. It generally gets into drinking water by improper waste disposal. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed at lower levels over long periods of time. EPA has set forth the enforceable drinking water standard for trichloroethylene at 0.005 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.

Vinyl chloride. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that vinyl chloride is a health concern at certain levels of exposure. This chemical is used in industry and is found in drinking water as a result of the breakdown of related solvents. The solvents are used as cleaners and degreasers of metals and generally get into drinking water by improper waste disposal. This chemical has been associated with significantly increased risks of cancer among certain industrial workers who were exposed to relatively large amounts of this chemical during their working careers. This chemical has also been shown to cause cancer in laboratory animals when the animals are exposed at high levels over their lifetimes. Chemicals that cause increased risk of cancer among exposed industrial workers and in laboratory animals also may increase the risk of cancer in humans who are exposed at lower levels over long periods of time. EPA has set the enforceable drinking water standard for vinyl chloride at 0.002 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in humans and laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.

Xylene. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that xylene is a health concern at certain levels of exposure. This organic chemical is used in the manufacture of gasoline for airplanes and as a solvent for pesticides, and as a cleaner and degreaser of metals. It usually gets into water by improper waste disposal. This chemical has been shown to damage the liver, kidneys and nervous system of laboratory animals such as rats and dogs exposed to high levels during their lifetimes. Some humans who were exposed to relatively large amounts of this chemical also suffered damage to the nervous system. EPA has set the drinking water standard for xylene at 10 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to xylene.

APPENDIX B:
MINIMUM SELF-MONITORING REQUIREMENTS (SMR)

I. Minimum Self-Monitoring Requirements for TNCs (excluding surface water or influenced groundwater PWSs)

Notes:

- The self-monitoring requirements (SMRs) only apply to those supplies meeting the criteria in 42.4(3)*"a"*(1).
- TNCs are exempt from the self-monitoring requirements for point-of-use treatment devices, unless the device is used to remove a contaminant which has a maximum contaminant level or treatment technique, in which case additional SMRs will be assigned by the department.
- Daily monitoring for TNCs applies only when the facility is in operation.
- Additional or more frequent monitoring requirements may be assigned by the department in the operation permit.
- Additional SMRs are required if treatment is used to remove a regulated contaminant. See Section II for the requirements under the specific treatment type.

General Requirements

All TNCs which meet the criteria in 42.4(3)*"a"*(1) must measure the following parameters, where applicable. Additional SMRs are required if treatment is used to remove a contaminant which has a maximum contaminant level or treatment technique. See Section II for the requirements under the specific treatment type.

	PWS Type:	TNC*
Parameter	Sample Site	Frequency
Pumpage (Flow)	raw: final:	1/week 1/week
Disinfectant Residual	final: distribution system**:	1/day 1/day
Disinfectant, quantity used	day tank/scale:	1/day
Static Water and Pumping Water Levels (Drawdown)	each active well:	1/month

*TNCs must measure and record the total water used each week, but daily measurements are recommended, and may be required by the department in specific PWSs.

**Monitoring is to be conducted at representative points in the distribution system which adequately demonstrate compliance with 42.4(3)*"b"*(1).

II. Minimum Self-Monitoring Requirements for CWS, NTNC, and IGW/SW TNC

Notes:

- The self-monitoring requirements (SMR) only apply to those supplies meeting the criteria in 42.4(3)*"a"*(1).
- NTNCs are exempt from the self-monitoring requirements for point-of-use treatment devices, unless the device is used to remove a contaminant which has a maximum contaminant level, treatment technique, action level, or health advisory, in which case additional SMRs will be assigned by the department.
- Daily monitoring for NTNCs and IGW/SW TNCs applies only when the facility is in operation.
- These are the minimum self-monitoring requirements. Additional or more frequent monitoring requirements may be assigned by the department in the operation permit.

A. General Requirements

All PWSs which meet the criteria in 42.4(3)*"a"*(1) must measure the following parameters, where applicable:

	PWS Type:	IGW TNC	NTNC*	CWS
Parameter	Sample Site	Frequency	Frequency	Frequency
Pumpage (Flow)	raw:	1/day	1/week	1/day
	bypass:		1/week	1/day
	final:	1/day	1/week	1/day
Static Water and Pumping Water Levels (Drawdown)	each active well:	1/month	1/month	1/month

*NTNCs must measure and record the total water used each week, but daily measurements are recommended, and may be required by the department in specific PWSs.

B. Chemical Addition

All PWSs which apply chemicals in the treatment process must monitor the following parameters, for the applicable processes:

	Pumpage or Flow:	0.025-0.1 MGD	0.1-0.5 MGD	>0.5 MGD
Parameter	Sample Site	Frequency	Frequency	Frequency
DISINFECTION				
Disinfectant Residual	final:	1/day	1/day	1/day
	distribution system*:	1/day	1/day	1/day
Disinfectant, quantity used	day tank/scale:	1/day	1/day	1/day
FLUORIDATION				
Fluoride	raw:	1/quarter	1/month	1/month
	final:	1/day	1/day	1/day
Fluoride, quantity used	day tank/scale:	1/day	1/day	1/day
pH ADJUSTMENT				
pH	final:	1/week	2/week	1/day
Caustic Soda, quantity used	day tank/scale:	1/week	1/week	1/week
PHOSPHATE ADDITION				
Phosphate, as PO_4	final:	1/week	2/week	1/day
Phosphate, quantity used	day tank/scale:	1/week	1/week	1/week
OTHER CHEMICALS				
Chemical	final:	1/week	2/week	1/day
Chemical, quantity used	day tank/scale:	1/week	1/week	1/week

Monitoring is to be conducted at representative points in the distribution system which adequately demonstrate compliance with 42.4(3)"b"*(1).

C. Iron or Manganese Removal

Nonmunicipalities except rural water systems, benefited water districts, and publicly owned PWSs are exempt from monitoring of iron/manganese removal equipment unless the treatment is or was installed to remove a contaminant which has a maximum contaminant level, treatment technique, action level, or health advisory. Any chemicals which are applied during the treatment process must be measured under section "B. Chemical Addition" of this table.

	Pumpage or Flow:	0.025-0.1 MGD	0.1-0.5 MGD	>0.5 MGD
Parameter	Sample Site	Frequency	Frequency	Frequency
Iron	raw:	1/quarter	1/month	1/month
	final:	1/week	2/week	1/day
Manganese	raw:	1/quarter	1/month	1/month
	final:	1/week	2/week	1/day

D. pH Adjustment for Iron and Manganese Removal, by precipitation and coagulation processes utilizing lime, soda ash, or other chemical additions. Testing is only required if a specific chemical is added.

	Pumpage or Flow:	0.025-0.1 MGD	0.1-0.5 MGD	>0.5 MGD
Parameter	Sample Site	Frequency	Frequency	Frequency
Alkalinity	raw:	1/quarter	1/month	1/month
	final:	1/week	2/week	1/day
Iron	raw:	1/quarter	1/month	1/month
	final:	1/week	2/week	1/day
Manganese	raw:	1/quarter	1/month	1/month
	final:	1/week	2/week	1/day
pH	raw:	1/week	1/week	1/week
	final:	1/week	2/week	1/day

E. Cation Exchange (Zeolite) Softening

Nonmunicipalities except for rural water systems and benefited water districts are exempt from the monitoring of water quality parameters associated with ion-exchange softening unless the treatment is or was installed to remove a contaminant which has a maximum contaminant level, treatment technique, action level, or health advisory.

	Pumpage or Flow:	0.025-0.1 MGD	0.1-0.5 MGD	>0.5 MGD
Parameter	Sample Site	Frequency	Frequency	Frequency
Hardness as $CaCO_3$	raw:	1/quarter	1/month	1/month
	final:	1/week	2/week	1/day
pH	final:	1/week	2/week	1/day
Sodium	final:	1/year	1/year	1/year

F. Direct Filtration of Surface Waters or Influenced Groundwaters

	Pumpage or Flow:	All
Parameter	Sample Site	Frequency
CT Ratio	final:	1/day
Disinfectant Residual	source/entry point: distribution system*:	see 567—subrules 43.5(2) and 43.5(4), and 567—43.6(455B) for the specific requirements
Disinfectant, quantity used	day tank/scale:	1/day
pH	final:	1/day
Temperature	raw:	1/day
Turbidity	raw: final:	see 567—subrules 43.5(3) and 43.5(4), and 567—43.9(455B) for the specific requirements

*Monitoring is to be conducted at representative points in the distribution system which adequately demonstrate compliance with 567—subrule 43.5(2), 567—subrule 43.5(4), and 567—43.6(455B).

G. Clarification or Lime Softening of Surface Waters or Influenced Groundwaters

	Pumpage or Flow:	All
Parameter	Sample Site	Frequency
Alkalinity	raw: final:	1/day 1/day
Caustic Soda, quantity used	day tank/scale:	1/week
CT Ratio	final:	1/day
Disinfectant Residual	source/entry point: distribution system*:	see 567—subrules 43.5(2) and 43.5(4), and 567—43.6(455B) for the specific requirements
Disinfectant, quantity used	day tank/scale:	1/day
Hardness as $CaCO_3$	raw: final:	1/day 1/day
Odor	raw: final:	1/week 1/day
pH	raw: final:	1/day 1/day
Temperature	raw:	1/day
Turbidity	raw: final:	see 567—subrules 43.5(3) and 43.5(4), and 567—43.9(455B) for the specific requirements

*Monitoring is to be conducted at representative points in the distribution system which adequately demonstrate compliance with 567—subrule 43.5(2), 567—subrule 43.5(4), and 567—43.6(455B).

H. Lime Softening of Groundwaters (excluding IGW)

	Pumpage or Flow:	0.025-0.1 MGD	>0.1 MGD
Parameter	Sample Site	Frequency	Frequency
Alkalinity	raw:	1/quarter	1/month
	final:	1/day	1/day
Hardness as $CaCO_3$	raw:	1/quarter	1/month
	final:	1/day	1/day
pH	raw:	1/week	1/week
	final:	1/day	1/day
Temperature	raw:	1/week	1/week

I. Reverse Osmosis or Electrodialysis

	Pumpage or Flow:	0.025-0.1 MGD	>0.1 MGD
Parameter	Sample Site	Frequency	Frequency
Alkalinity	raw:	1/quarter	1/month
	final:	1/day	1/day
Hardness as $CaCO_3$	raw:	1/quarter	1/month
	final:	1/day	1/day
Iron	raw:	1/day	1/day
Manganese	raw:	1/day	1/day
pH	raw:	1/week	1/week
	final:	1/day	1/day
Total Dissolved Solids	raw:	1/month	1/month

J. Anion Exchange (i.e., Nitrate Reduction)

	Pumpage or Flow:	0.025-0.1 MGD	>0.1 MGD
Parameter	Sample Site	Frequency	Frequency
Nitrate	raw:	1/day	1/day
	final:	1/day	1/day
Sulfate	raw:	1/week	1/week
	final:	1/week	1/week

K. Activated Carbon for TTHM, VOC, or SOC Removal (GAC or PAC)

	Pumpage or Flow:	0.025-0.1 MGD	>0.1 MGD
Parameter	Sample Site	Frequency	Frequency
Total Organic Carbon (TOC)	final:	1/quarter	1/month

L. Air-Stripping for TTHM, VOC, or SOC Removal

	Pumpage or Flow:	0.025-0.1 MGD	>0.1 MGD
Parameter	Sample Site	Frequency	Frequency
Total Organic Carbon (TOC)	final:	1/quarter	1/month

M. Lead and Copper: Corrosion Control and Water Quality Parameters

The specific SMRs for corrosion control and water quality parameters are listed in 567—paragraph 41.4(1)*"d"* and 567—subrules 43.8(1) and 43.8(2).

N. Consecutive PWSs Supplied by a Surface Water or IGW PWS

	Pumpage or Flow:	All
Parameter	Sample Site	Frequency
Disinfectant Residual	source/entry point:	1/day
	distribution system*:	1/day
Disinfectant, quantity used (if applicable)	day tank/scale:	1/day
Pumpage or Flow	master meter:	1/day

*Monitoring is to be conducted at representative points in the distribution system.

APPENDIX C:
CONVERTING MCL COMPLIANCE VALUES FOR CONSUMER CONFIDENCE REPORTS

Key

AL	Action Level
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
MFL	million fibers per liter
mrem/year	millirems per year (a measure of radiation absorbed by the body)
N/A	not applicable
NTU	nephelometric turbidity units
pCi/L	picocuries per liter (a measure of radioactivity)
ppb	parts per billion, or micrograms per liter (μg/L)
ppm	parts per million, or milligrams per liter (mg/L)
ppq	parts per quadrillion, or picograms per liter (pg/L)
ppt	parts per trillion, or nanograms per liter (ng/L)
TT	Treatment Technique

MICROBIOLOGICAL CONTAMINANTS

Contaminant	MCL in compliance units (mg/L)	multiply by...	MCL in CCR units	MCLG in CCR units
Total coliform bacteria			presence of coliform bacteria in > 5% of monthly samples	0
Fecal coliform and *E. coli*			A routine sample and a repeat sample are total coliform positive, and one is also fecal coliform or *E. coli* positive	0
Turbidity			TT (NTU)	n/a

RADIONUCLIDE CONTAMINANTS

Contaminant	MCL in compliance units (mg/L)	multiply by...	MCL in CCR units	MCLG in CCR units
Beta/photon emitters	4 mrem/yr		4 mrem/yr	0
Alpha emitters	15 pCi/L		15 pCi/L	0
Combined radium	5 pCi/L		5 pCi/L	0

INORGANIC CONTAMINANTS

Contaminant	MCL in compliance units (mg/L)	multiply by...	MCL in CCR units	MCLG in CCR units
Antimony	0.006	1000	6 ppb	6
Arsenic	0.05	1000	50 ppb	n/a
Asbestos	7 MFL		7 MFL	7
Barium	2		2 ppm	2
Beryllium	0.004	1000	4 ppb	4
Cadmium	0.005	1000	5 ppb	5
Chromium	0.1	1000	100 ppb	100
Copper	AL = 1.3		AL=1.3 ppm	1.3
Cyanide	0.2	1000	200 ppb	200
Fluoride	4		4 ppm	4
Lead	AL = 0.015	1000	AL=15 ppb	0
Mercury (inorganic)	0.002	1000	2 ppb	2
Nitrate (as Nitrogen)	10		10 ppm	10
Nitrite (as Nitrogen)	1		1 ppm	1
Selenium	0.05	1000	50 ppb	50
Thallium	0.002	1000	2 ppb	0.5

SYNTHETIC ORGANIC CONTAMINANTS, including Pesticides and Herbicides

Contaminant	MCL in compliance units (mg/L)	multiply by...	MCL in CCR units	MCLG in CCR units
2,4-D	0.07	1000	70 ppb	70
2,4,5-TP (Silvex)	0.05	1000	50 ppb	50
Acrylamide			TT	0
Alachlor	0.002	1000	2 ppb	0
Atrazine	0.003	1000	3 ppb	3
Benzo(a)pyrene [PAHs]	0.0002	1,000,000	200 ppt	0
Carbofuran	0.04	1000	40 ppb	40
Chlordane	0.002	1000	2 ppb	0
Dalapon	0.2	1000	200 ppb	200
Di(2-ethylhexyl)adipate	0.4	1000	400 ppb	400
Di(2-ethylhexyl)phthalate	0.006	1000	6 ppb	0
Dibromochloropropane	0.0002	1,000,000	200 ppt	0
Dinoseb	0.007	1000	7 ppb	7
Diquat	0.02	1000	20 ppb	20
Dioxin [2,3,7,8-TCDD]	0.00000003	1,000,000,000	30 ppq	0
Endothall	0.1	1000	100 ppb	100
Endrin	0.002	1000	2 ppb	2
Epichlorohydrin			TT	0
Ethylene dibromide	0.00005	1,000,000	50 ppt	0
Glyphosate	0.7	1000	700 ppb	700
Heptachlor	0.0004	1,000,000	400 ppt	0
Heptachlor epoxide	0.0002	1,000,000	200 ppt	0
Hexachlorobenzene	0.001	1000	1 ppb	0
Hexachlorocyclopentadiene	0.05	1000	50 ppb	50
Lindane	0.0002	1,000,000	200 ppt	200
Methoxychlor	0.04	1000	40 ppb	40
Oxamyl [Vydate]	0.2	1000	200 ppb	200
PCBs [Polychlorinated biphenyls]	0.0005	1,000,000	500 ppt	0
Pentachlorophenol	0.001	1000	1 ppb	0
Picloram	0.5	1000	500 ppb	500
Simazine	0.004	1000	4 ppb	4
Toxaphene	0.003	1000	3 ppb	0

VOLATILE ORGANIC CONTAMINANTS

Contaminant	MCL in compliance units (mg/L)	multiply by...	MCL in CCR units	MCLG in CCR units
Benzene	0.005	1000	5 ppb	0
Carbon tetrachloride	0.005	1000	5 ppb	0
Chlorobenzene	0.1	1000	100 ppb	100
o-Dichlorobenzene	0.6	1000	600 ppb	600
p-Dichlorobenzene	0.075	1000	75 ppb	75
1,2-Dichloroethane	0.005	1000	5 ppb	0
1,1-Dichloroethylene	0.007	1000	7 ppb	7
cis-1,2-Dichloroethylene	0.07	1000	70 ppb	70
trans-1,2-Dichloroethylene	0.1	1000	100 ppb	100
Dichloromethane	0.005	1000	5 ppb	0
1,2-Dichloropropane	0.005	1000	5 ppb	0
Ethylbenzene	0.7	1000	700 ppb	700
Styrene	0.1	1000	100 ppb	100
Tetrachloroethylene	0.005	1000	5 ppb	0
1,2,4-Trichlorobenzene	0.07	1000	70 ppb	70
1,1,1-Trichloroethane	0.2	1000	200 ppb	200
1,1,2-Trichloroethane	0.005	1000	5 ppb	3
Trichloroethylene	0.005	1000	5 ppb	0
TTHM [Total trihalomethanes]	0.10	1000	100 ppb	N/A
Toluene	1		1 ppm	1
Vinyl Chloride	0.002	1000	2 ppb	0
Xylene	10		10 ppm	10

APPENDIX D:
REGULATED CONTAMINANTS TABLES FOR CONSUMER CONFIDENCE REPORTS

Key

AL	Action Level
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
MFL	million fibers per liter
mrem/year	millirems per year (a measure of radiation absorbed by the body)
N/A	not applicable
NTU	nephelometric turbidity units
pCi/L	picocuries per liter (a measure of radioactivity)
ppb	parts per billion, or micrograms per liter (μg/L)
ppm	parts per million, or milligrams per liter (mg/L)
ppq	parts per quadrillion, or picograms per liter (pg/L)
ppt	parts per trillion, or nanograms per liter (ng/L)
TT	Treatment Technique

MICROBIOLOGICAL CONTAMINANTS

Contaminant (units)	MCLG	MCL	Major Source in drinking water
Total coliform bacteria	0	presence of coliform bacteria in >5% of monthly samples	Naturally present in the environment
Fecal coliform and *E. coli*	0	A routine sample and a repeat sample are total coliform positive, and one is also fecal coliform or *E. coli* positive	Human and animal fecal waste
Turbidity (NTU)	N/A	TT	Soil runoff

RADIONUCLIDE CONTAMINANTS

Contaminant (units)	MCLG	MCL	Major Source in drinking water
Beta/photon emitters (mrem/yr)	0	4	Decay of natural and man-made deposits
Alpha emitters (pCi/L)	0	15	Erosion of natural deposits
Combined radium (pCi/L)	0	5	Erosion of natural deposits

INORGANIC CONTAMINANTS

Contaminant (units)	MCLG	MCL	Major Source in drinking water
Antimony (ppb)	6	6	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder
Arsenic (ppb)	N/A	50	Erosion of natural deposits; runoff from orchards; runoff from glass and electronic production wastes
Asbestos (MFL)	7	7	Decay of asbestos cement water mains; erosion of natural deposits
Barium (ppm)	2	2	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits
Beryllium (ppb)	4	4	Discharge from metal refineries and coal-burning factories; discharge from electrical, aerospace, and defense industries
Cadmium (ppb)	5	5	Corrosion of galvanized pipes; erosion of natural deposits; discharge from metal refineries; runoff from waste batteries and paints
Chromium (ppb)	100	100	Discharge from steel and pulp mills; erosion of natural deposits
Copper (ppm)	1.3	AL=1.3	Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives
Cyanide (ppb)	200	200	Discharge from steel/metal factories; discharge from plastic and fertilizer factories
Fluoride (ppm)	4	4	Water additive which promotes strong teeth; erosion of natural deposits; discharge from fertilizer and aluminum factories
Lead (ppb)	0	AL=15	Corrosion of household plumbing systems; erosion of natural deposits
Mercury [inorganic] (ppb)	2	2	Erosion of natural deposits; discharge from refineries and factories; runoff from landfills; runoff from cropland
Nitrate [as N] (ppm)	10	10	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Nitrite [as N] (ppm)	1	1	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Selenium (ppb)	50	50	Discharge from petroleum and metal refineries; erosion of natural deposits; discharge from mines
Thallium (ppb)	0.5	2	Leaching from ore-processing sites; discharge from electronics, glass, and drug factories

SYNTHETIC ORGANIC CONTAMINANTS, including Pesticides and Herbicides

Contaminant (units)	MCLG	MCL	Major Source in drinking water
2,4-D (ppb)	70	70	Runoff from herbicide used on row crops
2,4,5-TP (Silvex) (ppb)	50	50	Residue of banned herbicide
Acrylamide	0	TT	Added to water during sewage/wastewater treatment
Alachlor (ppb)	0	2	Runoff from herbicide used on row crops
Atrazine (ppb)	3	3	Runoff from herbicide used on row crops
Benzo(a)pyrene [PAHs] (ppt)	0	200	Leaching from linings of water storage tanks and distribution lines
Carbofuran (ppb)	40	40	Leaching of soil fumigant used on rice and alfalfa
Chlordane (ppb)	0	2	Residue of banned termiticide
Dalapon (ppb)	200	200	Runoff from herbicide used on rights of way
Di(2-ethylhexyl)adipate (ppb)	400	400	Discharge from chemical factories
Di(2-ethylhexyl)phthalate (ppb)	0	6	Discharge from rubber and chemical factories
Dibromochloropropane (ppt)	0	200	Runoff/leaching from soil fumigant used on soybeans, cotton, pineapples, and orchards
Dinoseb (ppb)	7	7	Runoff from herbicide used on soybeans and vegetables
Diquat (ppb)	20	20	Runoff from herbicide use
Dioxin [2,3,7,8-TCDD] (ppq)	0	30	Emissions from waste incineration and other combustion; discharge from chemical factories
Endothall (ppb)	100	100	Runoff from herbicide use
Endrin (ppb)	2	2	Residue of banned insecticide
Epichlorohydrin	0	TT	Discharge from industrial chemical factories; an impurity of some water treatment chemicals
Ethylene dibromide (ppt)	0	50	Discharge from petroleum refineries

SYNTHETIC ORGANIC CONTAMINANTS, including Pesticides and Herbicides (cont'd)

Contaminant (units)	MCLG	MCL	Major Source in drinking water
Glyphosate (ppb)	700	700	Runoff from herbicide use
Heptachlor (ppt)	0	400	Residue of banned termiticide
Heptachlor epoxide (ppt)	0	200	Breakdown of heptachlor
Hexachlorobenzene (ppb)	0	1	Discharge from metal refineries and agricultural chemical factories
Hexachlorocyclopentadiene (ppb)	50	50	Discharge from chemical factories
Lindane (ppt)	200	200	Runoff/leaching from insecticide used on cattle, lumber, gardens
Methoxychlor (ppb)	40	40	Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, livestock
Oxamyl [Vydate] (ppb)	200	200	Runoff/leaching from insecticide used on apples, potatoes and tomatoes
PCBs (ppt) [Polychlorinated biphenyls]	0	500	Runoff from landfills; discharge of waste chemicals
Pentachlorophenol (ppb)	0	1	Discharge from wood preserving factories
Picloram (ppb)	500	500	Herbicide runoff
Simazine (ppb)	4	4	Herbicide runoff
Toxaphene (ppb)	0	3	Runoff/leaching from insecticide used on cotton and cattle

VOLATILE ORGANIC CONTAMINANTS

Contaminant (units)	MCLG	MCL	Major Source in drinking water
Benzene (ppb)	0	5	Discharge from factories; leaching from gas storage tanks and landfills
Carbon tetrachloride (ppb)	0	5	Discharge from chemical plants and other industrial activities
Chlorobenzene (ppb)	100	100	Discharge from chemical and agricultural chemical factories
o-Dichlorobenzene (ppb)	600	600	Discharge from industrial chemical factories
p-Dichlorobenzene (ppb)	75	75	Discharge from industrial chemical factories
1,2-Dichloroethane (ppb)	0	5	Discharge from industrial chemical factories
1,1-Dichloroethylene (ppb)	7	7	Discharge from industrial chemical factories
cis-1,2-Dichloroethylene (ppb)	70	70	Discharge from industrial chemical factories
trans-1,2-Dichloroethylene (ppb)	100	100	Discharge from industrial chemical factories
Dichloromethane (ppb)	0	5	Discharge from pharmaceutical and chemical factories
1,2-Dichloropropane (ppb)	0	5	Discharge from industrial chemical factories
Ethylbenzene (ppb)	700	700	Discharge from petroleum refineries
Styrene (ppb)	100	100	Discharge from rubber and plastic factories; leaching from landfills
Tetrachloroethylene (ppb)	0	5	Discharge from factories and dry cleaners
1,2,4-Trichlorobenzene (ppb)	70	70	Discharge from textile-finishing factories
1,1,1-Trichloroethane (ppb)	200	200	Discharge from metal degreasing sites and other factories
1,1,2-Trichloroethane (ppb)	3	5	Discharge from industrial chemical factories
Trichloroethylene (ppb)	0	5	Discharge from metal degreasing sites and other factories
TTHM (ppb) [Total trihalomethanes]	N/A	100	By-products of drinking water chlorination
Toluene (ppm)	1	1	Discharge from petroleum factories
Vinyl Chloride (ppb)	0	2	Leaching from PVC piping; discharge from plastics factories
Xylene (ppm)	10	10	Discharge from petroleum factories; discharge from chemical factories

APPENDIX E:
HEALTH EFFECTS LANGUAGE FOR CONSUMER CONFIDENCE REPORTS

MICROBIOLOGICAL CONTAMINANTS

(1) Total coliform. Coliforms are bacteria which are naturally present in the environment and are used as an indicator that other, potentially harmful bacteria may be present. Coliforms were found in more samples than allowed and this was a warning of potential problems.

(2) Fecal coliform/*E. coli*. Fecal coliform and *E. coli* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, and people with severely compromised immune systems.

(3) Turbidity. Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.

RADIOACTIVE CONTAMINANTS

(4) Beta/photon emitters. Certain minerals are radioactive and may emit forms of radiation known as photons and beta radiation. Some people who drink water containing beta and photon emitters in excess of the MCL over many years may have an increased risk of getting cancer.

(5) Alpha emitters. Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. People who drink water containing these alpha emitters in excess of the MCL over many years may have an increased risk of getting cancer.

(6) Combined radium 226/228. Some people who drink water containing radium 226 or 228 in excess of the MCL over many years may have an increased risk of getting cancer.

INORGANIC CONTAMINANTS

(7) Antimony. Some people who drink water containing antimony well in excess of the MCL over many years could experience increases in blood cholesterol and decreases in blood sugar.

(8) Arsenic. Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.

(9) Asbestos. Some people who drink water containing asbestos in excess of the MCL over many years may have an increased risk of developing benign intestinal polyps.

(10) Barium. Some people who drink water containing barium in excess of the MCL over many years could experience an increase in their blood pressure.

(11) Beryllium. Some people who drink water containing beryllium well in excess of the MCL over many years could develop intestinal lesions.

(12) Cadmium. Some people who drink water containing cadmium in excess of the MCL over many years could experience kidney damage.

(13) Chromium. Some people who use water containing chromium well in excess of the MCL over many years could experience allergic dermatitis.

(14) Copper. Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's disease should consult their personal doctor.

(15) Cyanide. Some people who drink water containing cyanide well in excess of the MCL over many years could experience nerve damage or problems with their thyroid.

(16) Fluoride. Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Children may get mottled teeth.

(17) Lead. Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.

(18) Mercury (inorganic). Some people who drink water containing inorganic mercury well in excess of the MCL over many years could experience kidney damage.

(19) Nitrate. Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.

(20) Nitrite. Infants below the age of six months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.

(21) Selenium. Selenium is an essential nutrient. However, some people who drink water containing selenium in excess of the MCL over many years could experience hair or fingernail loss, numbness in fingers or toes, or problems with their circulation.

(22) Thallium. Some people who drink water containing thallium in excess of the MCL over many years could experience hair loss, changes in their blood, or problems with their kidneys, intestines, or liver.

SYNTHETIC ORGANIC CONTAMINANTS INCLUDING PESTICIDES AND HERBICIDES

(23) 2,4-D. Some people who drink water containing the weedkiller 2,4-D well in excess of the MCL over many years could experience problems with their kidneys, liver, or adrenal glands.

(24) 2,4,5-TP (Silvex). Some people who drink water containing Silvex in excess of the MCL over many years could experience liver problems.

(25) Acrylamide. Some people who drink water containing high levels of acrylamide over a long period of time could have problems with their nervous system or blood and may have an increased risk of getting cancer.

(26) Alachlor. Some people who drink water containing alachlor in excess of the MCL over many years could have problems with their eyes, liver, kidneys, or spleen, or experience anemia, and may have an increased risk of getting cancer.

(27) Atrazine. Some people who drink water containing atrazine well in excess of the MCL over many years could experience problems with their cardiovascular system or difficulties with their reproductive system.

(28) Benzo(a)pyrene (PAHs). Some people who drink water containing benzo(a)pyrene in excess of the MCL over many years may experience reproductive difficulties and may have an increased risk of getting cancer.

(29) Carbofuran. Some people who drink water containing carbofuran in excess of the MCL over many years could experience problems with their blood or nervous or reproductive systems.

(30) Chlordane. Some people who drink water containing chlordane in excess of the MCL over many years could experience problems with their liver or nervous system and may have an increased risk of getting cancer.

(31) Dalapon. Some people who drink water containing dalapon well in excess of the MCL over many years could experience minor kidney changes.

(32) Dibromochloropropane (DBCP). Some people who drink water containing DBCP in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer.

(33) Di(2-ethylhexyl)adipate. Some people who drink water containing di(2-ethylhexyl)adipate well in excess of the MCL over many years could experience general toxic effects or reproductive difficulties.

(34) Di(2-ethylhexyl)phthalate. Some people who drink water containing di(2-ethylhexyl)phthalate in excess of the MCL over many years may have problems with their liver or experience reproductive difficulties and may have an increased risk of getting cancer.

(35) Dinoseb. Some people who drink water containing dinoseb well in excess of the MCL over many years could experience reproductive difficulties.

(36) Dioxin (2,3,7,8-TCDD). Some people who drink water containing dioxin in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer.

(37) Diquat. Some people who drink water containing diquat in excess of the MCL over many years could get cataracts.

(38) Endothall. Some people who drink water containing endothall in excess of the MCL over many years could experience problems with their stomach or intestines.

(39) Endrin. Some people who drink water containing endrin in excess of the MCL over many years could experience liver problems.

(40) Epichlorohydrin. Some people who drink water containing high levels of epichlorohydrin over a long period of time could experience stomach problems and may have an increased risk of getting cancer.

(41) Ethylene dibromide. Some people who drink water containing ethylene dibromide in excess of the MCL over many years could experience problems with their liver, stomach, reproductive system, or kidneys and may have an increased risk of getting cancer.

(42) Glyphosate. Some people who drink water containing glyphosate in excess of the MCL over many years could experience problems with their kidneys or reproductive difficulties.

(43) Heptachlor. Some people who drink water containing heptachlor in excess of the MCL over many years could experience liver damage and may have an increased risk of getting cancer.

(44) Heptachlor epoxide. Some people who drink water containing heptachlor epoxide in excess of the MCL over many years could experience liver damage and may have an increased risk of getting cancer.

(45) Hexachlorobenzene. Some people who drink water containing hexachlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys, adverse reproductive effects, and may have an increased risk of getting cancer.

(46) Hexachlorocyclopentadiene. Some people who drink water containing hexachlorocyclopentadiene well in excess of the MCL over many years could experience problems with their stomach or kidneys.

(47) Lindane. Some people who drink water containing lindane in excess of the MCL over many years could experience problems with their kidneys or liver.

(48) Methoxychlor. Some people who drink water containing methoxychlor in excess of the MCL over many years could experience reproductive difficulties.

(49) Oxamyl (Vydate). Some people who drink water containing oxamyl in excess of the MCL over many years could experience slight nervous system effects.

(50) PCBs (Polychlorinated biphenyls). Some people who drink water containing PCBs in excess of the MCL over many years could experience changes in their skin, problems with their thymus gland, immune deficiencies, or reproductive or nervous system difficulties, and may have an increased risk of getting cancer.

(51) Pentachlorophenol. Some people who drink water containing pentachlorophenol in excess of the MCL over many years could experience problems with their liver or kidneys and may have an increased risk of getting cancer.

(52) Picloram. Some people who drink water containing picloram well in excess of the MCL over many years could experience problems with their liver.

(53) Simazine. Some people who drink water containing simazine in excess of the MCL over many years could experience problems with their blood.

(54) Toxaphene. Some people who drink water containing toxaphene in excess of the MCL over many years could have problems with their kidneys, liver, or thyroid and may have an increased risk of getting cancer.

VOLATILE ORGANIC CONTAMINANTS

(55) Benzene. Some people who drink water containing benzene in excess of the MCL over many years could experience anemia or a decrease in blood platelets and may have an increased risk of getting cancer.

(56) Carbon tetrachloride. Some people who drink water containing carbon tetrachloride in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.

(57) Chlorobenzene. Some people who drink water containing chlorobenzene well in excess of the MCL over many years could experience problems with their kidneys or liver.

(58) o-Dichlorobenzene. Some people who drink water containing o-dichlorobenzene well in excess of the MCL over many years could experience problems with their liver, kidneys, or circulatory system.

(59) para-Dichlorobenzene. Some people who drink water containing p-dichlorobenzene in excess of the MCL over many years could experience anemia, damage to their liver, kidneys, or spleen, or changes in their blood.

(60) 1,2-Dichloroethane. Some people who drink water containing 1,2-dichloroethane in excess of the MCL over many years may have an increased risk of getting cancer.

(61) 1,1-Dichloroethylene. Some people who drink water containing 1,1-dichloroethylene in excess of the MCL over many years could experience problems with their liver.

(62) cis-1,2-Dichloroethylene. Some people who drink water containing cis-1,2-dichloroethylene in excess of the MCL over many years could experience problems with their liver.

(63) trans-1,2-Dicholoroethylene. Some people who drink water containing trans-1,2-dichloroethylene well in excess of the MCL over many years could experience problems with their liver.

(64) Dichloromethane. Some people who drink water containing dichloromethane in excess of the MCL over many years could have liver problems and may have an increased risk of getting cancer.

(65) 1,2-Dichloropropane. Some people who drink water containing 1,2-dichloropropane in excess of the MCL over many years may have an increased risk of getting cancer.

(66) Ethylbenzene. Some people who drink water containing ethylbenzene well in excess of the MCL over many years could experience problems with their liver or kidneys.

(67) Styrene. Some people who drink water containing styrene well in excess of the MCL over many years could have problems with their liver, kidneys, or circulatory system.

(68) Tetrachloroethylene. Some people who drink water containing tetrachloroethylene in excess of the MCL over many years could have problems with their liver and may have an increased risk of getting cancer.

(69) 1,2,4-Trichlorobenzene. Some people who drink water containing 1,2,4-trichlorobenzene well in excess of the MCL over many years could experience changes in their adrenal glands.

(70) 1,1,1-Trichloroethane. Some people who drink water containing 1,1,1-trichloroethane in excess of the MCL over many years could experience problems with their liver, nervous system or circulatory system.

(71) 1,1,2-Trichloroethane. Some people who drink water containing 1,1,2-trichloroethane well in excess of the MCL over many years could have problems with their liver, kidneys, or immune system.

(72) Trichloroethylene. Some people who drink water containing trichloroethylene in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.

(73) TTHMs (Total Trihalomethanes). Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous system and may have an increased risk of getting cancer.

(74) Toluene. Some people who drink water containing toluene well in excess of the MCL over many years could have problems with their nervous system, kidneys, or liver.

(75) Vinyl chloride. Some people who drink water containing vinyl chloride in excess of the MCL over many years may have an increased risk of getting cancer.

(76) Xylene. Some people who drink water containing xylene in excess of the MCL over many years could experience damage to their nervous system.

APPENDIX F:
HEALTH EFFECTS LANGUAGE FOR FLUORIDE LEVELS BETWEEN 2 AND 4 MG/L

Your public water supplier must notify customers when monitoring indicates that the fluoride in your drinking water exceeds 2.0 mg/L. This is intended to alert families about dental problems that might affect children under nine years of age. The fluoride concentration of your water exceeds this federal guideline.

Fluoride in children's drinking water at levels of approximately 1 mg/L reduces the number of dental cavities. However, some children exposed to levels of fluoride greater than about 2.0 mg/L may develop dental fluorosis. Dental fluorosis, in its moderate and severe forms, is a brown staining or pitting of the permanent teeth, or both.

Because dental fluorosis occurs only when developing teeth (before they erupt from the gums) are exposed to elevated fluoride levels, households without children are not expected to be affected by this level of fluoride.

Families with children under the age of nine are encouraged to seek other sources of drinking water for their children to avoid the possibility of staining and pitting.

Your water supplier can lower the concentration of fluoride in your water so you will still receive the benefits of cavity prevention while the possibility of stained and pitted teeth is minimized. Removal of fluoride may increase your water costs. Treatment systems are also commercially available for home use. Information on such systems is available at the address given by your public water supplier. Low fluoride bottled drinking water that would meet all standards is also commercially available.

[Filed 7/23/99, Notice 4/7/99—published 8/11/99, effective 9/15/99]
[Filed 9/29/00, Notice 6/14/00—published 10/18/00, effective 11/22/00]

CHAPTER 43
WATER SUPPLIES — DESIGN AND OPERATION
[Prior to 12/12/90, portions of this chapter appeared in 567—Ch 41]

567—43.1(455B) General information.

43.1(1) *Emergency actions regarding water supplies.* When, in the opinion of the director, an actual or imminent hazard exists, the supplier of water shall comply with the directives or orders of the director necessary to eliminate or minimize that hazard.

43.1(2) *Prohibition on the use of lead pipes, solder and flux.* Any pipe, solder or flux which is used in the installation or repair of any public water supply system or any plumbing in a residential or nonresidential facility providing water for human consumption which is connected to a public water supply system shall be lead-free as defined in 567—40.2(455B). This action shall not apply to leaded joints necessary for the repair of cast iron pipe.

43.1(3) *Use of noncentralized treatment devices.*

a. Community PWS. Community public water systems shall not use bottled water, point-of-use (POU) or point-of-entry (POE) devices to achieve permanent compliance with a maximum contaminant level, action level, or treatment technique requirement in 567—Chapters 41 and 43.

b. Noncommunity PWS. Noncommunity public water supply systems may be allowed by the department to use point-of-use devices to achieve MCL compliance provided the contaminant does not pose an imminent threat to health (such as bacteria) nor place a sensitive population at risk (such as infants for nitrate or nitrite).

c. Reduced monitoring requirements. Bottled water, point-of-use, or point-of-entry devices cannot be used to avoid the monitoring requirements of 567—Chapters 41 and 43, but the department may allow reduced monitoring requirements in specific instances.

d. Bottled water requirements. The department may require a public water system exceeding a maximum contaminant level, action level, or treatment technique requirement specified in 567—Chapters 41 and 43 to use bottled water as a condition of an interim compliance schedule or as a temporary measure to avoid an unreasonable risk to health. Any bottled water must, at a minimum, meet the federal Food and Drug Administration bottled water standards, listed in the Code of Federal Regulations, Title 21, Chapter 165.110. The system must meet the following requirements:

(1) Monitoring program. Submit for approval to the department a monitoring program for bottled water. The monitoring program must provide reasonable assurances that the bottled water complies with all maximum contaminant levels, action levels, or treatment technique requirements in 567—Chapters 41 and 43. The public water system must monitor a representative sample of bottled water for all contaminants regulated under 567—Chapters 41 and 43 the first quarter that it supplies the bottled water to the public, and annually thereafter. Results of the monitoring program shall be provided to the department annually.

(2) Certification and monitoring requirements. The public water system must receive a certification from the bottled water company that the bottled water supplied has been taken from an "approved source"; the bottled water company has conducted monitoring in accordance with 43.1(3)"*b*"(1); and the bottled water meets MCLs, action levels, or treatment technique requirements as set out in 567—Chapters 41 and 43. The public water system shall provide the certification to the department the first quarter after it supplies bottled water and annually thereafter.

(3) Provision of bottled water to consumers. The public water supply system is fully responsible for the provision of sufficient quantities of bottled water to every person supplied by the public water system via door-to-door bottled water delivery.

e. Point-of-use devices. Reserved.

f. Point-of-entry devices. Reserved.

43.1(4) *Cross-connection control.* To prevent backflow or backsiphonage of contaminants into a public water supply, connection shall not be permitted between a public water supply and any other system which does not meet the monitoring and drinking water standards required by this chapter except as provided below in *"a"* or *"b."*

a. Piping and plumbing systems. Piping systems or plumbing equipment carrying nonpotable water, contaminated water, stagnant water, liquids, mixtures or waste mixtures shall not be connected to a public water supply unless properly equipped with an antisiphon device or backflow preventer acceptable to the department.

b. Bulk water loading stations. Positive separation shall be provided through the use of an air gap separation or a backflow preventer, which is acceptable to the department, at all loading stations for bulk transport tanks.

(1) Minimum air gap. The minimum required air gap shall be twice the diameter of the discharge pipe.

(2) Backflow preventer criteria. An approved backflow preventer for this application shall be a reduced pressure backflow preventer or an antisiphon device which complies with the standards of the American Water Works Association and has been approved by the Foundation for Cross-Connection Control and Hydraulic Research, University of Southern California.

When, in the opinion of the department, evidence clearly indicates the source of contamination within the system is the result of a cross-connection, the department may require a public water supply to identify and eliminate the connection, and implement a systemwide cross-connection program.

43.1(5) *Requirement for certified operator.*

a. CWS and NTNC systems. All community and nontransient noncommunity public water supply systems must have a certified operator in direct responsible charge of the treatment and distribution systems, in accordance with 567—Chapters 40 through 44 and 81.

b. TNC systems. Any transient noncommunity public water supply system which is owned by the state or federal government, such as a state park, state hospital, or interstate rest stop, or is using a groundwater under the direct influence of surface water or surface water source, must have a certified operator in direct responsible charge of the treatment and distribution systems, in accordance with 567—Chapters 40 through 44 and 81. Any TNC which uses chlorine dioxide as a disinfectant or oxidant must have a certified operator in direct responsible charge of the system, pursuant to 567—Chapter 81. The department may require any TNC to have a certified operator in direct responsible charge.

567—43.2(455B) Permit to operate.

43.2(1) *Operation fees.*

a. Annual fee. A fee for the operation of a public water supply system shall be paid annually. The fee will not be prorated and is nonrefundable. The fee shall be based on the population served. The fee shall be the greater of $25 per year or $0.14 multiplied by the total population served by the public water supply for all community and nontransient noncommunity public water supply systems. The fee shall be $25 per year for all transient noncommunity water systems. Where a system provides water to another public water supply system (consecutive public water supply system) which is required to have an operation permit, the population of the recipient water supply shall not be counted as a part of the water system providing the water.

b. Fee notices. The department will send annual notices to public water supply systems at least 60 days prior to the date that the operation fee is due.

c. Fee payments. The annual operation fee must be paid to the department by September 1 each year.

d. Fee schedule adjustment. The department may adjust the per capita fee payment by up to +/– $0.02 per person served so as to achieve the targeted revenue of $350,000 during each fiscal year. The environmental protection commission must approve any per capita fee rate above $0.14 per person. The extent of the fee adjustment must comply with Iowa Code section 455B.183A.

e. Exempted public water supply systems. Public water supply systems located on Indian lands are exempt from the fee requirements.

f. Late fees. When the owner of a public water supply fails to make timely application or to remit payment of fees by September 1, the department will notify the system by a single notice of violation. In addition, a late fee of $100 will be assessed for failure to remit the operation fee by September 1. The department may thereafter issue an administrative order pursuant to Iowa Code section 455B.175(1) or request a referral to the attorney general under Iowa Code section 455B.175(3) as necessary.

43.2(2) *Operation permit requirement.* Except as provided in 43.2(3) and 43.2(4), no person shall operate any public water supply system or part thereof without, or contrary to any condition of, an operation permit issued by the director.

43.2(3) *Application for operation permit.* The owner of any public water supply system or part thereof must make application for an operation permit. No such system shall be operated without an operation permit, unless proper application has been made. Upon submission of a completed application form, the time requirement for having a valid operation permit is automatically extended until the application has either been approved or disapproved by the director.

43.2(4) *Operation permit application form issuance..*

a. Operation permit application form. Application for operation permits shall be made on forms provided by the department. The application for an operation permit shall be filed at least 90 days prior to the date operation is scheduled to begin unless a shorter time is approved by the director. The director shall issue or deny operation permits for facilities within 60 days of receipt of a completed application, unless a longer period is required and the applicant is so notified. The director may require the submission of additional information deemed necessary to evaluate the application. If the application is incomplete or otherwise deficient, processing of the application shall not be completed until such time as the applicant has supplied the missing information or otherwise corrected the deficiency.

b. Identity of signatories of operation permit applications. The person who signs the application for an operation permit shall be:

(1) Corporation. In the case of a corporation, a principal executive officer of at least the level of vice president. The corporation has the option of appointing a designated signatory to satisfy this requirement.

(2) Partnership. In the case of a partnership, a general partner.

(3) Sole proprietorship. In the case of a sole proprietorship, the proprietor.

(4) Public facility. In the case of a municipal, state or other public facility, by either the principal executive officer or the ranking elected official.

c. Appeal. The denial of a permit, or any permit condition, may be appealed by the applicant to the environmental protection commission pursuant to 567—Chapter 7.

43.2(5) *Operation permit conditions.*

a. Operation permit conditions. Operation permits may contain such conditions as are deemed necessary by the director to ensure compliance with all applicable rules of the department, to ensure that the public water supply system is properly operated and maintained, to ensure that potential hazards to the water consumer are eliminated promptly, and to ensure that the requirements of the Safe Drinking Water Act are met.

b. Compliance schedule. Where one or more maximum contaminant levels, treatment techniques, designated health advisories, or action levels cannot be met immediately, a compliance schedule for achieving compliance with standards may be made a condition of the permit. A compliance schedule requiring alterations in accordance with the standards for construction in 43.3(1) and 43.3(2) may also be included for any supply that, in the opinion of the director, contains a potential hazard.

c. Treatment. If the department determines that a treatment method identified in 43.3(10) is technically feasible, the department may require the system to install or use that treatment method in connection with a compliance schedule issued under the provisions of 43.2(5)*"b."* The department's determination shall be based upon studies by the system and other relevant information.

43.2(6) *Notification of change in operation permit application conditions.* The owner of a public water supply system shall notify the director within 30 days of any change in conditions identified in the permit application. This notice does not relieve the owner of the responsibility to obtain a construction permit as required by 43.3(455B).

43.2(7) *Renewal of operation permits.* The department may issue operation permits for durations of up to five years. Operation permits must be renewed prior to expiration in order to remain valid. The renewal date shall be specified in the permit or in any renewal. Application for renewal must be received by the director, or postmarked, 60 days prior to the renewal date, on forms provided by the department.

43.2(8) *Denial, modification, or suspension of operation permit.* The director may deny renewal of, modify, or suspend, in whole or in part, any operation permit for good cause. Denial of a new permit, renewal of an existing permit, or modification of a permit, may be appealed to the environmental protection commission pursuant to 567—Chapter 7. Suspension or revocation may occur after hearing, pursuant to 567—Chapter 7. Good cause includes the following:

a. Violation of any term or condition of the permit.

b. Obtaining a permit by misrepresentation of fact or failure to disclose fully all material facts.

c. A change in any condition that requires either a permanent or temporary modification of a permit condition.

d. Failure to submit such records and information as the director may require both generally and as a condition of the operation permit in order to ensure compliance with conditions specified in the permit.

e. Violation of any of the requirements contained in 567—Chapters 40 to 43.

f. Inability of a system to either achieve or maintain technical, managerial, or financial viability, as determined in rule 567—43.8(455B).

567—43.3(455B) Public water supply system construction.

43.3(1) *Standards for public water supplies.* Any public water supply that does not meet the drinking water standards contained in 567—Chapters 41 and 43 shall make the alterations in accordance with the standards for construction contained in 43.3(2) necessary to comply with the drinking water standards unless the public water supply has been granted a variance from a maximum contaminant level or treatment technique as a provision of its operation permit pursuant to 43.2(455B), provided that the public water supply meets the schedule established pursuant to 43.2(455B). Any public water supply that, in the opinion of the director, contains a potential hazard shall make the alterations in accordance with the standards for construction contained in this rule necessary to eliminate or minimize that hazard.

43.3(2) *Standards for construction.*

a. The standards for a project are the Ten States Standards and the American Water Works Association (AWWA) Standards as adopted through 1998 and 43.3(7) to 43.3(9). Polyvinyl chloride (PVC) pipe manufactured in accordance with ASTM D2241 or ASTM F1483 may also be used in Iowa. To the extent of any conflict between the Ten States Standards and the American Water Works Association Standards and 43.3(7) to 43.3(9), the Ten States Standards, 43.3(2), and 43.3(7) to 43.3(9) shall prevail. The maximum allowable pressure for PVC or polyethylene (PE) pipe shall be determined based on a safety factor of 2.5 and a surge allowance of no less than two feet per second (2 fps).

b. Variance. When engineering justification satisfactory to the director is provided substantially demonstrating that variation from the design standards will result in equivalent or improved effectiveness, such a variation from design standards may be accepted by the director. A variance denial may be appealed to the environmental protection commission pursuant to 567—Chapter 7. Variance requests for projects qualifying for a waiver from the engineering requirement of 43.3(4) may be made without the retained services of a professional engineer.

43.3(3) *Construction permits.* No person shall construct, install or modify any project without first obtaining, or contrary to any condition of, a construction permit issued by the director or by a local public works department authorized to issue permits under 567—Chapter 9 except as provided in 43.3(3)*"b,"* 43.3(4) and 43.3(6). Construction permits are not required for point-of-use treatment devices installed by a noncommunity water system except those devices required by the department to meet a drinking water standard pursuant to 567—Chapters 41 and 43. No construction permit will be issued for a new public water supply system without a completed viability assessment, which has been approved by the department, and demonstrates that the system is viable, pursuant to 43.8(455B).

a. Construction permit issuance conditions. A permit to construct shall be issued by the director if the director concludes from the application and specifications submitted pursuant to 43.3(4)*"b"* and 567—40.4(455B) that the project will comply with the rules of the department.

b. Construction permit application. Application for any project shall be submitted to the department at least 30 days prior to the proposed date for commencing construction or awarding of contracts. This requirement may be waived when it is determined by the department that an imminent health hazard exists to the consumers of a public water supply. Under this waiver, construction, installation, or modification may be allowed by the department prior to review and issuance of a permit if all the following conditions are met:

(1) The construction, installation or modification will alleviate the health hazard;

(2) The construction is done in accordance with the standards for construction pursuant to 43.3(2);

(3) Plans and specifications are submitted within 30 days after construction;

(4) An engineer, registered in the state of Iowa, supervises the construction; and

(5) The supplier of water receives approval of this waiver prior to any construction, installation, or modification.

43.3(4) *Waiver from engineering requirements.* The requirement for plans and specifications prepared by a registered engineer may be waived for the following types of projects, provided the improvement complies with the standards for construction. This waiver does not relieve the supplier of water from meeting the application and permit requirements pursuant to 43.3(3), except that the applicant need not obtain a written permit prior to installing the equipment.

a. Simple chemical feed, if all the following conditions are met:

(1) The improvement consists only of a simple chemical solution application or installation, which in no way affects the performance of a larger treatment process, or is included as part of a larger treatment project;

(2) The chemical application is by a positive displacement pump (of the piston type with a solenoid operated diaphragm), the acceptability of said pump to be determined by the department;

(3) The supplier of water provides the department with a schematic of the installation and manufacturer's specifications sufficient enough to determine if the simple chemical feed installation meets, where applicable, standards for construction pursuant to 43.3(2);

(4) The final installation is approved based on an on-site review and inspection by department staff; and

(5) The installation includes only the prepackaged delivery of chemicals (from sacks, containers, or carboys) and does not include the bulk storage or transfer of chemicals (from a delivery vehicle).

b. Self-contained treatment unit, if all the following conditions are met:

(1) The installation is proposed for the purpose of eliminating a maximum contaminant level violation and is of a type which can be purchased "off the shelf," is self-contained requiring only a piping hookup for installation and operates throughout a range of 35 to 80 pounds per square inch;

(2) The plant is designed to serve no more than an average of 250 individuals per day;

(3) The department receives adequate information from the supplier of water on the type of treatment unit, such as manufacturer's specifications, a schematic indicating the installation's location within the system and any other information necessary for review by the department to determine if the installation will alleviate the maximum contaminant level violation; and

(4) The final installation is approved based on an on-site inspection by department staff.

43.3(5) *Project planning and basis of design.* An engineering report containing information and data necessary to determine the conformance of the project to the standards for construction and operation in 43.3(2) and the adequacy of the project to supply water in sufficient quantity and at sufficient pressure and of a quality that complies with drinking water standards pursuant to 567—Chapters 41 and 43 must be submitted to the department either with the project or in advance.

a. Such information and data must supply pertinent information as set forth in part one of the Ten States Standards.

b. The department may reject receipt or delay review of the plans and specifications until an adequate basis of design is received.

43.3(6) *Standard specifications for water main construction.* Standard specifications for water main construction by an entity may be submitted to the department or an authorized local public works department for approval. Such approval shall apply to all future water main construction by or for that entity for which plans are submitted with a statement requiring construction in accordance with all applicable approved standard specifications unless the standards for public water supply systems specified in 43.3(2) are modified subsequent to such approval and the standard specifications would not be approvable under the modified standards. In those cases where such approved specifications are on file, construction may commence 30 days following receipt of such plans by the department or an authorized local public works department if no response has been received indicating construction shall not commence until a permit is issued.

43.3(7) *Proposed raw or finished water site approval.*

a. Approval required. The site for each proposed raw water supply source or finished water below-ground level storage facility must be approved by the department prior to the submission of plans and specifications.

b. Criteria for approval. A site may be approved by the director if the director concludes that the criteria in this paragraph are met.

(1) Groundwater source. A well site must be separated from sources of contamination by at least the distances specified in Table A.*

Drainage must be away from the well in all directions for a minimum radius of 15 feet.

After the well site has received preliminary approval from the department, the owner of the proposed public well shall submit proof of legal control of contiguous land, through purchase, lease, easement, ordinance, or other similar means that ensures that the siting criteria for distances of 200 feet or less described in the above table will be maintained for the life of the well. Such control shall also provide for a minimum separation distance of at least 200 feet between a public well and sources of contamination listed in Table A* with distances equal to or greater than 200 feet. Proof of legal control should be submitted as part of the construction permit application and shall be submitted prior to issuance of a permit to construct.

When a proposed well is located in an existing well field and will withdraw water from the same aquifer as the existing well or wells, individual separation distances may be waived if substantial historical data is available indicating that no contamination has resulted.

(2) Surface water source. The applicant must submit proof that a proposed surface water source can, through readily available treatment methodology, comply with 567—Chapter 41 and that the raw water source is adequately protected against potential health hazards including, but not limited to, point source discharges, hazardous chemical spills, and the potential sources of contamination listed in Table A.*

*See end of chapter for TABLE A.

Diquat	x		
Endothall	x		
Endrin	x		
Ethylene dibromide (EDB)	x	x	
Ethylbenzene	x	x	
Glyphosate			x
Heptachlor	x		
Heptachlor epoxide	x		
Hexachlorobenzene	x		
Hexachlorocyclopentadiene	x	x	
Lindane	x		
Methoxychlor	x		
Monochlorobenzene	x	x	
Oxamyl (Vydate)	x		
Pentachlorophenol	x		
Picloram	x		
Polychlorinated biphenyls (PCB)	x		
Simazine	x		
Styrene	x	x	
2,4,5-TP (Silvex)	x		
Tetrachloroethylene	x	x	
1,2,4-Trichlorobenzene	x	x	
1,1,1-Trichloroethane	x	x	
1,1,2-Trichloroethane	x	x	
Trichloroethylene	x	x	
2,3,7,8-TCDD (Dioxin)	x		
Toluene	x	x	
Toxaphene	x		
Vinyl chloride		x	
Xylene	x	x	

b. BATs for inorganic compounds. The department identifies the following as the best technology, treatment techniques, or other means available for achieving compliance with the maximum contaminant levels for the inorganic contaminants listed in 567—paragraph 41.3(1)*"b,"* except arsenic and fluoride.

INORGANIC CHEMICAL	BAT(s)
Antimony	2,7
Asbestos	2,3,8
Barium	5,6,7,9
Beryllium	1,2,5,6,7
Cadmium	2,5,6,7
Chromium	2,5,6[b],7
Cyanide	5,7,10
Mercury	2[a],4,6[a],7[a]
Nickel	5,6,7
Nitrate	5,7,9
Nitrite	5,7
Selenium	1,2[c],6,7,9
Thallium	1,5

Key to BATs

1=Activated Alumina
2=Coagulation/Filtration
3=Direct and Diatomite Filtration
4=Granular Activated Carbon
5=Ion Exchange
6=Lime Softening
7=Reverse Osmosis
8=Corrosion Control
9=Electrodialysis
10=Chlorine

[a]BAT only if influent Hg concentrations are less than or equal to 10 micrograms/liter.
[b]BAT for Chromium III only.
[c]BAT for Selenium IV only.

c. BATs for disinfection byproducts and disinfectants. The department identifies the following as the best technology, treatment techniques, or other means available for achieving compliance with the maximum contaminant levels for the disinfection byproducts listed in 567—paragraph 41.5(2)*"b,"* and the maximum residual disinfectant levels listed in 567—paragraph 41.5(2)*"c."*

DBP MCL or MRDL	Best Available Technology
Bromate MCL	Control of ozone treatment process to reduce production of bromate
Chlorite MCL	Control of treatment processes to reduce disinfectant demand and control of disinfection treatment processes to reduce disinfectant levels
HAA5 MCL	Enhanced coagulation or enhanced softening or GAC10, with chlorine as the primary and residual disinfectant
TTHM MCL	Enhanced coagulation or enhanced softening or GAC10, with chlorine as the primary and residual disinfectant
MRDL	Control of treatment processes to reduce disinfectant demand and control of disinfection treatment processes to reduce disinfectant levels

d. Requirement to install BAT. The department shall require community water systems and nontransient noncommunity water systems to install and use any treatment method identified in 43.3(10) as a condition for granting an interim contaminant level except as provided in paragraph *"e."* If, after the system's installation of the treatment method, the system cannot meet the maximum contaminant level, the system shall be eligible for a compliance schedule with an interim contaminant level granted under the provisions of 567—42.2(455B) and 43.2(455B).

e. Engineering assessment option. If a system can demonstrate through comprehensive engineering assessments, which may at the direction of the department include pilot plant studies, that the treatment methods identified in 43.3(10) would only achieve a de minimis reduction in contaminants, the department may issue a schedule of compliance that requires the system being granted the variance to examine other treatment methods as a condition of obtaining the interim contaminant level.

f. Compliance schedule. If the department determines that a treatment method identified in 43.3(10)*"a," "b,"* and *"c"* is technically feasible, the department may require the system to install or use that treatment method in connection with a compliance schedule issued under the provisions of 567—42.2(455B) and 43.2(455B). The determination shall be based upon studies by the system and other relevant information.

g. Avoidance of unacceptable risk to health (URTH). The department may require a public water system to use bottled water, point-of-use devices, point-of-entry devices or other means as a condition of granting a variance or an exemption, or issuance of a compliance schedule, from the requirements of 43.3(10) to avoid an unreasonable risk to health.

567—43.4(455B) Certification of completion. Within 30 days after completion of construction, installation or modification of any project, the permit holder shall submit a certification by a registered professional engineer that the project was completed in accordance with the approved plans and specifications except if the project received a waiver pursuant to 43.3(4).

567—43.5(455B) Filtration and disinfection for surface water and influenced groundwater public water supply systems.

43.5(1) *Applicability/general requirements.*

a. These rules apply to all public water supply systems using surface water or groundwater under the direct influence of surface water in whole or in part, and establish criteria under which filtration is required as a treatment technique. In addition, these rules establish treatment technique requirements in lieu of maximum contaminant levels for *Giardia lamblia*, heterotrophic plate count bacteria, *Legionella*, viruses and turbidity. Each public water system with a surface water source or a groundwater source under the direct influence of surface water must provide treatment of that source water which complies with these treatment technique requirements. Systems which serve at least 10,000 persons must also comply with the requirements of 43.9(455B). The department may require systems serving less than 10,000 persons to comply with 43.9(455B). The treatment technique requirements consist of installing and properly operating water treatment processes which reliably achieve:

(1) At least 99.9 percent (3-log) removal or inactivation of *Giardia lamblia* cysts between a point where the raw water is not subject to recontamination by surface water runoff and a point downstream before or at the first customer; and

(2) At least 99.99 percent (4-log) removal or inactivation of viruses between a point where the raw water is not subject to recontamination by surface water runoff and a point downstream before or at the first customer.

b. Criteria for identification of groundwater under the direct influence of surface water. "Groundwater under the direct influence of surface water" means any water beneath the surface of the ground with: (1) significant occurrence of insects or other macroorganisms, algae, or large-diameter pathogens such as *Giardia lamblia*, or (2) significant and relatively rapid shifts in water characteristics such as turbidity (particulate content), temperature, conductivity, or pH which closely correlate to climatological or surface water conditions. Direct influence must be determined for individual sources in accordance with criteria established by the department. The department determination of direct influence may be based on site-specific measurements of water quality or documentation of well construction characteristics and geology with field evaluation. Only surface water and groundwater sources under the direct influence of surface water that are at risk to the contamination from Giardia cysts are subject to the requirements of this rule. Groundwater sources shall not be subject to this rule. The evaluation process shall be used to delineate between surface water, groundwater under the direct influence of surface water and groundwater. The identification of a source as surface water and groundwater under the direct influence of surface water shall be determined for an individual source, by the department, in accordance with the following criteria. The public water supply shall provide to the department that information necessary to make the determination. The evaluation process will involve one or more of the following steps:

(1) Preliminary review. The department shall conduct a preliminary evaluation of information on the source provided by the public water supply to determine if the source is an obvious surface water (e.g., pond, lake, stream) or groundwater under the direct influence of surface water. The source shall be evaluated during that period of highest susceptibility to influence from surface water. The preliminary evaluation may include a review of surveys, reports, geological information of the area, physical properties of the source, and a review of departmental and public water system records. If the source is identified as a surface water, no additional evaluation shall be conducted. If the source is a groundwater and identified as a deep well, it shall be classified as a groundwater not under the direct influence of surface water and no additional evaluation shall be conducted, unless through direct knowledge or documentation the source does not meet the requirements of 43.5(1)*"b"*(2). The deep well shall then be evaluated in accordance with 43.5(1)*"b"*(3). If the source is a shallow well, the source shall be evaluated in accordance with 43.5(1)*"b"*(2). If the source is a spring, infiltration gallery, radial collector well, or any other subsurface source, it shall be evaluated in accordance with 43.5(1)*"b"*(3).

(2) Well source evaluation. Shallow wells greater than 50 feet in lateral distance from a surface water source shall be evaluated for direct influence of surface water through a review of departmental or public water system files in accordance with 43.5(1)*"b"*(2)"1" and 43.5(1)*"b"*(2)"2." Sources that meet the criteria shall be considered to be not under the direct influence of surface water. No additional evaluation will be required. Shallow wells 50 feet or less in lateral distance from a surface water shall be in accordance with 43.5(1)*"b"*(3) and (4).

1. Well construction criteria. The well shall be constructed so as to prevent surface water from entering the well or traversing the casing.

2. Water quality criteria. Water quality records shall indicate:

- No record of total coliform or fecal coliform contamination in untreated samples collected over the past three years.
- No history of turbidity problems associated with the well, other than turbidity as a result of inorganic chemical precipitates.
- No history of known or suspected outbreak of Giardia or other pathogenic organisms associated with surface water (e.g., *Cryptosporidium*) which has been attributed to the well.

3. Other available data. If data on particulate matter analysis of the well are available, there shall be no evidence of particulate matter present that is associated with surface water. If information on turbidity or temperature monitoring of the well and nearby surface water is available, there shall be no data on the source which correlates with that of a nearby surface water.

4. Further evaluation. Wells that do not meet all the requirements listed shall require further evaluation in accordance with 43.5(1)*"b"*(3) and (4).

(3) Formal evaluation. The evaluation shall be conducted by the department or registered engineer at the direction of the public water supply. The evaluation shall include:

1. Complete file review. In addition to the information gathered in 43.5(1)*"b"*(1), the complete file review shall consider but not be limited to: design and construction details; evidence of direct surface water contamination; water quality analysis; indications of waterborne disease outbreaks; operational procedures; and customer complaints regarding water quality or water-related infectious illness. Sources other than a well source shall be evaluated in a like manner to include a field survey.

2. Field survey. A field survey shall substantiate findings of the complete file review and determine if the source is at risk to pathogens from direct surface water influence. The field survey shall examine the following criteria for evidence that surface water enters the source through defects in the source which include but are not limited to: a lack of a surface seal on wells, infiltration gallery laterals exposed to surface water, springs open to the atmosphere, surface runoff entering a spring or other collector, and distances to obvious surface water sources.

A report summarizing the findings of the complete file review and field survey shall be submitted to the department for final review and classification of the source. If the complete file review or field survey demonstrates conclusively that the source is subject to the direct surface water influence, the source shall be classified as under the direct influence of surface water. Either method or both may be used to demonstrate that the source is a surface water or groundwater under the direct influence of surface water. If the findings do not demonstrate conclusive evidence of direct influence of surface water, the analysis outlined in 43.5(1)*"b"*(4) should be conducted.

(4) Particulate analysis and physical properties evaluation.

1. Surface water indicators. Particulate analysis shall be conducted to identify organisms which only occur in surface waters as opposed to groundwaters, and whose presence in a groundwater would indicate the direct influence of surface water.

- Identification of a Giardia cyst, live diatoms, and blue-green, green, or other chloroplast containing algae in any source water shall be considered evidence of direct surface water influence.
- Rotifers and insect parts are indicators of surface water. Without knowledge of which species is present, the finding of rotifers indicates that the source is either directly influenced by surface water, or the water contains organic matter sufficient to support the growth of rotifers. Insects or insect parts shall be considered strong evidence of surface water influence, if not direct evidence.
- The presence of coccidia (e.g., *Cryptosporidium*) in the source water is considered a good indicator of direct influence of surface water. Other macroorganisms (greater than 7 um) which are parasitic to animals and fish such as, but not limited to, helminths (e.g., tapeworm cysts), ascaris, and Diphyllobothrium, shall be considered as indicators of direct influence of surface water.

2. Physical properties. Turbidity, temperature, pH and conductivity provide supportive, but less direct, evidence of direct influence of surface water. Turbidity fluctuations of greater than 0.5-1.0 NTU over the course of a year may be indicative of direct influence of surface water. Temperature fluctuations may also indicate surface water influence. Changes in other chemical parameters such as pH, conductivity, or hardness may also give an indirect indication of influence by nearby surface water.

c. Compliance. A public water system using a surface water source or a groundwater source under the direct influence of surface water is considered to be in compliance with the requirements of this subrule if it meets the filtration requirements in 43.5(3) and the disinfection requirements in 43.5(2) in accordance with the effective dates specified within the respective subrules.

d. Certified operator requirement. Each public water system using a surface water source or a groundwater source under the direct influence of surface water must be operated by a certified operator who meets the requirements of 567—Chapter 81.

43.5(2) *Disinfection.* All community and noncommunity public water supply systems using surface water or groundwater under the direct influence of surface water in whole or in part shall be required to provide disinfection in compliance with this subrule and filtration in compliance with 43.5(3). If the department has determined that filtration is required, the system must comply with any interim disinfection requirements the department deems necessary before filtration is installed. A system providing filtration on or before December 30, 1991, must meet the disinfection requirements of this subrule beginning June 29, 1993. A system providing filtration after December 30, 1991, must meet the disinfection requirements of this subrule when filtration is installed. Failure to meet any requirement of this subrule after the applicable date specified in this subrule is a treatment technique violation. The disinfection requirements are as follows:

a. Disinfection treatment criteria. The disinfection treatment must be sufficient to ensure that the total treatment processes of that system achieve at least 99.9 percent (3-log) inactivation or removal of *Giardia lamblia* cysts and at least 99.99 percent (4-log) inactivation or removal of viruses, acceptable to the department.

b. Disinfection system. The disinfection system must include:

(1) Redundant components, including an auxiliary power supply with automatic start-up and alarm to ensure that disinfectant application is maintained continuously while water is being delivered to the distribution system, or

(2) Automatic shutoff of delivery of water to the distribution system whenever there is less than 0.3 mg/L of residual disinfectant concentration in the water. If the department determines that automatic shutoff would cause unreasonable risk to health or interfere with fire protection, the system must comply with 43.5(2)*"b"*(1).

c. Residual disinfectant entering system. The residual disinfectant concentration in the water entering the distribution system, measured as specified in 43.5(4)*"a"*(5) and 43.5(4)*"b"*(2), cannot be less than 0.3 mg/L free residual or 1.5 mg/L total residual chlorine for more than four hours.

d. Residual disinfectant in the system. The residual disinfectant concentration in the distribution system, measured as total chlorine, combined chlorine, or chlorine dioxide, as specified in 43.5(4)*"a"*(5) and 43.5(4)*"b"*(2), cannot be undetectable in more than 5 percent of the samples each month for any two consecutive months that the system serves water to the public. Water within the distribution system with a heterotrophic plate count bacteria concentration less than or equal to 500/mL, measured as heterotrophic plate count (HPC) as specified in 567—paragraph 41.2(3)*"e,"* is deemed to have a detectable disinfectant residual for purposes of determining compliance with this requirement. Therefore, the value "V" in the following formula cannot exceed 5 percent in one month for any two consecutive months.

$$V = \left[\frac{c+d+e}{a+b}\right] \times 100$$

where:

a = number of instances in which the residual disinfectant concentration is measured;

b = number of instances in which the residual disinfectant concentration is not measured but heterotrophic plate count bacteria (HPC) is measured;

c = number of instances in which the residual disinfectant concentration is measured but not detected and no HPC is measured;

d = number of instances in which no residual disinfectant concentration is detected and where the HPC is greater than 500/mL; and

e = number of instances in which the residual disinfectant concentration is not measured and HPC is greater than 500/mL.

43.5(3) *Filtration.*

a. Applicability. A public water system that uses a surface water source or a groundwater source under the direct influence of surface water must provide treatment consisting of both disinfection, as specified in 43.5(2), and filtration treatment which complies with the turbidity requirements of subrules 43.5(3), 43.5(4), and 43.5(5). A system providing or required to provide filtration on or before December 30, 1991, must meet the requirements of this subrule by June 29, 1993. A system providing or required to provide filtration after December 30, 1991, must meet the requirement of this subrule when filtration is installed. Beginning January 1, 2002, systems serving at least 10,000 people must meet the turbidity requirements in 43.9(455B). A system shall install filtration within 18 months after the department determines, in writing, that filtration is required. The department may require and the system shall comply with any interim turbidity requirements the department deems necessary. Failure to meet any requirements of the referenced subrules after the dates specified is a treatment technique violation.

b. Conventional filtration treatment or direct filtration.

(1) For systems using conventional filtration or direct filtration, the turbidity level of representative samples of a system's filtered water must be less than or equal to 0.5 nephelometric turbidity units (NTU) in at least 95 percent of the measurements taken each month when measured as specified in 43.5(4)*"a"*(1) and 43.5(4)*"b"*(1).

(2) The turbidity level of representative samples of a system's filtered water must at no time exceed 5 NTU when measured as specified in 43.5(4)*"a"*(1) and 43.5(4)*"b"*(1).

c. Slow sand filtration.

(1) For systems using slow sand filtration, the turbidity level of representative samples of a system's filtered water must be less than or equal to 1 NTU in at least 95 percent of the measurements taken each month when measured as specified in 43.5(4)*"a"*(1) and 43.5(4)*"b"*(1).

(2) The turbidity level of representative samples of a system's filtered water must at no time exceed 5 NTU when measured as specified in 43.5(4)*"a"*(1) and 43.5(4)*"b"*(1).

d. Diatomaceous earth filtration.

(1) For systems using diatomaceous earth filtration, the turbidity level of representative samples of a system's filtered water must be less than or equal to 1 NTU in at least 95 percent of the measurements taken each month when measured as specified in 43.5(4)*"a"*(1) and 43.5(4)*"b"*(1).

(2) The turbidity level of representative samples of a system's filtered water must at no time exceed 5 NTU when measured as specified in 43.5(4)*"a"*(1) and 43.5(4)*"b"*(1).

e. Other filtration technologies. A public water system may use either a filtration technology not listed in 43.5(3)*"b"* to 43.5(3)*"d"* or a filtration technology listed in 43.5(3)*"b"* or 43.5(3)*"c"* at a higher turbidity level if it demonstrates to the department through a preliminary report submitted by a registered professional engineer, using pilot plant studies or other means, that the alternative filtration technology in combination with disinfection treatment that meets the requirements of 43.5(2) consistently achieves 99.9 percent removal or inactivation of *Giardia lamblia* and 99.99 percent removal or inactivation of viruses. For a system that uses alternative filtration technology and makes this demonstration, the turbidity treatment technique requirements are as follows:

(1) The turbidity level of representative samples of a system's filtered water must be less than or equal to 1 NTU in at least 95 percent of the measurements taken each month when measured as specified in 43.5(4)*"a"*(1) and 43.5(4)*"b"*(1).

(2) The turbidity level of representative samples of a system's filtered water must at no time exceed 5 NTU when measured as specified in 43.5(4)*"a"*(1) and 43.5(4)*"b"*(1).

Beginning January 1, 2002, systems serving at least 10,000 people must meet the requirements for other filtration technologies in 43.9(3)*"b."*

43.5(4) *Analytical and monitoring requirements.*

a. Analytical requirements. Only the analytical method(s) specified in this paragraph, or otherwise approved by the department, may be used to demonstrate compliance with the requirements of 43.5(2) and 43.5(3). Measurements for pH, temperature, turbidity, and residual disinfectant concentrations must be conducted by a Grade II, III or IV operator meeting the requirements of 567—Chapter 81, any person under the supervision of a Grade II, III or IV operator meeting the requirements of 567—Chapter 81, or a laboratory certified by the department to perform analysis under 567—Chapter 83. For consecutive public water supplies from a surface water or groundwater under the direct influence of surface water system, the disinfectant concentration analyses must be conducted by a certified operator who meets the requirements of 567—Chapter 81. Measurements for heterotrophic plate count bacteria must be conducted by a laboratory certified by the department to do such analysis.

(1) Turbidity analytical methodology. Turbidity analysis shall be conducted using the following methodology:

Methodology	Analytical Method		
	EPA	SM	GLI
Nephelometric	180.1[1]	2130B[2]	Method 2[3]

1 "Methods for the Determination of Inorganic Substances in Environmental Samples," EPA-600/R-93-100, August 1993. Available at NTIS, PB94-121811.

2 Standard Methods for the Examination of Water and Wastewater, 18th edition, 1992, and 19th edition, 1995 (either edition may be used), American Public Health Association, 1015 Fifteenth Street NW, Washington, DC 20005.

3 GLI Method 2, "Turbidity," November 2, 1992, Great Lakes Instruments, Inc., 8855 North 55th Street, Milwaukee, WI 53223.

(2) Temperature analytical methodology. The temperature shall be determined in compliance with the methodology listed in 567—subparagraph 41.4(1)*"g"*(1).

(3) pH (hydrogen ion concentration) analytical methodology. The pH shall be determined in compliance with the methodology listed in 567—subparagraph 41.4(1)*"g"*(1).

(4) Heterotrophic plate count bacteria analytical methodology. The heterotrophic plate count bacteria sampling and analysis shall be conducted in compliance with 567—subrule 41.2(3) and 43.5(2)*"d."* The time from sample collection to initiation of analysis shall not exceed eight hours, and the samples must be held below 10 degrees C during transit.

(5) Residual disinfectant analytical methodology. The residual disinfectant concentrations shall be determined in compliance with one of the analytical methods in the following table. Residual disinfectant concentrations for free chlorine and combined chlorine may also be measured by using DPD colorimetric test kits. Free and total chlorine residuals may be measured continuously by adapting a specified chlorine residual method for use with a continuous monitoring instrument provided the chemistry, accuracy and precision remain the same. Instruments used for continuous monitoring must be calibrated with a grab sample measurement at least every five days.

Disinfectant Analytical Methodology

Residual	Methodology	Methods[1,2]
Free chlorine	Amperometric Titration	4500-Cl D
	DPD Ferrous Titrimetric	4500-Cl F
	DPD Colorimetric	4500-Cl G
	Syringaldazine (FACTS)	4500-Cl H
Total chlorine	Amperometric Titration	4500-Cl D
	Amperometric Titration (low level measurement)	4500-Cl E
	DPD Ferrous Titrimetric	4500-Cl F
	DPD Colorimetric	4500-Cl G
	Iodometric Electrode	4500-Cl I
Chlorine dioxide	Amperometric Titration	4500-ClO_2 C
	DPD Method	4500-ClO_2 D
	Amperometric Titration	4500-ClO_2 E
Ozone	Indigo Method	4500-O_3 B

1 Standard Methods for the Examination of Water and Wastewater, 18th edition, 1992, and 19th edition, 1995 (either edition may be used), American Public Health Association, 1015 Fifteenth Street NW, Washington, DC 20005.

2 Other analytical test procedures are contained within Technical Notes on Drinking Water Methods, EPA-600/R- 94-173, October 1994, which is available as NTIS PB95-104766.

b. Monitoring requirements. A public water system that uses a surface water source or groundwater source under the influence of surface water must monitor in accordance with this paragraph or some interim requirements required by the department, until filtration is installed.

(1) Turbidity.

1. Routine turbidity monitoring requirements. Turbidity measurements as required by 43.5(3) must be performed on representative samples of the system's filtered water every four hours (or more frequently) that the system serves water to the public. A public water system may substitute continuous turbidity monitoring for grab sample monitoring if it validates the continuous measurement for accuracy on a regular basis using a calibration protocol approved by the department and audited for compliance during sanitary surveys. Major elements of the protocol shall include, but are not limited to: method of calibration, calibration frequency, calibration standards, documentation, data collection and data reporting. For any systems using slow sand filtration or filtration treatment other than conventional treatment, direct filtration, or diatomaceous earth filtration, the department may reduce the sampling frequency to once per day if it determines that less frequent monitoring is sufficient to indicate effective filtration performance. For systems serving 500 or fewer persons, the department may reduce the turbidity sampling frequency to once per day, regardless of the type of filtration treatment used, if the department determines that less frequent monitoring is sufficient to indicate effective filtration performance. Approval shall be based upon documentation provided by the system, acceptable to the department and pursuant to the conditions of an operation permit.

2. Turbidity monitoring requirements for population greater than 100,000. A supplier of water serving a population or population equivalent of greater than 100,000 persons shall provide a continuous or rotating cycle turbidity monitoring and recording device or take hourly grab samples to determine compliance with 43.5(3).

(2) Residual disinfectant.

1. Residual disinfectant entering the system. The residual disinfectant concentration of the water entering the distribution system shall be monitored continuously, and the lowest value recorded each day, except that if there is a failure in the continuous monitoring equipment, grab sampling every four hours may be conducted in lieu of continuous monitoring, but not to exceed five working days following the failure of the equipment. If acceptable to the department, systems serving 3,300 or fewer persons may take grab samples in lieu of providing continuous monitoring on an ongoing basis at the frequencies prescribed below:

Residual Disinfectant Samples Required of Surface Water or IGW PWS

System size (persons served)	Samples per day*
500 or fewer	1
501 to 1,000	2
1,001 to 2,500	3
2,501 to 3,300	4

* When more than one grab sample is required per day, the day's samples cannot be taken at the same time. The sampling intervals must be at a minimum of four-hour intervals.

If at any time the disinfectant concentration falls below 0.3 mg/L free residual or 1.5 mg/L total residual chlorine in a system using grab sampling in lieu of continuous monitoring, the system shall take a grab sample every four hours until the residual disinfectant concentration is equal to or greater than 0.3 mg/L free residual or 1.5 mg/L total residual chlorine.

2. Residual disinfectant in the system. The residual disinfectant concentration must be measured at least at the same points in the distribution system and at the same time as total coliforms are sampled, as specified in 567—paragraph 41.2(1)*"c,"* except that the department may allow a public water system which uses both a surface water source or a groundwater source under direct influence of surface water, and a groundwater source to take residual disinfectant samples at points other than the total coliform sampling points, if these points are included as a part of the coliform sample site plan meeting the requirements of 567—numbered paragraph 41.2(1)*"c"*(1)"1" and the department determines that such points are representative of treated (disinfected) water quality within the distribution system. Heterotrophic plate count bacteria (HPC) may be measured in lieu of residual disinfectant concentration, using Method 9215B, Pour Plate Method, Standard Methods for the Examination of Water and Wastewater, 18th edition, 1992. The time from sample collection to initiation of analysis shall not exceed eight hours. Samples must be kept below 10 degrees C during transit to the laboratory. All samples must be analyzed by a department-certified laboratory meeting the requirements of 567—Chapter 83.

43.5(5) *Reporting requirements.* Public water supplies shall report the results of routine monitoring required to demonstrate compliance with 43.5(455B) and treatment technique violations as follows:

a. Waterborne disease outbreak. Each system, upon discovering that a waterborne disease outbreak potentially attributable to that water system has occurred, must report that occurrence to the department as soon as possible, but no later than by the end of the next business day.

b. Turbidity exceeds 5 NTU. If at any time the turbidity exceeds 5 NTU, the system must inform the department as soon as possible, but no later than by the end of the next business day.

c. Residual disinfectant entering distribution system below 0.3 mg/L. If at any time the residual falls below 0.3 mg/L in the water entering the distribution system, the system must notify the department as soon as possible, but no later than by the end of the next business day. The system also must notify the department by the end of the next business day whether or not the residual was restored to at least 0.3 mg/L within four hours.

d. Routine monitoring reporting requirements. Routine monitoring results shall be provided as part of the monthly operation reports in accordance with 567—40.3(455B) and 567—subrule 42.4(3).

567—43.6(455B) Residual disinfectant and disinfection byproduct precursors.

43.6(1) *Residual disinfectant.*

a. Applicability.

(1) CWS and NTNC systems. This rule establishes criteria under which CWS and NTNC public water supply systems that add a chemical disinfectant to the water in any part of the drinking water treatment process or that provide water that contains a chemical disinfectant must modify their practices to meet the MCLs listed in 567—41.6(455B), the maximum residual disinfectant levels (MRDL) listed in this subrule, and treatment technique requirements for disinfection byproduct precursors listed in subrule 43.6(3).

(2) TNC systems with chlorine dioxide disinfection. This rule establishes criteria under which TNC public water supply systems that use chlorine dioxide as a disinfectant or oxidant must modify their practices to meet the chlorine dioxide MRDL listed in paragraph 43.6(1)*"b."*

(3) Compliance dates. Compliance dates for this rule are based upon the source water type and the population served. Systems are required to comply with this rule as follows, unless otherwise noted:

1. Surface water and IGW CWS and NTNC. CWS and NTNC systems using surface water or groundwater under the direct influence of surface water (IGW) in whole or in part and which serve 10,000 or more persons must comply with this rule beginning January 1, 2002. CWS and NTNC surface water or IGW systems serving fewer than 10,000 persons must comply with this rule beginning January 1, 2004.

2. Groundwater CWS and NTNC. CWS and NTNC systems using only groundwater not under the direct influence of surface water must comply with this rule beginning January 1, 2004.

3. TNC using chlorine dioxide. TNC systems serving over 10,000 persons and using surface water or groundwater under the direct influence of surface water and using chlorine dioxide as a disinfectant or oxidant must comply with any requirements for chlorine dioxide in this rule beginning January 1, 2002. TNC systems serving 10,000 persons or less, regardless of source water type, and using chlorine dioxide as a disinfectant or oxidant must comply with any requirements for chlorine dioxide in this rule beginning January 1, 2004.

4. Extension of compliance period for GAC or membrane technology installation. A system that is installing GAC or membrane technology to comply with this rule may apply to the department for an extension of up to 24 months past the dates in 43.6(1)*"a"*(3), but not beyond December 31, 2003. In granting the extension, the department will set a schedule for compliance and may specify any interim measures the system must take. Failure to meet a compliance schedule or interim treatment requirements constitutes a violation of the public drinking water supply rules, requires public notification per 567—subrule 42.1(1), and may result in an administrative order.

(4) Control of residual disinfectants. Notwithstanding the MRDLs in this rule, systems may increase residual disinfectant levels of chlorine or chloramines (but not chlorine dioxide) in the distribution system to a level and for a time necessary to protect public health, to address specific microbiological contamination problems caused by circumstances such as, but not limited to, distribution line breaks, storm run-off events, source water contamination events, or cross-connection events.

(5) Consecutive systems. Consecutive systems that provide water containing a disinfectant or oxidant are required to comply with this rule. A consecutive system may be incorporated into the sampling plan of the supply that produces the water (the primary water supplier), provided:

1. There is a mutual signed agreement between the primary and consecutive system supplied by that primary system that states the primary system will be responsible for the compliance of its consecutive system with this rule, regardless of additional treatment by the consecutive system.

2. Beginning with the primary water supply, each successive consecutive system must also be included in the primary supply's sampling plan, so that there is no system with its own sampling plan between the primary supply and the consecutive supply covered by the primary supply's plan.

3. It is understood by the primary and all consecutive systems that even if only one system in the sampling plan has a violation, all systems in the sampling plan will receive the violation and be required to conduct public notification.

4. The department receives a copy of the signed agreement and approves the sampling plan prior to the beginning of the compliance period.

If a mutual agreement is not possible, each system (the primary system and each consecutive system) is responsible for compliance with this rule for its specific system.

(6) Systems with multiple water sources. Systems with water sources that are used independently from each other, are not from the same source as determined by the department, or do not go through identical treatment processes are required to conduct the monitoring for the applicable disinfectants or oxidants and disinfection byproducts during operation of each source. The system must comply with this rule during the use of each water source.

b. Maximum residual disinfectant levels. Maximum residual disinfectant levels (MRDLs) are as follows:

Disinfection Residual	MRDL (mg/L)
Chloramines	4.0 as Cl_2
Chlorine	4.0 as Cl_2
Chlorine dioxide	0.8 as ClO_2

c. Monitoring requirements for residual disinfectants.

(1) General requirements.

1. Systems must take all samples during normal operating conditions.

2. Failure to monitor in accordance with the monitoring plan required under 43.6(1)"*c*"(1)"5" is a monitoring violation.

3. Failure to monitor is a violation for the entire period covered by the annual average where compliance is based on a running annual average of monthly or quarterly samples or averages and the system's failure to monitor makes it impossible to determine compliance with MRDLs.

4. Systems may use only data collected under the provisions of this rule or of 567—41.6(455B) to qualify for reduced monitoring.

5. Systems required to monitor under the provisions of this rule or of 567—41.6(455B) must develop and implement a monitoring plan, in accordance with 567—numbered paragraph 41.6(1)"*c*"(1)"6."

(2) Chlorine and chloramines.

1. Routine monitoring. Community and nontransient noncommunity water systems that use chlorine or chloramines must measure the residual disinfectant level at the same points in the distribution system and at the same time as total coliforms are sampled, as specified in 43.5(4)"*b*"(2)"2." Surface water and groundwater under the direct influence of surface water systems may use the results of residual disinfectant concentration sampling conducted under 43.5(4)"*b*"(2)"1," in lieu of taking separate samples.

2. Reduced monitoring. Chlorine and chloramine monitoring may not be reduced.

(3) Chlorine dioxide.

1. Routine monitoring. Any public water supply systems that use chlorine dioxide for disinfection or oxidation must take daily samples at the entrance to the distribution system. For any daily sample that exceeds the MRDL, the system must take samples in the distribution system the following day at the locations required by 43.6(1)"*c*"(3)"2," in addition to the sample required at the entrance to the distribution system.

2. Additional monitoring. On each day following a routine sample monitoring result that exceeds the MRDL, the system is required to take three chlorine dioxide distribution system samples.

• If chlorine dioxide or chloramines are used to maintain a residual disinfectant in the distribution system, or if chlorine is used to maintain a residual disinfectant in the distribution system and there are no disinfection addition points after the entrance to the distribution system (i.e., no booster chlorination), the system must take three samples as close to the first customer as possible, at intervals of at least six hours.

• If chlorine is used to maintain a residual disinfectant in the distribution system and there are one or more disinfection addition points after the entrance to the distribution system (i.e., booster chlorination), the system must take one sample at each of the following locations: as close to the first customer as possible, in a location representative of average residence time, and as close to the end of the distribution system as possible (reflecting maximum residence time in the distribution system).

3. Reduced monitoring. Chlorine dioxide monitoring may not be reduced.

d. Analytical requirements for residual disinfectants.

(1) Analytical methods. Systems must measure residual disinfectant concentrations for free chlorine, combined chlorine (chloramines), and chlorine dioxide by the methods listed in the following table:

Approved Methods for Residual Disinfectant Compliance Monitoring

Methodology	Standard Methods	ASTM Method	Residual measured[1]			
			Free Chlorine	Combined Chlorine	Total Chlorine	Chlorine Dioxide
Amperometric Titration	4500-Cl D	D 1253-86	X	X	X	
Low Level Amperometric Titration	4500-Cl E				X	
DPD Ferrous Titrimetric	4500-Cl F		X	X	X	
DPD Colorimetric	4500-Cl G		X	X	X	
Syringaldazine (FACTS)	4500-Cl H		X			
Iodometric Electrode	4500-Cl I				X	
DPD	4500-ClO_2 D					X
Amperometric Method II	4500-ClO_2 E					X

The procedures shall be done in accordance with the documents listed below. The incorporation by reference of the following documents was approved by the Director of the Federal Register on February 16, 1999, in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. Copies of the documents may be obtained from the sources listed below. Information regarding obtaining these documents can be obtained from the Safe Drinking Water Hotline at (800)426-4791. Documents may be inspected at EPA's Drinking Water Docket, 401 M Street SW, Washington, DC 20460 (telephone: (202)260-3027); or at the Office of Federal Register, 800 North Capitol Street NW, Suite 700, Washington, DC.

The following method is available from the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428:
Annual Book of ASTM Standards, Volume 11.01, American Society for Testing and Materials, 1996: Method D 1253-86.

The following methods are available from the American Public Health Association, 1015 Fifteenth Street NW, Washington, DC 20005:
Standard Methods for the Examination of Water and Wastewater, 19th edition, American Public Health Association, 1995: Methods: 4500-Cl D, 4500-Cl E, 4500-Cl F, 4500-Cl G, 4500-Cl H, 4500-Cl I, 4500-ClO_2 D, 4500-ClO_2 E.

[1] X indicates method is approved for measuring specified residual disinfectant.

(2) Test kit use. Systems may also measure residual disinfectant concentrations for chlorine, chloramines, and chlorine dioxide by using DPD colorimetric test kits acceptable to the department. Free and total chlorine residual disinfectant concentrations may be measured continuously by adapting a specified chlorine residual method for use with a continuous monitoring instrument provided the chemistry, accuracy, and precision remain the same. Instruments used for continuous monitoring must be calibrated with a grab sample measurement at least every five days.

(3) Operator requirement. Measurements for residual disinfectant concentration shall be conducted by a Grade A through IV operator meeting the requirements of 567—Chapter 81, any person under the direct supervision of a Grade A through IV operator meeting the requirements of 567—Chapter 81, or a laboratory certified by the department to perform analysis under 567—Chapter 83.

e. Compliance requirements for residual disinfectants.

(1) General requirements.

1. When compliance is based on a running annual average of monthly or quarterly samples or averages and the system's failure to monitor makes it impossible to determine compliance with MRDLs for chlorine and chloramines, this failure to monitor will be treated as a monitoring violation for the entire period covered by the annual average.

2. All samples taken and analyzed under the provisions of this rule must be included in determining compliance, even if that number is greater than the minimum required.

(2) Chlorine and chloramines.

1. Compliance must be based on a running annual arithmetic average, computed quarterly, of monthly averages of all samples collected by the system under 43.6(1)*"c"*(2). If the average of quarterly averages covering any consecutive four-quarter period exceeds the MRDL, the system is in violation of the MRDL and must notify the public pursuant to 567—42.1(455B), in addition to reporting to the department pursuant to 567—paragraph 42.4(3)*"d."*

2. In cases where systems switch between the use of chlorine and chloramines for residual disinfection during the year, compliance must be determined by including together all monitoring results of both chlorine and chloramines in calculating compliance. Reports submitted pursuant to 567—paragraph 42.4(3)*"d"* must clearly indicate which residual disinfectant was analyzed for each sample.

(3) Chlorine dioxide.

1. Acute violations. Compliance must be based on consecutive daily samples collected by the system under 43.6(1)*"c"*(3). If any daily sample taken at the entrance to the distribution system exceeds the MRDL, and on the following day one or more of the three samples taken in the distribution system exceed the MRDL, the system is in violation of the MRDL and shall take immediate corrective action to lower the level of chlorine dioxide below the MRDL and shall notify the public pursuant to the procedures for acute health risks in 567—subparagraph 42.1(1)*"b"*(5) in addition to reporting to the department pursuant to 567—paragraph 42.4(3)*"d."* Failure to take samples in the distribution system the day following an exceedance of the chlorine dioxide MRDL at the entrance to the distribution system will also be considered an MRDL violation and the system must notify the public of the violation in accordance with the provisions for acute violations under 567—subparagraph 42.1(1)*"b"*(5) in addition to reporting to the department pursuant to 567—paragraph 42.4(3)*"d."*

2. Nonacute violations. Compliance must be based on consecutive daily samples collected by the system under 43.6(1)*"c"*(3). If any two consecutive daily samples taken at the entrance to the distribution system exceed the MRDL and all distribution system samples taken are below the MRDL, the system is in violation of the MRDL and must take corrective action to lower the level of chlorine dioxide below the MRDL at the point of sampling and will notify the public pursuant to the procedures for nonacute health violations in 567—subrule 42.1(1), in addition to reporting to the department pursuant to 567—paragraph 42.4(3)*"d."* Failure to monitor at the entrance to the distribution system the day following an exceedance of the chlorine dioxide MRDL at the entrance to the distribution system is also an MRDL violation and the system must notify the public of the violation in accordance with the provisions for nonacute violations under 567—subrule 42.1(1), in addition to reporting to the department pursuant to 567—paragraph 42.4(3)*"d."*

f. Reporting requirements for disinfectants. Systems required to sample quarterly or more frequently must report to the department within ten days after the end of each quarter in which samples were collected, notwithstanding the public notification provisions of 567—42.1(455B). Systems required to sample less frequently than quarterly must report to the department within ten days after the end of each monitoring period in which samples were collected. The specific reporting requirements for disinfectants are listed in 567—subparagraph 42.4(3)*"d"*(3).

43.6(2) *Disinfection byproduct precursors.*

a. Applicability.

(1) Surface water or IGW CWS and NTNC systems with conventional filtration. This rule establishes criteria under which surface water or influenced groundwater CWS and NTNC public water supply systems using conventional filtration treatment, as defined in 567—40.2(455B), that add a chemical disinfectant to the water in any part of the drinking water treatment process or which provide water that contains a chemical disinfectant must modify their practices to meet the MCLs listed in 567—41.6(455B) and the maximum residual disinfectant levels (MRDL) and treatment technique requirements for disinfection byproduct precursors listed in this rule.

(2) CWS and NTNC systems using ozone treatment. CWS and NTNC systems that use ozone in their treatment process must comply with the bromide requirements of this subrule.

(3) Compliance dates. Compliance dates for this rule are based upon the population served. CWS and NTNC systems using surface water or groundwater under the direct influence of surface water in whole or in part and which serve 10,000 or more persons must comply with this rule beginning January 1, 2002; while those systems serving fewer than 10,000 persons must comply with this rule beginning January 1, 2004.

(4) The department may require groundwater systems to conduct monitoring for disinfection byproduct precursors as a part of an operation permit.

b. Monitoring requirements for disinfection byproduct precursors.

(1) Routine monitoring. Surface water and groundwater under the direct influence of surface water systems which use conventional filtration treatment must monitor each treatment plant for total organic carbon (TOC) no later than the point of combined filter effluent turbidity monitoring and representative of the treated water. All systems required to monitor under this paragraph must also monitor for TOC in the source water prior to any treatment at the same time as monitoring for TOC in the treated water. These samples (source water and treated water) are referred to as paired samples. At the same time the source water sample is taken, all systems must monitor for alkalinity in the source water prior to any treatment. Systems must take one paired set of source water and treated water samples and one source water alkalinity sample per month per plant at a time representative of normal operating conditions and influent water quality.

(2) Reduced monitoring. The department may allow surface water and groundwater under the direct influence of surface water systems with an average treated water TOC of less than 2.0 mg/L for two consecutive years, or less than 1.0 mg/L for one year, to reduce monitoring for both TOC and alkalinity to one set of paired samples and one source water alkalinity sample per plant per quarter. The system must revert to routine monitoring in the month following the quarter when the annual average treated water TOC is greater than or equal to 2.0 mg/L.

(3) Bromide. The department may allow systems required to analyze for bromate to reduce bromate monitoring from monthly to once per quarter, if the system demonstrates that the average source water bromide concentration is less than 0.05 mg/L based upon representative monthly measurements for one year. The system must continue bromide monitoring to remain on reduced bromate monitoring.

(4) The department may assign disinfection byproduct precursor monitoring prior to the compliance dates in 43.6(2)*"a"*(2) as part of an operation permit.

c. Analytical requirements for disinfection byproduct precursors.

(1) Analytical methods. Systems required to monitor disinfectant byproduct precursors must use the following methods, which must be conducted by a certified laboratory pursuant to 567—Chapter 83, unless otherwise specified.

Approved Methods for Disinfection Byproduct Precursor Monitoring[1]

Analyte	Methodology	EPA	Standard Methods	ASTM	Other
Alkalinity	Titrimetric		2320B	D1067-92B	
	Electrometric titration				I-1030-85
Bromide	Ion chromatography	300.0			
		300.1			
Dissolved Organic Carbon[2]	High temperature combustion		5310B		
	Persulfate-UV or heated-persulfate oxidation		5310C		
	Wet oxidation		5310D		
pH[3]	Electrometric	150.1	4500-H^+-B	D1293-84	
		150.2			
Total Organic Carbon[4]	High temperature combustion		5310B		
	Persulfate-UV or heated-persulfate oxidation		5310C		
	Wet oxidation		5310D		
Ultraviolet Absorption at 254 nm[5]	UV absorption		5910B		

[1] The procedures shall be done in accordance with the documents listed below. The incorporation by reference of the following documents was approved by the Director of the Federal Register on February 16, 1999, in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. Copies of the documents may be obtained from the sources listed below. Information regarding obtaining these documents can be obtained from the Safe Drinking Water Hotline at (800)426-4791. Documents may be inspected at EPA's Drinking Water Docket, 401 M Street SW, Washington, DC 20460 (telephone: (202)260-3027); or at the Office of Federal Register, 800 North Capitol Street NW, Suite 700, Washington, DC.

The following methods are available from the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428:

Annual Book of ASTM Standards, Volume 11.01, American Society for Testing and Materials, 1996: Method D 1067-92B and Method D1293-84.

The following methods are available from the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161 (telephone: (800)553-6847):

"Determination of Inorganic Anions in Drinking Water by Ion Chromatography, Revision 1.0," EPA-600/R-98/118, 1997 (NTIS, PB98-169196): Method 300.1.

Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, March 1983, (NTIS PB84-128677): Methods 150.1 and 150.2.

Methods for the Determination of Inorganic Substances in Environmental Samples, EPA-600/R-93/100, August 1993, (NTIS PB94-121811): Method 300.0.

The following methods are available from the American Public Health Association, 1015 Fifteenth Street NW, Washington, DC 20005:

Standard Methods for the Examination of Water and Wastewater, 19th edition, American Public Health Association, 1995: Methods: 2320B, 4500-H^+-B, and 5910B.

Standard Methods for the Examination of Water and Wastewater, Supplement to the 19th edition, American Public Health Association, 1996: Methods: 5310B, 5310C, and 5310D.

Method I-1030-85 is available from the Books and Open-File Reports Section, U.S. Geological Survey, Federal Center, Box 25425, Denver, CO 80225-0425.

[2] Dissolved Organic Carbon (DOC). DOC and UV_{254} samples used to determine a SUVA value must be taken at the same time and at the same location, prior to the addition of any disinfectant or oxidant by the system. Prior to analysis, DOC samples must be filtered through a 0.45 μ pore-diameter filter. Water passed through the filter prior to filtration of the sample must serve as the filtered blank. This filtered blank must be analyzed using procedures identical to those used for analysis of the samples and must meet a DOC concentration of <0.5 mg/L. DOC samples must be filtered through the 0.45 μ pore-diameter filter prior to acidification. DOC samples must either be analyzed or must be acidified to achieve pH less than 2.0 by minimal addition of phosphoric or sulfuric acid as soon as practical after sampling, not to exceed 48 hours. Acidified DOC samples must be analyzed within 28 days.

[3] pH must be measured by a laboratory certified by the department to perform analysis under 567—Chapter 83; a Grade II, III or IV operator meeting the requirements of 567—Chapter 81; or any person under the supervision of a Grade II, III or IV operator meeting the requirements of 567—Chapter 81.

[4] Total Organic Carbon (TOC). TOC samples may not be filtered prior to analysis. TOC samples must either be analyzed or must be acidified to achieve pH less than 2.0 by minimal addition of phosphoric or sulfuric acid as soon as practical after sampling, not to exceed 24 hours. Acidified TOC samples must be analyzed within 28 days.

[5] Ultraviolet Absorption at 254 nm (UV_{254}). DOC and UV_{254} samples used to determine a SUVA value must be taken at the same time and at the same location, prior to the addition of any disinfectant or oxidant by the system. UV absorption must be measured at 253.7 nm (may be rounded off to 254 nm). Prior to analysis, UV_{254} samples must be filtered through a 0.45 μ pore-diameter filter. The pH of UV_{254} samples may not be adjusted. Samples must be analyzed as soon as practical after sampling, not to exceed 48 hours.

(2) SUVA. Specific Ultraviolet Absorbance (SUVA) is equal to the UV absorption at 254nm (UV_{254}) (measured in m^{-1}) divided by the dissolved organic carbon (DOC) concentration (measured as mg/L). In order to determine SUVA, it is necessary to separately measure UV_{254} and DOC. When determining SUVA, systems must use the methods stipulated in subparagraph 43.6(1)*"c"*(1) to measure DOC and UV_{254}. SUVA must be determined on water prior to the addition of disinfectants/oxidants by the system. DOC and UV_{254} samples used to determine an SUVA value must be taken at the same time and at the same location.

d. Compliance requirements for disinfection byproduct precursors.

(1) General requirements. All samples taken and analyzed under the provisions of this rule must be included in determining compliance, even if that number is greater than the minimum required.

(2) Compliance determination. Compliance must be determined as specified by 43.6(3)*"c."* The department may assign monitoring through an operation permit, or systems may begin monitoring to determine whether Step 1 TOC removals can be met 12 months prior to the compliance date for the system. This monitoring is not required and failure to monitor during this period is not a violation. However, any system that does not monitor during this period and then determines in the first 12 months after the compliance date that it is not able to meet the Step 1 requirements in 43.6(3)*"b"*(2), and must therefore apply for alternate minimum TOC removal (Step 2) requirements, is not eligible for retroactive approval of alternate minimum TOC removal (Step 2) requirements as allowed pursuant to 43.6(3)*"b"*(3) and is in violation. Systems may apply for alternate minimum TOC removal (Step 2) requirements anytime after the compliance date. For systems required to meet Step 1 TOC removals, if the value calculated under 43.6(3)*"c"*(1)"4" is less than 1.00, the system is in violation of the treatment technique requirements and must notify the public pursuant to 567—42.1(455B), in addition to reporting to the department pursuant to 567—paragraph 42.4(3)*"d."*

e. Reporting requirements for disinfection byproduct precursors. Systems required to sample quarterly or more frequently must report to the department within ten days after the end of each quarter in which samples were collected, notwithstanding the public notification provisions of 567—42.1(455B). Systems required to sample less frequently than quarterly must report to the department within ten days after the end of each monitoring period in which samples were collected. The specific reporting requirements for disinfection byproduct precursors are listed in 567—subparagraph 42.4(3)*"d"*(4).

43.6(3) *Treatment technique for control of disinfection byproduct precursors.*

a. Applicability.

(1) Systems using surface water or groundwater under the direct influence of surface water and conventional filtration treatment (as defined in 567—40.2(455B)) must operate with enhanced coagulation or enhanced softening to achieve the TOC percent removal levels specified in paragraph *"b"* of this subrule unless the system meets at least one of the alternative compliance criteria listed in 43.6(3)*"a"*(2) or (3).

(2) Alternative compliance criteria for enhanced coagulation and enhanced softening systems. Systems using surface water or groundwater under the direct influence of surface water and conventional filtration treatment may use the alternative compliance criteria in 43.6(3)*"a"*(2)"1" through "6" to comply with this subrule in lieu of complying with 43.6(3)*"b."* Systems must still comply with monitoring requirements in 43.6(2)*"b."*

1. The system's source water TOC level, measured according to 43.6(2)*"c"*(1), is less than 2.0 mg/L, calculated quarterly as a running annual average.

2. The system's treated water TOC level, measured according to 43.6(2)*"c"*(1), is less than 2.0 mg/L, calculated quarterly as a running annual average.

3. The system's source water TOC level, measured according to 43.6(2)"*c*"(1), is less than 4.0 mg/L, calculated quarterly as a running annual average; the source water alkalinity, measured according to 43.6(2)"*c*"(1), is greater than 60 mg/L as $CaCO_3$, calculated quarterly as a running annual average; and either the TTHM and HAA5 running annual averages are no greater than 0.040 mg/L and 0.030 mg/L, respectively; or prior to the effective date for compliance in 567—subparagraph 41.6(1)"*a*"(3) and in 43.6(1)"*a*"(3) and 43.6(2)"*a*"(3), the system has made a clear and irrevocable financial commitment not later than the effective date for compliance in 567—subparagraph 41.6(1)"*a*"(3) and in 43.6(1)"*a*"(3) and 43.6(2)"*a*"(3), to use of technologies that will limit the levels of TTHMs and HAA5 to no more than 0.040 mg/L and 0.030 mg/L, respectively. Systems must submit evidence of a clear and irrevocable financial commitment, in addition to a schedule containing milestones and periodic progress reports for installation and operation of appropriate technologies, to the department for approval not later than the effective date for compliance in 567—subparagraph 41.6(1)"*a*"(3) and in 43.6(1)"*a*"(3) and 43.6(2)"*a*"(3). These technologies must be installed and operating not later than June 30, 2005. Failure to install and operate these technologies by the date in the approved schedule will constitute a treatment technique violation.

4. The TTHM and HAA5 running annual averages are less than or equal to 0.040 mg/L and 0.030 mg/L, respectively, and the system uses only chlorine for primary disinfection and maintenance of a residual in the distribution system.

5. The system's source water SUVA, prior to any treatment and measured monthly according to 43.6(2)"*c,*" is less than or equal to 2.0 L/mg-m, calculated quarterly as a running annual average.

6. The system's finished water SUVA, measured monthly according to 43.6(2)"*c,*" is less than or equal to 2.0 L/mg-m, calculated quarterly as a running annual average.

(3) Additional alternative compliance criteria for softening systems. Systems practicing enhanced softening that cannot achieve the TOC removals required by 43.6(3)"*b*"(2) may use the alternative compliance criteria in 43.6(3)"*a*"(3)"1" and "2" in lieu of complying with 43.6(3)"*b.*" Systems must still comply with monitoring requirements in 43.6(2)"*b.*"

1. Softening that lowers the treated water alkalinity to less than 60 mg/L as $CaCO_3$, measured monthly according to 43.6(2)"*c*" and calculated quarterly as a running annual average.

2. Softening that removes at least 10 mg/L of magnesium hardness as $CaCO_3$, measured monthly and calculated quarterly as a running annual average.

b. Enhanced coagulation and enhanced softening performance requirements.

(1) Systems must achieve the percent reduction of TOC specified in 43.6(3)"*b*"(2) between the source water and the combined filter effluent, unless the department approves a system's request for alternate minimum TOC removal (Step 2 requirements under 43.6(3)"*b*"(3)).

(2) Required Step 1 TOC reductions, indicated in the following table, are based upon specified source water parameters measured in accordance with 43.6(2)"*c.*" Systems using softening are required to meet the Step 1 TOC reductions in the right-hand column (Source water alkalinity > 120 mg/L) for the specified source water TOC:

Step 1 Required Removal of TOC by Enhanced Coagulation and Enhanced Softening for Surface Water or IGW Systems Using Conventional Treatment[1,2]

Source water TOC, mg/L	Source water Alkalinity, mg/L as $CaCO_3$		
	0-60	>60-120	>120[3]
>2.0 - 4.0	35.0 %	25.0 %	15.0 %
>4.0 - 8.0	45.0 %	35.0 %	25.0 %
>8.0	50.0 %	40.0 %	30.0 %

1 Systems meeting at least one of the conditions in 43.6(3)"*a*"(2)"1" to "6" are not required to operate with enhanced coagulation.
2 Softening systems meeting one of the alternative compliance criteria in 43.6(3)"*a*"(3) are not required to operate with enhanced softening.
3 Systems practicing softening must meet the TOC removal requirements in this column.

(3) Surface water and groundwater under the influence of surface water systems using conventional treatment that cannot achieve the Step 1 TOC removals required by 43.6(3)"*b*"(2) due to water quality parameters or operational constraints must apply to the department for approval of alternative minimum Step 2 TOC removal requirements submitted by the system within three months of failure to achieve the TOC removals required by 43.6(3)"*b*"(2). If the department approves the alternative minimum Step 2 TOC removal requirements, the department may make those requirements retroactive for the purposes of determining compliance. The system must meet the Step 1 TOC removals contained in 43.6(3)"*b*"(2) until the department approves the alternate minimum Step 2 TOC removal requirements.

(4) Alternate minimum Step 2 TOC removal requirements. Applications made to the department by enhanced coagulation systems for approval of alternate minimum Step 2 TOC removal requirements under 43.6(3)"*b*"(3) must include, as a minimum, results of bench-scale or pilot-scale testing conducted under 43.6(3)"*b*"(4)"1" below and be used to determine the alternate enhanced coagulation level.

1. Alternate enhanced coagulation level. Alternate enhanced coagulation level is defined as coagulation at a coagulant dose and pH as determined by the method described in 43.6(3)"*b*"(4)"1" to "5" such that an incremental addition of 10 mg/L of alum (or equivalent amount of ferric salt) results in a TOC removal of less than or equal to 0.3 mg/L. The percent removal of TOC at this point on the "TOC removal versus coagulant dose" curve is then defined as the minimum TOC removal required for the system. Once approved by the department, this minimum requirement supersedes the minimum TOC removal required by the table in 43.6(3)"*b*"(2). This requirement will be effective until such time as the department approves a new value based on the results of a new bench-scale or pilot-scale test. Failure to achieve department-set alternative minimum TOC removal levels is a treatment technique violation.

2. Bench-scale or pilot-scale testing of enhanced coagulation must be conducted by using representative water samples and adding 10 mg/L increments of alum (or equivalent amounts of ferric salt) until the pH is reduced to a level less than or equal to the enhanced coagulation Step 2 target pH shown in the following table:

Enhanced Coagulation Step 2 Target pH

Alkalinity (mg/L as $CaCO_3$)	Target pH
0-60	5.5
>60-120	6.3
>120-240	7.0
>240	7.5

3. For waters with alkalinities of less than 60 mg/L for which addition of small amounts of alum or equivalent addition of iron coagulant drives the pH below 5.5 before significant TOC removal occurs, the system must add necessary chemicals to maintain the pH between 5.3 and 5.7 in samples until the TOC removal of 0.3 mg/L per 10 mg/L alum added (or equivalent addition of iron coagulant) is reached.

4. The system may operate at any coagulant dose or pH necessary (consistent with other public drinking water rules in 567—Chapters 41 through 43) to achieve the minimum TOC percent removal approved under 43.6(3)"*b*"(3).

5. If the TOC removal is consistently less than 0.3 mg/L of TOC per 10 mg/L of incremental alum dose at all dosages of alum (or equivalent addition of iron coagulant), the water is deemed to contain TOC not amenable to enhanced coagulation. The system may then apply to the department for a waiver of enhanced coagulation requirements.

c. Compliance calculations.

(1) Surface water or groundwater under the influence of surface water systems other than those identified in 43.6(3)"*a*"(2) or (3) must comply with requirements contained in 43.6(3)"*b*"(2) or (3). Systems must calculate compliance quarterly, beginning after the system has collected 12 months of data, by determining an annual average using the following method:

1. Step 1: Determine actual monthly TOC percent removal using the following equation, to two decimal places:

$$\text{Actual monthly TOC percent removal} = 1 - \left(\frac{\text{treated water TOC}}{\text{source water TOC}} \right) \times 100$$

2. Step 2: Determine the required monthly TOC percent removal from either 43.6(3)"*b*"(2) or (3).

3. Step 3: Divide the "actual monthly TOC percent removal" value (from Step 1) by the "required monthly TOC percent removal" value (from Step 2). Determine this value for each of the last 12 months.

$$\text{Monthly percent removal ratio} = \frac{\text{actual monthly TOC percent removal}}{\text{required monthly TOC percent removal}}$$

4. Step 4: Add together the "monthly percent removal ratio" values from Step 3 for each of the last 12 months and divide by 12, to determine the annual average value.

$$\text{Annual average} = \frac{\Sigma \text{ monthly percent removal ratio}}{12}$$

5. Step 5: If the "annual average" value calculated in Step 4 is less than 1.00, the system is not in compliance with the TOC percent removal requirements.

(2) Systems may use the provisions in 43.6(3)"*c*"(2)"1" through "5" in lieu of the calculations in 43.6(3)"*c*"(1)"1" through "5" to determine compliance with TOC percent removal requirements.

1. In any month that the system's treated or source water TOC level, measured according to 43.6(2)"*c*"(1), is less than 2.0 mg/L, the system may assign a monthly value of 1.0 (in lieu of the value calculated in 43.6(3)"*c*"(1)"3") when calculating compliance under the provisions of 43.6(3)"*c*"(1).

2. In any month that a system practicing softening removes at least 10 mg/L of magnesium hardness as $CaCO_3$, the system may assign a monthly value of 1.0 (in lieu of the value calculated in 43.6(3)"*c*"(1)"3") when calculating compliance under the provisions of 43.6(3)"*c*"(1).

3. In any month that the system's source water SUVA, prior to any treatment and measured according to 43.6(2)"*c*"(2), is less than or equal to 2.0 L/mg-m, the system may assign a monthly value of 1.0 (in lieu of the value calculated in 43.6(3)"*c*"(1)"3") when calculating compliance under the provisions of 43.6(3)"*c*"(1).

4. In any month that the system's finished water SUVA, measured according to 43.6(2)"*c*"(2), is less than or equal to 2.0 L/mg-m, the system may assign a monthly value of 1.0 (in lieu of the value calculated in 43.6(3)"*c*"(1)"3") when calculating compliance under the provisions of 43.6(3)"*c*"(1).

5. In any month that a system using enhanced softening lowers alkalinity below 60 mg/L as $CaCO_3$, the system may assign a monthly value of 1.0 (in lieu of the value calculated in 43.6(3)"*c*"(1)"3") when calculating compliance under the provisions of 43.6(3)"*c*"(1).

(3) Surface water or groundwater under the direct influence of surface water systems using conventional treatment may also comply with the requirements of this subrule by meeting the criteria in 43.6(3)"*a*"(2) or (3).

d. Treatment technique requirements for disinfection byproduct precursors. The treatment techniques to control the level of disinfection byproduct precursors in drinking water treatment and distribution systems, for surface water or groundwater under the direct influence of surface water systems using conventional filtration treatment, are enhanced coagulation or enhanced softening.

567—43.7(455B) Lead and copper treatment techniques.

43.7(1) *Corrosion control.*

a. Applicability of corrosion control treatment steps to small, medium-size and large water systems. (Corrosion control treatment compliance dates.) Systems shall complete the applicable corrosion control treatment requirements by the following deadlines:

(1) Population >50,000. Large systems (serving greater than 50,000 persons) shall complete the corrosion control treatment steps specified in 43.7(1)*"d,"* unless it is deemed to have optimized corrosion control under 43.7(1)*"b"*(2) or (3).

(2) Population ≤50,000. Small systems (serving less than or equal to 3,300 persons) and medium-size systems (serving greater than 3,300 and less than or equal to 50,000 persons) shall complete the corrosion control treatment steps specified in 43.7(1)*"e,"* unless it has optimized corrosion control under 43.7(1)*"b"*(1), (2), or (3).

b. Optimum corrosion control. A public water supply system has optimized corrosion control and is not required to complete the applicable corrosion control treatment steps identified in this subrule if the system satisfies one of the following criteria:

(1) A small or medium-size water supply system has optimized corrosion control if the system meets the lead and copper action levels during each of two consecutive six-month monitoring periods, conducted in accordance with 567—paragraph 41.4(1)*"c."*

(2) Any public water supply system may be deemed to have optimized corrosion control treatment if the system demonstrates to the satisfaction of the department that it has conducted activities equivalent to the corrosion control steps applicable to such system under this subrule. If the department makes this determination, it shall provide the water supply system with written notice explaining the basis for its decision and shall specify the water quality control parameters representing optimal corrosion control in accordance with 43.7(2)*"f."* A system shall provide the department with the following information in order to support a determination under this paragraph:

1. The results of all test samples collected for each of the water quality parameters in 43.7(2)*"c"*(3);

2. A report explaining the test methods used by the water system to evaluate the corrosion control treatments listed in 43.7(2)*"c"*(1), the results of all tests conducted, and the basis for the system's selection of optimal corrosion control treatment;

3. A report explaining how corrosion control was installed and how it is being maintained to ensure minimal lead and copper concentrations at consumers' taps; and

4. The results of tap water samples collected in accordance with 567—paragraph 41.4(1)*"c"* at least once every six months for one year after corrosion control has been installed.

(3) Any water system has optimized corrosion control if it submits results of tap water monitoring conducted in accordance with 567—paragraph 41.4(1)*"c"* and source water monitoring conducted in accordance with 567—paragraph 41.4(1)*"e"* that demonstrate for two consecutive six-month monitoring periods that the difference between the 90th percentile tap water lead level computed under 567—subparagraph 41.4(1)*"b"*(3) and the highest source water lead concentration is less than the practical quantitation level for lead specified in 567—paragraph 41.4(1)*"g."*

c. Recommence corrosion control. Any small or medium-size water system that is required to complete the corrosion control steps due to its exceedance of the lead or copper action level may cease completing the treatment steps whenever the system meets both action levels during each of two consecutive monitoring periods conducted pursuant to 567—paragraph 41.4(1)*"c"* and submits the results to the department. If any such water system thereafter exceeds the lead or copper action level during any monitoring period, the system shall recommence completion of the applicable treatment steps, beginning with the first treatment step which was not previously completed in its entirety. The department may require a system to repeat treatment steps previously completed by the system when it is determined by the department that this is necessary to implement properly the treatment requirements of this rule. The department will notify the system in writing of such a determination and explain the basis for its decision. The requirement for any small or medium-size system to implement corrosion control treatment steps in accordance with 43.7(1)*"e"* (including systems deemed to have optimized corrosion control under 43.7(1)*"b"*(1)) is triggered whenever any small or medium-size system exceeds the lead or copper action level.

d. Treatment steps and deadlines for large systems. Except as provided in 43.7(1)*"b"*(2) or (3), large systems shall complete the following corrosion control treatment steps (described in the referenced portions of 43.7(1)*"b,"* subrule 43.7(2), and 567—paragraphs 41.4(1)*"c"* and *"d"*) by the dates indicated below.

(1) Step 1. The system shall conduct initial monitoring pursuant to 567—paragraph 41.4(1)*"c"*(4)"1" and 567—paragraph 41.4(1)*"d"*(2) during two consecutive six-month monitoring periods by January 1, 1993.

(2) Step 2. The system shall complete corrosion control studies pursuant to 43.7(2)*"c"* by July 1, 1994.

(3) Step 3. The department will designate optimal corrosion control treatment within six months of receiving the corrosion control study results (by January 1, 1995).

(4) Step 4. The system shall install optimal corrosion control treatment by January 1, 1997.

(5) Step 5. The system shall complete follow-up sampling pursuant to 567—paragraph 41.4(1)*"c"*(4)"2" and 567—paragraph 41.4(1)*"d"*(3) by January 1, 1998.

(6) Step 6. The department will review installation of treatment and designate optimal water quality control parameters pursuant to 43.7(2)*"f"* by July 1, 1998.

(7) Step 7. The system shall operate in compliance with optimal water quality control parameters delineated by the department and continue to conduct tap sampling.

e. Treatment steps and deadlines for small and medium-size systems. Except as provided in 43.7(2), small and medium-size systems shall complete the following corrosion control treatment steps (described in subrule 43.7(2) and 567—paragraphs 41.4(1)*"c"* and *"d"*) by the indicated time periods listed below.

(1) Step 1. The system shall conduct initial tap sampling pursuant to 567—paragraph 41.4(1)*"c"*(4)"1" and 567—paragraph 41.4(1)*"d"*(2) until the system either exceeds the lead or copper action level or becomes eligible for reduced monitoring under 567—paragraph 41.4(1)*"c"*(4)"4." A system exceeding the lead or copper action level shall recommend optimal corrosion control treatment under 43.7(2)*"a"* within six months after it exceeds one of the action levels.

(2) Step 2. Within 12 months after a system exceeds the lead or copper action level, the department may require the system to perform corrosion control studies under 43.7(2)*"b."* If the system is not required to perform such studies, the department will specify optimal corrosion control treatment under 43.7(2)*"d"* as follows: for medium-size systems, within 18 months after such system exceeds the lead or copper action level, and, for small systems, within 24 months after such system exceeds the lead or copper action level.

(3) Step 3. If a system is required to perform corrosion control studies under Step 2, the system shall complete the studies (under 43.7(2)*"c"*) within 18 months after such studies are required to commence.

(4) Step 4. If the system has performed corrosion control studies under Step 2, the department will designate optimal corrosion control treatment under 43.7(2)*"d"* within six months after completion of Step 3.

(5) Step 5. The system shall install optimal corrosion control treatment under 43.7(2)*"e"* within 24 months after such treatment is designated.

(6) Step 6. The system shall complete follow-up sampling pursuant to 567—paragraph 41.4(1)*"c"*(4)"2" and 567—paragraph 41.4(1)*"d"*(3) within 36 months after optimal corrosion control treatment is designated.

(7) Step 7. The department will review the system's installation of treatment and designate optimal water quality control parameters pursuant to 43.7(2)*"f"* within six months after completion of Step 6.

(8) Step 8. The system shall operate in compliance with the department-designated optimal water quality control parameters under 43.7(2)*"f"* (and continue to conduct tap sampling as per 567—paragraph 41.4(1)*"c"*(4)"3" and 567—paragraph 41.4(1)*"d"*(4)).

43.7(2) *Description of corrosion control treatment requirements.* Each public water supply system shall complete the corrosion control treatment requirements described below which are applicable to such systems under 43.7(1).

a. Public water supply system recommendation regarding corrosion control treatment. Based upon the results of lead and copper tap monitoring and water quality parameter monitoring, small and medium-size water systems exceeding the lead or copper action level shall recommend installation of one or more of the corrosion control treatments listed in 43.7(2)*"c"* which the system believes constitute optimal corrosion control for that system. The department may require the system to conduct additional water quality parameter monitoring in accordance with 567—paragraph 41.4(1)*"d"*(2) to assist in reviewing the system's recommendation.

b. Department decision to require studies of corrosion control treatment (applicable to small and medium-size systems). The department may require any small or medium-size system that exceeds the lead or copper action level to perform corrosion control studies under 43.7(2)*"c"* to identify optimal corrosion control treatment for the system.

c. Performance of corrosion control studies.

(1) Any public water supply system performing corrosion control studies shall evaluate the effectiveness of each of the following treatments and, if appropriate, combinations of the following treatments to identify the optimal corrosion control treatment: alkalinity and pH adjustment; calcium hardness adjustment; and the addition of a phosphate or silicate-based corrosion inhibitor at a concentration sufficient to maintain an effective residual concentration in all test tap samples.

(2) The water system shall evaluate each of the corrosion control treatments using either pipe rig/loop tests, metal coupon tests, partial-system tests, or analyses based on documented analogous treatments with other systems of similar size, water chemistry and distribution system configuration.

(3) The public water supply system shall measure the following water quality parameters in any tests conducted under this paragraph before and after evaluating the corrosion control treatments listed above:

1. Lead;
2. Copper;
3. pH;
4. Alkalinity;
5. Calcium;
6. Conductivity;
7. Orthophosphate (when an inhibitor containing a phosphate compound is used);
8. Silicate (when an inhibitor containing a silicate compound is used);
9. Water temperature.

(4) The public water supply system shall identify all chemical or physical constraints that limit or prohibit the use of a particular corrosion control treatment and outline such constraints with the following: data and documentation showing that a particular corrosion control treatment has adversely affected other water treatment processes when used by another water system with comparable water quality characteristics; or data and documentation demonstrating that the water system has previously attempted to evaluate a particular corrosion control treatment and has found that the treatment is ineffective or adversely affects other water quality treatment processes.

(5) The water system shall evaluate the effect of the chemicals used for corrosion control treatment on other water quality treatment processes.

(6) On the basis of an analysis of the data generated during each evaluation, the water system shall recommend in writing to the department the treatment option that the corrosion control studies indicate constitutes optimal corrosion control treatment for that system. The water system shall provide a rationale for its recommendation along with all supporting documentation required by 43.7(2)*"c"*(1) through (5).

d. Department designation of optimal corrosion control treatment.

(1) Based upon consideration of available information including, where applicable, studies performed under 43.7(2)*"c"* and a system's recommended treatment alternative, the department will either approve the corrosion control treatment option recommended by the public water supply system, or designate alternative corrosion control treatment(s) from among those listed in 43.7(2)*"c."* The department will consider the effects that additional corrosion control treatment will have on water quality parameters and on other water quality treatment processes (when designating optimal corrosion control treatment).

(2) The department will notify the public water supply system of its decision on optimal corrosion control treatment in writing and explain the basis for this determination. If the department requests additional information to aid its review, the public water supply system shall provide the information.

e. Installation of optimal corrosion control. Each public water supply system shall properly install and operate throughout its distribution system the optimal corrosion control treatment designated under 43.7(2)*"d."*

f. Department review of treatment and specification of optimal water quality control parameters.

(1) The department will evaluate the results of all lead and copper tap samples and water quality parameter samples submitted by the public water supply system and determine whether the system has properly installed and operated the optimal corrosion control treatment designated in 43.7(2)*"d."* Upon reviewing the results of tap water and water quality parameter monitoring by the public water supply system, both before and after the system installs optimal corrosion control treatment, the department will designate the following:

1. A minimum value or a range of values for pH measured at each entry point to the distribution system;

2. A minimum pH value, measured in all tap samples. Such value shall be equal to or greater than 7.0 unless meeting a pH level of 7.0 is not technologically feasible or is not necessary for the public water supply system to optimize corrosion control;

3. If a corrosion inhibitor is used, a minimum concentration or a range of concentrations for the inhibitor, measured at each entry point to the distribution system and in all tap samples, necessary to form a passivating film on the interior walls of the pipes of the distribution system;

4. If alkalinity is adjusted as part of optimal corrosion control treatment, a minimum concentration or a range of concentrations for alkalinity, measured at each entry point to the distribution system and in all tap samples; or

5. If calcium carbonate stabilization is used as part of corrosion control, a minimum concentration or a range of concentrations for calcium, measured in all tap samples.

(2) The values for the applicable water quality control parameters listed above shall be those which reflect optimal corrosion control treatment for the public water supply system. The department may designate values for additional water quality control parameters determined by the department to reflect optimal corrosion control for the system. The department will notify the system in writing of these determinations and explain the basis for its decisions.

g. Continued operation and monitoring. All public water supply systems shall maintain water quality parameter values at or above minimum values or within ranges designated by the department under 43.7(2)*"f"* in each sample collected under 567—paragraph 41.4(1)*"d"*(4). If the water quality parameter value of any sample is below the minimum value or outside the range designated, the public water supply system is out of compliance. As specified in 567—paragraph 41.4(1)*"d"*(4), the public water supply system may take a confirmation sample for any water quality parameter value no later than three days after the first sample. If a confirmation sample is taken, the result must be averaged with the first sampling result and the average must be used for any compliance determinations under this paragraph.

h. Modification of department treatment decisions. A determination of the optimal corrosion control treatment under 43.7(2)*"d"* or optimal water quality control parameters under 43.7(2)*"f"* may be modified. A request for modification by a public water supply system or other interested party shall be in writing, explain why the modification is appropriate, and provide supporting documentation. The department may modify its determination when it concludes that such change is necessary to ensure that the public water supply system continues to optimize corrosion control treatment. A revised determination will be made in writing, which will set forth the new treatment requirements, explain the basis for the decision, and provide an implementation schedule for completing the treatment modifications.

43.7(3) *Source water treatment requirements.* Public water supply systems shall complete the applicable source water monitoring and treatment requirements, as described in the referenced portions of 43.7(3)*"b,"* and in 567—paragraphs 41.4(1)*"c"* and *"e,"* by the following deadlines.

a. Deadlines for completing source water treatment steps.

(1) Step 1. A public water supply system exceeding the lead or copper action level shall complete lead and copper source water monitoring under 567—paragraph 41.4(1)*"e"*(2) and make a written treatment recommendation to the department within six months after exceeding the lead or copper action level.

(2) Step 2. The department will make a determination regarding source water treatment pursuant to 43.7(3)*"b"*(2) within six months after submission of monitoring results under Step 1.

(3) Step 3. If installation of source water treatment is required, the system shall install the treatment pursuant to 43.7(3)*"b"*(3) within 24 months after completion of Step 2.

(4) Step 4. The public water supply system shall complete follow-up tap water monitoring under 567—paragraph 41.4(1)*"c"*(4)"2" and source water monitoring under 567—paragraph 41.4(1)*"e"*(3) within 36 months after completion of Step 2.

(5) Step 5. The department will review the system's installation and operation of source water treatment and specify maximum permissible source water levels under 43.7(3)*"b"*(4) within six months after completion of Step 4.

(6) Step 6. The public water supply system shall operate in compliance with the specified maximum permissible lead and copper source water levels under 43.7(3)*"b"*(4) and continue source water monitoring pursuant to 567—paragraph 41.4(1)*"e"*(4).

b. Description of source water treatment requirements.

(1) System treatment recommendation. Any system which exceeds the lead or copper action level shall recommend in writing to the department the installation and operation of one of the source water treatments listed in 43.7(3)*"b"*(2). A system may recommend that no treatment be installed based upon a demonstration that source water treatment is not necessary to minimize lead and copper levels at users' taps.

(2) Source water treatment determinations. The department will complete an evaluation of the results of all source water samples submitted by the public water supply system to determine whether source water treatment is necessary to minimize lead or copper levels in water delivered to users' taps. If the department determines that treatment is needed, the department will require installation and operation of the source water treatment recommended by the public water supply system or require the installation and operation of another source water treatment from among the following: ion exchange, reverse osmosis, lime softening or coagulation/filtration. If the department requests additional information to aid in its review, the water system shall provide the information by the date specified in its request. The department will notify the system in writing of its determination and set forth the basis for its decision.

(3) Installation of source water treatment. Public water supply systems shall properly install and operate the source water treatment designated by the department under 43.7(3)*"b"*(2).

(4) Department review of source water treatment and specification of maximum permissible source water levels. The department will review the source water samples taken by the water supply system both before and after the system installs source water treatment and determine whether the public water supply system has properly installed and operated the designated source water treatment. Based upon its review, the department will designate maximum permissible lead and copper concentrations for finished water entering the distribution system. Such levels shall reflect the contaminant removal capability of the treatment (properly operated and maintained). The department will notify the public water supply system in writing and explain the basis for its decision.

(5) Continued operation and maintenance. Each public water supply system shall maintain lead and copper levels below the maximum permissible concentrations designated by the department at each sampling point monitored in accordance with 567—paragraph 41.4(1)*"e."* The system is out of compliance with this paragraph if the level of lead or copper at any sampling point is greater than the maximum permissible designated concentration.

(6) Modification of treatment decisions. The department may modify its determination of the source water treatment under 43.7(3)*"b"*(6), or maximum permissible lead and copper concentrations for finished water entering the distribution system under 43.7(3)*"b"*(4). A request for modification by a public water supply system or other interested party shall be in writing, explain why the modification is appropriate, and provide supporting documentation. The department may modify its determination where it concludes that such change is necessary to ensure that the system continues to minimize lead and copper concentrations in source water. A revised determination will be made in writing, set forth the new treatment requirements, explain the basis for the decision, and provide an implementation schedule for completing the treatment modifications.

43.7(4) *Lead service line replacement requirements.*

a. Applicability. Public water supply systems that fail to meet the lead action level in tap samples taken pursuant to 567—paragraph 41.4(1)*"c"*(4)"2" after installing corrosion control or source water treatment (whichever sampling occurs later) shall replace lead service lines in accordance with the requirements of this subrule. If a system is in violation of 43.7(1) and 43.7(3) for failure to install source water or corrosion control treatment, the department may require the system to commence lead service line replacement under this subrule after the date by which the system was required to conduct monitoring under 567—paragraph 41.4(1)*"c"*(4)"2" has passed.

b. Lead service line replacement schedule. A public water supply system shall replace annually at least 7 percent of the initial number of lead service lines in its distribution system. The initial number of lead service lines is the number of lead lines in place at the time the replacement program begins. The system shall identify the initial number of lead service lines in its distribution system based upon a materials evaluation, including the evaluation required under 567—paragraph 41.4(1)*"c"*(1). The first year of lead service line replacement shall begin on the date the action level was exceeded in tap sampling referenced in 43.7(4)*"a."*

c. Exemption. A public water supply system is not required to replace an individual lead service line if the lead concentration in all service line samples from that line, taken pursuant to 567—paragraph 41.4(1)*"c"*(2)"3," is less than or equal to 0.015 mg/L.

d. Lead service line control. A public water supply system shall replace the entire service line (up to the building inlet) unless it demonstrates to the satisfaction of the department under 43.7(4)*"e"* that it controls less than the entire service line. In such cases, the system shall replace the portion of the line which the department determines is under the system's control. The system shall notify the user served by the line that the system will replace the portion of the service line under its control and shall offer to replace the building owner's portion of the line, but is not required to bear the cost of replacing the building owner's portion of the line. For buildings where only a portion of the lead service line is replaced, the water system shall inform the resident(s) that the system will collect a first flush tap water sample after partial replacement of the service line is completed if the resident(s) so desires. In cases where the resident(s) accepts the offer, the system shall collect the sample and report the results to the resident(s) within 14 days following partial lead service line replacement.

e. Lead service line control—department review. A public water supply system is presumed to control the entire lead service line (up to the building inlet) unless the system demonstrates to the satisfaction of the department in a letter submitted under 567—paragraph 42.4(2)*"e"*(4) that it does not have any of the following forms of control over the entire line (as defined by state statutes, municipal ordinances, public service contracts or other applicable legal authority): authority to set standards for construction, repair, or maintenance of the line, authority to replace, repair, or maintain the service line, or ownership of the service line. The department will review the information supplied by the system and determine whether the system controls less than the entire service line and, in such cases, will determine the extent of the system's control. The determination will be in writing and it must explain the basis underlying the decision.

f. Lead service line replacement schedule. The department may require a public water supply system to replace lead service lines on a shorter schedule than that required by this subrule, taking into account the number of lead service lines in the system, where such a shorter replacement schedule is feasible. The department will make this determination in writing and notify the system of its finding within six months after the system is triggered into lead service line replacement based on monitoring referenced in 43.7(4)*"a."*

g. Cessation of lead service line replacement. Any public water supply system may cease replacing lead service lines whenever first draw samples collected pursuant to 567—paragraph 41.4(1)*"c"*(2)"2" meet the lead action level during each of two consecutive monitoring periods and the system submits the results. If the first draw tap samples collected in any such water system thereafter exceed the lead action level, the system shall recommence replacing lead service lines, as detailed in 43.7(4)*"b."*

h. Reporting requirements. To demonstrate compliance with 43.7(4)*"a"* through *"d,"* a system shall report the information specified in 567—paragraph 42.4(2)*"e."*

567—43.8(455B) Viability assessment.

43.8(1) *Definitions specific to viability assessment.*

"New system" for viability assessment purposes includes public water supply systems which are newly constructed after the effective date of this rule, as well as systems which do not currently meet the definition of a PWS, but which expand their infrastructure and thereby grow to become a PWS. Systems not currently meeting the definition of a PWS and which add additional users and thereby become a PWS without constructing any additional infrastructure are not "new systems" for the purposes of this subrule.

"Nonviable system" for viability assessment purposes means a system lacking the technical, financial, and managerial ability to comply with 567—Chapters 40 through 43 and 81.

"Significant noncompliance (SNC)" for viability assessment purposes means the failure to comply with any drinking water standard as adopted by the state of Iowa as designated by the department.

"Viability" for viability assessment purposes is the ability to remain in compliance insofar as the requirements of the federal Safe Drinking Water Act and 567—Chapters 40 through 43 and 81.

"Viable system" for viability assessment purposes means a system with the technical, financial, and managerial ability to comply with applicable drinking water standards adopted by the state of Iowa.

43.8(2) *Applicability and purpose.* These rules apply to all new and existing public water supplies, including the following: new systems commencing operation after October 1, 1999; systems deemed to be in significant noncompliance with the primary drinking water standards; DWSRF applicants; and existing systems. The purpose of the viability assessment program is to ensure the safety of the public drinking water supplies and ensure the viability of new public water supply systems upon commencement of operation. The department may assess public notification requirements and administrative penalties to any public water supply system which fails to fulfill the requirements of this rule.

43.8(3) *Contents of a viability assessment.* The viability assessment must address the areas of technical, financial, and managerial viability for a public water supply system. The assessment must include evaluation of the following areas at a minimum, and the public water supply system may be required to include additional information as directed by the department. The viability of a system should be forecast for a 20-year period.

a. Technical viability.

(1) Supply sources and facilities
(2) Treatment
(3) Infrastructure (examples: pumping, storage, distribution)

b. Financial viability.

(1) Capital and operating costs
(2) Revenue sources
(3) Contingency plans

c. Managerial viability.

(1) Operation
(2) Maintenance
(3) Management
(4) Administration

43.8(4) *New systems.*

a. Submission of system viability assessment. New public water supply systems (including community, nontransient noncommunity systems, and transient noncommunity systems) commencing operation after the effective date of this rule are required to submit a completed system viability assessment for review by the department, prior to obtaining a construction permit. The viability assessment may be submitted with the application for a construction permit. The department may reject receipt or delay review of the construction plans and specifications until an adequate viability assessment is provided. If the department finds, upon review and approval of the viability assessment, that the PWS will be viable, a construction permit will be issued in accordance with 567—Chapters 40 and 43. Prior to beginning operation, a public water supply operation permit must be obtained in accordance with 43.2(455B) and 567—40.5(455B).

b. Review of the viability assessment. If the department declines to approve the viability assessment as submitted by the applicant, or if the department finds that the PWS is not viable, approval of construction and operation permit applications will be denied. If the viability assessment is conditionally approved, construction and operation permits will be issued, with conditions and a schedule to achieve compliance specified in the operation permit.

43.8(5) *Existing systems.*

a. Submission of system viability assessment. Any community, nontransient noncommunity, or transient noncommunity water system which operated prior to October 1, 1999, and was regulated as a public water system by the department shall be considered an existing system. Any system which does not currently meet the definition of a PWS, but which expands their infrastructure and thereby grows to become a PWS is considered a new system. Systems not currently meeting the definition of a PWS and which add additional users and thereby become a PWS without constructing any additional infrastructure are considered existing systems for the purposes of this subrule. All PWSs should complete a viability assessment. However, only those existing PWSs which meet one or more of the following criteria are required to complete a viability assessment for the department's review and approval.

(1) Systems applying for DWSRF loan funds.

(2) Systems categorized as being in significant noncompliance by the department, due to their history of failure to comply with drinking water standards.

(3) Systems identified by the department via a sanitary survey as having technical, managerial, or financial problems as evidenced by such conditions as poor operational control, a poor state of repair or maintenance, vulnerability to contamination, or inability to maintain adequate distribution system operating pressures.

(4) Systems which have been unable to retain a certified operator in accordance with 567—Chapter 81.

b. Review of viability assessments for systems required to submit an assessment. If the assessment is incomplete and does not include all of the required elements, the supply will be notified in writing and will be given an opportunity to modify and resubmit the assessment within the time period specified by the department. If the system fails to resubmit a completed viability assessment as specified by the department, the department may find that the system is not viable. If the submitted assessment is complete, the department will either indicate that the system is viable or not viable after the assessment review process. The system will be notified of the results of the evaluation by the department.

c. Review of voluntarily submitted viability assessments. It is recommended that all existing systems complete the viability assessment and submit it to the department. Voluntarily submitted assessments may be reviewed upon request and will be exempt from any requirements to modify the assessment if it is not approved, or from a determination that the system is not viable, providing the system does not meet any of the criteria for mandatory completion of a viability assessment as set forth in 43.8(4)*"a"* above.

43.8(6) *Systems which are determined to be not viable.*

a. Applicability. The following applies to community, nontransient noncommunity, and transient noncommunity systems:

(1) Systems applying for DWSRF loan funds must be viable, or the loan funds must be used to assist the system in attaining viable status. If a system making a loan application is found to be not viable, and loan funds will not be sufficient or available to ensure viability, then the situation must be corrected to the department's satisfaction prior to qualification to apply for loan funds.

(2) Systems which meet the department's criteria of significant noncompliance are not considered viable. The viability assessment completed by the public water supply and the most recent sanitary survey results will be evaluated by the department to assist the system in returning to and remaining in compliance, which would achieve viability. Required corrective actions will be specified in the system's operation permit and will include a compliance schedule. Field office inspections will be conducted on an as-needed basis to assist the system in implementing the required system improvements.

(3) Systems experiencing technical, managerial, or financial problems as noted by department in the sanitary survey will be considered not viable. The viability assessment completed by the public water supply will be evaluated by the department to assist the system in attaining viability, and any required corrective actions will be specified in the system's operation permit.

(4) Systems unable to retain a certified operator will be considered not viable. All community and nontransient noncommunity water systems, and transient noncommunity water systems as denoted by the department, are required to have a certified operator who meets the requirements of 567—Chapter 81. The viability assessment completed by the public water supply will be used to determine the source of the problem, and required corrective actions will be specified in the system's operation permit.

b. Reserved.

43.8(7) *Revocation or denial of operation or construction permit.*

a. Revocation or denial of an operation permit. Failure to correct the deficiencies regarding viability, as identified in accordance with a compliance schedule set by the department, may result in revocation or denial of the system's operation permit. If the department revokes or denies the operation permit, the owner of the system must negotiate an alternative arrangement with the department for providing treatment or water supply services within 30 days of receipt of the notification by the department unless the owner of the supply appeals the decision to the department. The public water supply is required to provide water that continually meets all health-based standards during the appeal process.

b. Denial of new construction permits for an existing system. In addition to the criteria provided in 567—Chapters 40 through 44, new construction permits for water system improvements may be denied until the system makes the required corrections and attains viable status unless the proposed project is necessary to attain viability.

c. Failure to conform to approved construction plans and specifications, or to comply with the requirements of 567—Chapters 40 to 44. Failure of a project to conform to approved construction plans and specifications, or failure to comply with the requirements of 567—Chapters 40 to 44, constitutes grounds for the director to withhold the applicable construction and operation permits. The system is then responsible for ensuring that the identified problem with the project is rectified so that permits may be issued. Once an agreement for correcting the problem is reached between the department and the system, the department will issue the appropriate permits according to the provisions of the agreement. If an agreement cannot be reached within a reasonable time period, the permit shall be denied.

d. Contents of the notification denying the permit. The notification of denial or withholding approval of the operation or construction permit will state the department's reasons for withholding or denying permit approval.

43.8(8) *Appeals.*

a. Request for formal review of determination of viability. A person or entity who disagrees with the decision regarding the viability of a public water supply system may request a formal review of the action. A request for review must be submitted in writing to the director by the owner or their designee within 30 days of the date of notification by the department of the viability decision.

b. Appeal of denial of operation or construction permit. A decision to deny an operation or construction permit may be appealed by the applicant to the environmental protection commission pursuant to 567—Chapter 7. The appeal must be made in writing to the director within 30 days of receiving the notice of denial by the owner of the public water supply.

567—43.9(455B) Enhanced filtration and disinfection requirements for surface water and IGW systems serving at least 10,000 people.

43.9(1) *General requirements.*

a. Applicability. The requirements of this rule constitute national primary drinking water regulations. This rule establishes the filtration and disinfection requirements that are in addition to criteria under which filtration and disinfection are required in 43.5(455B). The requirements of this rule are applicable, beginning January 1, 2002, to all public water systems using surface water or groundwater under the direct influence of surface water, in whole or in part, and which serve at least 10,000 people. This rule establishes or extends treatment technique requirements in lieu of maximum contaminant levels for the following contaminants: *Giardia lamblia*, viruses, heterotrophic plate count bacteria, *Legionella*, *Cryptosporidium*, and turbidity. Each surface water or groundwater under the direct influence of surface water system serving at least 10,000 people must provide treatment of its source water that complies with these treatment technique requirements and they are in addition to those identified in subrule 43.5(1). The treatment technique requirements consist of installing and properly operating water treatment processes that reliably achieve:

(1) At least 99 percent (2-log) removal of *Cryptosporidium* between a point where the raw water is not subject to recontamination by surface water runoff and a point downstream before or at the first customer for filtered systems.

(2) Compliance with the profiling and benchmark requirements under 43.9(2).

(3) The department may require other surface water or groundwater under the direct influence of surface water systems to comply with this rule, through an operation permit.

b. Compliance determination. A public water system subject to the requirements of this rule is considered to be in compliance with the requirements of 43.9(1)*"a"* if it meets the applicable filtration requirements in either 43.5(3) or 43.9(3) and the disinfection requirements in 43.5(2) and 43.6(2).

c. Prohibition of uncovered intermediate or finished water reservoirs new construction. Systems are not permitted to begin construction of uncovered intermediate or finished water storage facilities.

43.9(2) *Disinfection profiling and benchmarking.*

a. Determination of systems required to profile. A public water system subject to the requirements of this rule must determine its total trihalomethane (TTHM) and haloacetic acid (HAA5) annual averages using the procedures listed below. The annual average is the arithmetic average of the quarterly averages of four consecutive quarters of monitoring. Both the TTHM and HAA5 samples must be collected as paired samples during the same time period in order for each parameter to have the same annual average period for result comparison. A paired sample is one that is collected at the same location and time and is analyzed for both TTHM and HAA5 parameters.

(1) Allowance of information collection rule data. Those systems that collected data under the provisions of the federal Information Collection Rule listed in Code of Federal Regulations Title 40, Part 141, Subpart M, must use the results of the TTHM and HAA5 samples collected during the last four quarters of monitoring required under 40 CFR 141.142. The system must have submitted the results of the samples collected during the last 12 months of required monitoring.

(2) Systems that have not collected TTHM and HAA5 data under 43.9(2)*"a"*(1). Those systems that have not collected four consecutive quarters of paired TTHM and HAA5 samples as described under 43.9(2)*"a"*(1) must comply with all other provisions of this subrule as if the HAA5 monitoring had been conducted and the results of that monitoring required compliance with 43.9(2)*"b."* The system that elects this option must notify the department in writing of its decision.

(3) The department may require that a system use a more representative annual data set than the data set determined under 567—subparagraph 42.9(2)*"a"*(1) for the purpose of determining applicability of the requirements of this subrule.

(4) Profiling determination criteria. Any system having either a TTHM annual average greater than 0.064 mg/L or an HAA5 annual average greater than 0.048 mg/L during the period identified in 43.9(2)*"a"*(1) through (3) must comply with 43.9(2)*"b."*

b. Disinfection profiling.

(1) Applicability. Any system that meets the criteria in 43.9(2)*"a"*(4) must develop a disinfection profile of its disinfection practice for a period of up to three years.

(2) Monitoring requirements. The system must monitor daily for a period of 12 consecutive calendar months to determine the total logs of inactivation for each day of operation, based on the $CT_{99.9}$ values in Tables 1 through 8 in Appendix A, as appropriate, through the entire treatment plant. This system must begin this monitoring as directed by the department. As a minimum, the system with a single point of disinfectant application prior to entrance to the distribution system must conduct the monitoring in 43.9(2)*"b"*(2)"1" through "4." A system with more than one point of disinfectant application must conduct the monitoring in 43.9(2)*"b"*(2)"1" through "4" for each disinfection segment. The system must monitor the parameters necessary to determine the total inactivation ratio, using analytical methods in 43.5(4)*"a"* as follows:

1. The temperature of the disinfected water must be measured once per day at each residual disinfectant concentration sampling point during peak hourly flow.
2. If the system uses chlorine, the pH of the disinfected water must be measured once per day at each chlorine residual disinfectant concentration sampling point during peak hourly flow.
3. The disinfectant contact time(s) ("T") must be determined for each day during peak hourly flow.
4. The residual disinfectant concentration(s) ("C") of the water before or at the first customer and prior to each additional point of disinfection must be measured each day during peak hourly flow.

(3) Use of existing data. A system that has existing operational data may use those data to develop a disinfection profile for additional years, in addition to the disinfection profile generated under 43.9(2)*"b"*(2). Such systems may use these additional yearly disinfection profiles to develop a benchmark under the provisions of 43.9(2)*"c."* The department must determine whether these operational data are substantially equivalent to data collected under the provisions of 43.9(2)*"b"*(2). These data must also be representative of inactivation through the entire treatment plant and not just of certain treatment segments.

(4) Calculation of the total inactivation ratio. The system must calculate the total inactivation ratio as follows, using the $CT_{99.9}$ values from Tables 1 through 8 listed in Appendix A:

1. If the system uses only one point of disinfectant application, the system may determine the total inactivation ratio for the disinfection segment based on either of the following two methods:

- Determine one inactivation ratio ($CTcalc/CT_{99.9}$) before or at the first customer during peak hourly flow.
- Determine successive $CTcalc/CT_{99.9}$ values, representing sequential inactivation ratios, between the point of disinfectant application and a point before or at the first customer during peak hourly flow. Under this alternative, the system must calculate the total inactivation ratio by determining ($CTcalc/CT_{99.9}$) for each sequence and then adding the ($CTcalc/CT_{99.9}$) values together to determine $\Sigma(CTcalc/CT_{99.9})$.

2. If the system uses more than one point of disinfectant application before the first customer, the system must determine the CT value of each disinfection segment immediately prior to the next point of disinfectant application, or for the final segment, before or at the first customer, during peak hourly flow. The $CTcalc/CT_{99.9}$ value of each segment and $\Sigma(CTcalc/CT_{99.9})$ must be calculated using the method in 43.9(2)*"b"*(4)"1."

3. The system must determine the total logs of inactivation by multiplying the value calculated in 43.9(2)*"b"*(4)"1" or "2" by 3.0.

(5) Systems using chloramines or ozone. A system that uses either chloramines or ozone for primary disinfection must also calculate the logs of inactivation for viruses using a method approved by the department.

(6) Profile retention requirements. The system must retain disinfection profile data in graphic form, as a spreadsheet, or in some other format acceptable to the department for review as part of sanitary surveys conducted by the department. The department may require the system to submit the data to the department directly or as part of a monthly operation report.

c. Disinfection benchmarking.

(1) Significant change to disinfection practice. Any system required to develop a disinfection profile under the provisions of 43.9(2)*"a"* or *"b"* that decides to make a significant change to its disinfection practice must obtain department approval prior to making such change. Significant changes to disinfection practice are:

1. Changes to the point of disinfection;
2. Changes to the disinfectant(s) used in the treatment plant;
3. Changes to the disinfection process; and
4. Any other modification identified by the department.

(2) Calculation of the disinfection benchmark. Any system that is modifying its disinfection practice must calculate its disinfection benchmark using the procedure specified below:

1. For each year of profiling data collected and calculated under 43.9(2)*"b,"* the system must determine the lowest average monthly *Giardia lamblia* inactivation in each year of profiling data. The system must determine the average *Giardia lamblia* inactivation for each calendar month for each year of profiling data by dividing the sum of daily *Giardia lamblia* inactivation by the number of values calculated for that month.

2. The disinfection benchmark is the lowest monthly average value (for systems with one year of profiling data) or average of lowest monthly average values (for systems with more than one year of profiling data) of the monthly logs of *Giardia lamblia* inactivation in each year of profiling data.

(3) A system that uses either chloramines or ozone for primary disinfection must also calculate the disinfection benchmark for viruses using a method approved by the department.

(4) The system must submit the following information to the department as part of its consultation process:

1. A description of the proposed change;
2. The disinfection profile for *Giardia lamblia* (and, if necessary, viruses) under 43.9(2)*"b"* and the disinfection benchmark as required by 43.9(2)*"c"*(2); and
3. An analysis of how the proposed change will affect the current levels of disinfection.

43.9(3) *Filtration.*

a. Conventional filtration treatment or direct filtration.

(1) Turbidity requirement in 95 percent of samples. For systems using conventional filtration or direct filtration, the turbidity level of representative samples of a system's filtered water must be less than or equal to 0.3 NTU in at least 95 percent of the measurements taken each month, measured as specified in 43.5(4)*"a"*(1) and 43.5(4)*"b"*(1).

(2) Maximum turbidity level. The turbidity level of representative samples of a system's filtered water must at no time exceed 1 NTU, measured as specified in 43.5(4)*"a"*(1) and 43.5(4)*"b"*(1).

(3) Systems with lime-softening treatment. A system that uses lime softening may acidify representative samples prior to analysis using a protocol approved by the department.

b. Filtration technologies other than conventional filtration treatment, direct filtration, slow sand filtration, or diatomaceous earth filtration. The department may allow a public water system to use a filtration technology not listed in 43.9(3)*"a"* or 43.5(3)*"c"* or *"d"* if it demonstrates to the department, using pilot plant studies or other means, that the alternative filtration technology, in combination with disinfection treatment that meets the requirements of 43.5(2), consistently achieves 99.9 percent removal or inactivation of *Giardia lamblia* cysts, 99.99 percent removal or inactivation of viruses, and 99 percent removal of *Cryptosporidium* oocysts and the department approves the use of the filtration technology. For each approval, the department will set turbidity performance requirements that the system must meet at least 95 percent of the time and the requirement that the system shall not exceed at any time at a level that consistently achieves 99.9 percent removal or inactivation of *Giardia lamblia* cysts, 99.99 percent removal or inactivation of viruses, and 99 percent removal of *Cryptosporidium* oocysts.

43.9(4) *Filtration sampling requirements.*

a. Monitoring requirements for systems using filtration treatment. In addition to monitoring required by 43.5(4), a public water system subject to the requirements of this rule that provides conventional filtration treatment or direct filtration must conduct continuous monitoring of turbidity for each individual filter using an approved method in 43.5(4)*"a"*(1) and must calibrate turbidimeters using the procedure specified by the manufacturer. Systems must record the results of individual filter monitoring every 15 minutes.

b. Failure of the continuous turbidity monitoring equipment. If there is a failure in the continuous turbidity monitoring equipment, the system must conduct grab sampling every four hours in lieu of continuous monitoring until the turbidimeter is repaired and back online. A system has a maximum of five working days after failure to repair the equipment, or else it is in violation.

43.9(5) *Reporting and record-keeping requirements.* In addition to the reporting and record-keeping requirements in 567—paragraph 42.4(3)*"c,"* a system subject to the requirements of this rule that provides conventional filtration treatment or direct filtration must report monthly to the department the information specified in 43.9(5)*"a"* and *"b"* beginning January 1, 2002. In addition to the reporting and record-keeping requirements in 567—paragraph 42.4(3)*"c,"* a system subject to the requirements of this rule that provides filtration approved under 43.9(3)*"b"* must report monthly to the department the information specified in 43.9(5)*"a"* beginning January 1, 2002. The reporting in 43.9(5)*"a"* is in lieu of the reporting specified in 567—subparagraph 42.4(3)*"c"*(1).

a. Turbidity. Turbidity measurements as required by 43.9(3) must be reported in a format acceptable to the department and within ten days after the end of each month that the system serves water to the public. Information that must be reported includes:

(1) The total number of filtered water turbidity measurements taken during the month;

(2) The number and percentage of filtered water turbidity measurements taken during the month which are less than or equal to the turbidity limits specified in 43.9(3)*"a"* or *"b"*; and

(3) The date and value of any turbidity measurements taken during the month which exceed 1 NTU for systems using conventional filtration treatment or direct filtration or which exceed the maximum level set by the department under 43.9(3)*"b."*

b. Individual filter turbidity monitoring. Systems must maintain the results of individual filter turbidity per monitoring taken under 43.9(4) for at least three years. Systems must report to the department that they have conducted individual filter turbidity monitoring under 43.9(4) within ten days after the end of each month that the system serves water to the public. Systems must report to the department individual filter turbidity measurement results taken under 43.9(4) within ten days after the end of each month that the system serves water to the public only if measurements demonstrate one or more of the conditions specified in 43.9(5)*"b"*(1) through (4). Systems that use lime softening may apply to the department for alternative exceedance levels for the levels specified in 43.9(5)*"b"*(1) through (4) if they can demonstrate that higher turbidity levels in individual filters are due to lime carryover only and not due to degraded filter performance.

(1) For any individual filter that has a measured turbidity level of greater than 1.0 NTU in two consecutive measurements taken 15 minutes apart, the system must report the filter number, the turbidity measurement, and the date(s) on which the exceedance occurred. In addition, the system must either produce a filter profile for the filter within seven days of the exceedance (if the system is not able to identify an obvious reason for the abnormal filter performance) and report that the profile has been produced or report the obvious reason for the exceedance.

(2) For any individual filter that has a measured turbidity level of greater than 0.5 NTU in two consecutive measurements taken 15 minutes apart at the end of the first four hours of continuous filter operation after the filter has been backwashed or otherwise taken offline, the system must report the filter number, the turbidity, and the date(s) on which the exceedance occurred. In addition, the system must either produce a filter profile for the filter within seven days of the exceedance (if the system is not able to identify an obvious reason for the abnormal filter performance) and report that the profile has been produced or report the obvious reason for the exceedance.

(3) For any individual filter that has a measured turbidity level of greater than 1.0 NTU in two consecutive measurements taken 15 minutes apart at any time in each month of three consecutive months, the system must report the filter number, the turbidity measurement, and the date(s) on which the exceedance occurred. In addition, the system must conduct a self-assessment of the filter within 14 days of the exceedance and report that the self-assessment was conducted. The self-assessment must consist of at least the following components: assessment of filter performance; development of a filter profile; identification and prioritization of factors limiting filter performance; assessment of the applicability of corrections; and preparation of a filter self-assessment report.

(4) For any individual filter that has a measured turbidity level of greater than 2.0 NTU in two consecutive measurements taken 15 minutes apart at any time in each month of two consecutive months, the system must report the filter number, the turbidity measurement, and the date(s) on which the exceedance occurred. In addition, the system must arrange for a comprehensive performance evaluation to be conducted by the department or a third party approved by the department no later than 30 days following the exceedance and have the evaluation completed and submitted to the department no later than 90 days following the exceedance.

c. Additional reporting requirement for turbidity combined filter effluent.

(1) If at any time the turbidity exceeds 1 NTU in representative samples of filtered water in a system using conventional filtration treatment or direct filtration, the system must inform the department as soon as possible, but no later than the end of the next business day.

(2) If at any time the turbidity in representative samples of filtered water exceeds the maximum level set by the department under 43.9(3)*"b"* for filtration technologies other than conventional filtration treatment, direct filtration, slow sand filtration, or diatomaceous earth filtration, the system must inform the department as soon as possible, but no later than the end of the next business day.

TABLE A: SEPARATION DISTANCES FROM WELLS

SOURCE OF CONTAMINATION		REQUIRED DISTANCE FROM WELL, IN FEET								
		5	10	25	50	75	100	200	400	1000
WASTEWATER STRUCTURES										
POINT OF DISCHARGE TO GROUND SURFACE	Well house floor drains	A								
	Water treatment plant wastes				A					
	Sanitary & industrial discharges								A	
SEWERS AND DRAINS	Well house floor drains to surface	A-EWM	A-WM	A-WM	A-SP					
	Well house floor drains to sewers			A-WM	A-WM	A-SP	A-SP			
	Water plant wastes			A-WM	A-WM	A-SP	A-SP			
	Sanitary & storm sewers, drains			A-WM	A-WM	A-SP	A-SP			
	Sewer force mains					A-WM	A-WM	A-WM	A-SP	A-SP
LAND DISPOSAL OF WASTES	Land application of solid wastes						D	S		
	Irrigation of wastewater						D	S		
Concrete vaults & septic tanks							D	S		
Mechanical wastewater treatment plants								D	S	
Cesspools & earth pit privies								D	S	
Soil absorption fields								D	S	
Lagoons									D	S
CHEMICALS										
Chemical application to ground surface							D	S		
CHEMICAL AND MINERAL STORAGE	Above ground						D	S		
	On or under ground							D	S	
ANIMALS										
Animal pasturage					A					
Animal enclosure							D	S		

SOURCE OF CONTAMINATION		REQUIRED DISTANCE FROM WELL, IN FEET								
		5	10	25	50	75	100	200	400	1000
ANIMAL WASTES	Land application of solids						D	S		
	Land application of liquid or slurry						D	S		
	Storage tank						D	S		
	Solids stockpile							D	S	
	Storage basin or lagoon								D	S
Earthen silage storage trench or pit							D	S		
MISCELLANEOUS										
Basements, pits, sumps			A							
Flowing streams or other surface water bodies					A					
Cisterns					D		S			
Cemeteries								A		
Private wells								D	S	
Solid waste disposal sites										A

A: All wells
D: Deep wells
S: Shallow wells
EWM: Water main pipe specifications encased in 4" of concrete
SP: Pipe of sewer pipe specifications
WM: Pipe of water main specifications

TABLE B
Minimum Self-Monitoring Requirements
Public Water Supply Systems

[Prior to 12/12/90, appeared in 567—Ch 41, Table D]
[Rescinded IAB 8/11/99, effective 9/15/99]

APPENDIX A: $CT_{99.9}$ TABLES FOR DISINFECTION PROFILING

TABLE 1: CT Values ($CT_{99.9}$) for 99.9 Percent Inactivation of *Giardia lamblia* Cysts by Free Chlorine at 0.5°C or Lower[1]

Free Residual Chlorine, mg/L	pH						
	≤6.0	6.5	7.0	7.5	8.0	8.5	≤9.0
≤0.4	137	163	195	237	277	329	390
0.6	141	168	200	239	286	342	407
0.8	145	172	205	246	295	354	422
1.0	148	176	210	253	304	365	437
1.2	152	180	215	259	313	376	451
1.4	155	184	221	266	321	387	464
1.6	157	189	226	273	329	397	477
1.8	162	193	231	279	338	407	489
2.0	165	197	236	286	346	417	500
2.2	169	201	242	297	353	426	511
2.4	172	205	247	298	361	435	522
2.6	175	209	252	304	368	444	533
2.8	178	213	257	310	375	452	543
3.0	181	217	261	316	382	460	552

[1] These CT values achieve greater than a 99.99 percent inactivation of viruses. Any CT values between the indicated pH values may be determined by linear interpolation. Any CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature and at the higher pH.

TABLE 2: CT Values ($CT_{99.9}$) for 99.9 Percent Inactivation of *Giardia lamblia* Cysts by Free Chlorine at 5.0°C[1]

Free Residual Chlorine, mg/L	pH						
	≤6.0	6.5	7.0	7.5	8.0	8.5	≤9.0
≤0.4	97	117	139	166	198	236	279
0.6	100	120	143	171	204	244	291
0.8	103	122	146	175	210	252	301
1.0	105	125	149	179	216	260	312
1.2	107	127	152	183	221	267	320
1.4	109	130	155	187	227	274	329
1.6	111	132	158	192	232	281	337
1.8	114	135	162	196	238	287	345
2.0	116	138	165	200	243	294	353
2.2	118	140	169	204	248	300	361
2.4	120	143	172	209	253	306	368
2.6	122	146	175	213	258	312	375
2.8	124	148	178	217	263	318	382
3.0	126	151	182	221	268	324	389

[1] These CT values achieve greater than a 99.99 percent inactivation of viruses. Any CT values between the indicated pH values may be determined by linear interpolation. Any CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature and at the higher pH.

TABLE 3: CT Values ($CT_{99.9}$) for 99.9 Percent Inactivation of *Giardia lamblia* Cysts by Free Chlorine at 10.0°C[1]

Free Residual Chlorine, mg/L	pH						
	≤6.0	6.5	7.0	7.5	8.0	8.5	≤9.0
≤0.4	73	88	104	125	149	177	209
0.6	75	90	107	128	153	183	218
0.8	78	92	110	131	158	189	226
1.0	79	94	112	134	162	195	234
1.2	80	95	114	137	166	200	240
1.4	82	98	116	140	170	206	247
1.6	83	99	119	144	174	211	253
1.8	86	101	122	147	179	215	259
2.0	87	104	124	150	182	221	265
2.2	89	105	127	153	186	225	271
2.4	90	107	129	157	190	230	276
2.6	92	110	131	160	194	234	281
2.8	93	111	134	163	197	239	287
3.0	95	113	137	166	201	243	292

[1] These CT values achieve greater than a 99.99 percent inactivation of viruses. Any CT values between the indicated pH values may be determined by linear interpolation. Any CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature and at the higher pH.

TABLE 4: CT Values ($CT_{99.9}$) for 99.9 Percent Inactivation of *Giardia lamblia* Cysts by Free Chlorine at 15.0°C[1]

Free Residual Chlorine, mg/L	pH						
	≤6.0	6.5	7.0	7.5	8.0	8.5	≤9.0
≤0.4	49	59	70	83	99	118	140
0.6	50	60	72	86	102	122	146
0.8	52	61	73	88	105	126	151
1.0	53	63	75	90	108	130	156
1.2	54	64	76	92	111	134	160
1.4	55	65	78	94	114	137	165
1.6	56	66	79	96	116	141	169
1.8	57	68	81	98	119	144	173
2.0	58	69	83	100	122	147	177
2.2	59	70	85	102	124	150	181
2.4	60	72	86	105	127	153	184
2.6	61	73	88	107	129	156	188
2.8	62	74	89	109	132	159	191
3.0	63	76	91	111	134	162	195

[1] These CT values achieve greater than a 99.99 percent inactivation of viruses. Any CT values between the indicated pH values may be determined by linear interpolation. Any CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature and at the higher pH.

TABLE 5: CT Values ($CT_{99.9}$) for 99.9 Percent Inactivation of *Giardia lamblia* Cysts by Free Chlorine at 20.0°C[1]

Free Residual Chlorine, mg/L	pH						
	≤6.0	6.5	7.0	7.5	8.0	8.5	≤9.0
≤0.4	36	44	52	62	74	89	105
0.6	38	45	54	64	77	92	109
0.8	39	46	55	66	79	95	113
1.0	39	47	56	67	81	98	117
1.2	40	48	57	69	83	100	120
1.4	41	49	58	70	85	103	123
1.6	42	50	59	72	87	105	126
1.8	43	51	61	74	89	108	129
2.0	44	52	62	75	91	110	132
2.2	44	53	63	77	93	113	135
2.4	45	54	65	78	95	115	138
2.6	46	55	66	80	97	117	141
2.8	47	56	67	81	99	119	143
3.0	47	57	68	83	101	122	146

[1] These CT values achieve greater than a 99.99 percent inactivation of viruses. Any CT values between the indicated pH values may be determined by linear interpolation. Any CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature and at the higher pH.

TABLE 6: CT Values ($CT_{99.9}$) for 99.9 Percent Inactivation of *Giardia lamblia* Cysts by Free Chlorine at 25.0°C and Higher[1]

Free Residual Chlorine, mg/L	pH						
	≤6.0	6.5	7.0	7.5	8.0	8.5	≤9.0
≤0.4	24	29	35	42	50	59	70
0.6	25	30	36	43	51	61	73
0.8	26	31	37	44	53	63	75
1.0	26	31	37	45	54	65	78
1.2	27	32	38	46	55	67	80
1.4	27	33	39	47	57	69	82
1.6	28	33	40	48	58	70	84
1.8	29	34	41	49	60	72	86
2.0	29	35	41	50	61	74	88
2.2	30	35	42	51	62	75	90
2.4	30	36	43	52	63	77	92
2.6	31	37	44	53	65	78	94
2.8	31	37	45	54	66	80	96
3.0	32	38	46	55	67	81	97

[1] These CT values achieve greater than a 99.99 percent inactivation of viruses. Any CT values between the indicated pH values may be determined by linear interpolation. Any CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature and at the higher pH.

TABLE 7: CT Values ($CT_{99.9}$) for 99.9 Percent Inactivation of *Giardia lamblia* Cysts by Chlorine Dioxide and Ozone[1]

Disinfectant	Temperature, °C					
	<1	5	10	15	20	≥25
Chlorine Dioxide	63	26	23	19	15	11
Ozone	2.9	1.9	1.4	0.95	0.72	0.48

[1] These CT values achieve greater than a 99.99 percent inactivation of viruses. Any CT values between the indicated temperatures may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature for determining $CT_{99.9}$ values between indicated temperatures.

TABLE 8: CT Values ($CT_{99.9}$) for 99.9 Percent Inactivation of *Giardia lamblia* Cysts by Chloramines[1]

Disinfectant	Temperature, °C					
	<1	5	10	15	20	25
Chloramines	3800	2200	1850	1500	1100	750

[1] These values are for pH values of 6 to 9. These CT values may be assumed to achieve greater than 99.99 percent inactivation of viruses only if chlorine is added and mixed in the water prior to the addition of ammonia. If this condition is not met, the system must demonstrate, based on on-site studies or other information, as approved by the department, that the system is achieving at least 99.99 percent inactivation of viruses. Any CT values between the indicated temperatures may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature for determining $CT_{99.9}$ values between indicated temperatures.

These rules are intended to implement Iowa Code sections 455B.171 through 455B.188 and 455B.190 through 455B.192.

[Filed 11/26/90, Notice 6/13/90—published 12/12/90, effective 1/16/91]
[Filed 9/25/92, Notice 6/10/92—published 10/14/92, effective 11/18/92]
[Filed 7/30/93, Notice 5/12/93—published 8/18/93, effective 9/22/93]
[Filed 1/27/95, Notice 10/12/94—published 2/15/95, effective 3/22/95*]
[Filed emergency 8/25/95—published 9/13/95, effective 8/25/95]
[Filed 3/22/96, Notice 11/8/95—published 4/10/96, effective 5/15/96]
[Filed 7/23/99, Notice 4/7/99—published 8/11/99, effective 9/15/99]
[Filed 9/29/00, Notice 6/14/00—published 10/18/00, effective 11/22/00]

*Effective date of 43.2(3)"*b*"(1) to (9) and 43.3(3)"*b*"(1) and (2) delayed until adjournment of the 1995 General Assembly by the Administrative Rules Review Committee at its meeting held March 13, 1995.

CHAPTER 61
WATER QUALITY STANDARDS

[Prior to 7/1/83, DEQ Ch 16]
[Prior to 12/3/86, Water, Air and Waste Management[900]]

567—61.1 Rescinded, effective August 31, 1977.

567—61.2(455B) General considerations.

61.2(1) *Policy statement.* It shall be the policy of the commission to protect and enhance the quality of all the waters of the state. In the furtherance of this policy it will attempt to prevent and abate the pollution of all waters to the fullest extent possible consistent with statutory and technological limitations. This policy shall apply to all point and nonpoint sources of pollution.

These water quality standards establish selected criteria for certain present and future designated uses of the surface waters of the state. The standards establish the areas where these uses are to be protected and provide minimum criteria for waterways having nondesignated uses as well. Many surface waters are designated for more than one use. In these cases the more stringent criteria shall govern for each parameter.

Certain of the criteria are in narrative form without numeric limitations. In applying such narrative standards, decisions will be based on the U.S. Environmental Protection Agency's methodology described in "Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses," (1985) and on the rationale contained in "Quality Criteria for Water," published by the U.S. Environmental Protection Agency (1977), as updated by supplemental Section 304 (of the Act) Ambient Water Quality Criteria documents. To provide human health criteria for parameters not having numerical values listed in 61.3(3) Table 1, the required criteria will be based on the rationale contained in these EPA criteria documents. The human health criterion considered will be the value associated with the consumption of fish flesh and a risk factor of 10^{-5} for carcinogenic parameters. For noncarcinogenic parameters, the recommended EPA criterion will be selected. For Class C water, the EPA criteria for fish and water consumption will be selected using the same considerations for carcinogenic and noncarcinogenic parameters as noted above.

All methods of sample collection, preservation, and analysis used in applying any of the rules in these standards shall be in accord with those prescribed in 567—Chapter 63.

61.2(2) *Antidegradation policy.* It is the policy of the state of Iowa that:

a. Existing surface water uses and the level of water quality necessary to protect the existing uses will be maintained and protected.

b. Chemical integrity: For those water bodies where water quality significantly exceeds levels necessary to protect existing uses and the waters designated as high quality in 61.3(5)*"e,"* that water quality will be maintained at or above existing quality, except when it is determined by the environmental protection commission after public hearing and after intergovernmental coordination and public participation provisions noted in the continuing planning process that there is need to allow a lower chemical quality because of necessary and justifiable economic and social development in the area. The state shall ensure adequate chemical quality to fully protect existing uses.

(1) Bear Creek, mouth in Winneshiek County and tributary to the Upper Iowa River.

(2) Bloody Run, mouth in Clayton County and tributary to the Mississippi River.

(3) Catfish Creek from Swiss Valley Park in Dubuque County to its source.

(4) Unnamed Creek known locally as Coldwater Creek with mouth in Winneshiek County and tributary to the Upper Iowa River.

(5) Fenchel Creek, mouth to Richmond Springs, in Delaware County and tributary to the Maquoketa River.

(6) Odell Branch (aka Fountain Spring Creek), mouth (section 10, T90N, R4W, Delaware County), tributary to Elk Creek, which is tributary to the Turkey River to west line of section 9, T90N, R4W, Delaware County.

(7) Iowa Great Lakes chain of lakes in Dickinson County, including West Lake Okoboji, Spirit Lake, East Lake Okoboji, Minnewashta Lake, Upper Gar Lake, and Lower Gar Lake.

(8) North Bear Creek, with mouth in Winneshiek County and tributary to Bear Creek, listed as number 1 in this listing.

(9) North Cedar Creek, with mouth in Clayton County and tributary to Sny Magill Creek.

(10) Sny Magill Creek, with mouth in Clayton County and tributary to the Mississippi River.

(11) Turkey River, from the point where it is joined by the Volga River in Clayton County to Vernon Springs in Howard County.

(12) Waterloo Creek, with mouth in Allamakee County and tributary to the Upper Iowa River.

(13) Maquoketa River, from confluence with South Fork Maquoketa River (section 16, T90N, R6W, Delaware County) to Highway 3 (north line of section 24, T91N, R7W, Fayette County).

(14) Spring Branch, mouth (section 10, T88N, R5W, Delaware County) to spring source (section 35, T89N, R5W, Delaware County).

(15) Little Turkey River, Clayton-Delaware County line to south line of section 11, T90N, R3W, Delaware County.

(16) Middle Fork Little Maquoketa River (aka Bankston Creek), west line of section 31, T90N, R1E to north line of section 33, T90N, R1W, Dubuque County.

(17) Brush Creek, north line of section 23, T85N, R3E to north line of section 1, T85N, R3E, Jackson County.

(18) Dalton Lake — Jackson County.

(19) Little Mill Creek, mouth (Jackson County) to west line of section 29, T86N, R4E, Jackson County.

(20) Mill Creek (aka Big Mill Creek), from confluence with Little Mill Creek in section 13, T86N, R4E, Jackson County, to confluence with Unnamed Creek, section 1, T86N, R3E, Jackson County.

(21) Unnamed Creek (tributary to Mill Creek), mouth (section 1, T86N, R3E, Jackson County) to west line of section 1, T86N, R3E, Jackson County.

(22) Unnamed Creek (aka South Fork Big Mill), tributary to Mill Creek, from mouth (section 8, T86N, R4E, Jackson County) to west line of section 17, T86N, R4E, Jackson County.

(23) Clear Creek, mouth (Allamakee County) to west line of section 25, T99N, R4W, Allamakee County.

(24) French Creek, mouth (Allamakee County) to east line of section 23, T99N, R5W, Allamakee County.

(25) Hickory Creek, mouth (Allamakee County) to south line of section 28, T96N, R5W, Allamakee County.

(26) Little Paint Creek, mouth to north line of section 30, T97N, R3W, Allamakee County.

(27) Paint Creek, from confluence with Little Paint Creek to road crossing in section 18, T97N, R4W, Allamakee County.

(28) Patterson Creek, mouth (Allamakee County) to east line of section 3, T98N, R6W, Allamakee County.

(29) Silver Creek, mouth (Allamakee County) to south line of section 31, T99N, R5W, Allamakee County.

(30) Village Creek, mouth (Allamakee County) to west line of section 19, T98N, R4W, Allamakee County.

(31) Wexford Creek, mouth to west line of section 25, T98N, R3W, Allamakee County.

(32) Buck Creek, mouth (Clayton County) to west line of section 9, T93N, R3W, Clayton County.

(33) Ensign Creek (aka Ensign Hollow), mouth (section 28, T92N, R6W, Clayton County) to spring source (section 29, T92N, R6W, Clayton County).

(34) South Cedar Creek (aka Cedar Creek), mouth (Clayton County) to north line of section 7, T92N, R3W, Clayton County.

(35) Bear Creek, mouth (Fayette County) to west line of section 6, T92N, R7W, Fayette County.

(36) Unnamed Creek (aka Glover's Creek), mouth to west line of section 15, T94N, R8W, Fayette County.

(37) Grannis Creek, mouth to west line of section 36, T93N, R8W, Fayette County.

(38) Mink Creek, mouth to west line of section 15, T93N, R7W, Fayette County.

(39) Otter Creek, mouth (Fayette County) to confluence with Unnamed Creek (aka Glover's Creek) in section 22, T94N, R8W, Fayette County.

(40) Nichols Creek (aka Bigalk Creek), mouth (section 18, T100N, R10W, Winneshiek County) to west line of section 23, T100N, R11W, Howard County.

(41) Spring Creek, mouth (Mitchell County) to north line of section 8, T97N, R16W, Mitchell County.

(42) Turtle Creek, mouth (Mitchell County) to east line of section 7, T99N, R17W, Mitchell County.

(43) Wapsipinicon River, from the town of McIntire to north line of section 20, T99N, R15W, Mitchell County.

(44) Bohemian Creek, mouth (Winneshiek County) to Howard County Road 58 (west line of section 2, T97N, R11W, Howard County).

(45) Coon Creek, mouth (Winneshiek County) to road crossing in section 13, T98N, R7W, Winneshiek County.

(46) Smith Creek (aka Trout River), mouth to south line of section 33, T98N, R7W, Winneshiek County.

(47) Unnamed Stream (aka Trout Run), mouth to south line of section 27, T98N, R8W, Winneshiek County.

(48) Twin Springs Creek, mouth to springs in Twin Springs Park in section 20, T98N, R8W, Winneshiek County.

(49) Canoe Creek (aka West Canoe Creek), from Winneshiek County Road W38 to west line of section 8, T99N, R8W, Winneshiek County.

c. Standards and restrictions more stringent than those applied to other waters may be applied by the commission to those waters listed below when it is determined that such more stringent standards and restrictions are necessary to fully maintain water quality at existing levels.

West Lake Okoboji in Dickinson County.

d. The Mississippi River and the Missouri River do not meet the criteria of 61.2(2)*"c"* but nevertheless constitute waters of exceptional state and national significance. Water quality management decisions will be made in consideration of the exceptional value of the resource.

e. In furtherance of the policy stated in 61.2(2)*"b,"* there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources, and feasible management and regulatory programs pursuant to Section 208 of the Federal Water Pollution Control Act for nonpoint sources, both existing and proposed.

f. Physical and biological integrity: The waters designated as high-quality resource waters in 61.3(5)*"e"* will receive protection of existing uses through maintaining water quality levels necessary to fully protect existing uses or improve water quality to levels necessary to meet the designated use criterion in Tables 1, 2 and 3 and at preserving or enhancing the physical and biological integrity of these waters. This involves the protection of such features of the water body as channel alignment, bed characteristics, water velocity, aquatic habitat, and the type, distribution and abundance of existing aquatic species.

g. It is the intent of the antidegradation policy to protect and maintain the existing physical, biological, and chemical integrity of all waters of the state. Consistency with Iowa's water quality standards requires that any proposed activity modifying the existing physical, biological, or chemical integrity of a water of the state shall not adversely impact these resource attributes, either on an individual or cumulative basis. An adverse impact shall refer to the loss of or irreparable damage to the aquatic, semiaquatic or wildlife habitat or population, or a modification to the water body that would cause an overall degradation to the aquatic or wildlife population and diversity. The fish and wildlife division of the department and the U.S. Fish and Wildlife Service shall serve as consultants to the department for assessing impacts. Exceptions to the preceding will be allowed only if full mitigation is provided by the applicant and approved by the department.

For those waters of the state designated as high quality or high quality resource waters and the Mississippi and Missouri Rivers, any proposed activity that will adversely impact the existing physical, chemical, or biological integrity of that water will not be consistent with Iowa's water quality standards. Mitigation will not be allowed except in highly unusual situations where no other project alternatives exist. In these cases, full mitigation must be provided by the applicant and approved by the department.

h. This policy shall be applied in conjunction with water quality certification review pursuant to Section 401 of the Act. In the event that activities are specifically exempted from flood plain development permits or any other permits issued by this department in 567—Chapters 70, 71, and 72, the activity will be considered consistent with this policy. Other activities not otherwise exempted will be subject to 567—Chapters 70, 71, and 72 and this policy. The repair and maintenance of a drainage district ditch as defined in 567—70.2(455B,481A) will not be considered a violation of the antidegradation policy for the purpose of implementing Title IV of these rules. United States Army Corps of Engineers (Corps) nationwide permits 3, 4, 5, 6, 7, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 25, 27, 29, 30, 31, 32, 33, 34, 36, 37, 38, 39, 40, 41, 42, 43, and 44 as promulgated March 9, 2000, are certified pursuant to Section 401 of the Clean Water Act. Regional permit numbers 2, 7, 12, and 20 of the Rock Island District of the Corps are also certified. No specific Corps permit or 401 certification is required for activities covered by these permits unless required by the nationwide permit or the Corps, and the activities are allowed subject to the terms of the nationwide and regional permits.

61.2(3) *Minimum treatment required.* All wastes discharged to the waters of the state must be of such quality that the discharge will not cause the narrative or numeric criteria limitations to be exceeded. Where the receiving waters provide sufficient assimilative capacity that the water quality standards are not the limiting factor, all point source wastes shall receive treatment in compliance with minimum effluent standards as adopted in rules by the department.

There are numerous parameters of water quality associated with nonpoint source runoff which are of significance to the designated water uses specified in the general and specific designations in 61.3(455B), but which are not delineated. It shall be the intent of these standards that the limits on such nonpoint source related parameters when adopted shall be those that can be achieved by best management practices as defined in the course of the continuing planning process from time to time. Existing water quality and nonpoint source runoff control technology will be evaluated in the course of the Iowa continuing planning process, and best management practices and limitations on specific water quality parameters will be reviewed and revised from time to time to ensure that the designated water uses and water quality enhancement goals are met.

61.2(4) *Regulatory mixing zones.* Mixing zones are recognized as being necessary for the initial assimilation of point source discharges which have received the required degree of treatment or control. Mixing zones shall not be used for, or considered as, a substitute for minimum treatment technology required by subrule 61.2(3). The objective of establishing mixing zones is to provide a means of control over the placement and emission of point source discharges so as to minimize environmental impacts. Waters within a mixing zone shall meet the general water quality criteria of subrule 61.3(2). Waters at and beyond mixing zone boundaries shall meet all applicable standards and the chronic and human health criteria of subrule 61.3(3), Tables 1 and 3, for that particular water body or segment. A zone of initial dilution may be established within the mixing zone beyond which the applicable standards and the acute criteria of subrule 61.3(3) will be met. For waters designated under subrule 61.3(5), any parameter not included in Tables 1, 2 and 3 of subrule 61.3(3), the chronic and human health criteria, and the acute criterion calculated following subrule 61.2(1), will be met at the mixing zone and zone of initial dilution boundaries, respectively.

a. Due to extreme variations in wastewater and receiving water characteristics, spatial dimensions of mixing zones shall be defined on a site-specific basis. These rules are not intended to define each individual mixing zone, but will set maximum limits which will satisfy most biological, chemical, physical and radiological considerations in defining a particular mixing zone. Additional details are noted in the "Supporting Document for Iowa Water Quality Management Plans," Chapter IV, July 1976, as revised on November 8, 2000, for considering unusual site-specific features such as side channels and sand bars which may influence a mixing zone. Applications for operation permits under 567—subrule 64.3(1) may be required to provide specific information related to the mixing zone characteristics below their outfall so that mixing zone boundaries can be determined.

b. For parameters included in Table 1 only (which does not include ammonia nitrogen), the dimensions of the mixing zone and the zone of initial dilution will be calculated using a mathematical model presented in the "Supporting Document for Iowa Water Quality Management Plans," Chapter IV, July 1976, as revised on November 8, 2000, or from instream studies of the mixing characteristics during low flow. In addition, the most restrictive of the following factors will be met:

(1) The stream flow in the mixing zone may not exceed the most restrictive of the following:

1. Twenty-five percent of the design low stream flows noted in subrule 61.2(5) for interior streams and rivers, and the Big Sioux and Des Moines Rivers.
2. Ten percent of the design low stream flows noted in subrule 61.2(5) for the Mississippi and Missouri Rivers.
3. The stream flow contained in the mixing zone at the most restrictive of the applicable mixing zone length criteria, noted below.

(2) The length of the mixing zone below the point of discharge shall be set by the most restrictive of the following:

1. The distance to the juncture of two perennial streams.
2. The distance to a public water supply intake.
3. The distance to the upstream limits of an established recreational area, such as public beaches, and state, county and local parks.
4. The distance to the middle of a crossover point in a stream where the main current flows from one bank across to the opposite bank.
5. The distance to another mixing zone.
6. Not to exceed a distance of 2000 feet.
7. The location where the mixing zone contained the percentages of stream flow noted in 61.2(4)*"b"*(1).

(3) The width of the mixing zone is calculated as the portion of the stream containing the allowed mixing zone stream flow. The mixing zone width will be measured perpendicular to the basic direction of stream flow at the downstream boundary of the mixing zone. This measurement will only consider the distance of continuous water surface.

(4) The width and length of the zone of initial dilution may not exceed 10 percent of the width and length of the mixing zone.

c. The stream flow used in determining wasteload allocations to ensure compliance with the maximum contaminant level (MCL), chronic and human health criteria of Table 1 will be that value contained at the boundary of the allowed mixing zone. This stream flow may not exceed the following percentages of the design low stream flow as measured at the point of discharge:

(1) Twenty-five percent for interior streams and rivers, and the Big Sioux and Des Moines Rivers.

(2) Ten percent for the Mississippi and Missouri Rivers.

The stream flow in the zone of initial dilution used in determining effluent limits to ensure compliance with the acute criteria of Table 1 may not exceed 10 percent of the calculated flow associated with the mixing zone.

d. For toxic parameters noted in Table 1, the following exceptions apply to the mixing zone requirements:

(1) No mixing zone or zone of initial dilution will be allowed for waters designated as lakes or wetlands.

(2) No zone of initial dilution will be allowed in waters designated as cold water.

(3) The use of a diffuser device to promote rapid mixing of an effluent in a receiving stream will be considered on a case-by-case basis with its usage as a means for dischargers to comply with an acute numerical criterion.

(4) A discharger to interior streams and rivers, the Big Sioux and Des Moines Rivers, and the Mississippi or Missouri Rivers may provide to the department, for consideration, instream data which technically supports the allowance of an increased percentage of the stream flow contained in the mixing zone due to rapid and complete mixing. Any allowed increase in mixing zone flow would still be governed by the mixing zone length restrictions. The submission of data should follow the guidance provided in the "Supporting Document for Iowa Water Quality Management Plans," Chapter IV, July 1976, as revised on November 8, 2000.

e. For ammonia criteria noted in Table 3, the dimensions of the mixing zone and the zone of initial dilution will be calculated using a mathematical model presented in the "Supporting Document for Iowa Water Quality Management Plans," Chapter IV, July 1976, as revised on November 8, 2000, or from instream studies of the mixing characteristics during low flow. In addition, the most restrictive of the following factors will be met:

(1) The stream flow in the mixing zone may not exceed the most restrictive of the following:

1. One hundred percent of the design low stream flows noted in subrule 61.2(5) for locations where the dilution ratio is less than or equal to 2:1.

2. Fifty percent of the design low stream flows noted in subrule 61.2(5) for locations where the dilution ratio is greater than 2:1, but less than or equal to 5:1.

3. Twenty-five percent of the design low stream flows noted in subrule 61.2(5) for locations where the dilution ratio is greater than 5:1.

4. The stream flow contained in the mixing zone at the most restrictive of the applicable mixing zone length criteria, noted below.

(2) The length of the mixing zone below the point of discharge shall be set by the most restrictive of the following:

1. The distance to the juncture of two perennial streams.

2. The distance to a public water supply intake.

3. The distance to the upstream limits of an established recreational area, such as public beaches, and state, county, and local parks.

4. The distance to the middle of a crossover point in a stream where the main current flows from one bank across to the opposite bank.

5. The distance to another mixing zone.

6. Not to exceed a distance of 2000 feet.

7. The location where the mixing zone contained the percentages of stream flow noted in 61.2(4)*"e"*(1).

(3) The width of the mixing zone is calculated as the portion of the stream containing the allowed mixing zone stream flow. The mixing zone width will be measured perpendicular to the basic direction of stream flow at the downstream boundary of the mixing zone. This measurement will only consider the distance of continuous water surface.

(4) The width and length of the zone of initial dilution may not exceed 10 percent of the width and length of the mixing zone.

f. For ammonia criteria noted in Table 3, the stream flow used in determining wasteload allocations to ensure compliance with the chronic criteria of Table 3 will be that value contained at the boundary of the allowed mixing zone. This stream flow may not exceed the percentages of the design low stream flow noted in 61.2(4)*"e"*(1) as measured at the point of discharge.

The pH and temperature values at the boundary of the mixing zone used to select the chronic ammonia criteria of Table 3 will be from one of the following sources. The source of the pH and temperature data will follow the sequence listed below, if applicable data exists from the source.

(1) Specific pH and temperature data provided by the applicant gathered at their mixing zone boundary. Procedures for obtaining this data are noted in the "Supporting Document for Iowa Water Quality Management Plans," Chapter IV, July 1976, as revised on November 8, 2000.

(2) Regional background pH and temperature data provided by the applicant gathered along the receiving stream and representative of the background conditions at the outfall. Procedures for obtaining this data are noted in the "Supporting Document for Iowa Water Quality Management Plans," Chapter IV, July 1976, as revised on November 8, 2000.

(3) The statewide average background values presented in Table IV-5 of the "Supporting Document for Iowa Water Quality Management Plans," Chapter IV, July 1976, as revised on November 8, 2000.

The stream flow in the zone of initial dilution used in determining effluent limits to ensure compliance with the acute criteria of Table 3 may not exceed 5 percent of the calculated flow associated with the mixing zone for facilities with a dilution ratio of less than or equal to 2:1, and not exceed 10 percent of the calculated flow associated with the mixing zone for facilities with a dilution ratio of greater than 2:1. The pH and temperature values at the boundary of the zone of initial dilution used to select the acute ammonia criteria of Table 3 will be from one of the following sources and follow the sequence listed below, if applicable data exists from the source.

1. Specific effluent pH and temperature data if the dilution ratio is less than or equal to 2:1.

2. If the dilution ratio is greater than 2:1, the logarithmic average pH of the effluent and the regional or statewide pH provided in 61.2(4)*"f"* will be used. In addition, the flow proportioned average temperature of the effluent and the regional or statewide temperature provided in 61.2(4)*"f"* will be used. The procedures for calculating these data are noted in the "Supporting Document for Iowa Water Quality Management Plans," Chapter IV, July 1976, as revised on November 8, 2000.

g. For ammonia criteria noted in Table 3, the following exceptions apply to the mixing zone requirements.

(1) No mixing zone or zone of initial dilution will be allowed for waters designated as lakes or wetlands.

(2) No zone of initial dilution will be allowed in waters designated as cold water.

(3) The use of a diffuser device to promote rapid mixing of an effluent in a receiving stream will be considered on a case-by-case basis with its usage as a means for dischargers to comply with an acute numerical criterion.

(4) A discharger to interior streams and rivers, the Big Sioux and Des Moines Rivers, and the Mississippi and Missouri Rivers may provide to the department, for consideration, instream data which technically supports the allowance of an increased percentage of the stream flow contained in the mixing zone due to rapid and complete mixing. Any allowed increase in mixing zone flow would still be governed by the mixing zone length restrictions. The submission of data should follow the guidance provided in the "Supporting Document for Iowa Water Quality Management Plans," Chapter IV, July 1976, as revised on November 8, 2000.

h. Temperature changes within mixing zones established for heat dissipation will not exceed the temperature criteria in 61.3(3)*"b"*(5).

i. The appropriateness of establishing a mixing zone where a substance discharged is bioaccumulative, persistent, carcinogenic, mutagenic, or teratogenic will be carefully evaluated. In such cases, effects such as potential groundwater contamination, sediment deposition, fish attraction, bioaccumulation in aquatic life, bioconcentration in the food chain, and known or predicted safe exposure levels shall be considered.

61.2(5) *Implementation strategy.* Numerical criteria specified in these water quality standards shall be met when the flow of the receiving stream equals or exceeds the design low flows noted below.

Type of Numerical Criteria	Design Low Flow Regime
Aquatic Life Protection (TOXICS)	
Acute	$1Q_{10}$
Chronic	$7Q_{10}$
Aquatic Life Protection (AMMONIA - N)	
Acute	$1Q_{10}$
Chronic	$30Q_{10}$
Human Health Protection & MCL	
Noncarcinogenic	$30Q_5$
Carcinogenic	Harmonic mean

Exceptions may be made for intermittent or low flow streams classified as significant resource warm waters or limited resource warm waters. For these waters, the department may waive the design low flow requirement and establish a minimum flow in lieu thereof. Such waiver shall be granted only when it has been determined that the aquatic resources of the receiving waters are of no significance at flows less than the established minimum, and that the continued maintenance of the beneficial uses of the receiving waters will be ensured. In no event will toxic conditions be allowed to occur in the receiving waters outside of mixing zones established pursuant to subrule 61.2(4). The policy for granting waivers is described in the "Supporting Document for Iowa Water Quality Management Plans," Chapter IV, July 1976, as revised on November 8, 2000. (Copies are available upon request to the Department of Natural Resources, Henry A. Wallace Building, 900 East Grand, Des Moines, Iowa 50319-0034. Copy also on file with the Iowa Administrative Rules Coordinator.)

All minimum flows established under the provisions of this rule will be published by the department. The minimum flows, commonly termed protected flows, are presented in "Iowa Water Quality Standards: Protected Flows For Selected Stream Segments," dated April 1, 1996. A copy of this document is available upon request from the department. A copy is also on file with the Iowa Administrative Rules Coordinator.

a. The allowable 3°C temperature increase criterion for warm water interior streams, 61.3(3)*"f"*(1), is based in part on the need to protect fish from cold shock due to rapid cessation of heat source and resultant return of the receiving stream temperature to natural background temperature. On low flow streams, in winter, during certain conditions of relatively cold background stream temperature and relatively warm ambient air and groundwater temperature, certain wastewater treatment plants with relatively constant flow and constant temperature discharges will cause temperature increases in the receiving stream greater than allowed in 61.3(3)*"f"*(1).

b. During the period November 1 to March 31, for the purpose of applying the 3°C temperature increase criterion, the minimum protected receiving stream flow rate below such discharges may be increased to not more than three times the rate of flow of the discharge, where there is reasonable assurance that the discharge is of such constant temperature and flow rate and continuous duration as to not constitute a threat of heat cessation and not cause the receiving stream temperature to vary more than 3°C per day.

c. Site-specific water quality criteria may be allowed in lieu of the specific numerical criteria listed in Tables 1 and 3 of this chapter if adequate documentation is provided to show that the proposed criteria will protect all existing or potential uses of the surface water. Site-specific water quality criteria may be appropriate where:

(1) The types of organisms differ significantly from those used in setting the statewide criteria; or

(2) The chemical characteristics of the surface water such as pH, temperature, and hardness differ significantly from the characteristics used in setting the statewide criteria.

Development of site-specific criteria shall include an evaluation of the chemical and biological characteristics of the water resource and an evaluation of the impact of the discharge. All evaluations for site-specific criteria modification must be coordinated through the department, and be conducted using scientifically accepted procedures approved by the department. Any site-specific criterion developed under the provisions of this subrule is subject to the review and approval of the U.S. Environmental Protection Agency. All criteria approved under the provisions of this subrule will be published periodically by the department. Guidelines for establishing site-specific water quality criteria can be found in "Water Quality Standards Handbook," published by the U.S. Environmental Protection Agency, December 1983.

d. A wastewater treatment facility may submit to the department technically valid instream data which provides additional information to be used in the calculations of their wasteload allocations and effluent limitations. This information would be in association with the low flow characteristics, width, length and time of travel associated with the mixing zone or decay rates of various effluent parameters. The wasteload allocation will be calculated considering the applicable data and consistent with the provisions and restrictions in the rules.

567—61.3(455B) Surface water quality criteria.

61.3(1) *Surface water classification.* All waters of the state are classified for protection of beneficial uses. These classified waters include general use segments and designated use segments.

a. General use segments. These are intermittent watercourses and those watercourses which typically flow only for short periods of time following precipitation in the immediate locality or as a result of discharges from wastewater treatment facilities, and whose channels are normally above the water table. These waters do not support a viable aquatic community of significance during low flow, and do not maintain pooled conditions during periods of no flow.

However, during periods when sufficient flow exists in the intermittent watercourses to support various uses, the general use segments are to be protected for livestock and wildlife watering, noncontact recreation, crop irrigation, and industrial, agricultural, domestic and other incidental water withdrawal uses. The aquatic life existing within these watercourses during elevated flows will be protected from acutely toxic conditions.

b. Designated use segments. These are water bodies which maintain flow throughout the year, or contain sufficient pooled areas during intermittent flow periods to maintain a viable aquatic community of significance.

Designated use waters are to be protected for all uses of general use segments in addition to the specific uses assigned. Designated use segments include:

(1) Primary contact recreation (Class "A"). Waters in which recreational or other uses may result in prolonged and direct contact with the water, involving considerable risk of ingesting water in quantities sufficient to pose a health hazard. Such activities would include, but not be limited to, swimming, diving, water skiing, and water contact recreational canoeing.

(2) Cold water aquatic life (Class "B(CW)"). Waters in which the temperature, flow, and other habitat characteristics are suitable for the maintenance of a wide variety of cold water species, including nonreproducing populations of trout and associated aquatic communities.

(3) High quality water (Class "HQ"). Waters with exceptionally better quality than the levels specified in Tables 1, 2 and 3 and with exceptional recreational and ecological importance. Special protection is warranted to maintain the unusual, unique or outstanding physical, chemical, or biological characteristics which these waters possess.

(4) High quality resource water (Class "HQR"). Waters of substantial recreational or ecological significance which possess unusual, outstanding or unique physical, chemical, or biological characteristics which enhance the beneficial uses and warrant special protection.

(5) Significant resource warm water (Class "B(WW)"). Waters in which temperature, flow and other habitat characteristics are suitable for the maintenance of a wide variety of reproducing populations of warm water fish and associated aquatic communities, including sensitive species.

(6) Limited resource warm water (Class "B(LR)"). Waters in which flow or other physical characteristics limit the ability of the water body to maintain a balanced warm water community. Such waters support only populations composed of species able to survive and reproduce in a wide range of physical and chemical conditions, and are not generally harvested for human consumption.

(7) Lakes and wetlands (Class "B(LW)"). These are artificial and natural impoundments with hydraulic retention times and other physical and chemical characteristics suitable to maintain a balanced community normally associated with lake-like conditions.

(8) Drinking water supply (Class "C"). Waters which are used as a raw water source of potable water supply.

61.3(2) *General water quality criteria.* The following criteria are applicable to all surface waters including general use and designated use waters, at all places and at all times to protect livestock and wildlife watering, aquatic life, noncontact recreation, crop irrigation, and industrial, domestic, agricultural and other incidental water withdrawal uses not protected by the specific numerical criteria of subrule 61.3(3).

a. Such waters shall be free from substances attributable to point source wastewater discharges that will settle to form sludge deposits.

b. Such waters shall be free from floating debris, oil, grease, scum and other floating materials attributable to wastewater discharges or agricultural practices in amounts sufficient to create a nuisance.

c. Such waters shall be free from materials attributable to wastewater discharges or agricultural practices producing objectionable color, odor or other aesthetically objectionable conditions.

d. Such waters shall be free from substances attributable to wastewater discharges or agricultural practices in concentrations or combinations which are acutely toxic to human, animal, or plant life.

e. Such waters shall be free from substances, attributable to wastewater discharges or agricultural practices, in quantities which would produce undesirable or nuisance aquatic life.

f. The turbidity of the receiving water shall not be increased by more than 25 Nephelometric turbidity units by any point source discharge.

g. Total dissolved solids shall not exceed 750 mg/l in any lake or impoundment or in any stream with a flow rate equal to or greater than three times the flow rate of upstream point source discharges.

h. Water which enters a sinkhole or losing stream segment shall not exceed a fecal coliform content of 200 organisms/100 ml, except when the waters are materially affected by surface runoff; but in no case shall fecal coliform levels downstream from an existing discharge which may contain pathogens to humans be more than 200 organisms/100 ml higher than the background level upstream from the discharge. No new wastewater discharges will be allowed on watercourses which directly or indirectly enter sinkholes or losing stream segments.

61.3(3) *Specific water quality criteria.*

a. Class "A" waters. Waters which are designated as Class "A" in subrule 61.3(5) are to be protected for primary contact recreation. The general criteria of subrule 61.3(2) and the following specific criteria apply to all Class "A" waters.

(1) From April 1 through October 31, the fecal coliform content shall not exceed 200 organisms/100 ml, except when the waters are materially affected by surface runoff; but in no case shall fecal coliform levels downstream from a discharge which may contain pathogens to humans be more than 200 organisms/100 ml higher than the background level upstream from the discharge.

(2) The pH shall not be less than 6.5 nor greater than 9.0. The maximum change permitted as a result of a waste discharge shall not exceed 0.5 pH units.

b. Class "B" waters. All waters which are designated as Class B(CW), B(WW), B(LR), or B(LW) are to be protected for wildlife, fish, aquatic and semiaquatic life, and secondary contact water uses. The following criteria shall apply to all Class "B" waters designated in subrule 61.3(5).

(1) Dissolved oxygen. Dissolved oxygen shall not be less than the values shown in Table 2 of this subrule.

(2) pH. The pH shall not be less than 6.5 nor greater than 9.0. The maximum change permitted as a result of a waste discharge shall not exceed 0.5 pH units.

(3) General chemical constituents. The specific numerical criteria shown in Tables 1, 2, and 3 of this subrule apply to all waters designated in subrule 61.3(5). The sole determinant of compliance with these criteria will be established by the department on a case-by-case basis. Effluent monitoring or instream monitoring, or both, will be the required approach to determine compliance.

1. The acute criteria represent the level of protection necessary to prevent acute toxicity to aquatic life. Instream concentrations above the acute criteria will be allowed only within the boundaries of the zone of initial dilution.

2. The chronic criteria represent the level of protection necessary to prevent chronic toxicity to aquatic life. Excursions above the chronic criteria will be allowed only inside of mixing zones or only for short-term periods outside of mixing zones; however, these excursions cannot exceed the acute criteria shown in Tables 1 and 3. The chronic criteria will be met as short-term average conditions at all times the flow equals or exceeds either the design flows noted in subrule 61.2(5) or any site-specific low flow established under the provisions of subrule 61.2(5).

3. The human health criteria represent the level of protection necessary, in the case of noncarcinogens, to prevent adverse health effects in humans, and in the case of carcinogens, to prevent a level of incremental cancer risk not exceeding 1 in 100,000. Instream concentrations in excess of the human health criteria will be allowed only within the boundaries of the mixing zone.

(4) The waters shall contain no substances in concentrations which will make fish or shellfish inedible due to undesirable tastes or cause a hazard to humans after consumption.

(5) Temperature.

1. No heat shall be added to interior streams or the Big Sioux River that would cause an increase of more than 3°C. The rate of temperature change shall not exceed 1°C per hour. In no case shall heat be added in excess of that amount that would raise the stream temperature above 32°C.

2. No heat shall be added to streams designated as cold water fisheries that would cause an increase of more than 2°C. The rate of temperature change shall not exceed 1°C per hour. In no case shall heat be added in excess of that amount that would raise the stream temperature above 20°C.

3. No heat shall be added to lakes and reservoirs that would cause an increase of more than 2°C. The rate of temperature change shall not exceed 1°C per hour. In no case shall heat be added in excess of that amount that would raise the temperature of the lake or reservoirs above 32°C.

4. No heat shall be added to the Missouri River that would cause an increase of more than 3°C. The rate of temperature change shall not exceed 1°C per hour. In no case shall heat be added that would raise the stream temperature above 32°C.

5. No heat shall be added to the Mississippi River that would cause an increase of more than 3°C. The rate of temperature change shall not exceed 1°C per hour. In addition, the water temperature at representative locations in the Mississippi River shall not exceed the maximum limits in the table below during more than 1 percent of the hours in the 12-month period ending with any month. Moreover, at no time shall the water temperature at such locations exceed the maximum limits in the table below by more than 2°C.

Zone II—Iowa-Minnesota state line to the northern Illinois border (Mile Point 1534.6).

Zone III—Northern Illinois border (Mile Point 1534.6) to Iowa-Missouri state line.

Month	Zone II	Zone III
January	4°C	7°C
February	4°C	7°C
March	12°C	14°C
April	18°C	20°C
May	24°C	26°C
June	29°C	29°C
July	29°C	30°C
August	29°C	30°C
September	28°C	29°C
October	23°C	24°C
November	14°C	18°C
December	9°C	11°C

(6) Early life stage for each use designation. The following seasons will be used in applying the early life stage present chronic criteria noted in Table 3b, "Chronic Criterion for Ammonia in Iowa Streams - Early Life Stages Present."

1. For all Class B(CW) waters, the early life stage will be year-round.

2. For all Class B(WW) significant resource waters, the early life stage will begin in March and last through September except the following:

- For the following, the early life stage will begin in February and last through September:

—The entire length of the Mississippi and Missouri Rivers,

—The lower reach of the Des Moines River south of the Ottumwa dam, and

—The lower reach of the Iowa River below the Cedar River.

- For the following, the early life stage will begin in April and last through September:

—All Class B(WW) waters in the Southern Iowa River Basin,

—All of the Class B(WW) reach of the Skunk River, the North Skunk River and the South Skunk River south of Indian Creek (Jasper County), and the Class B(WW) tributaries to these reaches, and

—The entire Class B(WW) reach of the English River.

3. For all Class B(LR) waters, the early life stage will begin in April and last through September.

4. For all Class B(LW) lake and wetland waters, the early life stage will begin in March and last through September except for the Class B(LW) waters in the southern two tiers of Iowa counties which will have the early life stage of April through September.

c. Class "C" waters. Waters which are designated as Class "C" are to be protected as a raw water source of potable water supply. The following criteria shall apply to all Class "C" waters designated in subrule 61.3(5).

(1) Radioactive substances.

1. The combined radium-226 and radium-228 shall not exceed 5 picocuries per liter at the point of withdrawal.

2. Gross alpha particle activity (including radium-226 but excluding radon and uranium) shall not exceed 15 picocuries per liter at the point of withdrawal.

3. The average annual concentration at the point of withdrawal of beta particle and photon radioactivity from man-made radionuclides other than tritium and strontium-90 shall not produce an annual dose equivalent to the total body or any internal organ greater than 4 millirem/year.

4. The average annual concentration of tritium shall not exceed 20,000 picocuries per liter at the point of withdrawal; the average annual concentration of strontium-90 shall not exceed 8 picocuries per liter at the point of withdrawal.

(2) All substances toxic or detrimental to humans or detrimental to treatment process shall be limited to nontoxic or nondetrimental concentrations in the surface water.

(3) The pH shall not be less than 6.5 nor greater than 9.0.

TABLE 1. Criteria for Chemical Constituents
(all values as micrograms per liter unless noted otherwise)

Human health criteria for carcinogenic parameters noted below were based on the prevention of an incremental cancer risk of 1 in 100,000. For parameters not having a noted human health criterion, the U.S. Environmental Protection Agency has not developed final national guideline values. For noncarcinogenic parameters, the recommended EPA criterion was selected. For Class C waters, the EPA criteria for fish and water consumption were selected using the same considerations for carcinogenic and noncarcinogenic parameters as noted above. For Class C waters for which no EPA human health criteria were available, the EPA MCL value was selected.

		Use Designations				
Parameter		B(CW)	B(WW)	B(LR)	B(LW)	C
Alachlor	MCL	—	—	—	—	2
Aluminum	Chronic	87	388	773	748	—
	Acute	1106	4539	9035	983	—
Antimony	Human Health + — F & W	—	—	—	—	14
Arsenic (III)	Chronic	200	200	1000	200	—
	Acute	360	360	1800	360	—
	Human Health — Fish	50	50	—	50	—
	Human Health — F & W	—	—	—	—	.18
Asbestos	Human Health — F & W	—	—	—	—	7[a]
Atrazine	MCL	—	—	—	—	3

Parameter		Use Designations B(CW)	B(WW)	B(LR)	B(LW)	C
Barium	Human Health + — F & W	—	—	—	—	1000
Benzene	Human Health — F & W	—	—	—	—	12
	Human Health — Fish	712.8	712.8	—	712.8	—
Benzo(a)Pyrene	Human Health — F & W	—	—	—	—	.044
Beryllium	MCL	—	—	—	—	4
Cadmium	Chronic	1	15	25	1	—
	Acute	4	75	100	4	—
	Human Health + — Fish	168	168	—	168	—
	MCL	—	—	—	—	5
Carbofuran	MCL	—	—	—	—	40
Carbon Tetrachloride	Human Health — F & W	—	—	—	—	2.5
	Human Health — Fish	44.2	44.2	—	44.2	—
Chlordane	Chronic	.004	.004	.15	.004	—
	Acute	2.5	2.5	2.5	2.5	—
	Human Health — Fish	.006	.006	—	.006	—
	Human Health — F & W	—	—	—	—	.021
Chloride	MCL	—	—	—	—	250*
Chlorobenzene	Human Health + — Fish	20	20	—	20	—
	Human Health + — F & W	—	—	—	—	680
Chloropyrifos	Chronic	.041	.041	.041	.041	—
	Acute	.083	.083	.083	.083	—
Chromium (VI)	Chronic	40	40	200	10	—
	Acute	60	60	300	15	—
	Human Health + — Fish	3365	3365	—	3365	—
	MCL	—	—	—	—	100
Copper	Chronic	20	35	55	10	—
	Acute	30	60	90	20	—
	Human Health + — Fish	1000	1000	—	1000	—
	Human Health + — F & W	—	—	—	—	1300
Cyanide	Chronic	5	10	10	10	—
	Acute	20	45	45	45	—
	Human Health + — F & W	—	—	—	—	700

Parameter		Use Designations B(CW)	B(WW)	B(LR)	B(LW)	C
Dalapon	MCL	—	—	—	—	200
Dibromochloropropane	MCL	—	—	—	—	.2
4,4-DDT + +	Chronic	.001	.001	.029	.001	—
	Acute	.9	.8	.95	.55	—
	Human Health — Fish	.0059	.0059	—	.0059	—
	Human Health — F & W	—	—	—	—	.0059
o-Dichlorobenzene	MCL	—	—	—	—	600
para-Dichlorobenzene	Human Health + — F & W	—	—	—	—	400
	Human Health + — Fish	2.6*	2.6*	—	2.6*	—
3,3-Dichlorobenzidine	Human Health — Fish	.2	.2	—	.2	—
	Human Health — F & W	—	—	—	—	.4
1,2-Dichloroethane	Human Health — F & W	—	—	—	—	3.8
	Human Health — Fish	986	986	—	986	—
1,1-Dichloroethylene	Human Health — F & W	—	—	—	—	.57
	Human Health — Fish	32	32	—	32	—
cis-1,2-Dichloroethylene	MCL	—	—	—	—	70
trans-1,2-Dichlorethylene	Human Health + — F & W	—	—	—	—	700
Dichloromethane	MCL	—	—	—	—	5
1,2-Dichloropropane	Human Health — F & W	—	—	—	—	5.2
Di(2-ethylhexyl)adipate	MCL	—	—	—	—	400
Di(2-ethylhexyl)phthalate	Human Health — F & W	—	—	—	—	18
Dieldrin	Chronic	.056	.056	.056	.056	—
	Acute	.24	.24	.24	.24	—
	Human Health — Fish	.0014	.0014	—	.0014	—
	Human Health — F & W	—	—	—	—	.0014
Dinoseb	MCL	—	—	—	—	7
2,3,7,8-TCDD (Dioxin)	Human Health — F & W	—	—	—	—	1.3^{-7}
	Human Health — Fish	.00014†	.00014†	—	.00014†	—

Parameter		Use Designations B(CW)	B(WW)	B(LR)	B(LW)	C
Diquat	MCL	—	—	—	—	20
2,4-D	Human Health + — F & W	—	—	—	—	100
Endosulfan	Chronic	.056	.15	.15	.15	—
	Acute	.11	.3	.3	.3	—
	Human Health + — Fish	2400	2400	—	2400	—
	Human Health + — F & W	—	—	—	—	110
Endothall	MCL	—	—	—	—	100
Endrin	Chronic	.05	.036	.036	.036	—
	Acute	.12	.086	.086	.086	—
	Human Health + — Fish	8.1	8.1	—	8.1	—
	Human Health + — F & W	—	—	—	—	.76
Ethylbenzene	Human Health + — F & W	—	—	—	—	3100
Ethylene dibromide	MCL	—	—	—	—	.05
Fluoride	MCL	—	—	—	—	4000
Glyphosate	MCL	—	—	—	—	700
Heptachlor	Chronic	.0038	.0038	.01	.0038	—
	Acute	.38	.38	.38	.38	—
	Human Health — Fish	.002	.002	—	.002	—
	Human Health — F & W	—	—	—	—	.0021
Heptachlor epoxide	Human Health — F & W	—	—	—	—	.001
Hexachlorobenzene	Human Health — F & W	—	—	—	—	.0075
y-Hexachlorocyclohexane	Chronic	N/A	N/A	N/A	N/A	—
(Lindane)	Acute	.95	.95	.95	.95	—
	Human Health — Fish	.63	.63	—	.63	—
	Human Health — F & W	—	—	—	—	.19
Hexachlorocyclo-pentadiene	Human Health — F & W	—	—	—	—	240
Lead	Chronic	3	30	80	3	—
	Acute	80	200	750	80	—
	MCL	—	—	—	—	50

Parameter		Use Designations B(CW)	B(WW)	B(LR)	B(LW)	C
Mercury (II)	Chronic	3.5	2.1	3.7	.91	—
	Acute	6.5	4.0	6.9	1.7	—
	Human Health + — Fish	.15	.15	—	.15	—
	Human Health + — F & W	—	—	—	—	.05
Methoxychlor	Human health + — F & W	—	—	—	—	100
Monochlorobenzene	MCL	—	—	—	—	100
Nickel	Chronic	350	650	750	150	—
	Acute	3250	5800	7000	1400	—
	Human Health + — Fish	4584	4584	—	4584	—
	Human Health + — F & W	—	—	—	—	610
Nitrate as N	MCL	—	—	—	—	10*
Nitrate + Nitrite as N	MCL	—	—	—	—	10*
Nitrite as N	MCL	—	—	—	—	1*
Oxamyl (Vydate)	MCL	—	—	—	—	200
Parathion	Chronic	.013	.013	.013	.013	—
	Acute	.065	.065	.065	.065	—
Pentachlorophenol (PCP)	Chronic	(d)	(d)	(d)	(d)	—
	Acute	(d)	(d)	(d)	(d)	—
	Human Health — Fish	82	82	—	82	—
	Human Health — F & W	—	—	—	—	.28
Picloram	MCL	—	—	—	—	500
Polychlorinated Biphenyls (PCBs)	Chronic	.014	.014	1	.014	—
	Acute	2	2	2	2	—
	Human Health — Fish	.0004	.0004	—	.0004	—
	Human Health — F & W	—	—	—	—	.0017
Polynuclear Aromatic Hydrocarbons (PAHs)**	Chronic	.03	.03	3	.03	—
	Acute	30	30	30	30	—
	Human Health — Fish	.3	.3	—	.3	—
	Human Health — F& W	—	—	—	—	.044
Phenols	Chronic	50	50	50	50	—
	Acute	1000	2500	2500	1000	—
	Human Health + — Fish	300	300	—	300	—
	Human Health + — F & W	—	—	—	—	21*

Parameter		Use Designations B(CW)	B(WW)	B(LR)	B(LW)	C
Selenium (VI)	Chronic	10	125	125	70	—
	Acute	15	175	175	100	—
	Human Health + — F & W	—	—	—	—	170
Silver	Chronic	N/A	N/A	N/A	N/A	—
	Acute	30	100	100	4	—
	MCL	—	—	—	—	50
2,4,5-TP (Silvex)	MCL	—	—	—	—	10
Simazine	MCL	—	—	—	—	4
Styrene	MCL	—	—	—	—	100
Tetracholorethylene	Human Health — F & W	—	—	—	—	8
Thallium	Human Health + — F & W	—	—	—	—	1.7
Toluene	Chronic	50	50	150	50	—
	Acute	2500	2500	7500	2500	—
	Human Health + — Fish	300*	300*	—	300*	—
	Human Health + — F & W	—	—	—	—	6800
Total Residual Chlorine (TRC)	Chronic	10	20	25	10	—
	Acute	35	35	40	20	—
Toxaphene	Chronic	.037	.037	.037	.037	—
	Acute	.73	.73	.73	.73	—
	Human Health — Fish	.0075	.0075	—	.0075	—
	Human Health — F & W	—	—	—	—	.0073
1,2,4-Trichlorobenzene	MCL	—	—	—	—	70
1,1,1-Trichlorethane	MCL	—	—	—	—	200
	Human Health + — Fish	173*	173*	—	173*	—
1,1,2-Trichloroethane	Human Health — F & W	—	—	—	—	6
Trichloroethylene (TCE)	Chronic	80	80	80	80	—
	Acute	4000	4000	4000	4000	—
	Human Health — Fish	807	807	—	807	—
	Human Health — F & W	—	—	—	—	27
Trihalomethanes (total)[c]	MCL	—	—	—	—	100

Parameter		Use Designations B(CW)	B(WW)	B(LR)	B(LW)	C
Vinyl Chloride	Human Health — F & W	—	—	—	—	20
	Human Health — Fish	5250	5250	—	5250	—
Xylenes (Total)	MCL	—	—	—	—	10*
Zinc	Chronic	200	450	2000	100	—
	Acute	220	500	2200	110	—
	Human Health + — Fish	5000	5000	—	5000	—
	Human Health + — F & W	—	—	—	—	9100

* units expressed as milligrams/liter

** to include the sum of known and suspected carcinogenic PAHs

† expressed as nanograms/liter

\+ represents the noncarcinogenic human health parameters

++ The concentrations of 4,4-DDT or its metabolites; 4,4-DDE and 4,4-DDD, individually shall not exceed the human health criteria.

(a) units expressed as million fibers/liter (longer than 10 micrometers)

(c) total trihalomethanes includes the sum of bromodichloromethane, dibromochloromethane, tribromomethane (bromoform), and trichloromethane (chloroform)

(d) Class B numerical criteria are for pentachlorophenol a function of pH using the equation: Criterion ($\mu g/l$) = $e^{[1.005(pH) - x]}$, where e = 2.71828 and x varies according to the following table.

	B(CW)	B(WW)	B(LR)	B(LW)
Acute	3.869	4.869	4.869	4.869
Chronic	4.134	5.134	5.134	5.134

TABLE 2. Criteria for Dissolved Oxygen

(all values expressed in milligrams per liter as N)

	B(CW)	B(WW)	B(LR)	B(LW)
Minimum value for at least 16 hours of every 24-hour period	7.0	5.0	5.0	5.0*
Minimum value at any time during every 24-hour period	5.0	5.0	4.0	5.0*

**applies only to the upper layer of stratification in lakes*

TABLE 3a. Acute Criterion for Ammonia in Iowa Streams

Acute Criterion, mg/l as N (or Criterion Maximum Concentration, CMC)		
pH	Class B(WW), B(LR) & B(LW)	Class B(CW) Cold Water
6.5	48.8	32.6
6.6	46.8	31.3
6.7	44.6	29.8
6.8	42.0	28.0
6.9	39.1	26.1
7.0	36.1	24.1
7.1	32.8	21.9
7.2	29.5	19.7
7.3	26.2	17.5
7.4	23.0	15.3
7.5	19.9	13.3
7.6	17.0	11.4
7.7	14.4	9.64
7.8	12.1	8.11
7.9	10.1	6.77
8.0	8.40	5.62
8.1	6.95	4.64
8.2	5.72	3.83
8.3	4.71	3.15
8.4	3.88	2.59
8.5	3.20	2.14
8.6	2.65	1.77
8.7	2.20	1.47
8.8	1.84	1.23
8.9	1.56	1.04
9.0	1.32	0.885

TABLE 3b. Chronic Criterion for Ammonia in Iowa Streams - Early Life Stages Present

Chronic Criterion - Early Life Stages Present, mg/l as N (or Criterion Continuous Concentration, CCC)										
pH	Temperature, °C									
	0	14	16	18	20	22	24	26	28	30
6.5	6.67	6.67	6.06	5.33	4.68	4.12	3.62	3.18	2.80	2.46
6.6	6.57	6.57	5.97	5.25	4.61	4.05	3.56	3.13	2.75	2.42
6.7	6.44	6.44	5.86	5.15	4.52	3.98	3.50	3.07	2.70	2.37
6.8	6.29	6.29	5.72	5.03	4.42	3.89	3.42	3.00	2.64	2.32
6.9	6.12	6.12	5.56	4.89	4.30	3.78	3.32	2.92	2.57	2.25
7.0	5.91	5.91	5.37	4.72	4.15	3.65	3.21	2.82	2.48	2.18
7.1	5.67	5.67	5.15	4.53	3.98	3.50	3.08	2.70	2.38	2.09
7.2	5.39	5.39	4.90	4.31	3.78	3.33	2.92	2.57	2.26	1.99
7.3	5.08	5.08	4.61	4.06	3.57	3.13	2.76	2.42	2.13	1.87
7.4	4.73	4.73	4.30	3.78	3.32	2.92	2.57	2.26	1.98	1.74
7.5	4.36	4.36	3.97	3.49	3.06	2.69	2.37	2.08	1.83	1.61
7.6	3.98	3.98	3.61	3.18	2.79	2.45	2.16	1.90	1.67	1.47
7.7	3.58	3.58	3.25	2.86	2.51	2.21	1.94	1.71	1.50	1.32
7.8	3.18	3.18	2.89	2.54	2.23	1.96	1.73	1.52	1.33	1.17
7.9	2.8	2.8	2.54	2.24	1.96	1.73	1.52	1.33	1.17	1.03
8.0	2.43	2.43	2.21	1.94	1.71	1.50	1.32	1.16	1.02	0.897
8.1	2.10	2.10	1.91	1.68	1.47	1.29	1.14	1.00	0.879	0.773
8.2	1.79	1.79	1.63	1.43	1.26	1.11	0.973	0.855	0.752	0.661
8.3	1.52	1.52	1.39	1.22	1.07	0.941	0.827	0.727	0.639	0.562
8.4	1.29	1.29	1.17	1.03	0.906	0.796	0.700	0.615	0.541	0.475
8.5	1.09	1.09	0.990	0.870	0.765	0.672	0.591	0.520	0.457	0.401
8.6	0.920	0.920	0.836	0.735	0.646	0.568	0.499	0.439	0.386	0.339
8.7	0.778	0.778	0.707	0.622	0.547	0.480	0.422	0.371	0.326	0.287
8.8	0.661	0.661	0.601	0.528	0.464	0.408	0.359	0.315	0.277	0.244
8.9	0.565	0.565	0.513	0.451	0.397	0.349	0.306	0.269	0.237	0.208
9.0	0.486	0.486	0.442	0.389	0.342	0.300	0.264	0.232	0.204	0.179

TABLE 3c. Chronic Criterion for Ammonia in Iowa Streams - Early Life Stages Absent

Chronic Criterion - Early Life Stages Absent, mg/l as N (or Criterion Continuous Concentration, CCC)										
pH	Temperature, °C									
	0-7	8	9	10	11	12	13	14	15*	16*
6.5	10.8	10.1	9.51	8.92	8.36	7.84	7.35	6.89	6.46	6.06
6.6	10.7	9.99	9.37	8.79	8.24	7.72	7.24	6.79	6.36	5.97
6.7	10.5	9.81	9.20	8.62	8.08	7.58	7.11	6.66	6.25	5.86
6.8	10.2	9.58	8.98	8.42	7.90	7.40	6.94	6.51	6.10	5.72
6.9	9.93	9.31	8.73	8.19	7.68	7.20	6.75	6.33	5.93	5.56
7.0	9.60	9.00	8.43	7.91	7.41	6.95	6.52	6.11	5.73	5.37
7.1	9.20	8.63	8.09	7.58	7.11	6.67	6.25	5.86	5.49	5.15
7.2	8.75	8.20	7.69	7.21	6.76	6.34	5.94	5.57	5.22	4.90
7.3	8.24	7.73	7.25	6.79	6.37	5.97	5.60	5.25	4.92	4.61
7.4	7.69	7.21	6.76	6.33	5.94	5.57	5.22	4.89	4.59	4.30
7.5	7.09	6.64	6.23	5.84	5.48	5.13	4.81	4.51	4.23	3.97
7.6	6.46	6.05	5.67	5.32	4.99	4.68	4.38	4.11	3.85	3.61
7.7	5.81	5.45	5.11	4.79	4.49	4.21	3.95	3.70	3.47	3.25
7.8	5.17	4.84	4.54	4.26	3.99	3.74	3.51	3.29	3.09	2.89
7.9	4.54	4.26	3.99	3.74	3.51	3.29	3.09	2.89	2.71	2.54
8.0	3.95	3.70	3.47	3.26	3.05	2.86	2.68	2.52	2.36	2.21
8.1	3.41	3.19	2.99	2.81	2.63	2.47	2.31	2.17	2.03	1.91
8.2	2.91	2.73	2.56	2.40	2.25	2.11	1.98	1.85	1.74	1.63
8.3	2.47	2.32	2.18	2.04	1.91	1.79	1.68	1.58	1.48	1.39
8.4	2.09	1.96	1.84	1.73	1.62	1.52	1.42	1.33	1.25	1.17
8.5	1.77	1.66	1.55	1.46	1.37	1.28	1.20	1.13	1.06	0.99
8.6	1.49	1.40	1.31	1.23	1.15	1.08	1.01	0.951	0.892	0.836
8.7	1.26	1.18	1.11	1.04	0.976	0.915	0.858	0.805	0.754	0.707
8.8	1.07	1.01	0.944	0.885	0.829	0.778	0.729	0.684	0.641	0.601
8.9	0.917	0.860	0.806	0.756	0.709	0.664	0.623	0.584	0.548	0.513
9.0	0.790	0.740	0.694	0.651	0.610	0.572	0.536	0.503	0.471	0.442

*At 15°C and above, the criterion for fish early life stage (ELS) absent is the same as the criterion for fish ELS present.

61.3(4) *Class "C" waters.* Rescinded IAB 4/18/90, effective 5/23/90.

61.3(5) *Surface water classification.*

a. Water use designation abbreviations.

(1) "A" means primary body contact recreation.

(2) "B" means wildlife, aquatic life, and secondary body contact uses. "WW" means significant resource warm water, "LR" means limited resource warm water, "LW" means lakes and wetlands warm water, "CW" means cold water.

(3) "C" means raw water source of potable water supply.

b. Key to the order of streams.

(1) Streams are listed in downstream to upstream sequence within a basin.

(2) Major streams (1st order) are described in entirety from downstream end to upstream end, before listing their tributary (2nd order) streams, or the next (major) stream.

(3) Tributary (2nd order) streams (if any) are then listed in downstream to upstream sequence, and each is described in entirety before listing its tributaries (3rd order), or before listing the next upstream 2nd order tributary.

(4) When a stream and all its tributaries are described in entirety, the next upstream equal order stream is then listed and described.

(5) The scheme is repeated through 3rd, 4th and 5th orders, as necessary.

(6) The relationship of tributaries is indicated in the list by the spacing from the left margin. Names of tributaries are indented two spaces from the name of the stream to which they are tributary, and equal order streams fall one below the other on the same margin.

EXAMPLE:

(I) River
  (A) River
  (B) River
    (1) Creek
    (2) Creek
      (a) Creek
    (3) Creek
  (C) River
(II) River

(I) and (II) are first order streams and (II) is upstream from (I). (A), (B) and (C) are tributaries of (I). (B) is upstream from (A), and (C) is upstream from (B). (1), (2) and (3) are tributaries of (B). (2) is upstream from (1), and (3) is upstream from (2). (a) is a tributary of (2).

(7) Stream names are in accordance with "Drainage Areas of Iowa Streams," U.S. Geological Survey, March 1974, except that locally known names are used for streams not listed therein.

c. Stream abbreviations.

(1) "R" means river.

(2) "Cr." means creek.

(3) "Br." means branch.

(4) "D.D." means drainage ditch.

(5) "E," "W," "N," and "S" are compass directions.

(6) "Fk." means fork.

(7) "aka" means also known as.

d. Location abbreviations.

(1) "R" means range.

(2) "T" means township.

(3) "S" means section.

(4) "Rd." means road.

(5) "Hwy." means highway.

(6) "Co." means county.

(7) "St." means street.

e. Iowa water quality standards water use designations.

WESTERN IOWA RIVER BASINS

Western Iowa River Basins (Missouri, Big Sioux, and Little Sioux Rivers)

The streams or stream segments named below in alphabetical order are referenced within the Water Use Designations for the Western Iowa River Basins. Reference numbers provided in the alphabetical list correspond to numbered stream segments in the Water Use Designations.

Ashton Cr. - 39
Bacon Cr. - 37
Battle Cr. - 29
Beaver Cr. - 20
Big Cr. - 36
Big Muddy Cr. - 57
Big Sioux R. - 76
Boyer R. - 11
Boyer R. - 12
Broken Kettle Cr. - 77
Brooke Cr. - 48
Bull Run - 78
Deep Cr. - 73
Dry Run - 59
Dugout Cr. - 62
East Boyer R. - 14
East Soldier R. - 19
Elk Cr. - 31
Floyd R. - 68
Floyd R. - 69
Fox Run - 49
Gray Cr. - 44
Halfway Cr. - 33
Henry Cr. - 47
Indian Cr. - 79
Johns Cr. - 28
Jordan Cr. - 18
Kanaranzi Cr. - 87
Keg Cr. - 5
Lake Manawa water intake - 8
Little Floyd R. - 74
Little Maple R. - 34
Little Ocheyedan R. - 55
Little Rock R. - 84
Little Sioux R. - 21
Little Sioux R. - 22
Little Sioux R. - 23
Little Sioux R. - 25
Little Sioux R. - 24
Lost Island Outlet - 52
Maple Cr. - 35
Maple R. - 26
Maple R. -27
Milford Cr. - 60
Mill Cr. - 43
Mink Cr. - 71
Missouri R. - 1
Missouri R. - 2
Monona Harrison Co. Ditc - 63
Montgomery Cr. - 51
Moser Cr. - 9
Mosquito Cr. - 6
Mosquito Cr. - 7
Mud Cr. - 65
Mud Cr. - 86
Ocheyedan R. - 58
Odebolt Cr. - 30
Otter Cr. - 15
Otter Cr. - 85
Perry Cr. - 75
Pickerel Run - 53
Pierson Cr. - 38
Pigeon Cr. - 10
Plum Cr. - 3
Prairie Cr. - 56
Rock Cr. - 41
Rock R. - 81
Rock R. - 82
Silver Cr. - 32
Silver Cr. - 42
Sixmile Cr. - 80
Soldier R. - 16
Soldier R. - 17
Stony Cr. - 54
Unnamed Cr. - 83
Unnamed Cr. - 88
Unnamed Cr. - 89
Waterman Cr. - 46
Waubonsie Cr. - 4
West Branch Floyd R. - 70
West Fork Little Sioux R.- 61
West Fork Little Sioux R. - 64
Whiskey Cr. - 66
Willow Cr. - 13
Willow Cr. - 40
Willow Cr. - 45
Willow Cr. - 50
Willow Cr. - 72
Wolf Cr. - 67

WESTERN	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
MAJOR RIVER - MISSOURI R. AND ITS TRIBUTARIES								
MISSOURI R. AND ITS TRIBUTARIES								
Missouri R.								
1. Iowa-Missouri state line to confluence with the Big Sioux R.	X	X						
Missouri R.								
2. City of Council Bluffs Water Works Intakes						X		
PLUM CR. AND ITS TRIBUTARIES								
Plum Cr.								
3. Mouth (S6, T69N, R43W, Fremont Co.) to confluence with an unnamed tributary (S29, T70N, R42W, Fremont Co.)			X					

WESTERN MAJOR RIVER - MISSOURI R. AND ITS TRIBUTARIES WAUBONSIE CR. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Waubonsie Cr. 4. Mouth (S8, T70N, R43W, Fremont Co.) to confluence with an unnamed tributary (S25, T71N, R43W, Mills Co.)			X					
KEG CR. AND ITS TRIBUTARIES								
Keg Cr. 5. Mouth (S6, T71N, R43W, Mills Co.) to confluence with an unnamed tributary (S 1/2, S35, T78N, R41W, Harrison Co.)			X					
MOSQUITO CR. AND ITS TRIBUTARIES								
Mosquito Cr. 6. Mouth (Pottawattamie Co.) to confluence with Little Mosquito Cr. (S29, T75N, R43W, Pottawattamie Co.)		X						
Mosquito Cr. 7. Confluence with Little Mosquito Cr. (Pottawattamie Co.) to confluence with Moser Cr. (S12, T80N, R40W, Shelby Co.)			X					
Lake Manawa water intake structure 8. Intake near the Norfolk and Western Railroad crossing in the middle of S7, T74N, R43W, Pottawattamie Co.						X		
Moser Cr. 9. Mouth (Shelby Co.) to confluence with an unnamed tributary (S30, T81N, R39W, Shelby Co.)			X					
PIGEON CR. AND ITS TRIBUTARIES								
Pigeon Cr. 10. Mouth (S3, T75N, R44W, Pottawattamie Co.) to confluence with North Pigeon Cr. (S5, T76, R43W, Pottawattamie Co.)			X					
BOYER R. AND ITS TRIBUTARIES								
Boyer R. 11. Mouth (Pottawattamie Co.) to confluence with an unnamed tributary (S 1/2, S33, T88N, R37W, Sac Co.)		X						
Boyer R. 12. Confluence with an unnamed tributary (S33, T88N, R37W, Sac Co.) to confluence with an unnamed tributary (SE 1/4, SW 1/4, S5, T89N, R37W, Sac Co.)			X					
Willow Cr. 13. Mouth (S28, T78N, R44W, Harrison Co.) to confluence South Willow Cr. (S27, T82N, R42W, Monona Co.)			X					
East Boyer R. 14. Mouth (S10, T83N, R39W, Crawford Co.) to confluence with an unnamed tributary (NW 1/4, S15, T84N, R37W, Crawford Co.)			X					
Otter Cr. 15. Mouth (S18, T84N, R38W, Crawford Co.) to confluence with East Otter Cr. (NW 1/4, S13, T85N, R39W, Crawford Co.)			X					

WESTERN MAJOR RIVER - MISSOURI R. AND ITS TRIBUTARIES SOLDIER R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Soldier R. 16. Mouth (Harrison Co.) to confluence with E. Soldier R.		X						
Soldier R. 17. Confluence with East Soldier River (S34, T84N, R42W, Monona Co.) to confluence with Little Soldier Cr. (S24, T86N, R40W, Ida Co.)			X					
Jordan Cr. 18. Mouth (S16, T82N, R43W, Monona Co.) to confluence with an unnamed tributary (SE 1/4, NE 1/4, S10, T83N, R43W, Monona Co.)			X					
East Soldier R. 19. Mouth (S34, T84N, R42W, Monona Co.) to confluence with Emigrant Cr. (S23, T84N, R41W, Crawford Co.)			X					
Beaver Cr. 20. Mouth (S1, T85N, R41W, Crawford Co.) to confluence with an unnamed tributary (NW 1/4, S9, T85N, R40W, Crawford Co.)			X					
LITTLE SIOUX R. AND ITS TRIBUTARIES								
Little Sioux R. 21. Mouth (Harrison Co.) to Hwy. 3 in Cherokee (S26, T92N, R40W, Cherokee Co.)		X						
Little Sioux R. 22. Hwy. 3 in Cherokee (S26, T92N, R40W, Cherokee Co.) to Linn Grove Dam (Buena Vista Co.)	X	X						X
Little Sioux R. 23. Linn Grove Dam (Buena Vista Co.) to Clay Co., S17, T96N, R36W (east corporate limit, Spencer)		X						X
Little Sioux R. 24. West Line, S17, T96N, R36W, Clay Co. to confluence with West Fork Little Sioux River (Dickinson Co.)		X						
Little Sioux R. 25. Confluence with W. Fork Little Sioux R. (S7, T99N, R37W Dickinson Co.) to the Iowa-Minnesota state line			X					
Maple R. 26. Mouth (S17, T83N, R44W, Monona Co.) to confluence with Silver Cr. (S13, T88N, R40W, Ida Co.)		X						
Maple R. 27. Confluence with Silver Cr. (S13, T88N, R40W, Ida Co.) to confluence with Maple Cr. (S5, T91N, R39W, Cherokee Co.)			X					
Johns Cr. (aka Clear Cr.) 28. Mouth (S24, T90N, R44W, Plymouth Co.) to confluence with Rathbun Cr. (S26, T91N, R44W, Plymouth Co.)			X					
Battle Cr. 29. Mouth (S26, T87N, R41W, Ida Co.) to confluence with an unnamed tributary (SW 1/4, S24, T88N, R41W, Ida Co.)			X					
Odebolt Cr. 30. Mouth (Ida Co.) to confluence with an unnamed tributary (S24, T87N, R39W, Ida Co.)			X					
Elk Cr. 31. Mouth (S1, T87N, R40W, Ida Co.) to confluence with an unnamed tributary (W 1/2, S36, T88N, R39W, Ida Co.)			X					

WESTERN MAJOR RIVER - MISSOURI R. AND ITS TRIBUTARIES LITTLE SIOUX R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Silver Cr. 32. Mouth (S13, T88N, R39W, Ida Co.) to confluence with South Silver Cr. (S16, T88N, R39W, Ida Co.)			X					
Halfway Cr. 33. Mouth (S22, T89N, R39W, Ida Co.) to confluence with unnamed tributary (SE 1/4, S24, T89N, R39W, Ida Co.)			X					
Little Maple R. 34. Mouth (SW 1/4, S34, T90N, R39W, Cherokee Co.) to confluence with an unnamed tributary (NE 1/4, S20, T90N, R38W, Buena Vista Co.)			X					
Maple Cr. 35. Mouth (S5, T91N, R39W, Cherokee Co.) to confluence with an unnamed tributary (W 1/2, S1, T91N, R39W, Cherokee Co.)			X					
Big Cr. 36. Mouth (S4, T87N, R43W, Woodbury Co.) to confluence with Coon Cr. (S35, T88N, R43W, Woodbury Co.)			X					
Bacon Cr. 37. Mouth (S1, T88N, R43W, Woodbury Co.) to confluence with an unnamed tributary (S2, T88N, R42W, Woodbury Co.)			X					
Pierson Cr. 38. Mouth (S34, T89N, R42W, Woodbury Co.) to confluence with an unnamed tributary (N 1/2, S20, T89N, R42W, Woodbury Co.)			X					
Ashton Cr. 39. Mouth (S7, T89N, R41W, Ida Co.) to confluence with an unnamed tributary (S3, T89N, R41W, Ida Co.)			X					
Willow Cr. 40. Mouth (S30, T90N, R41W, Cherokee Co.) to confluence with an unnamed tributary (N 1/2, S31, T91N, R41W, Cherokee Co.)			X					
Rock Cr. 41. Mouth (S10, T90N, R41W, Cherokee Co.) to confluence with an unnamed tributary (SE 1/4, S21, T91N, R41W, Cherokee Co.)			X					
Silver Cr. 42. Mouth (S32, T91N, R40W, Cherokee Co.) to confluence with an unnamed tributary (N 1/2, S22, T90N, R40W, Cherokee Co.)			X					
Mill Cr. 43. Mouth (S14, T92N, R40W, Cherokee Co.) to confluence with West Branch Mill Cr. (S4, T95N, R41W, O'Brien Co.)			X					
Gray Cr. 44. Mouth (S10, T92N, R40W, Cherokee Co.) to confluence with an unnamed tributary (NE 1/4, S22, T93N, R40W, Cherokee Co.)			X					
Willow Cr. 45. Mouth (SW 1/4, S1, T93N, R41W, Cherokee Co.) to confluence with Nelson Cr. (S25, T94N, R41W, O'Brien Co.)			X					

WESTERN MAJOR RIVER - MISSOURI R. AND ITS TRIBUTARIES LITTLE SIOUX R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Waterman Cr. 46. Mouth (S26, T94N, R39W, O'Brien Co.) to confluence with Epping Cr. (S36, T97N, R40W, O'Brien Co.)			X					
Henry Cr. 47. Mouth (S24, T94N, R39W, O'Brien Co.) to confluence with an unnamed tributary (S24, T94N, R39W, O'Brien Co.)			X					
Brooke Cr. 48. Mouth (SW 1/4, S11, T93N, R38W, Buena Vista Co.) to confluence with an unnamed tributary (Center of S 1/2, S24, T92N, R38W, Buena Vista Co.)			X					
Fox Run 49. Mouth (SW 1/4, S12, T93N, R38W, Buena Vista Co.) to confluence with an unnamed tributary (NE 1/4, S19, T93N, R37W, Buena Vista Co.)			X					
Willow Cr. 50. Mouth (S17, T94N, R36W, Clay Co.) to confluence with an unnamed tributary (NW 1/4, S31, T95N, R37W, Clay Co.)			X					
Montgomery Cr. 51. Mouth (S3, T94N, R36W, Clay Co.) to confluence with an unnamed tributary (SE 1/4, S11, T94N, R36W, Clay Co.)			X					
Lost Island Outlet 52. Mouth (Clay Co.) to confluence with Pickerel Run S17, T96N, R36W, Clay Co.)			X					
Pickerel Run 53. Mouth (Clay Co.) to confluence with an unnamed tributary (S31, T97N, R35W, Clay Co.)			X					
Stony Cr. 54. Mouth (Clay Co.) to confluence with an unnamed tributary (S27, T98N, R38W, Dickinson Co.)			X					
Little Ocheyedan R. 55. Mouth (Osceola Co.) to confluence with an unnamed tributary (NW 1/4, S4, T89N, R40W, Osceola Co.)			X					
Prairie Cr. 56. Mouth (S26, T96N, R36W, Clay Co.) to confluence with an unnamed tributary (S33, T96N, R36W, Clay Co.)			X					
Big Muddy Cr. 57. Mouth (S15, T96N, R36W, Clay Co.) to confluence with unnamed tributary (S17, T98N, R35W, Clay Co.)			X					
Ocheyedan R. 58. Mouth (Clay Co.) to the Iowa-Minnesota state line			X					
Dry Run 59. Mouth (Osceola Co.) to confluence with an unnamed tributary (S17, T99N, R39W, Osceola Co.)			X					
Milford Cr. (aka Mill Cr.) 60. Mouth (Dickinson Co.) to confluence with an unnamed tributary (S18, T98N, R36W, Dickinson Co.)			X					

WESTERN MAJOR RIVER - MISSOURI R. AND ITS TRIBUTARIES LITTLE SIOUX R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
West Fork Little Sioux R. 61. Mouth (Dickinson Co.) to the Iowa-Minnesota state line			X					
Dugout Cr. 62. Mouth (Dickinson Co.) to confluence with the first upstream unnamed tributary (S15, T99N, R38W, Dickinson Co.)			X					
MONONA-HARRISON DITCH AND ITS TRIBUTARIES								
Monona Harrison Co. Ditch 63. Mouth (S21, T81N, R45W, Harrison Co.) to confluence with W. Fk. L. Sioux River (Ditch) (S12, T84N, R45W, Monona Co.)		X						
West Fork Little Sioux R. 64. Mouth (S12, T84N, R45W, Monona Co.) to confluence with an unnamed tributary (S3, T91N, R42W, Cherokee Co.)			X					
Mud Cr. 65. Mouth (S31, T89N, R44W, Woodbury Co.) to confluence with an unnamed tributary (S6, T89N, R44W, Woodbury Co.)			X					
Whiskey Cr. 66. Mouth (Plymouth Co.) to confluence with an unnamed tributary (NW 1/4, S2, T91N, R43W, Plymouth Co.)			X					
Wolf Cr. (aka including Haitz Ditch) 67. Mouth (S12, T84N, R45W, Monona Co.) to confluence with East Fork Wolf Cr. (S30, T87N, R43W, Woodbury Co.)			X					
FLOYD R. AND ITS TRIBUTARIES								
Floyd R. 68. Mouth (Woodbury Co.) to confluence with W. Br. Floyd R. (Plymouth Co.)		X						
Floyd R. 69. Confluence with W. Br. Floyd R. (Plymouth Co.) to confluence with North Fork (S30, T97N, R41W, O'Brien Co.)			X					
West Branch Floyd R. 70. Mouth (Plymouth Co.) to confluence with an unnamed tributary (NE 1/4, S18, T96N, R44W, Sioux Co.)			X					
Mink Cr. 71. Mouth to confluence with an unnamed tributary (NE 1/4, S21, T93N, R46W, Plymouth Co.)			X					
Willow Cr. 72. Mouth (Plymouth Co.) to confluence with an unnamed tributary (NE 1/4, S11, T93N, R44W, Plymouth Co.)			X					

WESTERN MAJOR RIVER - MISSOURI R. AND ITS TRIBUTARIES FLOYD R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Deep Cr.								
73. Mouth (Plymouth Co.) to confluence with an unnamed tributary (NE 1/4, Sec. 35, T94N, R43W, Plymouth Co.)			X					
Little Floyd R.								
74. Mouth (Sioux Co.) to confluence with Lamkin Cr. (S8, T96N, R42W, O'Brien Co.)			X					
PERRY CR. AND ITS TRIBUTARIES								
Perry Cr.								
75. Mouth (S32, T89N, R47W, Woodbury Co.) to confluence with an unnamed tributary (S35, T91N, R47W, Plymouth Co.)			X					
BIG SIOUX R. AND ITS TRIBUTARIES								
Big Sioux R.								
76. Mouth (Woodbury Co.) to Iowa-Minnesota state line	X	X						
Broken Kettle Cr.								
77. Mouth (S9, T90N, R48W, Plymouth Co.) to confluence with an unnamed tributary (S19, T92N, R47W, Plymouth Co.)			X					
Bull Run								
78. Mouth (S25, T92N, R48W, Plymouth Co.) to confluence with an unnamed tributary (S29, T92N, R47W, Plymouth Co.)			X					
Indian Cr.								
79. Mouth (S9, T93N, R48W, Plymouth Co.) to confluence with an unnamed tributary (S33, T94N, R47W, Sioux Co.)			X					
Sixmile Cr.								
80. Mouth (S28, T94N, R48W, Sioux Co.) to confluence with an unnamed tributary (S19, T95N, R46W, Sioux Co.)			X					
Rock R.								
81. Mouth (Sioux Co.) to confluence with Kanaranzi Cr. (S28, T100N, R45W, Lyon Co.)		X						
Rock R.								
82. Confluence with Kanaranzi Cr. (Lyon Co.) to the Iowa-Minnesota state line			X					
Unnamed Cr.								
83. Mouth (S26, T97N, R47W, Sioux Co.) to confluence with an unnamed tributary (W 1/2, S14, T97N, R47W, Sioux Co.)			X					
Little Rock R.								
84. Mouth (Lyon Co.) to the Iowa-Minnesota state line			X					
Otter Cr.								
85. Mouth (Lyon Co.) to confluence with an unnamed tributary (S14, T99N, R42W, Osceola Co.)			X					
Mud Cr.								
86. Mouth (Lyon Co.) to the Iowa-Minnesota state line			X					
Kanaranzi Cr.								
87. Mouth (Lyon Co.) to the Iowa-Minnesota state line			X					

	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
WESTERN **MAJOR RIVER - MISSOURI R. AND ITS TRIBUTARIES** **BIG SIOUX R. AND ITS TRIBUTARIES**								
Unnamed Cr. 88. Mouth (S5, T96N, R47W, Sioux Co.) to confluence with an unnamed tributary (S29, T97N, R47W, Sioux Co.)			X					
Unnamed Cr. 89. Mouth (S16, T98N, R48W, Lyon Co.) to confluence with an unnamed tributary (S22, T98N, R48W, Lyon Co.)			X					

SOUTHERN IOWA RIVER BASINS

The streams or stream segments named below in alphabetical order are referenced within the Water Use Designations for the Southern Iowa River Basins. Reference numbers provided in the alphabetical list correspond to numbered stream segments in the Water Use Designations.

Bluegrass Cr. - 29
Brush Cr. - 95
Brush Cr. - 110
Brushy Cr. - 51
Camp Cr. - 24
Carter Cr. - 113
Chariton R. - 88
Chariton R. - 89
Chariton R. - 90
Chariton R. - 91
Chariton R. - 92
Chariton R. - 93
Cooper Cr. - 97
Crooked Cr. - 65
Davids Cr. - 28
Dick Cr. - 107
E. FK 102 R. - 52
E. FK 102 R. - 53
E. Nishnabotna R. - 19
E. Nishnabotna R. - 20
East Branch West Nishnabotna - 15
East Fork Grand R. - 69
East Fork Medicine Cr. - 82
East Nodaway R. - 39
East Nodaway R. - 40
East Platte R. - 60
East Tarkio Cr. - 32
Elk Cr. - 18
Elk Cr. - 73
Elkhorn Cr. - 25
Farm Cr. - 11
Fisher Cr. - 22
Fivemile Cr. - 111
Fourmile Cr. - 76
Fox R. - 115
Gard Branch - 59
Grand R. - 62
Grand R. - 63
Grand R. - 71
Grand R. - 72
Greybill Cr. - 12
Honey Cr. - 54
Honey Cr. - 108
Indian Cr. - 9
Indian Cr. - 23
Jackson Cr. - 103
Jim Cr. - 14
Jonathan Cr. - 81
Jordan Cr. - 13
Jordan Cr. - 102
Little R. - 78
Little Walnut Cr. - 99
Locust Cr. - 83
Long Cr. - 74
Lotts Cr. - 70
Middle Branch 102 R. - 48
Middle Fork 102 R. -50
Middle Fork Grand R. - 68
Middle Nodaway R. - 41
Middle Nodaway R. - 42
Middle Platte R. - 61
Middle Silver Cr. - 8
Mill Cr. - 21
Mud Cr. - 10
Ninemile Cr. - 106
Nishnabotna R. - 1
Nodaway R. - 34
North Cr. - 86
North Fabius R. - 112
North Fox Cr. - 116
Packard Cr. - 94
Platte Branch - 55
Platte R. - 56
Platte R. - 57
Plum Cr. - 67
Rose Branch - 49
S. Shoal Cr. - 84
Sevenmile Cr. -38
Shoal Cr. - 87
Silver Cr. - 6
Silver Cr. - 7
South Cr. - 85
South Fork Chariton R. - 100
South Fox Cr. - 117
South Wyaconda R. - 114
Squaw Cr. - 66
Steel Cr. - 80
Tarkio R. - 31
Troublesome Cr. - 27
Turkey Cr. - 26
Turkey Cr. - 58
Twelvemile Cr. - 75
Unnamed Cr. - 96
Unnamed Cr. - 105
W. Jackson Cr. - 104
W. Nishnabotna R. - 2
W. Nishnabotna R. - 3
Walker Br. - 101
Walnut Cr. - 4
Walnut Cr. - 5
Walnut Cr. - 64
Walnut Cr. - 98
Weldon R. - 79
West Branch 102 R. - 46
West Branch 102 R. - 47
West Branch Cr. - 77
West Fork 102 R. - 44
West Fork 102 R. - 45
West Fork Middle Nodaway - 43
West Fork West Nishnabotna - 16
West Mill Cr. - 33
West Nodaway R. - 35
West Nodaway R. - 36
West Nodaway R. - 37
West Tarkio Cr. - 30
Willow Cr. - 17
Wolf Cr. - 109

SOUTHERN MAJOR RIVER - NISHNABOTNA R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Nishnabotna R.								
1. Iowa-Missouri state line (Fremont Co.) to confluence of the E. Nishnabotna R. and the W. Nishnabotna R. (Fremont Co.)		X						
W. NISHNABOTNA R. AND ITS TRIBUTARIES								
W. Nishnabotna R.								
2. Mouth (Fremont Co.) to confluence with W. Fk. of W. Nishnabotna R. (Shelby Co.)		X						

SOUTHERN MAJOR RIVER - NISHNABOTNA R. AND ITS TRIBUTARIES W. NISHNABOTNA R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
W. Nishnabotna R. 3. Confluence with West Fork West Nishnabotna R. to confluence with an unnamed tributary (S34, T83N, R36W, Carroll Co.)			X					
Walnut Cr. 4. Mouth (S8, T69N, R41W, Fremont Co.) to confluence with an unnamed tributary (S30/31 line, T73N, R38W, Montgomery Co.)		X						
Walnut Cr. 5. Confluence with an unnamed tributary (S30/31 line, T73N, R38W, Montgomery Co.) to confluence with an unnamed tributary (S3, T76N, R38W, Pottawattamie Co.)			X					
Silver Cr. 6. Mouth (Mills Co.) to Hwy. 41 (Mills Co.)		X						
Silver Cr. 7. Hwy. 41 (Mills Co.) to confluence with Little Silver Cr. (S34, T78N, R40W, Shelby Co.)			X					
Middle Silver Cr. 8. Mouth (S31, T74N, R41W, Pottawattamie Co.) to confluence with Little Silver Cr. (S12, T74N, R42W, Pottawattamie Co.)			X					
Indian Cr. 9. Mouth (S13, T72N, R41W, Mills Co.) to confluence with an unnamed tributary (S26, T72N, R40W, Mills Co.)			X					
Mud Cr. 10. Mouth (S31, T73N, R40W, Mills Co.) to confluence with an unnamed tributary (NW 1/4, S14, T73N, R41W, Mills Co.)			X					
Farm Cr. 11. Mouth (S9, T73N, R40W, Mills Co.) to confluence with Jordan Cr. (S31, T74N, R39W, Pottawattamie Co.)			X					
Greybill Cr. 12. Mouth (S36, T74N, R40W, Pottawattamie Co.) to confluence with unnamed tributary (NW 1/4, S21, T75N, R39W, Pottawattamie Co.)			X					
Jordan Cr. 13. Mouth (S31, T74N, R39W, Pottawattamie Co.) to confluence with Spring Cr. (S4, T74N, R39W, Pottawattamie Co.)			X					
Jim Cr. 14. Mouth (S32, T77N, R39W, Pottawattamie Co.) to confluence with an unnamed tributary (S33, T77N, R39W, Pottawattamie Co.)			X					
East Branch West Nishnabotna R. 15. Mouth (S29, T77N, R39W, Pottawattamie Co.) to confluence with Lone Willow Cr. (S9, T80N, R36W, Audubon Co.)			X					
West Fork West Nishnabotna R. 16. Mouth (Shelby Co.) to confluence with Malony Branch (S29, T83N, R37W, Crawford Co.)			X					
Willow Cr. 17. Mouth (Shelby Co.) to confluence with an unnamed tributary (S3, T81N, R39W, Shelby Co.)			X					
Elk Cr. 18. Mouth (Shelby Co.) to confluence with an unnamed tributary (NW 1/4, S28, T82N, R37W, Crawford Co.)			X					

SOUTHERN	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
MAJOR RIVER - NISHNABOTNA R. AND ITS TRIBUTARIES								
E. NISHNABOTNA R. AND ITS TRIBUTARIES								
E. Nishnabotna R.								
19. Mouth (Fremont Co.) to confluence of Troublesome Creek (Cass Co.)		X						
E. Nishnabotna R.								
20. Confluence with Troublesome Cr. (S32, T77N, R36W, Cass Co.) to confluence with an unnamed tributary (E 1/2, NW 1/4, S6, T80N R34W, Audubon Co.)			X					
Mill Cr.								
21. Mouth (S31, T68N, R41W, Fremont Co.) to confluence with an unnamed tributary (SE 1/4, NW 1/4, S15, T67N, R41W, Fremont Co.)			X					
Fisher Cr.								
22. Mouth (S27, T69N, R40W, Fremont Co.) to confluence with an unnamed tributary (S11/12 line, T68N, R40W, Fremont Co.)			X					
Indian Cr.								
23. Mouth (S17, T75N, R37W, Cass Co.) to confluence with Wolf Cr. (S35, T79N, R37W, Shelby Co.)			X					
Camp Cr.								
24. Mouth (S5/6 line, T77N, R37W, Cass Co.) to confluence with an unnamed tributary (S16, T77N, R37W, Cass Co.)			X					
Elkhorn Cr.								
25. Mouth (S20, T78N, R37W, Shelby Co.) to confluence with an unnamed tributary (S10, T78N, R37W, Shelby Co.)			X					
Turkey Cr.								
26. Mouth (S2, T75N, R37W, Cass Co.) to confluence with Eller Branch (S13, T76N, R36W, Cass Co.)			X					
Troublesome Cr.								
27. Mouth (S32, T77N, R36W, Cass Co.) to confluence with Fourmile Cr. (S8, T78N, R34W, Audubon Co.)			X					
Davids Cr.								
28. Mouth (S4, T78N, R35W, Audubon Co.) to confluence with Honey Cr. (S31, T79N, R34W, Audubon Co.)			X					
Bluegrass Cr.								
29. Mouth (S14, T79N, R35W, Audubon Co.) to confluence with an unnamed tributary from the West (S34, T80N, R35W, Audubon Co.)			X					
MAJOR RIVER - WEST TARKIO CR. AND ITS TRIBUTARIES								
West Tarkio Cr.								
30. Iowa-Missouri state line (Page Co.) to confluence with an unnamed tributary (S9, T69N, R38W, Page Co.)			X					
MAJOR RIVER - TARKIO R. AND ITS TRIBUTARIES								
Tarkio R.								
31. Iowa-Missouri state line (Page Co.) to confluence with East Tarkio Cr. (S4, T72N, R37W, Montgomery Co.)			X					
EAST TARKIO CR. AND ITS TRIBUTARIES								
East Tarkio Cr.								
32. Mouth (S9, T68N, R38W, Page Co.) to confluence with an unnamed tributary (S7, T69N, R37W, Page Co.)			X					

SOUTHERN MAJOR RIVER - WEST MILL CR. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
West Mill Cr. 33. Iowa-Missouri state line to confluence with an unnamed tributary (NE 1/4, S12, T67N, R38W, Page Co.)			X					
MAJOR RIVER - NODAWAY R. AND ITS TRIBUTARIES Nodaway R. 34. Iowa-Missouri state line (Page Co.) to confluence of Middle Nodaway R. and the W. Nodaway R. (Montgomery Co.)		X						
WEST NODAWAY R. AND ITS TRIBUTARIES West Nodaway R. 35. Mouth (S33, T71N, R36W, Montgomery Co.) to confluence with Threemile Cr. (S35, T74N, R36W, Cass Co.)		X						
West Nodaway R. 36. City of Clarinda Water Works intake						X		
West Nodaway R. 37. Confluence with Threemile Cr. (S35, T74N, R36W, Cass Co.) to confluence with Whislers Branch (S17, T74N, R35W, Cass Co.)			X					
Sevenmile Cr. 38. Mouth (S33, T73N, R36W, Montgomery Co.) to confluence with Fourmile Cr. (S33, T75N, R36W, Cass Co.)			X					
EAST NODAWAY R. AND ITS TRIBUTARIES East Nodaway R. 39. Mouth (S6, T67N, R36W, Page Co.) to confluence with Long Branch (S17/18 line, T70N, R35W, Taylor Co.)		X						
East Nodaway R. 40. Confluence with Long Branch (S17/18 line, T70N, R35W, Taylor Co.) to confluence with Shanghai Cr. (S16, T73N, R32W, Adams Co.)			X					
Middle Nodaway R. 41. Mouth (Montgomery Co.) to confluence with West Fork Middle Nodaway (S33, T74N, R33W, Adair Co.)		X						
Middle Nodaway R. 42. Confluence with West Fork Middle Nodaway (Adair Co.) to confluence with an unnamed tributary (S1, T75N, R32W, Adair Co.)			X					
West Fork Middle Nodaway R. 43. Mouth (S33, T74N, R33W, Adair Co.) to confluence with Rutt Br. (S15, T75N, R33W, Adair Co.)			X					

SOUTHERN	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
MAJOR RIVER - WEST FORK 102 R. AND ITS TRIBUTARIES								
West Fork 102 R.								
44. Iowa-Missouri state line to the confluence with the West Branch 102 R. (S10, T68N, R35W, Taylor Co.)		X						
West Fork 102 R.								
45. Confluence with West Branch 102 R. (S10, T68N, R35W, Taylor Co.) to confluence with an unnamed tributary (S6, T70N, R34W, Taylor Co.)			X					
WEST BRANCH 102 R. AND ITS TRIBUTARIES								
West Branch 102 R.								
46. Mouth (Taylor Co.) to confluence with Middle Branch 102 R. (S6, T69N, R34W, Taylor Co.)		X						
West Branch 102 R.								
47. Confluence with Middle Branch 102 R. (S6, T69N, R34W, Taylor Co.) to confluence with Willow Cr. (S29, T71N, R33W, Adams Co.)			X					
Middle Branch 102 R.								
48. Mouth (Taylor Co.) to bridge crossing at (S16/21, T70N, R33W, Taylor Co.)			X					
ROSE BRANCH AND ITS TRIBUTARIES								
Rose Branch								
49. Mouth (Taylor Co.) to confluence with an unnamed tributary (S34, T71N, R34W, Adams Co.)			X					
MAJOR RIVER - MIDDLE FORK 102 R. AND ITS TRIBUTARIES								
Middle Fork 102 R.								
50. Iowa-Missouri state line to Hwy. 149 bridge crossing (S22/23, T69N, R34W, Taylor Co.)			X					
BRUSHY CR. AND ITS TRIBUTARIES								
Brushy Cr.								
51. Mouth (Taylor Co.) to confluence with an unnamed tributary (S24, T68N, R35W, Taylor Co.)			X					
MAJOR RIVER - E. FK 102 R. AND ITS TRIBUTARIES								
E. FK 102 R.								
52. Iowa-Missouri state line to bridge crossing (Center, S8, T68N, R33W, Taylor Co.)		X						
E. FK 102 R.								
53. City of Bedford Water Works intake						X		
MAJOR RIVER - HONEY CR. AND ITS TRIBUTARIES								
Honey Cr.								
54. Iowa-Missouri state line to confluence with an unnamed tributary (S14, T69N, R32W, Taylor Co.)			X					
MAJOR RIVER - PLATTE BRANCH AND ITS TRIBUTARIES								
Platte Branch								
55. Iowa-Missouri state line to bridge crossing (S16/17, T68N, R32W, Taylor Co.)			X					
MAJOR RIVER - PLATTE R. AND ITS TRIBUTARIES								
Platte R.								
56. Iowa-Missouri state line (S28, T67N, R32W, Taylor Co.) to confluence with an unnamed tributary (NE 1/4, S36, T68N, R32W, Taylor Co.)		X						

SOUTHERN	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
MAJOR RIVER - PLATTE R. AND ITS TRIBUTARIES								
Platte R.								
57. Confluence with an unnamed tributary (NE 1/4, S36, T68N, R32W, Taylor Co.) to confluence with an unnamed tributary (NE 1/4, S16, T72N, R31W, Union Co.)			X					
TURKEY CR. AND ITS TRIBUTARIES								
Turkey Cr.								
58. Mouth (Ringgold Co.) to confluence with an unnamed tributary (NE 1/4, S29, T69N, R31W, Ringgold Co.)			X					
GARD BRANCH AND ITS TRIBUTARIES								
Gard Branch								
59. Mouth (Ringgold Co.) to confluence with an unnamed tributary (SE 1/4, S20, T70N, R31W, Ringgold Co.)			X					
EAST PLATTE R. AND ITS TRIBUTARIES								
East Platte R.								
60. Mouth (S9, T70N, R31W, Ringgold Co.) to confluence with Middle Platte R. (S33, T71N, R31W, Union Co.)			X					
Middle Platte R.								
61. Mouth (S33, T71N, R31W, Union Co.) to confluence with East Branch Middle Platte R. (S16, T71N, R31W, Union Co.)			X					
MAJOR RIVER - GRAND R. AND ITS TRIBUTARIES								
Grand R.								
62. Iowa-Missouri state line (S30, T67N, R31W, Ringgold Co.) to confluence with Crooked Cr. (S5, T68N, R30W, Ringgold Co.)		X						
Grand R.								
63. Confluence with Crooked Cr. (S5, T68N, R30W, Ringgold Co.) to bridge crossing (S25/36 line, T71N, R30W, Union Co.)			X					
WALNUT CR. AND ITS TRIBUTARIES								
Walnut Cr.								
64. Mouth (Ringgold Co.) to confluence with an unnamed tributary (NE 1/4, S36, T69N, R30W, Ringgold Co.)			X					
CROOKED CR. AND ITS TRIBUTARIES								
Crooked Cr.								
65. Mouth (Ringgold Co.) to confluence with Brush Cr. (S28, T69N, R30W, Ringgold Co.)			X					
SQUAW CR. AND ITS TRIBUTARIES								
Squaw Cr.								
66. Mouth (Ringgold Co.) to confluence with an unnamed tributary (S27, T70N, R30W, Ringgold Co.)			X					
PLUM CR. AND ITS TRIBUTARIES								
Plum Cr.								
67. Mouth (Ringgold Co.) to confluence with West Plum Cr. (S18, T70N, R30W, Ringgold Co.)			X					
MAJOR RIVER - MIDDLE FORK GRAND R. AND ITS TRIBUTARIES								
Middle Fork Grand R.								
68. Iowa-Missouri state line (Ringgold Co.) to confluence with an unnamed tributary (S13, T68N, R30W, Ringgold Co.)			X					

SOUTHERN	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
MAJOR RIVER - EAST FORK GRAND R. AND ITS TRIBUTARIES								
East Fork Grand R.								
69. Iowa-Missouri state line (Ringgold Co.) to confluence with Goosebury Cr. (S2, T68N, R29W, Ringgold Co.)			X					
MAJOR RIVER - LOTTS CR. AND ITS TRIBUTARIES								
Lotts Cr.								
70. Iowa-Missouri state line (Ringgold Co.) to confluence with Tuckers Cr. (S12, T67N, R29W, Ringgold Co.)			X					
MAJOR RIVER - GRAND R. (AKA THOMPSON CR.) AND ITS TRIBUTUTARIES								
Grand R. (aka Thompson R.)								
71. Iowa-Missouri state line (Decatur Co.) to confluence with Long Cr. (SW 1/4, S8, T69N, R26W, Decatur Co.)		X						
Grand R. (aka Thompson R.)								
72. Confluence with Long Cr. (SW 1/4, S8, T69N, R26W, Decatur Co.) to confluence with Marvel Cr. (S8, T75N, R30W, Adair Co.)			X					
ELK CR. AND ITS TRIBUTARIES								
Elk Cr.								
73. Mouth (S18, T68N, R26W, Decatur Co.) to confluence with an unnamed tributary (S20, T69N, R27W, Decatur Co.)			X					
LONG CR. AND ITS TRIBUTARIES								
Long Cr.								
74. Mouth (S8, T69N, R26W, Decatur Co.) to confluence with East Long Creek (S36, T71N, R27W, Clarke Co.)			X					
TWELVEMILE CR. AND ITS TRIBUTARIES								
Twelvemile Cr.								
75. Mouth (S36, T71N, R28W, Union Co.) to confluence with an unnamed tributary (NW 1/4, NE 1/4, S12, T71N, R29W, Union Co.)			X					
FOURMILE CR. AND ITS TRIBUTARIES								
Fourmile Cr.								
76. Mouth (S2, T72N, R28W, Union Co.) to confluence with an unnamed tributary (E 1/2, S23, T72N, R28W, Union Co.)			X					
WEST BRANCH CR. AND ITS TRIBUTARIES								
West Branch Cr.								
77. Mouth (S34, T74N, R29W, Madison Co.) to confluence with an unnamed tributary (E 1/2, S32, T74N, R29W, Madison Co.)			X					
MAJOR RIVER - LITTLE R. AND ITS TRIBUTARIES								
Little R.								
78. Iowa-Missouri state line (Decatur Co.) to Dam at road crossing (SE 1/2, NW 1/4, S30, T69N, R25W, Decatur Co.)			X					
MAJOR RIVER - WELDON R. AND ITS TRIBUTARIES								
Weldon R.								
79. Iowa-Missouri state line (Decatur Co.) to confluence with Mormon Pool (S28, T70N, R24W, Decatur Co.)			X					
STEEL CR. AND ITS TRIBUTARIES								
Steel Cr.								
80. Mouth (S 10/11 line, T67N, R24W, Decatur Co.) to confluence with an unnamed tributary (NE 1/4, S11, T68N, R24W, Decatur Co.)			X					

SOUTHERN	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
MAJOR RIVER - WELDON R. AND ITS TRIBUTARIES								
JONATHAN CR. AND ITS TRIBUTARIES								
Jonathan Cr.								
81. Mouth (S20, T69N, R24W, Decatur Co.) to confluence with Cobbville Cr. (W 1/2, S6, T69N, R24W, Decatur Co.)			X					
MAJOR RIVER - EAST FORK MEDICINE CR. AND ITS TRIBUTARIES								
East Fork Medicine Cr.								
82. Iowa-Missouri state line (Wayne Co.) to confluence with an unnamed tributary (E 1/2, S24, T68N, R22W, Wayne Co.)			X					
MAJOR RIVER - LOCUST CR. AND ITS TRIBUTARIES								
Locust Cr.								
83. Iowa-Missouri state line (Wayne Co.) to confluence with an unnamed tributary (S15, T67N, R20W, Wayne Co.)			X					
MAJOR RIVER - S. SHOAL CR. AND ITS TRIBUTARIES								
S. Shoal Cr.								
84. Iowa-Missouri state line (Appanoose Co.) to confluence with North Cr. (N 1/2, S16, T67N, R18W, Appanoose Co.)			X					
SOUTH CR. AND ITS TRIBUTARIES								
South Cr.								
85. Mouth (S 1/2, S16, T67N, R18W, Appanoose Co.) to confluence with an unnamed tributary (W 1/2, S17, T67N, R18W, Appanoose Co.)			X					
NORTH CR. AND ITS TRIBUTARIES								
North Cr.								
86. Mouth (N 1/2, S16, T67N, R18W, Appanoose Co.) to confluence with an unnamed tributary (W 1/2, of SE 1/4, S8, T67N, R18W, Appanoose Co.)			X					
MAJOR RIVER - SHOAL CR. AND ITS TRIBUTARIES								
Shoal Cr.								
87. Iowa-Missouri state line (Appanoose Co.) to confluence with an unnamed tributary (S28, T68N, R19W, Appanoose Co.)			X					
MAJOR RIVER - CHARITON R. AND ITS TRIBUTARIES								
Chariton R.								
88. Iowa-Missouri state line (Appanoose Co.) to Hwy. 2 (Appanoose Co., S27, T69N, R17W)		X						
Chariton R.								
89. Hwy. 2 (Appanoose Co., S27, T69N, R17W) to Rathbun Reservoir Dam (Appanoose Co., S35, T69N, R18W)		X						X
Chariton R.								
90. Rathbun Regional Water Company water supply intake						X		
Chariton R.								
91. Rathbun Reservoir Dam to upper extent of Rathbun Lake conservation pool	X	X						X
Chariton R.								
92. Upper extent of Rathun Lake conservation pool to Highway 14 (Lucas Co.)			X					X
Chariton R.								
93. Highway 14 (Lucas Co.) to confluence with Chariton Creek (S19, T71N, R23W, Lucas Co.)			X					

SOUTHERN	A	(BWW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
MAJOR RIVER - CHARITON R. AND ITS TRIBUTARIES								
PACKARD CR. AND ITS TRIBUTARIES								
Packard Cr.								
94. Mouth (S8, T67N, R16W, Appanoose Co.) to confluence with an unnamed tributary (S1, T67N, R17W, Appanoose Co.)			X					
Brush Cr.								
95. Mouth (S6, T67N, R16W, Appanoose Co.) to confluence with an unnamed tributary (S22, T68N, R17W, Appanoose Co.)			X					
UNNAMED CR. AND ITS TRIBUTARIES								
Unnamed Cr.								
96. Mouth (S17, T67N, R16W, Appanoose Co.) to confluence with an unnamed tributary (S14, T67N, R16W, Appanoose Co.)			X					
COOPER CR. AND ITS TRIBUTARIES								
Cooper Cr.								
97. Mouth (Appanoose Co.) to confluence with an unnamed tributary (S9, T68N, R19W, Appanoose Co.)			X					
WALNUT CR. AND ITS TRIBUTARIES								
Walnut Cr.								
98. Mouth (Appanoose Co.) to confluence with an unnamed tributary (S31, T69N, R19W, Appanoose Co.)			X					
Little Walnut Cr.								
99. Mouth (Appanoose Co.) to confluence with Wolf Branch (S12, T69N, R19W, Appanoose Co.)			X					
SOUTH FORK CHARITON R. AND ITS TRIBUTARIES								
South Fork Chariton R.								
100. Mouth (Lake Rathbun) to outfall of Bob White State Park Lake (S4, T68N, R22W, Wayne Co.)			X					
Walker Br.								
101. Mouth (S36, T70N, R20W, Wayne Co.) to confluence with South Fork Walker Br. (SE 1/4, S26, T70N, R20W, Wayne Co.)			X					
Jordan Cr.								
102. Mouth (S1, T70N, R21W, Wayne Co.) to confluence with an unnamed tributary (E 1/2, of the NW 1/4, S26, T70N, R21W, Wayne Co.)			X					
Jackson Cr.								
103. Mouth (S1, T70N, R21W, Wayne Co.) to confluence with an unnamed tributary (S12, T68N, R21W, Wayne Co.)			X					
W. Jackson Cr.								
104. Mouth (S25, T69N, R21W, Wayne Co.) to confluence with an unnamed tributary (S31, T69N, R21W, Wayne Co.)			X					
Unnamed Cr.								
105. Mouth (S5, T69N, R21W, Wayne Co.) to confluence with an unnamed tributary (S7, T69N, R21W, Wayne Co.)			X					
Ninemile Cr.								
106. Mouth (S4, T69N, R22W, Wayne Co.) to confluence with an unnamed tributary (S31, T70N, R22W, Wayne Co.)			X					
Dick Cr.								
107. Mouth (S16, T69N, R22W, Wayne Co.) to confluence with an unnamed tributary (NE 1/4, S18, T69N, R22W, Wayne Co.)			X					

SOUTHERN	A	(BWW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
MAJOR RIVER - CHARITON R. AND ITS TRIBUTARIES								
HONEY CR. AND ITS TRIBUTARIES								
Honey Cr.								
108. Mouth (S26, T71N, R20W, Lucas Co.) to confluence with an unnamed tributary (S10, T71N, R20W, Lucas Co.)			X					
WOLF CR. AND ITS TRIBUTARIES								
Wolf Cr.								
109. Mouth (S15, T71N, R21W, Lucas Co.) to confluence with an unnamed tributary (E 1/2, NW 1/4, S8, T70N, R22W, Wayne Co.)			X					
Brush Cr.								
110. Mouth (S31, T71N, R21W, Lucas Co.) to confluence with an unnamed tributary (SW 1/4, S13, T70N, R22W, Wayne Co.)			X					
Fivemile Cr.								
111. Mouth (S35, T71N, R22W, Lucas Co.) to confluence with an unnamed tributary (S29, T71N, R22W, Lucas Co.)			X					
MAJOR RIVER - NORTH FABIUS R. AND ITS TRIBUTARIES								
North Fabius R.								
112. Iowa-Missouri state line to confluence with an unnamed tributary (Center, S33, T68N, R15W, Davis Co.)			X					
MAJOR RIVER - CARTER CR. AND ITS TRIBUTARIES								
Carter Cr.								
113. Iowa-Missouri state line to confluence with an unnamed tributary (NW 1/4, S28, T68N, R14W, Davis Co.)			X					
MAJOR RIVER - SOUTH WYACONDA R. AND ITS TRIBUTARIES								
South Wyaconda R.								
114. Iowa-Missouri state line to confluence with an unnamed tributary (NE 1/4, S19, T68N, R13W, Davis Co.)			X					
MAJOR RIVER - FOX R. AND ITS TRIBUTARIES								
Fox R.								
115. Iowa-Missouri state line to confluence with an unnamed tributary (S29, T69N, R15W, Davis Co.)			X					
NORTH FOX CR. AND ITS TRIBUTARIES								
North Fox Cr.								
116. Mouth (Davis Co.) to confluence with an unnamed tributary (S2, T69N, R15W, Appanoose Co.)			X					
SOUTH FOX CR. AND ITS TRIBUTARIES								
South Fox Cr.								
117. Mouth (SE 1/4, S28, T69N, R15W, Davis Co.) to confluence with an unnamed tributary (S5, T68N, R15W, Davis Co.)			X					

DES MOINES RIVER BASIN

Des Moines River Basin (Lower Des Moines River, Upper Des Moines River, East Fork Des Moines River, Blue Earth River, and Raccoon River Subbasins).

The streams or stream segments named below in alphabetical order are referenced within the Water Use Designations for the Des Moines River Basin. Reference numbers provided in the alphabetical list correspond to numbered stream segments in the Water Use Designations.

Badger Cr. - 59
Badger Cr. - 162
Bay Branch - 88
Bear Cr. - 20
Bear Cr. - 80
Bear Cr. - 138
Beaver Cr. - 128
Beaver Cr. - 164
Beaver Cr. - 183
Big Cr. - 136
Big Creek - 134
Big Creek - 135
Black Cat Cr. - 171
Bloody Run - 169
Blue Earth R. - 187
Bluff Cr. - 140
Boone R. - 142
Boone R. - 143
Boone R. - 144
Boone R. - 145
Brush Cr. - 19
Brush Cr. - 36
Brushy Cr. - 153
Brushy Cr. - 154
Brushy Creek - 94
Brushy Creek - 95
Buck Cr. - 147
Buck Run - 126
Buffalo Cr. - 174
Buttrick Cr. - 105
Calhoun Cr. - 37
Camp Cr. - 38
Camp Cr. - 121
Cavitt Cr. - 46
Cedar Cr. - 28
Cedar Cr. - 29
Cedar Cr. - 60
Cedar Cr. - 110
Cedar Cr. - 111
Cedar Cr. - 124
Chequest Cr. - 15
Clanton Cr. - 48
Coal Cr. - 40
Competine Cr. - 32
Cylinder Cr. - 182
D.D. 94 - 149
Dead Brier Cr. - 104
Deer Cr. - 93
Deer Cr. - 163
Des Moines R. - 1
Des Moines R. - 2
Des Moines R. - 3
Des Moines R. - 4
Des Moines R. - 5
Des Moines R. - 6
Des Moines R. - 7
Des Moines R. - 8
Des Moines R. - 9
Des Moines R. - 10
Des Moines R. - 11
Des Moines R. - 12
Ditch No. 9 & 13 - 119
E Fk. Des Moines R. - 165
E Fk. Des Moines R. - 166
E Fk. Des Moines R. - 167
Eagle Cr. - 148
East Buttrick Cr. - 107
East Cedar Cr. - 112
East Fork Des Moines R. - 168
Elk Run - 116
English Cr. - 31
Fourmile Cr. - 67
Fourmile Cr. - 68
Greenbrier Cr. - 103
Hardin Cr. - 108
Hickory Cr. - 100
Honey Cr. - 139
Howerdon Cr. - 65
Indian Cr. - 123
Indian Cr. - 180
Jack Cr. - 185
Jim Cr. - 63
Jones Cr. - 49
Lake Cr. - 117
Lake Cr. - 118
Lick Cr. - 14
Lindsey Cr. - 173
Little Beaver Cr. - 129
Little Beaver Cr. - 130
Little Cedar Cr. - 125
Little Fourmile Cr. - 69
Little Soap Cr. - 18
Little White Breast Cr. - 35
Lizard Cr. - 157
Lizard Cr. - 158
Lotts Cr. - 170
Marrowbone Cr. - 115
Middle Avery Cr. - 24
Middle Beaver Cr. - 132
Middle Branch Boone R. - 152
Middle Cr. - 58
Middle R. - 43
Middle R. - 45
Middle Raccoon R. - 81
Middle Raccoon R. - 82
Middle Raccoon R. - 83
Middle Raccoon R. - 84
Middle Raccoon R. - 85
Middle Raccoon R. - 86
Miller Cr. - 26
Mosquito Cr. - 87
Muchakinock Cr. - 27
Mud Cr. - 42
Mud Cr. - 177
N. Br. Lizard Cr. - 161
N. Raccoon R. - 96
N. Raccoon R. - 97
N. Raccoon R. - 99
North Avery Cr. - 25
North Branch North R. - 61
North Buffalo Cr. - 176
North Cedar Cr. - 30
North Fork Clanton Cr. - 51
North R. - 54
North R. - 55
North R. - 56
North R. - 57
North Raccoon River - 98
Old Channel - Des Moines - 186
Orman Cr. - 64
Otter Cr. - 41
Otter Cr. - 150
Outlet Cr. - 127
Panther Cr. - 78
Pilot Cr. - 181
Plum Cr. - 172
Plunger Cr. - 66
Prairie Cr. - 120
Prairie Cr. - 151
Prairie Cr. - 155
Prairie Cr. - 179
Purgatory Cr. - 114
Raccoon R. - 70
Raccoon R. - 71
Raccoon R. - 72
Rock Cr. - 133
S. Br. Lizard Cr. - 159
S. Raccoon R. - 76
S. Raccoon R. - 77
Short Cr. - 109
Silver Cr. - 184
Skillet Cr. - 141
Slough Cr. - 131
Snake Cr. - 102
Soap Cr. - 16
Soap Cr. - 17
Soldier Cr. - 156
Soldier Cr. - 178
South Avery Cr. - 23
South Fork Clanton Cr. - 50
South Fork Middle R. - 53
South R. - 39
South Soap Cr. - 21
Spring Branch - 91
Spring Cr. - 160
Sugar Cr. - 13
Sugar Cr. - 75
Swan Lake Branch - 101
Tom Cr. - 62
Union Slough - 175
Union Slough Ditch - 189
Unnamed Cr. - 92
Unnamed Cr. - 113
Village Cr. - 22
W. Fk. Camp Cr. - 122
Walnut Cr. - 73
Walnut Cr. - 74
Welty Cr. - 52
West Buttrick Cr. - 106
West Fork Blue Earth R. - 188
West Panther Cr. - 79
White Breast Cr. - 33
White Breast Cr. - 34
White Fox Cr. - 146
Willey Branch - 90
Willow Cr. - 89
Wolf Cr. - 137

DES MOINES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
MAJOR RIVER - LOWER DES MOINES R. AND ITS TRIBUTARIES								
DES MOINES R. AND ITS TRIBUTARIES								
Des Moines R.								
1. Mouth (Lee Co.) to confluence with the Raccoon River (includes Red Rock Reservoir)	X	X						
Des Moines R.								
2. Ottumwa Municipal Water Works intake						X		
MAJOR RIVER - UPPER DES MOINES R. AND ITS TRIBUTARIES								
Des Moines R.								
3. Raccoon R. to Center St. Dam in Des Moines		X						
Des Moines R.								
4. Center St. Dam in Des Moines to Hwy. I-80/I-35 (S17, T79N, R24W, Polk Co.)	X	X						
Des Moines R.								
5. Des Moines Water Works intake, Prospect Park (NE 1/4, S28, T79N, R24W, Polk Co.)						X		
Des Moines R.								
6. Hwy. I-80/I-35 to Saylorville Reservoir Dam		X						
Des Moines R.								
7. Saylorville Reservoir Dam to Polk-Dallas co. line	X	X						
Des Moines R.								
8. Saylorville Reservoir to Fraser Dam (S2, T84N, R27W, Boone Co.)		X						
Des Moines R.								
9. Fraser Dam (Boone Co.) to W. line of S15, T88N, R28W, Webster Co.		X						X
Des Moines R.								
10. West line of S15, T88N, R28W (Webster Co.) to dam of upper impoundment at Fort Dodge		X						
Des Moines R.								
11. Upper impoundment at Fort Dodge	X	X						
Des Moines R.								
12. Fort Dodge Upper impoundment to state line		X						
MAJOR RIVER - LOWER DES MOINES R. AND ITS TRIBUTARIES								
SUGAR CR. AND ITS TRIBUTARIES								
Sugar Cr.								
13. Mouth (Lee Co.) to bridge crossing (S8, T67N, R6W, Lee Co.)			X					
LICK CR. AND ITS TRIBUTARIES								
Lick Cr.								
14. Mouth (S19, T67N, R7W, Lee Co.) to confluence with an unnamed tributary (S32, T68N, R7W, Lee Co.)			X					
CHEQUEST CR. AND ITS TRIBUTARIES								
Chequest Cr.								
15. Mouth (S27, T69N, R10W, Van Buren Co.) to confluence with North Chequest Cr. (S25, T70N, R13W, Wapello Co.)			X					

DES MOINES MAJOR RIVER - LOWER DES MOINES R. AND ITS TRIBUTARIES SOAP CR. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Soap Cr. 16. Mouth (S35, T71N, R12W, Jefferson Co.) to confluence with Little Soap Creek (S1, T70N, R13W, Davis Co.)		X						
Soap Cr. 17. Confluence with Little Soap Cr. (S1, T70N, R13W, Davis Co.) to confluence with an unnamed tributary (W 1/2, NE 1/4, S31, T71N, R16W, Monroe Co.)			X					
Little Soap Cr. 18. Mouth (S1, T70N, R13W, Davis Co.) to confluence with an unnamed tributary (S21, T71N, R15W, Wapello Co.)			X					
Brush Cr. 19. Mouth (S3, T70N, R14W, Davis Co.) to confluence with an unnamed tributary (E 1/2, S25, T71N, R15W, Wapello Co.)			X					
Bear Cr. 20. Mouth (S19, T70N, R14W, Davis Co.) to confluence with an unnamed tributary (E 1/2, S4, T70N, R15W, Davis Co.)			X					
South Soap Cr. 21. Mouth (S21, T70N, R15W, Davis Co.) to Lake Dam (S29, T70N, R16W, Appanoose Co.)			X					
VILLAGE CR. AND ITS TRIBUTARIES Village Cr. 22. Mouth (S9, T71N, R13W, Wapello Co.) to confluence with Sandy Cr. (NW 1/4, S9, T71N, R14W, Wapello Co.)			X					
SOUTH AVERY CR. AND ITS TRIBUTARIES South Avery Cr. 23. Mouth (S31, T73N, R14W, Wapello Co.) to confluence with an unnamed tributary (NE 1/4, S15, T72N, R15W, Wapello Co.)			X					
MIDDLE AVERY CR. AND ITS TRIBUTARIES Middle Avery Cr. 24. Mouth (S25, T73N, R15W, Wapello Co.) to confluence with White Ash and Little Avery Crs. (W. line, S12, T72N, R16W, Monroe Co.)			X					
North Avery Cr. 25. Mouth (S34, T73N, R15W, Wapello Co.) to confluence with an unnamed tributary (Center, S34, T73N, R16W, Monroe Co.)			X					
MILLER CR. AND ITS TRIBUTARIES Miller Cr. 26. Mouth (Wapello Co.) to confluence with an unnamed tributary (Sec. 29, T73N, R16W, Monroe Co.)			X					
MUCHAKINOCK CR. AND ITS TRIBUTARIES Muchakinock Cr. 27. Mouth (Mahaska Co.) to confluence with an unnamed tributary (NW 1/4, SW 1/4, S27, T76N, R17W, Mahaska Co.)			X					

DES MOINES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
MAJOR RIVER - LOWER DES MOINES R. AND ITS TRIBUTARIES								
CEDAR CR. AND ITS TRIBUTARIES								
Cedar Cr.								
28. Mouth (S33, T75N, R17W, Mahaska Co.) to confluence with North Cedar Cr. (NE 1/4, S15, T74N, R18W, Marion Co.)		X						
Cedar Cr.								
29. Confluence with North Cedar Creek (NE 1/4, S15, T74N, R18W, Marion Co.) to confluence with Mormon Branch (S5, T71N, R18W, Monroe Co.)			X					
North Cedar Cr.								
30. Mouth (S15, T74N, R18W, Marion Co.) to confluence with Sage Cr. (SE 1/4, S7, T73N, R19W, Monroe Co.)			X					
ENGLISH CR. AND ITS TRIBUTARIES								
English Cr.								
31. Mouth (Marion Co.) to confluence with Long Branch (S16, T74N, R20W, Marion Co.)			X					
COMPETINE CR. AND ITS TRIBUTARIES								
Competine Cr.								
32. Mouth (Marion Co.) to confluence with an unnamed tributary (S5, T75N, R19W, Marion Co.)			X					
WHITE BREAST CR. AND ITS TRIBUTARIES								
White Breast Cr.								
33. Mouth (S10, T76N, R19W, Marion Co.) to confluence with Little White Breast Cr. (S11, T73N, R22W, Lucas Co.)		X						
White Breast Cr.								
34. Confluence with Little White Breast Cr. (Lucas Co.) to confluence with an unnamed tributary (S4, T71N, R24W, Clarke Co.)			X					
Little White Breast Cr.								
35. Mouth (Lucas Co.) to Ellis Lake (S27, T72N, R21W, Lucas Co.)			X					
Brush Cr.								
36. Mouth (Lucas Co.) to confluence with an unnamed tributary (W 1/2, S21, T72N, R23W, Lucas Co.)			X					
CALHOUN CR. AND ITS TRIBUTARIES								
Calhoun Cr.								
37. Mouth (Marion Co.) to confluence with Union Valley Cr. (S33, T78N, R20W, Jasper Co.)			X					
CAMP CR. AND ITS TRIBUTARIES								
Camp Cr.								
38. Mouth (Jasper Co.) to confluence with an unnamed tributary (S14, T79N, R22W, Polk Co.)			X					
SOUTH R. AND ITS TRIBUTARIES								
South R.								
39. Mouth (S12, T77N, R22W, Warren Co.) to confluence with Painter Cr. (SE 1/4, S13, T75N, R25W, Warren Co.)			X					
Coal Cr.								
40. Mouth (Warren Co.) to confluence with Coon Cr. (S29, T76N, R21W, Marion Co.)			X					
Otter Cr.								
41. Mouth (S34, T76N, R23W, Warren Co.) to confluence with Otter Cr. and South Otter Cr. (NW 1/4, S8, T73N, R23W, Lucas Co.)			X					

	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
DES MOINES								
MAJOR RIVER - LOWER DES MOINES R. AND ITS TRIBUTARIES								
MUD CR. AND ITS TRIBUTARIES								
Mud Cr.								
42. Mouth (Polk Co.) to confluence with an unnamed tributary (S36, T80N, R23W, Polk Co.)			X					
MIDDLE R. AND ITS TRIBUTARIES								
Middle R.								
43. Mouth (Warren Co.) to confluence with Bush Branch (S8, T75N, R29W, Madison Co.)		X						
Middle R.								
45. Confluence with Bush Branch (S8, T75N, R29W, Madison Co.) to confluence with an unnamed tributary (NE 1/4, S17, T78N, R32W, Guthrie Co.)			X					
Cavitt Cr.								
46. Mouth (Warren Co.) to confluence with an unnamed tributary (S13, T76N, R24W, Warren Co.)			X					
Clanton Cr.								
48. Mouth (N 1/2, S28, T76N, R25W, Warren Co.) to confluence with North & South Fork Clanton Cr. (SW 1/4, S10, T74N, R27W, Madison Co.)			X					
Jones Cr.								
49. Mouth (Madison Co.) to confluence with an unnamed tributary (S28, T75N, R27W, Madison Co.)			X					
South Fork Clanton Cr.								
50. Mouth (Madison Co.) to confluence with an unnamed tributary (NE 1/4 of NW 1/4, S36, T74N, R28W, Madison Co.)			X					
North Fork Clanton Cr.								
51. Mouth (Madison Co.) to confluence with an unnamed tributary (S8/9, T74N, R28W, Madison Co.)			X					
Welty Cr.								
52. Mouth (S14, T75N, R29W, Madison Co.) to confluence with Rocky Branch (SE 1/4, S22, T75N, R29W, Madison Co.)			X					
South Fork Middle R.								
53. Mouth (S35, T78N, R32W, Guthrie Co.) to confluence with an unnamed tributary (S33, T78N, R32W, Guthrie Co.)			X					
NORTH R. AND ITS TRIBUTARIES								
North R.								
54. Mouth (Polk Co.) to County Rd. R63 (S16, T77N, R24W, Warren Co.)		X						
North R.								
55. County Rd. R63 (S16, T77N, R24W, Warren Co.) to confluence with Badger Cr. (S33, T77N, R25W, Warren Co.)		X						X
North R.								
56. Confluence with Badger Cr. (S33, T77N, R25W, Warren Co.) to confluence with North Branch North R. (S33, T77N, R27W, Madison Co.)			X					
North R.								
57. Confluence with North Branch North R. (Madison Co.) to confluence with an unnamed tributary (S11, T77N, R31W, Adair Co.)			X					

DES MOINES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
MAJOR RIVER - LOWER DES MOINES R. AND ITS TRIBUTARIES								
NORTH R. AND ITS TRIBUTARIES								
Middle Cr.								
58. Mouth (Warren Co.) to Lake Colechester Dam (NE 1/4, S1, T77N, R25W, Warren Co.)			X					
Badger Cr.								
59. Mouth (Warren Co.) to Badger Lake Dam (NW 1/4, S13, T77N, R27W, Madison Co.)			X					
Cedar Cr.								
60. Mouth (S9, T76N, R26W, Madison Co.) to confluence with an unnamed tributary (NW 1/4, S26, T76N, R28W Madison Co.)			X					
North Branch North R.								
61. Mouth (Madison Co.) to confluence with an unnamed tributary (S5, T77N, R29W, Madison Co.)			X					
Tom Cr.								
62. Mouth (Madison Co.) to confluence with an unnamed tributary (S26, T77N, R29W, Madison Co.)			X					
Jim Cr.								
63. Mouth (Madison Co.) to confluence with an unnamed tributary (S15, T77N, R29W, Madison Co.)			X					
Orman Cr.								
64. Mouth (S10, T76N, R28W, Madison Co.) to confluence with unnamed tributary (E 1/2, S4, T76N, R28W, Madison Co.)			X					
Howerdon Cr.								
65. Mouth (S17, T76N, R28W, Madison Co.) to confluence with an unnamed tributary (SW 1/4, S25, T76N, R29W, Madison Co.)			X					
Plunger Cr.								
66. Mouth (Adair Co.) to confluence with an unnamed tributary (S26, T77N, R30W, Adair Co.)			X					
FOURMILE CR. AND ITS TRIBUTARIES								
Fourmile Cr.								
67. Mouth (Polk Co.) to Co. Rd. bridge (S18, T80N, R23W, Polk Co.)	X		X					
Fourmile Cr.								
68. Co. Rd. bridge (S18, T80N, R23W, Polk Co.) to bridge crossing (N. line of S22, T81N, R24W, Polk Co.)			X					
Little Fourmile Cr.								
69. Mouth (Polk Co.) to confluence with an unnamed tributary (S35, T79N, R23W, Polk Co.)			X					
MAJOR RIVER - UPPER DES MOINES R. AND ITS TRIBUTARIES								
RACCOON R. AND ITS TRIBUTARIES								
Raccoon R.								
70. Mouth (Polk Co.) to Polk-Dallas county line	X	X						
Raccoon R.								
71. City of Des Moines Water Works intake						X		
Raccoon R.								
72. Polk-Dallas co. line to confluence of N. Raccoon R. and S. Raccoon R.	X	X						X
Walnut Cr.								
73. Mouth (S13, T78N, R25W, Polk Co.) to Interstate 35/80 (S33, T79N, R25W, Polk Co.)	X		X					

DES MOINES MAJOR RIVER - UPPER DES MOINES R. AND ITS TRIBUTARIES RACCOON R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Walnut Cr. 74. Interstate 35/80 (S33, T79N, R25W, Polk Co.) to confluence with Little Walnut Cr. (SE 1/4, S24, T79N, R26W, Dallas Co.)			X					
Sugar Cr. 75. Mouth (S26, T78N, R26W, Dallas Co.) to confluence with an unnamed tributary from the West (S8, T78N, R26W, Dallas Co.)			X					
S. Raccoon R. 76. Mouth (Dallas Co.) to confluence with Brushy Cr. (Guthrie Co.)		X						
S. Raccoon R. 77. Confluence with Brushy Cr. (S22, T79N, R31W, Guthrie Co.) to confluence with Frost Cr. (S18, T80N, R32W, Guthrie Co.)			X					
Panther Cr. 78. Mouth (S16, T78N, R28W, Dallas Co.) to confluence with West & East Panther Cr. (S16, T79N, R28W, Dallas Co.)			X					
West Panther Cr. 79. Mouth (S16, T79N, R28W, Dallas Co.) to confluence with an unnamed tributary (NW 1/4, S9, T79N, R28W, Dallas Co.)			X					
Bear Cr. 80. Mouth (S17, T78N, R28W, Dallas Co.) to confluence with an unnamed tributary (SW 1/4, S25, T78N, R29W, Dallas Co.)			X					
Middle Raccoon R. 81. Mouth (Dallas Co.) to Redfield Dam (S5, T78N, R29W, Dallas Co.)	X	X						
Middle Raccoon R. 82. Redfield Dam (Dallas Co.) to Lake Panorama Dam (S31, T80N, R30W, Guthrie Co.)	X	X						X
Middle Raccoon R. 83. City of Panora Water Works intakes						X		
Middle Raccoon R. 84. Lake Panorama	X	X						X
Middle Raccoon R. 85. Lake Panorama to confluence with Willey Branch (A26, T83N, R34W, Carroll Co.)	X	X						
Middle Raccoon R. 86. Confluence with Willey Branch (Carroll Co.) to confluence with an unnamed tributary (S8, T84N, R35W, Carroll Co.)			X					
Mosquito Cr. 87. Mouth (S34, T79N, R29W, Dallas Co.) to confluence with an unnamed tributary (S21, T81N, R30W, Guthrie Co.)			X					
Bay Branch 88. Mouth (S9, T79N, R30W, Guthrie Co.) to dam at Bay Branch Marsh (NW 1/4, S27, T80N, R30W, Guthrie Co.)			X					

DES MOINES MAJOR RIVER - UPPER DES MOINES R. AND ITS TRIBUTARIES RACCOON R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Willow Cr. 89. Mouth (Guthrie Co.) to confluence with an unnamed tributary (SW 1/4, S30, T83N, R32W, Greene Co.)			X					
Willey Branch 90. Mouth (Carroll Co.) to confluence with an unnamed tributary (S29, T83N, R34W, Carroll Co.)			X					
Spring Branch 91. Mouth (Carroll Co.) to confluence with an unnamed tributary (S16, T83N, R34W, Carroll Co.)			X					
Unnamed Cr. 92. Mouth (S29, T84N, R34W, Carroll Co.) to the northern road crossing on the section line between S24, T84N, R35W, and S19, T84N, R34W, Carroll Co.)			X					
Deer Cr. 93. Mouth (S15, T78N, R30W, Guthrie Co.) to confluence with an unnamed tributary (NE1/4, NE1/4 S19, T78N, R30W, Guthrie Co.)			X					
Brushy Creek 94. Mouth (Guthrie Co.) to Guthrie-Audubon Co. line		X						
Brushy Creek 95. Guthrie-Audubon Co. line to confluence with an unnamed tributary (S6, T82N, R34W, Carroll Co.)			X					
N. Raccoon R. 96. Mouth (Dallas Co.) to Hwy. 286 (S17, T85N, R33W, Carroll Co.)	X	X						X
N. Raccoon R. 97. Hwy. 286 (Carroll Co.) to Sac. Co. Rd. M54 (S24, T88N, R36W, Sac Co.)	X	X						
North Raccoon R. 98. Sac Co. Road M54 (S24, T88N, R36W, Sac Co.) to confluence with D.D. 101 (S36, T91N, R36W, Buena Vista Co.)		X						
N. Raccoon R. 99. Confluence with Drainage Ditch No. 101 (S36, T91N, R36W, Buena Vista Co.) to confluence with unnamed tributary (S4, T92N, R36W, Buena Vista Co.)			X					
Hickory Cr. 100. Mouth (S17, T79N, R27W, Dallas Co.) to confluence with unnamed tributary (westernmost tributary in W 1/2, S16, T79N, R27W, Dallas Co.)			X					
Swan Lake Branch 101. Mouth (S28, T81N, R28W, Dallas Co.) to west line S4, T80N, R28W, Dallas Co.			X					
Snake Cr. 102. Mouth (S2, T81N, R29W, Dallas Co.) to north line S26, T82N, R29W, Greene Co.			X					
Greenbrier Cr. 103. Mouth (S5, T81N, R29W, Dallas Co.) to west line S13, T82N, R31W, Greene Co.			X					
Dead Brier Cr. 104. Mouth (S36, T82N, R30W, Greene Co.) to confluence with an unnamed tributary (NE1/4, S26, T82N, R30W, Greene Co.)			X					

DES MOINES MAJOR RIVER - UPPER DES MOINES R. AND ITS TRIBUTARIES RACCOON R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Buttrick Cr. 105. Mouth (S26, T83N, R30W, Greene Co.) to confluence with East & West Buttrick Cr. (SE 1/4, S25, T84N, R30W, Greene Co.)			X					
West Buttrick Cr. 106. Mouth (S25, T84N, R30W, Greene Co.) to confluence with Ditch No. 52 (SE 1/4, S16, T86N, R30W, Webster Co.)			X					
East Buttrick Cr. 107. Mouth (S25, T84N, R30W, Greene Co.) to confluence with Lost Grove Cr. (SW 1/4, S4, T85N, R29W, Greene Co.)			X					
Hardin Cr. 108. Mouth (S23, T83N, R30W, Greene Co.) to confluence with Happy Run (SW 1/4, S22, T85N, R31W, Greene Co.)			X					
Short Cr. 109. Mouth (Greene Co.) to confluence with an unnamed tributary (S21, T84N, R31W, Greene Co.)			X					
Cedar Cr. 110. Mouth (S33, T85N, R32W, Greene Co.) to confluence with an unnamed tributary (NW 1/4, S15, T85N, R32W, Greene Co.)		X						
Cedar Cr. 111. Confluence with an unnamed tributary (NW 1/4, S15, T85N, R32W, Greene Co.) to confluence with East & West Cedar Crs. (S31, T87N, R31W, Calhoun Co.)			X					
East Cedar Cr. 112. Mouth (South Line, S31, T87N, R31W, Calhoun Co.) to confluence with Welsh's Slough (Center, S3, T87N, R31W, Calhoun Co.)			X					
Unnamed Cr. 113. Mouth (S18, T84N, R32W, Greene Co.) to confluence with an unnamed tributary (NE 1/4, S19, T84N, R32W, Greene Co.)			X					
Purgatory Cr. 114. Mouth (S11, T84N, R33W, Carroll Co.) to confluence with an unnamed tributary (NE 1/4, S17, T86N, R32W, Calhoun Co.)			X					
Marrowbone Cr. 115. Mouth (S17, T85N, R33W, Carroll Co.) to confluence with an unnamed tributary (NW 1/4, S17, T85N, R33W, Carroll Co.)			X					
Elk Run 116. Mouth (S7, T85N, R33W, Carroll Co.) to confluence with D.D. Nos. 72 & 81 (S5, T85N, R34W, Carroll Co.)			X					
Lake Cr. 117. Mouth (S23, T86N, R34W, Calhoun Co.) to East line S12, T86N, R34W, Calhoun Co.		X						
Lake Cr. 118. East line S12, T86N, R34W, Calhoun Co. to confluence with Ditch Nos. 65, and 9 & 13 (S29, T88N, R32W, Calhoun Co.)			X					

DES MOINES MAJOR RIVER - UPPER DES MOINES R. AND ITS TRIBUTARIES RACCOON R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Ditch Nos. 9 & 13 119. Mouth (confluence with Ditch No. 65 in S29, T88N, R32W, Calhoun Co.) to the confluence with an unnamed tributary (SE 1/4, S8, T89N, R32W, Calhoun Co.)			X					
Prairie Cr. 120. Mouth (S16, T86N, R34W, Calhoun Co.) to confluence with Drainage Ditch No. 198 (S2, T86N, R34W, Calhoun Co.)			X					
Camp Cr. 121. Mouth (S7, T86N, R34W, Calhoun Co.) to confluence with unnamed tributary (S34, T88N, R34W, Calhoun Co.)			X					
W. Fk. Camp Cr. 122. Mouth (S8, T87N, R34W, Calhoun Co.) to confluence with Drainage Ditch No.1 (S10, T88N, R34W, Calhoun Co.)			X					
Indian Cr. 123. Mouth (S24, T87N, R36W, Sac Co.) to confluence with an unnamed tributary (N 1/2, SW 1/4, S20, T87N, R36W, Sac Co.)			X					
Cedar Cr. 124. Mouth (S25, T88N, R36W, Sac Co.) to confluence with Little Cedar Cr. (S15, T90N, R34W, Pocahontas Co.)			X					
Little Cedar Cr. 125. Mouth (S15, T90N, R34W, Pocahontas Co.) to confluence with unnamed tributary (S19, T91N, R34W, Pocahontas Co.)			X					
Buck Run 126. Mouth (SE 1/4, S11, T89N, R36W, Sac Co.) to confluence with an unnamed tributary (E 1/2, S9, T89N, R36W, Sac Co.)			X					
Outlet Cr. 127. Mouth (Buena Vista Co.) to bridge crossing at (S26/27, T90N, R36W, Buena Vista Co.)			X					
BEAVER CR. AND ITS TRIBUTARIES								
Beaver Cr. 128. Mouth (S17, T79N, R24W, Polk Co.) to confluence with an unnamed tributary (S29, T84N, R28W, Boone Co.)			X					
Little Beaver Cr. 129. Mouth (S35, T80N, R25W, Polk Co.) to confluence with an unnamed tributary (SW 1/4, SW 1/4, S29, T80N, R25W, Polk Co.)			X					
Little Beaver Cr. 130. Mouth (S14, T81N, R27W, Dallas Co.) to confluence with an unnamed tributary (SE 1/4, SE 1/4, S29, T82N, R27W, Boone Co.)			X					
Slough Cr. 131. Mouth (S16, T81N, R27W, Dallas Co.) to confluence with an unnamed tributary (NW 1/4, S21, T81N, R27W, Dallas Co.)			X					
Middle Beaver Cr. 132. Mouth (S21, T83N, R28W, Boone Co.) to Hwy. 30 (North line, S4, T83N, R28W, Boone Co.)			X					

DES MOINES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
MAJOR RIVER - UPPER DES MOINES R. AND ITS TRIBUTARIES								
ROCK CR. AND ITS TRIBUTARIES								
Rock Cr.								
133. Mouth (S32, T80N, R24W, Polk Co. to Hwy. 415 bridge crossing (S21, T80N, R24W, Polk Co.)			X					
BIG CREEK (AKA BIG CR. LAKE OUTLET) AND ITS TRIBUTARIES								
Big Creek (aka Big Cr. Lake Outlet)								
134. Mouth (Polk Co.) to Big Creek Lake Dam (SW 1/4, S26, T81N, R25W, Polk Co.)		X						
Big Creek (aka Big Cr. Lake Outlet)								
135. Big Cr. Lake	X	X						
Big Cr.								
136. Upper end of Big Creek Lake (Polk Co.) to confluence with an unnamed tributary (SE 1/4, S33, T83N, R25W, Boone Co.)			X					
Wolf Cr.								
137. Mouth (S36, T81N, R25W, Polk Co.) to North line, S25, T81N, R25W, Polk Co.			X					
BEAR CR. AND ITS TRIBUTARIES								
Bear Cr.								
138. Mouth (S29, T83N, R26W, Boone Co.) to confluence with an unnamed tributary (SE 1/4, S24, T83N, R27W, Boone Co.)			X					
HONEY CR. AND ITS TRIBUTARIES								
Honey Cr.								
139. Mouth (Boone Co.) to bridge crossing at (NW 1/4, S33, T84N, R26W, Boone Co.)		X						
BLUFF CR. AND ITS TRIBUTARIES								
Bluff Cr.								
140. Mouth (S22, T84N, R27W, Boone Co.) to dam/ spillway at Don Williams Lake (NE 1/4, SW 1/4, S5, T84N, R27W, Boone Co.)			X					
SKILLET CR. AND ITS TRIBUTARIES								
Skillet Cr.								
141. Mouth (S16, T86N, R27W, Webster Co.) to confluence with an unnamed tributary (NW 1/4, SE 1/4, S14, T86N, R28W, Webster Co.)			X					
BOONE R. AND ITS TRIBUTARIES								
Boone R.								
142. Mouth (Webster Co.) to State Hwy. 17 (S18, T88N, R25W, Hamilton Co.)	X	X						X
Boone R.								
143. State Hwy. 17 to confluence with Brewers Creek (Hamilton Co.)		X						X
Boone R.								
144. Confluence with Brewers Creek (Hamilton Co.) to confluence with Middle Branch Boone R. (Wright Co.)		X						
Boone R.								
145. Confluence with Middle Branch Boone R. (Wright Co.) to confluence with Drainage Ditch No. 10 (S29, T95N, R26W, Hancock Co.)			X					
White Fox Cr.								
146. Mouth (S33, T89N, R25W, Hamilton Co.) to confluence with an unnamed tributary (E 1/2 of the SE 1/4 of S36, T91N, R25W, Wright Co.)			X					

DES MOINES MAJOR RIVER - UPPER DES MOINES R. AND ITS TRIBUTARIES BOONE R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Buck Cr. 147. Mouth (S28, T89N, R25W, Hamilton Co.) to confluence with Drainage Ditch No. 144 (S11, T88N, R25W, Hamilton Co.)			X					
Eagle Cr. 148. Mouth (S6, T89N, R25W, Hamilton Co.) to confluence with Little Eagle Cr. (S9, T91N, R25W, Wright Co.)			X					
D.D. 94 149. Mouth (Wright Co.) to West line of S3, T90N, R26W, Wright Co.			X					
Otter Cr. 150. Mouth (Wright Co.) to confluence with West Otter Cr. (S31, T93N, R25W, Wright Co.)		X						
Prairie Cr. 151. Mouth (S30, T93N, R26W, Wright Co.) to confluence with D.D. No. 116 (S24, T94N, R28W, Kossuth Co.)			X					
Middle Branch Boone R. 152. Mouth (Hancock Co.) to confluence with an unnamed tributary (S31, T95N, R25W, Hancock Co.)		X						
BRUSHY CR. AND ITS TRIBUTARIES								
Brushy Cr. 153. Mouth (S15, T87N, R27W, Webster Co.) to Brushy Creek Lake Dam (S34, T88N, R27W, Webster Co.)			X					
Brushy Cr. 154. Upper extent of Brushy Creek Lake (W. line of S16, T88N, R27W) to confluence with unnamed tributary (SE 1/4, S34, T89N, R27W, Webster Co.)			X					
PRAIRIE CR. AND ITS TRIBUTARIES								
Prairie Cr. 155. Mouth (S35, T88N, R28W, Webster Co.) to confluence with D.D. No. 29 (S25, T88N, R29W, Webster Co.)			X					
SOLDIER CR. AND ITS TRIBUTARIES								
Soldier Cr. 156. Mouth (S19, T89N, R28W, Webster Co.) to confluence with unnamed tributary (S26, T90N, R28W, Webster Co.)			X					
LIZARD CR. AND ITS TRIBUTARIES								
Lizard Cr. 157. Mouth (S19, T89N, R28W, Webster Co.) to confluence with unnamed tributary (N 1/2, S31, T90N, R30W, Webster Co.)		X						
Lizard Cr. 158. Confluence with unnamed tributary (N 1/2, S31, T90N, R30W, Webster Co.) to confluence with Drainage Ditch No. 164 (S31, T91N, R31W, Pocahontas Co.)			X					
S. Br. Lizard Cr. 159. Mouth (S23, T89N, R29W, Webster Co.) to confluence with unnamed tributary (S25, T90N, R32W, Pocahontas Co.)			X					
Spring Cr. 160. Mouth (S33, T89N, R29W, Webster Co.) to confluence with Prairie Creek (S14, T88N, R30W, Webster Co.)			X					

DES MOINES MAJOR RIVER - UPPER DES MOINES R. AND ITS TRIBUTARIES LIZARD CR. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
N. Br. Lizard Cr. 161. Mouth (S2, T91N, R31W, Pocahontas Co.) to confluence with Drainage Ditch No. 169 (S6, T91N, R31W, Pocahontas Co.)			X					
BADGER CR. AND ITS TRIBUTARIES Badger Cr. 162. Mouth (S30, T90N, R28W, Webster Co.) to Badger Lake Dam (S19, T90N, R28W, Webster Co.)			X					
DEER CR. AND ITS TRIBUTARIES Deer Cr. 163. Mouth (S13, T90N, R29W, Webster Co.) to confluence with unnamed tributary (S16, T90N, R29W, Webster Co.)			X					
BEAVER CR. AND ITS TRIBUTARIES Beaver Cr. 164. Mouth (S32, T91N, R28W, Humboldt Co.) to confluence with unnamed tributary (S28, T91N, R28W, Humboldt Co.)			X					
E. FK. DES MOINES R. AND ITS TRIBUTARIES E. Fk. Des Moines R. 165. Mouth (Humboldt Co.) to Divine bridge access Hwy. 169 (S26, T94N, R29W, Kossuth Co.)	X	X						X
E. Fk. Des Moines R. 166. Divine bridge access Hwy. 169 (S26, T94N, R29W, Kossuth Co.) to County Rd. B63 (S23, T94N, R29W, Kossuth Co.)		X						X
E. Fk. Des Moines R. 167. County Rd. B63 (Kossuth Co.) to confluence with Buffalo Cr. (Kossuth Co.)		X						
East Fork Des Moines R. 168. Confluence with Buffalo Cr. (S20, T97N, R28W, Kossuth Co.) to outlet control structure Tuttle Lake (aka Okamanpeedan Lake) (S14, T100N, R32W, Emmet Co.)		X						
Bloody Run 169. Mouth (S33, T93N, R28W, Humboldt Co.) to confluence with unnamed tributary (S1, T92N, R29W, Humboldt Co.)			X					
Lotts Cr. 170. Mouth (S17, T93N, R28W, Humboldt Co.) to confluence with D.D. No. 79 (SE 1/4, S15, T94N, R30W, Kossuth Co.)			X					
Black Cat Cr. 171. Mouth (S24, T96N, R29W, Kossuth Co.) to North line (S5, T97N, R30W, Kossuth Co.)			X					
Plum Cr. 172. Mouth (S17, T96N, R28W, Kossuth Co.) to confluence with an unnamed tributary (S16, T96N, R27W, Kossuth Co.)			X					
Lindsey Cr. 173. Mouth (S28, T96N, R28W, Kossuth Co.) to confluence with an unnamed tributary (aka D.D. No. 36) (S30, T97N, R27W, Kossuth Co.)			X					
Buffalo Cr. 174. Mouth (S20, T97N, R28W, Kossuth Co.) to confluence with D.D. No. 48 (S33, T98N, R26W, Winnebago Co.)			X					

DES MOINES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
MAJOR RIVER - UPPER DES MOINES R. AND ITS TRIBUTARIES								
E. FK. DES MOINES R. AND ITS TRIBUTARIES								
Union Slough								
175. Mouth (S9, T97N, R28W, Kossuth Co.) to outlet control structure (aka Des Moines R./Blue Earth R. basin divide) (N 1/2, S14, T98N, R28W, Kossuth Co.)				X				
North Buffalo Cr. (aka Little Buffalo Cr.)								
176. Mouth (S4, T97N, R27W, Kossuth Co.) to confluence with an unnamed tributary (S5, T98N, R26W, Winnebago Co.)			X					
Mud Cr.								
177. Mouth (S1, T97N, R29W, Kossuth Co.) to confluence with an unnamed tributary (North line S3/4, T98N, R29W, Kossuth Co.)			X					
Soldier Cr.								
178. Mouth (S36, T100N, R32W, Emmet Co.) to confluence with D.D. No. 4 (S27, T100N, R32W, Emmet Co.)			X					
INDIAN CR. AND ITS TRIBUTARIES								
Prairie Cr. (aka Ditch No. 61)								
179. Mouth (S1, T93N, R31W, Pocahontas Co.) to confluence with an unnamed tributary (S13, T94N, R31W, Palo Alto Co.)			X					
Indian Cr.								
180. Mouth (S24, T91N, R29W, Humboldt Co.) to confluence with Drainage Ditch No. 20 (S21, T91N, R29W, Humboldt Co.)			X					
PILOT CR. AND ITS TRIBUTARIES								
Pilot Cr.								
181. Mouth (S1, T92N, R31W, Pocahontas Co.) to confluence with an unnamed tributary (SW 1/4, S16, T93N, R32W, Pocahontas Co.)			X					
CYLINDER CR. AND ITS TRIBUTARIES								
Cylinder Cr.								
182. Mouth (NW 1/4, S28, T94N, R31W, Palo Alto Co.) to confluence with D.D. No. 15 (NW 1/4, S18, T96N, R31W, Palo Alto Co.)			X					
BEAVER CR. AND ITS TRIBUTARIES								
Beaver Cr.								
183. Mouth (S36, T93N, R31W, Pocahontas Co.) to confluence with an unnamed tributary (S12, T93N, R32W, Pocahontas Co.)			X					
SILVER CR. AND ITS TRIBUTARIES								
Silver Cr.								
184. Mouth (S35, T96N, R33W, Palo Alto Co.) to confluence with D.D. No. 62 (S23, T95N, R34W, Palo Alto Co.)			X					
JACK CR. AND ITS TRIBUTARIES								
Jack Cr.								
185. Mouth (S35, T97N, R33W, Palo Alto Co.) to Swan Lake outlet structure (S29, T99N, R32W, Emmet Co.)			X					
OLD CHANNEL - DES MOINES R. AND ITS TRIBUTARIES								
Old Channel - Des Moines R.								
186. Mouth (S26, T95N, R32W, Palo Alto Co.) to confluence with Ditch No. 41 (S29, T95N, R32W, Palo Alto Co.)		X						

DES MOINES MAJOR RIVER - UPPER DES MOINES R. AND ITS TRIBUTARIES BLUE EARTH R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Blue Earth R. (aka Middle Branch Blue Earth R.) 187. Iowa-Minnesota state line (S12, T100N, R28W, Kossuth Co.) to confluence with Ditch #7 (S9, T99N, R27W, Kossuth Co.)			X					
West Fork Blue Earth R. (aka West Branch Blue Earth R.) 188. Iowa-Minnesota state line (S9, T100N, R28W, Kossuth Co.) to confluence with an unnamed tributary (S30, T100N, R28W, Kossuth Co.)			X					
Union Slough Ditch (aka Union Slough Outlet) 189. Mouth (S9, T100N, R28W, Kossuth Co.) to outlet control structure (aka Des Moines R./Blue Earth R. basin divide) (N 1/2, S14, T98N, R28W, Kossuth Co.)			X					

SKUNK RIVER BASIN

The streams or stream segments named below in alphabetical order are referenced within the Water Use Designations for the Skunk River Basin. Reference numbers provided in the alphabetical list correspond to numbered stream segments in the Water Use Designations.

Ballard Cr. - 46
Bear Cr. - 49
Benjamin Cr. - 39
Big Cr. - 16
Big Cr. - 17
Big Slough - 8
Brush Cr. - 18
Buckley Cr. - 37
Cedar Cr. - 22
Cedar Cr. - 23
Cedar Cr. - 54
Cherry Cr. - 38
Clear Cr. - 41
Competine Cr. - 27
Crooked Cr. - 28
Crow Cr. - 25
Dye Cr. - 44
E. Branch Indian Cr. - 43
East Fork Crooked Cr. - 29
Fish Cr. - 20
Indian Cr. - 40
Long Cr. - 14
Long Dick Cr. - 50
Lynn Cr. - 19
Middle Cr. - 56
Mississippi R. - 1
Mississippi R. - 2
Mississippi R. - 3
Mud Cr. - 15
N. Skunk R. - 51
N. Skunk R. - 52
N. Skunk R. - 53
Oakland Mills Impoundment - 10
Old South Skunk River Ch - 45
Pitman Cr. - 6
Rock Cr. - 24
Rock Cr. - 55
Rock Cr. - 58
Rock Cr. - 26
S. Skunk R. - 31
S. Skunk R. - 32
S. Skunk R. - 33
S. Skunk R. - 34
Skunk R. - 9
Skunk R. - 11
Skunk R. - 12
Skunk R. - 13
Snipe Cr. - 59
South Skunk R. - 35
South Skunk R. - 36
Squaw Cr. - 48
Sugar Cr. - 5
Sugar Cr. - 57
Unnamed Cr. - 4
W. Branch Indian Cr. - 42
W. Fk Crooked Cr. - 30
Walnut Cr. - 47
West Branch Sugar Cr. - 7
Wolf Cr. - 21

SKUNK MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES MISSISSIPPI R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Mississippi R. 1. Iowa-Missouri state line to confluence with the Skunk R.	X	X						
Mississippi R. 2. Keokuk Municipal Water Works intakes						X		
Mississippi R. 3. Fort Madison Municipal Water Works intakes						X		
UNNAMED CR. AND ITS TRIBUTARIES								
Unnamed Cr. (aka Labalees Cr.) 4. Mouth (S1, T65N, R5W, Lee Co.) to confluence with an unnamed tributary (E 1/2, S35, T66N, R5W, Lee Co.)			X					

SKUNK MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES SUGAR CR. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Sugar Cr. 5. Mouth (S23, T67N, R5W, Lee Co.) to confluence with an unnamed tributary (S 1/2, S16, T69N, R6W, Lee Co.)			X					
Pitman Cr. 6. Mouth (S29/30 line, T68N, R5W, Lee Co.) to confluence with an unnamed tributary (S21, T68N, R5W, Lee Co.)			X					
West Branch Sugar Cr. 7. Mouth (S11/14 line, T68N, R6W, Lee Co.) to confluence with an unnamed tributary (S3, T68N, R6W, Lee Co.)			X					
BIG SLOUGH AND ITS TRIBUTARIES								
Big Slough 8. Mouth (S24, T68N, R3W, Lee Co.) to confluence with an unnamed tributary (S18, T68N, R2W, Lee Co.)		X						
SKUNK R. AND ITS TRIBUTARIES								
Skunk R. 9. Mouth to Oakland Mills Dam Skunk R.		X						
Oakland Mills Impoundment 10. Dam to N line of S14, T71N, R7W, Henry Co.	X	X						
Skunk R. 11. City of Mt. Pleasant Water Works intake						X		
Skunk R. 12. Oakland Mills Impoundment to Henry Co. Rd. (S3, T71, R7W)		X						
Skunk R. 13. Henry Co. Rd. (S3, T73N, R7W) to confluence of N. Skunk R. and S. Skunk R.		X						X
Long Cr. 14. Mouth (Des Moines Co.) to confluence with an unnamed tributary (S3, T69N, R4W, Des Moines Co.)			X					
Mud Cr. 15. Mouth (S34, T70N, R5W, Henry Co.) to confluence with an unnamed tributary (S12, T70N, R5W, Henry Co.)			X					
Big Cr. 16. Mouth (Henry Co.) to confluence with Saunders Branch (S17, T71N, R6W, Henry Co.)		X						
Big Cr. 17. Confluence with Saunders Branch (Henry Co.) to confluence with Lawrence Creek (S5, T71N, R5W, Henry Co.)			X					
Brush Cr. 18. Mouth (Henry Co.) to confluence with an unnamed tributary (S32, T71N, R5W, Henry Co.)			X					
Lynn Cr. 19. Mouth (Henry Co.) to confluence with an unnamed tributary (S7, T72N, R6W, Henry Co.)			X					
Fish Cr. 20. Mouth (S23, T70N, R6W, Henry Co.) to confluence with an unnamed tributary (S16, T70N, R6W, Henry Co.)			X					

SKUNK MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES SKUNK R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Wolf Cr. 21. Mouth (S8, T71N, R7W, Henry Co.) to confluence with an unnamed tributary (S1, T71N, R8W, Jefferson Co.)			X					
Cedar Cr. 22. Mouth (Henry Co.) to confluence with Little Cedar Cr. (S17, T70N, R7W, Henry Co.)		X						
Cedar Cr. 23. Confluence with Little Cedar Cr. (Sec. 17, T70N, R7W, Henry Co.) to confluence with an unnamed tributary (NW 1/4, of the NE 1/4, S24, T74N, R15W, Mahaska Co.)			X					
Rock Cr. 24. Mouth (Jefferson Co.) to confluence with Jones Br. (Sec. 29, T71N, R8W, Jefferson Co.)			X					
Crow Cr. 25. Mouth (Jefferson Co.) to confluence with an unnamed tributary (NW 1/4 of SW 1/4, S31, T72N, R9W, Jefferson Co.)			X					
Rock Cr. 26. Mouth (S34, T72N, R11W, Jefferson Co.) to confluence with an unnamed tributary (NE1/4, S5, T71N, R11W, Jefferson Co.)			X					
Competine Cr. 27. Mouth (Jefferson Co.) to confluence with an unnamed tributary (S15, T73N, R12W, Wapello Co.)			X					
Crooked Cr. 28. Mouth (S1, T73N, R8W, Jefferson Co.) to confluence with East and West Fork Crooked Cr. (S24, T74N, R7W, Washington Co.)			X					
East Fork Crooked Cr. 29. Mouth (S24, T74N, R7W, Washington Co.) to confluence with Phillips Creek (S8, T73N, R5W, Henry Co.)			X					
W. Fk. Crooked Cr. 30. Mouth (Washington Co.) to confluence with an unnamed tributary (SW 1/4, S21, T76N, R9W, Washington Co.)			X					
S. Skunk R. 31. Mouth (Keokuk Co.) to Hwy. 21 (S34, T75N, R13W, (Keokuk Co.)		X						X
S. Skunk R. 32. Hwy. 21 (Keokuk Co.) to confluence with Indian Cr. (Jasper Co.)		X						
S. Skunk R. 33. At Oskaloosa						X		
S. Skunk R. 34. Confluence with Indian Creek (Jasper Co.) to Ames Water Works Dam (S36, T84N, R24W, Story Co.)			X					
South Skunk R. 35. Ames Waterworks Dam (S36, T84N, R24W, Story Co.) to North line S6, T85N, R23W, Story Co.		X						X
South Skunk R. 36. North line S6, T85N, R23W, Story Co. to confluence with D.D. No. 71 (S11, T86N, R24W, Hamilton Co.)			X					X

SKUNK MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES SKUNK R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Buckley Cr. 37. Mouth (S27, T77N, R17W, Mahaska Co.) to confluence with The Middle Br. Buckley Cr. (S9, T77N, R17W, Mahaska Co.)			X					
Cherry Cr. 38. Mouth (Jasper Co.) to confluence with Benjamin Cr. (S20, T80N, R19W, Jasper Co.)			X					
Benjamin Cr. 39. Mouth (Jasper Co.) to confluence with an unnamed tributary (NE 1/4, S21, T80N, R19W, Jasper Co.)			X					
Indian Cr. 40. Mouth (S32, T80N, R20W, Jasper Co.) to confluence with East and West Branch Indian Crs. (S16, T82N, R22W, Story Co.)			X					
Clear Cr. 41. Mouth (S2, T80N, R21W, Jasper Co.) to confluence with an unnamed tributary (S 1/2, SW 1/4, S28, T82N, R20W, Marshall Co.)			X					
W. Branch Indian Cr. 42. Mouth (S16, T82N, R22W, Story Co.) to confluence with an unnamed tributary (S1, T83N, R23W, Story Co.)			X					
E. Branch Indian Cr. 43. Mouth (S16, T82N, R22W, Story Co.) to confluence with an unnamed tributary (S34, T85N, R22W, Story Co.)			X					
Dye Cr. 44. Mouth (S14, T83N, R22W, Story Co. to confluence with unnamed tributary (NW 1/4, S7, T83N, R21W, Story Co.)			X					
Old South Skunk River Channel 45. East line S31, T81N, R22W, Polk Co. to South line S33/34, T81N, R22W, Polk Co.				X				
Ballard Cr. 46. Mouth (Story Co.) to confluence with an unnamed tributary (S15, T82N, R24W, Story Co.)			X					
Walnut Cr. 47. Mouth (S5, T82N, R23W, Story Co.) to confluence with an unnamed tributary (SE 1/4, S34, T83N, R24W, Story Co.)			X					
Squaw Cr. 48. Mouth (S12, T83N, R24W, Story Co.) to confluence with an unnamed tributary (NW 1/4, S9, T85N, R25W, Boone Co.)			X					
Bear Cr. 49. Mouth (Story Co.) to N. line of Sec. 32, T85N, R23W, Story Co.			X					
Long Dick Cr. 50. Mouth (S18, T85N, R23W, Story Co.) to bridge crossing (North line S34, T86N, R23W, Hamilton Co.)			X					
N. Skunk R. 51. Mouth (S5, T74N, R10W, Keokuk Co.) to confluence with Cedar Cr. (S15, T75N, R12W, Keokuk Co.)		X						X

SKUNK MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES SKUNK R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
N. Skunk R. 52. Confluence with Cedar Cr. (S15, T75N, R12W, Keokuk Co.) to Poweshiek-Mahaska co. line			X					X
N. Skunk R. 53. Poweshiek-Mahaska co. line to confluence with Snipe Cr. (S22, T81N, R19W, Jasper Co.)			X					
Cedar Cr. 54. Mouth (S15, T75N, R12W, Keokuk Co.) to confluence with an unnamed tributary (S34, T76N, R13W, Keokuk Co.)			X					
Rock Cr. 55. Mouth (S9, T75N, R12W, Keokuk Co.) to confluence with unnamed tributary (NE 1/4, S34, T76N, R12W, Keokuk Co.)			X					
Middle Cr. 56. Mouth (S35, T76N, R14W, Mahaska Co.) to Hwy. 146 road crossing at S1, T76N, R16W, Mahaska Co.)			X					
Sugar Cr. 57. Mouth (Poweshiek Co.) to confluence with an unnamed tributary (SW 1/4, Sec. 24, T80N, R17W, Jasper Co.)			X					
Rock Cr. 58. Mouth (S5, T79N, R17W, Jasper Co.) to Rock Creek Lake Dam (S17, T80N, R17W, Jasper Co.)			X					
Snipe Cr. 59. Mouth (S22, T81N, R19W, Jasper Co.) to confluence with Little Snipe Cr. (S14, T81N, R19W, Jasper Co.)			X					

IOWA-CEDAR RIVER BASIN

The streams or stream segments named below in alphabetical order are referenced within the Water Use Designations for the Iowa-Cedar River Basin. Reference numbers provided in the alphabetical list correspond to numbered stream segments in the Water Use Designations.

Abbe Cr. - 63
Asher Cr. - 187
Bailey Cr. - 130
Baskins Run - 138
Bear Cr. - 75
Bear Cr. - 78a
Bear Cr. - 192
Beaver Cr. - 95
Beaver Cr. - 96
Beaver Cr. - 106
Beaver Cr. - 116
Beaver Cr. - 142
Beaver Cr. - 196
Beaverdam Cr. - 133
Big Bear Cr. - 168
Big Cr. - 62
Big Hollow Cr. - 7
Black Hawk Cr. - 89
Black Hawk Cr. - 90
Black Hawk Cr. - 91
Blue Cr. - 76
Boylan Cr. - 122
Brush Cr. - 3
Brush Cr. - 183
Buckeye Cr. - 170
Buffalo Cr. - 129
Burnett Cr. - 186
Burr Oak Cr. - 140
Burr Oak Cr. - 141
Calmus Cr. - 112
Cedar R. - 33
Cedar R. - 34
Cedar R. - 35
Cedar R. - 36
Cedar R. - 37
Cedar R. - 38
Cedar R. - 39
Cedar R. - 40
Cedar R. - 41
Cedar R. - 42
Cedar R. - 43
Cedar R. - 44
Cedar R. - 45
Clear Cr. - 61
Clear Cr. - 160
Coldwater Cr. - 105
Cottonwood Drain - 8
Cottonwood Drain - 9
D.D. 70 - 131
Deep R. - 157
Deer Cr. - 148
Deer Cr. - 179
Dowd Cr. - 191
Drainage Ditch No. 3 - 206
Dry Cr. - 68
Dry Run - 94
Dugout Cr. - 158
E. Branch Beaverdam Cr. - 135
E. Branch Iowa R. - 210
E. Branch Salt Creek - 175
E. Otter Cr. - 74
East Big Cr. - 65
East Branch Salt Cr. - 174
Elk Cr. - 119
Elk Cr. - 120
Elk Run - 88
Elk Run - 204
English R. - 152
English R. - 153
Flint Cr. - 5
Flood Cr. - 104
Hartgrave Cr. - 126
Holland Cr. - 93
Honey Cr. - 150
Honey Cr. - 189
Honey Cr. - 190
Hoosier Cr. - 163
Indian Cr. - 66
Iowa R. - 20
Iowa R. - 21
Iowa R. - 22
Iowa R. - 23
Iowa R. - 24
Iowa R. - 25
Iowa R. - 26
Iowa R. - 27
Iowa R. - 28
Iowa R. - 29
Iowa R. - 30
Iowa Slough - 17
Iowa Slough - 16
Knapp Cr. - 164
Knotty Cr. - 6
Lime Cr. - 79
Lime Cr. - 80
Linn Cr. - 185
Little Bear Cr. - 169
Little Cedar R. - 139
Little Mosquito Cr. - 53
Long Cr. - 32
Luicks Cr. - 208
Maynes Cr. - 121
Middle English R. - 156
Mill Cr. - 162
Mill Race - 167
Miller Cr. - 87
Minerva Cr. - 188
Mississippi River - 1
Mississippi River - 2
Morgan Cr. - 71
Mud Cr. - 56
Mud Cr. - 70
Mud Cr. - 77
Mud Cr. - 86
N. Beaver Cr. - 98
N. Timber Cr. - 184
North English R. - 155
North Fork Black Hawk Cr. - 92
Old Mans Cr. - 159
Otter Cr. - 31
Otter Cr. - 72
Otter Cr. - 127
Otter Cr. - 128
Otter Cr. - 149
Otter Cr. - 177
Pike Cr. - 46
Pike Run - 51
Pike Run - 52
Pine Cr. - 198
Pine Cr. - 199
Pine Cr. - 200
Pine Cr. - 201
Prairie Cr. - 69
Pratt Cr. - 78
Price Cr. - 165
Price Cr. - 166
Quarter Section Run - 137
Rapid Cr. - 161
Raven Cr. - 180
Richland Cr. - 178
Rock Cr. - 57
Rock Cr. - 58
Rock Cr. - 85
Rock Cr. - 143
Rock Cr. - 144
Rock Cr. - 145
Rock Falls Cr. - 117
Rock Run Cr. - 60
Rose Cr. - 118
Running Slough Drain - 10
S. Timber Cr. - 182
Salt Cr. - 172
School Cr. - 202
Sheldon Cr. -203
Shell Rock R. - 101
Shell Rock R. - 102
Shell Rock R. - 103
Simmons Cr. - 64
South Beaver Cr. - 97
South English R. - 154
South Fork Iowa River - 193
South Fork Iowa River - 194
South Fork Iowa River - 195
Spring Cr. - 4
Spring Cr. - 81
Spring Cr. - 113
Spring Cr. - 124
Spring Cr. - 125
Spring Cr. - 146
Squaw Cr. - 67
Squaw Cr. - 123
Stein Cr. - 176
Sugar Cr. - 54
Sugar Cr. - 55
Timber Cr. - 181
Tipton Cr. - 197
Turtle Cr. - 147
Twelvemile Cr. - 85
Unnamed Cr. - 11
Unnamed Cr. - 12
Unnamed Cr. - 14
Unnamed Cr. - 15
Unnamed Cr. - 151
Unnamed Cr. - 205
Unnamed Cr. - 134
Unnamed Cr. - 207
Unnamed Cr. - 13
W. Branch Beaverdam Cr. - 136
W. Branch Wapsinonoc Cr. - 49
W. Fk. Cedar R. - 99
W. Fk. Cedar R. - 100
W. Otter Cr. - 73
Walnut Cr. - 171
Wapsinonoc Cr. - 47
Wapsinonoc Cr. - 48
West Branch Wapsinonoc Cr. - 50
West Fork Iowa River - 209
Wharam Cr. - 114
Willow Cr. - 111
Winans Cr. - 115
Winnebago R. - 108
Winnebago R. - 109
Winnebago R. - 110
Winnebago R. - 107
Wolf Cr. - 82
Wolf Cr. - 83
Ziegler Slough - 18
Ziegler Slough - 19

IOWA-CEDAR MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Mississippi River 1. Skunk R. to confluence with Iowa R.	X	X						
Mississippi River 2. Burlington Municipal Water Works intakes						X		
SKUNK SLU (AKA BRUSH CR.) AND ITS TRIBUTARIES								
Brush Cr. 3. Mouth (Des Moines Co.) to road crossing (S8, T69N, R3W, Des Moines Co.)			X					
SPRING CR. AND ITS TRIBUTARIES								
Spring Cr. 4. Mouth (Des Moines Co.) to confluence with an unnamed tributary (SE 1/4, S3, T69N, R3W, Des Moines Co.)			X					
FLINT CR. AND ITS TRIBUTARIES								
Flint Cr. 5. Mouth (Des Moines Co.) to confluence with an unnamed tributary (NW 1/4, S21, T71N, R4W, Des Moines Co.)			X					
Knotty Cr. 6. Mouth (Des Moines Co.) to confluence with an unnamed tributary (NE 1/4, S1, T70N, R3W, Des Moines Co.)			X					
Big Hollow Cr. 7. Mouth (Des Moines Co.) to confluence with an unnamed tributary (NE 1/4, S30, T71N, R3W, Des Moines Co.)			X					
COTTONWOOD DRAIN AND ITS TRIBUTARIES								
Cottonwood Drain 8. Mouth (S6, T70N, R1W, Des Moines Co.) to confluence with an unnamed tributary (S13, T71N, R2W, Des Moines Co.)		X						
Cottonwood Drain 9. Confluence with an unnamed tributary (S13, T71N, R2W, Des Moines Co.) to road crossing (S30, T2N, R1W, Des Moines Co.)			X					
Running Slough Drain 10. Mouth (S31, T71N, R1W, Des Moines Co.) to confluence with an unnamed tributary (S33, T72N, R1W, Des Moines Co.)		X						
Unnamed Cr. 11. Mouth (SW 1/4, S16, T71N, R1W, Des Moines Co.) to road crossing (E 1/2, NW 1/4, S10, T71N, R1W, Des Moines Co.)			X					
Unnamed Cr. 12. Mouth (NE 1/4, S16, T71N, R1W, Des Moines Co.) to road crossing (W 1/2, NW 1/4, S10, T71N, R1W, Des Moines Co.)			X					
Unnamed Cr. (aka Ray Lake Drain) 13. Mouth (S33, T72N, R1W, Des Moines Co.) to confluence with unnamed tributary (S29, T72N, R1W, Des Moines Co.)			X					
Unnamed Cr. 14. Mouth (S13, T71N, R2W, Des Moines Co.) to Section 7/8 line, T71N, R1W, Des Moines Co.)			X					
Unnamed Cr. 15. Mouth (NE 1/4, NW 1/4, S7, T71N, R1W, Des Moines Co.) to road crossing (N. line S5, T71N, R1W, Des Moines Co.)			X					

IOWA-CEDAR MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES IOWA SLOUGH AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Iowa Slough (aka Iowa Slough Lake) 16. Mouth (S3, T72N, R1W, Des Moines Co.) to South Line E1/2, S29, T73N, R1W, Lousia Co.				X				
Iowa Slough 17. South Line, S29, T73N, R1W, Lousia Co. to E/W road crossing E 1/2, S30, T73N, R1W, Louisa Co.			X					
Ziegler Slough 18. Mouth (S33, T73N, R1W, Louisa Co.) to confluence with unnamed tributary (S. line, S17, T73N, R1W, Louisa Co.)		X						
Ziegler Slough 19. Unnamed tributary (S. line, S17, T73N, R1W, Louisa Co.) to confluence with unnamed tributary (NW 1/4, S8, T73N, R1W, Louisa Co.)			X					
IOWA R. AND ITS TRIBUTARIES								
Iowa R. 20. Mouth (Louisa Co.) to Louisa County, Section 35, T74N, R3W, (south corporate limit, Wapello)	X	X						X
Iowa R. 21. South corporate limit, Wapello to confluence with Cedar River (Louisa County, Section 20, T75N, R4W)	X	X						
Iowa R. 22. Confluence with Cedar River to Johnson-Washington county line	X	X						X
Iowa R. 23. Johnson-Washington county line to Hwy. 149 (Iowa County, Section 35, T81N, R9W) (includes Coralville Reservoir)	X	X						
Iowa R. 24. University of Iowa Water Works intake						X		
Iowa R. 25. City of Iowa City Water Works intakes						X		
Iowa R. 26. Hwy. 149 to confluence with Asher Creek (Marshall County, Section 27, T84N, R18W) excluding all waters within the boundaries of the Meskwaki Settlement of the Sac Fox Tribe of the Mississippi	X	X						X
Iowa R. 27. Confluence with Asher Creek to Marshall-Hardin county line	X	X						
Iowa R. 28. Marshall-Hardin county line to Hardin County, Section 20, T89N, R20W, (east corporate limit, Iowa Falls)	X	X						X
Iowa R. 29. East corporate limit Iowa Falls to Hwy. 69 bridge (Section 30, T93N, R23W, Wright Co.)	X	X						
Iowa R. 30. Hwy. 69 bridge to confluence of E. Fk. Iowa R. and W. Fk. Iowa R. (Wright Co.)		X						

IOWA-CEDAR MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES IOWA R. BELOW CEDAR R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Otter Cr. 31. Mouth (S18, T73N, R2W, Louisa Co.) to confluence with an unnamed tributary (S4, T73N, R3W, Louisa Co.)			X					
Long Cr. 32. Mouth (S1, T74N, R4W, Louisa Co.) to confluence with South Fork Long Cr. (S26, T75N, R6W, Washington Co.)			X					
CEDAR R. AND ITS TRIBUTARIES								
Cedar R. 33. Mouth (Louisa Co.) to Hwy. 30 (Linn County, Section 9, T82N, R6W)	X	X						X
Cedar R. 34. Hwy. 30 to bridge crossing in LaPorte City (Section 19, T87N, R11W, Black Hawk Co.)	X	X						
Cedar R. 35. Cedar Rapids Municipal Water Works intake						X		
Cedar R. 36. Bridge crossing in LaPorte City to the dam at Cedar Falls		X						
Cedar R. 37. Cedar Falls impoundment Dam to W. line of Section 2, T89N, R14W, Black Hawk Co.	X	X						
Cedar R. 38. Cedar Falls impoundment to Black Hawk County, Section 34, T90N, R14W (confluence with Beaver Creek)		X						
Cedar R. 39. Confluence with Beaver Creek to dam at Waverly		X						X
Cedar R. 40. Waverly impoundment Dam to W. line of Section 35, T92N, R14W, Bremer Co.	X	X						X
Cedar R. 41. Waverly impoundment to Chickasaw County, Section 29, T94N, R14W (south corporate limits, Nashua)	X	X						X
Cedar R. 42. South corporate limits of Nashua to dam at Nashua		X						
Cedar R. 43. Nashua impoundment Dam to Chickasaw-Floyd co. line	X	X						
Cedar R. 44. Nashua impoundment to Charles City Dam #2		X						
Cedar R. 45. Charles City impoundment Dam #2 to Iowa-Minnesota state line	X	X						
Pike Cr. 46. Cone Lake	X	X						
Wapsinonoc Cr. 47. Mouth (Muscatine Co.) to confluence with Big Slough (S2, T77N, R4W, Muscatine Co.)		X						
Wapsinonoc Cr. 48. Confluence with Big Slough (Muscatine Co.) to confluence with the East Branch and Middle Branch Wapsinonoc Cr. (S6, T78N, R3W, Muscatine Co.)			X					

IOWA-CEDAR MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES CEDAR R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
W. Branch Wapsinonoc Cr. 49. Mouth (Muscatine Co.) to confluence with an unnamed tributary (S4, T78N, R4W, Muscatine Co.)			X					
West Branch Wapsinonoc Cr. 50. Confluence with an unnamed tributary (S4, T78N, R4W, Muscatine Co.) to confluence with an unnamed tributary (N 1/2, S32, T79N, R4W, Cedar Co.)			X					
Pike Run 51. Mouth (Muscatine Co.) to confluence with an unnamed tributary (NW 1/4, S9, T77N, R3W, Muscatine Co.)		X						
Pike Run 52. Confluence with an unnamed tributary (NW 1/4, S9, T77N, R3W, Muscatine Co.) to the road crossing at (SW 1/4, S34, T78N, R3W, Muscatine Co.)			X					
Little Mosquito Cr. 53. Mouth (S19, T78N, R2W, Muscatine Co.) to confluence with an unnamed tributary (S26, T78N, R2W, Muscatine Co.)			X					
Sugar Cr. 54. Mouth (Muscatine Co.) to confluence with Mud Cr. (Muscatine Co.)		X						
Sugar Cr. 55. Confluence with Mud Cr. (S10, T78N, R2W, Muscatine Co.) to confluence with an unnamed tributary (SW 1/4, S4, T80N, R2W, Cedar Co.)			X					
Mud Cr. 56. Confluence with Sugar Cr. (S10, T78N, R2W, Muscatine Co.) to confluence with an unnamed tributary (S5, T78N, R1E, Muscatine Co.)			X					
Rock Cr. 57. Mouth (S2, T79N, R3W, Cedar Co.) to confluence with unnamed tributary (SW 1/4, S11, T80N, R3W, Cedar Co.)		X						
Rock Cr. 58. Confluence with unnamed tributary (SW 1/4, S11, T80N, R3W, Cedar Co.) to the confluence with an unnamed tributary (center S1, T81N, R3W, Cedar Co.)			X					
Rock Run Cr. 60. Mouth (S28, T80N, R3W, Cedar Co.) to confluence with an unnamed tributary (S28, T81N, R3W, Cedar Co.)			X					
Clear Cr. 61. Mouth (S2, T81N, R5W, Johnson Co.) to confluence with an unnamed tributary (NW 1/4, NW 1/4, S28, T82N, R4W, Cedar Co.)			X					
Big Cr. 62. Mouth (S9, T82N, R6W, Linn Co.) to confluence with East Big Cr. (SE 1/4, S30, T84N, R5W, Linn Co.)			X					
Abbe Cr. 63. Mouth (S34, T83N, R6W, Linn Co.) to confluence with an unnamed tributary (S4, T82N, R5W, Linn Co.)			X					

IOWA-CEDAR MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES CEDAR R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Simmons Cr. 64. Mouth (S7, T83N, R6W, Linn Co.) to confluence with an unnamed tributary (S8, T83N, R5W, Linn Co.)			X					
East Big Cr. 65. Mouth (S30, T84N, R5W, Linn Co.) to Hwy. 151 crossing (S27, T84N, R5W, Linn Co.)			X					
Indian Cr. 66. Mouth (S30, T83N, R6W, Linn Co.) to confluence with an unnamed tributary (S20, T84N, R6W, Linn Co.)			X					
Squaw Cr. 67. Mouth (S29, T83N, R6W, Linn Co.) to confluence with an unnamed tributary (S20, T83N, R6W, Linn Co.)			X					
Dry Cr. 68. Mouth (S1, T83N, R7W, Linn Co.) to confluence with an unnamed tributary (S15, T84N, R7W, Linn Co.)			X					
Prairie Cr. 69. Mouth (Linn Co.) to confluence with an unnamed tributary (SE 1/4 of the SW 1/4, S13, T83N, R12W, Benton Co.)			X					
Mud Cr. 70. Mouth (S21, T82N, R9W, Benton Co.) to confluence with an unnamed tributary (E 1/2, S7, T82N, R9W, Benton Co.)			X					
Morgan Cr. 71. Mouth (S14, T83N, R8W, Linn Co.) to confluence with an unnamed tributary (SW 1/4, S22, T83N, R8W, Linn Co.)			X					
Otter Cr. 72. Mouth (S35, T84N, R8W, Linn Co.) to confluence with East & West Otter Creeks (S7, T84N, R7W, Linn Co.)			X					
W. Otter Cr. 73. Mouth (S7, T84N, R7W, Linn Co.) to confluence with unnamed perennial tributary entering along the left decending bank in Section 6, T85N, R7W, Linn Co.			X					
E. Otter Cr. 74. Mouth (S7, T84N, R7W, Linn Co.) to confluence with unnamed tributary (S16, T85N, R7W, Linn Co.)			X					
Bear Cr. 75. Mouth (S21, T84N, R8W, Linn Co.) to confluence with Wildcat Cr. (S5/8 line, T84N, R9W, Benton Co.)			X					
Blue Cr. 76. Mouth (S18, T85N, R8W, Linn Co.) to confluence with East Br. Blue Cr. (S7, T85N, R8W, Linn Co.)			X					
Mud Cr. 77. Mouth (Benton Co.) to confluence with an unnamed tributary (S15, T84N, R11W, Benton Co.)			X					
Pratt Cr. 78. Mouth (S6, T85N, R11W, Benton Co.) to confluence with an unnamed tributary (NE 1/4, S7, T85N, R11W, Benton Co.)			X					
Bear Cr. 78a. Mouth (S21, T86N, R10W, Benton Co.) to confluence with an unnamed tributary (SW 1/4, S34, T88N, R9W, Buchanan Co.)			X					

IOWA-CEDAR MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES CEDAR R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Lime Cr. 79. Mouth (Benton Co.) to confluence with an unnamed tributary (Sec. 1, T87N, R10W, Buchanan Co.)		X						
Lime Cr. 80. Confluence with an unnamed tributary (Sec. 1, T87N, R10W, Buchanan Co.) to confluence with an unnamed tributary (SW 1/4, Sec. 11, T88N, R10W, Buchanan Co.)			X					
Spring Cr. 81. Mouth (S27, T87N, R11W, Black Hawk Co.) to confluence with East Branch Spring Cr. (S11, T87N, R11W, Black Hawk Co.)			X					
Wolf Cr. 82. Mouth (Black Hawk Co.) to confluence with Twelvemile Cr. (Tama Co.)		X						
Wolf Cr. 83. Mouth of Twelvemile Cr. (S19, T86N, R13W, Tama Co.) to confluence with an unnamed tributary (S25, T86N, R18W, Grundy Co.)			X					
Twelvemile Cr. 84. Mouth (S19, T86N, R13W, Tama Co.) to confluence with Given Cr. (S24, T86N, R15W, Tama Co.)			X					
Rock Cr. 85. Mouth (S23, T86N, R14W, Tama Co.) to confluence with an unnamed tributary (S2, T86N, R14W, Tama Co.)			X					
Mud Cr. 86. Mouth (S13, T87N, R12W, Black Hawk Co.) to upper end of ponded area (S14, T87N, R12W, Black Hawk Co.)			X					
Miller Cr. 87. Mouth (S35, T88N, R12W, Black Hawk Co.) to confluence with an unnamed tributary (NW 1/4, S7, T87N, R12W, Black Hawk Co.)			X					
Elk Run 88. Mouth (S6, T88N, R12W, Black Hawk Co.) to confluence with an unnamed tributary (S27, T89N, R12W, Black Hawk Co.)			X					
Black Hawk Cr. 89. Mouth (Black Hawk Co.) to Hwy 58 (E. half of Section 27, T88N, R14W, Black Hawk Co.)	X	X						
Black Hawk Cr. 90. Hwy. 58 to confluence with N. Black Hawk Cr. (Grundy Co.)		X						
Black Hawk Cr. 91. Confluence with North Black Hawk Cr. (S1, T87N, R15W, Grundy Co.) to confluence with an unnamed tributary (S12, T87N, R18W, Grundy Co.)			X					
North Fork Black Hawk Cr. 92. Mouth (S1, T87N, R15W, Black Hawk Co.) to confluence with an unnamed tributary (S8, T88N, R15W, Grundy Co.)			X					
Holland Cr. 93. Mouth (Grundy Co.) to confluence with an unnamed tributary (S29, T88N, R17W, Grundy Co.)			X					

IOWA-CEDAR MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES CEDAR R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Dry Run 94. Mouth (S18, T89N, R13W, Black Hawk Co.) to confluence with an unnamed tributary (S23, T89N, R14W, Black Hawk Co.)			X					
Beaver Cr. 95. Mouth (S34, T90N, R14W, Black Hawk Co.) to confluence with S. Beaver Cr. (S25, T90N, R17W, Butler Co.)		X						
Beaver Cr. 96. Confluence with S. Beaver Cr. (S25, T90N, R17W, Butler Co.) to confluence with an unnamed tributary (SE 1/4, S29, T90N, R19W, Franklin Co.)			X					
South Beaver Cr. 97. Mouth (S25, T90N, R17W, Butler Co.) to confluence with an unnamed tributary (NE 1/4, NE 1/4, S9, T88N, R18W, Grundy Co.)			X					
N. Beaver Cr. 98. Mouth (S23, T90N, R18W, Butler Co.) to confluence with Fockler Cr. (S18, T90N, R18W, Butler Co.)			X					
W. Fk. Cedar R. 99. Mouth (Black Hawk Co.) to confluence with Maynes Creek (Butler County, S7, T91N, R17W)		X						X
W. Fk. Cedar R. 100. Confluence with Maynes Cr. (Butler Co.) to juncture of Beaverdam and Bailey Creeks (Franklin Co.)		X						
Shell Rock R. 101. Mouth (Black Hawk Co.) to Butler County, Section 12, T91N, R15W, (south corporate limits, Shell Rock)		X						X
Shell Rock R. 102. South corporate limit of Shell Rock to confluence with the Winnebago R.		X						
Shell Rock R. 103. Winnebago R. to Iowa-Minnesota state line	X	X						
Flood Cr. 104. Mouth (S27, T93N, R16W, Butler Co.) to confluence with Beaver Cr. (S36, T95N, R17W, Butler Co.)			X					
Coldwater Cr. 105. Mouth (S29, T93N, R16W, Butler Co.) to confluence with an unnamed tributary (S26, T94N, R19W, Cerro Gordo Co.)			X					
Beaver Cr. 106. Mouth (SW 1/4, S26, T95N, R18W, Floyd Co.) to confluence with L. Beaver Cr. (center S21, T95N, R18W, Floyd Co.)			X					
Winnebago R. (aka Lime Cr.) 107. Mouth (Floyd Co.) to dam at Fertile (S34, T98N, R22W, Worth Co.)		X						
Winnebago R. 108. Mill Pond at Fertile	X	X						
Winnebago R. 109. Upper extent of Mill Pond at Fertile to confluence with Pike Run (S25, T99N, R24W, Winnebago Co.)		X						

IOWA-CEDAR MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES CEDAR R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Winnebago R. 110. Confluence with Pike Run (S25, T99N, R24W, Winnebago Co.) to state line			X					
Willow Cr. 111. Mouth (S3, T96N, R20W, Cerro Gordo Co.) to confluence with Clear Cr. (S16, T96N, R21W, Cerro Gordo Co.)			X					
Calmus Cr. 112. Mouth (S34, T97N, R20W, Cerro Gordo Co.) to Cerro Gordo Co. Rd. S34 (W. line, S30, T97N, R20W, Cerro Gordo Co.)			X					
Spring Cr. 113. Mouth (S28, T97N, R20W, Cerro Gordo Co.) to confluence with Blair Cr. (S9, T97N, R20W, Cerro Gordo Co.)			X					
Wharam Cr. 114. Mouth (S29, T97N, R20W, Cerro Gordo Co.) to confluence with an unnamed tributary (S7, T97N, R20W, Cerro Gordo Co.)			X					
Winans Cr. 115. Mouth (S36, T98N, R22W, Worth Co.) to N/S road crossing S 1/2, S25, T98N, R22W, Worth Co.			X					
Beaver Cr. 116. Mouth (S34, T98N, R22W, Worth Co.) to confluence with D.D. No. 54 (S25, T98N, R23W, Winnebago Co.)			X					
Rock Falls Cr. 117. Mouth (S16, T97N, R19W, Cerro Gordo Co.) to confluence with an unnamed tributary (S4, T97N, R19W, Cerro Gordo Co.)			X					
Rose Cr. (aka Plymouth or Beaver Cr.) 118. Mouth (NW 1/4, S8, T97N, R19W, Cerro Gordo Co.) to confluence with an unnamed tributary (S35, T98N, R20W, Worth Co.)			X					
Elk Cr. 119. Mouth (S27, T99N, R20W, Worth Co.) to east line S13, T99N, R22W, Worth Co.			X					
Elk Cr. 120. East line S13, T99N, R22W, Worth Co. to confluence with unnamed tributary (S4, T99N, R22W, Worth Co.)				X				
Maynes Cr. 121. Mouth (S7, T91N, R17W, Butler Co.) to confluence with an unnamed tributary (S22, T91N, R21W, Franklin Co.)			X					
Boylan Cr. 122. Mouth (S1, T91N, R18W, Butler Co.) to confluence with unnamed tributary (NE 1/4, S31, T93N, R18W, Butler Co.)			X					
Squaw Cr. 123. Mouth (Franklin Co.) to confluence with an unnamed tributary (S29, T92N, R20W, Franklin Co.)			X					
Spring Cr. 124. Mouth (Franklin Co.) to bridge crossing at (S21/ 22, T92N, R21W, Franklin Co.) [excluding Beeds L.]			X					

IOWA-CEDAR MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES CEDAR R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Spring Cr. 125. Beeds Lake Dam to W. line of S19, T92N, R20W, Franklin Co.	X	X						
Hartgrave Cr. 126. Mouth (S34, T92N, R18W, Butler Co.) to confluence with Squaw Cr. (S28, T92N, R18W, Franklin Co.)			X					
Otter Cr. 127. Confluence with Buffalo Cr. (S5, T92N, R20W, Franklin Co.) to confluence with D.D. No. 55 (S24, T93N, R21W, Franklin Co.)			X					
Otter Cr. 128. Mouth (S28, T92N, R19W, Franklin Co.) to confluence with Buffalo Cr. (S5, T92N, R20W, Franklin Co.)			X					
Buffalo Cr. 129. Mouth (S5, T92N, R20W, Franklin Co.) to N/S road crossing, West line, S10, T92N, R21W, Franklin Co.			X					
Bailey Cr. 130. Mouth (Franklin Co.) to confluence with an unnamed tributary (S16, T94N, R22W, Cerro Gordo Co.)			X					
D.D. 70 131. Mouth (Cerro Gordo Co.) to bridge crossing at (S13/14, T94N, R22W, Cerro Gordo Co.)			X					
Beaverdam Cr. 133. Mouth (confluence with Bailey Cr. (S19, T93N, R19W, Franklin Co.) to confluence with an unnamed tributary (S12, T95N, R22W, Cerro Gordo Co.)			X					
Unnamed Cr. (aka D.D. 6) 134. Mouth (S29, T91N, R20W, Franklin Co.) to confluence with an unnamed tributary (S36, T91N, R20W, Franklin Co.)			X					
E. Branch Beaverdam Cr. 135. Mouth (Cerro Gordo Co.) to confluence with an unnamed tributary (S4, T94N, R20W, Cerro Gordo Co.)			X					
W. Branch Beaverdam Cr. 136. Mouth (Cerro Gordo Co.) to confluence with an unnamed tributary (S9, T94N, R21W, Cerro Gordo Co.)			X					
Quarter Section Run 137. Mouth (S19, T91N, R13W, Bremer Co.) to confluence with an unnamed tributary (NE 1/4, NW 1/4, S26, T92N, R13W, Bremer Co.)			X					
Baskins Run 138. Mouth (S28, T91N, R13W, Bremer Co.) to confluence with an unnamed tributary (S30, T92N, R13W, Bremer Co.)			X					
Little Cedar R. 139. Mouth (Chickasaw Co.) to Iowa-Minnesota state line		X						
Burr Oak Cr. 140. Mouth (S12, T98N, R16W, Mitchell Co.) to west line, S10, T98N, R16W, Mitchell Co.			X					

IOWA-CEDAR MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES CEDAR R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Burr Oak Cr. 141. Mitchell Co. Rd. T46 to N. line of S5, T98N, R16W, Mitchell Co.					X			X
Beaver Cr. 142. Mouth (Mitchell Co.) to Mitchell Co. Rd. A31 (N. line of S19, T99N, R15W, Mitchell Co.)					X			X
Rock Cr. 143. Mouth (Floyd Co.) to confluence with Goose Cr. (S35, T98N, R18W, Mitchell Co.)		X						
Rock Cr. 144. Confluence with Goose Cr. (Mitchell Co.) to Hwy. 9 (N. line of S26, T98N, R18W, Mitchell Co.)					X			X
Rock Cr. 145. Hwy. 9 to confluence with an unnamed tributary (S22, T98N, R18W, Mitchell Co.)			X					
Spring Cr. 146. Mouth (Mitchell Co.) to N. line of S8, T97N, R16W, Mitchell Co.					X		X	
Turtle Cr. 147. Mouth (Mitchell Co.) to E. line of Section 7, T99, R17W, Mitchell Co.					X		X	
Deer Cr. 148. Mouth (S23, T99N, R18W, Mitchell Co.) to confluence with an unnamed tributary (E. line, S28, T100N, R19W, Worth Co.)			X					
Otter Cr. 149. Mouth (S21, T100N, R18W, Mitchell Co.) to Iowa-Minnesota state line			X					
HONEY CR. AND ITS TRIBUTARIES								
Honey Cr. 150. Mouth (S1, T75N, R5W, Louisa Co.) to road crossing (S25, T76N, R5W, Louisa Co.)			X					
UNNAMED CR. AND ITS TRIBUTARIES								
Unnamed Cr. 151. Mouth (S16, T76N, R5W, Louisa Co.) to east/west road crossing (S9, T76N, R5W, Louisa Co.)			X					
IOWA R. ABOVE CEDAR R. AND ITS TRIBUTARIES								
English R. 152. Mouth (Washington Co.) to confluence with Ramsey Cr. (S14, T77N, R8W, Washington Co.)		X						X
English R. 153. Confluence with Ramsey Cr. (S14, T77N, R8W, Washington Co.) to confluence with North & South English R. (S6, T77N, R9W, Washington Co.)		X						
South English R. 154. Mouth (S6, T77N, R9W, Washington Co.) to confluence with an unnamed tributary (E 1/2, S9, T77N, R13W, Keokuk Co.)			X					
North English R. 155. Mouth (S6, T77N, R17W, Washington Co.) to confluence with an unnamed tributary (SE 1/4, S1, T79N, R16W, Poweshiek Co.)			X					

IOWA-CEDAR MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES IOWA R. ABOVE CEDAR R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Middle English R. 156. Mouth (S20, T78N, R10W, Iowa Co.) to confluence with an unnamed tributary (E 1/8, S24, T78N, R12W, Iowa Co.)			X					
Deep R. 157. Mouth (S4, T78N, R12W, Iowa Co.) to confluence with an unnamed tributary (SE 1/4, S34, T79N, R14W, Poweshiek Co.)			X					
Dugout Cr. 158. Mouth (S15, T79N, R14W, Poweshiek Co.) to confluence with an unnamed tributary (SE 1/4, T78N, R14W, Poweshiek Co.)			X					
Old Mans Cr. 159. Mouth (S27, T78N, R9W, Johnson Co.) to confluence with Hog Run (S6/12 line, T79N, R10W, Iowa Co.)			X					
Clear Cr. 160. Mouth (Johnson Co.) to confluence with an unnamed tributary (S22, T80N, R9W, Iowa Co.)			X					
Rapid Cr. 161. Mouth (S34, T80N, R6W, Johnson Co.) to confluence with an unnamed tributary (E 1/2, S20, T80N, R5W, Johnson Co.)			X					
Mill Cr. 162. Mouth (Johnson Co.) to confluence with an unnamed tributary (S23, T81N, R6W, Johnson Co.)			X					
Hoosier Cr. 163. Mouth (S17, T81N, R6W, Johnson Co.) to confluence with South Hoosier Cr. (S25, T82N, R7W, Linn Co.)			X					
Knapp Cr. 164. Mouth (S34, T81N, R8W, Johnson Co.) to confluence with an unnamed tributary (S16, T81N, R8W, Johnson Co.)			X					
Price Cr. 165. Mouth (S36, T81N, R9W, Iowa Co.) to mouth of Mill Race (S26, T81N, R9W, Iowa Co.)		X						
Price Cr. 166. Mouth of Mill Race (S26, T81N, R9W, Iowa Co.) confluence with an unnamed tributary (NW 1/4, S8, T81N, R9W, Iowa Co.)			X					
Mill Race 167. Upstream beginning (S27, T81N, R10W, Iowa Co.) to end (S26, T81N, R9W, Iowa Co.)		X						
Big Bear Cr. 168. Mouth (S24, T81N, R11W, Iowa Co.) to confluence with unnamed tributary (W. line, S21, T81N, R16W, Poweshiek Co.)			X					
Little Bear Cr. 169. Mouth (Poweshiek Co.) to confluence with an unnamed tributary (SW 1/4, Sec. 13, T80N, R16W, Poweshiek Co.)			X					
Buckeye Cr. 170. Mouth (S11, T81N, R12W, Iowa Co.) to confluence with unnamed tributary (SE 1/4, S22, T82N, R12W, Benton Co.)			X					

IOWA-CEDAR MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES IOWA R. ABOVE CEDAR R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Walnut Cr. 171. Mouth (S31, T82N, R12W, Benton Co.) to confluence with an unnamed tributary (NW 1/4, S24, T81N, R15W, Poweshiek Co.)			X					
Salt Cr. 172. Mouth (S31, T82N, R12W, Benton Co.) to confluence with unnamed tributary (S28, T85N, R14W, Tama Co.)			X					
East Branch Salt Cr. 174. Mouth (S34, T84N, R13W, Tama Co.) to confluence with Stein Cr. (S26, T84N, R13W, Tama Co.)			X					
E. Branch Salt Creek 175. Confluence with Stein Cr. (S26, T84N, R13W, Tama Co. to bridge crossing at (N. line of S3, T84N, R13W, Tama Co.)			X					
Stein Cr. 176. Mouth (S26, T84N, R13W, Tama Co.) to confluence with an unnamed tributary (NE 1/4, S17, T84N, R12W, Benton Co.)			X					
Otter Cr. 177. Mouth (Tama Co.) to the water control structure for Otter Creek Marsh (S12, T82N, R14W, Tama Co.)			X					
Richland Cr. 178. Mouth (S13, T82N, R14W, Tama Co.) to confluence with Abes Fork (Center, S20, T82N, R15W, Tama Co.)			X					
Deer Cr. 179. Mouth (S34, T83N, R15W, Tama Co.) to confluence with an unnamed tributary (NE 1/4, SE 1/4, S23, T84N, R16W, Tama Co.)			X					
Raven Cr. 180. Mouth (S25, T83N, R16W, Tama Co.) to West line S35, T83N, R16W, Tama Co.			X					
Timber Cr. 181. Mouth (Marshall Co.) to confluence with N. Timber Cr. (S24, T83N, R18W, Marshall Co.)			X					
S. Timber Cr. 182. Mouth (S17, T83N, R17W, Marshall Co.) to confluence with an unnamed tributary (S10, T82N, R18W, Marshall Co.)			X					
Brush Cr. 183. Mouth (Marshall Co.) to confluence with an unnamed tributary (S16, T82N, R17W, Marshall Co.)			X					
N. Timber Cr. 184. Mouth (S24, T83N, R18W, Marshall Co.) to confluence with an unnamed tributary (S23, T83N, R19W, Marshall Co.)			X					
Linn Cr. 185. Mouth (S30, T84N, R17W, Marshall Co.) to confluence with an unnamed tributary (W1/2, NE 1/4, S5, T83N, R19W, Marshall Co.)			X					
Burnett Cr. 186. Mouth (S24, T84N, R18W, Marshall Co.) to confluence with an unnamed tributary (SE 1/4, NW 1/4, S13, T84N, R18W, Marshall Co.)			X					

IOWA-CEDAR MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES IOWA R. ABOVE CEDAR R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Asher Cr. 187. Mouth (S27, T84N, R18W, Marshall Co.) to confluence with Chicken Cr. (NW 1/4, NE 1/4, S16, T84N, R18W, Marshall Co.)			X					
Minerva Cr. 188. Mouth (NW 1/4, S2, T84N, R19W, Marshall Co.) to confluence with an unnamed tributary (S33, T86N, R21W, Hardin Co.)			X					
Honey Cr. 189. Mouth (Marshall Co.) to confluence with an unnamed tributary (Sec. 15, T86N, R20W, Hardin Co.)			X					
Honey Cr. 190. Confluence with an unnamed tributary (S15, T86N, R20W, Hardin Co.) to confluence with D.D. No. 55 (S32, T87N, R21W, Hardin Co.)			X					
Dowd Cr. 191. Mouth (S2, T85N, R19W, Marshall Co.) to confluence with an unnamed tributary (S1, T85N, R19W, Marshall Co.)			X					
Bear Cr. 192. Mouth (S9, T86N, R19W, Hardin Co.) to confluence with an unnamed tributary (E 1/2, S3, T86N, R19W, Hardin Co.)			X					
South Fork Iowa River 193. Confluence with an unnamed tributary (S11, T88N, R22W, Hardin Co.) to confluence with an unnamed tributary (SE 1/4, S35, T90N, R23W, Wright Co.)			X					
South Fork Iowa River 194. Mouth (S4, T86N, R19W, Hardin Co.) to confluence with an unnamed tributary (W 1/2, S19, T88N, R21W, Hardin Co.)		X						
South Fork Iowa River 195. Confluence with an unnamed tributary (W 1/2, S19, T88N, R21W, Hardin Co.) to confluence with an unnamed tributary (S11, T88N, R22W, Hardin Co.)			X					
Beaver Cr. 196. Mouth (SE 1/4, S25, T87N, R19W, Hardin Co.) to confluence with S. Beaver Cr. (NE 1/4, S28, T88N, R20W, Hardin Co.)			X					
Tipton Cr. 197. Mouth (S21, T87N, R20W, Hardin Co.) to confluence with New York Branch (S28, T88N, R22W, Hardin Co.)			X					
Pine Cr. 198. Mouth (S8, T87N, R19W, Hardin Co.) to dam of Lower Pine Lake (S9, T87N, R19W, Hardin Co.)		X						
Pine Cr. 199. Lower Pine Lake	X	X						
Pine Cr. 200. Upper extent of Lower Pine Lake to dam of Upper Pine Lake (S4, T87N, R19W, Hardin Co.)		X						
Pine Cr. 201. Upper Pine Lake	X	X						

IOWA-CEDAR MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES IOWA R. ABOVE CEDAR R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
School Cr. 202. Mouth (S28, T89N, R20W, Hardin Co.) to confluence with an unnamed tributary (S16, T89N, R20W, Hardin Co.)			X					
Sheldon Cr. 203. Mouth (S19, T90N, R22W, Franklin Co.) to N/S road crossing bisecting N 1/2, S24, T90N, R23W, Wright Co.)			X					
Elk Run 204. Mouth (S13, T89N, R21W, Hardin Co.) to confluence with an unnamed tributary (S2, T89N, R21W, Hardin Co.)			X					
Unnamed Cr. (aka D.D. 32) 205. Mouth (SE 1/4, S30, T91N, R22W, Franklin Co.) to confluence with an unnamed tributary (NW 1/4, S29, T91N, R22W, Franklin Co.)			X					
Drainage Ditch No. 3 (aka Wheeler Cr.) 206. Mouth (NW 1/4, SE 1/4, S10, T91N, R23W, Wright Co.) to confluence with D.D. No. 5 (W line, S20, T91, R23, Wright Co.)			X					
Unnamed Cr. (aka Joint D.D. No.'s 7 & 146) 207. Mouth (N. line, S4, T91N, R23W, Wright Co.) to confluence with an unnamed tributary (aka Joint D.D. No.'s 4, 118) (SE 1/4, S28, T92N, R23W, Wright Co.)			X					
Luicks Cr. 208. Mouth (S31, T93N, R23W, Wright Co.) to confluence with an unnamed tributary (aka Joint D No.'s 3, 111) (NW 1/4, S3, T92N, R23W, Wright Co.)			X					
West Fork Iowa River (aka West Branch Iowa R.) 209. Mouth (S19, T93N, R23W, Wright Co.) to confluence with D.D. No. 1 (S2, T95N, R25W, Hancock Co.)			X					
E. Fork Iowa R. (aka East Branch Iowa R.) 210. Mouth (S19, T93N, R23W, Wright Co.) to confluence with an unnamed tributary (S27, T97N, R24W, Hancock Co.)			X					

NORTHEASTERN IOWA RIVER BASINS

Northeastern Iowa River Basins (Wapsipinicon River, Maquoketa River, North Fork Maquoketa River, Turkey River, Volga River, Yellow River, and Upper Iowa River Subbasins).

The streams or stream segments named below in alphabetical order are referenced within the Water Use Designations for the Northeastern Iowa River Basins. Reference numbers provided in the alphabetical list correspond to numbered stream segments in the Water Use Designations.

Ames Cr. - 19
Barber Cr. - 22
Baron Spring - 214
Bass Cr. - 257
Bass Cr. - 258
Bear Cr. - 107
Bear Cr. - 205
Bear Cr. - 206
Bear Cr. - 228
Bear Cr. - 229
Bear Cr. - 307
Bear Cr. - 308
Bear Cr. - 110
Bear Cr. - 111
Beaver Cr. - 71
Beaver Cr. - 246
Beaver Cr. - 341
Beaver Cr. - 342
Beers Cr. - 112
Bell Cr. - 250
Bloody Run - 154
Bloody Run - 273
Bloody Run Cr. - 181
Bohemian Cr. - 261
Brophy Cr. - 16
Brophy Cr. - 17
Brownfield Cr. - 195
Bruce Cr. - 131
Brush Cr. - 83
Brush Cr. - 84
Brush Cr. - 85
Brush Cr. - 225
Brush Cr. - 226
Brush Cr. - 227
Buck Cr. - 54
Buck Cr. - 118
Buck Cr. - 268
Buck Cr. - 269
Buffalo Cr. - 31
Buffalo Cr. - 32
Buffalo Cr. - 33
Buffalo Cr. - 34
Buncombe Cr. - 98
Calamus Cr. - 26
Canoe Cr. - 315
Canoe Cr. - 316
Canoe Cr. - 317
Carlan Cr. - 185
Catfish Cr. - 145
Catfish Cr. - 146
Catfish Cr. - 147
Cedar Cr. - 92
Cherry Cr. - 18
Chialk Cr. - 262
Clear Cr. - 297
Clear Cr. - 305
Cline Branch - 100
Cline Cr. - 116
Cloie Br. - 155
Cloie Br. - 156
Coffins Cr. - 124
Coon Cr. - 320
Cota Cr. - 292
Coulee Cr. - 235
Cox Cr. - 211
Cox Cr. - 212
Crane Cr. - 55
Crane Cr. - 59
Crane Cr. - 60
Crow Cr. - 9
Curran Branch - 105
D. D. 12 - 27
Deep Cr. - 80
Deep Cr. - 81
Deep Cr. - 221
Dibble Cr. - 251
Doe Cr. - 208
Dousman Cr. - 278
Dry Branch - 254
Dry Cr. - 43
Dry Mill Cr. - 240
Dry Mill Cr. - 241
Dry Run - 327
Duck Cr. - 8
Duck Cr. - 134
Durion Cr. - 106
E. Fk. Wapsipinicon R. - 56
E. Fk. Wapsipinicon R. - 57
E. Pine Cr. - 334
East Branch Buffalo Cr. - 37
East Branch Otter Cr. - 50
Elk Cr. - 62
Elk Cr. - 190
Elk Cr. - 191
Elk R. - 68
Elk R. - 69
Ensign Cr. - 217
Farmers Cr. - 93
Fenchel Cr. - 130
Fitzgerald Cr. - 252
Fountain Spring Cr. - 197
French Cr. - 304
Granger Cr. - 148
Grannis Cr. - 230
Hainer Cr. - 86
Harter Cr. - 44
Harts Mill Cr. - 66
Hazelton Cr. - 51
Heatons Cr. - 38
Hewett Cr. - 215
Hewitt Cr. - 108
Hickory Cr. - 109
Hickory Cr. - 281
Hickory Cr. - 282
Hogans Br. - 165
Hogans Br. - 166
Honey Cr. - 126
Honey Cr. - 209
Hunter Cr. - 49
Irish Hollow Cr. - 303
Johns Cr. - 104
Joles Cr. - 184
Kitty Cr. - 115
Kleinlein Cr. - 213
Little Maquoketa R. - 152
Little Maquoketa R. - 153
Little Mill Cr. - 137
Little Paint Cr. - 291
Little Turkey R. - 175
Little Turkey R. - 176
Little Turkey R. - 177
Little Turkey R. - 178
Little Turkey R. - 255
Little Turkey R. - 256
Little Volga R. - 236
Little Volga River - 237
Little Wapsipinicon R. - 52
Little Wapsipinicon R. - 53
Lost Cr. - 15
Lux Cr. - 144
Lytle Cr. - 94
Lytle Cr. - 95
Mad Cr. - 5
Maquoketa R. - 72
Maquoketa R. - 73
Maquoketa R. - 74
Maquoketa R. - 75
Maquoketa R. - 76
Maquoketa R. - 77
Maquoketa R. - 78
Maquoketa R. - 79
Martha Cr. - 336
Middle Bear Cr. - 311
Middle Fk. Catfish Cr. - 149
Middle Fk. Little Maquok - 158
Middle Fk. Little Maquok - 159
Mill Cr. - 29
Mill Cr. - 65
Mill Cr. - 135
Mill Cr. - 136
Mineral Cr. - 113
Miners Cr. - 266
Miners Cr. - 267
Mink Cr. - 222
Mink Cr. - 223
Minor Cr. - 338
Mississippi R. - 1
Mississippi R. - 2
Mossey Glen Cr. - 210
Mud Cr. - 23
Muscatine Slough - 3
N. Canoe Cr. - 319
N. Bear Cr. - 310
N. Cedar Cr. - 271
N. Fk. Maquoketa R. - 88
N. Fk. Maquoketa R. - 89
N. Fk. Maquoketa R. - 90
Nagel Cr. - 218
Nichols Cr. - 339
Norfolk Cr. - 284
North Branch Turkey River - 263
North Branch Volga R. - 238
North Fk. Catfish Cr. - 150
North Fk. Little Maquoke - 157
North Fork Yellow River - 287
Nutting Cr. - 253
Otter Cr. - 45
Otter Cr. - 46
Otter Cr. - 47
Otter Cr. - 48
Otter Cr. - 96
Otter Cr. - 247
Otter Cr. - 248
Ozark Spring Run - 101
Paint Cr. - 288
Paint Cr. - 289
Paint Cr. - 290
Paint Cr. - 312

Patterson Cr. - 314
Pecks Cr. - 183
Penn Cr. - 121
Pine Cr. - 6
Pine Cr. - 7
Pine Cr. - 42
Pine Cr. - 194
Pine Cr. - 318
Pine Cr. - 333
Pleasant Cr. - 132
Pleasant Cr. - 133
Plum Cr. - 28
Plum Cr. - 58
Plum Cr. - 119
Plum Cr. - 120
Plum Cr. - 167
Point Hollow Cr. - 180
Prairie Cr. - 87
Prairie Cr. - 99
Prairie Cr. - 125
Rabbit Cr. - 207
Ram Hollow - 182
Roberts Cr. - 239
Rock Cr. - 24
Rock Cr. - 64
Rogers Cr. - 259
S. Br. Fountain Spring Cr. - 198
S. Cedar Cr. - 186
S. Cedar Cr. - 187
Sand Cr. - 40
Sand Cr. - 123
Sand Hagen Cr. - 128
Schechtman Br. - 199
Schechtman Br. - 200
Schramling Cr. - 70
Silver Cr. - 20
Silver Cr. - 21
Silver Cr. - 35
Silver Cr. - 117
Silver Cr. - 242
Silver Cr. - 306
Silver Cr. - 331
Silver Cr. - 332
Silver Cr. - 337
Smith Cr. - 323
Sny Magill Cr. - 270
South Fk. Catfish Cr. - 151
South Fork Maquoketa R. - 129
Spencer Cr. - 10
Spring Br. - 61
Spring Br. - 122
Spruce Cr. - 141
Staff Cr. - 343
Steeles Br. - 193
Sugar Cr. - 82
Suttle Cr. - 279
Teeple Cr. - 285
Ten Mile Cr. - 329
Tete des Morts Cr. - 142
Tete des Morts Cr. - 143
Trout Cr. - 321
Trout Cr. - 322
Trout Cr. - 325
Trout Cr. - 324
Trout Run - 295
Tuecke Hollow - 188
Turkey R. - 168
Turkey R. - 169
Turkey R. - 170
Turkey R. - 171
Turkey R. - 172
Turkey R. - 173
Turkey R. - 174
Twin Springs Cr - 328
Twin Springs Cr. - 196
Unnamed Cr. - 4
Unnamed Cr. - 41
Unnamed Cr. - 67
Unnamed Cr. - 91
Unnamed Cr. - 97
Unnamed Cr. - 114
Unnamed Cr. - 127
Unnamed Cr. - 140
Unnamed Cr. - 160
Unnamed Cr. - 161
Unnamed Cr. - 163
Unnamed Cr. - 164
Unnamed Cr. - 216
Unnamed Cr. - 219
Unnamed Cr. - 224
Unnamed Cr. - 231
Unnamed Cr. - 232
Unnamed Cr. - 234
Unnamed Cr. - 243
Unnamed Cr. - 244
Unnamed Cr. - 245
Unnamed Cr. - 249
Unnamed Cr. - 265
Unnamed Cr. - 286
Unnamed Cr. - 313
Unnamed Cr. - 340
Unnamed Cr. - 280
Unnamed Cr. - 330
Unnamed Cr. - 179
Unnamed Cr. - 335
Unnamed Cr. - 296
Unnamed Cr. - 162
Unnamed Cr. - 138
Unnamed Cr. - 139
Unnamed Cr. - 233
Unnamed Cr. - 272
Unnamed Stream - 326
Upper Iowa R. - 298
Upper Iowa R. - 299
Upper Iowa R. - 300
Upper Iowa R. - 301
Upper Iowa R. - 302
Village Cr. - 294
Volga R. - 201
Volga R. - 202
Volga R. - 203
Volga R. - 204
W. Br. S. Cedar Cr. - 189
Walnut Cr. - 30
Walton Cr. - 39
Wapsipinicon R. - 11
Wapsipinicon R. - 12
Wapsipinicon R. - 14
Wapsipinicon R. - 13
Waterloo Cr. - 309
Watsons Cr. - 63
West Branch Buffalo Cr. - 36
West Branch Turkey River - 264
Wexford Cr. - 293
Whitewater Cr. - 102
Whitewater Cr. - 103
Williams Cr. - 283
Willow Cr. - 220
Winnebago Cr. - 302a
Wolf Cr. - 192
Wonder Cr. - 260
Yankee Run - 25
Yellow R. - 274
Yellow R. - 275
Yellow R. - 276

NORTHEASTERN MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Mississippi R. 1. Iowa R. to the Iowa-Minnesota state line	X	X						
Mississippi R. 2. Davenport Water Company Water Works intake						X		
MUSCATINE SLOUGH AND ITS TRIBUTARIES								
Muscatine Slough 3. Mouth (S32, T75N, R2W, Louisa Co.) to confluence with unnamed tributary (E 1/2, S7, T76N, R2W, Muscatine Co.)		X						
Unnamed Cr. 4. Mouth (S30, T75N, R2W, Louisa Co.) to confluence with unnamed tributary (N 1/2, S19, T75N, R2W, Louisa Co.)			X					
MAD CR. AND ITS TRIBUTARIES								
Mad Cr. 5. Mouth (S36, T77N, R1W, Muscatine Co.) to confluence with an unnamed tributary (SE 1/4, S13, T77N, R2W, Muscatine Co.)			X					

NORTHEASTERN MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES PINE CR. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Pine Cr. 6. Mouth (S21, T77N, R1E, Muscatine Co.) to Old Pine Creek Mill (SE 1/4, S17, T77N, R1E, Muscatine Co.)		X						
Pine Cr. 7. Old Pine Creek Mill (SE 1/4, S17, T77N, R1E, Muscatine Co.) to confluence with an unnamed tributary (S26, T78N, R1W, Muscatine Co.)			X					
DUCK CR. AND ITS TRIBUTARIES								
Duck Cr. 8. Mouth (S27, T78N, R4E, Scott Co.) to confluence with unnamed tributary (SE 1/4, S14, T78N, R2E, Scott Co.)			X					
CROW CR. AND ITS TRIBUTARIES								
Crow Cr. 9. Mouth (S24, T78N, R4E, Scott Co.) to confluence with unnamed tributary (W 1/2, S30, T79N, R4E, Scott Co.)			X					
SPENCER CR. AND ITS TRIBUTARIES								
Spencer Cr. 10. Mouth (S18, T89N, R5E, Scott Co.) to confluence with unnamed tributary (S34/35 line, T79N, R4E, Scott Co.)			X					
WAPSIPINICON R. AND ITS TRIBUTARIES								
Wapsipinicon R. 11. Mouth (Scott-Clinton Co. line) to Snyder Access	X	X						X
Wapsipinicon R. 12. Snyder Access (Section 34, T93N, R12W, Bremer Co.) to confluence with Watsons Cr. (S25, T99N, R15W, Mitchell Co.)		X						
Wapsipinicon R. 13. Confluence with Watsons Cr. (S25, T99N, R15W, Mitchell Co.) to town of McIntire			X					
Wapsipinicon R. 14. Town of McIntire to N. line of Section 20, T100N, R15W, Mitchell Co.					X		X	
Lost Cr. 15. Mouth (S15, T80N, R5E, Scott Co.) to confluence with an unnamed tributary (NW 1/4, S7, T79N, R5E, Scott Co.)			X					
Brophy Cr. 16. Mouth (Clinton Co.) to confluence with Cherry Cr. (Clinton Co.)		X						
Brophy Cr. 17. Confluence with Cherry Cr. (S17, T81N, R5E, Clinton Co.) to confluence with an unnamed tributary (S33/34 line, T82N, R5E, Clinton Co.)			X					
Cherry Cr. 18. Mouth (S17, T81N, R5E, Clinton Co.) to confluence with an unnamed tributary (W 1/2, S36, T82N, R4E, Clinton Co.)			X					
Ames Cr. 19. Mouth (S4, T80N, R4E, Clinton Co.) to confluence with an unnamed tributary (S16, T81N, R4E, Clinton Co.)			X					
Silver Cr. 20. Mouth (Clinton Cr.) to confluence with Clear Cr. (Clinton Co.)		X						

NORTHEASTERN MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES WAPSIPINICON R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Silver Cr. 21. Confluence with Crystal Cr. (aka Clear Cr.) (Clinton Co.) to confluence with Nigger Cr. (aka Negro Cr.) (S27, T82N, R13W, Chickasaw Co.)			X					
Barber Cr. 22. Mouth (Clinton Co.) to bridge crossing (SW 1/4, Sec. 33, T81N, R3E, Clinton Co.)			X					
Mud Cr. 23. Mouth (S12, T80N, R2E, Scott Co.) to confluence with Hickory Cr. (S31, T80N, R2E, Scott Co.)			X					
Rock Cr. 24. Mouth (S35, T81N, R1E, Clinton Co.) to bridge crossing (S2/11 line, T80N, R1W, Cedar Co.)			X					
Yankee Run 25. Mouth (S23, T81N, R1E, Clinton Co.) to confluence with an unnamed tributary (S34, T82N, R1W, Cedar Co.)			X					
Calamus Cr. 26. Mouth (S13, T81N, R1E, Clinton Co.) to confluence with an unnamed tributary (S9, T81N, R2E, Clinton Co.)			X					
D. D. 12 (aka Unnamed Cr.) 27. Mouth (S13, T81N, R1E, Clinton Co.) to confluence with an unnamed tributary (S19, T82N, R2E, Clinton Co.)			X					
Plum Cr. 28. Mouth (S18, T82N, R1E, Clinton Co.) to confluence with an unnamed tributary (S13, T82N, R1W, Cedar Co.)			X					
Mill Cr. 29. Mouth (S28, T83N, R1W, Jones Co.) to confluence with an unnamed tributary (S14, T82N, R2W, Cedar Co.)			X					
Walnut Cr. 30. Mouth (S18, T83N, R2W, Jones Co.) to confluence with White Oak Creek (S19, T83N, R3W, Jones Co.)			X					
Buffalo Cr. 31. Mouth (Jones Co.) to the dam at Coggon (Linn Co.)		X						
Buffalo Cr. 32. Coggon Impoundment	X	X						
Buffalo Cr. 33. Upper extent of Coggon Impoundment to confluence with an unnamed tributary (N 1/2, S27, T88N, R7W, Buchanan Co.)		X						
Buffalo Cr. 34. Confluence with an unnamed tributary (N 1/2, S27, T88N, R7W, Buchanan Co.) to confluence with the East and West Branch Buffalo Creeks (S35, T90N, R8W, Buchanan Co.)			X					
Silver Cr. 35. Mouth (NE 1/4, S13, T87N, R7W, Buchanan Co.) to confluence with an unnamed tributary (NW 1/4, S5, T87N, R6W, Delaware Co.)			X					

NORTHEASTERN MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES WAPSIPINICON R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
West Branch Buffalo Cr. 36. Mouth (S35, T90N, R8W, Buchanan Co.) to confluence with an unnamed tributary (S9, T90N, R8W, Buchanan Co.)			X					
East Branch Buffalo Cr. 37. Mouth (S35, T90N, R8W, Buchanan Co.) to confluence with an unnamed tributary (S34, T91N, R8W, Fayette Co.)			X					
Heatons Cr. 38. Mouth (S12, T85N, R6W, Linn Co.) to confluence with an unnamed tributary (S1, T85N, R6W, Linn Co.)			X					
Walton Cr. 39. Mouth (S20, T86N, R6W, Linn Co.) to confluence with an unnamed tributary (S 1/2, S1, T86N, R7W, Linn Co.)			X					
Sand Cr. 40. Mouth (S14, T87N, R8W, Buchanan Co.) to confluence with an unnamed tributary (W 1/2, S15, T87N, R8W, Buchanan Co.)			X					
Unnamed Cr. 41. Mouth (SE 1/4, S28, T88N, R8W, Buchanan Co.) to confluence with an unnamed tributary (SE 1/4, NW 1/4, S22, T88N, R8W, Buchanan Co.)			X					
Pine Cr. 42. Mouth (S28, T88N, R8W, Buchanan Co.) to confluence with an unnamed tributary (NE 1/4, S20, T89N, R8W, Buchanan Co.)			X					
Dry Cr. 43. Mouth (S21, T88N, R8W, Buchanan Co.) to confluence with an unnamed tributary (W 1/2, S15, T88N, R8W, Buchanan Co.)			X					
Harter Cr. 44. Mouth (S27, T89N, R9W, Buchanan Co.) to confluence with an unnamed tributary (W 1/2, S23, T89N, R9W, Buchanan Co.)			X					
Otter Cr. 45. Mouth (Buchanan Co.) to Dam at Lake Oelwein		X						
Otter Cr. 46. Lake Oelwein to N. line of Section 33, T91N, R9W, Fayette Co.	X	X						
Otter Cr. 47. N. line of Sec. 33, T91N, R9W, Fayette Co. to confluence with an unnamed tributary (Sec. 29, T91N, R9W, Fayette Co.)		X						
Otter Cr. 48. Confluence with an unnamed tributary (Sec. 29, T91N, R9W, Fayette Co.) to confluence with an unnamed tributary (Sec. 18, T91N, R9W, Fayette Co.)			X					
Hunter Cr. 49. Mouth (S6, T89N, R9W, Buchanan Co.) to confluence with an unnamed tributary (Center, S20, T90N, R9W, Buchanan Co.)			X					
East Branch Otter Cr. 50. Mouth (S22, T90N, R9W, Buchanan Co.) to confluence with an unnamed tributary (NE 1/4, S14, T90N, R9W, Buchanan Co.)			X					

	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
NORTHEASTERN								
MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES								
WAPSIPINICON R. AND ITS TRIBUTARIES								
Hazelton Cr.								
51. Mouth (S9, T90N, R9W, Buchanan Co.) to confluence with an unnamed tributary (S2, T90N, R9W, Buchanan Co.)			X					
Little Wapsipinicon R.								
52. Mouth (Buchanan Co.) to confluence with Buck Cr. (Buchanan Co.)		X						
Little Wapsipinicon R.								
53. Confluence with Buck Cr. (S32, T90N, R10W, Buchanan Co.) to confluence with unnamed tributary (S13, T93N, R11W, Bremer Co.)			X					
Buck Cr.								
54. Mouth (S32, T90N, R10W, Buchanan Co.) to confluence with unnamed tributary (S9, T92N, R11W, Bremer Co.)			X					
Crane Cr.								
55. Mouth (S26, T90N, R11W, Black Hawk Co.) to confluence with unnamed tributary (S17, T92N, R12W, Bremer Co.)			X					
E. Fk. Wapsipinicon R.								
56. Mouth (S34, T93N, R12W, Bremer Co.) to upper extent of Sweet Marsh (S26, T93N, R12W, Bremer Co.)				X				
E. Fk. Wapsipinicon R.								
57. Upper extent of Sweet Marsh (S26, T93N, R12W, Bremer Co.) to confluence with unnamed tributary (S36, T96N, R13W, Chickasaw Co.)			X					
Plum Cr.								
58. Mouth (S15, T95N, R12W, Chickasaw Co.) to confluence with an unnamed tributary (S3, T95N, R12W, Chickasaw Co.)			X					
Crane Cr.								
59. Mouth (S31, T95N, R9W, Fayette Co.) to confluence with Spring Cr. (S17, T97N, R12W, Howard Co.)		X						
Crane Cr.								
60. Confluence with Spring Cr. (S17, T97N, R12W, Howard Co.) to confluence with an unnamed tributary (S7, T99N, R13W, Howard Co.)			X					
Spring Br.								
61. Mouth (S3, T94N, R13W, Chickasaw Co.) to N. line of Sec. 35, T95N, R13W, Chickasaw Co.			X					
Elk Cr.								
62. Mouth (Sec. 1, T96N, R14W, Chickasaw Co.) to confluence with an unnamed tributary (SW 1/4, Sec. 20, T97N, R13W, Chickasaw Co.)			X					
Watsons Cr.								
63. Mouth (S25, T99N, R15W, Mitchell Co.) to confluence with an unnamed tributary (S30, T99N, R14W, Howard Co.)			X					
ROCK CR. AND ITS TRIBUTARIES								
Rock Cr.								
64. Mouth (S31, T81N, R6E, Clinton Co.) to confluence with an unnamed tributary (S23, T81N, R5E, Clinton Co.)			X					

NORTHEASTERN MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES MILL CR. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Mill Cr. 65. Mouth (Clinton Co.) to confluence with an unnamed tributary (Sec. 26, T82N, R6E, Clinton Co.)			X					
Harts Mill Cr. 66. Mouth (S15, T81N, R6E, Clinton Co.) to confluence with Little Mill Creek (S8, T81N, R6E, Clinton Co.)			X					
UNNAMED CR. AND ITS TRIBUTARIES								
Unnamed Cr. (aka Deer Cr.) 67. Mouth (S17, T82N, R7E, Clinton Co.) to confluence with an unnamed tributary (SW 1/4, S18, T82N, R7E, Clinton Co.)			X					
ELK R. AND ITS TRIBUTARIES								
Elk R. 68. Mouth (Clinton Co.) to confluence with N. Br. Elk R. (Clinton Co.)		X						
Elk R. 69. Confluence with N. Br. Elk R. (S10, T83N, R6E, Clinton Co.) to confluence with an unnamed tributary (S32, T84N, R6E, Jackson Co.)			X					
Schramling Cr. 70. Mouth (S7, T83N, R7E, Clinton Co.) to confluence with an unnamed tributary (NW 1/4, S6, T83N, R7E, Clinton Co.)			X					
BEAVER CR. AND ITS TRIBUTARIES								
Beaver Cr. 71. Mouth (S6, T84N, R7E, Jackson Co.) to confluence with an unnamed tributary (S3, T84N, R6E, Jackson Co.)			X					
MAQUOKETA R. AND ITS TRIBUTARIES								
Maquoketa R. 72. Mouth (Jackson Co.) to confluence with Deep Cr. Jackson Co., Section 18, T84N, R5E	X	X						
Maquoketa R. 73. Confluence with Deep Creek to confluence with Plum Creek (Delaware Co., Section 11, T87N, R4W)	X	X						X
Maquoketa R. 74. Confluence with Plum Creek to Quaker Mills Dam (Delaware County, Section 19, T89N, R5W)	X	X						
Maquoketa R. 75. Quaker Mills Impoundment	X	X						
Maquoketa R. 76. Quaker Mills Impoundment to Forestville Dam at Backbone Lake		X						
Maquoketa R. 77. Backbone Lake Dam to boundry of Backbone State Park	X	X						
Maquoketa R. 78. Mouth of S. Fk. Maquoketa R. (S16, T90N, R6W, Delaware Co.) to Hwy. 3 (N. line of Section 24, T91N, R7W, Fayette Co.)					X		X	
Maquoketa R. 79. Hwy. 3 crossing (N. line, S24, T91N, R7W, Fayette Co.) to confluence with an unnamed tributary (S11, T91N, R7W, Fayette Co.)			X					

NORTHEASTERN MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES MAQUOKETA R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Deep Cr. 80. Mouth (Jackson Co.) to confluence with Bear Cr. (S8, T23N, R5E, Clinton Co.)		X						
Deep Cr. 81. Confluence with Bear Cr. (S8, T83N, R5E, Clinton Co.) to confluence with Williams Cr. (S33, T83N, R4E, Clinton Co.)			X					
Sugar Cr. 82. Mouth (S30, T84N, R5E, Jackson Co.) to confluence with an unnamed tributary (S5, T83N, R4E, Clinton Co.)			X					
Brush Cr. 83. Mouth (Jackson Co.) to N. line of Section 23, T85N, R3E, Jackson Co.		X						
Brush Cr. 84. N. line of Section 23, T85N, R3E to N. line of Section 1, T85N, R3E, Jackson Co.					X		X	
Brush Cr. 85. N. line of Section 1, T85N, R3E, Jackson Co. to confluence with an unnamed tributary (second upstream tributary, SE 1/4, S26, T86N, R3E, Jackson Co.)			X					
Hainer Cr. 86. Mouth (S15, T84N, R3E, Jackson Co.) to confluence with unnamed tributary (S22, T84N, R3E, Jackson Co.)			X					
Prairie Cr. 87. Mouth (S17, T84N, R3E, Jackson Co.) to confluence with an unnamed tributary (S2, T83N, R2E, Jackson Co.)			X					
N. Fk. Maquoketa R. 88. Mouth (Jackson Co.) to confluence with White Water Cr. (Jones Co., Section 10, T86N, R1W)		X						X
N. Fk. Maquoketa R. 89. Confluence with White Water Cr. to confluence with Bear Cr. (Dubuque Co.)		X						
N. Fk. Maquoketa R. 90. Confluence with Bear Cr. (S31, T89N, R2W, Dubuque Co. to confluence with an unnamed tributary (S18, T90N, R1W, Dubuque Co.)			X					
Unnamed Cr. 91. Mouth (S12, T84N, R2E, Jackson Co.) to confluence with unnamed tributary (S12, T84N, R2E, Jackson Co.)			X					
Cedar Cr. 92. Mouth (S30, T85N, R3E, Jackson Co.) to E. line of Section 29, T85N, R3E, Jackson Co.)					X			X
Farmers Cr. 93. Mouth (S24, T85N, R2E, Jackson Co.) to confluence with an unnamed tributary (W 1/2, NW 1/4, S8, T86N, R3E, Jackson Co.)			X					
Lytle Cr. 94. Mouth (Jackson Co.) to confluence with Buncombe Cr. (Dubuque Co.)		X						

NORTHEASTERN MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES MAQUOKETA R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Lytle Cr. 95. Confluence with Buncombe Cr. (S19, T87N, R2E, Dubuque Co.) to confluence with an unnamed tributary (N 1/2, S4, T87N, R2E, Dubuque Co.)			X					
Otter Cr. 96. Mouth (S21, T86N, R2E, Jackson Co.) to confluence with an unnamed tributary (S36, T87N, R2E, Dubuque Co.)			X					
Unnamed Cr. 97. Mouth (S7, T86N, R2E, Jackson Co.) to W. line of Section 11, T86N, R1E, Jackson Co.					X			X
Buncombe Cr. 98. Mouth (S19, T87N, R2E, Dubuque Co.) to confluence with an unnamed tributary (S10/11 line, T87N, R2E)			X					
Prairie Cr. 99. Mouth (S24, T87N, R1E, Dubuque Co.) to confluence with unnamed tributary (SE 1/4, S22, T87N, R1E, Dubuque Co.)			X					
Cline Branch 100. Mouth (S7, T85N, R2E, Jackson Co.) to confluence with an unnamed tributary (S1, T85N, R1E, Jackson Co.)			X					
Ozark Spring Run 101. Mouth (S5, T85N, R1E, Jackson Co.) to spring source in center of S32, T86N, R1E, Jackson Co.					X			X
Whitewater Cr. 102. Mouth (S10, T86N, R1W, Jones Co.) to confluence with Curran Branch (S12, T87N, R1W, Dubuque Co.)		X						
Whitewater Cr. 103. Confluence with Curran Branch to confluence with an unnamed tributary (S18, T88N, R1E, Dubuque Co.)			X					
Johns Cr. 104. Mouth (S18, T88N, R1W, Dubuque Co.) to confluence with Bakers Cr. (S36, T88N, R2W, Dubuque Co.)			X					
Curran Branch 105. Mouth (S12, T87N, R1W, Dubuque Co.) to confluence with an unnamed tributary (S26/35 line, T88N, R1W, Dubuque Co.)			X					
Durion Cr. 106. Mouth (S36, T88N, R3W, Delaware Co.) to confluence with an unnamed tributary (S20, T88N, R2W, Dubuque Co.)			X					
Bear Cr. 107. Mouth (S31, T89N, R2W, Dubuque Co.) to confluence with an unnamed tributary (NW 1/4, S2, T89N, R3W, Delaware Co.)			X					
Hewitt Cr. 108. Mouth (S 29/30 line, T89N, R2W, Dubuque Co.) to confluence with Hickory Cr. (S21, T89N, R2W, Dubuque Co.)			X					
Hickory Cr. 109. Mouth (S21, T89N, R2W, Dubuque Co.) to confluence with an unnamed tributary (SE 1/4, S14, T89N, R2W)			X					

NORTHEASTERN MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES MAQUOKETA R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Bear Cr., (aka Big Bear Cr.) 110. Mouth (Jackson Co.) to confluence with Beers Cr. (Jackson Co.)		X						
Bear Cr., (aka Big Bear Cr.) 111. Confluence with Beers Cr. (S22/23 line, T84N, R1E, Jackson Co.) to confluence with an unnamed tributary (W 1/2, S28, T84N, R2W, Jones Co.)			X					
Beers Cr. 112. Mouth (S22/23 line, T84N, R1E, Jackson Co.) to confluence with an unnamed tributary (S9, T84N, R1W, Jones Co.)			X					
Mineral Cr. 113. Mouth (S32, T85N, R1E, Jackson Co.) to confluence with an unnamed tributary (S35, T85N, R2W, Jones Co.)			X					
Unnamed Cr. 114. Mouth (S30, T86N, R2W, Jones Co.) to confluence with an unnamed tributary (S19, T86N, R2W, Jones Co.)			X					
Kitty Cr. 115. Mouth (S22, T86N, R3W, Jones Co.) to confluence with an unnamed tributary (SE 1/4, S27, T86N, R3W, Jones Co.)			X					
Cline Cr. 116. Mouth (S16, T86N, R3W, Jones Co.) to confluence with an unnamed tributary (SW 1/4, S34, T87N, R3W, Delaware Co.)			X					
Silver Cr. 117. Mouth (S8, T86N, R3W, Jones Co.) to confluence with an unnamed tributary (S10, T86N, R4W, Jones Co.)			X					
Buck Cr. 118. Mouth (S11, T87N, R4W, Delaware Co.) to confluence with Golden Branch (S11, T87N, R5W, Delaware Co.)			X					
Plum Cr. 119. Mouth (Delaware Co.) to confluence with unnamed tributary (E 1/2, S24, T89N, R4W, Delaware Co.)		X						
Plum Cr. 120. Confluence with an unnamed tributary (S24, T89N, R4W, Delaware Co.) to confluence with an unnamed tributary (S8, T89N, R4W, Delaware Co.)			X					
Penn Cr. 121. Mouth (S18, T88N, R3W, Delaware Co.) to confluence with unnamed tributary (S11, T88N, R4W, Delaware Co.)			X					
Spring Br. 122. Mouth (S10, T88N, R5W, Delaware Co.) to spring source (Section 35, T89N, R5W, Delaware Co.)					X		X	
Sand Cr. 123. Mouth (S9, T88N, R5W, Delaware Co.) to confluence with Todds Cr. (S8, T88N, R5W, Delaware Co.)			X					
Coffins Cr. 124. Mouth (S19, T89N, R5W, Delaware Co.) to confluence with Prairie Cr. (S29, T89N, R6W, Delaware Co.)			X					

NORTHEASTERN MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES MAQUOKETA R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Prairie Cr. 125. Mouth (S29, T89N, R6W, Buchanan Co.) to confluence with an unnamed tributary (SW 1/4, NW 1/4, S22, T89N, R7W, Buchanan Co.)			X					
Honey Cr. 126. Mouth (S19, T89N, R5W, Delaware Co.) to confluence with Rutherford Branch (S26, T90N, R5W, Delaware Co.)			X					
Unnamed Cr. 127. Mouth (NW 1/4, SW 1/4, S1, T89N, R6W, Delaware Co.) to confluence with an unnamed tributary (S30, T90N, R5W, Delaware Co.)			X					
Sand Hagen Cr. 128. Mouth (S34, T90N, R6W, Delaware Co.) to confluence with an unnamed tributary (S29, T90N, R6W, Delaware Co.)			X					
South Fork Maquoketa R. 129. Mouth (S16, T90N, R6W, Delaware Co.) to confluence with an unnamed tributary (NE 1/4, SW 1/4, S30, T91N, R7W, Fayette Co.)			X					
Fenchel Cr. 130. Mouth (S5, T90N, R6W, Delaware Co.) to Richmond Springs (center of S4, T90N, R6W, Delaware Co.)					X		X	
Bruce Cr. 131. Mouth (S19/30 line, T91N, R6W, Clayton Co.) to confluence with an unnamed tributary (S27, T91N, R7W, Fayette Co.)			X					
PLEASANT CR. AND ITS TRIBUTARIES								
Pleasant Cr. 132. Mouth (S33, T86N, R5E, Jackson Co.) to W. line of Section 11, T85N, R4E, Jackson Co.			X					
Pleasant Cr. 133. W. line of Section 11, T85N, R4E to W. line of Section 15, T85N, R4E, Jackson Co.					X			X
DUCK CR. AND ITS TRIBUTARIES								
Duck Cr. 134. Mouth (S29, T86N, R5E, Jackson Co.) to confluence with an unnamed tributary (Center, S25, T86N, R4E, Jackson Co.)			X					
MILL CR. (AKA BIG MILL CR.) AND ITS TRIBUTARIES								
Mill Cr. (aka Big Mill Cr.) 135. Mouth (S29, T86N, R5E, Jackson Co.) to confluence with Little Mill Cr. (S13, T86N, R4E, Jackson Co.)		X						
Mill Cr. (aka Big Mill Cr.) 136. Confluence with Little Mill Cr. to confluence with Unnamed Cr. (Section 1, T86N, R3E, Jackson Co.)					X		X	
Little Mill Cr. 137. Mouth (Jackson Co.) to W. line of Section 29, T86N, R4E, Jackson Co.					X		X	
Unnamed Cr. (aka S. Fk. Big Mill) 138. Mouth (Section 8, T86N, R4E, Jackson Co.) to west line of Section 17, T86N, R4E, Jackson Co.					X		X	
Unnamed Cr. (aka Storybook Hollow) 139. Mouth (Section 1, T86N, R4E, Jackson Co.) to S. line of Section 12, T86N, R3E, Jackson Co.					X		X	

NORTHEASTERN MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES MILL CR. (AKA BIG MILL CR.) AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Unnamed Cr. 140. Mouth (Section 1, T86N, R3E, Jackson Co.) to W. line of Section 1, T86N, R3E, Jackson Co.					X		X	
SPRUCE CR. AND ITS TRIBUTARIES								
Spruce Cr. 141. Mouth (S36, T87N, R4E, Jackson Co.) to confluence with an unnamed tributary (SE 1/4, S33, T87N, R4E, Jackson Co.)			X					
TETE DES MORTS CR. AND ITS TRIBUTARIES								
Tete des Morts Cr. (aka Tete des Morts R.) 142. Mouth (Dubuque Co.) to confluence with Lux Creek (S7, T87N, R4E, Jackson Co.)		X						
Tete des Morts Cr. (aka Tete des Morts R.) 143. Confluence with Lux Creek (S7, T87N, R4E, Jackson Co.) to confluence with an unnamed tributary (SW 1/4, NE 1/4, S32, T88N, R3E, Dubuque Co.)			X					
Lux Cr. 144. Mouth (S7, T87N, R4E, Jackson Co.) to confluence with an unnamed tributary (S35, T88N, R3E, Dubuque Co.)			X					
CATFISH CR. AND ITS TRIBUTARIES								
Catfish Cr. 145. Mouth (Dubuque Co.) to confluence with South Fk. Catfish Cr. (Dubuque Co.)		X						
Catfish Cr. 146. Confluence with South Fk. Catfish Cr. (Dubuque Co.) to South line (S9, T88N, R2E, Dubuque Co.)			X					
Catfish Cr. 147. S. line of Section 9, T88N, R2E, to W. line of Section 30, T88N, R2E, Dubuque Co.					X			X
Granger Cr. 148. Mouth (Dubuque Co.) to county road bridge crossing (S24, T88N, R2E, Dubuque Co.)			X					
Middle Fk. Catfish Cr. (aka N. Fk. Catfish Cr.) 149. Mouth (S1, T88N, R2E, Dubuque Co.) to west line of Section 30, T89N, R2E, Dubuque Co.			X					
North Fk. Catfish Cr. 150. Mouth (S35, T89N, R2E, Dubuque Co.) to Hwy. 20 bridge crossing (S27, T89N, R2E, Dubuque Co.)			X					
South Fk. Catfish Cr. 151. Mouth (S2, T88N, R2E, Dubuque Co.) to confluence with an unnamed tributary (SW 1/4, S3, T88N, R1E)			X					
LITTLE MAQUOKETA R. AND ITS TRIBUTARIES								
Little Maquoketa R. 152. Mouth (Dubuque Co.) to confluence with Hogans Br. (S36, T89N, R1W, Dubuque Co.)		X						
Little Maquoketa R. 153. Hogans Br. to N. line of Section 5, T88N, R1W, Dubuque Co.					X			X
Bloody Run 154. Mouth (S4, T90N, R2E, Dubuque Co.) to W. line of Section 21, T90W, R2E, Dubuque Co.					X			X
Cloie Br. 155. Mouth (S5, T89N, R2E, Dubuque Co.) to W. line of Section 5, T89N, R2E, Dubuque Co.					X			X

NORTHEASTERN MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES LITTLE MAQUOKETA R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Cloie Br. 156. West line Section 5, T89N, R2E, Dubuque Co. to confluence with an unnamed tributary in S18, T89N, R2E, Dubuque Co.			X					
North Fk. Little Maquoketa R. 157. Mouth (S31, T90N, R2E, Dubuque Co.) to W. line S24, T90N, R1W, Dubuque Co.			X					
Middle Fk. Little Maquoketa R. 158. Mouth (S35, T90N, R1E, Dubuque Co.) to W. line S31, T90N, R1E, Dubuque Co.			X					
Middle Fk. Little Maquoketa R. (aka Bankston Cr.) 159. W. line of Section 31, T90N, R1E to N. line of Section 33, T90N, R1W, Dubuque Co.					X		X	
Unnamed Cr. 160. Mouth (S2, T89N, R1W, Dubuque Co.) to confluence with unnamed tributary (S11, T89N, R1W, Dubuque Co.)			X					
Unnamed Cr. 161. Mouth (S34, T90N, R1W, Dubuque Co.) to confluence with unnamed tributary (SE 1/4, S5, T89N, R1W, Dubuque Co.)			X					
Unnamed Cr. (aka Haberkorn Cr.) 162. Mouth (S27, T90N, R1E, Dubuque Co.) to confluence with an unnamed tributary (NE1/4, S15, T90N, R1E, Dubuque Co.)			X					
Unnamed Cr. 163. Mouth (S29, T89N, R1E, Dubuque Co.) to confluence with unnamed tributary (NE 1/4, S24, T89N, R1W, Dubuque Co.)			X					
Unnamed Cr. 164. Mouth (NE 1/4, S36, T89N, R1W, Dubuque Co.) to W. Line of S25, T89N, R1W, Dubuque Co.			X					
Hogans Br. 165. Mouth (S35, T89N, R1W, Dubuque Co.) to W. line of Section 9, T88N, R1W, Dubuque Co.					X			X
Hogans Br. 166. West line Section 9, T88N, R1W, Dubuque Co. to county road bridge crossing (W. line of S5, T88N, R1W)			X					
PLUM CR. AND ITS TRIBUTARIES								
Plum Cr. 167. Mouth (S23, T91N, R1W, Clayton Co.) to confluence with an unnamed tributary (S26, T91N, R1W, Clayton Co.)			X					
TURKEY R. AND ITS TRIBUTARIES								
Turkey R. 168. Mouth (Clayton Co.) to confluence with the Volga R. (Section 26, T92N, R4W, Clayton Co.)		X						
Turkey R. 169. Confluence with the Volga R. to W. line of Section 9, T93N, R5W, Clayton Co. (two stream miles downstream from Big Springs Trout Hatchery)	X	X					X	
Turkey R. 170. Two stream miles downstream from Big Springs Trout Hatchery to Big Springs Trout Hatchery (S31, T94N, R5W, Clayton Co.)	X				X		X	

NORTHEASTERN MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES TURKEY R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Turkey R. 171. Big Springs Trout Harchery to bridge crossing in Elgin (Section 13, T94N, R7W, Fayette Co.)	X	X					X	
Turkey R. 172. Bridge crossing in Elgin to Vernon Springs (road crossing S34, T99N, R11W, Howard Co.)		X					X	
Turkey R. 173. Vernon Springs (road crossing, S34, T99N, R11W, Howard Co.) to confluence with North Branch Turkey R. (S31, T99N, R11W, Howard Co.)		X						
Turkey R. 174. Confluence with North Branch Turkey R. to confluence with South Branch Turkey R. (S2, T98N, R12W, Howard Co.)			X					
Little Turkey R. 175. Mouth (S10, T91N, R2W, Clayton Co.) to confluence with White Pine Hollow (S31, T91N, R2W, Clayton Co.)		X						
Little Turkey R. 176. Confluence with White Pine Hollow (S31, T91N, R2W, Clayton Co.) to Clayton-Delaware co. line			X					
Little Turkey R. 177. Clayton-Delaware Co. Line to S. line of Section 11, T90N, R3W, Delaware Co.					X		X	
Little Turkey R. 178. S. line S11, T90N, R3W, Delaware Co. to confluence with an unnamed tributary (S 1/2, S15, T90N, R3W, Delaware Co.)			X					
Unnamed Cr. (aka Cherry Valley Cr.) 179. Mouth (S16, T91N, R2W, Clayton Co.) to confluence with unnamed tributary (aka Hog Hollow) (S22, T91N, R2W, Clayton Co.)			X					
Point Hollow Cr. (aka White Pine Cr.) 180. Mouth (S31, T91N, R2W, Clayton Co.) to spring source (S8, T90N, R2W, Dubuque Co.)					X			X
Bloody Run Cr. (aka Grimes Hollow) 181. Mouth (S36, T91N, R3W, Clayton Co.) to spring source (S3, T90N, R3W, Delaware Co.)					X			X
Ram Hollow 182. Mouth (S11, T90N, R3W, Clayton Co.) to spring source (S10, T90N, R3W, Delaware Co.)					X		X	
Pecks Cr. 183. Mouth (Clayton Co.) to S. line of Section 15, T91N, R3W, Clayton Co.					X			X
Joles Cr. 184. Mouth (S1, T91N, R3W, Clayton Co.) to confluence with an unnamed tributary (N 1/2, SW 1/4, S23, T92N, R3W, Clayton Co.)			X					
Carlan Cr. 185. Mouth (S2, T91N, R3W, Clayton Co.) to confluence with an unnamed tributary (S10, T91N, R3W, Clayton Co.)			X					
S. Cedar Cr. (aka Cedar Cr.) 186. Mouth (S33, T92N, R3W, Clayton Co.) to S. line (S6, T91N, R3W, Clayton Co.)			X					

NORTHEASTERN MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES TURKEY R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
S. Cedar Cr. (aka Cedar Cr.) 187. N. line of S7, T92N, R3W, Clayton Co. to N. line of S30, T93N, R3W, Clayton Co.					X			X
Tuecke Hollow 188. Mouth (S20, T92N, R3W, Clayton Co.) to confluence with an unnamed tributary (S9, T92N, R3W, Clayton Co.)			X					
W. Br. S. Cedar Cr. 189. Mouth (S31, T93N, R3W, Clayton Co.) to confluence with an unnamed tributary (S23, T93N, R4W, Clayton Co.)			X					
Elk Cr. 190. Mouth to confluence with Steeles Br. (Clayton Co.)		X						
Elk Cr. 191. Confluence with Steeles Branch (S26, T91N, R4W, Clayton Co.) to confluence with an unnamed tributary (NE 1/4, S13, T90N, R4W, Delaware Co.)			X					
Wolf Cr. 192. Mouth (S2/3 line, T91N, R4W, Clayton Co.) to confluence with an unnamed tributary (S10, T91N, R4W, Clayton Co.)			X					
Steeles Br. 193. Mouth (S26, T91N, R4W, Clayton Co.) to W. line of Section 5, T90N, R4W, Delaware Co.					X			X
Pine Cr. 194. Mouth (S26, T91N, R4W, Clayton Co.) to confluence with Brownfield Cr. (S25, T91N, R4W, Clayton Co.)					X			X
Brownfield Cr. 195. Mouth (Clayton Co.) to spring source (S31, T91N, R3W, Clayton Co.)					X			X
Twin Springs Cr. 196. Mouth (S2, T90N, R4W, Delaware Co.) to spring source (S12, T90N, R4W, Delaware Co.)					X			X
Fountain Spring Cr. (aka Odell Br.) 197. Mouth (SE 1/4 of S10, T90N, R4W, Delaware Co.) to W. line of NW 1/4, S16, T90N, R4W, Delaware Co.					X		X	
S. Br. Fountain Spring Cr. 198. Mouth (SW 1/4 of S10, T90N, R4W, Delaware Co.) to W. line of SW 1/4, S16, T90N, R4W, Delaware Co.					X			X
Schechtman Br. 199. Mouth (Delaware Co.) to S. line of Section 14, T90N, R4W, Delaware Co.					X			X
Schechtman Br. 200. S. line of Section 14, T90N, R4W, Delaware Co. to confluence with an unnamed tributary (S23, T90N, R4W, Delaware Co.)			X					
Volga R. 201. Mouth (Clayton Co.) to bridge crossing in Volga, (Section 3-10, T92N, R6W, Clayton Co.)	X	X						X
Volga R. 202. Bridge crossing in Volga to E. Corporate limit, Fayette, (NE 1/4 of S28, T93N, R8W, Fayette Co.)		X						X

NORTHEASTERN MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES TURKEY R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Volga R. 203. East corporate limit, Fayette, to confluence with Little Volga R. (Fayette Co.)		X						
Volga R. 204. Confluence with L. Volga R. (S2, T92N, R9W, Fayette Co.) to confluence with an unnamed tributary (SE 1/4, S24, T93N, R10W, Fayette Co.)			X					
Bear Cr. 205. Mouth (S34, T92N, R4W, Clayton Co.) to S. line of Section 18, T91N, R4W, Clayton Co.			X					
Bear Cr. 206. S. line of Section 18, T91N, R4W to W. line of Section 23, T91N, R5W, Clayton Co.					X			X
Rabbit Cr. 207. Mouth (S17, T91N, R4W, Clayton Co.) to confluence with an unnamed tributary (NE 1/4, S31, T91N, R4W, Clayton Co.)			X					
Doe Cr. 208. Mouth (S30, T92N, R4W, Clayton Co.) to confluence with an unnamed tributary (S1, T91N, R5W, Clayton Co.)			X					
Honey Cr. 209. Mouth (S25, T92N, R5W, Clayton Co.) to confluence with an unnamed tributary (second upstream trib. S5, T91N, R5W, Clayton Co.)			X					
Mossey Glen Cr. 210. Mouth (S3, T91N, R5W, Clayton Co.) to S. line of Section 10, T91N, R5W, Clayton Co.					X			X
Cox Cr. (aka Alderson Hollow) 211. Mouth (S21, T92N, R5W, Clayton Co.) to confluence with Kleinlein Cr. (S36, T92N, R6W, Clayton Co.)			X					
Cox Cr. (aka Alderson Hollow) 212. Kleinlein Cr. to S. line of Section 12, T91N, R6W, Clayton Co.					X			X
Kleinlein Cr. (aka Spring Cr.) 213. Mouth (Clayton Co.) to spring source (S10, T91N, R6W, Clayton Co.)					X			X
Baron Spring 214. Mouth (S2, T91N, R6W, Clayton Co.) to spring source (S4, T91N, R6W, Clayton Co.)					X		X	
Hewett Cr. 215. Mouth (Clayton Co.) to S. line of Section 29, T92N, R6W, Clayton Co.					X			X
Unnamed Cr. 216. Mouth (S28, T92N, R6W, Clayton Co.) to spring in Section 34, T92N, R6W, Clayton Co.			X					
Ensign Cr. (aka Ensign Hollow) 217. Mouth (Section 28, T92N, R6W, Clayton Co.) to spring source (S29, T92N, R6W, Clayton Co.)					X		X	
Nagel Cr. 218. Mouth (S10, T92N, R6W, Clayton Co.) to confluence with an unnamed tributary (W 1/2, S17, T92N, R6W, Clayton Co.)			X					

NORTHEASTERN MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES TURKEY R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Unnamed Cr. 219. Mouth (S33, T93N, R6W, Clayton Co.) to confluence with an unnamed tributary (S29, T93N, R6W, Clayton Co.)			X					
Willow Cr. 220. Mouth (S32, T93N, R6W, Clayton Co.) to spring source (S13, T92N, R7W, Fayette Co.)			X					
Deep Cr. 221. Mouth (S32, T93N, R6W, Clayton Co.) to confluence with an unnamed tributary (S2, T92N, R7W, Fayette Co.)			X					
Mink Cr. 222. Mouth (S30, T93N, R6W, Clayton Co.) to W. line of Section 15, T93N, R7W, Fayette Co.					X		X	
Mink Cr. 223. W. line of Section 15, T93N, R7W, Fayette Co. to confluence with an unnamed tributary (NE 1/4, S8, T93N, R7W, Fayette Co.)			X					
Unnamed Cr. 224. Mouth (S19, T93N, R6W, Clayton Co.) to confluence with an unnamed tributary (SW 1/4, NE 1/4, S19, T93N, R6W, Clayton Co.)			X					
Brush Cr. 225. Mouth (S26, T93N, R7W, Fayette Co.) to confluence with Bear Cr. (S8, T92N, R7W, Fayette Co.)			X					
Brush Cr. 226. Bear Cr. to E. line of Section 17, T92N, R7W, Fayette Co.					X			X
Brush Cr. 227. E. line of Section 17, T92N, R7W, Fayette Co. to confluence with an unnamed tributary (S28, T92N, R7W, Fayette Co.)			X					
Bear Cr. 228. Mouth (Fayette Co.) to W. line of Section 6, T92N, R7W, Fayette Co.					X		X	
Bear Cr. 229. W. line Section 6, T92N, R7W, Fayette Co. to confluence with an unnamed tributary (S 1/2, S13, T92N, R8W, Fayette Co.)			X					
Grannis Cr. 230. Mouth (S30, T95N, R7W, Fayette Co.) to W. line of Section 36, T93N, R8W, Fayette Co.					X		X	
Unnamed Cr. 231. Mouth (S19, T93N, R7W, Fayette Co.) to spring source (S24, T93N, R8W, Fayette Co.)			X					
Unnamed Cr. 232. Mouth (S18, T93N, R7W, Fayette Co.) to confluence with an unnamed tributary (N 1/2, S18, T93N, R7W, Fayette Co.)			X					
Unnamed Cr. (aka Volga Lake Outlet Cr.) 233. Mouth (S14, T93N, R8W, Fayette Co.) to Volga Lake Dam (S3, T93N, R8W, Fayette Co.)			X					
Unnamed Cr. 234. Mouth (SE 1/4, S10, T93N, R8W, Fayette Co.) to E/W road crossing (S10, T93N, R8W, Fayette Co.)			X					

NORTHEASTERN MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES TURKEY R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Coulee Cr. 235. Mouth (S31, T93N, R8W, Fayette Co.) to confluence with an unnamed tributary (S12, T93N, R9W, Fayette Co.)			X					
Little Volga R. 236. Mouth (Fayette Co.) to Hwy. 150 bridge crossing (Fayette Co.)		X						
Little Volga River 237. Hwy. 150 bridge (S14/23 line, T92N, R9W, Fayette Co.) to confluence with an unnamed tributary (NE 1/4, S36, T92N, R9W, Fayette Co.)			X					
North Branch Volga R. 238. Mouth (S33, T93N, R9W, Fayette Co.) to confluence with an unnamed tributary (S8, T93N, R9W, Fayette Co.)			X					
Roberts Cr. 239. Mouth (Clayton Co.) to confluence with an unnamed tributary (S8, T95N, R6W, Clayton Co.)			X					
Dry Mill Cr. 240. Mouth (S25, T94N, R5W, Clayton Co.) to W. line of Section 9, T93N, R4W, Clayton Co.					X			X
Dry Mill Cr. 241. W. line of S9, T93N, R4W, Clayton Co. to confluence with an unnamed tributary (SE 1/4, S5, T93N, R4W, Clayton Co.)			X					
Silver Cr. 242. Mouth (S16, T94N, R5W, Clayton Co.) to confluence with an unnamed tributary (S32, T95N, R5W, Clayton Co.)			X					
Unnamed Cr. 243. Mouth (SW 1/4 of NW 1/4 of S26, T93N, R5W, Clayton Co.) to confluence with an unnamed tributary (S28, T93N, R5W, Clayton Co.)			X					
Unnamed Cr. 244. Mouth (S31, T94N, R5W, Clayton Co.) to confluence with an unnamed tributary (NE 1/4, S30, T94N, R5W, Clayton Co.)			X					
Unnamed Cr. 245. Mouth (S27, T94N, R6W, Clayton Co.) to confluence with an unnamed tributary (S 1/2, SW 1/4, S31, T94N, R6W, Clayton Co.)			X					
Beaver Cr. 246. Mouth (S19, T94N, R6W, Clayton Co.) to dam in S34, T94N, R7W, Fayette Co.)			X					
Otter Cr. 247. Mouth (Fayette Co.) to confluence with Unnamed Cr. (aka Glovers Cr., S22, T94N, R8W, Fayette Co.)					X		X	
Otter Cr. 248. Confluence with an unnamed tributary (aka Glovers Cr., S22, T94N, R8W, Fayette Co.) to confluence with an unnamed tributary (NW 1/4, S17, T94N, R8W, Fayette Co.)			X					
Unnamed Cr. 249. Mouth to W. line of S15, T94N, R8W, Fayette Co.					X		X	

NORTHEASTERN MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES TURKEY R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Bell Cr. 250. Mouth (S10, T94N, R7W, Fayette Co.) to W. line of Section 8, T94N, R7W, Fayette Co.					X			X
Dibble Cr. 251. Mouth (S34, T95N, R7W, Fayette Co.) to confluence with an unnamed tributary (S27, T95N, R7W, Fayette Co.)			X					
Fitzgerald Cr. 252. Mouth (S28, T95N, R7W, Fayette Co.) to confluence with an unnamed tributary (S9, T95N, R7W, Fayette Co.)			X					
Nutting Cr. 253. Mouth (S19, T95N, R7W, Fayette Co.) to confluence with an unnamed tributary (S2, T95N, R8W, Fayette Co.)			X					
Dry Branch 254. Mouth (S15, T95N, R8W, Fayette Co.) to confluence with an unnamed tributary (N 1/2, S4, T95N, R8W, Fayette Co.)			X					
Little Turkey R. 255. Mouth (Fayette Co.) to confluence with unnamed tributary (SE 1/4, S14, T96N, R11W, Chickasaw Co.)		X						
Little Turkey R. 256. Confluence with unnamed tributary (SE 1/4, S14, T96N, R11W, Chickasaw Co.) to confluence with unnamed tributary (S12, T97N, R12W, Howard Co.)			X					
Bass Cr. 257. West line S3, T95N, R9W, Fayette Co. to confluence with unnamed tributary (NE 1/4, S4, T95N, R9W, Fayette Co.)			X					
Bass Cr. 258. Mouth (S3, T95N, R9W, Fayette Co.) to W. line of Section 3, T95N, R9W, Fayette Co.					X			X
Rogers Cr. 259. Mouth (Winneshiek Co.) to confluence with Goddard Cr. and Krumm Cr.			X					
Wonder Cr. 260. Mouth (S19, T97N, R9W, Winneshiek Co.) to confluence with an unnamed tributary (S24, T97N, R10W, Winneshiek Co.)			X					
Bohemian Cr. 261. Mouth (Winneshiek Co.) to Howard Co. Rd. V58 (W. line of Section 2, T97N, R11W, Howard Co.)					X		X	
Chialk Cr. 262. Mouth (Section 1, T98N, R11W, Howard Co.) to N. line of Section 36, T99N, R11W, Howard Co.					X			X
North Branch Turkey River 263. Mouth (S31, T99N, R11W, Howard Co.) to confluence with an unnamed tributary (mouth located on left descending bank SE 1/4, S14, T99N, R12W, Howard Co.)			X					
West Branch Turkey River 264. Mouth (S25, T99N, R12W, Howard Co.) to confluence with an unnamed tributary (E 1/2, NW 1/4, S26, T99N, R12W, Howard Co.)			X					

NORTHEASTERN MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES TURKEY R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Unnamed Cr. 265. Mouth (located on left descending bank SE 1/4, S14, T99N, R12W, Howard Co.) to confluence with an unnamed tributary (SW 1/4, S12, T99N, R12W, Howard Co.)			X					
MINERS CR. AND ITS TRIBUTARIES								
Miners Cr. 266. Mouth (S20, T92N, R2W, Clayton Co.) to Hwy. 52 bridge (SE 1/4, S20, T92N, R2W, Clayton Co.)			X					
Miners Cr. 267. Hwy. 52 (SE quarter of S20, T92N, R2W, Clayton Co. to W. line of Section 1, T92N, R3W, Clayton Co.)					X			X
BUCK CR. AND ITS TRIBUTARIES								
Buck Cr. 268. Mouth (Clayton Co.) to W. line of Section 9, T93N, R3W, Clayton Co.					X		X	
Buck Cr. 269. West line of S9, T93N, R3W, Clayton Co. to confluence with an unnamed tributary (S32, T94N, R3W, Clayton Co.)			X					
SNY MAGILL CR. (AKA MAGILL CR.) AND ITS TRIBUTARIES								
Sny Magill Cr. (aka Magill Cr.) 270. Mouth (S23, T94N, R3W, Clayton Co.) to W. line of Section 6, T94N, R3W, Clayton Co.)					X		X	
N. Cedar Cr. 271. Mouth (S8, T94N, R3W, Clayton Co.) to W. line of Section 24, T94N, R4W, Clayton Co.					X		X	
Unnamed Cr. (aka W. Fk. Sny Magill Cr.) 272. Mouth (S7, T94N, R3W, Clayton Co.) to W. line of Section 7, T94N, R3W, Clayton Co.					X			X
BLOODY RUN AND ITS TRIBUTARIES								
Bloody Run 273. Mouth (Clayton Co.) to W. line of Section 22, T95N, R4W, Clayton Co.					X			X
YELLOW R. AND ITS TRIBUTARIES								
Yellow R. 274. Mouth (Allamakee Co.) to County Rd. X-26 (Section 24, T96N, R5W, Allamakee Co.)	X	X						X
Yellow R. 275. County Rd. X-26 (Allamakee Co.) to old Hwy. 51 (NE quarter of S11, T96N, R6W, Allamakee Co.)		X						X
Yellow R. 276. Old Hwy. 51 to confluence with N. Fk. Yellow R. (S13, T96N, R7W, Winneshiek Co.)					X			X
Yellow River 277. Confluence with N. Fork Yellow R. to confluence with an unnamed tributary (SE 1/4, S8, T96N, R7W, Winneshiek Co.)			X					
Dousman Cr. 278. Mouth (S33, T96N, R3W, Allamakee Co.) to Allamakee-Clayton co. line					X			X
Suttle Cr. 279. Mouth (Allamakee Co.) to Allamakee-Clayton co. line					X			X

NORTHEASTERN MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES YELLOW R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Unnamed Cr. (aka Bear Cr.) 280. Mouth (S13, T96N, R5W, Allamakee Co.) to N. line of Section 12, T96N, R5W, Allamakee Co.					X			X
Hickory Cr. 281. Mouth (Allamakee Co.) to S. line of Section 28, T96N, R5W, Allamakee Co.					X		X	
Hickory Cr. 282. South line of S28, T96N, R5W, Allamakee Co. to confluence with an unnamed tributary (S5, T95N, R5W, Clayton Co.)			X					
Williams Cr. 283. Mouth (S9, T96N, R5W, Allamakee Co.) to confluence with an unnamed tributary (S17, T96N, R5W, Allamakee Co.)			X					
Norfolk Cr. 284. Mouth (S6, T96N, R5W, Allamakee Co.) to confluence with Teeple Cr. (S24, T97N, R6W, Allamakee Co.)					X			X
Teeple Cr. 285. Mouth (Allamakee Co.) to W. line of Section 11, T97N, R6W, Allamakee Co.)					X			X
Unnamed Cr. 286. Mouth (S2, T96N, R6W, Allamakee Co.) to confluence with an unnamed tributary (S33, T97N, R6W, Allamakee Co.)			X					
North Fork Yellow River 287. Mouth (S13, T96N, R7W, Winneshiek Co.) to confluence with an unnamed tributary (S3, T96N, R7W, Winneshiek Co.)			X					
PAINT CR. AND ITS TRIBUTARIES								
Paint Cr. 288. Mouth (Allamakee Co.) to confluence with Little Paint Cr. (S32, T97N, R3W, Allamakee Co.)		X						
Paint Cr. 289. Little Paint Cr. to Rd. crossing, S18, T97N, R4W, Allamakee Co.					X		X	
Paint Cr. 290. Road crossing (S18, T97N, R4W, Allamakee Co.) to confluence with an unnamed tributary (S15, T97N, R5W, Allamakee Co.)			X					
Little Paint Cr. 291. Mouth to N. line of Section 30, T97N, R3W, Allamakee Co.					X		X	
COTA CR. AND ITS TRIBUTARIES								
Cota Cr. 292. Mouth (S26, T97N, R3W, Allamakee Co.) to W. line of Section 10, T97N, R3W, Allamakee Co.					X			X
WEXFORD CR. AND ITS TRIBUTARIES								
Wexford Cr. 293. Mouth (S5, T97N, R2W, Allamakee Co.) to W. line of Section 25, T98N, R3W, Allamakee Co.					X		X	
VILLAGE CR. AND ITS TRIBUTARIES								
Village Cr. 294. Mouth (Allamakee Co.) to W. line of Section 19, T98N, R4W, Allamakee Co.					X		X	

NORTHEASTERN MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES VILLAGE CR. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Trout Run 295. Mouth (S16, T98N, R4W, Allamakee Co.) through one mile reach					X			X
Unnamed Cr. (aka Erickson Spring Branch) 296. Mouth (S23, T98N, R4W, Allamakee Co.) to W. line of Section 23, T98N, R4W, Allamakee Co.					X			X
CLEAR CR. AND ITS TRIBUTARIES								
Clear Cr. 297. Mouth (Allamakee Co.) to W. line of Section 25, T99N, R4W, Allamakee Co.					X		X	
UPPER IOWA R. AND ITS TRIBUTARIES								
Upper Iowa R. 298. Mouth (Allamakee Co.) to Lane's Bridge at river mile 6 (NW 1/4 of S31, T100N, R4W, Allamakee Co.)	X	X						
Upper Iowa R. 299. Lane's Bridge to confluence with Silver Creek (Winneshiek Co.)	X	X						X
Upper Iowa R. 300. Confluence with Silver Cr. (Winneshiek Co.) to Winneshiek-Howard county line	X	X						X
Upper Iowa R. 301. Winneshiek-Howard co. line to river mile 86 (NE 1/4, S12, T100N, R13W, Howard Co.)		X						X
Upper Iowa R. 302. River mile 86 (NE 1/4, S12, T100N, R13W, Howard Co.) to state line (S11, T100N, R14W, Howard Co.)		X						
Winnebago Cr. 302a. Mouth (Section 11, T100N, R4W, Allamakee Co.) to state line (S11, T100N, R4W, Allamakee Co.)			X					
Irish Hollow Cr. 303. Mouth (S21, T100N, R4W, Allamakee Co.) to N. line of Section 17, T100N, R4W, Allamakee Co.					X			X
French Cr. 304. Mouth (Allamakee Co.) to E. line of Section 23, T99N, R5W, Allamakee Co.					X		X	
Clear Cr. 305. Mouth (Allamakee Co.) to N. line of Section 15, T100N, R5W, Allamakee Co.					X			X
Silver Cr. 306. Mouth (Allamakee Co.) to S. line of Section 31, T99N, R5W, Allamakee Co.					X		X	
Bear Cr. 307. Mouth (Allamakee Co.) to confluence with N. Bear Cr. (S25, T100N, R7W, Winneshiek Co.)		X						
Bear Cr. 308. N. Bear Cr. to spring source (Mestad Spring) Section 29, T100N, R7W, Winneshiek Co.					X		X	
Waterloo Cr. 309. Mouth (S35, T100N, R6W, Allamakee Co.) to Iowa-Minnesota state line					X		X	
N. Bear Cr. 310. Mouth (S25, T100N, R7W, Winneshiek Co.) to Iowa-Minnesota state line					X		X	

NORTHEASTERN MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES UPPER IOWA R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Middle Bear Cr. 311. Mouth (S14, T100N, R7W, Winneshiek Co.) to N. line of Section 16, T100N, R7W, Winneshiek Co.					X			X
Paint Cr. (aka Pine Cr.) 312. Mouth (Section 9, T99N, R6W, Allamakee Co.) to confluence with Unnamed Cr. (SE 1/4 of Section 11, T99N, R7W, Winneshiek Co.					X			X
Unnamed Cr. 313. Mouth (SE 1/4, S11, T99N, R7W, Winneshiek Co.) to N. line of Section 12, T99N, R7W, Winneshiek Co.					X			X
Patterson Cr. 314. Mouth (Allamakee Co.) to E. line of Section 3, T98N, R6W, Allamakee Co.					X		X	
Canoe Cr. 315. Mouth (S25, T99N, R7W, Winneshiek Co.) to Winneshiek Co. Rd. W38 (S23, T99N, R8W, Winneshiek Co.)		X						
Canoe Cr. (aka W. Canoe Cr.) 316. Winneshiek Co. Rd. W38 to W. line of Section 8, T99N, R8W, Winneshiek Co.					X		X	
Canoe Cr. 317. West line S8, T99N, R8W, Winneshiek Co. to confluence with an unnamed tributary (E 1/2, S31, T100N, R8W, Winneshiek Co.)			X					
Pine Cr. 318. Mouth (S26, T99N, R7W, Winneshiek Co.) to N. line of Section 21, T99N, R7W, Winneshiek Co.					X			X
N. Canoe Cr. 319. Mouth (S22, T99N, R8W, Winneshiek Co.) to N. line of Section 2, T99N, R8W, Winneshiek Co.					X			X
Coon Cr. 320. Mouth (Winneshiek Co.) to rd. crossing in S13, T98N, R7W, Winneshiek Co.					X		X	
Trout Cr. 321. Mouth (S9, T98N, R7W, Winneshiek Co.) to confluence with Smith Cr. (aka Trout River) (S21, T98N, R7W, Winneshiek Co.)					X			X
Trout Cr. 322. Confluence with Smith Cr. (aka Trout River) (S21, T98N, R7W, Winneshiek Co.) to confluence with an unnamed tributary (S 1/2, S29, T98N, R7W, Winneshiek Co.)			X					
Smith Cr. (aka Trout River) 323. Mouth (Section 21, T98N, R7W, Winneshiek Co.) to S. line of S33, T98N, R7W, Winneshiek Co.)					X		X	
Trout Cr. (aka Trout Run) 324. Mouth (S23, T98N, R8W, Winneshiek Co.) to confluence with unnamed stream (aka Trout Run) (S27, T98N, R8W, Winneshiek Co.)					X			X
Trout Cr. 325. Confluence with an unnamed tributary (aka Trout Run) (S27, T98N, R8W, Winneshiek Co.) to confluence with an unnamed tributary (aka Trout Cr.) (S33, T98, R8W Winneshiek Co.)			X					

NORTHEASTERN MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES UPPER IOWA R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Unnamed Stream (aka Trout Run) 326. Mouth to S. line of S27, T98N, R8W, Winneshiek Co.					X		X	
Dry Run 327. Mouth (S17, T98N, R8W, Winneshiek Co.) to W. line of Section 36, T98N, R9W, Winneshiek Co.					X			X
Twin Springs Cr. 328. Mouth (S17, T98N, R8W, Winneshiek Co.) to springs in Twin Springs Park (S20, T98N, R8W, Winneshiek Co.)					X		X	
Ten Mile Cr. 329. Mouth (Winneshiek Co.) to confluence with Walnut Cr. (S18, T98N, R9W, Winneshiek Co.)					X			X
Unnamed Cr. (aka Casey Spring Cr.) 330. Mouth (S25, T99N, R9W, Winneshiek Co.) to W. line of Section 26, T99N, R9W, Winneshiek Co.					X			X
Silver Cr. 331. Mouth (S10, T99N, R9W, Winneshiek Co.) to N. line of Section 26, T100N, R9W, Winneshiek Co.					X			X
Silver Cr. 332. N. line of Sec.26, T100N, R9W, Winneshiek Co. to Hwy. 52 bridge crossing (Winneshiek Co.)			X					
Pine Cr. 333. Mouth (Winneshiek Co.) to Iowa-Minnesota state line.					X			X
E. Pine Cr. 334. Mouth (S28, T100N, R9W, Winneshiek Co.) to Iowa-Minnesota state line					X			X
Unnamed Cr. (aka Cold Water Cr.) 335. Mouth (S32, T100N, R9W, Winneshiek Co.) to N. line of Section 31, T100N, R9W, Winneshiek Co.					X		X	
Martha Cr. 336. Mouth (S6, T99N, R9W, Winneshiek Co.) to W. line of Section 13, T99N, R10W, Winneshiek Co.					X			X
Silver Cr. 337. Mouth (S2, T99N, R10W, Winneshiek Co.) to W. line of S12, T99N, R11W, Howard Co.			X					
Minor Cr. 338. Mouth (Winneshiek Co.) to confluence with an unnamed tributary (E 1/2, S1, T99N, R11W, Howard Co.)			X					
Nichols Cr. (aka Bigalk Cr.) 339. Mouth (S18, T100N, R10W, Winneshiek Co.) to W. line of Section 23, T100N, R11W, Howard Co.					X		X	
Unnamed Cr. 340. Mouth (S21, T100N, R12, Howard Co.) to confluence with an unnamed tributary in NW 1/4, SW 1/4, S28, T100N, R12W, Howard Co. (near Lime Springs)			X					
Beaver Cr. 341. Mouth (Howard Co.) to S. line of S29, T100N, R13W, Howard Co.					X			X

NORTHEASTERN MAJOR RIVER - MISSISSIPPI R. AND ITS TRIBUTARIES UPPER IOWA R. AND ITS TRIBUTARIES	A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Beaver Cr.								
342. South line of Section 29, T100N, R13W, Howard Co. to confluence with an unnamed tributary in the NE 1/4, S32, T200N, R13W, Howard Co.			X					
Staff Cr.								
343. Mouth (Howard Co.) to W. line of S27, T100N, R14W, Howard Co.					X			X

LAKES

Lakes Index

Index #	Lake Name	County	Index #	Lake Name	County
327	Afton City Reservoir	Union	113	Burr Oak Lake	Emmett
246	Albia City Reservoir	Monroe	185	Burt Lake	Kossuth
89	Allen Green Refuge Marsh	Des Moines	147	California Bend	Harrison
163	Amana Lily Pond	Iowa	360	Cardinal Marsh	Winneshiek
354	Ambrosson Pits	Winnebago	284	Carter Lake	Pottawattamie
35	Aplington Pits	Butler	317	Casey Lake	Tama
286	Arbor Lake	Poweshiek	16	Cedar Falls Impoundment	Black Hawk
296	Arrowhead Lake	Sac	213	Cedar Lake	Madison
282	Arrowhead Pond	Pottawattamie	91	Center Lake	Dickinson
42	Artesian Lake	Carroll	195	Central City Ponds	Linn
256	Ashton Pits	Osceola	180	Central Park Lake	Jones
86	Backbone Lake	Delaware	120	Charles City Impoundment	Floyd
212	Badger Creek Lake	Madison	190	Chatfield Lake	Lee
234	Badger Lake	Monona	17	City Park Pond	Black Hawk
351	Badger Lake	Webster	49	Clear Lake	Cerro Gordo
338	Banner Pits	Warren	50	Clear Lake Marsh	Cerro Gordo
66	Barringer Slough	Clay	300	Cody Lake	Scott
125	Bartlett Lake	Fremont	196	Coggon Impoundment	Linn
134	Bays Branch	Guthrie	44	Cold Springs Lake	Cass
76a	Beaver Lake	Dallas	251	Cone Lake	Muscatine
321	Bedford Impoundment	Taylor	199	Cone Marsh	Louisa
121	Beeds Lake	Franklin	176	Coralville Reservoir	Johnson
182	Belvadeer Park Ponds	Keokuk	347	Corydon Reservoir	Wayne
48	Bennett Lake	Cedar	247	Cottonwood Pits	Monroe
274	Big Creek Lake	Polk	160	Crawford Creek Impoundment	Ida
283	Big Lake (Including Gilbert's Pond)	Pottawattamie	139	Crystal Lake	Hancock
36	Big Marsh	Butler	313	Dakin Lake	Story
90	Big Spirit Lake	Dickinson	275	Dale Maffitt Reservoir	Polk
373	Big Wall Lake	Wright	166	Dalton Lake	Jackson
5	Binder Lake	Adams	68	Dan Greene Slough	Clay
297	Black Hawk Lake	Sac	148	DeSoto Bend	Harrison
15	Black Hawk Park Ponds	Black Hawk	149	DeSoto Bend Pond	Harrison
235	Blackbird Bend	Monona	238	Decatur Lake	Monona
236	Blencoe Lake	Monona	276	Des Moines Water Works Recharge Basins	Polk
299	Blue Grass Lake	Scott	92	Diamond Lake	Dickinson
237	Blue Lake	Monona	287	Diamond Lake	Poweshiek
346	Bob White Lake	Wayne	23	Dickcissell Lake	Boone
137	Briggs Woods Lake	Hamilton	252	Dog Creek (Lake)	O'Brien
202	Brown's Slough	Lucas	24	Don Williams Lake	Boone
363	Browns Lake	Woodbury	253	Douma Area Pond	O'Brien
67	Brugeman Park Pond	Clay	77	Drakesville Ponds	Davis
351a	Brushy Creek Lake	Webster	12	Dudgeon Lake	Benton

LAKES

Lakes Index

Index #	Lake Name	County	Index #	Lake Name	County
150	Dunlap Pond	Harrison	183	Griffin Lake	Keokuk
140	Eagle Lake	Hancock	45	Griswold Park Pond	Cass
63	East Lake	Clarke	95	Grover's Marsh	Dickinson
322	East Lake (Lenox)	Taylor	31	Gustafson Lake	Buena Vista
93	East Okoboji Lake	Dickinson	96	Hale Slough	Dickinson
141	East Twin Lake	Hancock	298	Hallet Pits	Sac
277	Easter Lake	Polk	13	Hannon Lake	Benton
214	Edmunson Pond	Mahaska	356	Harmon Lake	Winnebago
78	Eldon Game Area Ponds	Davis	215	Hawthorne Lake	Mahaska
336	Eldon Pond	Wapello	314	Hendrickson Marsh	Story
142	Eldred Sherwood Lake	Hancock	315	Hickory Grove Lake	Story
368	Elk Creek Marsh	Worth	114	High Lake	Emmett
304	Elk Horn Creek Pond	Shelby	288	Holiday Lake	Poweshiek
69	Elk Lake	Clay	81	Home Pond	Decatur
203	Ellis Lake	Lucas	339	Hooper Area Pond	Warren
374	Elm Lake	Wright	21	Hope Martin Pond	Black Hawk
172	Fairfield Municipal Reservoir #1	Jefferson	97	Hottes Lake	Dickinson
173	Fairfield Municipal Reservoir #2	Jefferson	159	Humboldt Impoundment	Humboldt
309	Fairview Area Impoundment	Sioux	348	Humeston Reservoir	Wayne
51	Fin and Feather Lake	Cerro Gordo	334	Indian Lake	Van Buren
18	Fisher Lake	Black Hawk	115	Ingham Lake	Emmett
264	Five Island Lake	Palo Alto	227	Institutional Pond	Mills
355	Florence Park Pond	Winnebago	116	Iowa Lake	Emmett
310	Floyd Park Pit	Sioux	164	Iowa Lake	Iowa
225	Folsom Lake	Mills	257	Iowa Lake	Osceola
270	Fonda Reservoir	Pocahontas	342	Iowa Township Pond	Washington
278	Fort Des Moines Park Pond	Polk	46	Iranistan Pond	Cass
341	Foster Woods Pond	Washington	174	Jefferson County Park Ponds	Jefferson
119	Frog Hollow	Fayette	228	Keg Creek Lake	Mills
94	Garlock Slough	Dickinson	177	Kent Park Lake	Johnson
155	Geode Lake	Henry	200	Klum Lake	Louisa
19	George Wyth Lake	Black Hawk	218	Knoxville Pond	Marion
226	Glenwood Lake	Mills	335	Lacey Keosauqua Park Lake	Van Buren
73	Goose Lake	Clinton	340	Lake Ahquabi	Warren
186	Goose Lake	Kossuth	47	Lake Anita	Cass
279	Grays Lake	Polk	357	Lake Catherine	Winnebago
337	Greater Ottumwa Central Park Ponds	Wapello	37	Lake Considine	Butler
20	Green Belt Lake	Black Hawk	375	Lake Cornelia	Wright
223	Green Castle Lake	Marshall	343	Lake Darling	Washington
167	Green Island Lake	Jackson	79	Lake Fisher	Davis
328	Green Valley Lake	Union	157	Lake Hendricks	Howard
191	Greenbay Lake	Lee	6	Lake Icaria	Adams

LAKES

Lakes Index

Index #	Lake Name	County	Index #	Lake Name	County
216	Lake Keomah	Mahaska	170	Mariposa Lake	Jasper
82	Lake LeShane	Decatur	344	Marr Park Pond	Washington
285	Lake Manawa	Pottawattamie	224	Marshall County Lake	Marshall
178	Lake McBride	Johnson	53	Mason City E. Park Pond	Cerro Gordo
361	Lake Meyers	Winneshiek	258	May City Pits	Osceola
248	Lake Miami	Monroe	316	McFarland's Pond	Story
201	Lake Odessa	Louisa	54	McIntosh Wildlife Area	Cerro Gordo
352	Lake Ole	Webster	329	McKinley Lake	Union
211	Lake Pahoja	Lyon	1	Meadow Lake	Adair
135	Lake Panorama	Guthrie	55	Meadow Lake	Cerro Gordo
98	Lake Park Pond	Dickinson	158	Merrick Pond	Howard
289	Lake Ponderosa	Poweshiek	22	Meyer Lake	Black Hawk
187	Lake Smith	Kossuth	241	Middle Decatur Lake	Monona
335a	Lake Sugema	Van Buren	365	Midway Park Lake	Woodbury
80	Lake Wapello	Davis	230	Mile Hill Lake	Mills
323	Lake of Three Fires	Taylor	254	Mill Creek (Lake)	O'Brien
301	Lake of the Hills	Scott	369	Mill Pond	Worth
302	Lambach Lake	Scott	103	Minnewashta Lake	Dickinson
59	Larson Lake	Cherokee	161	Moorhead Park Pond	Ida
269	LeMars Pit	Plymouth	2	Mormon Trail Lake	Adair
52	Lekwa Marsh	Cerro Gordo	204	Morris Lake	Lucas
64	Liberty Acres	Clarke	376	Morse Lake	Wright
99	Lily Lake	Dickinson	292	Mt. Ayr Game Area Ponds	Ringgold
349	Lineville Reservoir	Wayne	293	Mt. Ayr Old Reservoir	Ringgold
290	Lions Club Pond	Ringgold	181	Muskrat Slough	Jones
271	Little Clear-Lake	Pocahontas	358	Myre Slough	Winnebago
305	Little George Pond	Shelby	9a	Mystic Reservoir	Appanoose
83	Little River Watershed Lake	Decatur	11	Nabotna Pond	Audubon
364	Little Sioux Park Lake	Woodbury	61	Nashua Impoundment	Chickasaw
100	Little Spirit Lake	Dickinson	255	Negus Recreation Area Pond	O'Brien
138	Little Wall Lake	Hamilton	74	Nelson Park Lake	Crawford
11a	Littlefield Lake	Audubon	84	Nine Eagles Lake	Decatur
353	Lizard Creek Game Area Ponds	Webster	3	Nodaway Lake	Adair
272	Lizard Lake	Pocahontas	205	North Colyn Marsh	Lucas
291	Loch Ayr	Ringgold	168	North Sabula Lake	Jackson
265	Lost Island Lake	Palo Alto	39	North Twin Lake	Calhoun
239	Louisville Bend	Monona	156	Oakland Mills Impoundment	Henry
8	Lower Centerville Reservoir	Appanoose	259	Ocheyedan Pits	Osceola
240	Lower Decatur Lake	Monona	303	Odetta Lake	Scott
101	Lower Gar Lake	Dickinson	242	Oldham Lake	Monona
145	Lower Pine Lake	Hardin	4	Orient Lake	Adair
229	Malvern Pond	Mills	72	Osborne Pond	Clayton
306	Mantano Park Pond	Shelby			
32	Marathon City Park Pond	Buena Vista			
102	Marble Lake	Dickinson			

LAKES

Lakes Index

Index #	Lake Name	County	Index #	Lake Name	County
318	Otter Creek Lake	Tama	128	Scott Lake B	Fremont
319	Otter Creek Marsh	Tama	350	Seymour Reservoir	Wayne
231	P.J. Lake	Mills	244	Sherman Township Access Area	Monona
126	Percival Lake	Fremont	193	Shimek Forest Ponds	Lee
260	Peters Pit	Osceola	88	Silver Lake	Delaware
33	Pickerel Lake	Buena Vista	107	Silver Lake	Dickinson
261	Pierce Creek Pond	Page	266	Silver Lake	Palo Alto
249	Pilot Grove Lake	Montgomery	370	Silver Lake	Worth
143	Pilot Knob Lake	Hancock	371	Silver Lake Marsh	Worth
262	Pioneer Park Pond	Page	362	Silver Springs Pond	Winneshiek
197	Pleasant Creek Lake	Linn	311	Sioux Center Pit	Sioux
104	Pleasant Lake	Dickinson	85	Slip Bluff Lake	Decatur
219	Pleasantville Pond	Marion	366	Snyder Bend Lake	Woodbury
192	Poll Miller Park Lake	Lee	345	Sokum Ridge Pond	Washington
232	Pony Creek Lake	Mills	198	South Cedar Pond	Linn
122	Pope Joy Pond	Franklin	207	South Colyn Marsh	Lucas
105	Prairie Lake	Dickinson	169	South Sabula Lake	Jackson
307	Prairie Rose Lake	Shelby	41	South Twin Lake	Calhoun
87	Quaker Mills Impoundment	Delaware	62	Split Rock Lake	Chickasaw
243	Rabbitt Island Lake	Monona	267	Sportsman Park Pond	Palo Alto
9	Rathbun Reservoir	Appanoose	38	Sportsman's Pond	Butler
206	Red Haw Lake	Lucas	60	Spring Lake	Cherokee
220	Red Rock Reservoir	Marion	131	Spring Lake	Greene
359	Rice Lake	Winnebago	136	Springbrook Lake	Guthrie
294	Ringgold Management Area Ponds	Ringgold	152	St. John's Lake	Harrison
221	Roberts Creek Lake	Marion	208	Stephen's Forest Pond #1	Lucas
123	Robinsons Pond	Franklin	209	Stephen's Forest Pond #2	Lucas
171	Rock Creek Lake	Jasper	133	Stoehr Lake	Grundy
56	Rockfall Pond	Cerro Gordo	34	Storm Lake	Buena Vista
40	Rockwell City City Pond	Calhoun	330	Summitt Lake	Union
57	Rockwell Pond	Cerro Gordo	273	Sunken Grove Lake	Pocahontas
14	Rodgers Park Lake	Benton	108	Sunken Lake	Dickinson
132	Rodman Park Ponds	Grundy	75	Sunset Lake	Crawford
106	Sandbar Slough	Dickinson	43	Swan Lake	Carroll
280	Saylorville Reservoir	Polk	109	Swan Lake	Dickinson
151	Schaben Pond	Harrison	179	Swan Lake	Johnson
70	Scharnberg Pond	Clay	25	Sweet Marsh Reservoir	Bremer
308	Schimeroski Pond	Shelby	26	Sweet Marsh Seg. A	Bremer
263	Schneck's Lake	Page	27	Sweet Marsh Seg. B	Bremer
162	School Pond	Ida	28	Sweet Marsh Seg. C	Bremer
127	Scott Lake A	Fremont	331	Talmadge Hill Lake/Marsh	Union

LAKES

Lakes Index

Index #	Lake Name	County
332	Thayer Lake	Union
281	Thomas Mitchell Lake	Polk
332a	Three Mile Lake	Union
124	Toft Pit	Franklin
222	Tower Pond	Marion
30	Troy Mills Marsh	Buchanan
71	Trumbull Lake	Clay
117	Tuttle Lake	Emmett
333	Twelve Mile Creek Lake	Union
118	Twelve-Mile Lake	Emmett
153	Tyson Bend	Harrison
320	Union Grove Lake	Tama
188	Union Slough	Kossuth
10	Upper Centerville Reservoir	Appanoose
110	Upper Gar Lake	Dickinson
146	Upper Pine Lake	Hardin
58	Ventura Marsh	Cerro Gordo
250	Viking Lake	Montgomery
268	Virgin Lake	Palo Alto
295	Walnut Creek Marsh	Ringgold
175	Walton Reservoir	Jefferson
29	Waverly Impoundment	Bremer
111	Welch Lake	Dickinson
129	West Forney's Lake A	Fremont
130	West Forney's Lake B	Fremont
65	West Lake	Clarke
324	West Lake (Lenox)	Taylor
7	West Lake Corning	Adams
112	West Okoboji Lake	Dickinson
144	West Twin Lake	Hancock
217	White Oak Conservation Area	Mahaska
245	Whiting Woods Pond	Monona
189	Whittemore Pit	Kossuth
251a	Wiese Slough	Muscatine
165	Williamsburg Pond	Iowa
210	Williamson Pond	Lucas
154	Willow Lake	Harrison
233	Willow Slough	Mills
325	Wilson Park Lake	Taylor
194	Wilson Park Lakes	Lee
326	Windmill Lake	Taylor
367	Winnebago Bend Lake	Woodbury
312	Winterfield Pond	Sioux
372	Worth County Lake	Worth
76	Yellow Smoke Park Lake	Crawford
184	Yenrougis Pond	Keokuk

County / Lake Name		Location R.	T.	S.	Water Uses A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Adair												
1	Meadow Lake	31	76	17	X			X				
2	Mormon Trail Lake	33	74	3	X			X				
3	Nodaway Lake	32	75	14	X			X		X		
4	Orient Lake	31	74	20	X			X		X		
Adams												
5	Binder Lake	34	72	25	X			X		X		
6	Lake Icaria	34	72	10	X			X		X		
7	West Lake Corning	34	72	36				X		X		
Appanoose												
8	Lower Centerville Reservoir	18	68	12	X			X		X		
9	Rathbun Reservoir (refer to Southern Iowa River Basins)											
9a	Mystic Reservoir	18	69	8	X			X				
10	Upper Centerville Reservoir	18	68	11	X			X		X		
Audubon												
11	Nabotna Pond	35	80	11				X				
11a	Littlefield Lake	34	78	18				X				
Benton												
12	Dudgeon Lake	10	85	9				X				
13	Hannon Lake	11	82	32	X			X				
14	Rodgers Park Lake	11	86	1	X			X				
Black Hawk												
15	Black Hawk Park Ponds	14	90	34				X				
16	Cedar Falls Impoundment (refer to Iowa-Cedar River Basin)											
17	City Park Pond (Waterloo)	13	89	15				X				
18	Fisher Lake	13	89	6				X				
19	George Wyth Lake	13	89	6	X			X				
20	Green Belt Lake	13	89	6	X			X				
21	Hope Martin Pond	13	89	27				X				
22	Meyer Lake	12	88	6	X			X				
Boone												
23	Dickcissell Lake	26	84	24				X				
24	Don Williams Lake	27	84	5	X			X				

County / Lake Name	Location R.	T.	S.	Water Uses A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Bremer											
25 Sweet Marsh Reservoir	12	93	34				X				
26 Sweet Marsh Seg. A	12	92	2				X				
27 Sweet Marsh Seg. B	12	93	35				X				
28 Sweet Marsh Seg. C	12	93	34				X				
29 Waverly Impoundment (refer to Iowa-Cedar River Basin)											
Buchanan											
30 Troy Mills Marsh	8	87	25				X				
Buena Vista											
31 Gustafson Lake	36	93	18	X			X				
32 Marathon City Park Pond	35	93	20	X			X				
33 Pickerel Lake	35	93	1	X			X				
34 Storm Lake (including Little Storm Lake)	37	90	14	X			X				
Butler											
35 Aplington Pits	17	90	20				X				
36 Big Marsh	17	91	25				X				
37 Lake Considine	18	91	12				X				
38 Sportsman's Pond	16	92	13				X				
Calhoun											
39 North Twin Lake	35	88	1	X			X				
40 Rockwell City City Pond	32	88	36				X				
41 South Twin Lake	33	88	1				X				
Carroll											
42 Artesian Lake	33	85	27				X				
43 Swan Lake	34	83	5	X			X				
Cass											
44 Cold Springs Lake	37	75	15	X			X				
45 Griswold Park Pond	37	75	32				X				
46 Iranistan Pond	37	75	8				X				
47 Lake Anita	34	77	32	X			X				
Cedar											
48 Bennett Lake	1	80	11				X				

County / Lake Name		Location R.	T.	S.	Water Uses A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Cerro Gordo												
49	Clear Lake	22	96	13	X			X		X		X
50	Clear Lake Marsh	21	96	6				X				
51	Fin and Feather Lake	20	96	27				X				
52	Lekwa Marsh	22	96	26				X				
53	Mason City E. Park Pond	20	96	7				X				
54	McIntosh Wildlife Area	22	96	16				X				
55	Meadow Lake	20	96	14				X				
56	Rockfall Pond	19	97	22				X				
57	Rockwell Pond	20	94	10				X				
58	Ventura Marsh	22	96	19				X				
Cherokee												
59	Larson Lake	39	91	1				X				
60	Spring Lake	40	92	28	X			X				
Chickasaw												
61	Nashua Impoundment (refer to Iowa-Cedar River Basin)											
62	Split Rock Lake	12	94	35	X			X				
Clarke												
63	East Lake (Osceola)	25	72	16	X			X				
64	Liberty Acres	24	73	8				X				
65	West Lake (Osceola)	26	72	13				X		X		
Clay												
66	Barringer Slough	35	96	14				X				
67	Brugeman Park Pond	38	97	30	X			X				
68	Dan Greene Slough	35	97	20				X				
69	Elk Lake	35	96	36				X				X
70	Scharnberg Pond	38	96	11	X			X				
71	Trumbull Lake	35	97	27	X			X				
Clayton												
72	Osborne Pond	5	92	9	X			X				
Clinton												
73	Goose Lake	4	83	29				X				
Crawford												
74	Nelson Park Lake	41	82	2	X			X				
75	Sunset Lake	39	83	16				X				
76	Yellow Smoke Park Lake	38	83	6	X			X				
Dallas												
76a	Beaver Lake	29	78	29	X			X				

County / Lake Name	Location R.	T.	S.	Water Uses A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Davis											
77 Drakesville Ponds	14	69	6				X				
78 Eldon Game Area Ponds	12	70	9				X				
79 Lake Fisher	13	69	19				X		X		
80 Lake Wapello	15	70	34	X			X		X		
Decatur											
81 Home Pond	27	37	3				X		X		
82 Lake LeShane	27	67	4	X			X		X		
83 Little River Watershed Lake	25	69	19	X			X				
84 Nine Eagles Lake	25	67	18	X			X		X		
85 Slip Bluff Lake	26	68	28	X			X				
Delaware											
86 Backbone Lake (refer to Northeastern Iowa River Basins)											
87 Quaker Mills Impoundment (refer to Northeastern Iowa River Basins)											
88 Silver Lake	4	88	16	X			X				
Des Moines											
89 Allen Green Refuge-Marsh	1	72	29				X				
Dickinson											
90 Big Spirit Lake	36	100	33	X			X		X	X	
91 Center Lake	36	99	7	X			X				
92 Diamond Lake	37	100	15				X				
93 East Okoboji Lake	36	99	29	X			X			X	
94 Garlock Slough	37	99	35				X				
95 Grover's Marsh	36	100	12								X
96 Hale Slough	36	100	23				X				
97 Hottes Lake	36	100	18				X				
98 Lake Park Pond	38	100	32				X				
99 Lily Lake	35	99	18				X				
100 Little Spirit Lake	36	100	8	X			X				
101 Lower Gar Lake	36	99	32	X			X			X	
102 Marble Lake	36	100	17				X				
103 Minnewashta Lake	36	99	29	X			X			X	
104 Pleasant Lake	35	99	7				X				
105 Prairie Lake	36	99	23				X				
106 Sandbar Slough	36	100	14				X				

County / Lake Name	Location R.	T.	S.	Water Uses A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
107 Silver Lake	38	100	28	X			X		X		
108 Sunken Lake	36	100	17				X				
109 Swan Lake	35	100	23				X				
110 Upper Gar Lake	36	99	29	X			X			X	
111 Welch Lake	37	100	23				X				
112 West Okoboji Lake	36	99	20	X			X		X	X	
Emmett											
113 Burr Oak Lake	33	98	21								X
114 High Lake	33	98	14	X			X				
115 Ingham Lake	33	98	12	X			X				
116 Iowa Lake	31	100	12				X		X		
117 Tuttle Lake	32	100	14	X			X				X
118 Twelve-Mile Lake	34	98	21				X				
Fayette											
119 Frog Hollow (aka Volga Lake)	8	93	3	X			X				
Floyd											
120 Charles City Impoundment (refer to Iowa-Cedar River Basin)											
Franklin											
121 Beeds Lake (refer to Iowa-Cedar River Basin)											
122 Pope Joy Pond	22	90	21				X				
123 Robinsons Pond	20	92	23				X				
124 Toft Pit	22	91	30	X			X				
Fremont											
125 Bartlett Lake	43	70	4				X				
126 Percival Lake	43	69	20				X				
127 Scott Lake A	43	70	16				X				
128 Scott Lake B	43	70	16				X				
129 West Forney's Lake A	43	70	8				X				
130 West Forney's Lake B	43	70	8				X				
Greene											
131 Spring Lake	30	84	25	X			X				
Grundy											
132 Rodman Park Ponds	15	89	34				X				
133 Stoehr Lake (Wellsburg)	18	88	15				X				

County / Lake Name	Location R.	T.	S.	Water Uses A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Guthrie											
134 Bays Branch	30	80	22				X				
135 Lake Panorama (refer to Des Moines River Basin)											
136 Springbrook Lake	31	81	33	X			X				
Hamilton											
137 Briggs Woods Lake	25	88	17	X			X				
138 Little Wall Lake	24	86	10	X			X				
Hancock											
139 Crystal Lake	25	97	15	X			X				
140 Eagle Lake	24	96	18				X				
141 East Twin Lake	24	94	29				X				
142 Eldred Sherwood Lake	24	94	21	X			X				
143 Pilot Knob Lake	23	97	3	X			X				
144 West Twin Lake	24	94	30				X				
Hardin											
145 Lower Pine Lake (refer to Iowa-Cedar River Basin)											
146 Upper Pine Lake (refer to Iowa-Cedar River Basin)											
Harrison											
147 California Bend	45	78	7				X				
148 DeSoto Bend	45	78	21	X			X				X
149 DeSoto Bend Pond	45	78	20				X				
150 Dunlap Pond	41	81	2				X				
151 Schaben Pond	41	81	30				X				
152 St. John's Lake	44	78	8				X				
153 Tyson Bend	45	79	28				X				
154 Willow Lake	43	80	23	X			X				
Henry											
155 Geode Lake	5	70	36	X			X		X		
156 Oakland Mills Impoundment (refer to Skunk River Basin)											
Howard											
157 Lake Hendricks	14	99	19	X			X				
158 Merrick Pond	14	98	5				X				

County / Lake Name	Location R.	T.	S.	Water Uses A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Humboldt											
159 Humboldt Impoundment (aka Lake Nakomis) (refer to Des Moines River Basin)											
Ida											
160 Crawford Creek Impoundment	41	86	10	X			X				
161 Moorhead Park Pond	39	87	11				X				
162 School Pond	41	87	26	X							
Iowa											
163 Amana Lily Pond	9	81	27				X				
164 Iowa Lake	11	79	19	X			X				
165 Williamsburg Pond	10	79	9				X				
Jackson											
166 Dalton Lake	5E	84	34					X		X	
167 Green Island Lake	6E	85	20				X				
168 North Sabula Lake	7E	84	18	X			X				
169 South Sabula Lake	7E	84	19	X			X				
Jasper											
170 Mariposa Lake	18	81	32	X			X				
171 Rock Creek Lake	17	80	17	X			X		X		
Jefferson											
172 Fairfield Municipal Reservoir #1	10	72	24				X		X		
173 Fairfield Municipal Reservoir #2	10	72	24				X		X		
174 Jefferson County Park Ponds	8	71	32				X				
175 Walton Reservoir	9	72	30				X		X		
Johnson											
176 Coralville Reservoir (refer to Iowa-Cedar River Basin)											
177 Kent Park Lake	8	80	24	X			X				
178 Lake McBride	6	81	29	X			X				
179 Swan Lake	7	80	5				X				
Jones											
180 Central Park Lake	3	84	1	X			X				
181 Muskrat Slough	3	83	16				X				

County / Lake Name	Location R.	T.	S.	Water Uses A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Keokuk											
182 Belvadeer Park Ponds	11	76	21				X				
183 Griffin Lake	13	76	15				X				
184 Yenrougis Pond	12	76	23	X			X				
Kossuth											
185 Burt Lake	30	100	9				X				
186 Goose Lake	30	100	17				X				
187 Lake Smith	29	96	36	X			X				
188 Union Slough	28	98	35				X				X
189 Whittemore Pit	30	95	9	X			X				
Lee											
190 Chatfield Lake	5	65	2	X			X				
191 Greenbay Lake	3	68	28				X				
192 Poll Miller Park Lake	5	68	9	X			X				
193 Shimek Forest Ponds	7	67	31				X				
194 Wilson Park Lakes	6	68	35	X			X				
Linn											
195 Central City Ponds	6	85	3				X				
196 Coggon Impoundment (see Northeastern Iowa River Basins)											
197 Pleasant Creek Lake	8	85	31	X			X				
198 South Cedar Pond	5	82	28				X				
Louisa											
199 Cone Marsh	5	76	14				X				
200 Klum Lake	2	75	25				X				
201 Lake Odessa	2	73	2	X			X				
Lucas											
202 Brown's Slough	20	71	35				X				
203 Ellis Lake	21	72	27				X		X		
204 Morris Lake	21	72	26				X		X		
205 North Colyn Marsh	20	71	30				X				
206 Red Haw Lake	21	71	28	X			X		X		
207 South Colyn Marsh	20	71	30				X				
208 Stephen's Forest Pond #1	23	72	22				X				
209 Stephen's Forest Pond #2	23	72	28				X				
210 Williamson Pond	21	73	27	X			X				
Lyon											
211 Lake Pahoja	48	99	23	X			X				

County / Lake Name		Location R.	T.	S.	Water Uses A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Madison												
212	Badger Creek Lake	27	77	11	X			X				
213	Cedar Lake	27	76	19				X		X		
Mahaska												
214	Edmunson Pond	16	75	27				X				
215	Hawthorne Lake (aka Barnes City Lake)	14	77	10	X			X				
216	Lake Keomah	15	75	13	X			X		X		
217	White Oak Conservation Area	14	75	28	X			X				
Marion												
218	Knoxville Pond	20	75	11				X				
219	Pleasantville Pond	21	76	15				X				
220	Red Rock Reservoir (refer to Des Moines River Basin)											
221	Roberts Creek Lake	19	76	4	X			X				
222	Tower Pond	19	76	25				X				
Marshall												
223	Green Castle Lake	17	82	8	X			X				
224	Marshall County Lake	18	84	31				X				
Mills												
225	Folsom Lake	43	73	32	X			X				
226	Glenwood Lake	43	72	12				X				
227	Institutional Pond (aka Peter Pan Lake)	43	72	24				X				
228	Keg Creek Lake	43	72	32				X				
229	Malvern Pond (aka Bohner Pond)	41	72	32				X				
230	Mile Hill Lake	43	72	26				X				
231	P.J. Lake	43	72	29				X				
232	Pony Creek Lake	43	72	4				X				
233	Willow Slough	40	73	29				X				
Monona												
234	Badger Lake	46	85	29				X				
235	Blackbird Bend	47	85	28				X				
236	Blencoe Lake	45	82	31				X				
237	Blue Lake	46	84	35	X			X				
238	Decatur Lake	46	83	17	X			X				

County / Lake Name	Location R.	T.	S.	Water Uses A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
239 Louisville Bend	46	83	7				X				
240 Lower Decatur Lake	46	83	17				X				
241 Middle Decatur Lake	46	83	16	X			X				
242 Oldham Lake	43	83	13	X			X				
243 Rabbitt Island Lake	47	85	28				X				
244 Sherman Township Access Area	45	82	8				X				
245 Whiting Woods Pond	43	85	30				X				
Monroe											
246 Albia City Reservoir	17	72	9	X			X		X		
247 Cottonwood Pits	17	71	2				X				
248 Lake Miami	17	73	20	X			X				
Montgomery											
249 Pilot Grove Lake	36	73	1				X				
250 Viking Lake	36	71	6	X			X		X		
Muscatine											
251 Cone Lake (refer to Iowa-Cedar River Basin)											
251a Wiese Slough	2	78	19				X				
O'Brien											
252 Dog Creek (Lake)	39	94	29	X			X				
253 Douma Area Pond	41	96	5	X			X				
254 Mill Creek (Lake)	41	95	3				X				
255 Negus Recreation Area Pond	39	94	30				X				
Osceola											
256 Ashton Pits	42	98	11	X			X				
257 Iowa Lake	39	100	9				X				
258 May City Pits	39	98	6	X			X				
259 Ocheyedan Pits	40	99	23	X			X				
260 Peters Pit	42	100	19				X				
Page											
261 Pierce Creek Pond	39	70	29	X			X				
262 Pioneer Park Pond	38	69	28				X				
263 Schneck's Lake	36	69	6	X			X				

County / Lake Name	Location R.	T.	S.	Water Uses A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Palo Alto											
264 Five Island Lake	32	96	18	X			X				
265 Lost Island Lake	34	97	31	X			X				
266 Silver Lake	34	95	20	X			X				
267 Sportsman Park Pond	31	96	19	X			X				
268 Virgin Lake	34	96	30				X				X
Plymouth											
269 LeMars Pit	45	92	25	X			X				
Pocahontas											
270 Fonda Reservoir	34	90	22				X				
271 Little Clear Lake	34	91	6				X				
272 Lizard Lake	34	91	22				X				
273 Sunken Grove Lake	34	90	8				X				
Polk											
274 Big Creek Lake (refer to Des Moines River Basin)											
275 Dale Maffitt Reservoir	25	78	31	X			X		X		
276 Des Moines Water Works Recharge Basins	24	78	12	X			X		X		
277 Easter Lake	23	78	19	X			X				
278 Fort Des Moines Park Pond	24	78	33				X				
279 Grays Lake	24	78	7	X			X				
280 Saylorville Reservoir (refer to Des Moines River Basin)											
281 Thomas Mitchell Lake	23	79	23				X				
Pottawattamie											
282 Arrowhead Pond	41	77	29	X			X				
283 Big Lake (Including Gilbert's Pond)	44	75	13				X				
284 Carter Lake	44	75	23	X			X				
285 Lake Manawa	44	74	13	X			X				
Poweshiek											
286 Arbor Lake	16	80	20	X			X				
287 Diamond Lake	15	78	2				X		X		
288 Holiday Lake	14	81	23	X			X				
289 Lake Ponderosa	15	78	2	X			X				

County	Lake Name	Location R.	T.	S.	Water Uses A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Ringgold												
290	Lions Club Pond	29	69	31				X				
291	Loch Ayr	29	69	30	X			X		X		
292	Mt. Ayr Game Area Ponds	30	68	17				X				
293	Mt. Ayr Old Reservoir	29	69	31				X				
294	Ringgold Management Area Ponds	29	67	13				X				
295	Walnut Creek Marsh	30	68	17				X				
Sac												
296	Arrowhead Lake	36	86	4	X			X				
297	Black Hawk Lake	36	87	35	X			X				
298	Hallet Pits	36	86	5	X			X				
Scott												
299	Blue Grass Lake	2E	78	26				X				
300	Cody Lake	4E	80	20				X				
301	Lake of the Hills	2E	78	25				X				
302	Lambach Lake	2E	78	25				X				
303	Odetta Lake	4E	80	20				X				
Shelby												
304	Elk Horn Creek Pond	37	78	10				X				
305	Little George Pond	38	79	19				X				
306	Mantano Park Pond	40	81	2	X			X				
307	Prairie Rose Lake	38	79	36	X			X		X		
308	Schimeroski Pond	39	80	5				X				
Sioux												
309	Fairview Area Impoundment	48	97	14				X				
310	Floyd Park Pit	44	94	11				X				
311	Sioux Center Pit	45	95	8				X				
312	Winterfield Pond (aka Van Zee Pit)	46	97	19	X			X				
Story												
313	Dakin Lake	21	85	16				X				
314	Hendrickson Marsh	21	83	1				X				
315	Hickory Grove Lake	22	83	24	X			X				
316	McFarland's Pond	23	84	7				X				

County / Lake Name		Location R.	T.	S.	Water Uses A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Tama												
317	Casey Lake	13	86	13	X			X				
318	Otter Creek Lake	14	84	31	X			X				
319	Otter Creek Marsh	14	82	3				X				
320	Union Grove Lake	16	85	33	X			X				
Taylor												
321	Bedford Impoundment	34	68	26				X		X		
322	East Lake (Lenox)	32	70	6	X			X		X		
323	Lake of Three Fires	34	68	12	X			X		X		
324	West Lake (Lenox)	32	70	5				X		X		
325	Wilson Park Lake	32	70	28	X			X				
326	Windmill Lake	35	69	36	X			X				
Union												
327	Afton City Reservoir	29	72	17				X		X		
328	Green Valley Lake	31	73	26	X			X		X		
329	McKinley Lake	31	72	11	X			X				
330	Summitt Lake	31	72	3				X		X		
331	Talmadge Hill Lake/ Marsh	28	72	20	X			X				
332	Thayer Lake	28	72	22	X			X				
332a	Three Mile Lake	29	73	32				X		X		
333	Twelve Mile Creek Lake	30	72	12	X			X		X		
Van Buren												
334	Indian Lake	8	67	2	X			X				
335	Lacey Keosauqua Park Lake	10	68	2	X			X		X		
335a	Lake Sugema	10	68	14				X				
Wapello												
336	Eldon Pond	12	71	26				X				
337	Greater Ottumwa Central Park Ponds	14	72	25	X			X				
Warren												
338	Banner Pits	23	77	30				X				
339	Hooper Area Pond	24	75	26				X				
340	Lake Ahquabi	24	75	14	X			X		X		
Washington												
341	Foster Woods Pond	9	77	26				X				
342	Iowa Township Pond	6	77	7				X				
343	Lake Darling	9	74	21	X			X		X		
344	Marr Park Pond	6	75	19				X				
345	Sokum Ridge Pond	7	75	15				X				

County / Lake Name	Location R.	T.	S.	Water Uses A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Wayne											
346 Bob White Lake	22	68	4	X			X		X		
347 Corydon Reservoir	22	69	24	X			X		X		
348 Humeston Reservoir	23	70	9	X			X		X		
349 Lineville Reservoir	23	67	16				X		X		
350 Seymour Reservoir	20	68	23	X			X		X		
Webster											
351 Badger Lake	28	90	19	X			X				
351a Brushy Creek Lake	27	88	34				X				
352 Lake Ole	28	86	16				X				
353 Lizard Creek Game Area Ponds	29	89	33	X			X				
Winnebago											
354 Ambrosson Pits	24	98	11	X			X				
355 Florence Park Pond	25	99	26	X			X				
356 Harmon Lake	24	100	21				X				
357 Lake Catherine	25	98	35	X			X				
358 Myre Slough	25	98	22				X				
359 Rice Lake	23	99	13	X			X				
Winneshiek											
360 Cardinal Marsh	10	98	7				X				
361 Lake Meyers	9	97	34	X			X				
362 Silver Springs Pond	8	96	15				X				
Woodbury											
363 Browns Lake	47	87	32	X			X				
364 Little Sioux Park Lake	42	89	12	X			X				
365 Midway Park Lake	44	89	10	X			X				
366 Snyder Bend Lake	47	86	17	X			X				
367 Winnebago Bend Lake	47	86	28	X			X				
Worth											
368 Elk Creek Marsh	22	99	5				X				
369 Mill Pond (refer to Iowa-Cedar River Basin)											
370 Silver Lake	22	100	14	X			X				X
371 Silver Lake Marsh	22	100	10				X				X
372 Worth County Lake	20	99	26	X			X				

County Lake Name	Location R.	T.	S.	Water Uses A	B(WW)	B(LR)	B(LW)	B(CW)	C	HQ	HQR
Wright											
373 Big Wall Lake	24	90	14				X				
374 Elm Lake	24	92	21				X				X
375 Lake Cornelia	24	92	16	X			X				
376 Morse Lake	24	93	28				X				

This rule is intended to implement Iowa Code chapter 455B, division I, and division III, part 1.

567—61.4 Rescinded.

[Filed March 15, 1966; amended March 20, 1967, October 14, 1969, June 8, 1971, June 26, 1972, July 12, 1972, February 13, 1974]
[Filed 6/28/76, Notice 5/3/76—published 7/12/76, effective 8/16/76]
[Filed 7/1/77, Notice 2/23/77—published7/27/77, effective 8/31/77]
[Filed without Notice 7/28/77—published 8/24/77, effective 9/28/77]
[Filed 7/27/78, Notice 5/3/78—published 8/23/78, effective 9/27/78]
[Filed 2/2/79, Notice 11/1/78—published 2/21/79, effective 3/28/79]
[Filed 10/26/79, Notice 6/27/79—published 11/14/79, effective 12/19/79]
[Filed 8/29/80, Notice 6/25/80—published 9/17/80, effective 10/22/80]
[3/25/83, Notice 1/5/83—published 4/13/83, effective 5/18/83]
[Filed emergency 6/3/83—published 6/22/83, effective 7/1/83]
[Filed 12/2/83, Notice 6/22/83—published 12/21/83, effective 1/25/84]
[Filed 10/19/84, Notice 7/18/84—published 11/7/84, effective 12/12/84]
[Filed 7/12/85, Notice 3/13/85—published 7/31/85, effective 9/4/85]
[Filed 8/7/86, Notice 4/9/86—published 8/27/86, effective 10/1/86]
[Filed emergency 11/14/86—published 12/3/86, effective 12/3/86]
[Filed 3/30/90, Notice 8/9/89—published 4/18/90, effective 5/23/90]
[Filed 8/31/90, Notice 6/13/90—published 9/19/90, effective 10/24/90]
[Filed 10/26/90, Notice 7/11/90—published 11/14/90, effective 12/19/90]
[Filed 11/26/90, Notice 9/19/90—published 12/12/90, effective 1/16/91]
[Filed 7/19/91, Notice 2/20/91—published 8/7/91, effective 9/11/91]
[Filed 1/31/92, Notice 7/10/91—published 2/19/92, effective 3/25/92]
[Filed 2/28/92, Notice 11/13/91—published 3/18/92, effective 4/22/92]
[Filed 5/22/92, Notice 4/1/92—published 6/10/92, effective 7/15/92]
[Filed 7/31/92, Notice 5/13/92—published 8/19/92, effective 9/23/92]
[Filed 10/23/92, Notice 9/2/92—published 11/11/92, effective 12/16/92]
[Filed 5/21/93, Notice 2/17/93—published 6/9/93, effective 7/14/93]
[Filed 7/2/93, Notice 2/17/93—published 7/21/93, effective 8/25/93]
[Filed 10/22/93, Notice 8/18/93—published 11/10/93, effective 12/15/93]
[Filed 7/29/94, Notice 5/11/94—published 8/17/94, effective 9/21/94]
[Filed 5/19/95, Notice 2/15/95—published 6/7/95, effective 8/9/95]
[Filed 8/25/95, Notice 6/7/95—published 9/13/95, effective 10/18/95]
[Filed 2/23/96, Notice 12/20/95—published 3/13/96, effective 4/17/96]
[Filed 5/31/96, Notice 3/13/96—published 6/19/96, effective 7/24/96]
[Filed 1/24/97, Notice 10/9/96—published 2/12/97, effective 3/19/97]
[Filed 5/26/00, Notice 11/17/99—published 6/14/00, effective 7/19/00]
[Filed 9/29/00, Notice 5/17/00—published 10/18/00, effective 11/24/00]

CHAPTER 83
LABORATORY CERTIFICATION
[Prior to 4/10/96, see 567—Chapter 42]

PART A
GENERAL

567—83.1(455B) Authority, purpose, and applicability.

83.1(1) *Authority.* Pursuant to Iowa Code section 455B.113, a laboratory certification program is required for laboratories performing analyses of samples which are required to be submitted to the department as a result of Iowa Code provisions, rules, operation permits, or administrative orders. Pursuant to Iowa Code section 455B.114, the department may suspend or revoke the certification of a laboratory upon determination of the department that the laboratory no longer fulfills one or more of the requirements for certification.

83.1(2) *Purpose.* The purpose of these rules is to provide the procedures for laboratories to use to apply for certification, to establish laboratory certification fees, to maintain certification, and to provide the appropriate methods and references for evaluating laboratory competence including the requirements for laboratories to become certified.

83.1(3) *Applicability to environmental program areas.*

a. Water supply (drinking water). The requirements of this chapter apply to all laboratories conducting drinking water analyses pursuant to 567—Chapters 40, 41, 42, 43, and 47. Routine, on-site monitoring for alkalinity, calcium, conductivity, residual disinfectant, orthophosphate, pH, silica, temperature, turbidity and on-site operation and maintenance-related analytical monitoring are excluded from this requirement, and may be performed by a Grade I, II, III, or IV certified operator meeting the requirements of 567—Chapter 81, any person under the supervision of a Grade I, II, III, or IV certified operator meeting the requirements of 567—Chapter 81, or a laboratory certified by the department to perform water supply analyses under this chapter.

b. Underground storage tanks. The requirements of this chapter also apply to all laboratories conducting underground storage tank analyses for petroleum constituents pursuant to 567—Chapter 135. Routine on-site monitoring conducted by or for underground storage tank owners for leak detection or a nonregulatory purpose is excluded from this requirement.

c. Wastewater. The requirements of this chapter also apply to all laboratories conducting analyses of wastewater, groundwater or sewage sludge pursuant to 567—Chapters 63, 67, and 69. Routine on-site monitoring for pH, temperature, dissolved oxygen, total residual chlorine and other pollutants that must be analyzed immediately upon sample collection, settleable solids, physical measurements such as flow and cell depth, and operational monitoring tests specified in 567—subrule 63.3(4) are excluded from this requirement.

567—83.2(455B) Definitions.

"Certified" means a laboratory demonstrates to the satisfaction of the department its ability to consistently produce valid data within the acceptance limits as specified within the department's requirements for certification and meets the minimum requirements of this chapter and all applicable regulatory requirements. A laboratory may be certified for an analyte, an analytical series, or an environmental program area, except in the UST program area, where certification for individual analytes is not allowed.

"Environmental program area" means the water supply (drinking water) program, underground storage tank program, or wastewater program pursuant to 83.1(3).

"Manual for the Certification of Laboratories Analyzing Environmental Samples for the Iowa Department of Natural Resources" (1999) (Iowa Manual) is incorporated by reference in this chapter.

1. Chapter 1 of the Iowa Manual pertains to certification of laboratories analyzing samples of drinking water and incorporates by reference the Manual for the Certification of Laboratories Analyzing Drinking Water, 4th edition, March 1997, EPA document 815-B-97-001.

2. Chapter 2 of the Iowa Manual, 2nd edition, March 1999, pertains to laboratories analyzing samples for the underground storage tank program.

3. Chapter 3 of the Iowa Manual, 1st edition, March 1996, pertains to laboratories analyzing samples for the wastewater and sewage sludge disposal programs.

"Performance evaluation sample (PE)" means a reference sample provided to a laboratory for the purpose of demonstrating that a laboratory can successfully analyze the sample within limits of performance specified by the department. The true value of the concentration of the reference material is unknown to the laboratory at the time of analysis.

"Provisional certification" means a laboratory has deficiencies, which must be corrected within the specified time frames listed in 83.7(2)*"d,"* but demonstrates to the satisfaction of the department its ability to consistently produce valid data within the acceptance limits as specified within the department's certification requirements.

"Revoked certification" means a laboratory no longer fulfills the requirements of this chapter, and certification is revoked by the director upon determination of the director that the laboratory no longer fulfills the requirements for certification (455B.114).

"Suspended certification" means a temporary suspension of certification for a laboratory, conditional upon meeting the time frames in 83.7(4)*"d"* for the correction of the deficiency.

"Temporary certification" means short-term transitional certification granted in certain circumstances when the department implements certification in a new environmental program area.

PART B
CERTIFICATION PROCESS

567—83.3(455B) Application for laboratory certification.

83.3(1) *Application forms.* Application for laboratory certification, other than for temporary certification, shall be made on forms provided by the department and shall be accompanied by the nonrefundable fee specified in 83.3(2). The application for renewal of certification shall be made at least 60 days prior to the certification expiration date. The department may require submission of additional information necessary to evaluate the application. All required documentation must be supplied to the department prior to the on-site visit. Failure to submit a complete application may result in denial of the renewal.

83.3(2) *Fees and expenses.*

a. A nonrefundable fee for the administration, completion of on-site laboratory surveys and assessments, and enforcement of laboratory certification requirements shall be paid with the certification application.

(1) The on-site visit will not be conducted and certification will not be issued until the fees and expenses are paid and all other certification requirements are met. The fee for certification will not be refunded if an on-site visit is not performed.

(2) Out-of-state laboratories will be responsible for paying the expenses of an on-site visit, in addition to the standard certification fee if required, and the department or its agent will bill the out-of-state laboratory directly for the expenses.

(3) When a laboratory's certification is changed to "provisional" or "suspended" and the period for correcting deficiencies extends beyond the certification period, the laboratory must continue to pay the required fees in order to maintain its certification status.

(4) Any laboratory requiring additional on-site visits is responsible for paying the expenses of the additional on-site visits. The department or its agent will bill the laboratory directly for these expenses. The laboratory certification fees will be increased by $300 per visit in those cases where multiple on-site visits are necessary.

b. Certification in multiple environmental program areas. Where a laboratory is certified for the same analyte in more than one environmental program area, the laboratory must meet all the applicable certification requirements in addition to the payment of the fees.

c. The applicable fees shall be based on the type of analytical service provided as follows. The fee for certification of a single analyte, or for any analyses not covered in subparagraphs (1) to (4) below, shall be $300.

(1) Water supply laboratory certification fees.

1. The fee for microbiological analyses including total coliform, fecal coliform, *E. coli*, heterotrophic plate count bacteria, viruses, algae, diatoms, rotifers, and *Giardia* shall be $600. Laboratories may also be certified for fluoride, nitrate and nitrite with no additional fee (when they are certified for microbiological analyses) providing they are not seeking certification for any other inorganic analyte.

2. The fee for inorganic analyses including nitrate, nitrite, fluoride, arsenic, sodium, and other inorganics shall be $1,200. However, a laboratory certified to conduct inorganic analyses under the wastewater program may be certified to conduct inorganic analyses under the water supply program for an additional $300 ($1,500 total).

3. The fee for volatile organic chemical analyses such as benzene and trichloroethylene shall be $1,200. However, a laboratory certified to conduct analyses for volatile organic chemicals under the wastewater program may be certified to conduct analyses for volatile organic compounds under the water supply program for an additional $600 ($1,800 total).

4. The fee for synthetic (nonvolatile) organic chemical analyses such as atrazine and pentachlorophenol shall be $1,200. However, a laboratory certified to conduct analyses for synthetic organic chemicals under the wastewater program may be certified to conduct analyses for synthetic organic chemicals under the water supply program for an additional $600 ($1,800 total).

5. The fee for chemical analyses for dioxins shall be $600.

6. The fee for asbestos fiber analyses shall be $300.

7. The fee for analyses of radionuclides shall be $300. However, a laboratory certified to conduct radionuclide analyses under the wastewater program may be certified to conduct the same analyses for the water supply program for an additional $100 ($400 total).

8. Rescinded IAB 10/18/00, effective 11/22/00.

(2) Underground storage tank laboratory certification fees. The fee for analyses for petroleum constituents using methods OA-1 and OA-2 shall be $1,200. However, a laboratory certified to conduct analyses for petroleum constituents under the wastewater program may be certified to conduct the same analyses for the underground storage tank program for an additional $300 ($1,500 total).

(3) Wastewater program laboratory certification fees.

1. The fee for analyses of basic wastewater constituents which includes biochemical oxygen demand (BOD), carbonaceous biochemical oxygen demand (CBOD), total suspended solids (TSS), and ammonia nitrogen (NH_3) shall be $300.

2. The fee for microbiological analyses shall be $600.

3. The fee for effluent toxicity analyses shall be $600.

4. The fee for inorganic analyses shall be $300 per analyte to a maximum of $1,200. However, a laboratory certified to conduct inorganic analyses under the water supply program may be certified to conduct inorganic analyses under the wastewater program for an additional $300 ($1,500 total).

5. The fee for synthetic (nonvolatile) organic chemical analyses shall be $1,200. However, a laboratory certified to conduct analyses for synthetic organic chemicals under the water supply program may be certified to conduct analyses for synthetic organic chemicals under the wastewater program for an additional $600 ($1,800 total).

6. The fee for volatile organic chemical analyses shall be $1,200. However, a laboratory certified to conduct analyses for volatile organic chemicals under the water supply program may be certified to conduct analyses for volatile organic compounds under the wastewater program for an additional $600 ($1,800 total).

7. The fee for analyses for petroleum products using methods OA-1 or OA-2 shall be $1,200. However, a laboratory certified to conduct analyses for petroleum constituents under the underground storage tank program may be certified to conduct the same analyses for the wastewater program for an additional $300 ($1,500 total).

8. The fee for analyses of radionuclides shall be $300. However, a laboratory certified to conduct radionuclide analyses under the water supply program may be certified to conduct the same analyses for the wastewater program for an additional $100 ($400 total).

(4) The fee for certification of a single analyte, or for any analyses not covered by subparagraphs (1) to (3), shall be $300.

d. Payment of fees. Fees shall be paid by bank draft, check, money order, or other means acceptable to the department, made payable to the Iowa Department of Natural Resources. Purchase orders are not an acceptable form of payment.

83.3(3) *Reciprocity.* Reciprocal certification of out-of-state laboratories by Iowa, and of Iowa laboratories by other states or accreditation providers, is encouraged. A laboratory must meet all Iowa certification criteria and pay all applicable fees, pursuant to 567—Chapter 83. Any laboratory which is granted reciprocal certification in Iowa using primary certification from another state or provider is required to report any change in certification status from the accrediting state or provider to the department within 14 days of notification.

a. *Out-of-state laboratories.* Where an out-of-state laboratory has received an on-site visit within its own state, the fee for certification shall not be reduced if an on-site visit is not performed by Iowa.

b. Third-party accreditation. The department may accept third-party accreditation from national accreditation providers on an individual basis.

567—83.4(455B) Procedure for initial laboratory certification for wastewater laboratories. Rescinded IAB 8/11/99, effective 9/15/99.

567—83.5(455B) Procedures for certification of new laboratories or changes in certification. Laboratories that wish to become certified to conduct testing for an analyte or a method after the deadline for initial certification has passed, and any laboratory seeking initial certification, shall follow the procedures specified in 567—83.6(455B) for laboratory recertification. For changes in certification, the relevant fee must accompany the application where appropriate.

567—83.6(455B) Laboratory recertification. Laboratories shall be recertified every two years after initial certification. Applications for recertification must be on forms provided by the department and must be postmarked at least 60 days prior to the renewal date. Applications shall be accompanied by the fee specified in 83.3(2). To be recertified, laboratories must meet the following requirements.

83.6(1) Laboratories must use the approved methodology for all analyses the results of which are to be submitted to the department. A laboratory may not analyze and report data from samples collected for an environmental program area until certified in that area.

83.6(2) Certified laboratories must satisfactorily analyze PEs at least once every 12 months for each analyte by each method for which the laboratory wishes to retain certification unless a PE sample is not available for the particular analyte or method. Results must be submitted to Iowa department of natural resources or as otherwise directed, along with a statement of the method used within 30 days of receipt from the provider. The laboratory must maintain records of all PE samples for a minimum of 5 years.

83.6(3) Laboratories must notify the department, in writing, within 30 days of major changes in essential personnel, equipment, laboratory location, or other major change which might alter or impair analytical capability. Examples of a major change in essential personnel are the loss or replacement of the laboratory supervisor, or a trained and experienced analyst is no longer available to analyze a particular parameter for which certification has been granted.

83.6(4) Site visits.

a. Certification of the University of Iowa Hygienic Laboratory. The department has designated the University of Iowa Hygienic Laboratory (UHL) as its appraisal authority for laboratory certification. As such, the certification is the responsibility of the EPA for the water supply program, and the UHL quality assurance officer for the wastewater and underground storage tank programs for those areas with no available EPA certification program. The UHL quality assurance officer reports directly to the office of the UHL director and operates independently of all areas of the laboratory generating data to ensure complete objectivity in the evaluation of laboratory operations. The quality assurance officer will schedule a biennial on-site inspection of the UHL and review results for acceptable performance. Inadequacies or unacceptable performance shall be reported by the quality assurance officer to the UHL and the department for correction. The department shall be notified if corrective action is not taken.

b. On-site visits. Laboratories must consent to a periodic site visit by the department or its designee, at least every two years. However, an on-site visit may be conducted more frequently if the laboratory undergoes a major change which may alter or impair analytical capability, fails a PE sample analysis, or if the department questions an aspect of data submitted which is not satisfactorily resolved.

83.6(5) Period of validity. Certification shall be valid for a period not to exceed two years from the date of issuance, except in the case of reciprocal certification of an out-of-state laboratory. Reciprocal certification shall be valid for a period equal to that of the resident state in which the laboratory is certified, but shall not exceed two years. Certification shall remain in effect provided a laboratory has submitted a timely and complete application, until certification is either renewed or revoked.

83.6(6) Reporting requirements. Laboratories may not analyze or report sample results for any analyte, analytical series, or environmental program area until the initial certification status of "certified" or "temporary" has been granted by the department. Any data generated before certification status is granted will be considered invalid for compliance purposes. A laboratory with "provisional" status may analyze and report analyses for compliance purposes.

A certified laboratory may contract analyses to another certified laboratory. The responsibility lies with the primary certified laboratory contracting for services to verify that the secondary contracting laboratory is certified by the department and to ensure that reporting requirements and deadlines are met.

a. Water supply program.

(1) Certified laboratories must report to the department, or its designee such as the University of Iowa Hygienic Laboratory, all analytical test results for all public water supplies, using forms provided or approved by the department or by electronic means acceptable to the department. If a public water supply is required by the department to collect and analyze a sample for an analyte not normally required by 567—Chapters 41 and 43, the laboratory testing for that analyte must also be certified and report the results of that analyte to the department. It is the responsibility of the laboratory to correctly assign and track the sample identification number as well as facility ID and source/entry point data for all reported samples.

1. The following are examples of sample types for which data results must be reported:

- Routine: a regular sample which includes samples collected for compliance purposes from such locations as the source/entry point and in the distribution system, at various sampling frequencies;
- Repeat: a sample which must be collected after a positive result from a routine or previous repeat total coliform sample, per 567—41.2(455B);
- Confirmation: a sample which verifies a routine sample, normally used in determination of compliance with a health-based standard, such as nitrate;
- Special: a nonroutine sample, such as raw, plant, and troubleshooting samples;
- Maximum residence time: a sample which is collected at the maximum residence time location in the distribution system, usually for total trihalomethane measurement; and
- Replacement: a sample which replaces a missed sample from a prior monitoring period resulting in a monitoring violation.

2. The following additional types of data must be reported to the department:

• Monthly Operation Report (MOR) data which has been specifically required by the department to demonstrate compliance with public health standards;

• Chemical results not required to be analyzed but which are detected during analysis, such as detection of a synthetic organic chemical during a routine analysis of that related analytical series for compliance reporting; and

• Raw water sampling results specifically covered by 567—Chapters 40 to 43 for new surface water or groundwater sources, or reconstruction of groundwater sources.

3. The following are examples of data results that are not required to be reported by the laboratory to the department:

• Routine MOR data;

• Distribution samples for the Total Coliform Rule for water main repair or installation; or

• Results for contaminants that are not required by the department to be analyzed, which are below detection level.

4. The sample type cannot be changed after submittal to the laboratory, without written approval by the department. The prescreening, splitting, or selective reporting of compliance samples is not allowed.

(2) Certified laboratories must report all analytical results to the public water supply for which the analyses were performed.

(3) Analytical results must be reported to and received by the department's designee by the seventh day of the month following the month in which the samples were analyzed.

(4) In addition to the monthly reporting of the analytical results, the following results must be reported within 24 hours of the completion of the analysis to the department by facsimile transmission (fax) or other method acceptable to the department, and to the public water supply for which the analyses were conducted:

1. Results of positive coliform bacteria samples and their associated repeat and follow-up samples.

2. Results of any contaminant which exceeds public drinking water standards (maximum contaminant level, treatment technique, or health advisory), and any subsequent confirmation samples, excluding lead and copper.

b. Underground storage tank program. Certified laboratories must report to the person requesting the analysis and include the information required in 567—subrule 135.10(2) in their laboratory report.

c. Wastewater program. Certified laboratories must report to the person requesting the analysis and include the information required in 567—paragraphs 63.2(2)*"b"* to *"e"* in their laboratory report.

83.6(7) Performance evaluation (PE) and acceptance limits. All PE samples must be obtained from EPA; a provider accredited by EPA, the National Environmental Laboratory Accreditation Program (NELAP) or National Institute of Standards and Technology (NIST); or other provider acceptable to the department. All PE samples must have statistical acceptance limits. Certain environmental program areas may have specific PE requirements, as follows:

a. Water supply program. In addition to the analytes specifically listed in 83.6(7)*"a,"* PE samples are required for certification of the unregulated and discretionary compounds listed in 567—Chapter 41, using statistical acceptance limits determined by the PE sample provider.

(1) Volatile organic chemical (VOC) PE laboratory certification. Analysis for VOCs shall only be conducted by laboratories certified by EPA or the department or its authorized designee according to the following conditions. To receive approval to conduct analyses for the VOC contaminants in 567—subparagraph 41.5(1)*"b"*(1), except for vinyl chloride, the laboratory must:

1. Analyze PE samples provided by EPA, the department, or a third-party provider acceptable to the department, at least once a year by each method for which the laboratory desires certification.

2. Achieve the quantitative acceptance limits for at least 80 percent of the regulated organic chemicals included in the PE sample, except for vinyl chloride.

3. Achieve quantitative results on the PE samples within plus or minus 20 percent of the actual amount of the substances when the actual amount is greater than or equal to 0.010 mg/L.

4. Achieve quantitative results on the PE samples within plus or minus 40 percent of the actual amount of the substances when the actual amount is less than 0.010 mg/L.

5. Achieve a VOC method detection limit of 0.0005 mg/L.

(2) To receive approval for vinyl chloride, the laboratory must:

1. Analyze PE samples which include vinyl chloride provided by EPA, the department, or a third-party provider acceptable to the department, at least once a year by each method for which the laboratory desires certification.

2. Achieve quantitative results on the PE samples within plus or minus 40 percent of the actual amount of vinyl chloride.

3. Achieve a method detection limit of 0.0005 mg/L.

(3) Synthetic organic chemicals (SOCs) PEs—laboratory certification. Analysis under this paragraph shall only be conducted by laboratories certified by EPA or the department or its authorized designee. To receive approval to conduct analyses for the SOC contaminants in 567—subparagraph 41.5(1)*"b"*(2), the laboratory must:

1. Analyze PE samples which include those substances provided by EPA, the department, or a third-party provider acceptable to the department, at least once a year by each method for which the laboratory desires certification.

2. For each contaminant that has been included in the PE sample, achieve quantitative results on the analyses that are within the following acceptance limits:

ACCEPTANCE LIMITS

Contaminant	Acceptance Limit, in percent
Alachlor	(+ or -) 45
Aldicarb	2 standard deviations
Aldicarb sulfoxide	2 standard deviations
Aldicarb sulfone	2 standard deviations
Atrazine	(+ or -) 45
Benzo(a)pyrene	2 standard deviations
Carbofuran	(+ or -) 45
Chlordane	(+ or -) 45
2,4-D	(+ or -) 50
Dalapon	2 standard deviations
Dibromochloropropane (DBCP)	(+ or -) 40
Di(2-ethylhexyl)adipate	2 standard deviations
Di(2-ethylhexyl)phthalate	2 standard deviations
Dinoseb	2 standard deviations
Diquat	2 standard deviations
Endothall	2 standard deviations
Endrin	(+ or -) 30
Ethylene dibromide (EDB)	(+ or -) 40
Glyphosate	2 standard deviations
Heptachlor	(+ or -) 45

Heptachlor epoxide	(+ or -) 45
Hexachlorobenzene	2 standard deviations
Hexachlorocyclopentadiene	2 standard deviations
Lindane	(+ or -) 45
Methoxychlor	(+ or -) 45
Oxamyl	2 standard deviations
Pentachlorophenol	(+ or -) 50
Picloram	2 standard deviations
Polychlorinated biphenyls (PCBs as decachlorobiphenyl)	0 - 200
Simazine	2 standard deviations
2,3,7,8-TCDD (Dioxin)	2 standard deviations
2,4,5-TP (Silvex)	2 standard deviations
Toxaphene	(+ or -) 45

(4) Inorganic chemical PE—laboratory certification. Analysis under this paragraph shall be conducted only by laboratories certified by EPA or the department or a third-party provider acceptable to the department. To receive approval to conduct analyses for antimony, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, nitrate, nitrite, selenium and thallium, the laboratory must:

1. Analyze PE samples provided by EPA, the department, or a third-party provider acceptable to the department, at least once a year.

2. For each contaminant that has been included in the PE sample and for each method for which the laboratory desires certification, achieve quantitative results on the analyses that are within the following acceptance limits:

ACCEPTANCE LIMITS

Contaminant	Acceptance Limit
Antimony	(+ or -) 30% at greater than or equal to 0.006 mg/L
Asbestos	2 standard deviations based on study statistics
Barium	(+ or -) 15% at greater than or equal to 0.15 mg/L
Beryllium	(+ or -) 15% at greater than or equal to 0.001 mg/L
Cadmium	(+ or -) 20% at greater than or equal to 0.002 mg/L
Chromium	(+ or -) 15% at greater than or equal to 0.01 mg/L
Cyanide	(+ or -) 25% at greater than or equal to 0.1 mg/L
Fluoride	(+ or -) 10% at greater than or equal to 1 to 10 mg/L
Mercury	(+ or -) 30% at greater than or equal to 0.0005 mg/L
Nickel	(+ or -) 15% at greater than or equal to 0.01 mg/L
Nitrate	(+ or -) 10% at greater than or equal to 0.4 mg/L
Nitrite	(+ or -) 15% at greater than or equal to 0.4 mg/L
Selenium	(+ or -) 20% at greater than or equal to 0.01 mg/L
Thallium	(+ or -) 30% at greater than or equal to 0.002 mg/L

(5) Lead and copper PE—laboratory certification. To obtain certification to conduct analyses for lead and copper, laboratories must:

1. Analyze PE samples which include lead and copper provided by EPA, the department, or a third-party provider acceptable to the department, at least once a year; and

2. Achieve quantitative acceptance limits as follows for each method for which the laboratory desires certification:

- Lead: plus or minus 30 percent of the actual amount in the PE sample when the actual amount is greater than or equal to 0.005 mg/L. The practical quantitation level or PQL for lead is 0.005 mg/L; and
- Copper: plus or minus 10 percent of the actual amount in the PE sample when the actual amount is greater than or equal to 0.050 mg/L. The practical quantitation level or PQL for copper is 0.050 mg/L;

3. Achieve method detection limits as follows:

- Lead: 0.001 mg/L (only if source water compositing is done); and
- Copper: 0.001 mg/L or 0.020 mg/L when atomic absorption direct aspiration is used (only if source water compositing is done);

4. Be currently certified by EPA or the department to perform analyses to the specifications described in 567—paragraph 41.4(1)*"g."*

(6) Disinfection byproducts PE-laboratory certification. To obtain certification to conduct analyses for disinfection byproducts listed in 567—paragraph 41.6(1)*"b,"* laboratories must:

1. Analyze performance evaluation (PE) samples approved by EPA, the department, or its designee, at least once a year; and

2. Achieve quantitative results within the acceptance limit on a minimum of 80 percent of the analytes included in each PE sample. The acceptance limit is defined as the 95 percent confidence interval calculated around the mean of the PE study data. However, the acceptance limit range shall not exceed +/- 50 percent or be less than +/- 15 percent of the study mean.

3. Be currently certified by EPA or the department to perform analyses to the specifications described in 567—paragraph 41.6(1)*"d."*

b. Underground storage tank program. A laboratory must achieve quantitative results on PE samples every 12 months within plus or minus 20 percent of the true value for individual compounds (i.e., benzene, ethylbenzene, toluene, xylene by OA-1) and plus or minus 40 percent of the true value for multicomponent materials (i.e., gasoline, diesel fuel, motor oil by either OA-1 or OA-2).

c. Wastewater program. Achieve acceptable quantitative results on PE samples every 12 months equivalent to those used in the Water Pollution (WP) proficiency program, or the Discharge Monitoring Report Quality Assurance (DMRQA) program, both of which are administered by EPA or its designee.

567—83.7(455B) Criteria and procedure for provisional, suspended, and revoked laboratory certification.

83.7(1) *Provisional certification criteria.*

a. The department may downgrade certification to "provisional" status based on cause. The reasons for which a laboratory may be downgraded to "provisionally certified" status include, but are not limited to, the following list.

(1) Failure to analyze a performance evaluation (PE) sample annually within Iowa acceptance limits;

(2) Failure to notify the department within 30 days of changes in essential personnel, equipment, laboratory facilities or other major change which might impair analytical capability;

(3) Failure to satisfy the department that the laboratory is maintaining the required standard of quality based on an on-site visit;

(4) Failure to report compliance data in a timely manner to the department or the client, thereby preventing timely compliance with environmental program regulations.

b. The department may assess an administrative penalty for a laboratory's failure to comply with the laboratory certification or reporting requirements.

c. A laboratory will not be granted provisional certification by the department for contaminants which pose an acute risk to human health, including nitrate, nitrite, fecal coliform bacteria, and *Escherichia coli* bacteria.

83.7(2) *Provisional certification procedure.*

a. Notification to the laboratory. If a laboratory is subject to downgrading to "provisional" status on the basis of 83.7(1), the department will notify the laboratory or owner in writing of the downgraded status. Certification may be downgraded to provisional for an analyte, a related analytical series, an environmental program area, or the entire laboratory.

b. Reporting. A provisionally certified laboratory may continue to analyze samples for compliance purposes, but must notify the laboratory's IDNR-regulated clientele and other state certifying agencies of the change in laboratory certification status. If there is cause to question the quality of the data generated by the laboratory, the department may suspend the laboratory's ability to submit data to the department for any or all analytes, pursuant to 83.7(3), which includes suspension of the ability of the laboratory's client to report the data of questionable quality to the department.

c. Right to appeal. There is no appeal for this process, as it does not affect a laboratory's ability to analyze and report to the department.

d. Correction of deficiencies.

(1) If a laboratory failed to analyze a PE sample within acceptance limits, the laboratory has 60 days from receipt of the notification of the failure to identify and correct the problem to the department's satisfaction, and analyze a second PE sample. If the laboratory fails to analyze this second sample within acceptance limits and has had acceptable PE sample results within the last year, the department will downgrade the laboratory to "provisionally certified" status and notify the laboratory in writing.

(2) Once the department notifies a laboratory in writing that it has been downgraded to "provisionally certified" status, the laboratory must correct the problem within the following time frames, unless a written extension is obtained from the department. If the problem is not corrected, the laboratory is subject to suspension or revocation for that analyte, related analytical series, environmental program area, or the entire laboratory.

1. Unacceptable PE sample result within two months of notification.
2. Procedural deficiency within three months of notification.
3. Administrative deficiency within three months of notification.
4. Minor equipment deficiency within three months of notification. Examples of a minor equipment deficiency are inadequate analytical balances or incubators.

(3) The laboratory shall review the problems cited and, within the time period designated by the department, specify in writing to the department the corrective actions being taken, including an appropriate implementation schedule. The department shall consider the adequacy of the response and notify the laboratory of its certification status in a timely basis by mail, and may follow up to ensure corrective actions have been taken.

e. Reinstatement. Certification will be reinstated when the laboratory can demonstrate that all conditions for laboratory certification have been met to the satisfaction of the department and that the deficiencies which resulted in provisional certification status have been corrected. This may include an on-site visit, successful analysis of unknown samples, or any other measure that the department deems appropriate.

83.7(3) *Suspended certification criteria.*

a. The department may downgrade certification to "suspended" status based on cause. The reasons for which a laboratory may be downgraded to "suspended" status include, but are not limited to, the following list.

(1) Failure to analyze a PE sample annually for contaminants which pose an acute risk to human health, including nitrate, nitrite, fecal coliform bacteria, and *Escherichia coli* bacteria, or which pose an imminent risk to the environment;

(2) Failure to analyze a PE sample annually within Iowa acceptance limits for contaminants which pose an acute risk to human health, including nitrate, nitrite, fecal coliform bacteria, and *Escherichia coli* bacteria, or which pose an imminent risk to the environment;

(3) Failure to correct previously identified deficiencies, which resulted in "provisional" certification status, within the prescribed time frames of 83.7(2)*"d"*;

(4) Failure to analyze a PE sample within Iowa acceptance limits when there is not a reliable history of successful PE sample analysis within the past 12 months;

(5) Failure to satisfy the department that the laboratory is producing accurate data.

b. Administrative penalty. The department may assess an administrative penalty for a laboratory's failure to comply with the laboratory certification or reporting requirements.

c. Emergency suspension. The department may suspend certification without providing notice and opportunity to the laboratory to be heard if the department finds that the public health, safety, or welfare imperatively requires emergency action, and incorporates a finding to that effect in its administrative order, pursuant to 561—subrule 7.16(6).

83.7(4) *Suspended certification procedure.*

a. Notification to the laboratory. If a laboratory is subject to downgrading to "suspended" status on the basis of 83.7(3), the department will notify the laboratory or owner in writing of its intent to suspend certification in accordance with 561—7.16(17A,455A). Certification may be suspended for an analyte, a related analytical series, an environmental program area, or the entire laboratory.

b. Reporting. Once the suspension is effective, a laboratory must immediately discontinue analysis and reporting of compliance samples, may not analyze or report samples for compliance with departmental standards, and must notify the laboratory's Iowa regulated clientele and other state certifying agencies of the change of the laboratory certification status. Any results generated during the period of suspension may not be used for compliance purposes by the department.

c. Right to appeal.

(1) The laboratory may appeal this decision by filing a written notice of appeal and request an administrative hearing with the department director within 30 days of receipt of the notice of suspension of certification. Contested case procedures under 561—Chapter 7 shall govern administration of the appeal.

The appeal must identify the specific portion(s) of the department action being appealed and be supported with a statement of the reason(s) for the challenge and must be signed by a responsible official from the laboratory such as the president or owner for a commercial laboratory, or the laboratory supervisor in the case of a municipal laboratory, or the laboratory director for a state laboratory.

(2) If no timely notice of appeal is filed, suspension is effective 30 days after receipt of the notice of suspension unless an emergency suspension order is in effect.

d. Correction of deficiencies.

(1) If a laboratory failed to analyze a PE sample within acceptance limits, the laboratory has 30 days from receipt of the notification of the failure to identify and correct the problem to the department's satisfaction. If the laboratory fails to analyze this second sample within acceptance limits, the department will downgrade the laboratory to "suspended" status and notify the laboratory in writing.

(2) Once the department notifies a laboratory in writing that it has been downgraded to suspended status, the laboratory must correct the problem within the following timetable, unless a written extension is obtained from the department. If the problem is not corrected, the laboratory is subject to revocation for that analyte, related analytical series, environmental program area, or the entire laboratory.

1. Unacceptable PE sample result within two months of notification.
2. Procedural deficiency within three months of notification.
3. Administrative deficiency within three months of notification.
4. Minor equipment deficiency within three months of notification. Examples of a minor equipment deficiency are inadequate analytical balances or incubators.
5. Major equipment deficiency within six months of notification. An example of a major equipment deficiency would be the inability of existing complex analytical equipment to produce acceptable results, such as a chromatograph or spectrophotometer.

(3) The laboratory shall review the problems cited and, within the time period designated by the department, specify in writing to the department the corrective actions being taken including an appropriate implementation schedule. The department shall consider the adequacy of the response and notify the laboratory of its certification status in a timely basis by mail, and may follow up to ensure that corrective actions have been taken.

e. Reinstatement.

(1) Fee.

1. The laboratory will not be required to pay an additional fee if recertification affects an analyte or related analytical series, provided that:

- The laboratory is currently certified for other analytes, or
- A fee was paid within the two-year certification period for that related analytical series and the laboratory is certified for other parameters within that related analytical series.

2. A fee will be required if suspension affects a related analytical series effectively deleting that fee group from certification (such as all microbiological parameters in SDWA-MICRO), an environmental program area, or the entire laboratory. A fee will also be required if an additional on-site visit is required.

(2) Certification will be reinstated when the laboratory can demonstrate that all conditions for laboratory certification have been met to the department's satisfaction and, in particular, that the deficiencies which produced the suspension have been corrected. This may include an on-site visit, successful analysis of unknown samples, or any other measure that the department deems appropriate.

83.7(5) *Revoked certification criteria.*

a. A laboratory may have its certification revoked for cause including, but not limited to, any of the following reasons.

(1) For laboratories of any status, failure to analyze a PE sample within Iowa acceptance limits;

(2) Failure to satisfy the department that the laboratory has corrected deficiencies identified during the on-site visit within three months for a procedural or administrative deficiency or within six months for an equipment deficiency;

(3) Submission of a PE sample to another laboratory for analysis and reporting the data as its own;

(4) Falsification of data or other deceptive practices;

(5) Failure to use required analytical methodology for analyses submitted to the department;

(6) Failure to satisfy the department that the laboratory is maintaining the required standard of quality based on the on-site visit.

(7) Persistent failure to report compliance data to the regulated client or the department in a timely manner, thereby preventing compliance with state regulations and endangering public health.

(8) Subverting compliance with state regulations by actions such as changing the sample type for a noncompliance sample to a compliance sample after submission to the laboratory, allowing compliance samples to be changed to other noncompliance sample types, or selective reporting of split sample results.

b. The department may either downgrade or revoke certification based on cause.

c. Emergency revocation. The department may revoke certification without providing notice and opportunity to the laboratory to be heard if the department finds that the public health, safety, or welfare imperatively requires emergency action, and incorporates a finding to that effect in its administrative order, pursuant to 561—subrule 7.16(6).

d. Laboratory-requested revocation. The department may revoke certification upon receipt of a written request by the certified laboratory for removal from the certification program.

83.7(6) *Revoked certification procedure.*

a. Notification to the laboratory. Except for the instance when the laboratory voluntarily requests revocation in 83.7(5)*"d,"* if a laboratory is subject to revocation on the basis of 83.7(5), the department will notify the party in writing of its intent to revoke certification in accordance with 561—7.16(17A,455A). Certification may be revoked for an analyte, a related analytical series, an environmental program area, or the entire laboratory.

b. Reporting. A laboratory must notify the laboratory's IDNR-regulated clientele and other state certifying agencies, to which the notice of revocation is pertinent, of the department's intent to revoke certification, within 30 days of receipt of the notice.

c. Right to appeal. There is no appeal process for revocation of an analyte or a related analytical series unless the analyte(s) represents an entire environmental program area, such as underground storage tank parameters, or the entire laboratory. When the laboratory requests revocation pursuant to 83.7(5)*"d,"* the revocation will be promptly issued and will be immediately effective with no appeal process.

(1) For an environmental program area or for the entire laboratory, the laboratory may appeal this decision by filing a written notice of appeal and request for an administrative hearing with the department director within 30 days of receipt of the notice of revocation of certification. Contested case procedures under 561—Chapter 7 shall govern further administration of the appeal.

The appeal must identify the specific portion(s) of the department action being appealed and be supported with a statement of the reason(s) for the challenge and must be signed by a responsible official from the laboratory such as the president or owner for a commercial laboratory, or the laboratory supervisor in the case of a municipal laboratory, or the laboratory director for a state laboratory.

(2) If no timely notice of appeal is filed within the 30-day time period, revocation is effective 30 days after receipt of the notice of intent.

d. Reinstatement. A laboratory which has had its certification revoked may apply for certification in accordance with 83.3(455B) once the deficiencies have been corrected.

These rules are intended to implement Iowa Code sections 455B.113 through 455B.115.

[Filed emergency 8/22/86—published 9/10/86, effective 8/22/86]
[Filed emergency 11/14/86—published 12/3/86, effective 12/3/86]
[Filed emergency 9/30/88—published 10/19/88, effective 9/30/88]
[Filed 9/25/92, Notice 6/10/92—published 10/14/92, effective 11/18/92]*
[Filed 3/26/93, Notice 1/20/93—published 4/14/93, effective 5/19/93]
[Filed 7/30/93, Notice 5/12/93—published 8/18/93, effective 9/22/93]
[Filed 1/27/95, Notice 11/9/94—published 2/15/95, effective 3/22/95]
[Filed 3/22/96, Notice 11/8/95—published 4/10/96, effective 5/15/96**]
[Filed 7/23/99, Notice 4/7/99—published 8/11/99, effective 9/15/99]
[Filed 9/29/00, Notice 6/14/00—published 10/18/00, effective 11/22/00]

CHAPTERS 84 to 89
Reserved

Effective date of 42.2(1)"b"*(9) and (10) delayed 70 days by the Administrative Rules Review Committee at its meeting held November 10, 1992.
**Effective date of Ch 83 delayed 70 days by the Administrative Rules Review Committee at its meeting held May 14, 1996.

567—135.19(455B) Analyzing for methyl tertiary-butyl ether (MTBE) in soil and groundwater samples.

135.19(1) *General.* The objective of analyzing for MTBE is to determine its presence in soil and water samples collected as part of investigation and remediation of contamination at underground storage tank facilities.

135.19(2) *Required MTBE testing.* Soil and water samples must be analyzed for MTBE when collected for risk-based corrective action as required in rules 135.8(455B) through 135.12(455B). These sampling requirements include but are not limited to:

a. Risk-based corrective action (RBCA) evaluations required for Tier 1, Tier 2, and Tier 3 assessments and corrective action design reports.

b. Site monitoring.

c. Site remediation monitoring.

135.19(3) *MTBE testing not required.* Soil and water samples for the following actions are not required to be analyzed for MTBE:

a. Closure sampling under rule 135.15(455B) unless Tier 1 or Tier 2 sampling is being performed.

b. Site checks under subrule 135.7(3) unless Tier 1 or Tier 2 sampling is being performed.

c. If prior analysis at a site under 135.19(2) has not shown MTBE present in soil or groundwater.

d. If the department determines MTBE analysis is no longer needed at a site.

135.19(4) *Reporting.* The analytical data must be submitted in a format prescribed by the department.

135.19(5) *Analytical methods for methyl tertiary-butyl ether (MTBE).* When having soil or water analyzed for MTBE from contamination caused by petroleum or hazardous substances, owners and operators of UST systems must use a laboratory certified under 567—Chapter 83 for petroleum analyses. In addition, the owners and operators must ensure all soil and water samples are properly preserved and shipped within 72 hours of collection to a laboratory certified under 567—Chapter 83 for petroleum analyses.

a. Sample preparation and analysis shall be by:

(1) GC/MS version of OA-1, "Method for Determination of Volatile Petroleum Hydrocarbons (gasoline)," revision 7/27/93, University Hygienic Laboratory, Iowa City, Iowa; or

(2) U.S. Environmental Protection Agency Method 8260B, SW-846, "Test Methods for Evaluating Solid Waste," Third Edition.

b. Laboratories performing the analyses must run standards for MTBE on a routine basis, and standards for other possible compounds like ethyl tertiary-butyl ether (ETBE), tertiary-amyl methyl ether (TAME), diisopropyl ether (DIPE), and tertiary-butyl alcohol (TBA) to be certain of their identification should they be detected.

c. Laboratories must run a method detection limit study and an initial demonstration of capability for MTBE. These records must be kept on file.

d. The minimum detection level for MTBE in soil is 15 ug/kg. The minimum detection level for MTBE in water is 15 ug/l.

These rules are intended to implement Iowa Code sections 455B.304, 455B.424 and 455B.474.

[Filed emergency 9/20/85—published 10/9/85, effective 9/20/85]
[Filed emergency 11/14/86—published 12/3/86, effective 12/3/86]
[Filed emergency 12/29/86—published 1/14/87, effective 1/14/87]
[Filed 5/1/87, Notice 1/14/87—published 5/20/87, effective 7/15/87*]
[Filed emergency 9/22/87—published 10/21/87, effective 9/22/87]
[Filed 2/19/88, Notice 11/18/87—published 3/9/88, effective 4/13/88]
[Filed emergency 10/24/88—published 11/16/88, effective 10/24/88]
[Filed 7/21/89, Notice 2/22/89—published 8/9/89, effective 9/13/89]
[Filed emergency 8/25/89—published 9/20/89, effective 8/25/89]
[Filed 8/31/90, Notice 3/21/90—published 9/19/90, effective 10/24/90]
[Filed 2/1/91, Notice 11/14/90—published 2/20/91, effective 3/27/91]
[Filed emergency 3/29/91—published 4/17/91, effective 3/29/91]
[Filed emergency 8/28/91—published 9/18/91, effective 8/28/91]
[Filed emergency 2/21/92 after Notice 9/18/91—published 3/18/92, effective 2/21/92]
[Filed 9/24/93, Notice 3/17/93—published 10/13/93, effective 11/17/93]
[Filed 12/1/95, Notice 8/16/95—published 12/20/95, effective 1/24/96]
[Filed emergency 6/25/96—published 7/17/96, effective 8/15/96]
[Filed emergency 12/20/96 after Notice 7/17/96—published 1/15/97, effective 12/20/96]
[Filed emergency 6/25/99—published 7/14/99, effective 7/1/99]
[Filed 10/1/99, Notice 7/14/99—published 10/20/99, effective 11/24/99]
[Filed emergency 9/29/00—published 10/18/00, effective 9/29/00]

*Effective date of 135.9(4) delayed 70 days by Administrative Rules Review Committee at its June 1987 meeting.

NURSING HOME ADMINISTRATORS

CHAPTER 140
ADMINISTRATIVE AND REGULATORY AUTHORITY

140.1(155) Definitions
140.2(155) Severability
140.3(155) Description and organization of the board
140.4(155) Availability of forms

CHAPTER 141
LICENSURE OF NURSING HOME ADMINISTRATORS

141.1(155) Requirement for licensure
141.2(155) Minimum qualifications for licensure as a nursing home administrator prior to January 1, 1999
141.3(155) Minimum qualifications for licensure as a nursing home administrator beginning January 1, 1999
141.4(155) Practicum/internship
141.5(155) Application for licensure as a nursing home administrator
141.6(155) Examination
141.7(155) Provisional license
141.8(155) License cycle
141.9(155) Inactive license status
141.10(147,155,272C) Grounds for discipline
141.11(155) Penalties and license fees

CHAPTER 142
NURSING HOME ADMINISTRATION EDUCATION PROGRAMS

142.1(155) Accreditation
142.2(155) Application
142.3(155) Approval

CHAPTER 143
CONTINUING EDUCATION FOR NURSING HOME ADMINISTRATION

143.1(272C) Definitions
143.2(272C) Continuing education requirements
143.3(272C) Standards for approval
143.4(272C) Approval of sponsors, programs, and activities for continuing education
143.5(272C) Reporting continuing education by licensee
143.6(272C) Reinstatement of lapsed license
143.7(272C) Continuing education waiver for active practitioners
143.8(272C) Continuing education exemption for inactive practitioners
143.9(272C) Continuing education waiver for disability or illness
143.10(272C) Reinstatement of inactive practitioners
143.11(272C) Hearings

CHAPTERS 144 to 179
Reserved

OPTOMETRY EXAMINERS

CHAPTER 180
BOARD OF OPTOMETRY EXAMINERS

180.1(154) General definitions
180.2(154) Availability of information
180.3(154) Organization of the board and procedures
180.4 Reserved
180.5(154) Requirements for licensure
180.6(147,154) Licensure by endorsement
180.7(154) Diagnostic pharmaceutical agents
180.8(154) Notice of address
180.9(154) Furnishing prescriptions
180.10(147) Board of optometry examiners
180.11(272C) Grounds for discipline

STUDY COMPLIANCE FOR LICENSE RENEWAL AND REINSTATEMENT AND DISCIPLINARY PROCEDURES

180.12 to 180.199 Reserved
180.200(155A) Prescription drug orders

CHAPTER 181
CONTINUING EDUCATION FOR OPTOMETRISTS

181.1(154) Definitions
181.2(154) Continuing education requirements
181.3(154) Standards for approval
181.4(154) Approval of sponsors, programs, and activities for continuing education
181.5(154) Reporting continuing education by licensee
181.6(154) Reinstatement of lapsed license
181.7(154,272C) Continuing education waiver for active practitioners
181.8(154,272C) Continuing education waiver for inactive practitioners

141.7(2) Applications for a provisional appointment shall be in writing on a form prescribed by the board. Persons applying shall meet the following minimum qualifications:

a. Be at least 18 years of age.

b. Be employed on a full-time basis of no less than 32 hours per week to perform the duties of the nursing home administrator.

c. Be knowledgeable of the nursing home administrators' domains of practice including resident care management, personnel management, financial management, environmental management, regulatory management and organizational management.

d. Be without history of unprofessional conduct or denial or disciplinary action against a license to practice nursing home administration or any other profession by any lawful licensing authority for reasons outlined in 141.12(147,155,272C).

141.7(3) The board expressly reserves the right to withdraw approval of a provisional appointment. Withdrawal of approval shall be based on information or circumstances warranting such action.

645—141.8(155) License cycle.

141.8(1) *Name and address changes.* All board correspondence is mailed to the licensee at the last known address on file with the board office. Licensees shall provide written notification to the professional licensure division within 60 days of any change in name or address; there is no charge for a change of name or address in board records.

141.8(2) *New licenses.* New licenses shall be issued from the date of examination through the current biennium, except that persons licensed after October 1 of an odd-numbered year shall be licensed in full for the next biennium.

141.8(3) *Renewal of license.*

a. The period of licensure is January 1 of each even-numbered year through December 31 of the next odd-numbered year.

b. At least 60 days prior to the expiration of the license, the board office shall mail a renewal application and continuing education report form.

c. The licensee shall submit to the board office the completed application and continuing education report form with the renewal fee as specified in 141.11(5).

d. When the licensee has satisfactorily completed the requirements for renewal, a renewal shall be issued and mailed to the licensee.

141.8(4) *Late renewal.* The board grants a 30-day grace period for renewal. Any administrator who fails to submit the required renewal information and fee within 30 days after the expiration date on the current license and who has not submitted a request for inactive licensure status shall be considered a delinquent licensee.

a. Time frames for license renewal will not be extended based on failure to receive a renewal application due to change in address not reported to the board or failure to submit a completed continuing education report form or fees.

b. Immediately upon reaching a delinquent status, the delinquent licensee shall not practice nursing home administration in Iowa until the licensee is reinstated to current status.

c. If a delinquent licensee is found to be working without a current license, disciplinary action may be taken.

645—141.9(155) Inactive license status.

141.9(1) Inactive license status is a status where the licensee is not required to obtain continuing education or pay fees. An inactive licensee shall not practice nursing home administration in the state of Iowa.

141.9(2) Only current licensees may request inactive status. Licensees may request inactive status by one of the following methods:

a. The current certificate of license renewal may be returned to the board office prior to its expiration, with a written request for inactive status. Inactive status becomes effective immediately upon the board's receipt of the certificate.

b. Prior to the expiration of the current certificate, the licensee may submit the renewal form marked "requesting inactive status." Inactive status becomes effective when the current renewal certificate expires.

645—141.10(147,155,272C) Grounds for discipline. The board may impose any of the disciplinary sanctions set forth in rule 645—13.1(272C), including civil penalties in an amount not to exceed $1000, when the board determines that a licensee is guilty of any of the following acts or offenses:

141.10(1) Obtaining or attempting to obtain a license by fraud or deceit.

141.10(2) Professional incompetence.

141.10(3) Knowingly making misleading, deceptive, untrue or fraudulent representations in the practice of nursing home administration or engaging in unethical conduct or practice harmful or detrimental to the public. Proof of actual injury need not be established.

141.10(4) Habitual intoxication or addiction to the use of drugs.

141.10(5) Conviction of a felony that is substantially related to the qualifications, functions or duties of a nursing home administrator and evidences unfitness to perform as a nursing home administrator in a manner consistent with protecting the public health, safety and welfare, in the courts of this state or any other state territory, country or of the United States. As used in this paragraph, the term "conviction of a felony" shall include a conviction of an offense which if committed in this state would be deemed a felony under either state or federal law, without regard to its designation elsewhere. A copy of the record of conviction or plea of guilty shall be conclusive as evidence.

141.10(6) Having a license to practice nursing home administration or another profession revoked, suspended or annulled by any lawful licensing authority; or had other disciplinary action taken against the license by any lawful licensing authority; or was denied a license or was refused the renewal of a license by any lawful licensing authority pursuant to disciplinary proceedings.

141.10(7) Willful or repeated violations of any statute, rule or regulation regarding a nursing home.

141.10(8) Knowingly aided, assisted, procured, or advised any person to practice nursing home administration contrary to this chapter or to the rules and regulations of the board; or knowingly performed any act which in any way aids, assists, procures, advises, or encourages any unlicensed person or entity to practice nursing home administration.

141.10(9) Failure to report to the board every adverse judgment in a professional or occupational malpractice action to which the licensee is a party, and every settlement of a claim against the licensee alleging malpractice.

141.10(10) Use of untrue or improbable statements in advertisements.

141.10(11) Failure to report to the board in writing a change of name or address within 60 days after the change occurs.

645—141.11(155) Penalties and license fees. All fees are nonrefundable.

141.11(1) The basic application fee required from all applicants for licensure is $50.

141.11(2) Rescinded IAB 11/17/99, effective 12/22/99.

141.11(3) Rescinded IAB 11/17/99, effective 12/22/99.

141.11(4) The fee for a provisional letter is $120 for a maximum six-month period of time.

141.11(5) The fee for biennial renewal of a license is $90 payable on or before December 31 of each odd-numbered year.

141.11(6) The fee for a duplicate license to replace an original or for display in a second facility is $10.

141.11(7) The fee for a biennial renewal of a duplicate license for display in a second facility is $10, payable at the time of renewal for the original license.

141.11(8) The fee for a certified statement that a licensee is licensed in this state is $10.

141.11(9) The penalty fee for failure to obtain required continuing education credits within the compliance period is $30.

141.11(10) The penalty fee for failure to renew a license prior to its expiration is $75 in addition to the renewal fees.

141.11(11) The penalty fee for failure to renew a license after 30 days following the expiration is $150 in addition to renewal fees.

141.11(12) The fee for reinstatement of a license is based on $45 per year, or any portion thereof, from the date of reinstatement to the next December 31 of an odd-numbered year.

141.11(13) The application fee for an approved providership shall be $100.

These rules are intended to implement Iowa Code chapter 155.

[Filed 2/23/71]
[Filed 3/19/76, Notice 2/9/76—published 4/5/76, effective 5/10/76]
[Filed 11/18/76, Notice 9/22/76—published 12/15/76, effective 1/19/77]
[Filed 8/28/78, Notice 3/8/78—published 9/20/78, effective 10/25/78]
[Filed 12/8/78, Notice 9/20/78—published 12/27/78, effective 1/31/79]
[Filed 10/19/79, Notice 8/22/79—published 11/14/79, effective 12/21/79*]
[Filed emergency 12/18/79—published 1/9/80, effective 12/18/79]
[Filed 5/7/80, Notice 4/2/80—published 5/28/80, effective 7/7/80]
[Filed emergency 6/9/80—published 7/9/80, effective 7/7/80]
[Filed 3/13/81, Notice 12/24/80—published 4/1/81, effective 5/7/81]
[Filed 8/14/81, Notice 6/10/81—published 9/2/81, effective 10/7/81]
[Filed 3/18/82, Notice 2/3/82—published 4/14/82, effective 5/19/82]
[Filed 10/6/83, Notice 7/20/83—published 10/26/83, effective 12/1/83]
[Filed emergency 11/30/83 after Notice 10/26/83—published 12/21/83, effective 11/30/83]
[Filed 5/11/84, Notice 3/14/84—published 6/6/84, effective 7/12/84]
[Filed 7/13/84, Notice 6/6/84—published 8/1/84, effective 9/5/84]◊
[Filed 11/8/84, Notice 9/12/84—published 12/5/84, effective 1/9/85]
[Filed 1/11/85, Notice 11/7/84—published 1/30/85, effective 3/6/85]
[Filed 4/4/85, Notice 12/5/84—published 4/24/85, effective 5/29/85]
[Filed 7/10/85, Notice 6/5/85—published 7/31/85, effective 9/4/85]
[Filed 1/17/86, Notice 8/14/85—published 2/12/86, effective 3/21/86]
[Filed 8/5/88, Notice 3/23/88—published 8/24/88, effective 9/28/88]
[Filed 2/17/89, Notice 12/14/88—published 3/8/89, effective 4/12/89]
[Filed 11/22/89, Notice 9/20/89—published 12/13/89, effective 1/17/90]
[Filed 4/13/90, Notice 2/21/90—published 5/2/90, effective 6/6/90]
[Filed 7/20/90, Notice 4/4/90—published 8/8/90, effective 9/12/90]◊

*Effective date of rule 600—2.7 delayed by the Administrative Rules Review Committee 70 days.
◊Two ARCs

[Filed 3/15/91, Notice 12/26/90—published 4/3/91, effective 5/8/91]
[Filed emergency 8/16/91—published 9/4/91, effective 8/16/91]
[Filed 2/13/92, Notice 12/25/91—published 3/4/92, effective 4/8/92]
[Filed 8/25/95, Notice 3/15/95—published 9/13/95, effective 10/18/95**]
[Filed 9/4/98, Notice 7/15/98—published 9/23/98, effective 10/28/98]
[Filed 6/11/99, Notice 4/7/99—published 6/30/99, effective 8/4/99]
[Filed 10/29/99, Notice 9/8/99—published 11/17/99, effective 12/22/99]
[Filed 9/29/00, Notice 7/26/00—published 10/18/00, effective 11/22/00]

**Effective date of 645—subrule 141.3(2), delayed until adjournment of the 1996 General Assembly by the Administrative Rules Review Committee at its meeting held October 10, 1995.

CHAPTER 143
CONTINUING EDUCATION FOR NURSING HOME ADMINISTRATION

[Prior to 8/24/88, see Nursing Home Administrators Board of Examiners [600], Ch 3]
[Prior to 9/13/95, see 645—Chapter 142]

645—143.1(272C) Definitions. For the purpose of these rules, the following definitions shall apply:

"Active license" means the license of a person who is acting, practicing, functioning, and working in compliance with license requirements.

"Administrator" means the administrator of the board of examiners for nursing home administrators.

"Approved program/activity" means a continuing education program/activity meeting the standards set forth in these rules, which has received advance approval by the board pursuant to these rules.

"Approved sponsor" means a person or an organization sponsoring continuing education activities that has been approved by the board as a sponsor pursuant to these rules. During the time an organization, educational institution, or person is an approved sponsor, all continuing education activities of such organization, educational institution, or person may be deemed automatically approved.

"Audit" means the selection of licensees for verification of satisfactory completion of continuing education requirements during a specified time period or the selection of providers for verification of adherence to continuing education provider requirements during a specified time period.

"Board" means the board of examiners for nursing home administrators.

"Continuing education" means planned, organized learning acts designed to maintain, improve, or expand a licensee's knowledge and skills in order for the licensee to develop new knowledge and skills relevant to the enhancement of practice, education, or theory development to improve the safety and welfare of the public.

"Hour of continuing education" means a clock hour spent by a licensee in actual attendance at and completion of an approved continuing education activity.

"Inactive license" means the license of a person who is not in practice in the state of Iowa.

"Lapsed license" means a license that a person has failed to renew as required, or the license of a person who failed to meet stated obligations for renewal within a stated time.

"License" means license to practice.

"Licensee" means any person licensed to practice as a nursing home administrator in the state of Iowa.

"National Continuing Education Review Service (NCERS)" means the continuing education review service operated by the National Association of Boards of Examiners for Nursing Home Administrators, 808 17th Street NW, #200, Washington, DC 20006.

645—143.2(272C) Continuing education requirements.

143.2(1) The biennial continuing education compliance period shall extend for a two-year period beginning on January 1 of each even-numbered year and ending on December 31 of the next odd-numbered year. Each biennium, each person who is licensed to practice as a licensee in this state shall be required to complete a minimum of 40 hours of continuing education approved by the board.

143.2(2) Requirements of new licensees. Those persons licensed for the first time shall not be required to complete continuing education as a prerequisite for the first renewal of their licenses. Continuing education hours acquired anytime from the initial licensing until the second license renewal may be used. The new licensee will be required to complete a minimum of 40 hours of continuing education per biennium for each subsequent license renewal.

143.2(3) Hours of continuing education credit may be obtained by attending and participating in a continuing education activity. These hours must be approved by the board or otherwise meet the requirements herein pursuant to statutory provisions and the rules that implement them.

143.2(4) No hours of continuing education shall be carried over into the next biennium except as stated for the second renewal.

143.2(5) It is the responsibility of each licensee to finance the cost of continuing education.

645—143.3(272C) Standards for approval.

143.3(1) *General criteria.* A continuing education activity which meets all of the following criteria is appropriate for continuing education credit if it is determined by the board that the continuing education activity:

a. Constitutes an organized program of learning which contributes directly to the professional competency of the licensee;

b. Pertains to subject matters which integrally relate to the practice of the profession;

c. Is conducted by individuals who have specialized education, training and experience by reason of which said individuals should be considered qualified concerning the subject matter of the program. The application must be accompanied by a paper, manual or outline which substantively pertains to the subject matter of the program and reflects program schedule, goals and objectives. The board may request the qualifications of presenters;

d. Fulfills stated program goals, objectives, or both; and

e. Provides proof of attendance to licensees in attendance including:

(1) Date(s), location, course title, presenter(s);

(2) Number of program contact hours (One contact hour usually equals one hour of continuing education credit.); and

(3) Official signature or verification by program sponsor.

143.3(2) *Specific criteria.* Licensees may obtain continuing education hours of credit by:

a. Participating in the continuing education programs approved by the National Continuing Education Review Service (NCERS).

b. Academic coursework that meets the criteria set forth in these rules. Continuing education credit equivalents are as follows:

1 academic semester hour = 15 continuing education hours

1 academic quarter hour = 10 continuing education hours

c. Attendance at or participation in a program or course which is offered or sponsored by an approved continuing education sponsor.

d. Making presentations; conducting research; producing publications; preparing new courses; participating in home study courses; attending electronically transmitted courses; and attending workshops, conferences, or symposiums approved by the board.

e. Self-study coursework that meets the criteria set forth in these rules. Continuing education credit equivalent for self-study is as follows:

180 minutes of self-study work = 1 continuing education hour

The maximum number of hours for self-study, including television viewing, video or sound-recorded programs, correspondence work, or research, or by other similar means which is not directly sponsored by and supervised by an accredited postsecondary college or university or an approved provider, is 8 hours.

645—143.4(272C) Approval of sponsors, programs, and activities for continuing education.

143.4(1) *Approval of sponsors.* An applicant who desires approval as a sponsor of courses, programs, or other continuing education activities shall, unless exempted elsewhere in these rules, apply for approval to the board on the form designated by the board stating the applicant's educational history for the preceding two years or proposed plan for the next two years.

a. The form shall include the following:

(1) Date(s), location, course title(s) offered and outline of content;

(2) Total hours of instruction to be presented;

(3) Names and qualifications of instructors including résumés or vitae; and

(4) Evaluation form(s).

b. Records shall be retained by the sponsor for four years.

c. Attendance record report. The person or organization sponsoring an approved continuing education activity shall provide a certificate of attendance to the licensee providing the following information:

(1) Program date(s);

(2) Course title and presenter;

(3) Location;

(4) Number of clock hours attended and continuing education hours earned;

(5) Name of sponsor and sponsor number (if applicable);

(6) Licensee's name; and

(7) Method of presentation.

d. All approved sponsors shall maintain a copy of the following:

(1) The continuing education activity;

(2) List of enrolled licensees' names and license numbers; and

(3) Number of continuing education clock hours awarded for a minimum of four years from the date of the continuing education activity.

e. The sponsor shall submit a report of all continuing education programs conducted in the previous year during the assigned month for reporting designated by the board. The report shall include:

(1) Date(s), location, course title(s) offered and outline of content;

(2) Total hours of instruction presented;

(3) Names and qualifications of instructors including résumés or vitae;

(4) Evaluation form(s); and

(5) A summary of the evaluations completed by the licensees.

143.4(2) *Prior approval of programs/activities.* An organization or person other than an approved sponsor that desires prior approval of a course, program or other educational activity or that desires to establish approval of such activity prior to attendance shall apply for approval to the board on a form provided by the board at least 60 days in advance of the commencement of the activity. The board shall approve or deny such application in writing within 30 days of receipt of such application. The application shall state:

a. The date(s);

b. Course(s) offered;

c. Course outline;

d. Total hours of instruction; and

e. Names and qualifications of speakers and other pertinent information.

The organization or person shall be notified of approval or denial by ordinary mail.

143.4(3) *Review of programs.* Continuing education programs/activities shall be reported every year at the designated time as assigned by the board. The board may at any time reevaluate an approved sponsor. If, after reevaluation, the board finds there is cause for revocation of the approval of an approved sponsor, the board shall give notice of the revocation to that sponsor by certified mail. The sponsor shall have the right to hearing regarding the revocation. The request for hearing must be sent within 20 days after the receipt of the notice of revocation. The hearing shall be held within 90 days after the receipt of the request for hearing. The board shall give notice by certified mail to the sponsor of the date set for the hearing at least 30 days prior to the hearing. The board shall conduct the hearing in compliance with rule 645—11.9(17A).

143.4(4) *Postapproval of activities.* A licensee seeking credit for attendance and participation in an educational activity which was not conducted by an approved sponsor or otherwise approved shall submit to the board, within 60 days after completion of such activity, the following:

a. The date(s);
b. Course(s) offered;
c. Course outline;
d. Total hours of instruction and credit hours requested;
e. Names and qualifications of speakers and other pertinent information;
f. Request for credit which includes a brief summary of the activity; and
g. Certificate of attendance or verification.

Within 90 days after receipt of such application, the board shall advise the licensee in writing by ordinary mail whether the activity is approved and the number of hours allowed. A licensee not complying with the requirements of this subrule may be denied credit for such activity.

143.4(5) *Voluntary relinquishment.* The approved sponsor may voluntarily relinquish sponsorship by notifying the board office in writing.

645—143.5(272C) Reporting continuing education by licensee. At the time of license renewal, each licensee shall be required to submit a report on continuing education to the board on a board-approved form.

143.5(1) *The information on the form shall include:*

a. Title of continuing education activity;
b. Date(s);
c. Sponsor of the activity;
d. Board-approved sponsor number;
e. Number of continuing education hours earned; and
f. Teaching method used.

143.5(2) *Audit of continuing education report.* After each educational biennium, the board will audit a percentage of the continuing education reports before granting the renewal of licenses to those being audited.

a. The board will select licensees to be audited.

b. The licensee shall make available to the board for auditing purposes a certificate of attendance or verification for all reported activities that includes the following information:

(1) Date, location, course title, schedule (brochure, pamphlet, program, presenter(s)), and method of presentation;

(2) Number of contact hours for program attended; and

(3) Indication of successful completion of the course.

c. For auditing purposes, the licensee must retain the above information for two years after the biennium has ended.

d. Submission of a false report of continuing education or failure to meet continuing education requirements may cause the license to lapse and may result in formal disciplinary action.

e. All renewal license applications that are submitted late (after the end of the compliance period) may be subject to audit of the continuing education report.

f. Failure to receive the renewal application shall not relieve the licensee of the responsibility of meeting continuing education requirements and submitting the renewal fee by the end of the compliance period.

645—143.6(272C) Reinstatement of lapsed license. Failure of the licensee to renew within 30 days after expiration date shall cause the license to lapse. A person who allows the license to lapse cannot engage in practice in Iowa without first complying with all regulations governing reinstatement as outlined in the board rules. A person who allows the license to lapse must apply to the board for reinstatement of the license. Reinstatement of the lapsed license may be granted by the board if the applicant:

1. Submits a written application for reinstatement to the board;
2. Pays all of the renewal fees then due;
3. Pays all penalty fees which have been assessed by the board for failure to renew;
4. Pays the reinstatement fee; and
5. Provides evidence of satisfactory completion of continuing education requirements during the period since the license lapsed. The total number of continuing education hours required for license reinstatement is 40.
6. In addition to fees and penalties, any administrator who fails to renew a license within 90 days following the expiration of a current license may be required to meet with the board and, if through the interview process the board finds reasonable doubt that the licensee displays knowledge of the domains of practice, as listed on the national examination, the board may require the administrator to successfully complete any or all of the minimum qualifications for licensure as listed in the rules before the license shall be renewed.

645—143.7(272C) Continuing education waiver for active practitioners. A nursing home administrator licensed to practice nursing home administration shall be deemed to have complied with the continuing education requirements of this state during the period that the licensee serves honorably on active duty in the military services or as a government employee outside the United States as a practicing nursing home administrator.

645—143.8(272C) Continuing education exemption for inactive practitioners. A licensee who is not engaged in practice in the state of Iowa may be granted an exemption of continuing education compliance and obtain a certificate of exemption upon written application to the board. The application shall contain a statement that the applicant will not engage in practice in Iowa without first complying with all regulations governing reinstatement after exemption. The application for a certificate of exemption shall be submitted upon forms provided by the board. The licensee shall have completed the required continuing education at the time of reinstatement.

645—143.9(272C) Continuing education waiver for disability or illness. The board may, in individual cases involving disability or illness, grant waivers of the minimum education requirements or extension of time within which to fulfill the same or make the required reports. No waiver or extension of time shall be granted unless written application therefor is made on forms provided by the board and signed by the licensee and appropriate licensed health care practitioners. The board may grant waiver of the minimum educational requirements for any period of time not to exceed one calendar year from the onset of disability or illness. In the event that the disability or illness upon which a waiver has been granted continues beyond the period of waiver, the licensee must reapply for an extension of the waiver. The board may, as a condition of any waiver granted, require the applicant to make up a certain portion or all of the minimum educational requirements waived by such methods as may be prescribed by the board.

645—143.10(272C) Reinstatement of inactive practitioners. Inactive practitioners who have been granted a waiver of compliance with these rules and obtained a certificate of waiver shall, prior to engaging in the practice of nursing home administration in the state of Iowa, satisfy the following requirements for reinstatement.

143.10(1) Submit written application for reinstatement to the board upon forms provided by the board;

143.10(2) Submit payment of the current renewal fee;

143.10(3) Submit payment of the reinstatement fee; and

143.10(4) Furnish in the application evidence of one of the following:

a. Full-time practice in another state of the United States or the District of Columbia and completion of continuing education for each biennium of inactive status substantially equivalent in the opinion of the board to that required under these rules; or

b. Completion of 40 hours of approved continuing education.

645—143.11(272C) Hearings. In the event of denial, in whole or part, of any application for approval of a continuing education program or credit for continuing education activity, the applicant, licensee or program provider shall have the right within 20 days after the sending of the notification of denial by ordinary mail to request a hearing which shall be held within 90 days after receipt of the request for hearing. The hearing shall be conducted by the board or an administrative law judge designated by the board, in substantial compliance with the hearing procedure set forth in rule 645—11.9(17A).

These rules are intended to implement Iowa Code section 272C.2 and chapter 155.

[Filed 8/28/78, Notice 3/8/78—published 9/20/78, effective 10/25/78]
[Filed 8/14/81, Notice 6/10/81—published 9/2/81, effective 10/7/81]
[Filed 4/20/84, Notice 1/18/84—published 5/9/84, effective 6/14/84]
[Filed 7/10/85, Notice 6/5/85—published 7/31/85, effective 9/4/85]
[Filed 10/15/85, Notice 5/8/85—published 11/6/85, effective 12/11/85]
[Filed 1/17/86, Notice 8/14/85—published 2/12/86, effective 3/21/86]
[Filed 8/5/88, Notice 3/23/88—published 8/24/88, effective 9/28/88]
[Filed 11/22/89, Notice 9/20/89—published 12/13/89, effective 1/17/90]

[Filed 7/20/90, Notice 4/4/90—published 8/8/90, effective 9/12/90]
[Filed 8/25/95, Notice 3/15/95—published 9/13/95, effective 10/18/95]
[Filed 10/29/99, Notice 9/8/99—published 11/17/99, effective 12/22/99]
[Filed 9/29/00, Notice 7/26/00—published 10/18/00, effective 11/22/00]

CHAPTER 144
CHILD SUPPORT NONCOMPLIANCE
Rescinded IAB 6/30/99, effective 8/4/99

CHAPTER 145
IMPAIRED PRACTITIONER REVIEW COMMITTEE
Rescinded IAB 6/30/99, effective 8/4/99

CHAPTER 146
PETITIONS FOR RULE MAKING
Rescinded IAB 6/30/99, effective 8/4/99

CHAPTER 147
PUBLIC RECORDS AND FAIR INFORMATION PRACTICES
[Prior to 9/13/95, see 645—Chapter 149]
Rescinded IAB 6/30/99, effective 8/4/99

CHAPTER 148
DECLARATORY RULINGS
[Prior to 9/13/95, see 645—140.4(135E)]
Rescinded IAB 6/30/99, effective 8/4/99

CHAPTER 149
PUBLIC RECORDS AND FAIR INFORMATION PRACTICES
Rescinded IAB 9/13/95, effective 10/18/95; see 645—Chapter 147

CHAPTERS 150 to 159
Reserved

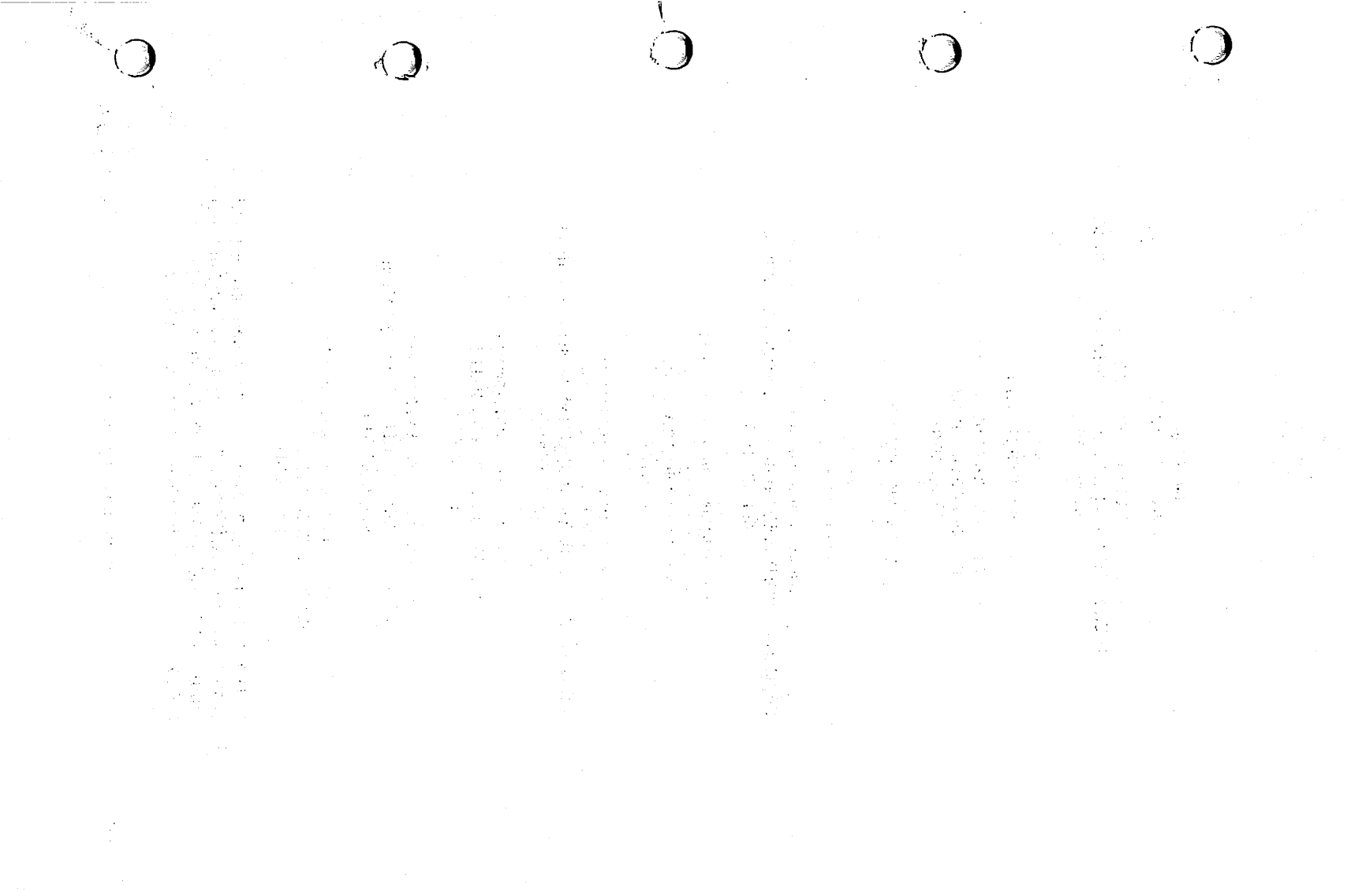
OPHTHALMIC DISPENSERS

CHAPTER 160
OPHTHALMIC DISPENSERS
Rescinded IAB 2/3/93, effective 1/15/93

CHAPTERS 161 to 168
Reserved

CHAPTER 169
PUBLIC RECORDS AND FAIR INFORMATION PRACTICES
Rescinded IAB 2/3/93, effective 1/15/93

CHAPTERS 170 to 179
Reserved



MEDICAL EXAMINERS BOARD[653]

[Prior to 5/4/88, see Health Department[470], Chs 135 and 136, renamed Medical Examiners Board[653] under the "umbrella" of Public Health Department[641] by 1986 Iowa Acts, ch 1245]

10.10(6) *Service and filing of petitions and other papers.*

a. When service required. Except where otherwise provided by law, every petition for declaratory order, petition for intervention, brief, or other paper filed in a proceeding for a declaratory order shall be served upon each of the parties of record to the proceeding, and on all other persons identified in the petition for declaratory order or petition for intervention as affected by or interested in the questions presented, simultaneously with their filing. The party filing a document is responsible for service on all parties and other affected or interested persons.

b. Filing—when required. All petitions for declaratory orders, petitions for intervention, briefs, or other papers in a proceeding for a declaratory order shall be filed with the Board of Medical Examiners, 1209 East Court, Executive Hills West, Des Moines, Iowa 50319. All petitions, briefs, or other papers that are required to be served upon a party shall be filed simultaneously with the board of medical examiners.

c. Method of service, time of filing, and proof of mailing. Method of service, time of filing, and proof of mailing shall be as provided by 653—12.19(17A).

10.10(7) *Consideration.* Upon request by petitioner, the board of medical examiners must schedule a brief and informal meeting between the original petitioner, all intervenors, and the board of medical examiners, a member of the board, or a member of the staff of the board, to discuss the questions raised. The board may solicit comments from any person on the questions raised. Also, comments on the questions raised may be submitted to the board by any person.

10.10(8) *Action on petition.*

a. Within the time allowed by 1998 Iowa Acts, chapter 1202, section 13(5), after receipt of a petition for a declaratory order, the board of medical examiners or designee shall take action on the petition as required by 1998 Iowa Acts, chapter 1202, section 13(5).

b. The date of issuance of an order or of a refusal to issue an order is as defined in 653—subrule 12.11(1).

10.10(9) *Refusal to issue order.*

a. The board of medical examiners shall not issue a declaratory order where prohibited by 1998 Iowa Acts, chapter 1202, section 13(1), and may refuse to issue a declaratory order on some or all questions raised for the following reasons:

(1) The petition does not substantially comply with the required form.

(2) The petition does not contain facts sufficient to demonstrate that the petitioner will be aggrieved or adversely affected by the failure of the board to issue an order.

(3) The board does not have jurisdiction over the questions presented in the petition.

(4) The questions presented by the petition are also presented in a current rule making, contested case, or other agency or judicial proceeding, that may definitively resolve them.

(5) The questions presented by the petition would more properly be resolved in a different type of proceeding or by another body with jurisdiction over the matter.

(6) The facts or questions presented in the petition are unclear, overbroad, insufficient, or otherwise inappropriate as a basis upon which to issue an order.

(7) There is no need to issue an order because the questions raised in the petition have been settled due to a change in circumstances.

(8) The petition is not based upon facts calculated to aid in the planning of future conduct but is, instead, based solely upon prior conduct in an effort to establish the effect of that conduct or to challenge an agency decision already made.

(9) The petition requests a declaratory order that would necessarily determine the legal rights, duties, or responsibilities of other persons who have not joined in the petition, intervened separately, or filed a similar petition and whose position on the questions presented may fairly be presumed to be adverse to that of petitioner.

(10) The petitioner requests the board to determine whether a statute is unconstitutional on its face.

b. A refusal to issue a declaratory order must indicate the specific grounds for the refusal and constitutes final agency action on the petition.

c. Refusal to issue a declaratory order pursuant to this provision does not preclude the filing of a new petition that seeks to eliminate the grounds for the refusal to issue an order.

10.10(10) *Contents of declaratory order—effective date.* In addition to the order itself, a declaratory order must contain the date of its issuance, the name of petitioner and all intervenors, the specific statutes, rules, policies, decisions, or orders involved, the particular facts upon which it is based, and the reasons for its conclusion.

A declaratory order is effective on the date of issuance.

10.10(11) *Copies of orders.* A copy of all orders issued in response to a petition for a declaratory order shall be mailed promptly to the original petitioner and all intervenors.

10.10(12) *Effect of a declaratory order.* A declaratory order has the same status and binding effect as a final order issued in a contested case proceeding. It is binding on the board of medical examiners, the petitioner, and any intervenors who consent to be bound and is applicable only in circumstances where the relevant facts and the law involved are indistinguishable from those on which the order was based. As to all other persons, a declaratory order serves only as precedent and is not binding on the board of medical examiners. The issuance of a declaratory order constitutes final agency action on the petition.

This rule is intended to implement Iowa Code section 17A.9 as amended by 1998 Iowa Acts, chapter 1202.

653—10.11(68B) Selling of goods or services by members of the board or impaired physician review committee (IPRC).

10.11(1) *Application of the rule.* The board members and members of the IPRC shall not sell, either directly or indirectly, any goods or services to individuals, associations, or corporations that are subject to the regulatory authority of the department except as authorized by this rule.

10.11(2) *Consent.* Consent shall be given by a majority of the members of the board. Consent shall not be given to an official to sell goods or services to an individual, association, or corporation regulated by the department unless all of the following conditions are met:

a. The official requesting consent does not have authority to determine whether consent should be given.

b. The official's duties or functions are not related to the department's regulatory authority over the individual, association or corporation to whom the goods and services are being sold, or the selling of the good or service does not affect the official's duties or functions.

c. The selling of the good or service does not include acting as an advocate on behalf of the individual, association, or corporation to the department.

d. The selling of the good or service does not result in the official's selling a good or service to the department on behalf of the individual, association, or corporation.

10.11(3) *Authorized sales.* Sales may be authorized under the following conditions:

a. A member of the board or IPRC may sell goods or services to any individual, association, or corporation regulated by any division within the department, other than the board or committee on which that official serves. This consent is granted because the sale of such goods or services does not affect the member's duties or functions on the board or IPRC.

b. A member of the board may sell goods or services to any individual, association, or corporation regulated by the board if those goods or services are routinely provided to the public as part of that person's regular professional practice. This consent is granted because the sale of such goods or services does not affect the board or IPRC member's duties or functions on the board or IPRC, respectively. In the event an individual, association, or corporation regulated by the board, to whom a board or IPRC member sells goods or services is directly involved in any matter pending before the board, including a disciplinary matter, that board or IPRC member shall not participate in any deliberation or decision concerning that matter. In the event a complaint is filed with the board concerning the services provided by the board or IPRC member to a member of the public, that board or IPRC member is otherwise prohibited by law from participating in any discussion or decision by the licensing board in that case.

c. Individual application and approval are not required for the sales authorized by this rule unless there are unique facts surrounding a particular sale which would cause the sale to affect the seller's duties or functions, would give the buyer an advantage in dealing with the board or IPRC, or would otherwise present a conflict of interest.

10.11(4) *Application for consent.* Prior to selling a good or service to an individual, association, or corporation subject to the regulatory authority of the department, an official must obtain prior written consent unless the sale is specifically allowed in subrule 10.11(3). The request for consent must be in writing and signed by the official requesting consent. The application must provide a clear statement of all relevant facts concerning the sale. The application should identify the parties to the sale and the amount of compensation. The application should also explain why the sale should be allowed.

10.11(5) *Limitation of consent.* Consent shall be in writing and shall be valid only for the activities and the time period specifically described in the consent. Consent can be revoked at any time by a majority vote of the members of the board upon written notice to the board. A consent provided under this chapter does not constitute authorization for any activity which is a conflict of interest under common law or which would violate any other statute or rule. It is the responsibility of the official requesting consent to ensure compliance with all other applicable laws and rules.

This rule is intended to implement Iowa Code section 68B.4.

[Filed 11/20/51; amended 5/13/64]
[Filed 2/5/79, Notice 11/29/78—published 2/21/79, effective 3/29/79]
[Filed without Notice 2/14/80—published 3/5/80, effective 4/9/80]
[Filed 3/13/81, Notice 1/7/81—published 4/1/81, effective 5/6/81]
[Filed emergency after Notice 4/28/83, Notice 2/2/83—published 5/25/83, effective 4/28/83]
[Filed 7/15/83, Notice 6/8/83—published 8/3/83, effective 9/7/83]
[Filed emergency 4/15/88—published 5/4/88, effective 4/15/88]
[Filed 4/25/89, Notice 2/22/89—published 5/17/89, effective 6/21/89]
[Filed 8/2/90, Notice 5/30/90—published 8/22/90, effective 9/26/90]
[Filed 1/10/94, Notice 11/24/93—published 2/2/94, effective 3/9/94]
[Filed 4/1/94, Notice 2/2/94—published 4/27/94, effective 6/1/94]
[Filed 5/2/97, Notice 3/12/97—published 5/21/97, effective 6/25/97]
[Filed 4/30/99, Notice 3/24/99—published 5/19/99, effective 7/1/99]
[Filed 11/10/99, Notice 9/22/99—published 12/1/99, effective 1/5/00]
[Filed 9/29/00, Notice 6/28/00—published 10/18/00, effective 11/22/00]

CHAPTER 21
PHYSICIAN ELIGIBILITY TO SUPERVISE A PHYSICIAN ASSISTANT

653—21.1(148,272C) Authority to supervise a physician assistant. A physician with an active permanent, special, or temporary Iowa license who is actively engaged in the practice of medicine in Iowa may supervise a physician assistant.

NOTE: A physician licensed in another state and working for a federal facility is exempt from this chapter when the physician is supervising a physician assistant in a federal facility in Iowa.

653—21.2(148,272C) Ineligibility determinants. A physician is ineligible to supervise a physician assistant for any of the following reasons:

21.2(1) The physician does not hold an active, permanent Iowa license.

21.2(2) The physician is not actively practicing medicine in Iowa.

21.2(3) The physician does not have sufficient training or experience to supervise a physician assistant in the area of medical practice in which a physician assistant is to be utilized.

21.2(4) The physician is subject to a disciplinary order of the board that restricts the physician from supervising a physician assistant.

653—21.3(148,272C) Criteria for determining a physician's eligibility or ineligibility to supervise a physician assistant.

21.3(1) The board deems the following person eligible to supervise a physician assistant: a physician who has a current active permanent, special, or temporary Iowa license, actively practices medicine in Iowa, and has no current disciplinary order or restriction by the board against the licensee supervising a physician assistant.

21.3(2) The board shall allow the board of physician assistant examiners to accept a copy of a current active permanent, special, or temporary Iowa license and a physician's attestation of eligibility as proof of eligibility to supervise a physician assistant.

21.3(3) The board deems a physician who does not actively practice medicine in Iowa as ineligible to supervise until the physician practices medicine with patients in Iowa on a regular basis. Part-time, voluntary practice with patients in Iowa meets the eligibility requirement.

21.3(4) The board deems a physician who has a lapsed, delinquent, inactive, or resident license as ineligible to supervise until the physician is issued a current active permanent, special, or temporary Iowa license by the board.

653—21.4(148,272C) Grounds for discipline. A physician may be subject to disciplinary action for supervising a physician assistant in violation of these rules or the rules found in 653—Chapter 12 or 645—Chapter 325, which relate to duties and responsibilities for physician supervision of physician assistants.

653—21.5(148,272C) Disciplinary sanction. The board may restrict or rescind a physician's authority to supervise a physician assistant as part of a disciplinary sanction following a contested case proceeding, if the reason for the disciplinary action impacts the ability of the physician to supervise a physician assistant. The board shall notify the board of physician assistant examiners when it takes a disciplinary action against a physician's license that affects the physician's eligibility to supervise a physician assistant.

653—21.6(148,272C) Communication with physician assistant supervisees. The physician shall notify all physician assistant supervisees within one workday upon receiving disciplinary action from the board or any other change in status that affects the physician's eligibility to supervise a physician assistant.

These rules are intended to implement Iowa Code sections 148.13 and 272C.3.

[Filed 1/4/89, Notice 11/16/88—published 1/25/89, effective 3/1/89*†**]
[Filed 8/31/89, Notice 5/31/89—published 9/20/89, effective 10/25/89]
[Filed 2/23/96, Notice 1/3/96—published 3/13/96, effective 4/17/96***]
[Filed emergency 10/4/96—published 10/23/96, effective 10/4/96]
[Filed 9/29/00, Notice 8/23/00—published 10/18/00, effective 11/22/00]

*Effective date of 3/1/89 delayed 70 days by Administrative Rules Review Committee at its February 13, 1989, meeting.
†Effective date of 3/1/89 delayed until adjournment of the 1990 Session of the General Assembly at its May 9, 1989, meeting.
**Delay until adjournment of the 1990 G.A. lifted by the Administrative Rules Review Committee at its August 3, 1989, meeting which allowed the rules to become effective August 4, 1989.
***Effective date of 4/17/96 delayed 70 days by the Administrative Rules Review Committee at its meeting held April 16, 1996. Effective date delayed until adjournment of the 1997 General Assembly by the Administrative Rules Review Committee at its meeting held June 11, 1996.

AMUSEMENT PARKS AND RIDES

CHAPTER 61
ADMINISTRATION—AMUSEMENT PARKS AND RIDES DIVISION

CHAPTER 62
SAFETY RULES FOR AMUSEMENT PARKS AND RIDES

CHAPTERS 63 to 70
Reserved

ELEVATOR DIVISION

CHAPTER 71
ADMINISTRATION

CHAPTER 72
NEW INSTALLATIONS

CHAPTER 73
EXISTING FACILITIES

CHAPTER 74
EXISTING ESCALATORS, MOVING WALKS AND DUMBWAITERS

CHAPTER 77
VARIANCES

[Prior to 9/24/86, Labor, Bureau of[530]]
[Prior to 10/21/98, see 347—Ch 77]

875—77.1(89A) Purpose and scope. This chapter contains rules of practice for administrative proceedings to grant variances and other relief under Iowa Code section 89A.11. These rules shall be construed to secure a prompt and just conclusion of proceedings subject thereto.

875—77.2(89A) Permanent variance and interim order. A permanent variance may be granted by the commissioner when the applicant cannot comply with rules adopted by the commissioner without undue hardship. The commissioner shall consider the age of the facility, the general operating condition of the facility and the effect upon the safe operation of the facility under the variance in determining if a variance shall be granted.

77.2(1) Any owner of a facility covered under Iowa Code chapter 89A desiring a permanent variance from a rule or portion thereof may file a written application with the commissioner.

77.2(2) Contents. An application filed pursuant to 77.2(1) shall include:

a. The name and address of the applicant;

b. The address, specific location, and state I.D. number, if any, of the facility involved;

c. A description of the operation and type of facility;

d. A listing of the rules to which the variance would apply;

e. A representation by the owner specifying the undue hardships which would arise from compliance with Iowa Code chapter 89A and its applicable rules and the effect upon the safe operation of the facility under the variance supported by representation from qualified persons having firsthand knowledge of the facts represented; and

f. A request for a hearing if one is desired.

77.2(3) Interim order. An application may also be made for an interim order to be effective until a decision is rendered on the application for the variance filed previously or concurrently. An application for an interim order may include statements of fact and arguments as to why the order should be granted. The commissioner may rule ex parte upon the application.

875—77.3(89A) Temporary variance. A temporary variance may be granted by an inspector for violations which would be considered to be noncritical to the safe operation of the facility. A temporary variance shall only be issued if the facility passed inspection on all other matters and failure to grant a temporary variance would result in a reinspection of the facility.

77.3(1) Application for variance. Any owner of a facility covered under Iowa Code chapter 89A desiring a temporary variance from a rule or portion thereof may seek a temporary variance. The owner may make a verbal request to the inspector at the time of the inspection or the inspector may grant a variance on his own initiative.

77.3(2) An inspector will consider the following factors prior to granting or denying a request for a temporary variance.

a. Degree and probability of threatened harm to the users of the facility;

b. A determination that the issuance of the variance will not substantially affect safe operation of the facility and the minor infractions cannot be corrected before the inspection is completed;

c. Degree of difficulty in abating the violation; and

d. General operating condition of the facility.

77.3(3) Upon granting a temporary variance, the inspector shall issue to the owner a written statement of the objects, conditions and violations covered by the temporary variance.

77.3(4) If a variance is denied, the owner may make a written application to the commissioner stating the factors believed to support the variance.

77.3(5) A temporary variance will be valid until the next inspection, although the owner is expected to comply as promptly as possible.

77.3(6) Temporary variances shall only be issued by employees of the division of labor services.

875—77.4(89A) Form of documents and copies. No particular form is prescribed for written applications and other papers filed in proceedings under this chapter. All applications for permanent variances or temporary variances submitted to the commissioner shall be clearly legible. An original and one copy of the application and all supporting documents shall be filed. All documents shall be signed and include the title of the applicant.

875—77.5(89A) Modification and revocation of variance orders.

77.5(1) An affected person may apply in writing for a modification or revocation of any variance. The application shall contain:

a. The name and address of the applicant;

b. A description of the relief sought;

c. A statement setting forth with particularity the grounds for relief; and

d. A request for a hearing if one is desired.

77.5(2) The commissioner may move to modify or revoke a variance order. The commissioner shall inform the owner of the action and allow for a hearing.

875—77.6(89A) Action on applications. Applicants shall be notified of the decision of the commissioner by a written order.

These rules are intended to implement Iowa Code chapter 89A.

[Filed 3/8/76, Notice 10/6/75—published 3/22/76, effective 4/30/76]
[Filed 7/28/82, Notice 5/26/82—published 8/18/82, effective 9/30/82]
[Filed emergency 9/5/86—published 9/24/86, effective 9/24/86]
[Filed emergency 4/17/87—published 5/6/87, effective 4/17/87]
[Filed emergency 12/4/92 after Notice 9/30/92—published 12/23/92, effective 12/23/92]

CHAPTERS 78 to 80
Reserved

CHAPTER 81
ASBESTOS CONTROL PROCEDURES
[Prior to 9/24/86, Labor, Bureau of[530]]
[Prior to 10/21/98, see 347—Ch 81]
Rescinded IAB 10/18/00, effective 11/22/00

CHAPTER 82
LICENSING OF BUSINESS ENTITIES, LICENSING OF TRAINING COURSES, AND WORKER CERTIFICATION
[Prior to 9/24/86, Labor, Bureau of[530]]
[Prior to 10/21/98, see 347—Ch 82]
Rescinded IAB 10/18/00, effective 11/22/00

CHAPTERS 83 to 93
Reserved

150.11(9) *Appeal procedures.* The rules of procedure of the employment appeal board shall apply to appealed decisions.

150.11(10) *Effect of revocation.* A contractor whose registration is revoked may reapply for a new registration number if all requirements for registration eligibility are met.

875—150.12(91C) Concurrent actions. Actions under rules 875—150.10(91C) and 150.11(91C) may proceed at the same time against a contractor.

875—150.13(91C) Out-of-state contractor bonds.

150.13(1) *Project size.* Before commencing a contract for a project in Iowa with a contract price in excess of $5,000 in value, an out-of-state contractor shall file a valid original project or blanket surety bond with the division.

150.13(2) *Information.* The division bond forms shall be used. The bond shall include the identification of the contractor including the name and address, and a valid power of attorney from the surety company shall be attached. If the Iowa construction contractor registration number has been issued, it shall be included on the bond.

150.13(3) *Surety company.* The bond shall be executed by a surety company authorized to do business in this state.

150.13(4) *Time.* The bond shall be continuous in nature until canceled by the surety or for the two-year registration period in the case of a blanket bond.

150.13(5) *Cancellation.* The surety shall give the commissioner and the contractor 30 days' written notice indicating the desire to cancel the bond.

150.13(6) *Federal preemption.* Rules 875—150.13(91C) to 150.15(91C) shall be suspended to the extent necessary to prevent any inconsistency with the requirements of federal law or to prevent the denial of federal funds. In addition, contractors performing work undertaken on a federal aid project shall submit to the division a letter of legal justification for the suspension or a letter from the contracting agency that the requirements of this rule are inconsistent with the federal requirements.

875—150.14(91C) Project bonds.

150.14(1) *Information.* In addition to the requirements in subrule 150.13(2), the following shall be included on the bond:

a. The name of the person for whom the construction work will be performed; and

b. The identification of the contract including the project name, contract number or identification, address where the work will be performed and a copy of the contract.

150.14(2) *Amount.* The bond shall be in the amount of $1000 or 5 percent of the contract price, whichever is greater. A separate bond is required for each contract. An increase in the bond may be required by the department of revenue and finance pursuant to Iowa Code chapter 91C.

875—150.15(91C) Blanket bonds. A blanket bond shall be in an amount not less than $50,000. The commissioner may increase the bond after a hearing conducted pursuant to 875—Chapter 1.

875—150.16(91C) Bond release.

150.16(1) *Notifications.* Prior to releasing a bond, the commissioner will notify the department of revenue and finance, the unemployment insurance services division of the workforce development department, and applicable state subdivisions of the intent to release the bond. The commissioner shall provide ten days for the filing of objections to the release of the bond. The commissioner may deem any failure to respond to the notice within the time provided as an approval of the release.

150.16(2) *Conditions for release.* A bond shall not be released until the contractor has made payment of all taxes, including contributions due under the unemployment compensation insurance system, penalties, interest, and fees, which may accrue to the state of Iowa or its subdivisions on account of the execution and performance of the contract or approval for the release is obtained from the appropriate agencies.

These rules are intended to implement Iowa Code chapter 91C.

[Filed 12/9/88, Notice 10/5/88—published 12/28/88, effective 2/15/89*]
[Filed emergency 4/26/89—published 5/17/89, effective 4/26/89]
[Filed 10/26/89, Notice 5/17/89—published 11/15/89, effective 12/29/89]◊
[Filed 2/7/97, Notice 8/14/96—published 2/26/97, effective 4/4/97]
[Filed emergency 5/4/99 after Notice 3/24/99—published 6/2/99, effective 7/1/99]

CHAPTERS 151 to 154
Reserved

*Effective date (2/15/89) delayed 70 days by the Administrative Rules Review Committee at its January 5, 1989, meeting.
◊Two ARCs

CHAPTER 155
ASBESTOS REMOVAL AND ENCAPSULATION
[Prior to 10/18/00, see 875—Chs 81 and 82]

875—155.1(88B) Definitions.

"Asbestos" means material containing at least 1 percent by weight of chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, actinolite asbestos or any combination of these minerals. Chemical treatment or alteration does not exempt the material from this definition.

"Asbestos project" means any activity involving the removal or encapsulation of friable asbestos materials, other releases of asbestos such as by the operation of hand-operated or power-operated tools that may produce or release fibers of asbestos, or other substantial alteration of asbestos-containing, nonfriable material. Any activities that do not qualify as construction pursuant to rule 875—150.2(91C) are not asbestos projects.

"Business entity" means a partnership, firm, association, corporation, sole proprietorship, or other business concern. A business entity that uses its own employees in removing or encapsulating asbestos for the purpose of renovating, maintaining or repairing its own facilities is not included.

"Contractor/supervisor" means a person who supervises workers on asbestos projects or a person who enters into contracts to perform asbestos projects and personally completes the work.

"Division" means the division of labor services.

"Friable asbestos material" means any material containing more than 1 percent asbestos by weight and that can be crumbled, pulverized, or reduced to powder by hand pressure when dry.

"Inspector" means a person who inspects for asbestos-containing building materials in a school or a public or commercial building.

"License" means an authorization issued by the division permitting an individual to be employed as a worker, contractor/supervisor, inspector, management planner, or project designer.

"Management planner" means a person who prepares asbestos management plans for a school building.

"Permit" means an authorization issued by the division permitting a business entity to remove or encapsulate asbestos.

"Project designer" means a person who designs asbestos response or maintenance projects for a school or a public or commercial building.

"Worker" means a person who performs response or maintenance activities on one or more asbestos projects.

"Working days" means Monday through Friday including holidays that fall on Monday through Friday. The first working day shall be the date of actual delivery or the postmark date, whichever is earlier. However, documents with Saturday or Sunday postmark dates will be treated as though postmarked on the following Monday.

875—155.2(88B) Permit application procedures.

155.2(1) *Application.* To apply for or to renew a permit, a business entity shall submit a completed application, Form 309-6504, to the division. All requested applicable information and attachments must be provided. A $500 nonrefundable application fee shall accompany each permit application.

155.2(2) *Action on application.* A new permit shall be valid for one year from the date of issuance. A renewal permit shall be valid for one year from the expiration date of the applicant's prior permit. A permit may be denied for the reasons set forth in rule 155.8(17A,88B,252J,261) or if the application package is incomplete. Within 60 days of receiving a completed application package for a new permit, the division will issue a license or deny the application. Within 30 days of receiving a completed application package for a permit renewal, the division will issue a license or deny the application. Applications received after expiration of a prior permit will be considered applications for new permits rather than renewals.

875—155.3(88B) Other asbestos regulations. Regulation of encapsulation, removal and abatement procedures are found in 875—Chapters 10 and 26 and 567—Chapter 23. Nothing in this chapter shall be viewed as providing an exemption, waiver, or variance from any otherwise applicable regulation or statute.

875—155.4(88B) Asbestos project records. The permittee shall keep a record of each asbestos project it performs and shall make the record available to the division at any reasonable time. Records required by this rule shall be kept for at least six years. The records shall include:

155.4(1) The name, address, and license number of the individual who supervised the asbestos project and of each employee or agent who worked on the project.

155.4(2) The location and a description of the project and the amount of asbestos material that was removed.

155.4(3) The start and completion dates of each instance of removal or encapsulation.

155.4(4) A summary of the procedures that were used to comply with all applicable standards.

155.4(5) The name and address of each asbestos disposal site where the asbestos-containing waste was deposited.

155.4(6) A receipt from the asbestos disposal site indicating the amount of asbestos and disposal date.

155.4(7) Copies of reports required by 29 CFR 1926.1101(k)(3)(iii).

155.4(8) Copies of air sampling results or initial negative assessment as required by 29 CFR 1926.1101(c).

155.4(9) Material safety data sheets for all solvents used on the asbestos project.

875—155.5(88B) Ten-day notices.

155.5(1) *General.* Permittees shall notify the division at least ten working days before an asbestos project begins. A project begins when site preparations for asbestos abatement, encapsulation, or removal begin; when asbestos abatement, encapsulation, or removal begins; or when any demolition begins, whichever is sooner. Facsimile transmissions of ten-day notices shall not be accepted.

155.5(2) *Emergency.* When there is an immediate danger to life, health or property, the permittee may file the notice within five days after beginning the project. An explanation of the emergency must be included.

155.5(3) *Format.* The notice shall be on an 8½" by 11" sheet of paper and shall contain the following information:

a. The name, address, and telephone number of and contact person for the permittee performing the project.

b. The name, address, and telephone number of the project.

c. A description of the structure and work to be performed, including type and quantity of asbestos-containing material.

d. The anticipated dates of the project's start and end.

e. Designation of the asbestos disposal site.
f. The signature and printed name of the person who completed the form.
g. The shift or work schedule on which the project will be performed.

875—155.6(88B) License application procedures.

155.6(1) *Forms.* Iowa Form 309-2068 must be used for all new and renewal asbestos license applications. The second page of the form is the respirator fit test and the third page is a physician's certification. Forms from other states may not be substituted for the Iowa form or any part thereof. Respirator fit tests and medical examinations must have occurred within the past 12 months. Only worker and contractor/supervisor license applicants must submit the respirator fit test and physician's certification forms. Photocopies of the forms shall not be accepted.

155.6(2) *Training.* A certificate of appropriate training from a course provider approved for asbestos training by the U.S. Environmental Protection Agency must accompany all applications. Applicants for a license must be trained by training providers other than themselves. Applicants who completed initial training under a prior set of applicable rules will not be required to take another initial training course if they complete annual refresher courses.

155.6(3) *Photographs.* Two passport-sized (1½" by 1½") photographs clearly showing the applicant's face shall accompany all license applications received after November 22, 2000.

155.6(4) *Worker licenses.* All persons seeking a license as an asbestos abatement worker shall complete an initial four-day training course and thereafter complete an annual one-day asbestos abatement worker refresher training course. A nonrefundable fee of $20 shall accompany the application.

155.6(5) *Contractor/supervisor licenses.* All persons seeking a license as an asbestos abatement contractor/supervisor shall complete an initial five-day training course and thereafter complete an annual one-day asbestos abatement contractor/supervisor refresher training course. A nonrefundable fee of $50 shall accompany the application.

155.6(6) *Inspector licenses.* All persons seeking a license as an asbestos inspector shall complete an initial three-day training course and thereafter complete an annual one-half-day asbestos inspector refresher training course. A nonrefundable fee of $20 shall accompany the application.

155.6(7) *Management planner licenses.* All persons seeking a license as an asbestos management planner shall complete an initial three-day inspector training course and an initial two-day management planning training course. Thereafter, an annual one-half-day asbestos inspector refresher training course plus an additional one-half-day course on management planning are required. A nonrefundable fee of $20 shall accompany the application.

155.6(8) *Abatement project designer licenses.* All persons seeking a license as an asbestos abatement project designer shall complete an initial three-day abatement project designer training course. Thereafter, an annual one-day asbestos abatement project designer refresher training course is required. A nonrefundable fee of $50 shall accompany the application.

155.6(9) *Action on application.* Within 30 days of receiving a completed application, the division will issue a license or deny the application. If a license is issued, it will expire one year from the date the training was completed. An application may be denied for the reasons set forth in rule 155.8(17A,88B,252J,261) or if the application package is incomplete.

155.6(10) *License on job site.* While conducting asbestos work that requires a license, the license or a legible copy of the license shall be in the licensee's possession at the work site.

875—155.7(88B) Duplicate permits and licenses. Duplicate original permits and licenses are available from the division for a $10 fee.

875—155.8(17A,88B,252J,261) Denial, suspension and revocation.

155.8(1) *Grounds.* The division may deny an application or suspend or revoke a permit or license when an investigation reasonably determines any of the following:

a. Fraud or deception was utilized in obtaining or attempting to obtain a permit or license.

b. The qualifications for a permit or license are not met.

c. Any applicable federal or state standard for removal or encapsulation of asbestos was violated.

d. An unlicensed or untrained person was employed or allowed to work on an asbestos project.

e. The division received a certificate of noncompliance from the college student aid commission or the child support recovery unit of the department of human services.

f. Penalties or other debts are owed by the applicant to the division and are 30 days or more in arrears.

155.8(2) *Relinquishing license or permit.* A licensee or permittee must return the original license or permit to the division when a revocation or suspension becomes final.

155.8(3) *Suspension period.* Unless ordered otherwise, a suspension shall last for 12 months.

875—155.9(17A,88B) Contested cases.

155.9(1) *Scope.* This rule applies to civil penalty assessments and to denials, revocations and suspensions of asbestos licenses and permits.

155.9(2) *Procedures.* The labor commissioner shall serve a notice of intended action by restricted certified mail, return receipt requested, or by other service as permitted by Iowa Code section 17A.8. A notice of contest must be received by the labor commissioner within 20 days after service of the notice of intended action. If a notice of contest is not timely filed, the action stated in the notice of intended action shall automatically be effective. Hearing procedures for asbestos contested cases are set forth in 875—Chapter 1, Division V. However, if a contested case is based on receipt by the division of a certificate of noncompliance, procedures outlined in Iowa Code chapter 252J or 261 shall apply.

These rules are intended to implement Iowa Code chapters 17A, 88B, 252J, and 261.

[Filed 3/22/85, Notice 11/7/84—published 4/10/85, effective 5/15/85*]
[Filed emergency 9/5/86—published 9/24/86, effective 9/24/86]
[Filed emergency 4/17/87—published 5/6/87, effective 4/17/87]
[Filed 4/27/88, Notice 12/30/87—published 5/18/88, effective 7/1/88]
[Filed 7/8/88, Notice 5/18/88—published 7/27/88, effective 9/1/88]
[Filed 3/17/89, Notice 9/21/88—published 4/5/89, effective 5/10/89]
[Filed emergency 5/25/89—published 6/14/89, effective 7/1/89]
[Filed 10/26/89, Notice 6/14/89—published 11/15/89, effective 12/29/89]
[Filed 4/19/91, Notices 12/26/90, 1/23/91—published 5/15/91, effective 6/19/91]
[Filed 9/19/00, Notice 3/22/00—published 10/18/00, effective 11/22/00]

CHAPTERS 156 to 159
Reserved

*Effective date of Ch 81 delayed seventy days by the Administrative Rules Review Committee.
Exception: See rule 82.11(88B).
Effective date of Ch 82 delayed seventy days by the Administrative Rules Review Committee, IAB 6/5/85.
Effective date (5/15/85) of 82.3(1)"a"(11) delayed by the Administrative Rules Review Committee until the expiration of forty-five calendar days into the 1986 session of the General Assembly pursuant to Iowa Code section 17A.8(9), IAB 7/31/85.

LABELS AND MARKS

See also SIGNS AND SIGNBOARDS

LAGOONS
See ENVIRONMENTAL PROTECTION COMMISSION: Air Quality: Anaerobic Lagoons

LAKES
Benefited recreational district elections **721**—21.830
Boating **571**—chs 36, 40, 45, *see also BOATS AND BOATING*
Docks **571**—16.3
Feeding operations, proximity **567**—65.11(5)*c*, ch 65 Table 2
Fishing **571**—61.22–61.24, 81.2, ch 82, 83.2, *see also FISH AND FISHING*
Grants, rehabilitation **571**—30.14
Hunting **571**—chs 52, 53, 91.4(3), *see also HUNTING*
Lakebed land, rental/lease **571**—ch 18
Standards, water quality **567**—ch 61
Swimming **571**—ch 40
Watersheds
  Establishment **571**—ch 31
  Rehabilitation, funds **571**—30.14
  Soil conservation appropriation **27**—10.41(2), 10.52, 10.56, 10.60(5)
Wildlife refuges **571**—ch 52

LAND
See also CROPS; LEASES; PROPERTY; SOIL CONSERVATION DIVISION
Acquisition
  Blufflands protection program **571**—ch 24
  Bureau **561**—1.3(2)*d*(7)
  Trails
    Recreational **761**—165.15
    Snowmobile/all-terrain vehicle **571**—28.8
  Water access **571**—ch 30
  Wildlife habitats **571**—ch 23
Agricultural
  Assessment/equalization **701**—ch 71
  Leasing
    State-owned **571**—ch 18
    Wildlife habitats **571**—ch 21
  Pipeline construction, land restoration **199**—ch 9
  Purchase, loans **25**—4.4(2)

LEMON LAW
See MOTOR VEHICLES

LEVEES
See FLOOD CONTROL

LIBRARIES

LIBRARIES (cont'd)
State

Internet access **286**—ch 7
Materials, disposal **286**—1.7
Organization **286**—1.3
Photocopies **286**—1.4
Records
Generally, public/fair information **286**—ch 2
Address **286**—2.3(1)
Confidential **286**—2.9(2), 2.10, 2.11, 2.13(2,3)
Data processing **286**—2.14, 2.16
Definition **286**—2.10(1)
Disclaimer **286**—2.17
Disclosure **286**—2.9–2.12
Open **286**—2.13(1), 2.15
Personally identifiable information **286**—2.14
Personnel **286**—2.14(1)
Rule-making **286**—2.15(5)
Services/programs, *generally* **286**—chs 3, 6, 8.6
Telecommunications network **199**—39.4; **751**—7.1, 7.4(6), 7.5"13–15," 8.3

LICENSES
See also PERMITS; PROFESSIONAL LICENSING AND REGULATION DIVISION; PROFESSIONAL LICENSURE
Accountants, *see ACCOUNTANCY, ACCOUNTANTS: Certification/Licensure*
Administrators, schools **282**—14.14, 14.25, 17.7, ch 20
Agriculture, *see AGRICULTURE AND LAND STEWARDSHIP DEPARTMENT*
Amateur radio operators **761**—401.5
Asbestos, removal/encapsulation **875**—155.1, 155.6–155.9
Athletic trainers **645**—ch 350, *see also ATHLETICS: Trainers*
Audiologists, *see SPEECH PATHOLOGY AND AUDIOLOGY*
Banks
Debt management **187**—2.9
Loans **187**—15.1, 15.2, 16.1
Barbers, *see BARBERS*
Beer/liquor establishments, *see BEER AND LIQUOR*
Bingo
Manufacturers/distributors **481**—100.80–100.82
Qualified organizations **481**—103.2, 103.10, 103.18, *see also Gambling below*
Birth centers **481**—50.3(3), 50.8(4), 52.2
Boats, excursion gambling **491**—1.5(1,3), ch 6, *see also RACING AND GAMING: Gaming, Boats/Racetracks*

LIVESTOCK (cont'd)
Disease