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Virginia Register of Regulations

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THE VIRGINIA REGISTER OF REGULATIONS (USPS-001831) is published biweekly, with quarterly cumulative indices published in January, April, July and October, for $188.00 per year by LexisNexis Matthew Bender, 1275 Broadway, Albany, NY 12204. Periodical postage is paid at Albany, NY and at additional mailing offices. POSTMASTER: Send address changes to LexisNexis Matthew Bender, 1275 Broadway, Albany, NY 12204.

THE VIRGINIA REGISTER INFORMATION PAGE

THE VIRGINIA REGISTER OF REGULATIONS is an official state publication issued every other week throughout the year. Indexes are published quarterly, and are cumulative for the year. The *Virginia Register* has several functions. The new and amended sections of regulations, both as proposed and as finally adopted, are required by law to be published in the *Virginia Register*. In addition, the *Virginia Register* is a source of other information about state government, including petitions for rulemaking, emergency regulations, executive orders issued by the Governor, and notices of public hearings on regulations.

ADOPTION, AMENDMENT, AND REPEAL OF REGULATIONS

An agency wishing to adopt, amend, or repeal regulations must first publish in the *Virginia Register* a notice of intended regulatory action; a basis, purpose, substance and issues statement; an economic impact analysis prepared by the Department of Planning and Budget; the agency's response to the economic impact analysis; a summary; a notice giving the public an opportunity to comment on the proposal; and the text of the proposed regulation.

Following publication of the proposal in the Virginia Register, the promulgating agency receives public comments for a minimum of 60 days. The Governor reviews the proposed regulation to determine if it is necessary to protect the public health, safety and welfare, and if it is clearly written and easily understandable. If the Governor chooses to comment on the proposed regulation, his comments must be transmitted to the agency and the Registrar no later than 15 days following the completion of the 60-day public comment period. The Governor's comments, if any, will be published in the *Virginia Register*. Not less than 15 days following the completion of the 60-day public comment period, the agency may adopt the proposed regulation.

The Joint Commission on Administrative Rules (JCAR) or the appropriate standing committee of each house of the General Assembly may meet during the promulgation or final adoption process and file an objection with the Registrar and the promulgating agency. The objection will be published in the *Virginia Register*. Within 21 days after receipt by the agency of a legislative objection, the agency shall file a response with the Registrar, the objecting legislative body, and the Governor.

When final action is taken, the agency again publishes the text of the regulation as adopted, highlighting all changes made to the proposed regulation and explaining any substantial changes made since publication of the proposal. A 30-day final adoption period begins upon final publication in the *Virginia Register*.

The Governor may review the final regulation during this time and, if he objects, forward his objection to the Registrar and the agency. In addition to or in lieu of filing a formal objection, the Governor may suspend the effective date of a portion or all of a regulation until the end of the next regular General Assembly session by issuing a directive signed by a majority of the members of the appropriate legislative body and the Governor. The Governor's objection or suspension of the regulation, or both, will be published in the *Virginia Register*. If the Governor finds that changes made to the proposed regulation have substantial impact, he may require the agency to provide an additional 30-day public comment period on the changes. Notice of the additional public comment period required by the Governor will be published in the *Virginia Register*.

The agency shall suspend the regulatory process for 30 days when it receives requests from 25 or more individuals to solicit additional public comment, unless the agency determines that the changes have minor or inconsequential impact.

A regulation becomes effective at the conclusion of the 30-day final adoption period, or at any other later date specified by the promulgating agency, unless (i) a legislative objection has been filed, in which event the regulation, unless withdrawn, becomes effective on the date specified, which shall be after the expiration of the 21-day objection period; (ii) the Governor exercises his authority to require the agency to provide for additional public comment, in which event the regulation, unless withdrawn, becomes effective on the date specified, which shall be after the expiration of the period for which the Governor has provided for additional public comment; (iii) the Governor and the General Assembly exercise their authority to suspend the effective date of a regulation until the end of the next regular legislative session; or (iv) the agency suspends the regulatory process, in which event the regulation, unless withdrawn, becomes effective on the date specified, which shall be after the expiration of the 30-day public comment period and no earlier than 15 days from publication of the readopted action.

A regulatory action may be withdrawn by the promulgating agency at any time before the regulation becomes final.

FAST-TRACK RULEMAKING PROCESS

Section 2.2-4012.1 of the Code of Virginia provides an exemption from certain provisions of the Administrative Process Act for agency regulations deemed by the Governor to be noncontroversial. To use this process, Governor's concurrence is required and advance notice must be provided to certain legislative committees. Fast-track regulations will become effective on the date noted in the regulatory action if no objections to using the process are filed in accordance with § 2.2-4012.1.

EMERGENCY REGULATIONS

Pursuant to § 2.2-4011 of the Code of Virginia, an agency, upon consultation with the Attorney General, and at the discretion of the Governor, may adopt emergency regulations that are necessitated by an emergency situation. An agency may also adopt an emergency regulation when Virginia statutory law or the appropriation act or federal law or federal regulation requires that a regulation be effective in 280 days or less from its enactment. The emergency regulation becomes operative upon its adoption and filing with the Registrar of Regulations, unless a later date is specified. Emergency regulations are limited to no more than 12 months in duration; however, may be extended for six months under certain circumstances as provided for in § 2.2-4011 D. Emergency regulations are published as soon as possible in the *Register*.

During the time the emergency status is in effect, the agency may proceed with the adoption of permanent regulations through the usual procedures. To begin promulgating the replacement regulation, the agency must (i) file the Notice of Intended Regulatory Action with the Registrar within 60 days of the effective date of the emergency regulation and (ii) file the proposed regulation with the Registrar within 180 days of the effective date of the emergency regulation. If the agency chooses not to adopt the regulations, the emergency status ends when the prescribed time limit expires.

STATEMENT

The foregoing constitutes a generalized statement of the procedures to be followed. For specific statutory language, it is suggested that Article 2 (§ 2.2-4006 et seq.) of Chapter 40 of Title 2.2 of the Code of Virginia be examined carefully.

CITATION TO THE *VIRGINIA REGISTER*

The *Virginia Register* is cited by volume, issue, page number, and date. **26:20 VA.R. 2510-2515 June 7, 2010,** refers to Volume 26, Issue 20, pages 2510 through 2515 of the *Virginia Register* issued on June 7, 2010.

The Virginia Register of Regulations is published pursuant to Article 6 (§ 2.2-4031 et seq.) of Chapter 40 of Title 2.2 of the Code of Virginia.

PUBLICATION SCHEDULE AND DEADLINES

This schedule is available on the *Register*'s Internet home page (http://register.state.va.us).

September 2010 through August 2011

Volume: Issue	Material Submitted By Noon*	Will Be Published On
27:1	August 25, 2010	September 13, 2010
27:2	September 8, 2010	September 27, 2010
27:3	September 22, 2010	October 11, 2010
27:4	October 6, 2010	October 25, 2010
27:5	October 20, 2010	November 8, 2010
27:6	November 3, 2010	November 22, 2010
27:7	November 16, 2010 **(Tuesday)**	December 6, 2010
27:8	December 1, 2010	December 20, 2010
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27:21	June 1, 2011	June 20, 2011
27:22	June 15, 2011	July 4, 2011
27:23	June 29, 2011	July 18, 2011
27:24	July 13, 2011	August 1, 2011
27:25	July 27, 2011	August 15, 2011
27:26	August 10, 2011	August 29, 2011

*Filing deadlines are Wednesdays unless otherwise specified.

TITLE 1. ADMINISTRATION

STATE BOARD OF ELECTIONS

REGISTRAR'S NOTICE: For the following regulations, the State Board of Elections is claiming an exemption from the Administrative Process Act pursuant to § 2.2-4002 B 8 of the Code of Virginia, which exempts agency action relating to the conduct of elections or eligibility to vote.

Proposed Regulation

Title of Regulation: **1VAC20-20. Records Administration (adding 1VAC20-20-10, 1VAC20-20-20).**

Statutory Authority: § 24.2-103 of the Code of Virginia.

Public Hearing Information:

September 14, 2010 - 10 a.m. - General Assembly Building, 910 Capitol Street, House Room D, Richmond, VA

Public Comment Deadline: October 14, 2010.

Agency Contact: Martha Brissette, Policy Analyst, State Board of Elections, 1100 Bank St., Richmond, VA 23219, telephone (804) 864-8925, or email martha.brissette@sbe.virginia.gov.

Summary:

Federal and state laws require Virginia election administrators to maintain the security and confidentiality of personal voter information, including social security number and full date of birth. The proposed regulation provides a standard for encryption technology that localities may provide as an alternative to redacting personal information from applications and other documents before transmitting them electronically.

CHAPTER 20
RECORDS ADMINISTRATION

1VAC20-20-10. (Reserved.)

1VAC20-20-20. Electronic transmission of records containing sensitive personal information; encryption or redaction required.

State and local election staff shall use encryption technology meeting the Security Requirements for Cryptographic Modules, FIPS PUB 140-2, issued May 25, 2001, with change notices through December 3, 2002, of the National Institute of Technology (NIST) of the United States Department of Commerce (http://csrc.nist.gov/publications/fips/fips140-2/fips1402.pdf) to transmit electronically any records containing sensitive personal information. Electronic transmission includes email or facsimile transmission. For purposes of this regulation, sensitive personal information means: (i) more than four digits of a social security number or other unique identifier other than voter identification number; (ii) day and month of birth; or (iii) the residence address of voters qualified for protection under § 24.2-418 of the Code of Virginia. If encryption is not used, then all sensitive personal information must be redacted from the record before the record is transmitted electronically. "Redact" means alteration or truncation of data so that no sensitive personal information is accessible.

DOCUMENTS INCORPORATED BY REFERENCE (1VAC20-20)

Security Requirements for Cryptographic Modules, FIPS PUB 140-2, issued May 25, 2001, including change notices through December 3, 2002, National Institute of Standards and Technology, U.S. Department of Commerce; http://csrc.nist.gov/publications/fips/fips140-2/fips1402.pdf.

VA.R. Doc. No. R11-2576; Filed August 26, 2010, 8:58 p.m.

Proposed Regulation

Title of Regulation: **1VAC20-40. Voter Registration (adding 1VAC20-40-10 through 1VAC20-40-60).**

Statutory Authority: § 24.2-103 of the Code of Virginia.

Public Hearing Information:

September 14, 2010 - 10 a.m. - General Assembly Building, 910 Capitol Street, House Room D, Richmond, VA

Public Comment Deadline: October 14, 2010.

Agency Contact: James B. Alcorn, Deputy Secretary, State Board of Elections, 1100 Bank Street, Richmond, VA 23219, telephone (804) 864-8944, or email james.alcorn@sbe.virginia.gov.

Summary:

As required by § 24.2-406 D of the Code of Virginia, the State Board of Elections adopted and secured preclearance for a regulation on determining residency for voter registration in 2009. This regulation was published on the board's website as SBE Policy 2009-005 with approved correspondence before the board adopted procedures for using the Virginia Regulatory Town Hall

and Virginia Register of Regulations for adopting regulations. The board recently approved procedures and the previously approved regulation is being proposed with stylistic changes to conform to Virginia Administrative Code technical specifications. A clarifying definition of address is also proposed to provide guidance and ensure uniform treatment of applicants requesting exclusion of residence addresses from published voter lists under § 24.2-418 of the Code of Virginia.

CHAPTER 40
VOTER REGISTRATION

Article 1
General Provisions

1VAC20-40-10. Definitions.

The following words and terms when used in this chapter shall have the following meanings unless the context clearly indicates otherwise:

"Abode" or "place of abode" means a physical place where a person dwells. One may have multiple places of abode, such as a second home.

"Address" or "residence address" for purposes of voter registration and address confirmation means the address of residence in the precinct required for voter registration. An alternative mailing address may be included on a voter registration application when: (i) the residence address of the applicant cannot receive mail; or (ii) the voter is otherwise eligible by law to provide an alternative mailing address. Alternative mailing addresses must be sufficient to enable the delivery of mail by the United States Postal Service. The post office box for published lists may be provided either by the United States Postal Service or a commercial mail receiving agency (CMRA) described in the United States Postal Service Domestic Mail Manual.

"Domicile" means a person's primary home, the place where a person dwells and which he considers to be the center of his domestic, social, and civil life. Domicile is primarily a matter of intention, supported by an individual's factual circumstances. Once a person has established domicile, establishing a new domicile requires that he intentionally abandon his old domicile. For any applicant, the registrar shall presume that domicile is at the address of residence given by the person on the application. The registrar shall not solicit evidence to rebut this presumption if the application appears to be legitimate, except as provided in 1VAC20-40-40 B and C.

"Residence," "residency," or "resident" for all purposes of qualification to register and vote means and requires both domicile and a place of abode.

Article 2
Residency for Voter Registration

1VAC20-40-20. Required intent for voter registration.

A. Nothing in this article shall be construed to confer upon any person any privileges or benefits other than the right to register to vote and to be qualified to vote in an election.

B. Pursuant to the requirements of § 24.2-404 D of the Code of Virginia, the following shall apply only in determining a person's residence under Article II, Sec. 1 of the Constitution of Virginia and Title 24.2 of the Code of Virginia.

1 A person who intends to remain in a location for an unlimited time has established the intent required to establish domicile.

2. A person who intends to remain in his current location for an unlimited time has established the intent required to establish domicile even if he may leave upon the happening of a future contingency. Examples of such future contingencies include, but are not limited to, a change in job status or location, graduation from school, military transfer deployments or other relocations, and medical emergencies.

3. A person who presently intends to leave his current location at a fixed and certain date may not have established the intent required to establish domicile depending on the facts and circumstances of each case, as determined by the registrar, with all due consideration given to persons in the circumstances contained in 1VAC20-40-30 B.

4. A person who applies to register to vote in a precinct for the primary purpose of registering to vote or voting in that precinct has not established the intent to establish domicile there.

1VAC20-40-30. Presumptions.

A. Residency shall be broadly construed to provide the greatest opportunity to register and to vote. A residence can be established in a commercial, industrial, or other building that is not normally used for residential purposes if the building serves as the applicant's primary nighttime residence. A homeless person will be considered resident in the location where the homeless person usually sleeps at night. In cases involving nontraditional habitations, the location of the person's usual sleeping area shall be controlling as to the residency of that person.

B. No presumption in favor of or against residence may arise merely on the basis of a person's presence or absence in the following circumstances:

1. While employed in the service of the Commonwealth or United States, whether military or civilian;

2. While engaged in the navigation of the waters of the United States or of the high seas;

3. While employed by or enrolled as a student in any educational institution, or residing in any housing commonly occupied by students or faculty;

4. While confined in any jail or other correctional facility as a nonfelon;

5. While receiving treatment or being confined for any reason in a nursing home, hospital, rehabilitation or short term care facility, retirement or veterans' home, or like institution or private facility;

6. While remaining in a location only during the workweek in order to conduct business; or

7. While residing in an area within the boundaries of Virginia that has been ceded to or acquired by the federal government.

C. If a person resides in an area lacking a specific mailing address, the general registrar shall ask him to provide a mailing address along with a description indicating where the person resides. However, no person shall be denied registration for failure to submit a mailing address. The description must identify the location with sufficient specificity to allow the general registrar to place the location in a defined precinct. The general registrar shall assign the person to the precinct containing the location where he resides.

D. A person whose home is destroyed or rendered uninhabitable does not lose residence at that home if he intends to return to the home when it is reconstructed or made habitable, unless he has either established a new domicile or has changed his voter registration.

E. A person whose residence is divided by a jurisdictional boundary line or election district boundary line shall be deemed to reside in the location of his bedroom or usual sleeping area.

F. The general registrar shall not automatically presume the residence of one spouse to be that of the other spouse, but shall determine the other spouse's residence in accordance with the applicable statutes and regulations.

G. A person loses voting residence in any county or city in Virginia by registering to vote or voting in any other county, city, or state. An otherwise qualified voter shall not lose their residence at an address until they have established their residence at another address.

1VAC20-40-40. Review of application.

A. Except as provided in § 24.2-411.1 of the Code of Virginia, if (i) application to register to vote is not signed or is missing information required by law, or (ii) the general registrar cannot determine from the information provided on the application the location at which the applicant intended to register, the general registrar shall deny the application and process it in accordance with § 24.2-422 of the Code of Virginia.

B. If an application to register to vote contains all information required by law but contains other apparent discrepancies, the general registrar may promptly resolve the discrepancies through informal means. Informal means include ascertainment of information through the statewide, voter registration system, the Division of Motor Vehicles, and any form of communication with the applicant.

C. If an application to register to vote contains all information required by law, and if any of the situations in the subdivisions of this subsection apply, the general registrar shall not deny the application, but shall ask the applicant to provide additional information in support of the application. The general registrar shall request the information in writing on a form prescribed by the board and the applicant shall respond in writing. The application shall not be accepted or denied while the registrar is awaiting the applicant's response. The general registrar shall act promptly to resolve the question of residency as soon as possible. In the event the applicant does not provide the requested information by the last day to register as established in § 24.2-416 of the Code of Virginia and the general registrar is unable to determine the applicant's residency through any other means, the general registrar shall deny the application in accordance with § 24.2-422 B of the Code of Virginia.

1. The applicant provides a mailing address in a different county, city, or state from his residential address. In this situation, the general registrar shall reconfirm the residential address and mailing address by asking the supplemental questions provided in 1VAC20-40-50 and mailing the questions to both the residential and mailing addresses;

2. The applicant provides a residential address that cannot receive mail, or from which mail sent by the registrar's office is returned. In this situation, the general registrar shall ask for an alternate mailing address;

3. The applicant provides an address that is temporary in nature. Temporary addresses shall include, but not be limited to, hotels, motels, motor homes, hospitals and other short term medical care facilities, houseboats, campgrounds or other facilities that have durational restrictions, such as a 30-day limitation, or any other transient address that would not be considered as a typical permanent residence address. Temporary addresses shall not include apartments or other facilities, such as dormitories, that provide for leases or other rental agreements of at least six months duration. The general registrar shall treat these addresses as permanent ones. In the event the applicant provides an address that is

temporary in nature, the general registrar shall ask the supplemental questions provided in 1VAC20-40-50;

4. The applicant provides a residential address that is a commercial, industrial, or other building that is not normally used for residential purposes, or other nontraditional residential address; or

5. The application causes a conflict with another existing voter in the statewide, voter registration system, such as a duplication of the social security number with an existing voter.

1VAC20-40-50. Supplemental questions.

When warranted by the situations described in 1VAC20-40-40 C and where any other information on the voter registration application is unclear, the general registrar shall ask the following questions on a form prescribed by the board after notifying the applicant that any response he makes is subject to the same oath he took to sign the application:

1. Are you currently registered to vote at another address? The general registrar shall not ask this question unless the applicant failed to provide the information on the voter registration application.

a. If yes to subdivision 1 of this section, what is that address, and in what county, city, or state is that address located?

b. If yes to subdivision 1 of this section or as indicated on the voter registration application, do you wish to cancel your registration in that county, city, or state and register and establish residence in this county or city in Virginia?

2. Do you have a specific plan to move away from this county or city at a fixed date in the future?

1VAC20-40-60. Review of supplemental questions.

A. If the applicant answers the questions asked pursuant to 1VAC20-40-50 with information sufficient to assign him a polling place within the precinct and to cancel his current registration elsewhere, if any, the applicant shall be registered and added to the voting rolls of the locality and the jurisdiction where the voter was previously registered shall be notified to remove the registrant from their rolls.

B. If the applicant does not provide information sufficient to assign him a polling place within the precinct, the application shall be denied.

C. If the applicant indicates that the application was in error or filed incorrectly the registrar shall provide him voting information that could allow the applicant to register or vote absentee in the Commonwealth.

D. No new or changed voter registration application is effective until an applicant provides answers to the supplemental questions. Any such answers must be in writing and must be returned before the last day to register as established in § 24.2-416 of the Code of Virginia. Any supplemental information based upon an application made prior to the close of books shall be accepted and the applicant registered if the response is received before the last day to register as established in § 24.2-416 of the Code of Virginia.

VA.R. Doc. No. R11-2351; Filed August 27, 2010, 9:01 a.m.

Proposed Regulation

Title of Regulation: **1VAC20-50. Candidate Qualification (adding 1VAC20-50-10, 1VAC20-50-20).**

Statutory Authority: § 24.2-103 of the Code of Virginia.

Public Hearing Information:

September 14, 2010 - 10 a.m. - General Assembly Building, 910 Capitol Street, House Room D, Richmond, VA

Public Comment Deadline: October 14, 2010.

Agency Contact: Peter Goldin, Policy Analyst, State Board of Elections, 1100 Bank Street, Richmond, VA 23219, telephone (804) 864-8930, FAX (804) 786-0760, or email peter.goldin@sbe.virginia.gov.

Summary:

The proposed regulation concerns material omissions from independent candidate petitions. It distinguishes between omissions that are always material and cause a petition to be rendered invalid and omissions that are not material.

CHAPTER 50
CANDIDATE QUALIFICATION

1VAC20-50-10. Definitions.

(Reserved.)

1VAC20-50-20. Material omissions from candidate petitions.

A. Pursuant to the requirements of § 24.2-506 of the Code of Virginia, a petition page should not be rendered invalid if it contains an error or omission not material to its proper processing.

B. The following omissions are always material and any petition containing such omissions should be rendered invalid if:

1. The petition submitted is not the double-sided, two-page document, or a copy thereof, provided by the State Board of Elections;

2. The petition does not have the name, or some variation of the name, and address of the candidate on the front of the form;

3. The circulator has not signed the petition affidavit and provided his current address;

4. The circulator is not a registered voter or qualified to register and vote for the candidate;

5. The circulator has not signed each petition page he circulated in the presence of a notary;

6. The circulator has not had a notary sign the affidavit for each petition submitted; or

7. Any combination of the scenarios of this subsection exists.

C. If the circulator signs the petition in the "Signature of Registered Voters," his signature shall be invalidated but the petition page shall be valid notwithstanding any other error or omission.

D. The petition should not be rendered invalid if:

1. An older version of the petition is used (provided that the information presented complies with current laws, regulations, and guidelines);

2. The "office sought" is omitted;

3. The "congressional district" is omitted;

4. The "election information" including (i) county, city, or town in which the election will be held; (ii) election type; and (iii) date of election are omitted;

5. The name of the candidate and office sought are omitted from the back page of the petition;

6. The circulator has not indicated the county, city, or town of his voter registration or voter eligibility in the affidavit;

7. The circulator has not provided the last four digits of his social security number in the affidavit;

8. The notary has not affixed a photographically reproducible seal; or

9. The notary has not included his registration number and commission expiration date.

VA.R. Doc. No. R11-2572; Filed August 27, 2010, 8:59 a.m.

Proposed Regulation

Title of Regulation: **1VAC20-60. Election Administration (adding 1VAC20-60-10, 1VAC20-60-20).**

Statutory Authority: § 24.2-103 of the Code of Virginia.

Public Hearing Information:

September 14, 2010 - 10 a.m. - General Assembly Building, 910 Capitol Street, House Room D, Richmond, VA

Public Comment Deadline: October 14, 2010.

Agency Contact: James B. Alcorn, Deputy Secretary, State Board of Elections, 1100 Bank Street, Richmond, VA 23219, telephone (804) 864-8944, or email james.alcorn@sbe.virginia.gov.

Summary:

The proposed regulation provides standards to assist general registrars in determining what omissions are always material and cause a petition to call for a referendum election to be rendered invalid and what omissions are not material.

CHAPTER 60
ELECTION ADMINISTRATION

1VAC20-60-10. Definitions.

(Reserved.)

1VAC20-60-20. Material omissions on referendum petitions.

A. Pursuant to the requirements of § 24.2-684.1 of the Code of Virginia, a petition should not be rendered invalid if it contains an error or omission not material to its proper processing.

B. The following omissions are always material and any petition containing such omissions should be rendered invalid if:

1. The petition submitted is not the double-sided, two-page document, or a copy thereof, provided by the State Board of Elections;

2. The "question" or "referendum issue" is not stated in a manner set forth by law on the front of the petition;

3. The circulator has not signed the petition affidavit and provided his current address;

4. The circulator is not a registered voter or qualified to register and vote on the issue;

5. The circulator has not signed the affidavit for each petition page he circulated in the presence of a notary;

6. The circulator has not had a notary sign the affidavit for each petition submitted;

7. The circulator has signed the petition in the "Signature of Registered Voter" field; or

8. Any combination of the aforementioned scenarios exist.

C. Subdivision B 3 of this section does not apply to a school board referendum submitted pursuant to § 24.2-57.2 or 24.2-165 of the Code of Virginia.

D. The petition should not be rendered invalid if:

1. An older version of the petition is used (provided that the information presented complies with current laws, regulations and guidelines);

2. The "election information" including: (i) county, city, or town in which the election will be held; (ii) election type; and (iii) date of election are omitted;

3. The circulator has not indicated the county, city, or town of his voter registration or voter eligibility in the affidavit;

4. The circulator has not provided the last four digits of his social security number in the affidavit;

5. The notary has not affixed a photographically reproducible seal; or

6. The notary has not included his registration number and commission expiration date.

VA.R. Doc. No. R11-2570; Filed August 26, 2010, 3:47 p.m.

Proposed Regulation

Title of Regulation: **1VAC20-70. Absentee Voting (adding 1VAC20-70-10, 1VAC20-70-20).**

Statutory Authority: § 24.2-103 of the Code of Virginia.

Public Hearing Information:

September 14, 2010 - 10 a.m. - General Assembly Building, 910 Capitol Street, House Room D, Richmond, VA

Public Comment Deadline: September 30, 2010.

Agency Contact: Peter Goldin, Policy Analyst, State Board of Elections, 1100 Bank St., Richmond, VA 23219, telephone (804) 864-8930, FAX (804) 786-0760, or email peter.goldin@sbe.virginia.gov.

Summary:

This proposed regulation details standards to assist local election officials in determining whether absentee ballots may be counted by distinguishing what omissions are always material and require that the ballot be treated as void or invalid from those that are not material.

CHAPTER 70
ABSENTEE VOTING

1VAC20-70-10. Definitions.

(Reserved.)

1VAC20-70-20. Material omissions from absentee ballots.

A. Pursuant to the requirements of § 24.2-706 of the Code of Virginia, a timely received absentee ballot contained in an "Envelope B" should not be rendered invalid if it contains an error or omission not material to its proper processing.

B. The following omissions are always material and any Envelope B containing such omissions should be rendered invalid if:

1. The voter has not included his full legal name in any order;

2. The voter has only included his first name;

3. The voter has only included his last name;

4. The voter has not provided his house number, street name, and city of residence;

5. The voter has not signed the Envelope B;

6. The voter has not had his witness sign the Envelope B;

7. The ballot is not submitted either enclosed in or attached to the Envelope B; or

8. Any combination of the omissions in subdivisions 1 to 7 of this subsection exists.

C. The ballot should not be rendered invalid if on the Envelope B:

1. The voter has omitted his middle name;

2. The voter has used a maiden name instead of a middle name;

3. The voter has used his middle initial instead of his full middle name;

4. The voter has used a nickname that is a derivative of his legal name instead of his first name ("Bob" instead of "Robert");

5. The voter has not provided his residential street identifier (Street, Drive, etc.);

6. The voter has not provided his residential zip code;

7. The voter has not provided the date or has only provided a partial date on which the absentee ballot was completed;

8. The signature of the voter is illegible; or

9. The signature of the witness is illegible.

VA.R. Doc. No. R11-2443; Filed August 27, 2010, 8:23 a.m.

TITLE 12. HEALTH

STATE BOARD OF HEALTH

Final Regulation

REGISTRAR'S NOTICE: The following regulatory action is exempt from the Administrative Process Act in accordance with § 2.2-4006 A 4 c of the Code of Virginia, which excludes regulations that are necessary to meet the requirements of federal law or regulations, provided such regulations do not differ materially from those required by federal law or regulation. The State Board of Health will receive, consider, and respond to petitions by any interested person at any time with respect to reconsideration or revision.

Title of Regulation: **12VAC5-590. Waterworks Regulations (amending 12VAC5-590-10, 12VAC5-590-50, 12VAC5-590-370, 12VAC5-590-410, 12VAC5-590-420, 12VAC5-590-530, 12VAC5-590-545, 12VAC5-590-550; adding 12VAC5-590-375, 12VAC5-590-385, 12VAC5-590-405).**

Statutory Authority: §§ 32.1-12 and 32.1-170 of the Code of Virginia.

Effective Date: October 13, 2010.

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Summary:

The Waterworks Regulations is amended to incorporate the federal Lead and Copper Rule (LCR) revisions, 40 CFR Part 141. The amendments are intended to help protect consumers from exposure to lead and copper in drinking water and enhance LCR monitoring, treatment, and lead service line replacement. Additionally, the revisions improve compliance with the public education requirements of the LCR and ensure drinking water consumers receive meaningful, timely, and useful information to help them limit their exposure to lead in drinking water.

Part I
General Framework for Waterworks Regulations

Article 1
Definitions

12VAC5-590-10. Definitions.

As used in this chapter, the following words and terms shall have meanings respectively set forth unless the context clearly requires a different meaning:

"Action level" means the concentration of lead or copper in water specified in ~~12VAC5-590-410 E~~ 12VAC5-590-385, which determines, in some cases, the treatment requirements contained in ~~12VAC5-590-420 C, D, E and F~~ 12VAC5-590-405 that an owner is required to complete.

"Air gap separation" means the unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe or faucet supplying pure water to a tank, plumbing fixture, or other device and the rim of the receptacle.

"Annual daily water demand" means the average rate of daily water usage over at least the most recent three-year period.

"Applied water" means water that is ready for filtration.

"Approved" means material, equipment, workmanship, process or method that has been accepted by the commissioner as suitable for the proposed use.

"Auxiliary water system" means any water system on or available to the premises other than the waterworks. These auxiliary waters may include water from a source such as wells, lakes, or streams; or process fluids; or used water. They may be polluted or contaminated or objectionable, or constitute an unapproved water source or system over which the water purveyor does not have control.

"Backflow" means the flow of water or other liquids, mixtures, or substances into the distribution piping of a waterworks from any source or sources other than its intended source.

"Backflow prevention device" means any approved device, method, or type of construction intended to prevent backflow into a waterworks.

"Bag filters" means pressure-driven separation devices that remove particulate matter larger than one micrometer using an engineered porous filtration media. They are typically constructed of a nonrigid, fabric filtration media housed in a pressure vessel in which the direction of flow is from the inside of the bag to outside.

"Bank filtration" means a water treatment process that uses a well to recover surface water that has naturally infiltrated into groundwater through a river bed or bank(s). Infiltration is typically enhanced by the hydraulic gradient imposed by a nearby pumping water supply or other well(s).

"Best available technology (BAT)" means the best technology, treatment techniques, or other means which the commissioner finds, after examination for efficacy under field conditions and not solely under laboratory conditions and in conformance with applicable EPA regulations, are available (taking cost into consideration).

"Board" means the State Board of Health.

"Breakpoint chlorination" means the addition of chlorine to water until the chlorine demand has been satisfied and further additions result in a residual that is directly proportional to the amount added.

"Cartridge filters" means pressure-driven separation devices that remove particulate matter larger than one micrometer using an engineered porous filtration media. They are typically constructed as rigid or semi-rigid, self-supporting filter elements housed in pressure vessels in which flow is from the outside of the cartridge to the inside.

"Chlorine" means dry chlorine.

"Chlorine gas" means dry chlorine in the gaseous state.

"Chlorine solution (chlorine water)" means a solution of chlorine in water.

"Coagulation" means a process using coagulant chemicals and mixing by which colloidal and suspended materials are destabilized and agglomerated into floc.

"Coliform bacteria group" means a group of bacteria predominantly inhabiting the intestines of man or animal but also occasionally found elsewhere. It includes all aerobic and facultative anaerobic, gram-negative, non-sporeforming bacilli that ferment lactose with production of gas. Also included are all bacteria that produce a dark, purplish-green colony with metallic sheen by the membrane filter technique used for coliform identification.

"Combined distribution system" means the interconnected distribution system consisting of the distribution systems of wholesale waterworks and of the consecutive waterworks that receive finished water.

"Commissioner" means the State Health Commissioner.

"Community waterworks" means a waterworks which serves 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 a waterworks shall 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.

"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.

"Comprehensive performance evaluation" or "(CPE)" means a thorough review and analysis of a treatment plant's performance-based capabilities and associated administrative, operational and maintenance practices. It 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 12VAC5-590-530 C 1 b (2), the comprehensive performance evaluation shall 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.

"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 waterworks" means a waterworks which has no water production or source facility of its own and which obtains all of its water from another permitted waterworks or receives some or all of its finished water from one or more wholesale waterworks. Delivery may be through a direct connection or through the distribution system of one or more consecutive waterworks.

"Consumer" means any person who drinks water from a waterworks.

"Consumer's water system" means any water system located on the consumer's premises, supplied by or in any manner connected to a waterworks.

"Contaminant" means any objectionable or hazardous 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.

"Cross connection" means any connection or structural arrangement, direct or indirect, to the waterworks whereby backflow can occur.

"CT" or "CT calc" means the product of "residual disinfectant concentration" (C) in mg/L determined before or at the first customer, and the corresponding "disinfectant contact time" (T) in minutes, i.e., "C" x "T."

"Daily fluid intake" means the daily intake of water for drinking and culinary use and is defined as two liters.

"Dechlorination" means the partial or complete reduction of residual chlorine in water by any chemical or physical process at a waterworks with a treatment facility.

"Degree of hazard" means the level of health hazard, as derived from an evaluation of the potential risk to health and the adverse effect upon the waterworks.

"Diatomaceous earth filtration" means a process resulting in substantial particulate removal in which (i) a precoat cake of diatomaceous earth filter media is deposited on a support membrane (septum), and (ii) 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.

"Disinfectant" means any oxidant (including chlorine) that is added to water in any part of the treatment or distribution

process for the purpose of killing or deactivating pathogenic organisms.

"Disinfectant contact time ("T" in CT calculations)" means the time in minutes that it takes for water to move from the point of disinfectant application to the point where residual disinfectant concentration ("C") is measured.

"Disinfection" means a process that inactivates pathogenic organisms in water by chemical oxidants or equivalent agents.

"Disinfection profile" means a summary of Giardia lamblia or virus inactivation through the treatment plant.

"Distribution main" means a water main whose primary purpose is to provide treated water to service connections.

"District Engineer" means the employee assigned by the Commonwealth of Virginia, Department of Health, Office of Drinking Water to manage its regulatory activities in a geographical area of the state consisting of a state planning district or subunit of a state planning district.

"Domestic or other nondistribution system plumbing problem" means a coliform contamination problem in a waterworks with more than one service connection that is limited to the specific service connection from which the coliform positive sample was taken.

"Domestic use or usage" means normal family or household use, including drinking, laundering, bathing, cooking, heating, cleaning and flushing toilets (see Article 2 (§ 32.1-167 et seq.) of Chapter 6 of Title 32.1 of the Code of Virginia).

"Double gate-double check valve assembly" means an approved assembly composed of two single independently acting check valves including tightly closing shutoff valves located at each end of the assembly and petcocks and test gauges for testing the watertightness of each check valve.

"Dual sample set" means a set of two samples collected at the same time and same location, with one sample analyzed for TTHM and the other sample analyzed for HAA5. Dual sample sets are collected for the purposes of conducting an initial distribution system evaluation (IDSE) under 12VAC5-590-370 B 3 e (2) and determining compliance with the TTHM and HAA5 MCLs under 12VAC5-590-370 B 3 e (3).

"Effective corrosion inhibitor residual" means, for the purpose of ~~12VAC5-590-420 C 1~~ 12VAC5-590-405 A 1 only, a concentration 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.

"Entry point" means the place where water from the source after application of any treatment is delivered to the distribution system.

"Equivalent residential connection" means a volume of water used equal to a residential connection which is 400 gallons per day unless supportive data indicates otherwise.

"Exception" means an approved deviation from a "shall" criteria contained in Part III (12VAC5-590-640 et seq.) of this chapter.

"Exemption" means a conditional waiver of a specific PMCL or treatment technique requirement which is granted to a specific waterworks for a limited period of time.

"Filter profile" means 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 porous media.

"Finished water" means water that is introduced into the distribution system of a waterworks and is intended for distribution and consumption without further treatment, except as treatment necessary to maintain water quality in the distribution system (e.g., booster disinfection, addition of corrosion control chemicals).

"First draw sample" means a one-liter sample of tap water, collected in accordance with ~~12VAC5-590-370 B 6 a (2)~~ 12VAC5-590-375 B 2, 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.

"Flowing stream" means a course of running water flowing in a definite channel.

"Free available chlorine" means that portion of the total residual chlorine remaining in water at the end of a specified contact period which will react chemically and biologically as hypochlorous acid or hypochlorite ion.

"GAC10" means granular activated carbon filter beds with an empty-bed contact time of 10 minutes based on average daily flow and a carbon reactivation frequency of every 180 days, except that the reactivation frequency for GAC10 used as a best available technology for compliance with 12VAC5-590-410 C 2 b (1) (b) shall be 120 days.

"GAC20" means granular activated carbon filter beds with an empty-bed contact time of 20 minutes based on average

daily flow and a carbon reactivation frequency of every 240 days.

"Governmental entity" means the Commonwealth, a town, city, county, service authority, sanitary district or any other governmental body established under the Code of Virginia, including departments, divisions, boards or commissions.

"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.

"Groundwater" means all water obtained from sources not classified as surface water (or surface water sources).

"Groundwater under the direct influence of surface water" means any water beneath the surface of the ground with significant occurrence of insects or other macroorganisms, algae, or large-diameter pathogens such as Giardia lamblia, or Cryptosporidium. It also means significant and relatively rapid shifts in water characteristics such as turbidity, temperature, conductivity, or pH that closely correlate to climatological or surface water conditions. The commissioner in accordance with 12VAC5-590-430 will determine direct influence of surface water.

"Haloacetic acids (five)" or "(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, fluorine, astatine or iodine.

"Health hazard" means any condition, device, or practice in a waterworks or its operation that creates, or may create, a danger to the health and well-being of the water consumer.

"Health regulations" means regulations which include all primary maximum contaminant levels, treatment technique requirements, and all operational regulations, the violation of which would jeopardize the public health.

"Hypochlorite" means a solution of water and some form of chlorine, usually sodium hypochlorite.

"Initial compliance period" means for all regulated contaminants, the initial compliance period is the first full three-year compliance period beginning at least 18 months after promulgation with the exception of waterworks with 150 or more service connections for contaminants listed at Table 2.3, VOC 19-21; Table 2.3, SOC 19-33; and antimony, beryllium, cyanide (as free cyanide), nickel, and thallium which shall begin January 1993.

"Interchangeable connection" means an arrangement or device that will allow alternate but not simultaneous use of two sources of water.

"Karstian geology" means an area predominantly underlain by limestone, dolomite, or gypsum and characterized by rapid underground drainage. Such areas often feature sinkholes, caverns, and sinking or disappearing creeks. In Virginia, this generally includes all that area west of the Blue Ridge and, in Southwest Virginia, east of the Cumberland Plateau.

"Lake/reservoir" means a natural or man-made basin or hollow on the Earth's surface in which water collects or is stored that may or may not have a current or single direction of flow.

"Large waterworks" means, for the purposes of ~~12VAC5-590-370 B 6, 12VAC5-590-420 C through F~~ 12VAC5-590-375, 12VAC5-590-405, 12VAC5-590-530 D, and 12VAC5-590-550 D only, a waterworks that serves more than 50,000 persons.

"Lead free" means the following:

1. When used with respect to solders and flux refers to solders and flux containing not more than 0.2% lead;

2. When used with respect to pipes and pipe fittings refers to pipes and pipe fittings containing not more than 8.0% lead;

3. When used with respect to plumbing fittings and fixtures intended by the plumbing manufacturer to dispense water for human ingestion refers to fittings and fixtures that are in compliance with standards established in accordance with 42 USC § 300g-6(e).

"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 that is connected to such lead line.

"Legionella" means a genus of bacteria, some species of which have caused a type of pneumonia called Legionnaires Disease.

"Liquid chlorine" means a liquefied, compressed chlorine gas as shipped in commerce.

"Locational running annual average" or "LRAA" means the average of sample analytical results for samples taken at a particular monitoring location during the previous four calendar quarters.

"Log inactivation (log removal)" means that a 99% reduction is a 2-log inactivation; a 99.9% reduction is a 3-log inactivation; a 99.99% reduction is a 4-log inactivation.

"Man-made beta particle and photon emitters" means all radionuclides emitting beta particles and/or photons listed in the most current edition of "Maximum Permissible Body Burdens and Maximum Permissible Concentration of

Radionuclides in Air or Water for Occupational Exposure," National Bureau of Standards Handbook 69, except the daughter products of thorium-232, uranium-235 and uranium-238.

"Maximum daily water demand" means the rate of water usage during the day of maximum water use.

"Maximum contaminant level (MCL)" means the maximum permissible level of a contaminant in pure water which is delivered to any user of a waterworks~~, except in the cases of turbidity and VOCs, where the maximum permissible level is measured at each entry point to the distribution system. Contaminants added to the water under circumstances controlled by the user, except those resulting from corrosion of piping and plumbing caused by water quality, are excluded from this definition~~. MCLs are set as close to the MCLGs as feasible using the best available treatment technology. ~~Maximum contaminant levels~~ MCLs may be either "primary" (PMCL), meaning based on health considerations or "secondary" (SMCL) meaning based on aesthetic considerations.

"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. For chlorine and chloramines, a waterworks is in compliance with the MRDL when the running annual average of monthly averages of samples taken in the distribution system, computed quarterly, is less than or equal to the MRDL. For chlorine dioxide, a waterworks is in compliance with the MRDL when daily samples are taken at the entrance to the distribution system and no two consecutive daily samples exceed the MRDL. MRDLs are enforceable in the same manner as maximum contaminant levels. There is convincing evidence that addition of a disinfectant is necessary for control of waterborne microbial contaminants. Notwithstanding the MRDLs listed in Table 2.12, operators 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 distribution line breaks, storm runoff events, source water contamination, or cross-connections.

"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. MRDLGs are nonenforceable health goals and do not reflect the benefit of the addition of the chemical for control of waterborne microbial contaminants.

"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°C or above.

"Medium-size waterworks" means, for the purpose of ~~12VAC5-590-370 B 6, 12VAC5-590-420 C through F~~ 12VAC5-590-375, 12VAC5-590-405, 12VAC5-590-530, and 12VAC5-590-550 D only, a waterworks that serves greater than 3,300 and less than or equal to 50,000 persons.

"Membrane filtration" means a pressure or vacuum-driven separation process in which particulate matter larger than one micrometer is rejected by an engineered barrier, primarily through a size exclusion mechanism, and that has a measurable removal efficiency of a target organism that can be verified through the application of a direct integrity test. This definition includes the common membrane technologies of microfiltration, ultrafiltration, nanofiltration, and reverse osmosis.

"Method detection limit" means the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix containing the analyte.

"Most probable number (MPN)" means that number of organisms per unit volume that, in accordance with statistical theory, would be more likely than any other number to yield the observed test result or that would yield the observed test result with the greatest frequency, expressed as density of organisms per 100 milliliters. Results are computed from the number of positive findings of coliform-group organisms resulting from multiple-portion decimal-dilution plantings.

"Noncommunity waterworks" means a waterworks that is not a community waterworks, but operates at least 60 days out of the year.

"Nonpotable water" means water not classified as pure water.

"Nontransient noncommunity waterworks (NTNC)" means a waterworks that is not a community waterworks and that regularly serves at least 25 of the same persons over six months out of the year.

"Office" means the Commonwealth of Virginia, Department of Health, Office of Drinking Water.

"One hundred year flood level" means the flood elevation which will, over a long period of time, be equaled or exceeded on the average once every 100 years.

"Operator" means any individual employed or appointed by any owner, and who is designated by such owner to be the person in responsible charge, such as a supervisor, a shift operator, or a substitute in charge, and whose duties include testing or evaluation to control waterworks operations. Not included in this definition are superintendents or directors of public works, city engineers, or other municipal or industrial

officials whose duties do not include the actual operation or direct supervision of waterworks.

"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 waterworks to violate any other section of this chapter.

"Owner" or "water purveyor" means an individual, group of individuals, partnership, firm, association, institution, corporation, governmental entity, or the federal government which supplies or proposes to supply water to any person within this state from or by means of any waterworks (see Article 2 (§ 32.1-167 et seq.) of Chapter 6 of Title 32.1 of the Code of Virginia).

"Picocurie (pCi)" means that quantity of radioactive material producing 2.22 nuclear transformations per minute.

"Plant intake" means the works or structures at the head of a conduit through which water is diverted from a source (e.g., river or lake) into the treatment plant.

"Point of disinfectant application" means 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 (POE)" means a treatment device applied to the water entering a house or building for the purpose of reducing contaminants in the water distributed throughout the house or building.

"Point-of-use treatment device (POU)" means a treatment device applied to a single tap for the purpose of reducing contaminants in the water at that one tap.

"Pollution" means the presence of any foreign substance (chemical, physical, radiological, or biological) in water that tends to degrade its quality so as to constitute an unnecessary risk or impair the usefulness of the water.

"Pollution hazard" means a condition through which an aesthetically objectionable or degrading material may enter the waterworks or a consumer's water system.

"Post-chlorination" means the application of chlorine to water subsequent to treatment.

"Practical quantitation level (PQL)" means the lowest level achievable by good laboratories within specified limits during routine laboratory operating conditions.

"Prechlorination" means the application of chlorine to water prior to filtration.

"Presedimentation" means a preliminary treatment process used to remove gravel, sand and other particulate material from the source water through settling before the water enters the primary clarification and filtration processes in a treatment plant.

"Process fluids" means any fluid or solution which may be chemically, biologically, or otherwise contaminated or polluted which would constitute a health, pollutional, or system hazard if introduced into the waterworks. This includes, but is not limited to:

1. Polluted or contaminated water;

2. Process waters;

3. Used waters, originating from the waterworks which may have deteriorated in sanitary quality;

4. Cooling waters;

5. Contaminated natural waters taken from wells, lakes, streams, or irrigation systems;

6. Chemicals in solution or suspension; and

7. Oils, gases, acids, alkalis, and other liquid and gaseous fluid used in industrial or other processes, or for fire fighting purposes.

"Pure water" or "potable water" means water fit for human consumption and domestic use which is sanitary and normally free of minerals, organic substances, and toxic agents in excess of reasonable amounts for domestic usage in the area served and normally adequate in quantity and quality for the minimum health requirements of the persons served (see Article 2 (§ 32.1-167 et seq.) of Chapter 6 of Title 32.1 of the Code of Virginia).

"Raw water main" means a water main which conveys untreated water from a source to a treatment facility.

"Reduced pressure principle backflow prevention device (RPZ device)" means a device containing a minimum of two independently acting check valves together with an automatically operated pressure differential relief valve located between the two check valves. During normal flow and at the cessation of normal flow, the pressure between these two checks shall be less than the supply pressure. In case of leakage of either check valve, the differential relief valve, by discharging to the atmosphere, shall operate to maintain the pressure between the check valves at less than the supply pressure. The unit shall include tightly closing shut-off valves located at each end of the device, and each device shall be fitted with properly located test cocks. These devices shall be of the approved type.

"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.

"Responsible charge" means designation by the owner of any individual to have duty and authority to operate or modify the operation of waterworks processes.

"Sanitary facilities" means piping and fixtures, such as sinks, lavatories, showers, and toilets, supplied with potable water and drained by wastewater piping.

"Sanitary survey" means an investigation of any condition that may affect public health.

"Secondary water source" means any approved water source, other than a waterworks' primary source, connected to or available to that waterworks for emergency or other nonregular use.

"Sedimentation" means a process for removal of solids before filtration by gravity or separation.

"Service connection" means the point of delivery of water to a customer's building service line as follows:

1. If a meter is installed, the service connection is the downstream side of the meter;

2. If a meter is not installed, the service connection is the point of connection to the waterworks;

3. When the water purveyor is also the building owner, the service connection is the entry point to the building.

"Service line sample" means a one-liter sample of water, collected in accordance with ~~12VAC5-590-370 B 6 a (2) (c)~~ 12VAC5-590-375 B 2 c, that has been standing for at least six hours in a service line.

"Sewer" means any pipe or conduit used to convey sewage or industrial waste streams.

"Single family structure" means, for the purpose of ~~12VAC5-590-370 B 6 (a)~~ 12VAC5-590-375 B only, 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) resulting in substantial particulate removal by physical and biological mechanisms.

"Small waterworks" means, for the purpose of ~~12VAC5-590-370 B 6, 12VAC5-590-420 C through F~~ 12VAC5-590-375, 12VAC5-590-405, 12VAC5-590-530 D and 12VAC5-590-550 D only, a waterworks that serves 3,300 persons or fewer.

"Standard sample" means that portion of finished drinking water that is examined for the presence of coliform bacteria.

"Surface water" means all water 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 (UV_{254}) (in m-1) by its concentration of dissolved organic carbon (DOC) (in mg/L).

"Synthetic organic chemicals (SOC)" means one of the family of organic man-made compounds generally utilized for agriculture or industrial purposes.

"System hazard" means a condition posing an actual, or threat of, damage to the physical properties of the waterworks or a consumer's water system.

"Terminal reservoir" means an impoundment providing end storage of water prior to treatment.

"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 effective storage volume" means the volume available to store water in distribution reservoirs measured as the difference between the reservoir's overflow elevation and the minimum storage elevation. The minimum storage elevation is that elevation of water in the reservoir that can provide a minimum pressure of 20 psi at a flow as determined in 12VAC5-590-690 C to the highest elevation served within that reservoir's service area under systemwide maximum daily water demand.

"Total organic carbon (TOC)" means total organic carbon in mg/L 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 concentrations of the trihalomethanes expressed in milligrams per liter (mg/L) and rounded to two significant figures. For the purpose of these regulations, the TTHM's shall mean trichloromethane (chloroform), dibromochloromethane, bromodichloromethane, and tribromomethane (bromoform).

"Transmission main" means a water main whose primary purpose is to move significant quantities of treated water among service areas.

"Treatment technique requirement" means a requirement which specifies for a contaminant a specific treatment technique(s) demonstrated to the satisfaction of the division to lead to a reduction in the level of such contaminant sufficient to comply with these regulations.

"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.

"Two-stage lime softening" means a process in which chemical addition and hardness precipitation occur in each of

two distinct unit clarification processes in series prior to filtration.

"Uncovered finished water storage facility" means a tank, reservoir, or other facility used to store water that will undergo no further treatment to reduce microbial pathogens (except residual disinfection) and is directly open to the atmosphere.

"Unregulated contaminant (UC)" means a contaminant for which a monitoring requirement has been established, but for which no MCL or treatment technique requirement has been established.

"Used water" means any water supplied by a water purveyor from the waterworks to a consumer's water system after it has passed through the service connection.

"Variance" means a conditional waiver of a specific regulation which is granted to a specific waterworks. A PMCL Variance is a variance to a Primary Maximum Contaminant Level, or a treatment technique requirement. An Operational Variance is a variance to an operational regulation or a Secondary Maximum Contaminant Level. Variances for monitoring, reporting and public notification requirements will not be granted.

"Virus" means a microbe that is infectious to humans by waterborne transmission.

"Volatile synthetic organic chemical (VOC)" means one of the family of manmade organic compounds generally characterized by low molecular weight and rapid vaporization at relatively low temperatures or pressures.

"Waterborne disease outbreak" means the significant occurrence of acute infectious illness, epidemiologically associated with the ingestion of water from a waterworks which is deficient in treatment, as determined by the commissioner or the State Epidemiologist.

"Water purveyor" (same as owner).

"Water supply" means water that shall have been taken into a waterworks from all wells, streams, springs, lakes, and other bodies of surface waters (natural or impounded), and the tributaries thereto, and all impounded groundwater, but the term "water supply" shall not include any waters above the point of intake of such waterworks (see Article 2 (§ 32.1-167 et seq.) of Chapter 6 of Title 32.1 of the Code of Virginia).

"Water supply main" or "main" means any water supply pipeline that is part of a waterworks distribution system.

"Water Well Completion Report" means a report form published by the State Water Control Board entitled "Water Well Completion Report" which requests specific information pertaining to the ownership, driller, location, geological formations penetrated, water quantity and quality encountered as well as construction of water wells. The form is to be completed by the well driller.

"Waterworks" means a system that serves piped water for drinking or domestic use to (i) the public, (ii) at least 15 connections, or (iii) an average of 25 individuals for at least 60 days out of the year. The term "waterworks" shall include all structures, equipment and appurtenances used in the storage, collection, purification, treatment and distribution of pure water except the piping and fixtures inside the building where such water is delivered (see Article 2 (§ 32.1-167 et seq.) of Chapter 6 of Title 32.1 of the Code of Virginia).

"Waterworks with a single service connection" means a waterworks which supplies drinking water to consumers via a single service line.

"Wholesale waterworks" means a waterworks that treats source water as necessary to produce finished water and then delivers some or all of that finished water to another waterworks. Delivery may be through a direct connection or through the distribution system of one or more consecutive waterworks.

12VAC5-590-50. Application of regulations to waterworks and water supplies in operation or planned prior to the effective date of the regulations.

Waterworks and water supplies which were in operation prior to the effective date of the regulations may continue operation if they comply with the operational regulations set forth in Part II. Operation permits, which will be in addition to all permits previously received, will be issued to such waterworks as soon as practicable after the effective date of these regulations.

A. Waterworks and water supplies unable to comply with Part II of this chapter may be issued the appropriate variances and/or exemptions in conjunction with the operation permit to allow continued operation during the period of adjustment. Any variances and/or exemptions will be issued in accordance with the procedures contained in Article 3 of Part I of this chapter.

B. Compliance with design criteria set forth in Parts III and IV is necessary for waterworks modification and construction commenced after the effective date of these revised regulations. Waterworks construction or modification is deemed to be commenced for purposes of this section upon receipt of final plans and specifications by the field office.

C. Compliance with the requirements set forth in Parts III and IV for materials, construction methods, disinfection, etc., is necessary for all repairs to pipes, tanks, pumps, and appurtenances which are part of a waterworks.

D. Volatile Synthetic Organic Chemicals (VOCs) and Unregulated Contaminants (UCs) Regulations are effective immediately for those community and NTNC waterworks which serve more than 10,000 persons. The VOC and UC

regulations are effective immediately for community and NTNC waterworks serving 3,300 to 10,000 persons. The VOC and UC regulations become effective on January 1, 1991, for community and NTNC waterworks serving less than 3,300 persons. (See Table 2.7.)

E. The Lead and Copper Regulations establish a treatment technique that includes requirements for corrosion control treatment, water supply (source water) treatment, lead service line replacement, and public education. These requirements are triggered, in some cases, by lead and copper action levels measured in samples collected at consumers' taps. Unless otherwise indicated, each of the provisions of ~~12VAC5-590-370 B 6, 12VAC5-590-420 C through F~~ 12VAC5-590-375, 12VAC5-590-405, 12VAC5-590-530 D and 12VAC5-590-550 D applies to community waterworks and nontransient noncommunity waterworks. The requirements set forth in ~~12VAC5-590-370 B 6~~ 12VAC5-590-375, 12VAC5-590-530 D and 12VAC5-590-550 D shall take effect on July 7, 1991. ~~The requirements in 12VAC5-590-420 C through F shall take effect on December 7, 1992.~~

Article 2
General Information

12VAC5-590-370. Sampling frequency.

The commissioner may exempt consecutive waterworks that obtain potable water from another water system for distribution from all monitoring requirements in this section except for bacteriological (subsection Aof this section), disinfectant residuals, byproducts and disinfection byproduct precursors (subdivision B 3 of this section), and lead and copper (subdivision B 6 of this section). The required sampling frequencies are as follows:

A. Bacteriological.

1. The owner shall collect total coliform samples at sites which are representative of water throughout the distribution system according to a written sample siting report. The report shall be established or approved by the district engineer after investigation of the source, method of treatment and storage, and protection of the water concerned. The report shall include, but is not limited to, the following:

a. The frequency of sampling distributed evenly throughout the month/quarter.

b. Distribution map showing the generalized location where specific sampling sites will be selected.

c. Supporting statement explaining how specific individual sites are selected, how sampling will be rotated among the sites, how repeat samples will be collected and other information demonstrating that sampling will be conducted in a manner to comply with this chapter.

d. Adequate sampling points to provide sampling representative of all the conditions in the system.

e. For small systems (less than 3,301 population), sample sites shall also be identified by address and code number location.

f. Minimum of three sample locations for each sample required monthly so repeat sample locations are previously ascertained as being adequate in number and five customer service connections upstream and downstream. (See Appendix J for an example.)

g. The sampling point required to be repeat sampled shall not be eliminated from future collections based on a history of questionable water quality unless the sampling point is unacceptable as determined by the district engineer.

2. The minimum number of bacteriological samples for total coliform evaluation to be collected and analyzed monthly from the distribution system of a community or nontransient noncommunity waterworks shall be in accordance with Table 2.1. Owners of all noncommunity waterworks that use a surface water source or a groundwater source under the direct influence of surface water, and large noncommunity (serving 1,000 or more persons per day) waterworks, shall collect and submit samples monthly for analysis in accordance with Table 2.1. Owners of all other noncommunity waterworks shall submit samples for analysis each calendar quarter in accordance with Table 2.1.

3. The samples shall be taken at reasonably evenly spaced time intervals throughout the month or quarter.

If the results of a sanitary survey or other factors determine that some other frequency is more appropriate than that stated above, a modified sampling program report may be required. The altered frequency shall be confirmed or changed on the basis of subsequent surveys.

TABLE 2.1

POPULATION SERVED PER DAY	MINIMUM NUMBER OF SAMPLES (See subdivision A 2 of this section)
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
320,001 to 450,000	180
450,001 to 600,000	210
600,001 to 780,000	240
780,001 to 970,000	270
970,001 to 1,230,000	300
1,230,001 to 1,520,000	330
1,520,001 to 1,850,000	360
1,850,001 to 2,270,000	390

4. All bacteriological analyses shall be performed in accordance with 12VAC5-590-440 by the DCLS or by a laboratory certified by DCLS for drinking water samples.

B. Chemical. The location of sampling points, the chemicals measured, the frequency, and the timing of sampling within each compliance period shall be established or approved by the commissioner at the time of issuance of a waterworks operation permit. The commissioner may increase required monitoring where necessary to detect variations within the waterworks. Analysis of field composite samples shall not be allowed. Samples for contaminants that may exhibit seasonal variations shall be collected during the period of the year when contamination is most likely to occur. Failure to comply with the sampling schedules in this section shall require public notification pursuant to 12VAC5-590-540.

Any other dates contained in this chapter notwithstanding, all waterworks shall comply with all applicable PMCLs listed in Tables 2.2 and 2.3.

Design criteria for new or modified waterworks or owners developing new sources of supply are found in 12VAC5-590-820, 12VAC5-590-830 and 12VAC5-590-840.

1. Inorganic chemical. Community and nontransient noncommunity waterworks owners shall conduct monitoring to determine compliance with the MCLs in Table 2.2 in accordance with this section. All other noncommunity waterworks owners shall conduct monitoring to determine compliance with the nitrate and nitrite PMCLs in Table 2.2 (as appropriate) in accordance with this section. Monitoring shall be conducted as follows:

a. The owner of any groundwater source waterworks with 150 or more service connections shall take a minimum of one sample at each entry point to the distribution system which is representative of each source, after treatment, unless a change in condition makes another sampling point more representative of each source or treatment plant (hereafter called a sampling point) starting in the compliance period beginning January 1, 1993. The owner of any groundwater source waterworks with fewer than 150 service connections shall take a minimum of one sample at each sampling point for asbestos, barium, cadmium, chromium, fluoride, mercury, nitrate, nitrite, and selenium in the compliance period beginning January 1, 1993, for antimony, beryllium, cyanide (as free cyanide), nickel, and thallium in the compliance period beginning January 1, 1996, and for arsenic (for community and nontransient noncommunity waterworks) in compliance with subdivision B 1 d (6) (b) of this section.

b. The owner of any waterworks which uses a surface water source in whole or in part with 150 or more service connections shall take a minimum of one sample at each 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, unless a change in conditions makes another sampling point more representative of each source or treatment plant (hereafter called a sampling point) beginning January 1, 1993. The owner of any waterworks which use a surface water source in whole or in part with fewer than 150 service connections shall take a minimum of one sample at each sampling point for asbestos, barium, cadmium, chromium, fluoride, mercury, nitrate, nitrite, and selenium beginning January 1, 1993, for antimony, beryllium, cyanide (as free cyanide), nickel, and thallium beginning January 1, 1996, and for arsenic (for community and nontransient noncommunity waterworks) in compliance with subdivision B 1 d (6) (a) of this section.

c. If a waterworks draws water from more than one source and the sources are combined before distribution,

the owner shall 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).

d. The frequency of monitoring for asbestos shall be in accordance with subdivision B 1 d (1) of this section; the frequency of monitoring for barium, cadmium, chromium, fluoride, mercury, and selenium shall be in accordance with subdivision B 1 d (2) of this section; the frequency of monitoring for antimony, beryllium, cyanide (as free cyanide), nickel, and thallium shall be in accordance with subdivision B 1 d (3) of this section; the frequency of monitoring for nitrate shall be in accordance with subdivision B 1 d (4) of this section; the frequency of monitoring for nitrite shall be in accordance with subdivision B 1 d (5) of this section; and the frequency of monitoring for arsenic shall be in accordance with subdivision B 1 d (6) of this section.

(1) The frequency of monitoring conducted to determine compliance with the PMCL for asbestos specified in Table 2.2 shall be conducted as follows:

(a) The owner of each community and nontransient noncommunity waterworks 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.

(b) If the owner believes the waterworks is not vulnerable to either asbestos contamination in its source water or due to corrosion of asbestos-cement pipe, or both, the owner may apply to the commissioner for a waiver of the monitoring requirement in subdivision B 1 d (1) (a) of this section. If the commissioner grants the waiver, the owner is not required to monitor.

(c) The commissioner may grant a waiver based on a consideration of the following factors:

(i) Potential asbestos contamination of the water source; and

(ii) The use of asbestos-cement pipe for finished water distribution and the corrosive nature of the water.

(d) A waiver remains in effect until the completion of the three-year compliance period. The owner of a waterworks not receiving a waiver shall monitor in accordance with the provisions of subdivision B 1 d (1) (a) of this section.

(e) The owner of a waterworks 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.

(f) The owner of a waterworks vulnerable to asbestos contamination due solely to source water shall monitor sampling points in accordance with subdivision B 1 of this section.

(g) The owner of a waterworks 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.

(h) The owner of a waterworks which exceeds the PMCL as determined in 12VAC5-590-410 B 1 shall monitor quarterly beginning in the next quarter after the exceedance occurred.

(i) The commissioner may decrease the quarterly monitoring requirement to the frequency specified in subdivision B 1 d (1) (a) of this section provided the commissioner has determined that the waterworks is reliably and consistently below the PMCL. In no case can the commissioner make this determination unless the owner of a groundwater source waterworks takes a minimum of two quarterly samples or the owner of a waterworks which uses a surface water source in whole or in part takes a minimum of four quarterly samples.

(j) If monitoring data collected after January 1, 1990, are generally consistent with the requirements of subdivision B 1 d (1) of this section, then the commissioner may allow an owner to use that data to satisfy the monitoring requirement for the initial compliance period beginning January 1, 1993.

(2) The frequency of monitoring conducted to determine compliance with the MCLs in Table 2.2 for barium, cadmium, chromium, fluoride, mercury, and selenium shall be as follows:

(a) The owner of a groundwater source waterworks shall take one sample at each sampling point during each compliance period beginning in the compliance period starting January 1, 1993.

(b) The owner of a waterworks which uses a surface water source in whole or in part shall take one sample annually at each sampling point beginning January 1, 1993.

(c) An owner may apply to the commissioner for a waiver from the monitoring frequencies specified in subdivision B 1 d (2) (a) or (b) of this section.

(d) A condition of the waiver shall require that the owner 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).

(e) The commissioner may grant a waiver provided the owner of a waterworks that uses a surface water source in whole or in part has monitored annually for at least three years and groundwater waterworks have conducted a minimum of three rounds of monitoring. (At least one sample shall have been taken since January 1, 1990.) The owner of any waterworks which uses a surface water source in whole or in part or a groundwater source waterworks shall demonstrate that all previous analytical results were less than the PMCL. Waterworks that use a new water source are not eligible for a waiver until three rounds of monitoring from the new source have been completed.

(f) In determining the appropriate reduced monitoring frequency, the commissioner shall consider:

(i) Reported concentrations from all previous monitoring;

(ii) The degree of variation in reported concentrations; and

(iii) Other factors that may affect contaminant concentrations such as changes in groundwater pumping rates, changes in the waterworks configuration, changes in the waterworks operating procedures, or changes in stream flows or characteristics.

(g) A decision by the commissioner to grant a waiver shall be made in writing and shall set forth the basis for the determination. The request for a waiver may be initiated by the commissioner or upon an application by the owner. The owner shall specify the basis for the request. The commissioner shall review and, where appropriate, revise the determination of the appropriate monitoring frequency when the owner submits new monitoring data or when other data relevant to the waterworks appropriate monitoring frequency become available.

(h) Owners of waterworks that exceed the PMCLs as calculated in 12VAC5-590-410 shall monitor quarterly beginning in the next quarter after the exceedance occurred.

(i) The commissioner may decrease the quarterly monitoring requirement to the frequencies specified in subdivision B 2 d (2) (a), (b) or (c) of this section provided a determination has been made that the waterworks is reliably and consistently below the PMCL. In no case can the commissioner make this determination unless the owner of a groundwater source waterworks takes a minimum of two quarterly samples or the owner of a waterworks which uses a surface water source in whole or in part takes a minimum of four quarterly samples.

(3) The frequency of monitoring conducted to determine compliance with the PMCLs in Table 2.2 for antimony, beryllium, cyanide (as free cyanide), nickel, and thallium shall be as follows:

(a) The owner of a groundwater source waterworks with 150 or more service connections shall take one sample at each sampling point during each compliance period beginning in the compliance period starting January 1, 1993. The owner of a groundwater source waterworks with fewer than 150 service connections shall take one sample at each sampling point during each compliance period beginning in the compliance period starting January 1, 1996.

(b) The owner of a waterworks that uses a surface water source in whole or in part with 150 or more service connections shall take one sample annually at each sampling point beginning January 1, 1993. The owner of a waterworks that uses a surface water source in whole or in part with fewer than 150 service connections shall take one sample annually at each sampling point beginning January 1, 1996.

(c) An owner may apply to the commissioner for a waiver from the monitoring frequencies specified in subdivision B 2 d (3) (a) or (b) of this section.

(d) A condition of the waiver shall require that the owner 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).

(e) The commissioner may grant a waiver provided the owner of a waterworks that uses a surface water source in whole or in part has monitored annually for at least three years and groundwater waterworks have conducted a minimum of three rounds of monitoring. (At least one sample shall have been taken since January 1, 1990.) The owner of any waterworks which uses a surface water source in whole or in part or a groundwater source waterworks shall demonstrate that all previous analytical results were less than the PMCL. Waterworks that use a new water source are not eligible for a waiver until three rounds of monitoring from the new source have been completed.

(f) In determining the appropriate reduced monitoring frequency, the commissioner shall consider:

(i) Reported concentrations from all previous monitoring;

(ii) The degree of variation in reported concentrations; and

(iii) Other factors which may affect contaminant concentrations such as changes in groundwater pumping rates, changes in the waterworks configuration, changes in the waterworks operating procedures, or changes in stream flows or characteristics.

(g) A decision by the commissioner to grant a waiver shall be made in writing and shall set forth the basis for the determination. The request for a waiver may be initiated by the commissioner or upon an application by the owner. The owner shall specify the basis for the request. The commissioner shall review and, where appropriate, revise the determination of the appropriate monitoring frequency when the owner submits new monitoring data or when other data relevant to the waterworks appropriate monitoring frequency become available.

(h) Owners of waterworks that exceed the PMCLs as calculated in 12VAC5-590-410 shall monitor quarterly beginning in the next quarter after the exceedance occurred.

(i) The commissioner may decrease the quarterly monitoring requirement to the frequencies specified in subdivision B 2 d (3) (a), (b) or (c) of this section provided a determination has been made that the waterworks is reliably and consistently below the PMCL. In no case shall the commissioner make this determination unless the owner of a groundwater source waterworks takes a minimum of two quarterly samples or the owner of a waterworks which uses a surface water source in whole or in part takes a minimum of four quarterly samples.

(4) All community, nontransient noncommunity and noncommunity waterworks owners shall monitor to determine compliance with the PMCL for nitrate in Table 2.2.

(a) Owners of community and nontransient noncommunity waterworks that use a groundwater source shall monitor annually beginning January 1, 1993.

(b) Owners of community and nontransient noncommunity waterworks that use a surface water source in whole or in part shall monitor quarterly beginning January 1, 1993.

(c) For owners of community and nontransient noncommunity waterworks that use groundwater, the repeat monitoring frequency shall be quarterly for at least one year following any one sample in which the concentration is greater than 50% of the PMCL. The commissioner may allow the owner of a waterworks, that uses groundwater, to reduce the sampling frequency to annually after four consecutive quarterly samples are reliably and consistently less than the PMCL.

(d) For community and nontransient noncommunity waterworks, the commissioner may allow the owner of a waterworks that uses a surface water source in whole or in part, to reduce the sampling frequency to annually if all analytical results from four consecutive quarters are less than 50% of the PMCL. Such waterworks shall return to quarterly monitoring if any one sample is greater than or equal to 50% of the PMCL.

(e) The owners of all other noncommunity waterworks shall monitor annually beginning January 1, 1993.

(f) After the initial round of quarterly sampling is completed, the owner of each community and nontransient noncommunity waterworks that is monitoring annually shall take subsequent samples during the quarter(s) which previously resulted in the highest analytical result.

(5) All owners shall monitor to determine compliance with the PMCL for nitrite in Table 2.2.

(a) All owners shall take one sample at each sampling point in the compliance period beginning January 1, 1993.

(b) After the initial sample, the owner of any waterworks where an analytical result for nitrite is less than 50% of the PMCL shall monitor at the frequency specified by the commissioner.

(c) The repeat monitoring frequency for any owner shall be quarterly for at least one year following any one sample in which the concentration is greater than 50% of the PMCL. The commissioner may allow an owner to reduce the sampling frequency to annually after determining the analysis results are reliably and consistently less than the PMCL.

(d) Owners of waterworks which are monitoring annually shall take each subsequent sample during the quarter(s) which previously resulted in the highest analytical result.

(6) The frequency of monitoring conducted to determine compliance with the PMCLs in Table 2.2 for arsenic shall be as follows:

(a) The owner of each community and nontransient noncommunity waterworks that uses a surface water source in whole or in part shall take one sample annually at each sampling point beginning January 23, 2006.

(b) The owner of each community and nontransient noncommunity groundwater source waterworks shall take one sample at each entry point during each compliance period starting January 23, 2006.

(c) Owners of waterworks that exceed the PMCL, as calculated in 12VAC5-590-410, shall monitor quarterly beginning in the next quarter after the exceedance has occurred.

(d) The commissioner may decrease the quarterly monitoring requirement to the frequencies specified in subdivision B 1 d (6) (a) or (b) of this section provided a determination has been made that the waterworks is reliably and consistently below the PMCL. In no case can

the commissioner make this determination unless the owner of a groundwater source waterworks takes a minimum of two quarterly samples or the owner of a waterworks that uses a surface water source in whole or in part takes a minimum of four quarterly samples.

(e) No waivers shall be granted by the commissioner for arsenic.

2. Organic chemicals. Owners of all community and nontransient noncommunity waterworks shall sample for organic chemicals in accordance with their water source. Where two or more sources are combined before distribution, the owner shall sample at the entry point for the combined sources during periods of normal operating conditions.

a. Owners of waterworks that use groundwater shall take a minimum of one sample at each entry point to the distribution system which is representative of each source, after treatment (hereafter called a sampling point).

b. Owners of waterworks that use a surface water source in whole or in part shall take a minimum of one sample at points in the distribution system that are representative of each source or at each entry point to the distribution system, after treatment (hereafter called a sampling point).

c. The owner of each community and nontransient noncommunity waterworks shall take four consecutive quarterly samples for each contaminant listed in Table 2.3-VOC 2 through 21 and SOC during each compliance period, beginning in the compliance period starting January 1, 1993.

d. Reduced monitoring.

(1) VOC.

(a) If the initial monitoring for contaminants listed in Table 2.3-VOC 1 through 8 and the monitoring for the contaminants listed in Table 2.3-VOC 9 through 21 as allowed in subdivision B 2 d (1) (c) of this section has been completed by December 31, 1992, and the waterworks did not detect any contaminant listed in Table 2.3-VOC 1 through 21, then the owner of each groundwater waterworks and waterworks that use a surface water source in whole or in part shall take one sample annually beginning January 1, 1993.

(b) After a minimum of three years of annual sampling, the commissioner may allow the owner of a groundwater waterworks with no previous detection of any contaminant listed in Table 2.3-VOC 2 through 21 to take one sample during each compliance period.

(c) The commissioner may allow the use of monitoring data collected after January 1, 1988, for purposes of initial monitoring compliance. If the data are generally consistent with the other requirements in this section, the commissioner may use these data (i.e., a single sample rather than four quarterly samples) to satisfy the initial monitoring requirement of subdivision B 2 c of this section. Owners of waterworks that use grandfathered samples and did not detect any contaminants listed in Table 2.3-VOC, 2 through 21, shall begin monitoring annually in accordance with subdivision B 2 d (1) (a) of this section beginning January 1, 1993.

(2) SOC.

(a) Owners of waterworks serving more than 3,300 persons that do not detect a contaminant listed in Table 2.3-SOC in the initial compliance period, may reduce the sampling frequency to a minimum of two quarterly samples in one year during each repeat compliance period.

(b) Owners of waterworks serving less than or equal to 3,300 persons that do not detect a contaminant listed in Table 2.3-SOC in the initial compliance period may reduce the sampling frequency to a minimum of one sample during each repeat compliance period.

e. Waiver application.

(1) For VOCs. The owner of any community and nontransient noncommunity groundwater waterworks which does not detect a contaminant listed in Table 2.3-VOC may apply to the commissioner for a waiver from the requirements of subdivisions B 2 d (1) (a) and (b) of this section after completing the initial monitoring. A waiver shall be effective for no more than six years (two compliance periods). The commissioner may also issue waivers to small systems for the initial round of monitoring for 1,2,4-trichlorobenzene.

(2) For SOCs. The owner of any community and nontransient noncommunity waterworks may apply to the commissioner for a waiver from the requirement of subdivisions B 2 c and d (2) of this section. The owner shall reapply for a waiver for each compliance period.

f. The commissioner may grant a waiver after evaluating the following factors: Knowledge of previous use (including transport, storage, or disposal) of the contaminant within the watershed or zone of influence of the source. If a determination by the commissioner reveals no previous use of the contaminant within the watershed or zone of influence, a waiver may be granted. If previous use of the contaminant is unknown or it has been used previously, then the following factors shall be used to determine whether a waiver is granted.

(1) Previous analytical results.

(2) The proximity of the waterworks to a potential point or nonpoint source of contamination. Point sources

include spills and leaks of chemicals at or near a waterworks or at manufacturing, distribution, or storage facilities, or from hazardous and municipal waste landfills and other waste handling or treatment facilities. Nonpoint sources for SOCs include the use of pesticides to control insect and weed pests on agricultural areas, forest lands, home and gardens, and other land application uses.

(3) The environmental persistence and transport of the contaminants listed in Table 2.3 VOC and SOC.

(4) How well the water source is protected against contamination, such as whether it is a waterworks that uses a surface water source in whole or in part or whether it is a groundwater source waterworks. Groundwater source waterworks shall consider factors such as depth of the well, the type of soil, wellhead protection, and well structure integrity. Owners of waterworks that use surface water in whole or in part shall consider watershed protection.

(5) Special factors.

(a) For VOCs. The number of persons served by the waterworks and the proximity of a smaller waterworks to a larger waterworks.

(b) For SOCs. Elevated nitrate levels at the waterworks supply source.

(c) For SOCs. Use of PCBs in equipment used in the production, storage, or distribution of water (i.e., PCBs used in pumps, transformers, etc.).

g. Condition for waivers.

(1) As a condition of the VOC waiver the owner of a groundwater waterworks shall take one sample at each sampling point during the time the waiver is effective (i.e., one sample during two compliance periods or six years) and update its vulnerability assessment considering the factors listed in subdivision B 2 f of this section. Based on this vulnerability assessment the commissioner shall reconfirm that the waterworks is nonvulnerable. If the commissioner does not make this reconfirmation within three years of the initial determination, then the waiver is invalidated and the owner is required to sample annually as specified in subdivision B 2 d (1) (a) of this section.

(2) The owner of any community and nontransient noncommunity waterworks that use surface water in whole or in part which does not detect a contaminant listed in Table 2.3-VOC may apply to the commissioner for a waiver from the requirements of subdivision B 2 d (1) (a) of this section after completing the initial monitoring. Waterworks meeting these criteria shall be determined by the commissioner to be nonvulnerable based on a vulnerability assessment during each compliance period. Each owner receiving a waiver shall sample at the frequency specified by the commissioner (if any).

(3) There are no conditions to SOC waivers.

h. If a contaminant listed in Table 2.3-VOC 2 through 21 or SOC 1 through 33 is detected then (NOTE: Detection occurs when a contaminant level exceeds the current detection limit as defined by EPA.):

(1) Each owner shall monitor quarterly at each sampling point which resulted in a detection.

(2) The commissioner may decrease the quarterly monitoring requirement specified in subdivision B 2 h (1) of this section provided it has determined that the waterworks is reliably and consistently below the PMCL. In no case shall the commissioner make this determination unless the owner of a groundwater waterworks takes a minimum of two quarterly samples and the owner of a waterworks that use surface water in whole or in part takes a minimum of four quarterly samples.

(3) If the commissioner determines that the waterworks is reliably and consistently below the PMCL, the commissioner may allow the waterworks to monitor annually. Owners of waterworks that monitor annually shall monitor during the quarter(s) that previously yielded the highest analytical result.

(4) Owners of waterworks that have three consecutive annual samples with no detection of a contaminant may apply to the commissioner for a waiver for VOC as specified in subdivision B 2 e (1) or to SOC as specified in subdivision B 2 e (2) of this section.

(5) Subsequent monitoring due to contaminant detection.

(a) Owners of groundwater waterworks that have detected one or more of the following two-carbon organic compounds: trichloroethylene, tetrachloroethylene, 1,2-dichloroethane, 1,1,1-trichloroethane, cis-1,2-dichloroethylene, trans-1,2-dichloroethylene, or 1,1-dichloroethylene shall monitor quarterly for vinyl chloride. A vinyl chloride sample shall be taken at each sampling point at which one or more of the two-carbon organic compounds was detected. If the results of the first analysis do not detect vinyl chloride, the commissioner may reduce the quarterly monitoring frequency of vinyl chloride monitoring to one sample during each compliance period. Owners of waterworks that use surface water in whole or in part are required to monitor for vinyl chloride as specified by the commissioner.

(b) If monitoring results in detection of one or more of certain related contaminants (heptachlor and heptachlor

epoxide), then subsequent monitoring shall analyze for all related contaminants.

i. Owners of waterworks that violate the requirements of Table 2.3 for VOCs or SOCs, as determined by 12VAC5-590-410 C, shall monitor quarterly. After a minimum of four consecutive quarterly samples that show the waterworks is in compliance as specified in 12VAC5-590-410 C and the commissioner determines that the waterworks is reliably and consistently below the PMCL, the owner may monitor at the frequency and time specified in subdivision B 2 h (3) of this section.

3. Disinfectant residuals, disinfection byproducts and disinfection byproduct precursors.

a. Unless otherwise noted, owners of all waterworks that use a chemical disinfectant shall comply with the requirements of this section as follows:

(1) Owners of community or nontransient noncommunity waterworks that use surface water or groundwater under the direct influence of surface water and serving 10,000 or more persons shall comply with this section beginning January 1, 2002.

(2) Owners of community or nontransient noncommunity waterworks that use surface water or groundwater under the direct influence of surface water serving fewer than 10,000 persons and waterworks using only groundwater not under the direct influence of surface water shall comply with this section beginning January 1, 2004.

(3) Owners of transient noncommunity waterworks that use surface water or groundwater under the direct influence of surface water and serving 10,000 or more persons and using chlorine dioxide as a disinfectant or oxidant shall comply with any requirements for chlorine dioxide in this section beginning January 1, 2002.

(4) Owners of transient noncommunity waterworks that use surface water or groundwater under the direct influence of surface water serving fewer than 10,000 persons and using chlorine dioxide as a disinfectant or oxidant and waterworks using only groundwater not under the direct influence of surface water and using chlorine dioxide as a disinfectant or oxidant shall comply with any requirements for chlorine dioxide in this section beginning January 1, 2004.

b. Owners shall take all samples during normal operating conditions.

(1) Analysis under this section for disinfection byproducts (TTHM, HAA5, chlorite and bromate) shall be conducted by a laboratory that has received certification by EPA or the state except as noted in subdivision B 3 b (2) of this section.

(2) Measurement under this section of daily chlorite samples at the entry point to the distribution system, disinfection residuals (free chlorine, combined chlorine, total chlorine and chlorine dioxide), alkalinity, bromide, TOC, SUVA (DOC and UV_{254}), pH and magnesium shall be made by a party approved by the commissioner.

(3) DPD colorimetric test kits may be used to measure residual disinfectant concentrations for chlorine, chloramines and chlorine dioxide.

c. Failure to monitor in accordance with the monitoring plan required under subdivision B 3 j of this section is a monitoring violation. Failure to monitor shall be treated as 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 owner's failure to monitor makes it impossible to determine compliance with PMCLs or MRDLs.

d. Owners may use only data collected under the provisions of this section or the US EPA Information Collection Rule, 40 CFR Part 141 Subpart M, Information Collection Requirements (ICR) for Public Water Systems, to qualify for reduced monitoring.

e. TTHM/HAA5 monitoring. Owners of community or nontransient noncommunity waterworks shall monitor TTHM and HAA5 at the frequency indicated below, unless otherwise indicated:

(1) Running annual average monitoring requirements.

(a) Routine monitoring requirements:

(i) Owners of waterworks using surface water or groundwater under the direct influence of surface water and serving at least 10,000 persons shall collect four water samples per quarter per treatment plant. At least 25% of all samples collected each quarter shall be at locations representing maximum residence time in the distribution system. The remaining samples shall be taken at locations representative of at least average residence time in the distribution system and representative of the entire distribution system. When setting the sample locations the waterworks shall take into account number of persons served, different sources of water, and different treatment methods.

(ii) Owners of waterworks using surface water or groundwater under the direct influence of surface water and serving from 500 to 9,999 persons shall collect one sample per quarter per treatment plant. The sample location shall represent maximum residence time in the distribution system.

(iii) Owners of waterworks using surface water or groundwater under the direct influence of surface water and serving fewer than 500 persons shall collect one sample per year per treatment plant during the month of

warmest water temperature. The sample location shall represent maximum residence time in the distribution system. If the sample (or average of annual samples, if more than one sample is taken) exceeds PMCL in Table 2.13, the owner shall increase monitoring to one sample per treatment plant per quarter, taken at a point reflecting the maximum residence time in the distribution system, until waterworks meets reduced monitoring criteria.

(iv) Owners of waterworks using only groundwater not under direct influence of surface water using chemical disinfectant and serving at least 10,000 persons shall collect one sample per quarter per treatment plant. The sample location shall represent maximum residence time in the distribution system.

(v) Owners of waterworks using only groundwater not under direct influence of surface water using chemical disinfectant and serving fewer than 10,000 persons shall collect one sample per year per treatment plant during the month of warmest water temperature. The sample location shall represent maximum residence time in the distribution system. If the sample (or average of annual samples, if more than one sample is taken) exceeds PMCL in Table 2.13, the owner shall increase monitoring to one sample per treatment plant per quarter, taken at a point reflecting the maximum residence time in the distribution system, until the waterworks meets the criteria for reduced monitoring found in subdivision B 3 e (1) (d) of this section.

(vi) If an owner elects to sample more frequently than the minimum required, at least 25% of all samples collected each quarter (including those taken in excess of the required frequency) shall be taken at locations that represent the maximum residence time of the water in the distribution system. The remaining samples shall be taken at locations representative of at least average residence time in the distribution system.

(vii) With prior approval of the commissioner, owners of waterworks that utilize multiple wells from a common aquifer may consider these multiple sources as one treatment plant for determining the minimum number of samples to be collected for TTHM and HAA5 analysis.

(b) After one year of routine monitoring an owner may reduce monitoring, except as otherwise provided, as follows:

(i) Owners of waterworks using surface water or groundwater under the direct influence of surface water and serving at least 10,000 persons that has a source water annual average TOC level, before any treatment, of equal to or less than 4.0 mg/L and a TTHM annual average equal to or less than 0.040 mg/L and HAA5 annual average equal to or less than 0.030 mg/L may reduce its monitoring to one sample per treatment plant per quarter at a distribution system location reflecting maximum residence time.

(ii) Owners of waterworks using surface water or groundwater under the direct influence of surface water serving from 500 to 9,999 persons that has a source water annual average TOC level, before any treatment, equal to or less than 4.0 mg/L and a TTHM annual average equal to or less than 0.040 mg/L and HAA5 annual average equal to or less than 0.030 mg/L may reduce its monitoring to one sample per treatment plant per year at a distribution system location reflecting maximum residence time during the month of warmest water temperature.

(iii) Owners of waterworks using only groundwater not under the direct influence of surface water, using chemical disinfectant and serving at least 10,000 persons that has a TTHM annual average of equal to or less than 0.040 mg/L and HAA5 annual average of equal to or less than 0.030 mg/L may reduce its monitoring to one sample per treatment plant per year at a distribution system location reflecting maximum residence time during the month of warmest water temperature.

(iv) Owners of waterworks using only groundwater not under the direct influence of surface water, using chemical disinfectant and serving fewer than 10,000 persons that has a TTHM annual average equal to or less than 0.040 mg/L and HAA5 annual average equal to or less than 0.030 mg/L for two consecutive years or TTHM annual average equal to or less than 0.020 mg/L and HAA5 annual average of equal to or less than 0.015 mg/L for one year may reduce its monitoring to one sample per treatment plant per three-year monitoring cycle at a distribution system location reflecting maximum residence time during the month of warmest water temperature, with the three-year cycle beginning on January 1 following the quarter in which the system qualifies for reduced monitoring.

(v) Owners of waterworks using surface water or groundwater under the direct influence of surface water serving fewer than 500 persons may not reduce its monitoring to less than one sample per treatment plant per year.

(vi) In order to qualify for reduced monitoring for TTHM and HAA5 under subdivision B 3 e (1) (b) (i) through (iv) of this section, owners of waterworks using surface water or groundwater under the direct influence of surface water not monitoring under the provisions of subdivision B 3 (i) shall take monthly TOC samples every 30 days at a location prior to any treatment, beginning April 1, 2008. In addition to meeting other criteria for reduced monitoring in subdivision B 3 e (1) (b) (i) through (iv) of this section, the source water TOC running annual average shall be less than or equal to 4.0

mg/L (based on the most recent four quarters of monitoring) on a continuing basis at each treatment plant to reduce or remain on reduced monitoring for TTHM and HAA5. Once qualified for reduced monitoring for TTHM and HAA5 under subdivision B 3 e (1) (b) (i) through (iv) of this section, a system may reduce source water TOC monitoring to quarterly TOC samples taken every 90 days at a location prior to any treatment.

(c) Owners of waterworks on a reduced monitoring schedule may remain on that reduced schedule as long as the average of all samples taken in the year (for waterworks that must monitor quarterly) or the result of the sample (for waterworks that must monitor no more frequently than annually) is no more than 0.060 mg/L and 0.045 mg/L for TTHMs and HAA5, respectively. Owners of waterworks that do not meet these levels shall resume monitoring at the frequency identified in subdivision B 3 e (1) (a) of this section in the quarter immediately following the monitoring period in which the waterworks exceeds 0.060 mg/L or 0.045 mg/L for TTHMs and HAA5, respectively. For waterworks using only groundwater not under the direct influence of surface water and serving fewer than 10,000 persons, if either the TTHMs annual average is greater than 0.080 mg/L or the HAA5 annual average is greater than 0.060 mg/L, the owner shall go to increased monitoring identified in subdivision B 3 e (1) (a) of this section in the quarter immediately following the monitoring period in which the waterworks exceeds 0.080 mg/L or 0.060 mg/L for TTHM or HAA5 respectively.

(d) Owners of waterworks on increased monitoring may return to routine monitoring if, after at least one year of monitoring, their TTHM annual average is equal to or less than 0.060 mg/L and their HAA5 annual average is equal to or less than 0.045 mg/L.

(e) The commissioner may return a waterworks to routine monitoring at the commissioner's discretion.

(2) Initial distribution system evaluations (IDSE).

(a) This subdivision establishes monitoring and other requirements for identifying locational running annual average (LRAA) compliance monitoring locations for determining compliance with maximum contaminant levels for total trihalomethanes (TTHM) and haloacetic acids (five) (HAA5). Owners shall use an IDSE to determine locations with representative high TTHM and HAA5 concentrations throughout the distribution system. IDSEs are used in conjunction with, but separate from running annual average compliance monitoring locations, subdivision B 3 e (1) (a) of this section, to identify and select locational running annual average compliance monitoring locations, subdivision B 3 e (3) of this section.

(b) This subdivision applies to the following waterworks:

(i) Community waterworks that use a primary or residual disinfectant other than ultraviolet light or delivers water that has been treated with a primary or residual disinfectant other than ultraviolet light; or,

(ii) Nontransient noncommunity waterworks that serve at least 10,000 people and use a primary or residual disinfectant other than ultraviolet light or delivers water that has been treated with a primary or residual disinfectant other than ultraviolet light.

(c) Owners shall comply with the following schedule:

Waterworks Population	Owners shall submit a standard monitoring plan or system specific study plan[1] or 40/30 certification[2] to the commissioner by or receive very small system waiver from the commissioner.	Owners shall complete standard monitoring or system specific study by	Owners shall submit IDSE report to the commissioner by[3]
Waterworks that are not part of a combined distribution system and waterworks that serve the largest population in the combined distribution system			
Egual to or greater than 100,000	October 1, 2006	September 30, 2008	January 1, 2009
50,000-99,999	April 1, 2007	March 31, 2009	July 1, 2009
10,000-49,999	October 1, 2007	September 30, 2009	January 1, 2010
Less than 10,000 (CWS Only)	April 1, 2008	March 31, 2010	July 1, 2010
Other waterworks that are part of a combined distribution system			
Wholesale waterworks or consecutive waterworks	-at the same time as the waterworks with the earliest compliance date in the combined distribution system	-at the same time as the waterworks with the earliest compliance date in the combined distribution system	-at the same time as the waterworks with the earliest compliance date in the combined distribution system

[1]If, within 12 months after the date identified in this column, the commissioner does not approve the plan or notify the owner that the review has been completed; the owner may consider the

submitted plan as approved. The owner shall implement the plan and shall complete standard monitoring or a system specific study no later than the date identified in the third column.

[2]The owner shall submit the 40/30 certification under subdivision B 3 e (2) (d) (v) of this section by the date indicated.

[3]If, within three months after the date identified in this column (nine months after the date identified in this column if the owner is required to comply with the schedule for waterworks populations 10,000 to 49,999), the commissioner does not approve the IDSE report or notify the owner that the review has not been completed, the owner may consider the submitted report as approved and the owner shall implement the recommended monitoring in accordance with subdivision B 3 e (3) of this section as required.

For the purpose of this schedule, the commissioner has determined that the combined distribution ~~system`~~ system does not include consecutive waterworks that receive water from a wholesale waterworks only on an emergency basis or receive less than 10% of their total water consumption from a wholesale waterworks. The commissioner has also determined that the combined distribution system does not include wholesale waterworks that deliver water to a consecutive waterworks only on an emergency basis or delivers less than 10% of the total water used by a consecutive waterworks.

(d) Owners shall conduct standard monitoring that meets the requirements in subdivision B 3 e (2) (d) (iii) of this section, or a system specific study that meets the requirements in subdivision B 3 e (2) (d) (iv) of this section, or certify to the commissioner that the waterworks meets 40/30 certification criteria under subdivision B 3 e (2) (d) (v) of this section, or qualify for a very small system waiver under subdivision B 3 e (2) (d) (vi) of this section.

(i) Owners shall have taken the full complement of routine TTHM and HAA5 compliance samples required of a waterworks based on population and source water under subdivision B 3 e (1) of this section (or the owner shall have taken the full complement of reduced TTHM and HAA5 compliance samples required of an owner based population and source water under subdivision B 3 e (1) of this section if the waterworks meet reduced monitoring criteria under subdivision B 3 e (1)) of this section during the period specified in subdivision B 3 e (2) (d) (v) ((a)) of this section to meet the 40/30 certification criteria in subdivision B 3 e (2) (d) (v) of this section. Owners shall have taken TTHM and HAA5 samples under subdivision B 3 e (1) of this section to be eligible for the very small system waiver in subdivision B 3 e (2) (d) (vi) of this section.

(ii) If the owner has not taken the required samples, the owner shall conduct standard monitoring that meets the requirements in subdivision B 3 e (2) (d) (iii) of this section, or a system specific study that meets the requirements in subdivision B 3 e (2) (d) (iv) of this section.

(iii) Standard Monitoring.

((a)) The standard monitoring plan shall comply with the following paragraphs ((i)) through ((iv)). Owners shall prepare and submit the standard monitoring plan to the commissioner according to the schedule in subdivision B 3 e (2) (c) of this section.

((i)) The standard monitoring plan shall include a schematic of the waterworks distribution system (including distribution system entry points and their sources, and storage facilities), with notes indicating locations and dates of all projected standard monitoring, and all projected compliance monitoring in accordance with subdivision B 3 e (1) of this section.

((ii)) The standard monitoring plan shall include justification of standard monitoring location selection and a summary of data relied on to justify standard monitoring location selection.

((iii)) The standard monitoring plan shall specify the population served and waterworks type (surface water, groundwater under the direct influence of surface water or groundwater).

((iv)) Owners shall retain a complete copy of the submitted standard monitoring plan, including any modification required by the commissioner of the standard monitoring plan, for as long as the owner is required to retain the IDSE report under subdivision B 3 e (2) (d) (iii) ((c)) ((iv)) of this section.

((b)) Owners shall monitor as indicated in the following table. Owners shall collect dual sample sets at each monitoring location. One sample in the dual sample set shall be analyzed for TTHM. The other sample in the dual sample set shall be analyzed for HAA5. Owners shall conduct one monitoring period during the peak historical month for TTHM levels or HAA5 levels or the month of warmest water temperature. Owners shall review available compliance, study, or operational data to determine the peak historical month for TTHM or HAA5 levels or warmest water temperature.

Source Water Type	Population Size Category	Monitoring Periods and Frequency of Sampling	Distribution System Monitoring Locations[1]				
			Total per monitoring period	Near Entry Points	Average Residence Time	High TTHM Locations	High HAA5 Locations
Surface water or ground-water under the direct influence of surface water.	Less than 500 consecutive systems	one (during peak historical month)[2]	2	1		1	
	Less than 500 nonconsecutive systems		2			1	1
	500-3,300 consecutive systems	four (every 90 days)	2	1		1	
	500-3,300 nonconsecutive systems		2			1	1
	3,301-9,999		4		1	2	1
	10,000-49,999	six (every 60 days)	8	1	2	3	2
	50,000-249,999		16	3	4	5	4
	250,000-999,999		24	4	6	8	6
	1,000,000-4,999,999		32	6	8	10	8
	Equal to or greater than 5,000,000		40	8	10	12	10
Ground-water	Less than 500 consecutive systems	one (during peak historical month)[2]	2	1		1	
	Less than 500 nonconsecutive systems		2			1	1
	500-9,999	four (every 90 days)	2			1	1
	10,000-99,999		6	1	1	2	2
	100,000-499,999		8	1	1	3	3
	Equal to or greater than 500,000		12	2	2	4	4

[1]A dual sample set (i.e., a TTHM and an HAA5 sample) shall be taken at each monitoring location during each monitoring period.

[2]The peak historical month is the month with the highest TTHM or HAA5 levels or the warmest water temperature.

((i)) Owners shall take samples at locations other than the existing monitoring locations used in subdivision B 3 e (1) of this section. Monitoring locations shall be distributed throughout the distribution system.

((ii)) If the number of entry points to the distribution system is fewer than the specified number of entry point monitoring locations, excess entry point samples shall be replaced equally at high TTHM and HAA5 locations. If there is an odd extra location number, the owner shall take a sample at a high TTHM location. If the number of entry points to the distribution system is more than the specified number of entry point monitoring locations, owners shall take samples at entry points to the distribution system having the highest annual water flows.

((iii)) The monitoring under subdivision B 3 e (2) (d) (iii) ((b)) of this section may not be reduced.

((c)) The IDSE report shall include the elements required in the following paragraphs. Owners shall submit the IDSE report to the commissioner according to the schedule in subdivision B 3 e (2) (c) of this section.

((i)) The IDSE report shall include all TTHM and HAA5 analytical results from compliance monitoring required under subdivision B 3 e (1) of this section and all standard monitoring conducted during the period of the IDSE as individual analytical results and LRAAs presented in a tabular or spreadsheet format acceptable to the commissioner. If changed from the standard monitoring plan submitted under subdivision B 3 e (2) (d) (iii) ((a)) of this section, the report shall also include a schematic of the distribution system, the population served, and system type (surface water, groundwater under the direct influence of surface water or groundwater).

((ii)) The IDSE report shall include an explanation of any deviations from the approved standard monitoring plan.

((iii)) Owners shall recommend and justify the compliance monitoring locations to be used in accordance with subdivision B 3 e (3) of this section and timing based on the protocol in subdivision B 3 e (2) (e) of this section.

((iv)) Owners shall retain a complete copy of the IDSE report submitted under this section for 10 years after the date the report was submitted to the commissioner. If the commissioner modifies the LRAA monitoring requirements recommended in the IDSE report or if the commissioner approves alternative monitoring locations, the owner shall keep a copy of the commissioner's notification on file for 10 years after the date of the commissioner's notification. The owner shall make the IDSE report and any commissioner's notification available for review by the commissioner or the public.

(iv) System Specific Studies.

((a)) The system specific study plan shall be based on either existing monitoring results as required under subdivision B 3 e (2) (d) (iv) ((a)) or modeling as required under subdivision B 3 e (2) (d) (iv) ((a)) of this section. Owners shall prepare and submit the waterworks specific study plan to the commissioner according to the schedule in subdivision B 3 e (2) (c) of this section.

((i)) Existing monitoring results. Owners may comply by submitting monitoring results collected before the waterworks is required to begin monitoring under subdivision B 3 e (2) (c) of this section. The monitoring results and analysis shall meet the criteria in subdivisions ((1)) and ((2)) as follows:

((1)) Minimum requirements.

((A)) TTHM and HAA5 results shall be based on samples collected and analyzed in accordance with 12VAC5-590-440. Samples shall be collected no earlier than five years prior to the study plan submission date.

((B)) The monitoring locations and frequency shall meet the conditions identified in the following table. Each location shall be sampled once during the peak historical month for TTHM levels or HAA5 levels or the month of warmest water temperature for every 12 months of data submitted for that location. Monitoring results shall include all compliance monitoring results in accordance with subdivision B 3 e (1) of this section plus additional monitoring results as necessary to meet minimum sample requirements.

System Type	Population Size Category	Number of Monitoring Locations	Number of Samples	
			TTHM	HAA5
Surface water or ground-water under the direct influence of surface water	Less than 500	3	3	3
	500-3,300	3	9	9
	3,301-9,999	6	36	36
	10,000-49,999	12	72	72
	50,000-249,999	24	144	144
	250,000-999,999	36	216	216
	1,000,000-4,999,999	48	288	288
	Equal to or greater than 5,000,000	60	360	360
Ground-water	Less than 500	3	3	3
	500-9,999	3	9	9
	10,000-99,999	12	48	48
	100,000-499,999	18	72	72
	Equal to or greater than 500,000	24	96	96

((2)) Reporting monitoring results. Owners shall report the following information:

((A)) Owners shall report previously collected monitoring results and certify that the reported monitoring results include all compliance and non-compliance results generated during the time period beginning with the first reported result and ending with

the most recent results collected in accordance with subdivision B 3 e (1) of this section.

((B)) Owners shall certify that the samples were representative of the entire distribution system and that treatment, and distribution system have not changed significantly since the samples were collected.

((C)) The study monitoring plan shall include a schematic of the distribution system (including distribution system entry points and their sources, and storage facilities), with notes indicating the locations and dates of all completed or planned system specific study monitoring.

((D)) The system specific study plan shall specify the population served and system type (surface water, groundwater under the direct influence of surface water or groundwater).

((E)) Owners shall retain a complete copy of the system specific study plan submitted, including any modification requested by the commissioner of the system specific study plan, for as long as the owner is required to retain the IDSE report under subdivision B 3 e (2) (d) (iv) ((b)) ((vii)) of this section.

((F)) If previously collected data that fully meets the number of samples required under subdivision B 3 e (2) (d) (iv) ((a)) ((ii)) ((1)) ((b)) of this section and the commissioner rejects some of the data, the owner shall either conduct additional monitoring to replace rejected data on a schedule the commissioner approves or conduct standard monitoring under subdivision B 3 e (2) (d) (iii) of this section.

((ii)) Modeling. Owners may comply through analysis of an extended period simulation hydraulic model. The extended period simulation hydraulic model and analysis shall meet the following criteria:

((1)) Minimum requirements.

((A)) The model shall simulate 24-hour variation in demand and show a consistently repeating 24-hour pattern of residence time.

((B)) The model shall represent the criteria listed in the following table:

75% of pipe volume;
50% of pipe length;
All pressure zones;
All 12-inch diameter and larger pipes;
All 8-inch and larger pipes that connect pressure zones, influence zones from different sources, storage facilities, major demand areas, pumps, and control valves, or are known or expected to be significant conveyors of water;
All 6-inch and larger pipes that connect remote areas of a distribution system to the main portion of the system;
All storage facilities with standard operations represented in the model; and
All active pump stations with controls represented in the model; and
All active control valves.

((C)) The model shall be calibrated, or have calibration plans, for the current configuration of the distribution system during the period of high TTHM formation potential. All storage facilities shall be evaluated as part of the calibration process. All required calibration shall be completed no later than 12 months after plan submission.

((2)) Reporting modeling. The system specific study plan shall include the following information:

((A)) Tabular or spreadsheet data demonstrating that the model meets requirements in subdivision B 3 e (2) (d) (iv) ((a)) ((ii)) ((1)) ((b)) of this section.

((B)) A description of all calibration activities undertaken, and if calibration is complete, a graph of predicted tank levels versus measured tank levels for the storage facility with the highest residence time in each pressure zone, and a time series graph of the residence time at the longest residence time storage facility in the distribution system showing the predictions for the entire simulation period (i.e., from time zero until the time it takes to for the model to reach a consistently repeating pattern of residence time).

((C)) Model output showing preliminary 24-hour average residence time predictions throughout the distribution system.

((D)) Timing and number of samples representative of the distribution system planned for at least one monitoring period of TTHM and HAA5 dual sample monitoring at a number of locations no less than would be required for the system under standard monitoring in subdivision B 3 e (2) (d) (iii) of this section during the historical month of high TTHM. These samples shall be taken at locations other than existing compliance monitoring locations listed in subdivision B 3 e (1) (a) of this section.

((E)) Description of how all requirements will be completed no later than 12 months after owner submits the system specific study plan.

((F)) Schematic of the distribution system (including distribution system entry points and their sources, and

storage facilities), with notes indicating the locations and dates of all completed system specific study monitoring (if calibration is complete) and all compliance monitoring listed in subdivision B 3 e (1) (a) of this section.

((G)) Population served and system type (surface water, groundwater under the direct influence of surface water or groundwater).

((H)) Owners shall retain a complete copy of the system specific study plan submitted, including any modification recommended by the commissioner to the waterworks specific study plan, for as long as the owner is required to retain the IDSE report under subdivision B 3 e (2) (d) (iv) ((b)) ((vii)) of this section.

((3)) If an owner submits a model that does not fully meet the requirements under paragraph (iv) ((a)) ((ii)) of this section, the owners shall correct the deficiencies and respond to commissioner's inquiries concerning the model. If the owner fails to correct deficiencies or respond to inquiries to the commissioner's satisfaction, the owner shall conduct standard monitoring under subdivision B 3 e (2) (d) (iii) of this section.

((b)) The IDSE report shall include the elements required in the following paragraphs. Owners shall submit the IDSE report according to the schedule in subdivision B 3 e (2) (c) of this section.

((i)) The IDSE report shall include all TTHM and HAA5 analytical results from compliance monitoring in subdivision B 3 e (1) (a) of this section and all system specific study monitoring conducted during the period of the system specific study presented in a tabular or spreadsheet format acceptable to the commissioner. If changed from the system specific study plan submitted under subdivision B 3 e (2) (d) (iv) ((a)) of this section, the IDSE report shall also include a schematic of the distribution system, the population served; and system type (surface water, groundwater under the direct influence of surface water or groundwater).

((ii)) Owners of waterworks using the modeling provision under subdivision B 3 e (2) (d) (iv) ((a)) ((ii)) of this section shall include final information for the elements described in subdivision B 3 e (2) (d) (iv) ((a)) ((ii)) ((2)) of this section, and a 24-hour time series graph of residence time for each LRAA compliance monitoring location selected.

((iii)) The owner shall recommend and justify LRAA compliance monitoring locations and timing based on the protocol in subdivision B 3 e (2) (e) of this section.

((iv)) The IDSE report shall include an explanation of any deviations from the waterworks approved system specific study plan.

((v)) The IDSE report shall include the basis (analytical and modeling results) and justification the owner used to select the recommended LRAA monitoring locations.

((vi)) The owner may submit the IDSE report in lieu of the system specific study plan on the schedule identified in subdivision B 3 e (2) (c) of this section for submission of the system specific study plan if the owner believes the necessary information has been obtained by the time that the waterworks specific study plan is due. If the owner elects this approach, the IDSE report shall also include all information required under subdivision B 3 e (2) (d) (iv) ((a)) of this section.

((vii)) The owner shall retain a complete copy of the IDSE report submitted under this subdivision for 10 years after the date submitted. If the commissioner modifies the LRAA monitoring requirements that the owner recommended in the IDSE report or if the commissioner approves alternative monitoring locations, the owner shall keep a copy of the commissioner's notification on file for 10 years after the date of the commissioner's notification. The owner shall make the IDSE report and any notification from the commissioner available for review by the commissioner or the public.

(v) 40/30 certifications.

((a)) Eligibility. Waterworks are eligible for 40/30 certification if the waterworks had no TTHM or HAA5 monitoring violations under subdivision B 3 e (1) of this section and no individual sample exceeded 0.040 mg/L for TTHM or 0.030 mg/L for HAA5 during an eight consecutive calendar quarter period beginning no earlier than the date specified in the following table.

If the waterworks 40/30 Certification Is Due	Then the waterworks eligibility for 40/30 certification is based on eight consecutive calendar quarters of compliance monitoring under subdivision B 3 e (1) results beginning no earlier than[1]
October 1, 2006	January 2004
April 1, 2007	January 2004
October 1, 2007	January 2005
April 1, 2008	January 2005

[1]Unless the waterworks is on reduced monitoring under subdivision B 3 e (1) of this section and was not required to monitor during the specified period. If the owner did not monitor during the specified period, the owner shall base eligibility on compliance samples taken during the 12 months preceding the specified period.

((b)) Requirements for 40/30 certification:

((i)) Certify to the commissioner that every individual compliance sample taken under subdivision B 3 e (1) of this section during the periods specified in subdivision B 3 e (2) (d) (v) ((a)) of this section were less than or equal to 0.040 mg/L for TTHM and less than or equal to 0.030 mg/L for HAA5, and that the waterworks has not had any TTHM or HAA5 monitoring violations during the period specified in subdivision ((a)).

((ii)) The commissioner may require the owner to submit compliance monitoring results, distribution system schematics, and/or recommended LRAA compliance monitoring locations in addition to the certification. If an owner fails to submit the requested information, the commissioner may require standard monitoring under subdivision B 3 e (2) (d) (iii) of this section or a system specific study under subdivision B 3 e (2) (d) (iv) of this section.

((iii)) The commissioner may still require standard monitoring under subdivision B 3 e (2) (d) (iii) or a system specific study under subdivision B 3 e (2) (d) (iv) of this section even if the waterworks meet the criteria in subdivision B 3 e (2) (d) (v) ((a)) of this section.

((iv)) The owner shall retain a complete copy of the certification submitted under this subdivision for 10 years after the date that the owner submitted the certification. The owner shall make the certification, all data upon which the certification is based, and any notification from the commissioner available for review by the commissioner or the public.

(vi) Very small system waivers.

((a)) If the waterworks serves fewer than 500 people and has taken TTHM and HAA5 samples under subdivision B 3 e (1) of this section, the owner is not required to comply with this subdivision unless the commissioner notifies the owner to conduct standard monitoring under subdivision B 3 e (2) (d) (iii) or a system specific study under subdivision B 3 e (2) (d) (iv) of this section.

((b)) If the owner has not taken TTHM and HAA5 samples under subdivision B 3 e (1) of this section or if the commissioner notifies the owner to comply with this subdivision, the owner shall conduct standard monitoring under subdivision B 3 e (2) (d) (iii) of this section or a system specific study under subdivision B 3 e (2) (d) (iv) of this section.

(e) LRAA compliance monitoring location recommendations.

(i) The IDSE report shall include recommendations and justification for where and during what month(s) TTHM and HAA5 monitoring in accordance with subdivision B 3 e (3) of this section should be conducted. These recommendations shall be based on the criteria in the paragraphs in this section.

(ii) Owners shall select the number of monitoring locations specified in the following table. These recommended locations will be used as LRAA routine compliance monitoring locations, unless the commissioner requires different or additional locations. The locations should be distributed throughout the distribution system to the extent possible.

Source Water Type	Population Size Category	Monitoring Frequency[1]	Distribution System Monitoring Location			
			Total per monitoring period[2]	Highest TTHM Locations	Highest HAA5 Locations	Existing Compliance Locations in accordance with subdivision B 3 e (1)
Surface water or ground-water under the direct influence of surface water	Less than 500	per year	2	1	1	
	500-3,300	per quarter	2	1	1	
	3,301-9,999	per quarter	2	1	1	
	10,000-49,999	per quarter	4	2	1	1
	50,000-249,999	per quarter	8	3	3	2
	250,000-999,999	per quarter	12	5	4	3
	1,000,000-4,999,999	per quarter	16	6	6	4
	Equal to or greater than 5,000,000	per quarter	20	8	7	5

Ground-water	Less than 500	per year	2	1	1	
	500-9,999	per year	2	1	1	
	10,000-99,999	per quarter	4	2	1	1
	100,000-499,999	per quarter	6	3	2	1
	Equal to or greater than 500,000	per quarter	8	3	3	2

[1]All owners shall monitor during month of highest DBP concentrations.

[2]Owners of waterworks on quarterly monitoring (except for surface water source or GUDI source waterworks serving 500-3,300) shall take dual sample sets every 90 days at each monitoring location. Groundwater source waterworks serving 500-9,999 (on annual monitoring) shall take dual sample sets annually at each monitoring location. Waterworks serving fewer than 500 and surface water source or GUDI source waterworks serving 500-3,300 shall take individual TTHM and HAA5 samples (instead of a dual sample set) at the locations with the highest TTHM and HAA5 concentrations, respectively. Waterworks serving fewer than 500 shall sample annually and surface water source or GUDI source systems serving 500-3,300 shall sample every 90 days. Only one location with a dual sample set per monitoring period is needed if highest TTHM and HAA5 concentrations occur at the same location (and month, if monitoring annually).

(iii) Owners shall recommend LRRA compliance monitoring locations based on standard monitoring results, system specific study results, and compliance monitoring results under subdivision B 3 e (1) of this section. Owners shall follow the protocol in subdivision B 3 e (2) (e) (iii) ((a)) through ((h)) of this section. If required to monitor at more than eight locations, the owner shall repeat the protocol as necessary. If a owner does not have existing compliance monitoring results under subdivision B 3 e (1) of this section or if the owner does not have enough existing compliance monitoring results under subdivision B 3 e (1) of this section, the owner shall repeat the protocol, skipping the provisions of subdivision B 3 e (2) (e) (iii) ((c)) and ((g)) of this section as necessary, until the owner has identified the required total number of monitoring locations.

((a)) Location with the highest TTHM LRAA not previously selected as a LRAA monitoring location.

((b)) Location with the highest HAA5 LRAA not previously selected as a LRAA monitoring location.

((c)) Existing average residence time compliance monitoring location under subdivision B 3 e (1) of this section (maximum residence time compliance monitoring location for ground water systems) with the highest HAA5 LRAA not previously selected as a LRAA monitoring location.

((d)) Location with the highest TTHM LRAA not previously selected as a LRAA monitoring location.

((e)) Location with the highest TTHM LRAA not previously selected as a LRAA monitoring location.

((f)) Location with the highest HAA5 LRAA not previously selected as a LRAA monitoring location.

((g)) Existing average residence time compliance monitoring location under subdivision B 3 e (1) of this section (maximum residence time compliance monitoring location for ground water systems) with the highest TTHM LRAA not previously selected as a LRAA monitoring location.

((h)) Location with the highest HAA5 LRAA not previously selected as a LRAA monitoring location.

(iv) An owner may recommend locations other than those specified in subdivision B 3 e (2) (e) (iii) of this section if the owner includes a rationale for selecting other locations. If the commissioner approves the alternate locations, the owners shall monitor at these locations to determine compliance under subdivision B 3 e (3) of this section.

(v) The recommended schedule shall include LRAA monitoring during the peak historical month for TTHM and HAA5 concentration, unless the commissioner approves another month. Once the owner has identified the peak historical month, and if the owner is required to conduct routine monitoring at least quarterly, the owner shall schedule LRAA compliance monitoring at a regular frequency of every 90 days or fewer.

(f) The owner shall use only the analytical methods specified in 12VAC5-590-440, or otherwise approved by EPA for monitoring, to demonstrate compliance.

(g) IDSE results will not be used for the purpose of determining compliance with MCLs in Table 2.13.

(3) Locational running annual average monitoring requirements.

(a) This subdivision establishes monitoring and other requirements for achieving compliance with maximum contaminant levels based on locational running annual averages (LRAA) for total trihalomethanes (TTHM) and haloacetic acids (five) (HAA5), and for achieving compliance with maximum residual disinfectant residuals for chlorine and chloramines for certain consecutive systems.

(b) This subdivision applies to community waterworks or nontransient noncommunity waterworks that uses a

primary or residual disinfectant other than ultraviolet light or delivers water that has been treated with a primary or residual disinfectant other than ultraviolet light.

(c) Owner shall comply on the schedule in the following table based on the type of waterworks:

Type of Waterworks	Waterworks shall comply with Locational Running Average monitoring by:[1]
Waterworks that are not part of a combined distribution system and waterworks that serve the largest population in the combined distribution system	
Waterworks serving equal to or greater than 100,000	April 1, 2012
Waterworks serving 50,000-99,999	October 1, 2012
Waterworks serving 10,000-49,999	October 1, 2013
Waterworks serving less than 10,000	October 1, 2013 if no Cryptosporidium monitoring is required under 12VAC5-590-420 ~~subdivision~~ B 3 a (1) (c) or October 1, 2014 if Cryptosporidium monitoring is required under 12VAC5-590-420 ~~subdivision~~ B 3 a (1) (c)
Other waterworks that are part of a combined distribution system	
Consecutive waterworks or wholesale waterworks	-at the same time as the waterworks with the earliest compliance date in the combined distribution system
[1]The commissioner may grant up to an additional 24 months for compliance with MCLs and operational evaluation levels if the waterworks require capital improvements to comply with an MCL.	

(i) Waterworks monitoring frequency is specified in subdivision B 3 e (3) (d) (ii) of this section.

((a)) Owners of waterworks required to conduct quarterly monitoring shall begin monitoring in the first full calendar quarter that includes the compliance date in the table in subdivision B 3 e (3) (c) of this section.

((b)) Owners of waterworks required to conduct monitoring at a frequency that is less than quarterly shall begin monitoring in the calendar month recommended in the IDSE report prepared under subdivision B 3 e (2) (d) (iii) or subdivision B 3 e (2) (d) (iv) of this section or the calendar month identified in the LRAA monitoring plan developed under subdivision B 3 e (3) (e) of this section no later than 12 months after the compliance date in the table in subdivision B 3 e (3) (c) of this section.

(ii) Owners of waterworks required to conduct quarterly monitoring shall make compliance calculations at the end of the fourth calendar quarter that follows the compliance date and at the end of each subsequent quarter (or earlier if the LRAA calculated based on fewer than four quarters of data would cause the MCL to be exceeded regardless of the monitoring results of subsequent quarters). Owners of waterworks required to conduct monitoring at a frequency that is less than quarterly shall make compliance calculations beginning with the first compliance sample taken after the compliance date.

(iii) For the purpose of the schedule in subdivision B 3 e (3) (c) of this section, the commissioner has determine that the combined distribution system does not include consecutive waterworks that receive water from a wholesale waterworks only on an emergency basis or receive less than 10% of their total water consumption from a wholesale waterworks. The commissioner has also determine that the combined distribution system does not include wholesale waterworks which deliver water to a consecutive waterworks only on an emergency basis or deliver less than 10% of the total water used by a consecutive waterworks.

(d) Routine monitoring.

(i) Owners submitting an IDSE report shall begin monitoring at the locations and months the owner recommended in the IDSE report submitted under subdivision B 3 e (2) (e) of this section following the schedule in subdivision B 3 e (3) (c) of this section, unless the commissioner requires other locations or additional locations after review. If the owner submitted a 40/30 certification under subdivision B 3 e (2) (d) (v) of this section or the waterworks qualified for a very small system waiver under subdivision B 3 e (2) (d) (vi) of this section or the waterworks is a nontransient noncommunity waterworks serving less than 10,000, the owner shall monitor at the location(s) and dates identified in the monitoring plan in subdivision B 3 j of this section, updated as required by subdivision B 3 e (3) (e) of this section.

(ii) Owners shall monitor at no fewer than the number of locations identified in the following table:

Source Water Type	Population Size Category	Monitoring Frequency[1]	Distribution System Monitoring Location Total per Monitoring Period[2]
Surface water or groundwater under the direct influence of surface water	Less than 500	per year	2
	500-3,300	per quarter	2
	3,301-9,999	per quarter	2
	10,000-49,999	per quarter	4
	50,000-249,999	per quarter	8
	250,000-999,999	per quarter	12
	1,000,000-4,999,999	per quarter	16
	Equal to or greater than 5,000,000	per quarter	20
Groundwater	Less than 500	per year	2
	500-9,999	per year	2
	10,000-99,999	per quarter	4
	100,000-499,999	per quarter	6
	Equal to or greater than 500,000	per quarter	8

[1]All owners shall monitor during month of highest DBP concentrations.

[2]Owners of waterworks on quarterly monitoring (except for surface water source or GUDI source waterworks serving 500-3,300) shall take dual sample sets every 90 days at each monitoring location. Groundwater source waterworks serving 500-9,999 (on annual monitoring) shall take dual sample sets annually at each monitoring location. Waterworks serving fewer than 500 and surface water source or GUDI source waterworks serving 500-3,300 shall take individual TTHM and HAA5 samples (instead of a dual sample set) at the locations with the highest TTHM and HAA5 concentrations, respectively. Waterworks serving fewer than 500 shall sample annually and surface water source or GUDI source systems serving 500-3,300 shall sample every 90 days. Only one location with a dual sample set per monitoring period is needed if highest TTHM and HAA5 concentrations occur at the same location (and month, if monitoring annually).

(iii) Owners of waterworks not using disinfection that begin using a disinfectant other than UV light after the dates in subdivision B 3 e (2) of this section for complying with the IDSE requirements shall consult with the commissioner to identify compliance monitoring locations. Owners shall then develop a monitoring plan under subdivision B 3 e (3) (e) of this section that includes those monitoring locations.

(iv) Owners shall use an approved method listed in 12VAC5-590-440 for TTHM and HAA5 analyses. Analyses shall be conducted by laboratories that have received certification by EPA or the state as specified in 12VAC5-590-440.

(e) Monitoring plan.

(i) Owners shall develop and implement a monitoring plan to be kept on file for review by the commissioner and the public. The monitoring plan shall be completed no later than the date the owner conducts the initial monitoring and contain:

((a)) Monitoring locations;

((b)) Monitoring dates; and

((c)) Compliance calculation procedures.

(ii) If the owner was not required to submit an IDSE report under either subdivision B 3 e (2) (d) (iii) or subdivision B 3 e (2) (d) (iv) of this section, and the waterworks did not have sufficient monitoring locations under subdivision B 3 e (1) of this section to identify the required number of LRAA compliance monitoring locations indicated in subdivision B 3 e (2) (e) (ii) of this section, the owner shall identify additional locations by alternating selection of locations representing high TTHM levels and high HAA5 levels until the required number of compliance monitoring locations have been identified. The owner shall also provide the rationale for identifying the locations as having high levels of TTHM or HAA5. If the waterworks has more monitoring locations under subdivision B 3 e (1) of this section than required for LRAA compliance monitoring in subdivision B 3 e (2) (e) (ii) of this section, the owner shall identify which locations the waterworks will use for LRAA compliance monitoring by alternating selection of locations representing high TTHM levels and high HAA5 levels until the required number of LRAA compliance monitoring locations have been identified.

(iii) Owners of waterworks using surface water or groundwater under the direct influence of surface water serving more than 3,300 people shall submit a copy of the monitoring plan to the commissioner prior to the date the waterworks conducts the initial monitoring, unless the IDSE report submitted under subdivision B 3 e (2) of this section contains all the information required by this section.

(iv) Owners may revise the monitoring plan to reflect changes in treatment, distribution system operations and layout (including new service areas), or other factors that may affect TTHM or HAA5 formation, or for reasons approved by the commissioner, after consultation with the commissioner regarding the need for changes and the

appropriateness of the changes. If the owner changes monitoring locations, the owner shall replace existing compliance monitoring locations with the lowest LRAA with new locations that reflect the current distribution system locations with expected high TTHM or HAA5 levels. The commissioner may also require modifications in the monitoring plan. Owners of waterworks using surface water or groundwater under the direct influence of surface water serving more than 3,300 people shall submit a copy of the modified monitoring plan to the commissioner prior to the date the owner is required to comply with the revised monitoring plan.

(f) Reduced monitoring

(i) Owners may reduce monitoring to the level specified in the following table any time the LRAA is less than or equal to 0.040 mg/L for TTHM and less than or equal to 0.030 mg/L for HAA5 at all monitoring locations. Owners may only use data collected under the provisions of this subdivision or subdivision B 3 e (1) of this section to qualify for reduced monitoring. In addition, the source water annual average TOC level, before any treatment, shall be less than or equal to 4.0 mg/L at each treatment plant treating surface water or ground water under the direct influence of surface water, based on monitoring conducted under either subdivision B 3 e (1) (b) (vi) or B 3 i of this section.

Source Water Type	Population Size Category	Monitoring Frequency[1]	Distribution System Monitoring Location per Monitoring Period
Surface water or ground-water under the direct influence of surface water	Less than 500		monitoring may not be reduced
	500-3,300	per year	1 TTHM and 1 HAA5 sample: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement; 1 dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and quarter.
	3,301-9,999	per year	2 dual sample sets: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement
	10,000-49,999	per quarter	2 dual sample sets at the locations with the highest TTHM and highest HAA5 LRAAs
	50,000-249,999	per quarter	4 dual sample sets - at the locations with the two highest TTHM and two highest HAA5 LRAAs
	250,000-999,999	per quarter	6 dual sample sets - at the locations with the three highest TTHM and three highest HAA5 LRAAs
	1,000,000-4,999,999	per quarter	8 dual sample sets - at the locations with the four highest TTHM and four highest HAA5 LRAAs
	Equal to or greater than 5,000,000	per quarter	10 dual sample sets - at the locations with the five highest TTHM and five highest HAA5 LRAAs

Groundwater	Less than 500	every third year	1 TTHM and 1 HAA5 sample: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement; 1 dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and quarter.
	500-9,999	per year	1 TTHM and 1 HAA5 sample: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement; 1 dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and quarter.
	10,000-99,999	per year	2 dual sample sets: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement
	100,000-499,999	per quarter	2 dual sample sets; at the locations with the highest TTHM and highest HAA5 LRAAs
	Equal to or greater than 500,000	per quarter	4 dual sample sets at the locations with the two highest TTHM and two highest HAA5 LRAAs

[1]Owners of waterworks on quarterly monitoring shall take dual sample sets every 90 days.

(ii) owners may remain on reduced monitoring as long as the TTHM LRAA is less than or equal to 0.040 mg/L and the HAA5 LRAA is less than or equal to 0.030 mg/L at each monitoring location (for waterworks with quarterly reduced monitoring) or each TTHM sample is less than or equal to 0.060 mg/L and each HAA5 sample is less than or equal to 0.045 mg/L (for waterworks with annual or less frequent monitoring). In addition, the source water annual average TOC level, before any treatment, shall be less than or equal to 4.0 mg/L at each treatment plant treating surface water or ground water under the direct influence of surface water, based on monitoring conducted under either subdivision B 3 e (1) (b) (vi) or B 3 i of this section.

(iii) If the LRAA based on quarterly monitoring at any monitoring location exceeds either 0.040 mg/L for TTHM or 0.030 mg/L for HAA5 or if the annual (or less frequent) sample at any location exceeds either 0.060 mg/L for TTHM or 0.045 mg/L for HAA5, or if the source water annual average TOC level, before any treatment, is greater than 4.0 mg/L at any treatment plant treating surface water or ground water under the direct influence of surface water, the owner shall resume routine monitoring under subdivision B 3 e (3) (d) of this section or begin increased monitoring if subdivision B 3 e (3) (g) of this section applies.

(iv) The commissioner may return the waterworks to routine monitoring at the commissioner's discretion.

(v) A waterworks may remain on reduced monitoring after the dates identified in subdivision B 3 e (3) (c) of this section for compliance with this section only if the waterworks qualifies for a 40/30 certification under subdivision B 3 e (2) (d) (v) of this section or has received a very small system waiver under subdivision B 3 e (2) (d) (vi) of this section, plus the waterworks meets the reduced monitoring criteria in subdivision B 3 e (3) (f) of this section, and the owner did not change or add monitoring locations from those used for compliance

monitoring under subdivision B 3 e (1) of this section. If the monitoring locations under this subdivision differ from the monitoring locations under subdivision B 3 e (1) of this section, the owner may not remain on reduced monitoring after the dates identified in subdivision B 3 e (3) (c) of this section for compliance with this subdivision.

(g) Increased Monitoring

(i) Owners of waterworks required to monitor at a particular location annually or less frequently than annually under subdivision B 3 e (3) (d) or subdivision B 3 e (3) (f) of this section, shall increase monitoring to dual sample sets once per quarter (taken every 90 days) at all locations if a TTHM sample is greater than 0.080 mg/L or a HAA5 sample is greater than 0.060 mg/L at any location.

(ii) A waterworks is in violation of the MCL when the LRAA exceeds the MCLs in Table 2.13, calculated based on four consecutive quarters of monitoring (or the LRAA calculated based on fewer than four quarters of data if the MCL would be exceeded regardless of the monitoring results of subsequent quarters). Waterworks are in violation of the monitoring requirements for each quarter that a monitoring result would be used in calculating an LRAA if the owner fails to monitor.

(iii) Owners may return to routine monitoring once the waterworks has conducted increased monitoring for at least four consecutive quarters and the LRAA for every monitoring location is less than or equal to 0.060 mg/L for TTHM and less than or equal to 0.045 mg/L for HAA5.

(iv) Owners of waterworks on increased monitoring under subdivision e (1) in this section shall remain on increased monitoring until the waterworks qualify for a return to routine monitoring under subdivision B 3 e (3) (g) (iii) of this section. The owner shall conduct increased monitoring under subdivision B 3 e (3) (g) of this section at the monitoring locations in the monitoring plan developed under subdivision B 3 e (3) (e) of this section beginning at the date identified in subdivision B 3 e (3) (c) of this section for compliance with this subdivision and remain on increased monitoring until the waterworks qualifies for a return to routine monitoring under subdivision B 3 e (3) (g) (iii) of this section.

f. Chlorite. Owners of community and nontransient noncommunity waterworks using chlorine dioxide, for disinfection or oxidation, shall conduct monitoring for chlorite.

(1) Routine monitoring.

(a) Daily monitoring. Owners shall take daily samples at the entrance to the distribution system. For any daily sample that exceeds the chlorite PMCL in Table 2.13, the owner shall take additional samples in the distribution system the following day at the locations required by subdivision B 3 f (1) (c) of this section, in addition to the sample required at the entrance to the distribution system.

(b) Monthly monitoring. Owners shall take a three-sample set each month in the distribution system. The owner shall 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 shall be conducted in the same manner (as three-sample sets, at the specified locations). The owner may use the results of additional monitoring conducted under subdivision B 3 f (1) (c) of this section to meet the requirement for monitoring in this paragraph.

(c) Additional monitoring requirements. On each day following a routine sample monitoring result that exceeds the chlorite PMCL in Table 2.13 at the entrance to the distribution system, the owner 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).

(2) Reduced monitoring.

(a) Chlorite monitoring at the entrance to the distribution system required by subdivision B 3 f (1) (a) of this section may not be reduced.

(b) Chlorite monitoring in the distribution system required by subdivision B 3 f (1) (b) of this section may be reduced to one three-sample set per quarter after one year of monitoring where no individual chlorite sample taken in the distribution system under subdivision B 3 f (1) (b) of this section has exceeded the chlorite PMCL in Table 2.13 and the owner has not been required to conduct monitoring under subdivision B 3 f (1) (c) of this section. The owner may remain on the reduced monitoring schedule until either any of the three individual chlorite samples taken quarterly in the distribution system under subdivision B 3 f (1) (b) of this section exceeds the chlorite PMCL or the owner is required to conduct monitoring under subdivision B 3 f (1) (c) of this section, at which time the owner shall revert to routine monitoring.

g. Bromate.

(1) The owner of a community or nontransient noncommunity waterworks treatment plant using ozone, for disinfection or oxidation, shall take one sample per

month and analyze it for bromate. The owner shall take samples monthly at the entrance to the distribution system while the ozonation system is operating under normal conditions.

(2) Reduced monitoring.

(a) Until March 31, 2009, owners of waterworks required to analyze for bromate may reduce monitoring from monthly to quarterly, if the waterworks average source water bromide concentration is less than 0.05 mg/L based on representative monthly bromide measurements for one year. The owner may remain on reduced bromate monitoring until the running annual average source water bromide concentration, computed quarterly, is equal to or greater than 0.05 mg/L based on representative monthly measurements. If the running annual average source water bromide concentration is equal to or greater than 0.05 mg/L, the owner shall resume routine monitoring required by subdivision B 3 g (1) of this section in the following month.

(b) Beginning April 1, 2009, owners may no longer use the provisions of subdivision B 3 g (2) (a) of this section to qualify for reduced monitoring. An owner required to analyze for bromate may reduce monitoring from monthly to quarterly, if the waterworks running annual average bromate concentration is equal to or less than 0.0025 mg/L based on monthly bromate measurements under subdivision B 3 g (1) of this section for the most recent four quarters, with samples analyzed in accordance with 12VAC5-590-440. If a waterworks has qualified for reduced bromate monitoring under subdivision B 3 g (2) (a) of this section, the owner may remain on reduced monitoring as long as the running annual average of quarterly bromate samples is equal to or less than 0.0025 mg/L based on samples analyzed in accordance with 12VAC5-590-440. If the running annual average bromate concentration is greater than 0.0025 mg/L, the owner shall resume routine monitoring required by subdivision B 3 g (1) of this section.

(3) Bromide. Owners of waterworks required to analyze for bromate may reduce bromate monitoring from monthly to once per quarter, if the owner demonstrates that the average source water bromide concentration is less than 0.05 mg/L based upon representative monthly measurements for one year. The owner shall continue bromide monitoring to remain on reduced bromate monitoring.

h. Monitoring requirements for disinfectant residuals.

(1) Chlorine and chloramines.

(a) Owners of waterworks that use chlorine or chloramines shall measure the residual disinfectant level in the distribution system at the same point in the distribution system and at the same time as total coliforms are sampled, as specified in subsection A. Owners of waterworks that use surface water or groundwater under the direct influence of surface water may use the results of residual disinfectant concentration sampling found in subdivision B 7 c (1) of this section in lieu of taking separate samples.

(b) Residual disinfectant level monitoring may not be reduced.

(2) Chlorine dioxide.

(a) Owners of waterworks that use chlorine dioxide for disinfection or oxidation shall take daily samples at the entrance to the distribution system. For any daily sample that exceeds the MRDL in Table 2.12, the owner shall take samples in the distribution system the following day at the locations required by subdivision B 3 h (2) (b) of this section, in addition to the sample required at the entrance to the distribution system.

(b) On each day following a routine sample monitoring result that exceeds the MRDL in Table 2.12, the owner is required to take three chlorine dioxide distribution system samples. If chlorine dioxide or chloramines are used to maintain a disinfectant residual in the distribution system, or if chlorine is used to maintain a disinfectant residual in the distribution system and there are no disinfection addition points after the entrance to the distribution system (i.e., no booster chlorination), the owner shall 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 disinfectant residual 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 owner shall 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).

(c) Chlorine dioxide monitoring may not be reduced.

i. Monitoring requirements for disinfection byproduct precursors (DBPP).

(1) Owners of community or nontransient noncommunity waterworks using surface water or groundwater under the direct influence of surface water and using conventional filtration treatment (as defined in 12VAC5-590-10) shall monitor each treatment plant for TOC no later than the point of combined filter effluent turbidity monitoring and representative of the treated water. All owners required to monitor under subdivision (B 3 i (1)) shall 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

as the source water sample is taken, all owners shall monitor for alkalinity in the source water prior to any treatment. Owners shall take one paired sample and one source water alkalinity sample per month per plant at a time representative of normal operating conditions and influent water quality.

(2) Owners of community or nontransient noncommunity waterworks that use surface water or groundwater under the direct influence of surface water 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, may reduce monitoring for both TOC and alkalinity to one paired sample and one source water alkalinity sample per plant per quarter. The owners shall revert to routine monitoring in the month following the quarter when the annual average treated water TOC equal to or greater than 2.0 mg/L.

j. The owner of each waterworks required to monitor under subdivision B 3 of this section shall develop and implement a monitoring plan. The owner shall maintain the plan and make it available for inspection by the commissioner and the general public no later than 30 days following the applicable compliance dates in subdivision B 3 a of this section. The owners of all community or nontransient noncommunity waterworks that use surface water or groundwater under the direct influence of surface water serving more than 3,300 people shall submit a copy of the monitoring plan to the commissioner no later than the date of the first report required under 12VAC5-590-530 A. The commissioner may also require the plan to be submitted by any other owner. After review, the commissioner may require changes in any plan elements. The plan shall include at least the following elements:

(1) Specific locations and schedules for collecting samples for any parameters included in subdivision B 3 of this section.

(2) How the owner will calculate compliance with PMCLs, MRDLs, and treatment techniques.

(3) The sampling plan for a consecutive waterworks shall reflect the entire consecutive distribution system.

4. Unregulated contaminants (UCs). Owners of all community and nontransient noncommunity waterworks shall sample for the contaminants listed in Table 2.6 and Table 2.7 as follows:

a. Table 2.6—Group A

(1) Owners of waterworks that use a surface water source in whole or in part shall sample at the entry points to the distribution system which is representative of each source, after treatment (hereafter called a sampling point). The minimum number of samples is one year of consecutive quarterly samples per sampling point beginning in accordance with Table 2.8.

(2) Owners of waterworks that use groundwater shall sample at points of entry to the distribution system which is representative of each source (hereafter called a sampling point). The minimum number of samples is one sample per sampling point beginning in accordance with Table 2.8.

(3) The commissioner may require a confirmation sample for positive or negative results.

(4) Owners of waterworks serving less than 150 connections may inform the commissioner, in writing, that their waterworks is available for sampling instead of performing the required sampling.

(5) All waterworks required to sample under this section shall repeat the sampling at least every five years.

b. Table 2.6—Group B and Table 2.7

(1) The owner of each community and nontransient noncommunity waterworks shall take four consecutive quarterly samples at the entry points to the distribution system which is representative of each source (hereafter called a sampling point) for each contaminant listed in Table 2.6 Group B and report the results to the commissioner. Monitoring shall be completed by December 31, 1995.

(2) The owner of each community and nontransient noncommunity waterworks shall take one sample at each sampling point for each contaminant listed in Table 2.7 and report the results to the commissioner. Monitoring shall be completed by December 31, 1995.

(3) The owner of each community and nontransient noncommunity waterworks may apply to the commissioner for a waiver from the monitoring requirements of subdivisions B 4 b (1) and (2) of this section for the contaminants listed in Table 2.6 Group B and Table 2.7.

(4) The commissioner may grant a waiver for the requirement of subdivision B 4 b (1) of this section based on the criteria specified in subdivision B 2 f of this section. The commissioner may grant a waiver from the requirement of subdivision B 4 b (2) of this section if previous analytical results indicate contamination would not occur, provided this data was collected after January 1, 1990.

(5) If the waterworks utilizes more than one source and the sources are combined before distribution, the owner shall 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).

(6) The commissioner may require a confirmation sample for positive or negative results.

(7) Instead of performing the monitoring required by this section, the owner of a community waterworks or nontransient noncommunity waterworks serving fewer than 150 service connections may send a letter to the commissioner stating that the waterworks is available for sampling. This letter shall be sent to the commissioner by January 1, 1994. The owner shall not send such samples to the commissioner unless requested to do so by the commissioner.

(8) All waterworks required to sample under this subdivision shall repeat the sampling at least every five years.

5. ~~Repealed.~~ Reserved.

6. ~~Monitoring requirements for lead and copper. The owners of all community and nontransient noncommunity waterworks shall monitor for lead and copper in tap water (subdivision B 6 a of this section), water quality (corrosion) parameters in the distribution system and at entry points (subdivision B 6 b of this section), and lead and copper in water supplies (subdivision B 6 c of this section). The monitoring requirements contained in this section are summarized in Appendix M.~~ Reserved.

~~a. Monitoring requirements for lead and copper in tap water.~~

~~(1) Sample site location.~~

~~(a) By the applicable date for commencement of monitoring under subdivision B 6 a (4) (a) of this section, each owner shall complete a materials evaluation of the distribution system in order to identify a pool of targeted sampling sites that meets the requirements of this section, and which is sufficiently large to ensure that the owner can collect the number of lead and copper tap samples required in subdivision B 6 a (3) of this section. 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.~~

~~(b) An owner shall use the information on lead, copper, and galvanized steel that the owner is required to collect when conducting a materials evaluation (reference Appendix B Corrosion). When this evaluation is insufficient to locate the requisite number of lead and copper sampling sites that meet the targeting criteria of this section, the owner shall review the sources of information listed below in order to identify a sufficient number of sampling sites. In addition, the owner 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):~~

~~(i) 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;~~

~~(ii) 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~~

~~(iii) All existing water quality information, which includes the results of all prior analyses of the waterworks or individual structures connected to the waterworks, indicating locations that may be particularly susceptible to high lead or copper concentrations.~~

~~(c) The sampling sites selected for a community waterworks' sampling pool ("tier 1 sampling sites") shall consist of single family structures that:~~

~~(i) Contain copper pipes with lead solder installed between January 1983 and April 1986 or contain lead pipes; and/or~~

~~(ii) Are served by a lead service line.~~

~~NOTE: When multiple family residences comprise at least 20% of the structures served by a waterworks, the owner may include these types of structures in the sampling pool.~~

~~(d) The owner of any community waterworks with insufficient tier 1 sampling sites shall complete the sampling pool with "tier 2 sampling sites," consisting of buildings, including multiple-family residences that:~~

~~(i) Contain copper pipes with lead solder installed between January 1983 and April 1986 or contain lead pipes; and/or~~

~~(ii) Are served by a lead service line.~~

~~(e) The owner of any community waterworks with insufficient tier 1 and tier 2 sampling sites shall complete the sampling pool with "tier 3 sampling sites," consisting of single family structures that contain copper pipes with lead solder installed before 1983. The owner of a community waterworks with insufficient tier 1, tier 2, and tier 3 sampling sites shall complete the sampling pool with representative sites throughout the distribution system. For the purpose of this paragraph, a representative site is a site in which the plumbing materials used at that site would be commonly found at other sites served by the waterworks.~~

(f) The sampling sites selected for a nontransient noncommunity waterworks ("tier 1 sampling sites") shall consist of buildings that:

(i) Contain copper pipes with lead solder installed between January 1983 and April 1986 or contain lead pipes; and/or

(ii) Are served by a lead service line.

(g) The owner of a nontransient noncommunity waterworks with insufficient tier 1 sites that meet the targeting criteria in subdivision B 6 a (1) (f) of this section shall complete the sampling pool with sampling sites that contain copper pipes with lead solder installed before 1983. If additional sites are needed to complete the sampling pool, the owner of a nontransient noncommunity waterworks shall use representative sites throughout the distribution system. For the purpose of this paragraph, a representative site is a site in which the plumbing materials used at that site would be commonly found at other sites served by the waterworks.

(h) The owner of any waterworks whose distribution system contains lead service lines shall draw 50% of the samples the owner collects during each monitoring period from sites that contain lead pipes, or copper pipes with lead solder, and 50% of the samples the owner collects from sites served by a lead service line. Any owner who cannot identify a sufficient number of sampling sites served by a lead service line shall collect first draw tap samples from all of the sites identified as being served by such lines.

(2) Sample collection methods.

(a) All tap samples for lead and copper, with the exception of lead service line samples collected under 12VAC5-590-420 E 3 and samples collected under subdivision B 6 a (2) (e) of this section, shall be first draw samples.

(b) Each first draw tap sample for lead and copper shall be one liter in volume and have stood motionless in the plumbing system of each sampling site for at least six hours. First draw samples from residential housing shall be collected from the cold-water kitchen tap or bathroom sink tap. First draw samples from a nonresidential building shall be one liter in volume and shall be collected at an interior tap from which water is typically drawn for consumption. Non first draw samples collected in lieu of first draw samples pursuant to subdivision B 6 a (2) (e) of this section shall be one liter in volume and shall be collected at an interior tap from which water is typically drawn for consumption. First draw samples may be collected by the owner or the owner may allow residents to collect first draw samples after instructing the residents of the sampling procedures specified in this paragraph. To avoid problems of residents handling nitric acid, acidification of first draw samples may be done up to 14 days after the sample is collected. After acidification to resolubilize the metals, the sample must stand in the original container for the time specified in the approved EPA method before the sample can be analyzed. If an owner allows residents to perform sampling, the owner may not challenge, based on alleged errors in sample collection, the accuracy of sampling results.

(c) Each lead service line sample collected pursuant to 12VAC5-590-420 E 3 for the purpose of avoiding replacement shall be one liter in volume and have stood motionless in the lead service line for at least six hours. Lead service line samples shall be collected in one of the following three ways:

(i) At the tap after flushing the volume of water between the tap and the lead service line. The volume of water shall be calculated based on the interior diameter and length of the pipe between the tap and the lead service line;

(ii) Tapping directly into the lead service line; or

(iii) If the sampling site is a building constructed as a single family residence, allowing the water to run until there is a significant change in temperature which would be indicative of water that has been standing in the lead service line.

(d) An owner shall collect each first draw tap sample from the same sampling site from which the owner collected a previous sample. If, for any reason, the owner cannot gain entry to a sampling site in order to collect a follow-up tap sample, the owner may collect the follow-up tap sample from another sampling site in the sampling pool as long as the new site meets the same targeting criteria, and is within reasonable proximity of the original site.

(e) The owner of a nontransient noncommunity waterworks, or a community waterworks that meets the criteria of 12VAC5-590-420 F 3 g (1) and (2) that does not have enough taps that can supply first draw samples, as defined in subdivision B 6 a (2) (b) of this section, may apply to the district engineer in writing to substitute non first draw samples. If approved by the commissioner, such owners shall collect as many first-draw samples from appropriate taps as possible and identify sampling times and locations that would likely result in the longest standing time for the remaining sites.

(3) Number of samples. Owners shall collect at least one sample during each monitoring period specified in subdivision B 6 a (4) of this section from the number of sites listed in the first column ("standard monitoring") of the table in this paragraph. The owner of a waterworks conducting reduced monitoring under subdivision B 6 a

(4) (d) of this section shall collect at least one sample from the number of sites specified in the second column ("reduced monitoring") of the table in this paragraph during each monitoring period specified in subdivision B 6 a (4) (d) of this section. Such reduced monitoring sites shall be representative of the sites required for standard monitoring. The commissioner may specify sampling locations when an owner is conducting reduced monitoring. The table is as follows:

System Size (Number of People Served)	Number of sites (Standard Monitoring)	Number of sites (Reduced Monitoring)
greater than 100,000	100	50
10,001-100,000	60	30
3,301 to 10,000	40	20
501 to 3,300	20	10
101 to 500	10	5
less than or equal to100	5	5

(4) Timing of monitoring.

(a) Initial tap sampling. The first six-month monitoring period for small (serving less than 3,300 population), medium size (serving 3,301 to 50,000 population) and large waterworks (serving greater than 50,000 population) shall be established by the commissioner.

(i) Owners of all large waterworks shall monitor during two consecutive six-month periods.

(ii) Owners of all small and medium size waterworks shall monitor during each six month monitoring period until: the waterworks exceeds the lead or copper action level and is therefore required to implement the corrosion control treatment requirements under 12VAC5-590-420 C, in which case the owner shall continue monitoring in accordance with subdivision B 6 a (4) (b) of this section, or the waterworks meets the lead and copper action levels during two consecutive six-month monitoring periods, in which case the owner may reduce monitoring in accordance with subdivision B 6 a (4) (d) of this section.

(b) Monitoring after installation of corrosion control and water supply (source water) treatment.

(i) The owner of any large waterworks that installs optimal corrosion control treatment pursuant to 12VAC5-590-420 C 2 d (4) shall monitor during two consecutive six-month monitoring periods by the date specified in 12VAC5-590-420 C 2 d (5).

(ii) The owner of any small or medium size waterworks that installs optimal corrosion control treatment pursuant to 12VAC5-590-420 C 2 e (5) shall monitor during two consecutive six month monitoring periods by the date specified in 12VAC5-590-420 C 2 e (6).

(iii) The owner of any waterworks that installs source water treatment pursuant to 12VAC5-590-420 D 1 c shall monitor during two consecutive six-month monitoring periods by the date specified in 12VAC5-590-420 D 1 d.

(c) Monitoring after the commissioner specifies water quality parameter values for optimal corrosion control. After the commissioner specifies the values for water quality control parameters under 12VAC5-590-420 C 1 f, the owner shall monitor during each subsequent six-month monitoring period, with the first monitoring period to begin on the date the commissioner specifies the optimal values under 12VAC5-590-420 C 1 f.

(d) Reduced monitoring.

(i) The owner of a small or medium size waterworks that meets the lead and copper action levels during each of two consecutive six month monitoring periods may reduce the number of samples in accordance with subdivision B 6 a (3) of this section, and reduce the frequency of sampling to once per year.

(ii) The owner of any waterworks that maintains the range of values for the water quality control parameters reflecting optimal corrosion control treatment specified by the commissioner under 12VAC5-590-420 C 1 f during each of two consecutive six month monitoring periods may reduce the frequency of monitoring to once per year and to reduce the number of lead and copper samples in accordance with subdivision B 6 a (3) of this section if the owner receives written approval from the commissioner. The commissioner shall review monitoring, treatment, and other relevant information submitted by the owner in accordance with 12VAC5-590-530 D, and shall notify the owner in writing when a determination is made that the owner is eligible to commence reduced monitoring pursuant to this paragraph. The commissioner shall review, and where appropriate, revise its determination when the owner submits new monitoring or treatment data, or when other data relevant to the number and frequency of tap sampling becomes available.

(iii) The owner of a small or medium size waterworks that meets the lead and copper action levels during three consecutive years of monitoring may reduce the frequency of monitoring for lead and copper from annually to once every three years. The owner of any waterworks that maintains the range of values for the water quality control parameters reflecting optimal corrosion control treatment specified by the

~~commissioner under 12VAC5-590-420-C-1-f during three consecutive years of monitoring may reduce the frequency of monitoring from annually to once every three years if the owner receives written approval from the commissioner. The commissioner shall review monitoring, treatment, and other relevant information submitted by the owner in accordance with 12VAC5-590-530-D and shall notify the owner in writing when a determination is made that the owner is eligible to commence reduced monitoring pursuant to this paragraph. The commissioner shall review, and where appropriate, revise its determination when the owner submits new monitoring or treatment data, or when other data relevant to the number and frequency of tap sampling becomes available.~~

~~(iv) The owner of a waterworks that reduces the number and frequency of sampling shall collect these samples from representative sites included in the pool of targeted sampling sites identified in subdivision B-6-a-(1) of this section. Owners sampling annually or less frequently shall conduct the lead and copper tap sampling during the months of June, July, August or September. For a nontransient noncommunity waterworks that does not operate during the months of June through September, the commissioner shall designate an alternate monitoring period that represents a time of normal operation for the waterworks.~~

~~(v) The owner of any waterworks that demonstrates for two consecutive six month monitoring periods that the tap water lead level computed under 12VAC5-590-410-E-3 is less than or equal to 0.005 mg/L and the tap water copper level computed under 12VAC5-590-410-E-3 is less than or equal to 0.65 mg/L may reduce the number of samples in accordance with subdivision B-6-a-(3) of this section and reduce the frequency of sampling to once every three calendar years.~~

~~(vi) The owner of a small or medium-size waterworks subject to reduced monitoring that exceeds the lead or copper action level shall resume sampling in accordance with subdivision B-6-a-(4)-(c) of this section and collect the number of samples specified for standard monitoring under subdivision B-6-a-(3). Such owner shall also conduct water quality parameter monitoring in accordance with subdivision B-6-b-(2), (3), or (4) of this section (as appropriate) during the monitoring period in which the action level is exceeded. The owner of any such waterworks may resume annual monitoring for lead and copper at the tap at the reduced number of sites specified in subdivision B-6-a-(3) of this section after it has completed two subsequent consecutive six month rounds of monitoring that meet the criteria of subdivision B-6-a-(4)-(d)-(i) of this section and/or may resume triennial monitoring for lead and copper at the reduced number of sites after it demonstrates through subsequent rounds of monitoring that it meets the criteria of either subdivision B-6-a-(4)-(d)-(iii) or (v) of this section.~~

~~(vii) The owner of any waterworks subject to the reduced monitoring frequency that fails to operate at or above the minimum value or within the range of values for the water quality parameters specified by the commissioner under 12VAC5-590-420-C-1-f for more than nine days in any six-month period specified in subdivision B-6-b-(4) of this section shall conduct tap water sampling for lead and copper at the frequency specified in subdivision B-6-a-(4)-(c) of this section, collect the number of samples specified for standard monitoring under subdivision B-6-a-(3) of this section, and shall resume monitoring for water quality parameters within the distribution system in accordance with subdivision B-6-b-(4) of this section. The owner of such a waterworks may resume reduced monitoring for lead and copper at the tap and for water quality parameters within the distribution system under the following conditions:~~

~~((a)) The owner may resume annual monitoring for lead and copper at the tap at the reduced number of sites specified in subdivision B-6-a-(3) of this section after completion of two subsequent six month rounds of monitoring that meet the criteria of subdivision B-6-a-(4)-(d)-(ii) of this section and the owner has received written approval from the commissioner that it is appropriate to resume reduced monitoring on an annual frequency.~~

~~((b)) The owner may resume triennial monitoring for lead and copper at the tap at the reduced number of sites after demonstration through subsequent rounds of monitoring that it meets the criteria of either subdivision B-6-a-(4)-(d)-(iii) or (v) of this section and the owner has received written approval from the commissioner that it is appropriate to resume triennial monitoring.~~

~~((c)) The owner may reduce the number of water quality parameter tap water samples required in accordance with subdivision B-6-b-(5)-(a) of this section and the frequency with which it collects such samples in accordance with subdivision B-6-b-(5)-(b) of this section. The owner of such a waterworks may not resume triennial monitoring for water quality parameters at the tap until it demonstrates, in accordance with the requirements of subdivision B-6-b-(5)-(b) of this section, that it has requalified for triennial monitoring.~~

~~(viii) The owner of any waterworks subject to a reduced monitoring frequency under subdivision B-6-a-(4)-(d) of this section that either adds a new source of water or changes any water treatment shall inform the district engineer in writing in accordance with 12VAC5-590-530-D-1-c. The commissioner may require the owner to resume sampling in accordance with subdivision B-6-a-(4)-(c) of this section and collect the number of samples specified for standard monitoring under subdivision 6-a~~

(3) of this section or take other appropriate steps such as increased water quality parameter monitoring or re-evaluation of its corrosion control treatment given the potentially different water quality considerations.

(5) Additional monitoring by owner. The results of any monitoring conducted in addition to the minimum requirements of this section shall be considered by the owner and the commissioner in making any determinations (i.e., calculating the 90th percentile lead or copper level) under this subpart.

(6) Invalidation of lead or copper tap water samples. A sample invalidated under this paragraph does not count toward determining lead or copper 90th percentile levels under 12VAC5-590-410 E or toward meeting the minimum monitoring requirements of subdivision B 6 a (3) of this section.

(a) The commissioner may invalidate a lead or copper tap water sample if at least one of the following conditions is met.

(i) The laboratory establishes that improper sample analysis caused erroneous results.

(ii) The commissioner determines that the sample was taken from a site that did not meet the site selection criteria of this section.

(iii) The sample container was damaged in transit.

(iv) There is substantial reason to believe that the sample was subject to tampering.

(b) The waterworks owner shall report the results of all samples to the district engineer and all supporting documentation for samples the owner believes should be invalidated.

(c) To invalidate a sample under subdivision B 6 a (6) (a) of this section, the decision and the rationale for the decision shall be documented in writing. The commissioner may not invalidate a sample solely on the grounds that a follow-up sample result is higher or lower than that of the original sample.

(d) The owner shall collect replacement samples for any samples invalidated under this section if, after the invalidation of one or more samples, the owner has too few samples to meet the minimum requirements of subdivision B 6 a (3) of this section. Any such replacement samples shall be taken as soon as possible, but no later than 20 days after the date the commissioner invalidates the sample or by the end of the applicable monitoring period, whichever occurs later. Replacement samples taken after the end of the applicable monitoring period shall not also be used to meet the monitoring requirements of a subsequent monitoring period. The replacement samples shall be taken at the same locations as the invalidated samples or, if that is not possible, at locations other than those already used for sampling during the monitoring period.

(7) Monitoring waivers for small waterworks. The owner of any small waterworks that meets the criteria of this section may apply to the commissioner to reduce the frequency of monitoring for lead and copper to once every nine years (i.e., a "full waiver") if the owner meets all of the materials criteria specified in subdivision B 6 a (7) (a) of this section and all of the monitoring criteria specified in subdivision B 6 a (7) (b) of this section. The owner of any small waterworks that meets the criteria in subdivisions B 6 a (7) (a) and (b) of this section only for lead, or only for copper, may apply to the commissioner for a waiver to reduce the frequency of tap water monitoring to once every nine years for that contaminant only (i.e., a "partial waiver").

(a) Materials criteria. The owner shall demonstrate that the distribution system and service lines and all drinking water supply plumbing, including plumbing conveying drinking water within all residences and buildings connected to the waterworks, are free of lead containing materials and/or copper containing materials, as those terms are defined in this paragraph, as follows:

(i) Lead. To qualify for a full waiver, or a waiver of the tap water monitoring requirements for lead (i.e., a "lead waiver"), the owner shall provide certification and supporting documentation to the commissioner that the waterworks is free of all lead containing materials, as follows:

((a)) It contains no plastic pipes that contain lead plasticizers, or plastic service lines that contain lead plasticizers; and

((b)) It is free of lead service lines, lead pipes, lead soldered pipe joints, and leaded brass or bronze alloy fittings and fixtures, unless such fittings and fixtures meet the specifications of any standard established pursuant to 42 USC § 300g-6(e) (SDWA § 1417(e)).

(ii) Copper. To qualify for a full waiver, or a waiver of the tap water monitoring requirements for copper (i.e., a "copper waiver"), the owner shall provide certification and supporting documentation to the commissioner that the waterworks contains no copper pipes or copper service lines.

(b) Monitoring criteria for waiver issuance. The owner shall have completed at least one six-month round of standard tap water monitoring for lead and copper at sites approved by the commissioner and from the number of sites required by subdivision B 6 a (3) of this section and demonstrate that the 90th percentile levels for any and all rounds of monitoring conducted since the owner became

~~free of all lead-containing and/or copper-containing materials, as appropriate, meet the following criteria.~~

~~(i) Lead levels. To qualify for a full waiver, or a lead waiver, the owner shall demonstrate that the 90th percentile lead level does not exceed 0.005 mg/L.~~

~~(ii) Copper levels. To qualify for a full waiver, or a copper waiver, the owner shall demonstrate that the 90th percentile copper level does not exceed 0.65 mg/L.~~

~~(c) Commissioner approval of waiver application. The commissioner shall notify the owner of the waiver determination, in writing, setting forth the basis of its decision and any condition of the waiver. As a condition of the waiver, the commissioner may require the owner to perform specific activities (e.g., limited monitoring, periodic outreach to customers to remind them to avoid installation of materials that might void the waiver) to avoid the risk of lead or copper concentration of concern in tap water. The owner of a small waterworks shall continue monitoring for lead and copper at the tap as required by subdivisions B 6 a (4) (a) through (d) of this section, as appropriate, until it receives written notification from the commissioner that the waiver has been approved.~~

~~(d) Monitoring frequency for waterworks owners with waivers.~~

~~(i) An owner with a full waiver shall conduct tap water monitoring for lead and copper in accordance with subdivision B 6 a (4) (d) (iv) of this section at the reduced number of sampling sites identified in subdivision B 6 a (3) of this section at least once every nine years and provide the materials certification specified in subdivision B 6 a (7) (a) of this section for both lead and copper to the commissioner along with the monitoring results.~~

~~(ii) An owner with a partial waiver shall conduct tap water monitoring for the waived contaminant in accordance with subdivision B 6 a (4) (d) (iv) of this section at the reduced number of sampling sites specified in subdivision B 6 a (3) of this section at least once every nine years and provide the materials certification specified in subdivision B 6 a (7) (a) of this section pertaining to the waived contaminant along with the monitoring results. Such an owner also shall continue to monitor for the nonwaived contaminant in accordance with requirements of subdivisions B 6 a (4) (a) through (d) of this section, as appropriate.~~

~~(iii) If an owner with a full or partial waiver adds a new source of water or changes any water treatment, the owner shall notify the commissioner in writing in accordance with 12VAC5-590-530 D 1 c. The commissioner has the authority to require the owner to add or modify waiver conditions (e.g., require recertification that the waterworks is free of lead-containing and/or copper-containing materials require additional round(s) of monitoring), if it deems such modifications are necessary to address treatment or source water changes at the waterworks.~~

~~(iv) If an owner with a full or partial waiver becomes aware that it is no longer free of lead-containing or copper-containing materials, as appropriate, (e.g., as a result of new construction or repairs), the owner shall notify the commissioner in writing no later than 60 days after becoming aware of such a change.~~

~~(e) Continued eligibility. If the owner continues to satisfy the requirements of subdivision B 6 a (7) (d) of this section, the waiver will be renewed automatically, unless any of the conditions listed in subdivisions (i), (ii), or (iii) of this section occurs. An owner whose waiver has been revoked may reapply for a waiver at such time as it again meets the appropriate materials and monitoring criteria of subdivisions B 6 a (7) (a) and (b) of this section.~~

~~(i) A waterworks with a full waiver or a lead waiver no longer satisfies the materials criteria of subdivision B 6 a (7) (a) (i) of this section or has a 90th percentile lead level greater than 0.005 mg/L.~~

~~(ii) A waterworks with a full waiver or a copper waiver no longer satisfies the materials criteria of subdivision B 6 a (7) (a) (ii) of this section or has a 90th percentile copper level greater than 0.65 mg/L.~~

~~(iii) The commissioner notifies the owner, in writing, that the waiver has been revoked, setting forth the basis of the decision.~~

~~(f) Requirements following waiver revocation. A waterworks whose full or partial waiver has been revoked by the commissioner is subject to the corrosion control treatment and lead and copper tap water monitoring requirements, as follows:~~

~~(i) If the waterworks exceeds the lead and/or copper action level, the owner shall implement corrosion control treatment in accordance with the deadlines specified in 12VAC5-590-420 C 2 e and any other applicable requirements of this subpart.~~

~~(ii) If the waterworks meets both the lead and the copper action level, the owner shall monitor for lead and copper at the tap no less frequently than once every three years using the reduced number of sample sites specified in subdivision B 6 a (3) of this section.~~

~~(g) Pre-existing waivers. Waivers for small waterworks approved by the commissioner in writing prior to April 11, 2000, shall remain in effect under the following conditions:~~

(i) If the waterworks has demonstrated that it is both free of lead-containing and copper-containing materials, as required by subdivision B 6 a (7) (a) of this section and that its 90th percentile lead levels and 90th percentile copper levels meet the criteria of subdivision B 6 a (7) (b) of this section, the waiver remains in effect so long as the owner continues to meet the waiver eligibility criteria of subdivision B 6 a (7) (c) of this section. The first round of tap water monitoring conducted pursuant to subdivision 6 a (7) (d) of this section shall be completed no later than nine years after the last time the owner has monitored for lead and copper at the tap.

(ii) If the waterworks has met the materials criteria of subdivision B 6 a (7) (a) of this section but has not met the monitoring criteria of subdivision B 6 a (7) (b) of this section, the owner shall conduct a round of monitoring for lead and copper at the tap demonstrating that it meets the criteria of subdivision B 6 a (7) (b) of this section no later than September 30, 2000. Thereafter, the waiver shall remain in effect as long as the owner meets the continued eligibility criteria of subdivision B 6 a (7) (c) of this section. The first round of tap water monitoring conducted pursuant to subdivision B 6 a (7) (d) of this section shall be completed no later than nine years after the round of monitoring conducted pursuant to subdivision B 6 a (7) (b) of this section.

b. Monitoring requirements for water quality parameters. The owners of all large waterworks and all small and medium size waterworks that exceed the lead or copper action level shall monitor water quality parameters in addition to lead and copper in accordance with this section. The requirements of this section are summarized in Appendix M.

(1) General requirements.

(a) Sample collection methods.

(i) Tap samples shall be representative of water quality throughout the distribution system taking into account the number of persons served, the different sources of water, the different treatment methods employed by the waterworks, and seasonal variability. Tap sampling under this section is not required to be conducted at taps targeted for lead and copper sampling under subdivision B 6 (a) (1) of this section. Owners may find it convenient to conduct tap sampling for water quality parameters at sites approved for coliform sampling.

(ii) Samples collected at the entry point(s) to the distribution system shall be from locations representative of each source after treatment. If a waterworks draws water from more than one source and the sources are combined before distribution, the owner shall 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).

(b) Number of samples.

(i) Owners shall collect two tap samples for applicable water quality parameters during each monitoring period specified under subdivision 6 b (2) through (5) of this section from the following number of sites.

System Size (Number of People Served)	Number of Sites for Water Quality Parameters
greater than 100,000	25
10,001-100,000	10
3,301 to 10,000	3
501 to 3,300	2
101 to 500	1
less than or equal to 100	1

(ii) Except as provided in subdivision B 6 b (3) (c) of this section, owners shall collect two samples for each applicable water quality parameter at each entry point to the distribution system during each monitoring period specified in subdivision B 6 b (2) of this section. During each monitoring period specified in subdivision B 6 b (3) through (5) of this section, owners shall collect one sample for each applicable water quality parameter at each entry point to the distribution system.

(2) Initial sampling. The owners of all large waterworks shall measure the applicable water quality parameters as specified below at taps and at each entry point to the distribution system during each six month monitoring period specified in subdivision B 6 a (4) (a) of this section. The owners of all small and medium size waterworks shall measure the applicable water quality parameters at the locations specified below during each six month monitoring period specified in subdivision B 6 a (4) (a) of this section during which the waterworks exceeds the lead or copper action level.

(a) At taps:

(i) pH;

(ii) alkalinity;

(iii) orthophosphate, when an inhibitor containing a phosphate compound is used;

(iv) silica, when an inhibitor containing a silicate compound is used;

(v) calcium;

(vi) conductivity; and

(vii) water temperature.

~~(b) At each entry point to the distribution system: all of the applicable parameters listed in subdivision B 6 b (2) (a) of this section.~~

~~(3) Monitoring after installation of corrosion control. The owner of any large waterworks which installs optimal corrosion control treatment pursuant to 12VAC5 590 420 C 2 d (4) shall measure the water quality parameters at the locations and frequencies specified below during each six month monitoring period specified in subdivision B 6 a (4) (b) (i) of this section. The owner of any small or medium size waterworks that installs optimal corrosion control treatment shall conduct such monitoring during each six month monitoring period specified in subdivision B 6 a (4) (b) (ii) of this section in which the waterworks exceeds the lead or copper action level.~~

~~(a) At taps, two samples for:~~

~~(i) pH;~~

~~(ii) alkalinity;~~

~~(iii) orthophosphate, when an inhibitor containing a phosphate compound is used;~~

~~(iv) silica, when an inhibitor containing a silicate compound is used~~

~~(v) calcium, when calcium carbonate stabilization is used as part of corrosion control.~~

~~(b) Except as provided in subdivision B 6 b (3) (c) of this section, at each entry point to the distribution system, at least one sample no less frequently than every two weeks (bi weekly) for:~~

~~(i) pH;~~

~~(ii) when alkalinity is adjusted as part of optimal corrosion control, a reading of the dosage rate of the chemical used to adjust alkalinity, and the alkalinity concentration; and~~

~~(iii) when a corrosion inhibitor is used as part of optimal corrosion control, a reading of the dosage rate of the inhibitor used, and the concentration of orthophosphate or silica (whichever is applicable).~~

~~(c) The owner of any ground water waterworks can limit entry point sampling described in subdivision B 6 b (3) (b) of this section to those entry points that are representative of water quality and treatment conditions throughout the waterworks. If water from untreated ground water sources mixes with water from treated ground water sources, the owner shall monitor for water quality parameters both at representative entry points receiving treatment and representative entry points receiving no treatment. Prior to the start of any monitoring under this paragraph, the owner shall provide to the commissioner written information identifying the selected entry points and documentation, including information on seasonal variability, sufficient to demonstrate that the sites are representative of water quality and treatment conditions throughout the waterworks.~~

~~(4) Monitoring after the commissioner specifies water quality parameter values for optimal corrosion control. After the commissioner specifies the values for applicable water quality control parameters reflecting optimal corrosion control treatment under 12VAC5 590 420 C 1 f, the owners of all large waterworks shall measure the applicable water quality parameters in accordance with subdivision B 6 b (3) of this section and determine compliance with the requirements of 12VAC5 590 420 C 1 g every six months with the first six month period to begin on the date the commissioner specifies the optimal values under 12VAC5 590 420 C 1 f. The owner of any small or medium size waterworks shall conduct such monitoring during each six month monitoring period specified in this subdivision in which the waterworks exceeds the lead or copper action level. For the owner of any such small and medium size waterworks that is subject to a reduced monitoring frequency pursuant to subdivision B 6 a (4) (d) of this section at the time of the action level exceedance, the end of the applicable six month period under this paragraph shall coincide with the end of the applicable monitoring period under subdivision B 6 a (4) (d) of this section. Compliance with the commissioner designated optimal water quality parameter values shall be determined as specified under 12VAC5 590 420 C 1 g.~~

~~(5) Reduced monitoring.~~

~~(a) The owner of any waterworks that maintains the range of values for the water quality parameters reflecting optimal corrosion control treatment during each of two consecutive six month monitoring periods under subdivision B 6 b (4) of this section shall continue monitoring at the entry point(s) to the distribution system as specified in subdivision B 6 b (3) (b) of this section. The owner of such waterworks may collect two tap samples for applicable water quality parameters from the following reduced number of sites during each six month monitoring period.~~

~~Size of Water System (Number of People Served)~~	~~Reduced Number of WQP Monitoring Sites~~
~~greater than 100,000~~	~~10~~
~~10,001 to 100,000~~	~~7~~
~~3,301 to 10,000~~	~~3~~
~~501 to 3,300~~	~~2~~

101 to 500	1
less than or equal to 100	1

(b) The owner of any waterworks that maintains the range of values for the water quality parameters reflecting optimal corrosion control treatment specified by the commissioner under 12VAC5-590-420-C-1f during three consecutive years of monitoring may reduce the frequency with which the owner collects the number of tap samples for applicable water quality parameters specified in subdivision B-6-b-(5)-(a) of this section from every six months to annually. The owner of any waterworks that maintains the range of values for the water quality parameters reflecting optimal corrosion control treatment specified by the commissioner under 12VAC5-590-420-C-1-f during three consecutive years of annual monitoring under this paragraph may reduce the frequency with which it collects the number of tap samples for applicable water quality parameters specified in subdivision B-6-a-(5)-(a) of this section from annually to every three years.

(c) The owner of a waterworks may reduce the frequency with which tap samples are collected for applicable water quality parameters specified in subdivision B-6-b-(5)-(a) of this section to every three years if the owner demonstrates during two consecutive monitoring periods that the tap water lead level at the 90th percentile is less than or equal to the PQL for lead (0.005 mg/L), that the tap water copper level at the 90th percentile is less than or equal to 0.65 mg/L for copper, and that the owner also has maintained the range of values for water quality parameters reflecting optimal corrosion control treatment specified by the commissioner under 12VAC5-590-420-C-1-f.

(d) The owner of a waterworks that conducts sampling annually shall collect these samples evenly throughout the year so as to reflect seasonal variability.

(e) The owner of any waterworks subject to the reduced monitoring frequency that fails to operate at or above the minimum value or within the range of values for the water quality parameters specified by the commissioner under 12VAC5-590-420-C-1-f for more than nine days in any six month period specified in 12VAC5-590-420-C-1-g shall resume distribution system tap water sampling in accordance with the number and frequency requirements in subdivision B-6-b-(4) of this section. Such an owner may resume annual monitoring for water quality parameters at the tap at the reduced number of sites specified in subdivision B-6-b-(5) of this section after completion of two subsequent consecutive six-month rounds of monitoring that meet the criteria of that subdivision and/or may resume triennial monitoring for water quality parameters at the tap at the reduced number of sites after demonstration through subsequent rounds of monitoring that the criteria of either subdivision B-6-b-(5)-(b) or (c) of this section has been met.

(6) Additional monitoring by owners. The results of any monitoring conducted in addition to the minimum requirements of this section shall be considered by the owner and the commissioner in making any determinations under this section or 12VAC5-590-420-C-1.

c. Monitoring requirements for lead and copper in water supplies (source water).

(1) Sample location, collection methods, and number of samples.

(a) The owner of a waterworks that fails to meet the lead or copper action level on the basis of tap samples collected in accordance with subdivision B-6-a of this section shall collect lead and copper water supply samples in accordance with the following requirements regarding sample location, number of samples, and collection methods:

(i) The owner of a waterworks served by groundwater sources 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 sampling point). The owner shall take one sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

(ii) The owner of a waterworks served by surface water sources 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 sampling point). The owner shall take each sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant. Note that for the purpose of this paragraph, a waterworks served by a surface water source includes waterworks served by a combination of surface and ground sources.

(iii) If a waterworks draws water from more than one source and the sources are combined before distribution, the owner shall collect samples 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).

(iv) The commissioner may reduce the total number of samples that must be analyzed by allowing the use of compositing. Compositing of samples shall be done by certified laboratory personnel. Composite samples from a maximum of five samples are allowed, provided that if the lead concentration in the composite sample is greater

than or equal to 0.001 mg/L or the copper concentration is greater than or equal to 0.160 mg/L, then either a follow up sample shall be collected and analyzed within 14 days at each sampling point included in the composite or if duplicates of or sufficient quantities from the original samples from each sampling point used in the composite are available, the owner may use these instead of resampling.

(b) Where the results of sampling indicate an exceedance of maximum permissible water supply levels established under 12VAC5-590-420-D-4, the commissioner 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. If a commissioner required confirmation sample is taken for lead or copper, then the results of the initial and confirmation sample shall be averaged in determining compliance with the commissioner specified maximum permissible levels. Any sample value below the method detection limit shall be considered to be zero. Any value above the method detection limit but below the PQL shall either be considered as the measured value or be considered one half the PQL. The PQL for Lead is equal to 0.005 mg/L and the PQL for Copper is equal to 0.050 mg/L.

(2) Monitoring frequency after waterworks exceeds tap action level. The owner of any waterworks which exceeds the lead or copper action level at the tap shall collect one water supply sample from each entry point to the distribution system within six months after the exceedance.

(3) Monitoring frequency after installation of water supply treatment. The owner of any waterworks which installs water supply treatment pursuant to 12VAC5-590-420-D-1-c shall collect an additional water supply sample from each entry point to the distribution system during two consecutive six-month monitoring periods by the deadline specified in 12VAC5-590-420-D-1-d.

(4) Monitoring frequency after the commissioner specifies maximum permissible water supply lead and copper levels or determines that water supply treatment is not needed.

(a) An owner shall monitor at the frequency specified below in cases where the commissioner specifies maximum permissible water supply lead and copper levels under 12VAC5-590-420-D-4 or determines that the owner is not required to install water supply treatment under 12VAC5-590-420-D-2-(b).

(i) The owner of a waterworks using only groundwater shall collect samples once during the three-year compliance period in effect when the applicable commissioner determination under subdivision B-6-c-(4)-(a) of this section is made. Owners of such waterworks shall collect samples once during each subsequent compliance period.

(ii) The owner of a waterworks 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 applicable commissioner determination is made under subdivision B-6-c-(4)-(a) of this section.

(b) An owner is not required to conduct water supply sampling for lead and/or copper if the waterworks meets the action level for the specific contaminant in tap water samples during the entire water supply sampling period applicable to the waterworks under subdivision B-6-c-(4)-(a)-(i) or (ii) of this section.

(5) Reduced monitoring frequency.

(a) The owner of a waterworks using only groundwater may reduce the monitoring frequency for lead and copper in water supplies to once during each nine-year compliance cycle if the owner meets one of the following criteria:

(i) The owner demonstrates that finished drinking water entering the distribution system has been maintained below the maximum permissible lead and copper concentrations specified by the commissioner under 12VAC5-590-420-D-4 during at least three consecutive compliance periods under subdivision B-6-c-(4)-(a) of this section; or

(ii) The commissioner has determined that water supply treatment is not needed and the owner demonstrates that, during the last three consecutive compliance periods in which sampling was conducted under subdivision B-6-c-(4)-(a) of this section, the concentration of lead in the water supply was less than or equal to 0.005 mg/L and the concentration of copper in the water supply was less than or equal to 0.65 mg/L.

(b) The owner of a waterworks using surface water (or a combination of surface and ground waters) may reduce the monitoring frequency for lead and copper in water supplies to once during each nine-year compliance cycle if the owner meets one of the following criteria:

(i) The owner demonstrates that finished drinking water entering the distribution system has been maintained below the maximum permissible lead and copper concentrations specified by the commissioner under 12VAC5-590-420-D-4 for at least three consecutive years; or

(ii) The commissioner has determined that water supply treatment is not needed and the owner demonstrates that, during the last three consecutive years, the concentration of lead in the water supply was less than or equal to

~~0.005 mg/L and the concentration of copper in the water supply was less than or equal to 0.65 mg/L.~~

~~(c) Owners of a waterworks that uses a new water supply is not eligible for reduced monitoring for lead and/or copper until concentrations in samples collected from the new supply during three consecutive monitoring periods are below the maximum permissible lead and copper concentrations specified in 12VAC5-590-420 D 1 e.~~

7. Monitoring filtration and disinfection.

a. The owner of a waterworks that uses a surface water source or a groundwater source under the direct influence of surface water and provides filtration treatment shall monitor in accordance with this section beginning June 29, 1993, or when filtration is installed, whichever is later.

b. Turbidity measurements as required by 12VAC5-590-370 C shall be performed on representative samples of the filtered water every four hours (or more frequently) that the waterworks serves water to the public. An owner may substitute continuous turbidity monitoring for grab sample monitoring if it validates the continuous measurement for accuracy on a regular basis using a protocol approved by the commissioner. For any waterworks using slow sand filtration or filtration treatment other than conventional treatment, direct filtration, or diatomaceous earth filtration, the office may reduce the sampling frequency to once per day if it determines that less frequent monitoring is sufficient to indicate effective filtration performance. For waterworks serving 500 or fewer persons, the commissioner may reduce the turbidity sampling frequency to once per day, regardless of the type of filtration treatment used, if the commissioner determines that less frequent monitoring is sufficient to indicate effective filtration performance.

(1) In addition to the above, as of January 1, 2001, waterworks serving at least 10,000 people and as of January 1, 2005, waterworks serving less than 10,000 people supplied by surface water or groundwater under the direct influence of surface water using conventional filtration treatment or direct filtration shall conduct continuous monitoring of turbidity for each individual filter, using an approved method in 12VAC5-590-440. The turbidimeter shall be calibrated using the procedure specified by the manufacturer. The owner shall record the results of individual filter turbidity monitoring every 15 minutes.

(2) If there is a failure in the continuous turbidity monitoring equipment, the owner shall conduct grab sampling every four hours in lieu of continuous monitoring but for no more than five working days (for waterworks serving at least 10,000 people) or 14 days (for waterworks serving less than 10,000 people) following the failure of the equipment.

(3) If a waterworks serving less than 10,000 people consists of two or fewer filters, continuous monitoring of the combined filter effluent may be used in lieu of individual filter monitoring.

c. The residual disinfectant concentration of the water entering the distribution system shall be monitored continuously, and the lowest value shall be 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 for no more than five working days following the failure of the equipment, and owners of waterworks serving 3,300 or fewer persons may take grab samples in lieu of continuous monitoring on an ongoing basis at the frequencies each day prescribed below:

Table 2.5
Grab Sample Monitoring Frequency

Waterworks Size By Population	Samples/Day[1]
500 or less	1
501 to 1,000	2
1,000 to 2,500	3
2,501 to 3,300	4

[1]The day's samples cannot be taken at the same time. The sampling intervals are subject to commissioner's review and approval. If at any time the residual disinfectant concentration falls below 0.2 mg/L in a waterworks using grab sampling in lieu of continuous monitoring, the waterworks owner shall take a grab sample every four hours until the residual disinfectant concentration is equal to or greater than 0.2 mg/L.

(1) The residual disinfectant concentration shall 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 subsection A of this section, except that the district engineer may allow an owner which uses both a surface water source or a groundwater source under direct influence of surface water, and a groundwater source to take disinfectant residual samples at points other than the total coliform sampling points if the division determines that such points are more representative of treated (disinfected) water quality within the distribution system. Heterotrophic bacteria, measured as heterotrophic plate count (HPC) as specified in 12VAC5-590-420 B may be measured in lieu of residual disinfectant concentration.

(2) If the commissioner determines, based on site-specific considerations, that a waterworks has no means for having a sample transported and analyzed for HPC by a certified laboratory under the requisite time and temperature conditions and that the waterworks is

providing adequate disinfection in the distribution system, the requirements of subdivision B 7 (1) of this section do not apply to that waterworks.

d. The following information on the samples taken in the distribution system in conjunction with total coliform monitoring pursuant to 12VAC5-590-420 B shall be reported monthly to the district engineer by the owner:

(1) Number of instances where the residual disinfectant concentration is measured;

(2) Number of instances where the residual disinfectant concentration is not measured but HPC is measured;

(3) Number of instances where the residual disinfectant concentration is measured but not detected and no HPC is measured;

(4) Number of instances where no residual disinfectant concentration is detected and where the HPC is greater than 500/mL;

(5) Number of instances where the residual disinfectant concentration is not measured and HPC is greater than 500/mL.

(6) For the current and previous month the waterworks serves water to the public, the value of "V" in percent in the following formula:

V = (c + d + e) / (a + b) X 100

where

a = the value in subdivision B 7 d (1) of this section,

b = the value in subdivision B 7 d (2) of this section,

c = the value in subdivision B 7 d (3) of this section,

d = the value in subdivision B 7 d (4) of this section,

e = the value in subdivision B 7 d (5) of this section,

(7) If the commissioner determines, based on site-specific considerations, that an owner has no means for having a sample transported and analyzed for HPC by a certified laboratory within the requisite time and temperature conditions and that the waterworks is providing adequate disinfection in the distribution system, the requirements of subdivision B 7 c (1) of this section do not apply.

e. An owner need not report the data listed in 12VAC5-590-530 C 2 a if all data listed in 12VAC5-590-530 C 2 a through c remain on file at the waterworks and the district engineer determines that the owner has submitted all the information required by 12VAC5-590-530 C 2 a through c for at least 12 months.

8. Operational. Owners may be required by the commissioner to collect additional samples to provide quality control for any treatment processes that are employed.

C. Physical. All samples for turbidity analysis shall be taken at a representative entry point or points to the water distribution system unless otherwise specified. Turbidity samples shall be analyzed in accordance with 12VAC5-590-480 B 1 a, at least once per day at all waterworks that use surface water sources or groundwater sources under the direct influence of surface water.

D. Radiological. The location of sampling points, the radionuclides measured in community waterworks, the frequency, and the timing of sampling within each compliance period shall be established or approved by the commissioner. The commissioner may increase required monitoring where necessary to detect variations within the waterworks. Failure to comply with the sampling schedules in this section will require public notification pursuant to 12VAC5-590-540.

Community waterworks owners shall conduct monitoring to determine compliance with the PMCLs in Table 2.5 and 12VAC5-590-400 in accordance with this section.

1. Monitoring and compliance requirements for gross alpha particle activity, radium-226, radium-228, and uranium.

a. Community waterworks owners shall conduct initial monitoring to determine compliance with 12VAC5-590-400 B 2, 12VAC5-590-400 B 3 and 12VAC5-590-400 B 4 by December 31, 2007. For the purposes of monitoring for gross alpha particle activity, radium-226, radium-228, uranium, and beta particle and photon radioactivity in drinking water, "detection limit" is defined as in Appendix B of this chapter.

(1) Applicability and sampling location for existing community waterworks or sources. The owners of all existing community waterworks using ground water, surface water or waterworks using both ground and surface water shall sample at every entry point to the distribution system that is representative of all sources being used under normal operating conditions. The community waterworks owner shall take each sample at the same entry point unless conditions make another sampling point more representative of each source.

(2) Applicability and sampling location for new community waterworks or sources. All new community waterworks or community waterworks that use a new source of water shall begin to conduct initial monitoring for the new source within the first quarter after initiating use of the source. Community waterworks owners shall conduct more frequent monitoring when directed by the commissioner in the event of possible contamination or when changes in the distribution system or treatment processes occur which may increase the concentration of radioactivity in finished water.

b. Initial monitoring: Community waterworks owners shall conduct initial monitoring for gross alpha particle activity, radium-226, radium-228, and uranium as follows:

(1) Community waterworks without acceptable historical data, as defined below, shall collect four consecutive quarterly samples at all entry points before December 31, 2007.

(2) Grandfathering of data: The commissioner may allow historical monitoring data collected at an entry point to satisfy the initial monitoring requirements for that entry point, for the following situations:

(a) To satisfy initial monitoring requirements, a community waterworks owner having only one entry point to the distribution system may use the monitoring data from the last compliance monitoring period that began between June 2000 and December 8, 2003.

(b) To satisfy initial monitoring requirements, a community waterworks owner with multiple entry points and having appropriate historical monitoring data for each entry point to the distribution system may use the monitoring data from the last compliance monitoring period that began between June 2000 and December 8, 2003.

(3) For gross alpha particle activity, uranium, radium-226, and radium-228 monitoring, the commissioner may waive the final two quarters of initial monitoring for an entry point if the results of the samples from the previous two quarters are below the method detection limit specified in Appendix B.

(4) If the average of the initial monitoring results for an entry point is above the PMCL, the community waterworks owner shall collect and analyze quarterly samples at that entry point until the owner has results from four consecutive quarters that are at or below the PMCL, unless the community waterworks owner enters into another schedule as part of a formal compliance agreement with the commissioner.

c. Reduced monitoring: The commissioner may allow community waterworks owners to reduce the future frequency of monitoring from once every three years to once every six or nine years at each entry point, based on the following criteria:

(1) If the average of the initial monitoring results for each contaminant (i.e., gross alpha particle activity, uranium, radium-226, or radium-228) is below the method detection limit specified in Appendix B, the community waterworks owner shall collect and analyze for that contaminant using at least one sample at that entry point every nine years.

(2) For gross alpha particle activity and uranium, if the average of the initial monitoring results for each contaminant is at or above the method detection limit specified in Appendix B but at or below 1/2 of the PMCL, the community waterworks owner shall collect and analyze for that contaminant using at least one sample at that entry point every six years. For combined radium-226 and radium-228, the analytical results shall be combined. If the average of the combined initial monitoring results for radium-226 and radium-228 is at or above the method detection limit specified in Appendix B but at or below 1/2 the PMCL, the community waterworks owner shall collect and analyze for that contaminant using at least one sample at that entry point every six years.

(3) For gross alpha particle activity and uranium, if the average of the initial monitoring results for each contaminant is above 1/2 the PMCL but at or below the PMCL, the community waterworks owner shall collect and analyze at least one sample at that entry point every three years. For combined radium-226 and radium-228, the analytical results shall be combined. If the average of the combined initial monitoring results for radium-226 and radium-228 is above 1/2 the PMCL but at or below the MPCL, the community waterworks owner shall collect and analyze at least one sample at that entry point every three years.

(4) Community waterworks owners shall use the samples collected during the reduced monitoring period to determine the monitoring frequency for subsequent monitoring periods (e.g., if a community waterworks' entry point is on a nine-year monitoring period, and the sample result is above 1/2 the PMCL, then the next monitoring period for that entry point is three years).

(5) If a community waterworks owner has a monitoring result that exceeds the PMCL while on reduced monitoring, the community waterworks owner shall collect and analyze quarterly samples at that entry point until the community waterworks owner has results from four consecutive quarters that are below the PMCL, unless the community waterworks enters into another schedule as part of a formal compliance agreement with the commissioner.

d. Compositing: To fulfill quarterly monitoring requirements for gross alpha particle activity, radium-226, radium-228, or uranium, a community waterworks owner may composite up to four consecutive quarterly samples from a single entry point if analysis is done within a year of the first sample. The commissioner will treat analytical results from the composited sample as the average analytical result to determine compliance with the PMCLs and the future monitoring frequency. If the analytical result from the composited sample is greater

than 1/2 the PMCL, the commissioner may direct the community waterworks owner to take additional quarterly samples before allowing the community waterworks owner to sample under a reduced monitoring schedule.

e. A gross alpha particle activity measurement may be substituted for the required radium-226 measurement provided that the measured gross alpha particle activity does not exceed 5 pCi/L. A gross alpha particle activity measurement may be substituted for the required uranium measurement provided that the measured gross alpha particle activity does not exceed 15 pCi/L.

The gross alpha measurement shall have a confidence interval of 95% (1.65, where is the standard deviation of the net counting rate of the sample) for radium-226 and uranium. When a community waterworks owner uses a gross alpha particle activity measurement in lieu of a radium-226 and/or uranium measurement, the gross alpha particle activity analytical result will be used to determine the future monitoring frequency for radium-226 and/or uranium. If the gross alpha particle activity result is less than the detection limit as specified in Appendix B, 1/2 the detection limit will be used to determine compliance and the future monitoring frequency.

2. Monitoring and compliance requirements for beta particle and photon radioactivity. To determine compliance with the maximum contaminant levels in 12VAC5-590-400 B 5 for beta particle and photon radioactivity, a community waterworks owner shall monitor at a frequency as follows:

a. Community waterworks owners (using surface or groundwater) designated by the commissioner as vulnerable shall sample for beta particle and photon radioactivity. Community waterworks owners shall collect quarterly samples for beta emitters and annual samples for tritium and strontium-90 at each entry point to the distribution system, beginning within one quarter after being notified by the commissioner. Community waterworks already designated by the commissioner shall continue to sample until the commissioner reviews and either reaffirms or removes the designation.

(1) If the gross beta particle activity minus the naturally occurring potassium-40 beta particle activity at an entry point has a running annual average (computed quarterly) less than or equal to 50 pCi/L (screening level), the commissioner may reduce the frequency of monitoring at that entry point to once every three years. Community waterworks owners shall collect all samples required in subdivision 2 a of this subsection during the reduced monitoring period.

(2) For community waterworks in the vicinity of a nuclear facility, the commissioner may allow the community waterworks owners to utilize environmental surveillance data collected by the nuclear facility in lieu of monitoring at the community waterworks' entry point(s), where the commissioner determines if such data is applicable to a particular community waterworks. In the event that there is a release from a nuclear facility, community waterworks owners which are using surveillance data shall begin monitoring at the community waterworks' entry point(s) in accordance with subdivision 2 a of this subsection.

b. Community waterworks owners (using surface or groundwater) designated by the commissioner as utilizing waters contaminated by effluents from nuclear facilities shall sample for beta particle and photon radioactivity. Community waterworks owners shall collect quarterly samples for beta emitters and iodine-131 and annual samples for tritium and strontium-90 at each entry point to the distribution system, beginning within one quarter after being notified by the commissioner. Owners of community waterworks already designated by the commissioner as using waters contaminated by effluents from nuclear facilities shall continue to sample until the commissioner reviews and either reaffirms or removes the designation.

(1) 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.

(2) For iodine-131, a composite of five consecutive daily samples shall be analyzed once each quarter. As directed by the commission, more frequent monitoring shall be conducted when iodine-131 is identified in the finished water.

(3) 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.

(4) If the gross beta particle activity minus the naturally occurring potassium-40 beta particle activity at a sampling point has a running annual average (computed quarterly) less than or equal to 15 pCi/L (screening level), the commissioner may reduce the frequency of monitoring at that sampling point to every three years. Community waterworks owners shall collect all samples required in subdivision 2 b of this subsection during the reduced monitoring period.

(5) For community waterworks in the vicinity of a nuclear facility, the commissioner may allow the community waterworks owner to utilize environmental surveillance data collected by the nuclear facility in lieu

of the monitoring at the community waterworks' entry point(s), where the commissioner determines such data is applicable to a particular waterworks. In the event that there is a release from a nuclear facility, community waterworks owners which are using surveillance data shall begin monitoring at the community waterworks' entry point(s) in accordance with subdivision 2 b of this subsection.

c. Owners of community waterworks designated by the commissioner to monitor for beta particle and photon radioactivity can not apply to the commissioner for a waiver from the monitoring frequencies specified in subdivision 2 a or b of this subsection.

d. Community waterworks owners may analyze for naturally occurring potassium-40 beta particle activity from the same or equivalent sample used for the gross beta particle activity analysis. Community waterworks owners are allowed to subtract the potassium-40 beta particle activity value from the total gross beta particle activity value to determine if the screening level is exceeded. The potassium-40 beta particle activity shall be calculated by multiplying elemental potassium concentrations (in mg/L) by a factor of 0.82.

e. If the gross beta particle activity minus the naturally occurring potassium-40 beta particle activity exceeds the appropriate screening level, an analysis of the sample shall be performed to identify the major radioactive constituents present in the sample and the appropriate doses shall be calculated and summed to determine compliance with 12VAC5-590-400 B 5 a, using the formula in 12VAC590-400 B 5 b. Doses shall also be calculated and combined for measured levels of tritium and strontium to determine compliance.

f. Community waterworks owners shall monitor monthly at the entry point(s) which exceed the maximum contaminant level in 12VAC5-590-400 B 5 beginning the month after the exceedance occurs. Community waterworks owners shall continue monthly monitoring until the community waterworks has established, by a rolling average of three monthly samples, that the PMCL is being met. Community waterworks owners who establish that the PMCL is being met shall return to quarterly monitoring until they meet the requirements set forth in subdivision 2 a (1) or 2 b (4) of this subsection.

3. General monitoring and compliance requirements for radionuclides.

a. The commissioner may require more frequent monitoring than specified in subdivisions 1 and 2 of this subsection, or may require confirmation samples at his discretion. The results of the initial and confirmation samples shall be averaged for use in compliance determinations.

b. Each community waterworks owner shall monitor at the time designated by the commissioner during each compliance period.

c. Compliance: Compliance with 12VAC5-590-400 B 2 through 12VAC5-590-400 B 5 will be determined based on the analytical results(s) obtained at each entry point. If one entry point is in violation of a PMCL, the community waterworks is in violation of the PMCL.

(1) For community waterworks monitoring more than once per year, compliance with the PMCL is determined by a running annual average at each entry point. If the average of any entry point is greater than the PMCL, then the community waterworks is out of compliance with the PMCL.

(2) For community waterworks monitoring more than once per year, if any sample result will cause the running average to exceed the PMCL at any entry point, the community waterworks is out of compliance with the PMCL immediately.

(3) Community waterworks owners shall include all samples taken and analyzed under the provisions of this section in determining compliance, even if that number is greater than the minimum required.

(4) If a community waterworks owner does not collect all required samples when compliance is based on a running annual average of quarterly samples, compliance will be based on the running average of the samples collected.

(5) If a sample result is less than the method detection limit as specified in Appendix B, zero will be used to calculate the annual average, unless a gross alpha particle activity is being used in lieu of radium-226 and/or uranium. If the gross alpha particle activity result is less than the method detection limit as specified in Appendix B, 1/2 the method detection limit will be used to calculate the annual average.

d. The commissioner has the discretion to delete results of obvious sampling or analytic errors.

e. If the PMCL for radioactivity set forth in 12VAC5-590-400 B through 12VAC5-590-400 B 5 is exceeded, the owner of a community waterworks shall give notice to the commissioner pursuant to 12VAC5-590-530 and to the public as required by 12VAC5-590-540.

12VAC5-590-375. Lead and copper monitoring.

A. The owners of all community and nontransient noncommunity waterworks shall monitor for lead and copper in tap water (subsection B of this section), water quality (corrosion) parameters in the distribution system and at entry points (subsection C of this section), and lead and copper in water supplies (subsection D of this section).

B. Monitoring requirements for lead and copper in tap water.

1. Sample site location.

a. By the commissioner determined date for commencement of monitoring under subdivision B 4 a of this section, each owner shall complete a materials evaluation of the distribution system in order to identify a pool of targeted sampling sites that meets the requirements of this subdivision, and that is sufficiently large to ensure that the owner can collect the number of lead and copper tap samples required in subdivision B 3 of this section. 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.

b. When the distribution system evaluation required in subdivision B 1 a of this section is insufficient to locate the requisite number of lead and copper sampling sites that meet the targeting criteria of this section, the owner shall review the sources of information listed below in order to identify a sufficient number of sampling sites. In addition, the owner 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) All plumbing codes, permits, and records in the files of the building department or departments that indicate the plumbing materials that are installed within publicly and privately owned structures connected to the distribution system;

(2) 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

(3) All existing water quality information, which includes the results of all prior analyses of the waterworks or individual structures connected to the waterworks, indicating locations that may be particularly susceptible to high lead or copper concentrations.

c. The sampling sites selected for a community waterworks' sampling pool (tier 1 sampling sites) shall consist of single family structures that:

(1) Contain copper pipes with lead solder installed between January 1983 and April 1986 or contain lead pipes; or

(2) Are served by a lead service line.

NOTE: When multiple-family residences comprise at least 20% of the structures served by a waterworks, the owner may include these types of structures in the sampling pool.

d. The owner of any community waterworks with insufficient tier 1 sampling sites shall complete the sampling pool with tier 2 sampling sites consisting of buildings, including multiple-family residences that:

(1) Contain copper pipes with lead solder installed between January 1983 and April 1986 or contain lead pipes; or

(2) Are served by a lead service line.

e. The owner of any community waterworks with insufficient tier 1 and tier 2 sampling sites shall complete the sampling pool with tier 3 sampling sites, consisting of single family structures that contain copper pipes with lead solder installed before 1983. The owner of a community waterworks with insufficient tier 1, tier 2, and tier 3 sampling sites shall complete the sampling pool with representative sites throughout the distribution system. For the purpose of this subdivision, a representative site is a site in which the plumbing materials used at that site would be commonly found at other sites served by the waterworks.

f. The sampling sites selected for a nontransient noncommunity waterworks (tier 1 sampling sites) shall consist of buildings that:

(1) Contain copper pipes with lead solder installed between January 1983 and April 1986 or contain lead pipes; or

(2) Are served by a lead service line.

g. The owner of a nontransient noncommunity waterworks with insufficient tier 1 sites that meet the targeting criteria in subdivision B 1 f of this section shall complete the sampling pool with sampling sites that contain copper pipes with lead solder installed before 1983. If additional sites are needed to complete the sampling pool, the owner of a nontransient noncommunity waterworks shall use representative sites throughout the distribution system. For the purpose of this subdivision, a representative site is a site in which the plumbing materials used at that site would be commonly found at other sites served by the waterworks.

h. The owner of any waterworks whose distribution system contains lead service lines shall draw 50% of the samples the owner collects during each monitoring period from sites that contain lead pipes, or copper pipes with lead solder, and 50% of the samples the owner collects from sites served by a lead service line. Any owner who cannot identify a sufficient number of sampling sites served by a lead service line shall collect first draw tap samples from all of the sites identified as being served by such lines.

2. Sample collection methods.

a. All tap samples for lead and copper, with the exception of lead service line samples collected under 12VAC5-590-405 C 4 and samples collected under subdivision B 2 e of this section, shall be first draw samples.

b. Each first-draw tap sample for lead and copper shall be one liter in volume and have stood motionless in the plumbing system of each sampling site for at least six hours. First draw samples from residential housing shall be collected from the cold-water kitchen tap or bathroom sink tap. First-draw samples from a nonresidential building shall be one liter in volume and shall be collected at an interior tap from which water is typically drawn for consumption. Non-first-draw samples collected in lieu of first-draw samples pursuant to subdivision B 2 e of this section shall be one liter in volume and shall be collected at an interior tap from which water is typically drawn for consumption. First draw samples may be collected by the owner or the owner may allow residents to collect first draw samples after instructing the residents of the sampling procedures specified in this subdivision. To avoid problems of residents handling nitric acid, acidification of first draw samples may be done up to 14 days after the sample is collected. After acidification to resolubilize the metals, the sample must stand in the original container for the time specified in the approved EPA method before the sample can be analyzed. If an owner allows residents to perform sampling, the owner may not challenge, based on alleged errors in sample collection, the accuracy of sampling results.

c. Each lead service line sample collected pursuant to 12VAC5-590-405 C 4 for the purpose of avoiding replacement shall be one liter in volume and have stood motionless in the lead service line for at least six hours. Lead service line samples shall be collected in one of the following three ways:

(1) At the tap after flushing the volume of water between the tap and the lead service line. The volume of water shall be calculated based on the interior diameter and length of the pipe between the tap and the lead service line;

(2) Tapping directly into the lead service line; or

(3) If the sampling site is a building constructed as a single-family residence, allowing the water to run until there is a significant change in temperature that would be indicative of water that has been standing in the lead service line.

d. An owner shall collect each first draw tap sample from the same sampling site from which the owner collected a previous sample. If, for any reason, the owner cannot gain entry to a sampling site in order to collect a follow-up tap sample, the owner may collect the follow-up tap sample from another sampling site in the sampling pool as long as the new site meets the same targeting criteria and is within reasonable proximity of the original site.

e. The owner of a nontransient noncommunity waterworks, or a community waterworks that meets the criteria of 12VAC5-590-405 D 2 e (2) that does not have enough taps that can supply first-draw samples, as defined in subdivision B 2 b of this section, may apply to the district engineer in writing to substitute non-first-draw samples. If approved by the commissioner, such owners shall collect as many first-draw samples from appropriate taps as possible and identify sampling times and locations that would likely result in the longest standing time for the remaining sites.

3. Number of samples.

a. Owners shall collect at least one sample during each monitoring period specified in subdivision B 4 of this section from the number of sites listed in the first column (standard monitoring) of the table in subdivision B 3 c of this section. The owner of a waterworks conducting reduced monitoring under subdivision B 4 d of this section shall collect at least one sample from the number of sites specified in the second column (reduced monitoring) of the table in subdivision B 3 c of this section during each monitoring period specified in subdivision B 4 d of this section. Such reduced monitoring sites shall be representative of the sites required for standard monitoring. The commissioner may specify sampling locations when an owner is conducting reduced monitoring.

b. The owner of a waterworks that has fewer than five drinking water taps that are normally used for human consumption meeting the sample site criteria of subdivision B 1 of this section to reach the required number of sample sites listed in the table in subdivision B 3 c of this section, shall collect at least one sample from each tap and then shall collect additional samples from those taps on different days during the monitoring period to meet the required number of sites. Alternatively, the commissioner may allow these owners to collect a number of samples less than the number of sites specified in the table in subdivision B 3 c of this section, provided that 100% of all taps that are normally used for human consumption are sampled. The commissioner must approve this reduction of the minimum number of samples in writing based on a request from the owner or onsite verification by the district engineer.

c. The lead and copper tap sample table is as follows:

System Size (Number of People Served)	Number of sites (Standard Monitoring)	Number of sites (Reduced Monitoring)
greater than 100,000	100	50
10,001-100,000	60	30
3,301 to 10,000	40	20
501 to 3,300	20	10
101 to 500	10	5
less than or equal to 100	5	5

4. Timing of monitoring.

a. Initial tap sampling. The first six-month monitoring period for small (serving less than 3,300 population), medium-size (serving 3,301 to 50,000 population), and large waterworks (serving greater than 50,000 population) shall be established by the commissioner.

(1) Owners of all large waterworks shall monitor during two consecutive six-month periods.

(2) Owners of all small and medium-size waterworks shall monitor during each six-month monitoring period until the waterworks exceeds the lead or copper action level and is therefore required to implement the corrosion control treatment requirements under 12VAC5-590-405 A 2, in which case the owner shall continue monitoring in accordance with subdivision B 4 b of this section, or the waterworks meets the lead and copper action levels during two consecutive six-month monitoring periods, in which case the owner may reduce monitoring in accordance with subdivision B 4 d of this section.

b. Monitoring after installation of corrosion control and water supply (source water) treatment.

(1) The owner of any large waterworks that installs optimal corrosion control treatment pursuant to 12VAC5-590-405 A 2 d (4) shall monitor during two consecutive six-month monitoring periods by the date specified in 12VAC5-590-405 A 2 d (5).

(2) The owner of any small or medium-size waterworks that installs optimal corrosion control treatment pursuant to 12VAC5-590-405 A 2 e (5) shall monitor during two consecutive six-month monitoring periods by the date specified in 12VAC5-590-405 A 2 d (6).

(3) The owner of any waterworks that installs source water treatment pursuant to 12VAC5-590-405 B 1 c shall monitor during two consecutive six-month monitoring periods by the date specified in 12VAC5-590-405 B 1 d.

c. Monitoring after the commissioner specifies water quality parameter values for optimal corrosion control. After the commissioner specifies the values for water quality control parameters under 12VAC5-590-405 A 1 f the owner shall monitor during each subsequent six-month monitoring period, with the first monitoring period to begin on the date the commissioner specifies the optimal values.

d. Reduced monitoring.

(1) The owner of a small or medium-size waterworks that meets the lead and copper action levels during each of two consecutive six-month monitoring periods may reduce the number of samples in accordance with subdivision B 3 of this section, and reduce the frequency of sampling to once per year. The owner of a small or medium water system collecting fewer than five samples as specified in subdivision B 3 b of this section, that meets the lead and copper action levels during each of two consecutive six-month monitoring periods may reduce the frequency of sampling to once per year. In no case may the owner reduce the number of samples required below the minimum of one sample per available tap. This sampling shall begin during the calendar year immediately following the end of the second consecutive six-month monitoring period.

(2) The owner of any waterworks that meets the lead action level and maintains the range of values for the water quality control parameters reflecting optimal corrosion control treatment specified by the commissioner under 12VAC5-590-405 A 1 f during each of two consecutive six-month monitoring periods may reduce the frequency of monitoring to once per year and to reduce the number of lead and copper samples in accordance with subdivision B 3 of this section if the owner receives written approval from the commissioner. This sampling shall begin during the calendar year immediately following the end of the second consecutive six-month monitoring period. The commissioner must review monitoring, treatment, and other relevant information submitted by the owner in accordance with 12VAC5-590-530 D and must notify the owner in writing when a determination is made that the owner is eligible to commence reduced monitoring pursuant to this subdivision. The commissioner must review, and where appropriate, revise his determination when the owner submits new monitoring or treatment data, or when other data relevant to the number and frequency of tap sampling becomes available.

(3) The owner of a small or medium-size waterworks that meets the lead and copper action levels during three consecutive years of monitoring may reduce the frequency of monitoring for lead and copper from annually to once every three years. The owner of any waterworks that meets the lead action level and maintains the range of values for the water quality control

parameters reflecting optimal corrosion control treatment specified by the commissioner under 12VAC5-590-405 A 1 f during three consecutive years of monitoring may reduce the frequency of monitoring from annually to once every three years if the owner receives written approval from the commissioner. Samples collected once every three years shall be collected no later than every third calendar year. The commissioner must review monitoring, treatment, and other relevant information submitted by the owner in accordance with 12VAC5-590-530 D and must notify the owner in writing when a determination is made that the owner is eligible to commence reduced monitoring pursuant to this subdivision. The commissioner must review, and where appropriate, revise his determination when the owner submits new monitoring or treatment data, or when other data relevant to the number and frequency of tap sampling becomes available.

(4) The owner of a waterworks that reduces the number and frequency of sampling shall collect these samples from representative sites included in the pool of targeted sampling sites identified in subdivision B 1 of this section. Owners sampling annually or less frequently shall conduct the lead and copper tap sampling during the months of June, July, August, or September. For a nontransient noncommunity waterworks that does not operate during the months of June through September, the commissioner shall designate an alternate monitoring period that represents a time of normal operation for the waterworks. This sampling shall begin in the calendar year immediately following the end of the second consecutive six-month monitoring period of the owners initiating annual monitoring and during the three-year period following the end of the third consecutive calendar year of annual monitoring for the owners initiating triennial monitoring.

(5) The owner of any waterworks that demonstrates for two consecutive six-month monitoring periods that the tap water lead level computed under 12VAC5-590-385 C is less than or equal to 0.005 mg/L and the tap water copper level computed under 12VAC5-590-385 C is less than or equal to 0.65 mg/L may reduce the number of samples in accordance with subdivision B 3 of this section and reduce the frequency of sampling to once every three calendar years.

(6) The owner of a small or medium-size waterworks subject to reduced monitoring that exceeds the lead or copper action level shall resume sampling in accordance with subdivision B 4 c of this section and collect the number of samples specified for standard monitoring under subdivision B 3 of this section. Such owner shall also conduct water quality parameter monitoring in accordance with subdivision C 2, 3, or 4 of this section (as appropriate) during the monitoring period in which the action level is exceeded. The owner of any such waterworks may resume annual monitoring for lead and copper at the tap at the reduced number of sites specified in subdivision B 3 of this section after it has completed two subsequent consecutive six-month rounds of monitoring that meet the criteria of subdivision B 4 d (1) of this section or may resume triennial monitoring for lead and copper at the reduced number of sites after it demonstrates through subsequent rounds of monitoring that it meets the criteria of either subdivision B 4 d (3) or (5) of this section.

(7) The owner of any waterworks subject to the reduced monitoring frequency that fails to meet the lead action level during any four-month monitoring period or that fails to operate at or above the minimum value or within the range of values for the water quality parameters specified by the commissioner under 12VAC5-590-405 A 1 f for more than nine days in any six-month period specified in subdivision C 4 of this section shall conduct tap water sampling for lead and copper at the frequency specified in subdivision B 4 c of this section, collect the number of samples specified for standard monitoring under subdivision B 3 of this section, and resume monitoring for water quality parameters within the distribution system in accordance with subdivision C 4 of this section. This standard tap water sampling shall begin no later than the six-month period beginning January 1 of the calendar year following the lead action level exceedance or water quality parameter excursion. The owner of such a waterworks may resume reduced monitoring for lead and copper at the tap and for water quality parameters within the distribution system under the following conditions:

(a) The owner may resume annual monitoring for lead and copper at the tap at the reduced number of sites specified in subdivision B 3 of this section after completion of two subsequent six-month rounds of monitoring that meet the criteria of subdivision B 4 d 2 of this section and the owner has received written approval from the commissioner that it is appropriate to resume reduced monitoring on an annual frequency. This sampling shall begin during the calendar year immediately following the end of the second consecutive six-month monitoring period.

(b) The owner may resume triennial monitoring for lead and copper at the tap at the reduced number of sites after demonstration through subsequent rounds of monitoring that it meets the criteria of either subdivision B 4 d (3) or (5) of this section and the owner has received written approval from the commissioner that it is appropriate to resume triennial monitoring.

(c) The owner may reduce the number of water quality parameter tap water samples required in accordance with

subdivision C 5 a of this section and the frequency with which it collects such samples in accordance with subdivision C 5 b of this section. The owner of such a waterworks may not resume triennial monitoring for water quality parameters at the tap until it demonstrates, in accordance with the requirements of subdivision C 5 b of this section, that it has requalified for triennial monitoring.

(8) The owner of any waterworks subject to a reduced monitoring frequency under subdivision B 4 d of this section shall notify the district engineer in writing in accordance with 12VAC5-590-530 D 1 c of any upcoming long-term change in treatment or addition of a new water source as described in this section. The commissioner must review and approve the addition of a new water source or long-term change in water treatment before it is implemented by the owner. The commissioner may require the owner to resume sampling in accordance with subdivision B 4 c of this section and collect the number of samples specified for standard monitoring under subdivision B 3 of this section or take other appropriate steps such as increased water quality parameter monitoring or re-evaluation of its corrosion control treatment given the potentially different water quality considerations.

5. Additional monitoring by owner. The results of any monitoring conducted in addition to the minimum requirements of this section shall be considered by the owner and the commissioner in making any determinations (i.e., calculating the 90th percentile lead or copper level) under 12VAC5-590-385 C.

6. Invalidation of lead or copper tap water samples. A sample invalidated under this subdivision does not count toward determining lead or copper 90th percentile levels under 12VAC5-590-385 C or toward meeting the minimum monitoring requirements of subdivision B 3 of this section.

a. The commissioner may invalidate a lead or copper tap water sample if at least one of the following conditions is met.

(1) The laboratory establishes that improper sample analysis caused erroneous results.

(2) The commissioner determines that the sample was taken from a site that did not meet the site selection criteria of this section.

(3) The sample container was damaged in transit.

(4) There is substantial reason to believe that the sample was subject to tampering.

b. The owner shall report the results of all samples to the district engineer and all supporting documentation for samples the owner believes should be invalidated.

c. To invalidate a sample under subdivision B 6 a of this section, the decision and the rationale for the decision shall be documented in writing. The commissioner may not invalidate a sample solely on the grounds that a follow-up sample result is higher or lower than that of the original sample.

d. The owner shall collect replacement samples for any samples invalidated under this section if, after the invalidation of one or more samples, the owner has too few samples to meet the minimum requirements of subdivision B 3 of this section. Any such replacement samples shall be taken as soon as possible, but no later than 20 days after the date the commissioner invalidates the sample or by the end of the applicable monitoring period, whichever occurs later. Replacement samples taken after the end of the applicable monitoring period shall not also be used to meet the monitoring requirements of a subsequent monitoring period. The replacement samples shall be taken at the same locations as the invalidated samples or, if that is not possible, at locations other than those already used for sampling during the monitoring period.

7. Monitoring waivers for small waterworks. The owner of any small waterworks that meets the criteria of this subdivision may apply to the commissioner to reduce the frequency of monitoring for lead and copper to once every nine years (i.e., a full waiver) if the owner meets all of the materials criteria specified in subdivision B 7 a of this section and all of the monitoring criteria specified in subdivision B 7 b of this section. The owner of any small waterworks that meets the criteria in subdivisions B 7 a and b of this section only for lead, or only for copper, may apply to the commissioner for a waiver to reduce the frequency of tap water monitoring to once every nine years for that contaminant only (i.e., a partial waiver).

a. Materials criteria. The owner shall demonstrate that the distribution system and service lines and all drinking water supply plumbing, including plumbing conveying drinking water within all residences and buildings connected to the waterworks, are free of lead-containing materials or copper-containing materials, as those terms are defined in this subdivision, as follows:

(1) Lead. To qualify for a full waiver, or a waiver of the tap water monitoring requirements for lead (i.e., a lead waiver), the owner shall provide certification and supporting documentation to the commissioner that the waterworks is free of all lead-containing materials, as follows:

(a) It contains no plastic pipes that contain lead plasticizers, or plastic service lines that contain lead plasticizers; and

(b) It is free of lead service lines, lead pipes, lead soldered pipe joints, and leaded brass or bronze alloy fittings and fixtures, unless such fittings and fixtures meet the specifications of any standard established pursuant to 42 USC § 300g-6(e) (SDWA § 1417(e)).

(2) Copper. To qualify for a full waiver, or a waiver of the tap water monitoring requirements for copper (i.e., a copper waiver), the owner shall provide certification and supporting documentation to the commissioner that the waterworks contains no copper pipes or copper service lines.

b. Monitoring criteria for waiver issuance. The owner shall have completed at least one six-month round of standard tap water monitoring for lead and copper at sites approved by the commissioner and from the number of sites required by subdivision B 3 of this section and demonstrate that the 90th percentile levels for any and all rounds of monitoring conducted since the owner became free of all lead-containing or copper-containing materials, as appropriate, meet the following criteria:

(1) Lead levels. To qualify for a full waiver, or a lead waiver, the owner shall demonstrate that the 90th percentile lead level does not exceed 0.005 mg/L.

(2) Copper levels. To qualify for a full waiver, or a copper waiver, the owner shall demonstrate that the 90th percentile copper level does not exceed 0.65 mg/L.

c. Commissioner approval of waiver application. The commissioner shall notify the owner of the waiver determination, in writing, setting forth the basis of his decision and any condition of the waiver. As a condition of the waiver, the commissioner may require the owner to perform specific activities (e.g., limited monitoring, periodic outreach to customers to remind them to avoid installation of materials that might void the waiver) to avoid the risk of lead or copper concentration of concern in tap water. The owner of a small waterworks shall continue monitoring for lead and copper at the tap as required by subdivisions B 4 a through d of this section, as appropriate, until it receives written notification from the commissioner that the waiver has been approved.

d. Monitoring frequency for owners with waivers.

(1) An owner with a full waiver shall conduct tap water monitoring for lead and copper in accordance with subdivision B 4 d (4) of this section at the reduced number of sampling sites identified in subdivision B 3 of this section at least once every nine years and provide the materials certification specified in subdivision B 7 a of this section for both lead and copper to the commissioner along with the monitoring results. Samples collected every nine years shall be collected no later than every ninth calendar year.

(2) An owner with a partial waiver shall conduct tap water monitoring for the waived contaminant in accordance with subdivision B 4 d (4) of this section at the reduced number of sampling sites specified in subdivision B 3 of this section at least once every nine years and provide the materials certification specified in subdivision B 7 a of this section pertaining to the waived contaminant along with the monitoring results. Such an owner also shall continue to monitor for the nonwaived contaminant in accordance with requirements of subdivisions B 4 a through d of this section, as appropriate.

(3) Any owner with a full or partial waiver shall notify the district engineer in writing in accordance with 12VAC5-590-530 D 1 c of any upcoming long-term change in treatment or addition of a new source, as described in that section. The commissioner must review and approve the addition of a new source or long-term change in water treatment before it is implemented by the owner. The commissioner has the authority to require the owner to add or modify waiver conditions (e.g., require recertification that the waterworks is free of lead-containing or copper-containing materials; require additional round or rounds of monitoring), if it deems such modifications are necessary to address treatment or source water changes at the waterworks.

(4) If an owner with a full or partial waiver becomes aware that it is no longer free of lead-containing or copper-containing materials, as appropriate, (e.g., as a result of new construction or repairs), the owner shall notify the district engineer in writing no later than 60 days after becoming aware of such a change.

e. Continued eligibility. If the owner continues to satisfy the requirements of subdivision B 7 d of this section, the waiver will be renewed automatically, unless any of the conditions listed in subdivisions B 7 e (1), (2), or (3) of this section occurs. An owner whose waiver has been revoked may reapply for a waiver at such time as it again meets the appropriate materials and monitoring criteria of subdivisions B 7 a and b of this section.

(1) A waterworks with a full waiver or a lead waiver no longer satisfies the materials criteria of subdivision B 7 a (1) of this section or has a 90th percentile lead level greater than 0.005 mg/L.

(2) A waterworks with a full waiver or a copper waiver no longer satisfies the materials criteria of subdivision B 7 a (2) of this section or has a 90th percentile copper level greater than 0.65 mg/L.

(3) The commissioner notifies the owner, in writing, that the waiver has been revoked, setting forth the basis of the decision.

f. Requirements following waiver revocation. A waterworks whose full or partial waiver has been revoked by the commissioner is subject to the corrosion control treatment and lead and copper tap water monitoring requirements, as follows:

(1) If the waterworks exceeds the lead or copper action level, the owner shall implement corrosion control treatment in accordance with the deadlines specified in 12VAC5-590-405 A 2 e and any other applicable requirements of this section.

(2) If the waterworks meets both the lead and the copper action level, the owner shall monitor for lead and copper at the tap no less frequently than once every three years using the reduced number of sample sites specified in subdivision B 3 of this section.

g. Pre-existing waivers. Waivers for small waterworks approved by the commissioner in writing prior to April 11, 2000, shall remain in effect under the following conditions:

(1) If the waterworks has demonstrated that it is both free of lead-containing and copper-containing materials, as required by subdivision B 7 a of this section and that its 90th percentile lead levels and 90th percentile copper levels meet the criteria of subdivision B 7 b of this section, the waiver remains in effect so long as the owner continues to meet the waiver eligibility criteria of subdivision B 7 e of this section. The first round of tap water monitoring conducted pursuant to subdivision B 7 d of this section shall be completed no later than nine years after the last time the owner has monitored for lead and copper at the tap.

(2) If the waterworks has met the materials criteria of subdivision B 7 a of this section but has not met the monitoring criteria of subdivision B 7 b of this section, the owner shall conduct one six-month round of standard tap water monitoring for lead and copper at sites approved by the commissioner demonstrating that it meets the criteria of subdivision B 7 b of this section. Thereafter, the waiver shall remain in effect as long as the owner meets the continued eligibility criteria of subdivision B 7 e of this section. The first round of tap water monitoring conducted pursuant to subdivision B 7 d of this section shall be completed no later than nine years after the round of monitoring conducted pursuant to subdivision B 7 b of this section.

C. Monitoring requirements for water quality parameters. The owners of all large waterworks and all small and medium-size waterworks that exceed the lead or copper action level shall monitor water quality parameters in addition to lead and copper in accordance with this section.

1. General requirements.

a. Sample collection methods.

(1) Tap samples shall be representative of water quality throughout the distribution system taking into account the number of persons served, the different sources of water, the different treatment methods employed by the waterworks, and seasonal variability. Tap sampling under this section is not required to be conducted at taps targeted for lead and copper sampling under subdivision B 1 of this section. Owners may find it convenient to conduct tap sampling for water quality parameters at sites approved for coliform sampling.

(2) Samples collected at the entry point or points to the distribution system shall be from locations representative of each source after treatment. If a waterworks draws water from more than one source and the sources are combined before distribution, the owner shall 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).

b. Number of samples.

(1) Owners shall collect two tap samples for applicable water quality parameters during each monitoring period specified under subdivision C 2 through 5 of this section from the following number of sites.

System Size (Number of People Served)	Number of Sites for Water Quality Parameters
greater than 100,000	25
10,001-100,000	10
3,301 to 10,000	3
501 to 3,300	2
101 to 500	1
less than or equal to 100	1

(2) Except as provided in subdivision C 3 c of this section, owners shall collect two samples for each applicable water quality parameter at each entry point to the distribution system during each monitoring period specified in subdivision C 2 of this section. During each monitoring period specified in subdivision C 3 through 5 of this section, owners shall collect one sample for each applicable water quality parameter at each entry point to the distribution system.

2. Initial sampling. The owners of all large waterworks shall measure the applicable water quality parameters as specified below at taps and at each entry point to the distribution system during each six-month monitoring period specified in subdivision B 4 a of this section. The owners of all small and medium-size waterworks shall measure the applicable water quality parameters at the locations specified below during each six-month

monitoring period specified in subdivision B 4 a of this section during which the waterworks exceeds the lead or copper action level.

a. At taps:

(1) pH;

(2) Alkalinity;

(3) Orthophosphate, when an inhibitor containing a phosphate compound is used;

(4) Silica, when an inhibitor containing a silicate compound is used;

(5) Calcium;

(6) Conductivity; and

(7) Water temperature.

b. At each entry point to the distribution system: all of the applicable parameters listed in subdivision C 2 a of this section.

3. Monitoring after installation of corrosion control. The owner of any large waterworks which installs optimal corrosion control treatment pursuant to 12VAC5-590-405 A 2 d (4) shall measure the water quality parameters at the locations and frequencies specified below during each six-month monitoring period specified in subdivision B 4 b (1) of this section. The owner of any small or medium-size waterworks that installs optimal corrosion control treatment shall conduct such monitoring during each six-month monitoring period specified in subdivision B 4 b (2) of this section in which the waterworks exceeds the lead or copper action level.

a. At taps, two samples for:

(1) pH;

(2) Alkalinity;

(3) Orthophosphate, when an inhibitor containing a phosphate compound is used;

(4) Silica, when an inhibitor containing a silicate compound is used; and

(5) Calcium, when calcium carbonate stabilization is used as part of corrosion control.

b. Except as provided in subdivision C 3 c of this section, at each entry point to the distribution system, at least one sample no less frequently than every two weeks (bi-weekly) for:

(1) pH;

(2) When alkalinity is adjusted as part of optimal corrosion control, a reading of the dosage rate of the chemical used to adjust alkalinity, and the alkalinity concentration; and

(3) When a corrosion inhibitor is used as part of optimal corrosion control, a reading of the dosage rate of the inhibitor used, and the concentration of orthophosphate or silica (whichever is applicable).

c. The owner of any groundwater waterworks may limit entry point sampling described in subdivision C 3 b of this section to those entry points that are representative of water quality and treatment conditions throughout the waterworks. If water from untreated ground water sources mixes with water from treated ground water sources, the owner shall monitor for water quality parameters both at representative entry points receiving treatment and representative entry points receiving no treatment. Prior to the start of any monitoring under this subdivision, the owner shall provide to the commissioner written information identifying the selected entry points and documentation, including information on seasonal variability, sufficient to demonstrate that the sites are representative of water quality and treatment conditions throughout the waterworks.

4. Monitoring after the commissioner specifies water quality parameter values for optimal corrosion control. After the commissioner specifies the values for applicable water quality control parameters reflecting optimal corrosion control treatment under 12VAC5-590-405 A 1 f, the owners of all large waterworks shall measure the applicable water quality parameters in accordance with subdivision C 3 of this section and determine compliance with the requirements of 12VAC5-590-405 A 1 g every six months with the first six-month period to begin on either January 1 or July 1, whichever comes first, after the commissioner specifies the optimal values under 12VAC5-590-405 A 1 f. The owner of any small or medium-size waterworks shall conduct such monitoring during each six-month monitoring period specified in this subdivision in which the waterworks exceeds the lead or copper action level. For the owner of any such small and medium-size waterworks that is subject to a reduced monitoring frequency pursuant to subdivision B 4 d of this section at the time of the action level exceedance, the start of the applicable six-month period under this subdivision shall coincide with the start of the applicable monitoring period under subdivision B 4 d of this section. Compliance with the commissioner-designated optimal water quality parameter values shall be determined as specified under 12VAC5-590-405 A 1 g.

5. Reduced monitoring.

a. The owner of any waterworks that maintains the range of values for the water quality parameters reflecting optimal corrosion control treatment during each of two consecutive six-month monitoring periods under subdivision C 4 of this section shall continue monitoring at the entry point or points to the distribution system as

specified in subdivision C 3 b of this section. The owner of such waterworks may collect two tap samples for applicable water quality parameters from the following reduced number of sites during each six-month monitoring period.

Size of Water System (Number of People Served)	Reduced Number of WQP Monitoring Sites
greater than 100,000	10
10,001 to 100,000	7
3,301 to 10,000	3
501 to 3,300	2
101 to 500	1
less than or equal to 100	1

b. The owner of any waterworks that maintains the range of values for the water quality parameters reflecting optimal corrosion control treatment specified by the commissioner under 12VAC5-590-405 A 1 f during three consecutive years of monitoring may reduce the frequency with which the owner collects the number of tap samples for applicable water quality parameters specified in subdivision C 5 of this section from every six months to annually. This sampling begins during the calendar year immediately following the end of the monitoring period in which the third consecutive year of six-month monitoring occurs. The owner of any waterworks that maintains the range of values for the water quality parameters reflecting optimal corrosion control treatment specified by the commissioner under 12VAC5-590-405 A 1 f during three consecutive years of annual monitoring under this subdivision may reduce the frequency with which it collects the number of tap samples for applicable water quality parameters specified in subdivision C 5 a of this section from annually to every three years. This sampling begins during the calendar year immediately following the end of the monitoring period in which the third consecutive year of six-month monitoring occurs.

c. The owner of a waterworks may reduce the frequency with which tap samples are collected for applicable water quality parameters specified in subdivision C 5 a of this section to every three years if the owner demonstrates during two consecutive monitoring periods that the tap water lead level at the 90th percentile is less than or equal to the PQL for lead (0.005 mg/L), that the tap water copper level at the 90th percentile is less than or equal to 0.65 mg/L for copper, and that the owner also has maintained the range of values for water quality parameters reflecting optimal corrosion control treatment specified by the commissioner under 12VAC5-590-405 A 1 f. Monitoring conducted every three years shall be done no later than every third calendar year.

d. The owner of a waterworks that conducts sampling annually shall collect these samples evenly throughout the year so as to reflect seasonal variability.

e. The owner of any waterworks subject to the reduced monitoring frequency that fails to operate at or above the minimum value or within the range of values for the water quality parameters specified by the commissioner under 12VAC5-590-405 A 1 f for more than nine days in any six-month period specified in 12VAC5-590-405 A 1 g shall resume distribution system tap water sampling in accordance with the number and frequency requirements in subdivision C 4 of this section. Such an owner may resume annual monitoring for water quality parameters at the tap at the reduced number of sites specified in subdivision C 5 of this section after completion of two subsequent consecutive six-month rounds of monitoring that meet the criteria of that subdivision or may resume triennial monitoring for water quality parameters at the tap at the reduced number of sites after demonstration through subsequent rounds of monitoring that the criteria of either subdivision C 5 b or c of this section has been met.

6. Additional monitoring by owners. The results of any monitoring conducted in addition to the minimum requirements of this section shall be considered by the owner and the commissioner in making any determinations under this section or 12VAC5-590-405 A 1.

D. Monitoring requirements for lead and copper in water supplies (source water).

1. Sample location, collection methods, and number of samples.

a. The owner of a waterworks that fails to meet the lead or copper action level on the basis of tap samples collected in accordance with subsection A of this section shall collect lead and copper water supply samples in accordance with the following requirements regarding sample location, number of samples, and collection methods:

(1) The owner of a waterworks served by groundwater sources shall take a minimum of one sample at every entry point to the distribution system that is representative of each well after treatment (hereafter called a sampling point). The owner shall take one sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

(2) The owner of a waterworks served by surface water sources 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 that is representative of each source after treatment (hereafter called a sampling point). The owner shall take

each sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant. Note that for the purpose of this subdivision, a waterworks served by a surface water source includes waterworks served by a combination of surface and ground sources.

(3) If a waterworks draws water from more than one source and the sources are combined before distribution, the owner shall collect samples 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) The commissioner may reduce the total number of samples that must be analyzed by allowing the use of compositing. Compositing of samples shall be done by certified laboratory personnel. Composite samples from a maximum of five samples are allowed, provided that if the lead concentration in the composite sample is greater than or equal to 0.001 mg/L or the copper concentration is greater than or equal to 0.160 mg/L, then either a follow-up sample shall be collected and analyzed within 14 days at each sampling point included in the composite or if duplicates of or sufficient quantities from the original samples from each sampling point used in the composite are available, the owner may use these instead of resampling.

b. Where the results of sampling indicate an exceedance of maximum permissible water supply levels established under 12VAC5-590-405 B 4, the commissioner 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. If a commissioner required confirmation sample is taken for lead or copper, then the results of the initial and confirmation sample shall be averaged in determining compliance with the commissioner-specified maximum permissible levels. Any sample value below the method detection limit shall be considered to be zero. Any value above the method detection limit but below the PQL shall either be considered as the measured value or be considered one-half the PQL. The PQL for lead is equal to 0.005 mg/L and the PQL for copper is equal to 0.050 mg/L.

2. Monitoring frequency after waterworks exceeds tap action level. The owner of any waterworks which exceeds the lead or copper action level at the tap shall collect one water supply sample from each entry point to the distribution system no later than six months after the end of the monitoring period during which the lead or copper action level was exceeded. For monitoring periods that are annual or less frequent, the end of the monitoring period is September 30 of the calendar year in which the sampling occurs, or if the commissioner has established an alternate monitoring period, the last day of that period.

3. Monitoring frequency after installation of water supply treatment. The owner of any waterworks that installs water supply treatment pursuant to 12VAC5-590-405 B 1 c shall collect an additional water supply sample from each entry point to the distribution system during two consecutive six-month monitoring periods by the deadline specified in 12VAC5-590-405 B 1 d.

4. Monitoring frequency after the commissioner specifies maximum permissible water supply lead and copper levels or determines that water supply treatment is not needed.

a. An owner shall monitor at the frequency specified below in cases where the commissioner specifies maximum permissible water supply lead and copper levels under 12VAC5-590-405 B 1 e or determines that the owner is not required to install water supply treatment under 12VAC5-590-405 B 2 b.

(1) The owner of a waterworks using only groundwater shall collect samples once during the three-year compliance period in effect when the applicable commissioner determination under subdivision D 4 a of this section is made. Owners of such waterworks shall collect samples once during each subsequent compliance period. Triennial samples shall be collected every third calendar year.

(2) The owner of a waterworks using surface water (or a combination of surface and groundwater) shall collect samples once during each year, the first annual monitoring period to begin during the year in which the applicable commissioner determination is made under subdivision D 4 a of this section.

b. An owner is not required to conduct water supply sampling for lead or copper if the waterworks meets the action level for the specific contaminant in tap water samples during the entire water supply sampling period applicable to the waterworks under subdivision D 4 a (1) or (2) of this section.

5. Reduced monitoring frequency.

a. The owner of a waterworks using only groundwater may reduce the monitoring frequency for lead and copper in water supplies to once during each nine-year compliance cycle provided that the samples are collected no later than every ninth calendar year and if the owner meets one of the following criteria:

(1) The owner demonstrates that finished drinking water entering the distribution system has been maintained below the maximum permissible lead and copper concentrations specified by the commissioner under 12VAC5-590-405 B 1 e during at least three consecutive

compliance periods under subdivision D 4 a of this section; or

(2) The commissioner has determined that water supply treatment is not needed and the owner demonstrates that, during the last three consecutive compliance periods in which sampling was conducted under subdivision D 4 a of this section, the concentration of lead in the water supply was less than or equal to 0.005 mg/L and the concentration of copper in the water supply was less than or equal to 0.65 mg/L.

b. The owner of a waterworks using surface water (or a combination of surface and ground waters) may reduce the monitoring frequency for lead and copper in water supplies to once during each nine-year compliance cycle provided that the samples are collected no later than every ninth calendar year and if the owner meets one of the following criteria:

(1) The owner demonstrates that finished drinking water entering the distribution system has been maintained below the maximum permissible lead and copper concentrations specified by the commissioner under 12VAC5-590-405 B 1 e for at least three consecutive years; or

(2) The commissioner has determined that water supply treatment is not needed and the owner demonstrates that, during the last three consecutive years, the concentration of lead in the water supply was less than or equal to 0.005 mg/L and the concentration of copper in the water supply was less than or equal to 0.65 mg/L.

c. Owners of a waterworks that uses a new water supply is not eligible for reduced monitoring for lead or copper until concentrations in samples collected from the new supply during three consecutive monitoring periods are below the maximum permissible lead and copper concentrations specified in 12VAC5-590-405 B 1 e.

12VAC5-590-385. Lead and copper action level compliance.

A. The lead action level is exceeded if the concentration of lead in more than 10% of tap water samples collected during any monitoring period conducted in accordance with 12VAC5-590-375 B is greater than 0.015 mg/L (i.e., if the 90th percentile lead level is greater than 0.015 mg/L).

B. The copper action level is exceeded if the concentration of copper in more than 10% of tap water samples collected during any monitoring period conducted in accordance with 12VAC5-590-375 B is greater than 1.3 mg/L (i.e., if the 90th percentile copper level is greater than 1.3 mg/L).

C. The 90th percentile lead and copper levels shall be computed as follows:

1. 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.

2. The number of samples taken during the monitoring period shall be multiplied by 0.9.

3. The contaminant concentration in the numbered sample yielded by the calculation in subdivision C 2 of this section is the 90th percentile contaminant level.

4. For waterworks 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.

5. For an owner that has been allowed by the commissioner to collect fewer than five samples in accordance with 12VAC5-590-375 B 3, the sample result with the highest concentration is considered the 90th percentile value.

12VAC5-590-405. Lead and copper treatment techniques.

A. Lead and copper corrosion control techniques.

1. Corrosion control treatment requirements. The owners of all community and nontransient noncommunity waterworks shall install and operate optimum corrosion control treatment by completing the corrosion control treatment requirements described below which are applicable to such owners under subdivision A 2 of this section.

a. Owner's proposal regarding corrosion control treatment. Based upon the results of lead and copper tap monitoring and water quality parameter monitoring, the owners of small and medium waterworks exceeding the lead or copper action level shall propose installation of one or more of the corrosion control treatments listed in subdivision A 1 c (1) of this section that the owner believes constitutes optimal corrosion control for that waterworks. The commissioner may require the owner to conduct additional water quality parameter monitoring in accordance with 12VAC5-590-375 C 2 to assist the commissioner in reviewing the proposal.

b. Applicability of studies of corrosion control treatment (applicable to small and medium waterworks). The commissioner may require the owner of any small or medium waterworks that exceeds the lead or copper action level to perform corrosion control studies under subdivision A 1 c of this section to identify optimal corrosion control treatment for the waterworks.

c. Corrosion control studies.

(1) The owner of any waterworks required by the commissioner to perform 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 for that waterworks:

(a) Alkalinity and pH adjustment;

(b) Calcium hardness adjustment; and

(c) The addition of a phosphate or silicate based corrosion inhibitor at a concentration sufficient to maintain an effective corrosion inhibitor residual concentration in all test tap samples.

(2) The owner 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 waterworks of similar size, water chemistry, and distribution system configuration.

(3) The owner shall measure the following water quality parameters in any tests conducted under subdivision A 1 c of this section before and after evaluating the corrosion control treatments listed above:

(a) Lead;

(b) Copper;

(c) pH;

(d) Alkalinity;

(e) Calcium;

(f) Conductivity;

(g) Orthophosphate (when an inhibitor containing a phosphate compound is used);

(h) Silicate (when an inhibitor containing a silicate compound is used); and

(i) Water temperature.

(4) The owner shall identify all chemical or physical constraints that limit or prohibit the use of a particular corrosion control treatment and document such constraints with at least one of the following:

(a) Data and documentation showing that a particular corrosion control treatment has adversely affected other water treatment processes when used by another waterworks with comparable water quality characteristics; or

(b) Data and documentation demonstrating that the owner 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 owner 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 owner shall propose to the district engineer in writing, the treatment option that the corrosion control studies indicate constitutes optimal corrosion control treatment for that waterworks. The owner shall provide a rationale for its recommendation along with all supporting documentation specified in subdivisions A 1 c (1) through A 1 c (5) of this section.

d. Approval of optimal corrosion control treatment.

(1) Based upon consideration of available information including, where applicable, studies performed under subdivision A 1 c of this section and an owner's proposed treatment alternative, the commissioner shall either approve the corrosion control treatment option recommended by the owner, or designate alternative corrosion control treatment or treatments from among those listed in subdivision A 1 c (1) of this section. When approving optimal treatment the commissioner shall consider the effects that additional corrosion control treatment will have on water quality parameters and on other water quality treatment processes.

(2) The commissioner shall notify the owner of his determination on optimal corrosion control treatment in writing and explain the basis for this determination. If the commissioner requests additional information to aid a review, the owner shall provide the information.

e. Installation of optimal corrosion control. Each owner shall properly install and operate throughout the waterworks the optimal corrosion control treatment approved by the commissioner under subdivision A 1 d of this section. Also see 12VAC5-590-190.

f. Commissioner's review of treatment and specification of optimal water quality control parameters.

(1) The commissioner shall evaluate the results of all lead and copper tap samples and water quality parameter samples submitted by the owner and determine whether the owner has properly installed and operated the optimal corrosion control treatment approved by the commissioner under subdivision A 1 d. Upon reviewing the results of tap water and water quality parameter monitoring by the owner, both before and after the owner installs optimal corrosion control treatment, the commissioner shall designate:

(a) A minimum value or a range of values for pH measured at each entry point to the distribution system;

(b) A minimum pH value, measured in all tap samples. Such value shall be equal to or greater than 7.0, unless the commissioner determines that meeting a pH level of 7.0 is not technologically feasible or is not necessary for the owner to optimize corrosion control;

(c) 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, that the commissioner determines is necessary to form a passivating film on the interior walls of the pipes of the distribution system;

(d) 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

(e) 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 that the commissioner determines to reflect optimal corrosion control treatment for the waterworks. The commissioner may designate values for additional water quality control parameters determined by the commissioner to reflect optimal corrosion control for the waterworks. The commissioner shall notify the owner in writing of these determinations and explain the basis for his decisions.

g. Continued operation and monitoring. The owners of all waterworks optimizing corrosion control shall continue to operate and maintain optimal corrosion control treatment, including maintaining water quality parameters at or above minimum values or within ranges designated by the commissioner under subdivision A 1 f of this section as verified by all samples collected under 12VAC5-590-375 C 4 through 12VAC5-590-375 C 6. Compliance with the requirements of this subdivision shall be determined every six months, as specified under 12VAC5-590-375 C 4. The owner of a waterworks is out of compliance with the requirements of this subdivision for a six-month period if excursions occur for any commissioner-specified parameter on more than nine days during the period. An excursion occurs whenever the daily value for one or more of the water quality parameters measured at a sampling location is below the minimum value or outside the range designated by the commissioner. Daily values shall be calculated as follows. The commissioner has discretion to delete results of obvious sampling errors from this calculation.

(1) On days when more than one measurement for the water quality parameter is collected at the sampling location, the daily value shall be the average of all results collected during the day regardless of whether they are collected through continuous monitoring, grab sampling, or a combination of both.

(2) On days when only one measurement for the water quality parameter is collected at the sampling location, the daily value shall be the result of that measurement.

(3) On days when no measurement is collected for the water quality parameter at the sampling location, the daily value shall be the daily value calculated on the most recent day on which the water quality parameter was measured at the sample site.

h. Modification of the commissioner's treatment decisions. Upon his own initiative or in response to a request by an owner or other interested party, the commissioner may modify his determination of the optimal corrosion control treatment under subdivision A 1 d of this section or optimal water quality control parameters under subdivision A 1 f of this section. A request for modification by an owner or other interested party shall be in writing, explain why the modification is appropriate, and provide supporting documentation. The commissioner may modify the determination where it is concluded that such change is necessary to ensure that the waterworks continues to optimize corrosion control treatment. A revised determination shall be made in writing, set forth the new treatment requirements, explain the basis for the commissioner's decision, and provide an implementation schedule for completing the treatment modifications.

2. Corrosion control treatment steps.

a. Owners shall complete the applicable corrosion control treatment requirements described in subdivision A 1 of this section by the deadlines established in this subdivision.

(1) The owner of a large waterworks (serving >50,000 persons) shall complete the corrosion control treatment steps specified in subdivision A 2 d of this section, unless the owner is deemed to have optimized corrosion control under subdivision A 2 b (2) or subdivision A 2 b (3) of this section.

(2) The owner of a small waterworks (serving ≤ 3300 persons) and a medium waterworks (serving >3,300 and ≤ 50,000 persons) shall complete the corrosion control treatment steps specified in subdivision A 2 e of this section, unless the owner is deemed to have optimized corrosion control under subdivisions A 2 b (1) through A 2 b (3) of this section.

b. An owner is deemed to have optimized corrosion control and is not required to complete the applicable corrosion control treatment steps identified in this subdivision if the waterworks satisfies one of the criteria specified in subdivisions A 2 b (1) through A 2 b (3) of

this section. Any such owner deemed to have optimized corrosion control under this subdivision, and which has treatment in place, shall continue to operate and maintain optimal corrosion control treatment and meet any requirements that the commissioner determines appropriate to ensure optimal corrosion control treatment is maintained.

(1) The owner of a small or medium waterworks is deemed to have optimized corrosion control if the waterworks meets the lead and copper action levels during each of two consecutive six-month monitoring periods conducted in accordance with 12VAC5-590-375.

(2) Any owner may be deemed by the commissioner to have optimized corrosion control treatment if the owner demonstrates to the satisfaction of the commissioner that the owner has conducted activities equivalent to the corrosion control steps applicable to such waterworks under this section. If the commissioner makes this determination, the owner shall be provided with a written notice explaining the basis for the decision and the notice shall specify the water quality control parameters representing optimal corrosion control in accordance with subdivision A 1 f of this section. Waterworks owners deemed to have optimized corrosion control under this subdivision shall operate in compliance with the commissioner designated optimal water quality control parameters in accordance with subdivision A 1 g and continue to conduct lead and copper tap and water quality parameter sampling in accordance with 12VAC5-590-375 B 4 c and 12VAC5-590-375 C 4, respectively. The owner shall provide the commissioner with the following information in order to support a determination under this subdivision:

(a) The results of all test samples collected for each of the water quality parameters in subdivision A 1 c (3) of this section;

(b) A report explaining the test methods used by the owner to evaluate the corrosion control treatments listed in subdivision A 1 c (1) of this section, the results of all tests conducted, and the basis for the owner's selection of optimal corrosion control treatment;

(c) A report explaining how corrosion control has been installed and how it is being maintained to insure minimal lead and copper concentrations at consumers' taps; and

(d) The results of tap water samples collected in accordance with 12VAC5-590-375 B at least once every six months for one year after corrosion control has been installed.

(3) Any waterworks is deemed to have optimized corrosion control if the owner submits results of tap water monitoring conducted in accordance with 12VAC5-590-375 B and source water monitoring conducted in accordance with 12VAC5-590-375 D that demonstrates for two consecutive six-month monitoring periods that the difference between the 90th percentile tap water lead level computed under 12VAC5-590-385 C, and the highest source water lead concentration is less than the PQL for lead (0.005 mg/L).

(a) Any owner that submits monitoring results indicating that the highest source water lead level is below the method detection limit may also be deemed to have optimized corrosion control under this subdivision if the 90th percentile tap water lead level is less than or equal to the PQL for lead (0.005 mg/L) for two consecutive six-month monitoring periods.

(b) Any owner deemed to have optimized corrosion control under this subdivision shall continue monitoring for lead and copper at the tap no less frequently than once every three calendar years using the reduced number of sites specified in 12VAC5-590-375 B 3 and collecting the samples at times and locations specified in 12VAC5-590-375 B 4 d (4).

(c) Any owner deemed to have optimized corrosion control pursuant to this subdivision shall notify the district engineer in writing pursuant to 12VAC5-590-530 D 1 c of any upcoming long-term change in treatment or addition of a new water source as described in that subdivision. The commissioner must review and approve the addition of a new water source or long-term change in water treatment before it is implemented by the owner. The commissioner may require the owner of any such waterworks to conduct additional monitoring or to take other actions the commissioner deems appropriate to ensure that minimum levels of corrosion control are being maintained in the distribution system.

(d) An owner is not deemed to have optimized corrosion control under this subdivision, and shall implement corrosion control treatment specified in subdivision A 2 b (3) (e) of this section unless the copper action level is met.

(e) The owner of a waterworks triggered into corrosion control because the waterworks no longer is deemed to have optimized corrosion control under this subsection shall implement corrosion control treatment in accordance with the deadlines in subdivision A 2 e of this section. The owner of any such large waterworks shall adhere to the schedule specified in subdivision A 2 e of this section for medium-size systems, with the time period for completing each step being triggered by the date the owner is no longer deemed to have optimized corrosion control treatment under this subsection.

c. The owner of any small or medium waterworks that is required to complete the corrosion control steps due to

the exceedance of the lead or copper action level may cease completing the treatment steps whenever the waterworks meets both action levels during each of two consecutive monitoring periods conducted pursuant to 12VAC5-590-375 B 4 a and submits the results to the district engineer. If any such waterworks thereafter exceeds the lead or copper action level during any monitoring period, the owner shall recommence completion of the applicable treatment steps, beginning with the first treatment step which was not previously completed in its entirety. The commissioner may require the owner to repeat treatment steps previously completed where the commissioner determines that this is necessary to properly implement the treatment requirements of this section. The commissioner shall notify the owner in writing of such a determination and explain the basis for his decision. The requirement for the owner of any small or medium waterworks to implement corrosion control treatment steps in accordance with subdivision A 2 e of this section (including waterworks deemed to have optimized corrosion control under subdivision A 2 b (1) of this section) is triggered whenever any small or medium waterworks exceeds the lead or copper action level.

d. Treatment steps and deadlines for large waterworks. Except as provided in subdivisions A 2 b (2) and A 2 b (3) of this section, owners of large waterworks shall complete the following corrosion control treatment steps (described in the referenced portions of subdivision A 1 of this section, 12VAC5-590-375 B and 12VAC5-590-375 C).

(1) Step 1: The owner shall conduct initial monitoring (12VAC5-590-375 B 4 a and 12VAC5-590-375 C 2) during two consecutive six-month monitoring periods by a date specified by the commissioner.

(2) Step 2: The owner shall complete corrosion control studies (subdivision A 1 c of this section) and submit the study and recommendations to the commissioner no later than 18 months after the date that initial monitoring is completed as specified in Step 1.

(3) Step 3: The commissioner shall approve optimal corrosion control treatment (subdivision A 1 d) no later than 12 months following receipt of the corrosion control study required in Step 2.

(4) Step 4: The owner shall install optimal corrosion control treatment (subdivision A 1 e) no later than 24 months following the commissioner's approval of optimal corrosion control treatment specified in Step 3 (See 12VAC5-590-200).

(5) Step 5: The owner shall complete follow-up sampling (12VAC5-590-375 B 4 b and 12VAC5-590-375 C 3) no later than 12 months following the installation of optimal corrosion control treatment specified in Step 4.

(6) Step 6: The commissioner shall review installation of treatment and designate optimal water quality control parameters (subdivision A 1 f) no later than six months following completion of follow-up sampling specified in Step 5.

(7) Step 7: The owner shall operate the waterworks in compliance with the commissioner-specified optimal water quality control parameters (subdivision A 1 g) and continue to conduct tap sampling (12VAC5-590-375 B 4 c and 12VAC5-590-375 C 4).

e. Treatment steps and deadlines for small and medium waterworks. Except as provided in subdivision A 2 b of this section, owners of small and medium waterworks shall complete the following corrosion control treatment steps (described in the referenced portions of subdivision A 1, 12VAC5-590-375 B and 12VAC5-590-375 C).

(1) Step 1: The owner shall conduct initial tap sampling (12VAC5-590-375 B 4 a and 12VAC5-590-375 C 2) until the waterworks either exceeds the lead or copper action level or becomes eligible for reduced monitoring under 12VAC5-590-375 B 4 d. The owner of a waterworks exceeding the lead or copper action level shall propose optimal corrosion control treatment (subdivision A 1 a of this section) within six months after the end of the monitoring period during which it exceeds one of the action levels.

(2) Step 2: Within 12 months after the end of the monitoring period during which a waterworks exceeds the lead or copper action level, the commissioner may require the owner to perform corrosion control studies (subdivision A 1 b of this section). If the commissioner does not require the owner to perform such studies, the commissioner shall specify optimal corrosion control treatment (subdivision A 1 d of this section) within the following timeframes:

(a) For medium waterworks, within 18 months after the end of the monitoring period during which such waterworks exceeds the lead or copper action level.

(b) For small waterworks, within 24 months after the end of the monitoring period during which such waterworks exceeds the lead or copper action level.

(3) Step 3: If the commissioner requires an owner to perform corrosion control studies under Step 2, the owner shall complete the studies (subdivision A 1 c of this section) and submit the study and recommendations to the commissioner within 18 months after the commissioner requires that such studies be conducted.

(4) Step 4: If the waterworks owner has performed corrosion control studies under Step 2, the commissioner

shall designate optimal corrosion control treatment (subdivision A 1 d of this section) within six months after completion of Step 3.

(5) Step 5: The owner shall install optimal corrosion control treatment (subdivision A 1 e of this section) within 24 months after the commissioner designates such treatment. See 12VAC5-590-200.

(6) Step 6: The owner shall complete follow-up sampling (12VAC5-590-375 B 4 b and 12VAC5-590-375 C 3) within 36 months after the commissioner designates optimal corrosion control treatment.

(7) Step 7: The commissioner shall review the owner's installation of treatment and designate optimal water quality control parameters (subdivision A 1 f of this section) within six months after completion of Step 6.

(8) Step 8: The owner shall operate in compliance with the commissioner designated optimal water quality control parameters (subdivision A 1 g of this section) and continue to conduct tap sampling (12VAC5-590-375 B 4 c and 12VAC5-590-375 C 4).

B. Water supply (source water) treatment technique requirements for lead and copper. The owner of any waterworks exceeding the lead or copper action level shall complete the applicable water supply monitoring and treatment requirements (described in the referenced portions of subdivision B 2 of this section, and in 12VAC5-590-375 B and D) by the following deadlines.

1. Deadlines for completing water supply treatment steps.

a. Step 1: The owner of a waterworks exceeding the lead or copper action level shall complete lead and copper water supply monitoring (12VAC5-590-375 D 2) and make a treatment proposal to the district engineer (subdivision B 2 a of this section) no later than 180 days after the end of the monitoring period during which the lead or copper action level was exceeded.

b. Step 2: The commissioner shall make a determination regarding the need for water supply treatment (subdivision B 2 b of this section) within six months after submission of monitoring results under Step 1.

c. Step 3: If the commissioner requires installation of water supply treatment, the owner shall install the treatment (subdivision B 3 of this section) within 24 months after completion of Step 2.

d. Step 4: The owner shall complete follow-up tap water monitoring (12VAC5-590-375 B 4 b) and water supply lead and copper monitoring (12VAC5-590-375 D 3) within 36 months after completion of Step 2.

e. Step 5: The commissioner shall review the owner's installation and operation of water supply treatment and specify maximum permissible water supply lead and copper levels (subdivision B 4 of this section) within six months after completion of Step 4.

f. Step 6: The owner shall operate in compliance with the commissioner-specified maximum permissible lead and copper water supply levels (subdivision B 4 of this section) and continue water supply monitoring (12VAC5-590-375 D 4).

2. Description of water supply treatment requirements.

a. Waterworks treatment recommendation. The owner of any waterworks which exceeds the lead or copper action level shall propose in writing to the district engineer, the installation and operation of one of the water supply treatments listed in subdivision B 2 b of this section. An owner may propose that no treatment be installed based upon a demonstration that water supply treatment is not necessary to minimize lead and copper levels at users' taps.

b. Commissioner's determination regarding water supply treatment. The commissioner shall complete an evaluation of the results of all water supply samples submitted by the owner to determine whether water supply treatment is necessary to minimize lead or copper levels in water delivered to users' taps. If the commissioner determines that treatment is needed, the commissioner shall either require installation and operation of the water supply treatment recommended by the owner or require the installation and operation of another water supply treatment from among the following: ion exchange, reverse osmosis, lime softening, or coagulation/filtration. If the commissioner requests additional information to aid in the review, the owner shall provide the information by the date specified by the commissioner in the request. The commissioner shall notify the owner in writing of the determination and set forth the basis for the decision.

3. Installation of water supply treatment. Each owner shall properly install and operate the water supply treatment designated by the commissioner under subdivision B 2 b of this section.

4. Commissioner's review of water supply treatment and specification of maximum permissible water supply lead and copper levels. The commissioner shall review the water supply samples taken by the owner both before and after the owner installs water supply treatment, and determine whether the owner has properly installed and operated the water supply treatment designated by the commissioner. Based upon the review, the commissioner shall designate the 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 commissioner shall notify the owner in writing and explain the basis for the decision.

5. Continued operation and maintenance. Each waterworks shall be operated to maintain lead and copper levels below the maximum permissible concentrations designated by the commissioner at each sampling point monitored in accordance with 12VAC5-590-375 D. The waterworks is out of compliance with this subdivision if the level of lead or copper at any sampling point is greater than the maximum permissible concentration designated by the commissioner.

6. Modification of the commissioner's treatment decisions. Upon his own initiative or in response to a request by an owner or other interested party, the commissioner may modify his determination of the water supply treatment under subdivision B 2 b of this section, or may modify the maximum permissible lead and copper concentrations for finished water entering the distribution system under subdivision B 4 of this section. A request for modification by an owner or other interested party shall be in writing, explain why the modification is appropriate, and provide supporting documentation. The commissioner may modify the determination where he concludes that such change is necessary to ensure that the waterworks continues to minimize lead and copper concentrations in water supplies. A revised determination shall be made in writing, set forth the new treatment requirements, explain the basis for the commissioner's decision, and provide an implementation schedule for completing the treatment modifications.

C. Lead service line replacement treatment technique requirements:

1. Owners of waterworks that fail to meet the lead action level in tap samples taken pursuant to 12VAC5-590-375 B 4 b, after installing corrosion control or water supply treatment (whichever sampling occurs later), shall replace lead service lines in accordance with the requirements of this section. If a waterworks is in violation of subdivision A 2 of this section or subsection B of this section for failure to install water supply or corrosion control treatment, the commissioner may require the owner to commence lead service line replacement under this section after the date by which the owner was required to conduct monitoring under 12VAC5-590-375 B 4 b has passed.

2. An owner shall replace annually at least 7.0% 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 owner shall identify the initial number of lead service lines in its distribution system based upon a materials evaluation, including the evaluation required under 12VAC5-590-375 B 1. The first year of lead service line replacement shall begin on the first day following the end of the monitoring period in which the lead action level was exceeded under subdivision C 1 of this subsection. If monitoring is required annually or less frequently, the end of the monitoring period is September 30 of the calendar year in which the sampling occurs. If the commissioner has established an alternate monitoring period, then the end of the monitoring period will be the last day of that period.

3. The owner of any waterworks resuming a lead service line replacement program after the cessation of the lead service line replacement program as allowed by subdivision C 7 of this section shall update the inventory of lead service lines to include those sites that were previously determined not to require replacement through the sampling provision under subdivision C 4 of this section. The owner shall then divide the updated number of remaining lead service lines by the number of remaining years in the program to determine the number of lines that must be replaced per year (7.0% lead service line replacement is based on a 15-year replacement program; so, for example, owners resuming lead service line replacement after previously conducting two years of replacement would divide the updated inventory by 13). For those owners that have completed a 15-year lead service line replacement program, the commissioner will determine a schedule for replacing or retesting lines that were previously tested out under the replacement program when the waterworks re-exceeds the lead action level.

4. An owner 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 12VAC5-590-375 B 2 c, is less than or equal to 0.015 mg/L.

5. An owner shall replace that portion of the lead service line that is owned by the waterworks. In cases where the waterworks owner does not own the entire lead service line, the waterworks owner shall notify the building owner, or the building owner's authorized agent, that the waterworks owner will replace that portion of the service line that is owned by the waterworks and shall offer to replace the building owner's portion of the line. The waterworks owner is not required to bear the cost of replacing the building owner's portion of the service line, nor is the waterworks owner required to replace the building owner's portion where the waterworks owner chooses not to pay the cost of replacing the building owner's portion of the line, or where replacing the building owner's portion would be precluded by state, local, or common law. A waterworks owner that does not replace the entire length of the service line also shall complete the following tasks.

a. At least 45 days prior to commencing with the partial replacement of a lead service line, the waterworks owner shall provide notice to the resident or residents of all buildings served by the line explaining that they may

experience a temporary increase of lead levels in their drinking water, along with guidance on measures consumers can take to minimize their exposure to lead. The commissioner may allow the waterworks owner to provide notice under the previous sentence less than 45 days prior to commencing partial lead service line replacement where such replacement is in conjunction with emergency repairs. In addition, the waterworks owner shall inform the resident or residents served by the line that the waterworks owner will, at the waterworks owner's expense, collect a sample from each partially-replaced lead service line that is representative of the water in the service line for analysis of lead content, as prescribed in 12VAC5-590-375 B 2 c, within 72 hours after the completion of the partial replacement of the lead service line. The waterworks owner shall collect the sample and report the results of the analysis to the building owner and resident or residents served by the line within three business days of receiving the results. Mailed notices post-marked within three business days of receiving the results shall be considered on time.

b. The waterworks owner shall provide the information required by subdivision C 5 a of this section to the residents of individual dwellings by mail or by other methods approved by the commissioner. In instances where multi-family dwellings are served by the line, the waterworks owner shall have the option to post the information at a conspicuous location.

6. The commissioner shall require an owner to replace lead service lines on a shorter schedule than that required by this subsection, taking into account the number of lead service lines in the waterworks, where such a shorter replacement schedule is feasible. The commissioner shall make this determination in writing and notify the owner of the findings within six months after the waterworks is triggered into lead service line replacement based on monitoring referenced in subdivision C 1 of this section.

7. Any owner may cease replacing lead service lines whenever first draw tap samples collected pursuant to 12VAC5-590-375 B 2 b meet the lead action level during each of two consecutive monitoring periods and the owner submits the results to the district engineer. If the first draw tap samples collected in any such waterworks thereafter exceeds the lead action level, the owner shall recommence replacing lead service lines, pursuant to subdivision C 3 of this section.

8. To demonstrate compliance with subdivisions C 1 through C 5 of this section, an owner shall report to the district engineer the information specified in 12VAC5-590-530 D 5.

D. Lead public education requirements. The waterworks owner shall deliver a consumer notice of lead tap water monitoring results to all persons served by the water system at sites that are tested in accordance with subdivision D 4 of this section. The owner of a waterworks that exceeds the lead action level based on tap water samples collected in accordance with 12VAC5-590-375 B shall deliver the public education materials contained in subdivisions D 1 of this section in accordance with the requirements in subdivision D 2 of this section. The owner of a waterworks that exceeds the lead action level shall sample the tap water of any customer who requests it in accordance with subdivision D 3 of this section.

1. Content of written materials. The owner shall include the following text in all of the printed materials distributed through the lead public education program.

a. Community waterworks and nontransient noncommunity waterworks. Owners of community waterworks or nontransient noncommunity waterworks shall include the following elements in printed materials (e.g., brochures and pamphlets) in the same order as listed below. In addition, the language specified in subdivisions D 1 a (1) through D 1 a (2) and in subdivision D 1 a (6) of this section shall be included in materials, exactly as written, except for the text in brackets for which the waterworks owner shall include system-specific information. Any additional information presented by the owner shall be consistent with the information below and be in plain language that can be understood by the general public. The commissioner may require the waterworks owner to obtain approval of the content of written material prior to delivery.

(1) IMPORTANT INFORMATION ABOUT LEAD IN YOUR DRINKING WATER. [INSERT NAME OF WATERWORKS] found elevated levels of lead in drinking water in some homes/buildings. Lead can cause serious health problems, especially for pregnant women and young children. Please read this information closely to see what you can do to reduce lead in your drinking water.

(2) Health effects of lead. Lead can cause serious health problems if too much enters your body from drinking water or other sources. It can cause damage to the brain and kidneys, and can interfere with the production of red blood cells that carry oxygen to all parts of your body. The greatest risk of lead exposure is to infants, young children, and pregnant women. Scientists have linked the effects of lead on the brain with lowered IQ in children. Adults with kidney problems and high blood pressure can be affected by low levels of lead more than healthy adults. Lead is stored in the bones, and it can be released later in life. During pregnancy, the child receives lead from the mother's bones, which may affect brain development.

(3) Sources of lead.

(a) Explain what lead is.

(b) Explain possible sources of lead in drinking water and how lead enters drinking water. Include information on home/building materials and services lines that may contain lead.

(c) Discuss other important sources of lead exposure in addition to drinking water (e.g., paint).

(4) Discuss the steps the consumer can take to reduce their exposure to lead in drinking water.

(a) Encourage running the water to flush out the lead.

(b) Explain concerns with using hot water from the tap and specifically caution against the use of hot water for preparing baby formula.

(c) Explain that boiling water does not reduce lead levels.

(d) Discuss other options consumers can take to reduce exposure to lead in drinking water, such as alternative sources or treatment of water.

(e) Suggest that parents have their child's blood tested for lead.

(5) Explain why there are elevated levels of lead in the waterworks' drinking water (if known) and what the waterworks owner is doing to reduce the lead levels in homes/buildings.

(6) For more information call us at [INSERT WATERWORKS OWNER'S CONTACT PHONE NUMBER], or [IF APPLICABLE] visit our website at [INSERT WATERWORKS' WEBSITE HERE]. For more information on reducing lead exposure around your home/building and the health effects of lead, visit EPA's website at http://www.epa.gov/lead or contact your health care provider.

b. In addition to including the elements specified in subdivision D 1 a of this section, the owners of community waterworks shall:

(1) Tell consumers how to get their water tested.

(2) Discuss lead in plumbing components and the difference between low lead and lead free.

2. Delivery of public education materials.

a. The owner of any waterworks serving a large proportion of non-English speaking consumers, as determined by the commissioner, shall include in all public education materials information in the appropriate language(s) regarding the importance of the notice or contain a telephone number or address where persons served may contact the water system to obtain a translated copy of the public education materials or to request assistance in the appropriate language.

b. The owner of a community waterworks that exceeds the lead action level on the basis of tap water samples collected in accordance with 12VAC5-590-375 B, and that is not already conducting public education tasks shall conduct the public education tasks under this subdivision within 60 days after the end of the monitoring period in which the exceedance occurred. For waterworks that are required to conduct monitoring annually or less frequently, the end of the monitoring period is September 30 of the calendar year in which the sampling occurs, or, if the commissioner has established an alternate monitoring period, the last day of that period. These public education tasks include:

(1) Deliver printed materials meeting the content requirements of subdivision D 1 of this section to all bill paying customers.

(2) Contact customers who are most at risk by delivering education materials that meet the content requirements of subdivision D 1 of this section to the local health department even if they are not located within the water system's service area, along with an informational notice that encourages distribution to all the organization's potentially affected customers or community water system's users. The waterworks owner shall contact the local health department directly by phone or in person. The local health department may provide a specific list of additional community based organizations serving target populations, which may include organizations outside the service area of the water system. If such lists are provided, the waterworks owner shall deliver education materials that meet the content requirements of subdivision D 1 of this section to all organizations on the provided lists.

(3) Contact customers who are most at risk by delivering materials that meet the content requirements of subdivision D 1 of this section to the following organizations that are located within the water system's service area, along with an informational notice that encourages distribution to all the organization's potentially affected customers or community water system's users: (i) public and private schools or school boards; (ii) Women, Infants and Children (WIC) and Head Start programs; (iii) public and private hospitals and medical clinics; (iv) pediatricians; (v) family planning clinics; and (vi) local welfare agencies.

(4) Make a good faith effort to locate the following organizations within the service area and deliver materials that meet the content requirements of subdivision D 1 of this section to them, along with an informational notice that encourages distribution to all potentially affected customers or users. The good faith effort to contact at-risk customers may include requesting a specific contact list of these organizations from the

local health department, even if the agencies are not located within the water system's service area: (i) licensed childcare centers; (ii) public and private preschools; and (iii) obstetricians-gynecologists and midwives.

(5) No less often than quarterly, provide information on or in each water bill as long as the waterworks exceeds the action level for lead. The message on the water bill shall include the following statement exactly as written except for the text in brackets for which the owner shall include system-specific information: [INSERT NAME OF WATERWORKS] found high levels of lead in drinking water in some homes. Lead can cause serious health problems. For more information please call [INSERT NAME OF WATERWORKS] or visit [IF APPLICABLE INSERT WATERWORKS' WEBSITE]. The message or delivery mechanism can be modified in consultation with the commissioner; specifically, the commissioner may allow a separate mailing of public education materials to customers if the waterworks owner cannot place the information on water bills.

(6) Post materials meeting the content requirements of subdivision D 1 of this section on the waterworks' website if the waterworks serves a population greater than 100,000 persons.

(7) Submit a press release to newspapers, television, and radio stations.

(8) In addition to the delivery requirements contained in subdivisions D 2 b (1) through D 2 b (7) of this section, the owners of waterworks exceeding the lead action level shall implement at least three activities from one or more of the following categories: (i) public service announcements; (ii) paid advertisements; (iii) public area informational displays; (iv) e-mails to customers; (v) public meetings; (vi) household deliveries; (vii) targeted individual customer contact; (viii) direct material distribution to all multi-family homes and institutions; and (ix) other methods approved by the commissioner. The educational content and selection of these activities shall be determined in consultation with the district engineer.

(9) As long as a community water system exceeds the lead action level, the waterworks owner shall repeat the following public education activities:

(a) The community water system owner shall repeat the tasks contained in subdivisions D 2 b (1) through D 2 b (3), and D 2 b (8) of this section every 12 months.

(b) The community water system owner shall repeat tasks contained in subdivision D 2 b (5) of this section with each billing cycle.

(c) The owner of a community water system serving a population greater than 100,000 shall post and retain material on a publicly accessible website pursuant to subdivision D 2 b (6) of this section.

(d) The community water system owner shall repeat the task in subdivision D 2 b (7) of this section twice every 12 months on a schedule agreed upon with the commissioner.

(10) The commissioner may allow the public education activities described in subdivision D 2 b of this section to extend beyond the 60-day requirement if needed for implementation purposes on a case-by-case basis; however, this extension must be approved in writing by the commissioner in advance of the 60-day deadline.

c. The owner of a nontransient noncommunity waterworks that exceeds the lead action level on the basis of tap water samples collected in accordance with 12VAC5-590-375 B, and that is not already conducting public education tasks, shall conduct the public education tasks under this subdivision within 60 days after the end of the monitoring period in which the exceedance occurred. For waterworks that are required to conduct monitoring annually or less frequently, the end of the monitoring period is September 30 of the calendar year in which the sampling occurs, or, if the commissioner has established an alternate monitoring period, the last day of that period. These public education tasks include:

(1) Post informational posters containing all of the public education elements contained in subdivision D 1 of this section in a public place or common area in each of the buildings served by the waterworks; and

(2) Distribute informational pamphlets or brochures on lead in drinking water containing all of the public education elements in subdivision D 1 of this section to each person served by the nontransient noncommunity waterworks. The commissioner may allow the owner to utilize electronic transmission in lieu of or combined with printed materials as long as it achieves at least the same coverage.

(3) The owner of a nontransient noncommunity waterworks shall repeat the tasks contained in subdivisions D 2 c (1) through D 2 c (2) of this section at least once during each calendar year in which the waterworks exceeds the lead action level.

(4) The commissioner may allow the public education activities described in subdivision D 2 c of this section to extend beyond the 60-day requirement if needed for implementation purposes on a case-by-case basis; however, this extension must be approved in writing by the commissioner in advance of the 60-day deadline.

d. An owner may discontinue delivery of public education materials if the waterworks has met the lead action level during the most recent six-month monitoring period conducted pursuant to 12VAC5-590-375 B. The owner shall recommence public education in accordance with this subsection if the waterworks subsequently exceeds the lead action level during any monitoring period.

e. The owner of a community waterworks may apply to the district engineer, in writing, (unless the commissioner has waived the requirement for prior approval) to use only the text specified in subdivision D 1 a of this section in lieu of the text in subdivisions D 1 a through D 1 b of this section and to perform the tasks listed in subdivisions D 2 c (1) through D 2 c (2) of this section in lieu of the tasks in subdivisions D 2 b (1) through D 2 b (9) of this section if:

(1) The waterworks serves a facility, such as a prison or a hospital, where the population served is not capable of or is prevented from making improvements to plumbing or installing POU treatment devices; and

(2) The owner provides water as part of the cost of services provided and does not separately charge for water consumption.

f. The owner of a community waterworks serving 3,300 or fewer people may limit certain aspects their public education programs as follows:

(1) With respect to the requirements of subdivision D 2 b (8) of this section, the owner of a waterworks serving 3,300 or fewer people shall implement at least one of the activities listed in that subdivision.

(2) With respect to the requirements of subdivision D 2 b (2) of this section, the owner of a waterworks serving 3,300 or fewer people may limit the distribution of the public education materials required under that subdivision to facilities and organizations served by the waterworks that are most likely to be visited regularly by pregnant women and children.

(3) With respect to the requirements of subdivision D 2 b (7) of this section, the commissioner may waive this requirement for systems serving 3,300 or fewer persons as long as the owner distributes notices to every household served by the waterworks.

3. Supplemental monitoring and notification of results. The owner of a waterworks that fails to meet the lead action level on the basis of tap samples collected in accordance with 12VAC5-590-375 B shall offer to sample the tap water of any customer who requests it. The owner is not required to pay for collecting or analyzing the sample, nor is the owner required to collect and analyze the sample itself.

4. Notification of results. The owners of all community and nontransient noncommunity waterworks shall provide a notice of the individual tap results from lead tap water monitoring carried out under the requirements of 12VAC5-590-375 B to the persons served by the waterworks at the specific sampling site from which the sample was taken (e.g., the occupants of the residence or buildings where the tap was tested).

a. Timing of notification. An owner shall provide this consumer notice as soon as practical, but no later than 30 days after the owner learns of the tap monitoring results.

b. Content. The consumer notice shall include the results of lead tap water monitoring for the tap that was tested, an explanation of the health effects of lead, list steps consumers can take to reduce exposure to lead in drinking water, and contact information for the waterworks. The notice shall also provide the maximum contaminant level goal and the action level for lead and the definitions for these two terms from 12VAC5-590-10.

c. Delivery. The consumer notice shall be provided to persons served at the tap that was tested, either by mail or by another method approved by the commissioner. For example, the owner of a nontransient noncommunity waterworks may post the results on a bulletin board in the facility to allow users to review the information. The owner shall provide the notice to customers at sample taps tested, including consumers who do not receive water bills.

12VAC5-590-410. Determination of compliance.

For the purposes of determining compliance with a PMCL or action level, the following criteria shall be used:

A. Bacteriological results. Compliance with the PMCL for coliform bacteria shall be determined as specified in 12VAC5-590-380 C. Repeat samples shall be used as a basis for determining compliance with these regulations.

B. Inorganic chemicals.

1. Antimony, arsenic, asbestos, barium, beryllium, cadmium, cyanide (as free cyanide), chromium, fluoride, mercury, nickel, selenium, and thallium. Where the results of sampling for antimony, arsenic, asbestos, barium, beryllium, cadmium, cyanide (as free cyanide), chromium, fluoride, mercury, nickel, selenium, or thallium exceed the PMCL, the owner shall take a confirmation sample, at the same sampling point, within two weeks of notification of the analytical results of the first sample.

a. The results of the initial and confirmation samples shall be averaged to determine compliance with subdivision B 1 c of this subsection. The commissioner has the discretion to delete results of obvious sampling errors.

b. The commissioner may require more frequent monitoring.

c. Compliance with antimony, arsenic, asbestos, barium, beryllium, cadmium, cyanide (as free cyanide), chromium, fluoride, mercury, nickel, selenium, and thallium in Table 2.2 of 12VAC5-590-440 shall be determined based on the analytical result(s) obtained at each sampling point.

(1) Owners that are conducting monitoring more frequently than annually, compliance with the PMCL for antimony, arsenic, asbestos, barium, beryllium, cadmium, cyanide (as free cyanide), chromium, fluoride, mercury, nickel, selenium, and thallium is determined by a running annual average at each sampling point. If the average at any sampling point is greater than the PMCL, then the waterworks is out of compliance. If any one sample would cause the annual average to be exceeded, then the waterworks 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. If an owner fails to collect the required number of samples, compliance (average concentration) shall be based on the total number of samples collected.

(2) Owners that are monitoring annually, or less frequently, the waterworks is out of compliance with the PMCL for antimony, arsenic, asbestos, barium, beryllium, cadmium, cyanide (as free cyanide), chromium, fluoride, mercury, nickel, selenium, and thallium if the average of the original sample and a confirmation sample of a contaminant at any sampling point is greater than the PMCL. Owners of waterworks monitoring annually or less frequently whose sample result exceeds the PMCL shall begin quarterly sampling. The waterworks shall not be considered in violation of the PMCL until it has completed one year of quarterly sampling. However, if the confirmation sample is not collected, the waterworks is in violation of the PMCL for antimony, arsenic, asbestos, barium, beryllium, cadmium, cyanide (as free cyanide), chromium, fluoride, mercury, nickel, selenium, or thallium. If an owner fails to collect the required number of samples, compliance (average concentration) shall be based on the total number of samples collected.

2. Nitrate and nitrite. Compliance with the PMCL is determined based on one sample from each sampling point if the levels of these contaminants are below the PMCLs. Where nitrate or nitrite sample results exceed the PMCL, the owner shall take a confirmation sample from the same sampling point that exceeded the PMCL within 24 hours of the owner's receipt of the analytical results of the first sample. The results of the initial and confirmation sample shall be averaged to determine compliance with this subdivision. Owners unable to comply with the 24-hour sampling requirement shall immediately notify the consumers in the area served by the waterworks in accordance with 12VAC5-590-540. Owners exercising this option shall take and analyze a confirmation sample within two weeks of notification of the analytical results of the first sample. The commissioner may require more frequent monitoring. The commissioner has the discretion to delete results of obvious sampling errors.

C. Organic chemicals.

1. VOCs and SOCs. A confirmation sample shall be required for positive results for contaminants listed in Table 2.3. The commissioner has the discretion to delete results of obvious sampling errors from this calculation.

a. The results of the initial and confirmation sample shall be averaged to determine the waterworks' compliance in accordance with subdivision C 1 b of this subsection.

b. Compliance with Table 2.3 shall be determined based on the analytical results obtained at each sampling point. Any samples below the detection limit shall be calculated as zero for the purposes of determining the annual average. (Note: Refer to detection definition at 12VAC5-590-370 B 2 h.) If an owner fails to collect the required number of samples, compliance (average concentration) will be based on the total number of samples collected.

(1) Owners that are conducting monitoring more frequently than annually, 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 PMCL, then the waterworks is out of compliance. If the initial sample or a subsequent sample would cause the annual average to be exceeded, then the waterworks is out of compliance immediately. Any samples below the detection limit shall be calculated as zero for purposes of determining the annual average. (Note: Refer to detection definition at 12VAC5-590-370 B 2 h.)

(2) If monitoring is conducted annually, or less frequently, the waterworks is not in violation if the average of the initial and confirmation sample is greater than the PMCL for that contaminant; however, the owner shall begin quarterly sampling. The waterworks will not be considered in violation of the PMCL until the owner has completed one year of quarterly sampling. If any sample will cause the running annual average to exceed the PMCL at any sampling point, the waterworks is immediately out of compliance with the PMCL.

2. Disinfectant residuals, disinfection byproducts and disinfection byproduct precursors. Compliance with 12VAC5-590-370 B 3 a through B 3 k is as follows:

a. General requirements.

(1) Where compliance is based on a running annual average of monthly or quarterly samples or averages and the owner 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. Where compliance is based on a running annual average of monthly or quarterly samples or averages and the owner's failure to monitor makes it impossible to determine compliance with MRDLs for chlorine and chloramines, this failure to monitor shall 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 subpart~~ subdivision C 2 of this section shall be included in determining compliance, even if that number is greater than the minimum required.

(3) If during the first year of monitoring under 12VAC5-590-370 B 3 b, any individual quarter's average will cause the running annual average of that waterworks to exceed the PMCL in Table 2.12 and Table 2.13, the waterworks is out of compliance at the end of that quarter.

b. Disinfection byproducts.

(1) TTHMs and HAA5.

(a) Running Annual Average. All waterworks using surface water or groundwater under the direct influence of surface water serving 10,000 or more persons shall comply with this section beginning January 1, 2002. All waterworks using surface water or groundwater under the direct influence of surface water serving less than 10,000 persons and all waterworks using groundwater not under the direct influence of surface water shall comply with this section beginning January 1, 2004. All waterworks shall comply with this section until the dates listed in 12VAC5-590-370 B e (3) (c).

(i) For waterworks monitoring quarterly, compliance with PMCLs in Table 2.13 shall be based on a running annual arithmetic average, computed quarterly, of quarterly arithmetic averages of all samples collected by the owner as prescribed by 12VAC5-590-370 B 3 e (1).

(ii) For waterworks monitoring less frequently than quarterly, the owner demonstrates PMCL compliance if the average of samples taken that year under the provisions of 12VAC5-590-370 B 3 e (1) does not exceed the PMCLs in Table 2.13. If the average of these samples exceeds the PMCL, the owner shall increase monitoring to once per quarter per treatment plant and such a waterworks is not in violation of the PMCL until it has completed one year of quarterly monitoring, unless the result of fewer then four quarter of monitoring will cause the running annual average to exceed the PMCL, in which case the waterworks is in violation at the end of that quarter. Owners of waterworks required to increase monitoring frequency to quarterly monitoring shall calculate compliance by including the sample that triggered the increase monitoring plus the following three quarter of monitoring.

(iii) If the running annual arithmetic average of quarterly averages covering any consecutive four-quarter period exceeds the PMCL in Table 2.12 and Table 2.13, the waterworks is in violation of the PMCL and the owner shall notify the public pursuant to 12VAC5-590-540 in addition to reporting to the commissioner pursuant to 12VAC5-590-530.

(iv) If an owner fails to complete four consecutive quarters of monitoring, compliance with the PMCL in Table 2.13 for the last four-quarter compliance period shall be based on an average of the available data.

(b) Locational Running Annual Average (LRAA). All waterworks shall comply with this section beginning on the dates listed in 12VAC5-590-370 B e (3) (c).

(i) Owners of waterworks required to monitor quarterly shall calculate LRAAs for TTHM and HAA5 using monitoring results collected under 12VAC5-590-370 B 3 e (3) and determine that each LRAA does not exceed the PMCL in order to comply with PMCLs in Table 2.13. If the owner fails to complete four consecutive quarters of monitoring, the owner shall calculate compliance with the PMCL based on the average of the available data from the most recent four quarters. If the owner takes more than one sample per quarter at a monitoring location, the owner shall average all samples taken in the quarter at that location to determine a quarterly average to be used in the LRAA calculation.

(ii) Owners of waterworks required to monitor yearly or less frequently shall determine that each sample taken is less than the PMCL in order to determine compliance with PMCLs in Table 2.13. If any sample exceeds the PMCL, the owner shall comply with the requirements of 12VAC5–590-370 B 3 e (3) (g). If no sample exceeds the PMCL, the sample result for each monitoring location is considered the LRAA for that monitoring location.

(iii) Waterworks are in violation of the monitoring requirements for each quarter that a monitoring result would be used in calculating an LRAA if the owner fails to monitor.

(iv) Waterworks have exceeded the operational evaluation level at any monitoring location where the sum of the two previous quarters' TTHM results plus twice the current quarter's TTHM result, divided by four to determine an average, exceeds 0.080 mg/L, or where the sum of the two previous quarters' HAA5 results plus twice the current quarter's HAA5 result, divided by four to determine an average, exceeds 0.060 mg/L.

((a)) Owners of waterworks that exceed the operational evaluation level shall conduct an operational evaluation and submit a written report of the evaluation to the commissioner no later than 90 days after being notified of the analytical result that causes the waterworks to exceed the operational evaluation level. The written report shall be made available to the public upon request.

((b)) The operational evaluation report shall include an examination of waterworks treatment and distribution operational practices, including storage tank operations, excess storage capacity, distribution system flushing, changes in sources or source water quality, and treatment changes or problems that may contribute to TTHM and HAA5 formation and what steps could be considered to minimize future exceedances.

((c)) The owner may request and the commissioner may allow waterworks to limit the scope of the evaluation if the owner is able to identify the cause of the operational evaluation level exceedance. The request to limit the scope of the evaluation does not extend the schedule in paragraph ((a)) of this section for submitting the written report. The commissioner shall approve this limited scope of evaluation in writing and the owner shall keep that approval with the completed report.

(2) Bromate. Compliance shall be based on a running annual arithmetic average, computed quarterly, of monthly samples (or, for months in which the waterworks takes more than one sample, the average of all samples taken during the month) collected by the owner as prescribed by 12VAC5-590-370 B 3 g. If the average of samples covering any consecutive four-quarter period exceeds the PMCL in Table 2.13, the waterworks is in violation of the PMCL and the owner shall notify the public pursuant to 12VAC5-590-540, in addition to reporting to the commissioner pursuant to 12VAC5-590-530. If an owner fails to complete 12 consecutive months' monitoring, compliance with the PMCL for the last four-quarter compliance period shall be based on an average of the available data.

(3) Chlorite. Compliance shall be based on an arithmetic average of each three sample set taken in the distribution system as prescribed by 12VAC5-590-370 B 3 f (1) (a), (b) and (c). If the arithmetic average of any three sample set exceeds the PMCL in Table 2.13, the waterworks is in violation of the PMCL and the owner shall notify the public pursuant to 12VAC5-590-540, in addition to reporting to the commissioner pursuant to 12VAC5-590-530.

c. Disinfectant residuals.

(1) Chlorine and chloramines.

(a) Compliance shall be based on a running annual arithmetic average, computed quarterly, of monthly averages of all samples collected by the waterworks under 12VAC5-590-370 B 3 h (1) (a). If the average covering any consecutive four-quarter period exceeds the MRDL in Table 2.12, the waterworks is in violation of the MRDL and the owner shall notify the public pursuant to 12VAC5-590-540, in addition to reporting to the commissioner pursuant to 12VAC5-590-530.

(b) In cases where waterworks switch between the use of chlorine and chloramines for residual disinfection during the year, compliance shall be determined by including together all monitoring results of both chlorine and chloramines in calculating compliance. Reports submitted pursuant to 12VAC5-590-530 shall clearly indicate which residual disinfectant was analyzed for each sample.

(2) Chlorine dioxide.

(a) Acute violations. Compliance shall be based on consecutive daily samples collected by the owner under 12VAC5-590-370 B 3 h (2) (a). If any daily sample taken at the entrance to the distribution system exceeds the MRDL in Table 2.12, and on the following day one (or more) of the three samples taken in the distribution system exceed the MRDL, the waterworks is in violation of the MRDL and the owner shall take immediate corrective action to lower the level of chlorine dioxide below the MRDL and the owner shall notify the public pursuant to the procedures for Tier 1 conditions in 12VAC5-590-540 in addition to reporting to the commissioner in pursuant to 12VAC5-590-530. 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 owner shall notify the public of the violation in accordance with the provisions for Tier 1 conditions in 12VAC5-590-540 in addition to reporting to the commissioner in pursuant to 12VAC5-590-530.

(b) Nonacute violations. Compliance shall be based on consecutive daily samples collected by the owner under 12VAC5-590-370 B 3 h (2) (a). If any two consecutive daily samples taken at the entrance to the distribution system exceed the MRDL in Table 2.12 and all distribution system samples taken are below the MRDL, the waterworks is in violation of the MRDL and the owner shall take corrective action to lower the level of chlorine dioxide below the MRDL at the point of sampling and shall notify the public pursuant to the procedures for Tier 2 conditions in 12VAC5-590-540 in addition to reporting to the commissioner in pursuant to 12VAC5-590-530. 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

owner shall notify the public of the violation in accordance with the provisions for Tier 2 conditions in 12VAC5-590-540 in addition to reporting to the commissioner in pursuant to 12VAC5-590-530.

d. Disinfection byproduct precursors (DBPP). Compliance shall be determined as specified by 12VAC5-590-420 H 3. Owners may begin monitoring to determine whether Step 1 TOC removals can be met 12 months prior to the compliance date for the waterworks. This monitoring is not required and failure to monitor during this period is not a violation. However, any owner 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 12VAC5-590-420 H 2 b and shall 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 12VAC5-590-420 H 2 c and is in violation. Owners may apply for alternate minimum TOC removal (Step 2) requirements any time after the compliance date. For waterworks required to meet Step 1 TOC removals, if the value calculated under 12VAC5-590-420 H 3 a (4) is less than 1.00, the waterworks is in violation of the treatment technique requirements and the owner shall notify the public pursuant to 12VAC5-590-540 in addition to reporting to the commissioner pursuant to 12VAC5-90-530.

D. Radiological results (gross alpha, combined radium-226 and radium-228, uranium and man-made radioactivity). Compliance with the radiological PMCLs shall be in accordance with 12VAC5-590-370 D 3 c. PMCLs are indicated in subsection B of Table 2.5. Sampling for radiological analysis shall be in compliance with 12VAC5-590-370 D 1 and D 2. Furthermore, compliance shall be determined by rounding off results to the same number of significant figures as the PMCL for the substance in question.

E. ~~Lead and copper action levels.~~ Reserved.

~~1. The lead action level is exceeded if the concentration of lead in more than 10% of tap water samples collected during any monitoring period conducted in accordance with 12VAC5-590-370 B 6 a is greater than 0.015 mg/L (i.e., if the "90th percentile" lead level is greater than 0.015 mg/L).~~

~~2. The copper action level is exceeded if the concentration of copper in more than 10% of tap water samples collected during any monitoring period conducted in accordance with 12VAC5-590-370 B 6 a is greater than 1.3 mg/L (i.e., if the "90th percentile" copper level is greater than 1.3 mg/L).~~

~~3. The 90th percentile lead and copper levels shall be computed as follows:~~

~~a. 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.~~

~~b. The number of samples taken during the monitoring period shall be multiplied by 0.9.~~

~~c. The contaminant concentration in the numbered sample yielded by the calculation in subdivision 3 b of this subsection is the 90th percentile contaminant level.~~

~~d. For waterworks 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.~~

F. Turbidity. The requirements in this subsection apply to filtered waterworks until June 29, 1993. The requirements in this section apply to unfiltered waterworks with surface water sources or groundwater sources under the direct influence of surface water that are required to install filtration equipment until June 29, 1993, or until filtration is installed, whichever is later. When a sample exceeds the PMCL for turbidity a confirmation sample shall be collected for analysis as soon as possible. In cases where a turbidimeter is required at the waterworks, the preferable resampling time is within one hour of the initial sampling. The repeat sample shall be the sample used for the purpose of calculating the monthly average. Compliance for public notification purposes shall be based on the monthly averages of the daily samples. However, public notification is also required if the average of samples taken on two consecutive days exceeds five NTU.

G. All analyses for PMCL and action level compliance determinations shall be consistent with current Environmental Protection Agency Regulations found at 40 CFR Part 141.

12VAC5-590-420. Treatment technique requirement.

This section establishes treatment technique requirements in lieu of maximum contaminant levels for specified contaminants. Failure to meet any requirement of this section after the applicable date specified is a treatment technique violation.

A. The filtration and disinfection provisions of this section are required treatment techniques for any waterworks supplied by a surface water source and waterworks supplied by a groundwater source under the direct influence of surface water. This section establishes treatment technique requirements in lieu of PMCL's for the following contaminants: Giardia lamblia, viruses, heterotrophic bacteria (HPC), Legionella, Cryptosporidium and turbidity. Each

waterworks with a surface water source or a groundwater source under the direct influence of surface water shall provide treatment of that source water that complies with these treatment technique requirements. The treatment technique requirements consist of installing and properly operating water treatment processes which reliably achieve:

1. At least 99.9% (3-log) removal and/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% (4-log) removal and/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; and

3. At least 99% (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.

B. A waterworks 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 subsection A of this section if it meets the following disinfection filtration and enhanced filtration and disinfection for Cryptosporidium requirements:

1. Disinfection. Waterworks with a surface water source or a groundwater source under the direct influence of surface water shall provide disinfection treatment in accordance with this section.

a. The disinfection treatment shall be sufficient to ensure that the total treatment processes of that waterworks achieve at least 99.9% (3-log) inactivation and/or removal of Giardia lamblia cysts and at least 99.99% (4-log) inactivation and/or removal of viruses.

b. The residual disinfectant concentration in the water entering the distribution system cannot be less than 0.2 mg/L for more than four hours.

c. The residual disinfectant concentration in the distribution system, measured as total chlorine, combined chlorine, or chlorine dioxide cannot be undetectable in more than 5.0% of the samples each month, for any two consecutive months that the waterworks serves water to the public. Water in the distribution system with a heterotrophic bacteria concentration less than or equal to 500/mL, measured as heterotrophic plate count (HPC) is deemed to have a detectable disinfectant residual for purposes of determining compliance with this requirement. Thus, the value "V" in percent in the following formula cannot exceed 5.0% in one month, for any two consecutive months.

$V = (c + d + e) / (a + b) \times 100$

a = number of instances where the residual disinfectant concentration is measured;

b = number of instances where the residual disinfectant concentration is not measured but HPC is measured;

c = number of instances where the residual disinfectant concentration is measured but not detected and no HPC is measured;

d = number of instances where no residual disinfectant concentration is detected and where the HPC is greater than 500/mL; and

e = number of instances where the residual disinfectant concentration s not measured and HPC is greater than 500/mL.

d. The commissioner may determine, based on site-specific considerations, that an owner has no means for having a sample transported and analyzed for HPC by a certified laboratory under the requisite time and temperature conditions and the waterworks is providing adequate disinfection in the distribution system, that the requirements of subdivision B 1 c of this section does not apply.

2. Filtration. (Also see 12VAC5-590-880.) All waterworks that use a surface water source or a groundwater source under the direct influence of surface water shall provide filtration treatment by using one of the following methods:

a. Conventional filtration or direct filtration.

(1) Achieve a filtered water turbidity of less than or equal to 0.3 NTU in at least 95% of the measurements taken each month. Samples shall be representative of the waterworks' filtered water.

(2) The turbidity level of representative samples of a system's filtered water shall at no time exceed 1 NTU, measured as specified in 12VAC5-590-440.

(3) A system that uses lime softening may acidify representative samples prior to analysis using a protocol approved by the commissioner.

b. Slow sand filtration.

(1) The turbidity level of representative samples of a waterworks' filtered water shall be less than or equal to one NTU in at least 95% of the measurements taken each month, except that if the commissioner determines there is no significant interference with disinfection at a higher turbidity level, the commissioner may substitute this higher turbidity limit for that waterworks.

(2) The turbidity level of representative samples of a waterworks' filtered water shall at no time exceed five NTU.

c. Diatomaceous earth filtration.

(1) The turbidity level of representative samples of a waterworks' filtered water shall be less than or equal to one NTU in at least 95% of the measurements taken each month.

(2) The turbidity level of representative samples of a waterworks' filtered water shall at no time exceed five NTU.

d. Other filtration technologies. An owner may use a filtration technology not listed in subdivisions 2 a through c of this subsection if the owner demonstrates to the commissioner (by pilot plant studies or other means) that the alternative filtration technology, in combination with disinfection treatment, achieves 99.9% removal (3-log) and/or inactivation of Giardia lamblia cysts, 99.99% removal (4-log) and/or inactivation of viruses, and 99% removal (2-log) of Cryptosporidium oocysts. For an owner that makes this demonstration, a turbidity limit of representative samples of a waterworks' filtered water, not to exceed 0.3 NTU, shall be established by the commissioner, which the waterworks must meet at least 95% of the time. In addition, the commissioner shall establish a maximum turbidity limit of representative samples of a waterworks' filtered water, not to exceed 1 NTU that the waterworks must not exceed at any time. These turbidity limits shall consistently achieve the removal rates and/or inactivation rates stated in this subdivision.

e. Each waterworks using a surface water source or groundwater source under the direct influence of surface water shall be operated by licensed operators of the appropriate classification as per the Virginia Board for Waterworks and Wastewater Works Operators Regulations (18VAC155-20).

f. If the commissioner has determined that a waterworks has a surface water source or a groundwater source under the direct influence of surface water, filtration is required. The waterworks shall provide disinfection during the interim before filtration is installed as follows:

(1) The residual disinfectant concentration in the distribution system shall not be less than 2.0 mg/L for more than four hours.

(2) The owner shall issue continuing boil water notices through the public notification procedure in 12VAC5-590-540 until such time as the required filtration equipment is installed.

(3) As an alternative to subdivisions B f 2 (1) and (2) of this section, the owner may demonstrate that the source can meet the appropriate C-T values shown in Appendix L and be considered to satisfy the requirements for 99.9% removal of Giardia cysts and virus, respectively. In addition, the waterworks owner shall comply with the following:

(a) Justify that other alternative sources of supply meeting these regulations are not immediately available.

(b) Analysis of the source is performed quarterly for the contaminants listed in Tables 2.2, 2.3, and 2.4. The primary maximum contaminant levels shall not be exceeded.

(c) Daily turbidity monitoring and maintenance of the turbidity level not to exceed five NTU.

(d) MPN analysis of the raw water based on the minimum sample frequency chart below:

Population Served	Coliform Samples/Week
≤500	1
501 - 3,300	2
3,301 - 10,000	3
10,001 - 25,000	4
>25,000	5

Note: Shall be taken on separate days.

(e) Bacteriological sampling of the distribution system at a frequency of twice that required by Table 2.1.

3. Enhanced filtration and disinfection for Cryptosporidium – All waterworks using a surface water source or a groundwater source under the direct influence of surface water shall comply with the following requirements based on their population or if the waterworks is a wholesaler, based on the population of the largest waterworks in the combined distribution system:

a. Owners shall conduct an initial and a second round of source water monitoring for each plant that treats a surface water or groundwater under the direct influence of surface water source. This monitoring may include sampling for Cryptosporidium, E. coli, and turbidity to determine what level, if any, of additional Cryptosporidium treatment is required.

(1) Initial round of source water monitoring. Owners shall conduct the following monitoring on the schedule in subdivision B 3 a (3) of this section unless they meet the monitoring avoidance criteria in subdivision B 3 a (4) of this section.

(a) Owners of waterworks serving at least 10,000 people shall sample their source water for Cryptosporidium, E. coli, and turbidity at least monthly for 24 months.

(b) Owners of waterworks serving fewer than 10,000 people:

(i) shall sample their source water for E. coli at least once every two weeks for 12 months, or

(ii) may avoid E. coli monitoring if the waterworks notifies the commissioner that it will monitor for

Cryptosporidium as described in paragraph (c) of this section. The owner shall notify the commissioner no later than three months prior to the date the waterworks is otherwise required to start E. coli monitoring.

(c) Owners of waterworks serving fewer than 10,000 people shall sample their source water for Cryptosporidium at least twice per month for 12 months or at least monthly for 24 months if they meet one of the following, based on monitoring conducted under subdivision B 3 a (1) (b) of this section:

(i) For waterworks using lake/reservoir sources, the annual mean E. coli concentration is greater than 10 E. coli/100 mL.

(ii) For waterworks using flowing stream sources, the annual mean E. coli concentration is greater than 50 E. coli/100 mL.

(iii) The waterworks does not conduct E. coli monitoring as described in paragraph (1) (b) of this section.

(iv) Waterworks using ground water under the direct influence of surface water shall comply with the requirements of subdivision B 3 a (1) (c) of this section based on the E. coli level that applies to the nearest surface water body. If no surface water body is nearby, the waterworks shall comply based on the requirements that apply to waterworks using lake/reservoir sources.

(d) For waterworks serving fewer than 10,000 people, the commissioner may approve monitoring for an indicator other than E. coli under subdivision B 3 a (1) (b) (i) of this section. The commissioner also may approve an alternative to the E. coli concentration in subdivision B 3 a (1) (c) (i), (ii) or (iv) of this section to trigger Cryptosporidium monitoring. This approval by the commissioner shall be provided to the waterworks in writing and shall include the basis for the commission's determination that the alternative indicator and/or trigger level will provide a more accurate identification of whether a waterworks will exceed the Bin 1 Cryptosporidium level in subdivision B 3 c (1) (a) of this section.

(e) Waterworks may sample more frequently than required under this section if the sampling frequency is evenly spaced throughout the monitoring period.

(2) Second round of source water monitoring: Owners shall conduct a second round of source water monitoring that meets the requirements for monitoring parameters, frequency, and duration described in subdivision B 3 a (1) of this section, unless they meet the monitoring exemption criteria in subdivision B 3 a (4) of this section. Owners shall conduct this monitoring on the schedule in subdivision B 3 a (3) of this section.

(3) Monitoring schedule. Owners shall begin the monitoring required in subdivisions B 3 a (1) and (2) of this section no later than the month beginning with the date listed in the following table:

Source Water Monitoring Starting Dates Table

Owners of waterworks that serve...	Shall begin the first round of source water monitoring no later than the month beginning...	And shall begin the second round of source water monitoring no later than the month beginning...
At least 100,000 people	October 1, 2006	April 1, 2015
From 50,000 to 99,999 people	April 1, 2007	October 1, 2015
From 10,000 to 49,999 people	April 1, 2008	October 1, 2016
Fewer than 10,000 and monitor for E. coli	October 1, 2008	October 1, 2017
Fewer than 10,000 and monitor for Cryptosporidium[1]	April 1, 2010	April 1, 2019

[1]Applies to waterworks that meet the conditions of subdivision B 3 a (1) (c) of this section.

(4) Monitoring avoidance.

(a) Owners are not required to conduct source water monitoring under ~~this subpart~~ subdivision C 3 a of this section if the waterworks will provide a total of at least 5.5-log of treatment for Cryptosporidium, equivalent to meeting the treatment requirements of Bin 4 in subdivision B 3 c (2) of this section.

(b) If an owner chooses to provide the level of treatment in subdivision B 3 a (4) (a) of this section, rather than start source water monitoring, the owners shall notify the commissioner in writing no later than the date the owner is otherwise required to submit a sampling schedule for monitoring under subdivision B 3 a (5) of this section. Alternatively, an owner may choose to stop sampling at any point after the owner has initiated monitoring if the owner notifies the commissioner in writing that it will provide this level of treatment. Owners shall install and operate technologies to provide this level of treatment by the applicable treatment compliance date in subdivision B 3 c (3).

(5) Sampling schedules.

(a) Owners of waterworks required to conduct source water monitoring in accordance with subdivision B 3 a shall submit a sampling schedule that specifies the

calendar dates when the owner shall collect each required sample.

(i) Owners shall submit sampling schedules to the commissioner no later than three months prior to the applicable date listed in subdivision B 3 a (3) for each round of required monitoring.

(ii) If the commissioner does not respond to an owner regarding the sampling schedule, the owner shall sample at the reported schedule.

(b) Owners shall collect samples within two days before or two days after the dates indicated in their sampling schedule (i.e., within a five-day period around the schedule date) unless one of the conditions of the following paragraphs apply.

(i) If an extreme condition or situation exists that may pose danger to the sample collector, or that cannot be avoided and causes the owner to be unable to sample in the scheduled five-day period, the owner shall sample as close to the scheduled date as is feasible unless the commissioner approves an alternative sampling date. The owner shall submit an explanation for the delayed sampling date to the commissioner concurrent with the shipment of the sample to the laboratory.

(ii) If an owner is unable to report a valid analytical result for a scheduled sampling date due to equipment failure, loss of or damage to the sample, failure to comply with the analytical method requirements, including the quality control requirements of 12VAC5-590-440, or the failure of an approved laboratory to analyze the sample, then the owner shall collect a replacement sample. The owner shall collect the replacement sample not later than 21 days after receiving information that an analytical result cannot be reported for the scheduled date unless the owner demonstrates that collecting a replacement sample within this time frame is not feasible or the commissioner approves an alternative resampling date. The owner shall submit an explanation for the delayed sampling date to the commissioner concurrent with the shipment of the sample to the laboratory.

(c) Owners of waterworks that fail to meet the criteria of subdivision B 3 a (5) (b) of this section for any source water sample required under subdivision B 3 a shall revise their sampling schedules to add dates for collecting all missed samples. Owners shall submit the revised schedule to the commissioner for approval prior to when the owner begins collecting the missed samples.

(6) Sampling locations.

(a) Owners of waterworks required to conduct source water monitoring under subdivision B 3 a shall collect samples for each plant that treats a surface water or groundwater under the direct influence of surface water source. Where multiple plants draw water from the same influent, such as the same pipe or intake, the commissioner may approve one set of monitoring results to be used to satisfy the requirements subdivision B 3 a for all plants.

(b) Owners shall collect source water samples prior to chemical treatment, such as coagulants, oxidants and disinfectants. However, the commissioner may approve the collection of a source water sample after chemical treatment. To grant this approval, the commissioner shall determine that collecting a sample prior to chemical treatment is not feasible for the waterworks and that the chemical treatment is unlikely to have a significant adverse effect on the analysis of the sample.

(c) Owners of waterworks that recycle filter backwash water shall collect source water samples prior to the point of filter backwash water addition.

(d) Bank filtration.

(i) Waterworks that receive Cryptosporidium treatment credit for bank filtration under 12VAC5-590-420 B 2 d, shall collect source water samples in the surface water prior to bank filtration.

(ii) Waterworks that use bank filtration as pretreatment to a filtration plant shall collect source water samples from the well (i.e., after bank filtration). Use of bank filtration during monitoring shall be consistent with routine operational practice. Waterworks collecting samples after a bank filtration process may not receive treatment credit for the bank filtration under subdivision B 3 d (4) (c) of this section.

(e) Multiple sources. Owners of waterworks with plants that use multiple water sources, including multiple surface water sources and blended surface water and ground water sources shall collect samples as specified in subdivision B 3 a (6) (e) (i) or (ii) of this section. The use of multiple sources during monitoring shall be consistent with routine operational practice.

(i) If a sampling tap is available where the sources are combined prior to treatment, waterworks shall collect samples from the tap.

(ii) If a sampling tap where the sources are combined prior to treatment is not available, owners shall collect samples at each source near the intake on the same day and shall follow either subdivision B 3 a (6) (e) (ii) ((a)) or ((b)) of this section for sample analysis.

((a)) Owners may composite samples from each source into one sample prior to analysis. The volume of sample from each source shall be weighted according to the proportion of the source in the total plant flow at the time the sample is collected.

((b)) Owners may analyze samples from each source separately and calculate a weighted average of the analysis results for each sampling date. The weighted average shall be calculated by multiplying the analysis result for each source by the fraction the source contributed to total plant flow at the time the sample was collected and then summing these values.

(f) Additional Requirements. Owners shall submit a description of their sampling location(s) to the commissioner at the same time as the sampling schedule required in subdivision B 3 a (3) of this section. This description shall address the position of the sampling location in relation to the waterworks water source(s) and treatment processes, including pretreatment, points of chemical treatment, and filter backwash recycle. If the commissioner does not respond to an owner regarding sampling location(s), the owner shall sample at the reported location(s).

(7) Analytical methods. All analytical methods shall be conducted in accordance with 12VAC5-590-440.

(8) Approved laboratories.

(a) Cryptosporidium. Owners shall have Cryptosporidium samples analyzed by a laboratory that is approved under EPA's Laboratory Quality Assurance Evaluation Program for Analysis of Cryptosporidium in Water or a laboratory that has been certified for Cryptosporidium analysis by an equivalent state laboratory certification program.

(b) E. coli. Any laboratory certified by the state for total coliform or fecal coliform analysis under 12VAC5-590-440 is approved for E. coli analysis ~~under this subpart~~ when the laboratory uses the same technique for E. coli that the laboratory uses under 12VAC5-590-440. Laboratories shall use methods for enumeration of E. coli in source water approved in 12VAC5-590-440.

(c) Turbidity. Measurements of turbidity shall be made by a party approved by the commissioner.

(9) Reporting of the source water results shall be in accordance with 12VAC5-590-530.

(10) Plants operating only part of the year. Owners of waterworks treating surface water or groundwater under the direct influence of surface water that operates for only part of the year shall conduct source water monitoring in accordance with this section, but with the following modifications:

(a) Owners shall sample their source water only during the months that the plant operates unless the commissioner specifies another monitoring period based on plant operating practices.

(b) Owners of waterworks with plants that operate less than six months per year and that monitor for Cryptosporidium shall collect at least six Cryptosporidium samples per year during each of two years of monitoring. Samples shall be evenly spaced throughout the period the plant operates.

(11) New sources;

(a) Owners of waterworks that begin using a new source of surface water or groundwater under the direct influence of surface water after the waterworks is required to begin monitoring under subdivision B 3 a (3) of this section shall monitor the new source on a schedule the commissioner approves. Source water monitoring shall meet the requirements of this section. The owner shall also meet the bin classification and Cryptosporidium treatment requirements of subdivision B 3 c (1) and (2) of this section, for the new source on a schedule the commissioner approves.

(b) The requirements of this section apply to waterworks using surface water or groundwater under the direct influence of surface water that begin operation after the monitoring start date applicable to the waterworks size under subdivision B 3 a (3) of this section.

(c) The owner shall begin a second round of source water monitoring no later than six years following initial bin classification under in subdivision B 3 c (1) of this section.

(12) Failure to collect any source water sample required under this section in accordance with the sampling schedule, sampling location, analytical method, approved laboratory, and reporting requirements of subdivision B 3 a (5), (6), (7), (8), or (9) of this section is a monitoring violation.

(13) Grandfathering monitoring data. Owners may use (grandfather) monitoring data collected prior to the applicable monitoring start date in subdivision B 3 a (3) of this section to meet the initial source water monitoring requirements in subdivision B 3 a (1) of this section. Grandfathered data may substitute for an equivalent number of months at the end of the monitoring period. All data submitted under this paragraph shall meet the requirements in (13) (a) through (h) listed below and be approved by the commissioner:

(a) An owner may grandfather Cryptosporidium samples to meet the requirements of this section when the owner does not have corresponding E. coli and turbidity samples. A waterworks that grandfathers Cryptosporidium samples without E. coli and turbidity samples is not required to collect E. coli and turbidity samples when the system completes the requirements for Cryptosporidium monitoring under this section.

(b) E. coli sample analysis. The analysis of E. coli samples shall meet the analytical method and approved laboratory requirements of subdivision B 3 a (7) and (8) of this section.

(c) Cryptosporidium sample analysis. The analysis of Cryptosporidium samples shall meet the requirements of subdivision B 3 a (8) of this section.

(d) Sampling location. The sampling location shall meet the conditions in subdivision B 3 a (6) of this section.

(e) Sampling frequency. Cryptosporidium samples were collected no less frequently than each calendar month on a regular schedule, beginning no earlier than January 1999. Sample collection intervals may vary for the conditions specified in subdivision B 3 a (5) (b) (i) and (ii) of this section, if the owner provides documentation of the condition when reporting monitoring results.

(i) The commissioner may approve grandfathering of previously collected data where there are time gaps in the sampling frequency if the owner conducts additional monitoring the commissioner specifies to ensure that the data used to comply with the initial source water monitoring requirements of subdivision B 3 a of this section are seasonally representative and unbiased.

(ii) Owners may grandfather previously collected data where the sampling frequency within each month varied. If the Cryptosporidium sampling frequency varied, owners shall follow the monthly averaging procedure in subdivision B 3 c (1) (a) (v) of this section, when calculating the bin classification for filtered systems.

(f) Reporting monitoring results for grandfathering. Owners that request to grandfather previously collected monitoring results shall report the following information by the applicable dates listed in the following paragraphs. Owners shall report this information to the commissioner.

(i) Owners shall report that they intend to submit previously collected monitoring results for grandfathering. This report shall specify the number of previously collected results the owner shall submit, the dates of the first and last sample, and whether an owner shall conduct additional source water monitoring to meet the requirements in subdivision B 3 a of this section. Owners shall report this information no later than the date the sampling schedule listed in subdivision B 3 a (3) of this section is required.

(ii) Owners shall report previously collected monitoring results for grandfathering, along with the associated documentation listed in paragraphs ((a)) through ((d)) listed below, no later than two months after the applicable date listed in subdivision B 3 a (3) of this section.

((a)) For each sample result, owners shall report the applicable data elements in 12VAC5-590-530 C 1 c.

((b)) Owners shall certify that the reported monitoring results include all results the waterworks generated during the time period beginning with the first reported result and ending with the final reported result. This applies to samples that were collected from the sampling location specified for source water monitoring under ~~this subpart~~ subdivision B 3 a (13) (f) of this section, not spiked, and analyzed using the laboratory's routine process for the analytical methods listed in this section.

((c)) Owners shall certify that the samples were representative of a plant's source water(s) and the source water(s) have not changed. Owners shall report a description of the sampling location(s), which shall address the position of the sampling location in relation to the waterworks' water source(s) and treatment processes, including points of chemical addition and filter backwash recycle.

((d)) For Cryptosporidium samples, the laboratory or laboratories that analyzed the samples shall provide a letter certifying that the quality control criteria specified in the methods listed in subdivision B 3 a (8) of this section were met for each sample batch associated with the reported results. Alternatively, the laboratory may provide bench sheets and sample examination report forms for each field, matrix spike, IPR, OPR, and method blank sample associated with the reported results.

(g) If the commissioner determines that a previously collected data set submitted for grandfathering was generated during source water conditions that were not normal for the waterworks, such as a drought, the commissioner may disapprove the data. Alternatively, the commissioner may approve the previously collected data if the owner reports additional source water monitoring data, as determined by the commissioner, to ensure that the data set used under subdivision B 3 c (1) of this section represents average source water conditions for the waterworks.

(h) If an owner submits previously collected data that fully meets the number of samples required for initial source water monitoring under subdivision B 3 a (1) of this section and some of the data are rejected due to not meeting the requirements of this section, the owner shall conduct additional monitoring to replace rejected data on a schedule the commissioner approves. Owners are not required to begin this additional monitoring until two months after notification that data have been rejected and additional monitoring is necessary.

b. Owners of waterworks that plan to make a significant change to their disinfection practice shall develop disinfection profiles and calculate disinfection

benchmarks, as described in subdivision B 3 a (1) and (2) below.

(1) Requirements when making a significant change in disinfection practice.

(a) Following the completion of initial source water monitoring under subdivision B 3 a (1) of this section, owners of waterworks that plan to make a significant change to its disinfection practice, as defined in subdivision B 3 b (1) (b) of this section, shall develop disinfection profiles and calculate disinfection benchmarks for Giardia lamblia and viruses as described in subdivision B 3 b (2) of this section. Prior to changing the disinfection practice, the owner shall notify the commissioner and shall include in this notice the information in subdivision B 3 b (1) a) (i) through (iii) of this section.

(i) A completed disinfection profile and disinfection benchmark for Giardia lamblia and viruses as described in subdivision B 3 b (2) of this section.

(ii) A description of the proposed change in disinfection practice.

(iii) An analysis of how the proposed change will affect the current level of disinfection.

(b) Significant changes to disinfection practice are defined as follows:

(i) Changes to the point of disinfection;

(ii) Changes to the disinfectant(s) used in the treatment plant;

(iii) Changes to the disinfection process; or

(iv) Any other modification identified by the commissioner as a significant change to disinfection practice.

(2) Developing the disinfection profile and benchmark.

(a) Owners of waterworks required to develop disinfection profiles in accordance with subdivision B 3 b (1) of this section shall follow the requirements of this section. Owners shall monitor at least weekly for a period of 12 consecutive months to determine the total log inactivation for Giardia lamblia and viruses. If owners monitor more frequently, the monitoring frequency shall be evenly spaced. Owners of waterworks that operate for fewer than 12 months per year shall monitor weekly during the period of operation. Owners shall determine log inactivation for Giardia lamblia through the entire plant, based on CT99.9 values in Appendix L. Owners shall determine log inactivation for viruses through the entire treatment plant based on a protocol approved by the commissioner.

(b) Owners of waterworks with a single point of disinfectant application prior to the entrance to the distribution system shall conduct the monitoring in subdivision B 3 b (2) (b) (i) through (iv) of this section. Owners of waterworks with more than one point of disinfectant application shall conduct the monitoring in subdivision B 3 b (2) (b) (i) through (iv) of this section for each disinfection segment. Owners shall monitor the parameters necessary to determine the total inactivation ratio, using analytical methods in Appendix L.

(i) For waterworks using a disinfectant other than UV, the temperature of the disinfected water shall be measured at each residual disinfectant concentration sampling point during peak hourly flow or at an alternative location approved by the commissioner.

(ii) For waterworks using chlorine, the pH of the disinfected water shall be measured at each chlorine residual disinfectant concentration sampling point during peak hourly flow or at an alternative location approved by the commissioner.

(iii) The disinfectant contact time(s) (t) shall be determined during peak hourly flow.

(iv) The residual disinfectant concentration(s) (C) of the water before or at the first customer and prior to each additional point of disinfectant application shall be measured during peak hourly flow.

(c) In lieu of conducting new monitoring under subdivision B 3 b (2) (b) of this section, owners may elect to meet the requirements of subdivision B 3 b (2) (c) (i) or (ii) of this section.

(i) Owners of waterworks that have at least one year of existing data that are substantially equivalent to data collected under the provisions of subdivision B 3 b (2) (b) of this section may use these data to develop disinfection profiles as specified in this section if the owner has neither made a significant change to its treatment practice nor changed sources since the data were collected. Owners may develop disinfection profiles using up to three years of existing data.

(ii) Owners may use disinfection profile(s) developed under 12VAC5-590-500 E 2 in lieu of developing a new profile if the owner has neither made a significant change to its treatment practice nor changed sources since the profile was developed. Owners that have not developed a virus profile under 12VAC5-590-500 E 2 shall develop a virus profile using the same monitoring data on which the Giardia lamblia profile is based.

(d) Owners of waterworks shall calculate the total inactivation ratio for Giardia lamblia as specified in subdivision B 3 b (2) (d) (i) through (iii) of this section.

(i) Owners of waterworks using only one point of disinfectant application may determine the total inactivation ratio for the disinfection segment based on either of the methods in subdivision B 3 b (2) (d) (i) ((a)) or ((b)) of this section.

((a)) Determine one inactivation ratio (CTcalc/CT99.9) before or at the first customer during peak hourly flow.

((b)) Determine successive CTcalc/CT99.9 values, representing sequential inactivation ratios, between the point of disinfectant application and a point before or at the first customer during peak hourly flow. The owner shall calculate the total inactivation ratio by determining (CTcalc/CT99.9) for each sequence and then adding the (CTcalc/CT99.9) values together to determine (Σ (CTcalc/CT99.9)).

(ii) Owners of waterworks using more than one point of disinfectant application before the first customer shall 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/CT99.9) value of each segment and (Σ (CTcalc/CT99.9)) shall be calculated using the method in paragraph (i) ((b)) of this section.

(iii) The owner shall determine the total logs of inactivation by multiplying the value calculated in subdivision B 3 b (2) (d) (i) or (ii) of this section by 3.0.

(iv) Owners shall calculate the log of inactivation for viruses using a protocol approved by the commissioner.

(e) Owners shall use the procedures specified in (i) and (ii) listed below to calculate a disinfection benchmark.

(i) For each year of profiling data collected and calculated under subdivision B 3 b (2) (a) through (d) of this section, owners shall determine the lowest mean monthly level of both Giardia lamblia and virus inactivation. Owners shall determine the mean Giardia lamblia and virus inactivation for each calendar month for each year of profiling data by dividing the sum of daily or weekly Giardia lamblia and virus log inactivation by the number of values calculated for that month.

(ii) The disinfection benchmark is the lowest monthly mean value (for waterworks with one year of profiling data) or the mean of the lowest monthly mean values (for waterworks with more than one year of profiling data) of Giardia lamblia and virus log inactivation in each year of profiling data.

c. Owners shall determine their Cryptosporidium treatment bin classification as described in subdivision B 3 c (1) and provide additional treatment for Cryptosporidium, if required, as described in subdivision B 3 c (2). Owners shall implement Cryptosporidium treatment according to the schedule in subdivision B 3 c (3).

(1) Bin classification for waterworks.

(a) Following completion of the initial round of source water monitoring required under subdivision B 3 a (1), owners shall calculate an initial Cryptosporidium bin concentration for each plant for which monitoring was required. Calculation of the bin concentration shall use the Cryptosporidium results reported under subdivision B 3 a (1) and shall follow these procedures:

(i) For waterworks that collect a total of at least 48 samples, the bin concentration is equal to the arithmetic mean of all sample concentrations.

(ii) For waterworks that collect a total of at least 24 samples, but not more than 47 samples, the bin concentration is equal to the highest arithmetic mean of all sample concentrations in any 12 consecutive months during which Cryptosporidium samples were collected.

(iii) For waterworks that serve fewer than 10,000 people and monitor for Cryptosporidium for only one year (i.e., collect 24 samples in 12 months), the bin concentration is equal to the arithmetic mean of all sample concentrations.

(iv) For waterworks with plants operating only part of the year that monitor fewer than 12 months per year under subdivision B 3 a (1), the bin concentration is equal to the highest arithmetic mean of all sample concentrations during any year of Cryptosporidium monitoring.

(v) If the monthly Cryptosporidium sampling frequency varies, owners shall first calculate a monthly average for each month of monitoring. Owners shall then use these monthly average concentrations, rather than individual sample concentrations, in the applicable calculation for bin classification in subdivision B 3 c (1) (a) (i) through (iv) of this section.

(b) Owners shall determine their initial bin classification from the following table and using the Cryptosporidium bin concentration calculated under subdivision B 3 c (1) (a) of this section:

Bin Classification Table for Filtered Systems

For owners of waterworks that are:	with a Cryptosporidium bin concentration of[1] ...	The bin classification is...
...required to monitor for Cryptosporidium under subdivision	Cryptosporidium less than 0.075 oocysts/L	Bin 1

B 3 a (1)	Cryptosporidium equal to or greater than 0.075 oocysts/L but less than 1.0 oocysts/L	Bin 2
	Cryptosporidium equal to or greater than 1.0 oocysts/L but less than 3.0 oocysts/L	Bin 3
	Cryptosporidium equal to or greater than 3.0 oocysts/L	Bin 4
...serving fewer than 10,000 people and NOT required to monitor for Cryptosporidium under B 3 a (1)(c)	NA	Bin 1

[1]Based on calculations in subdivision B 3 c (1) (a) or (c) of this section, as applicable

(c) Following completion of the second round of source water monitoring required under subdivision B 3 a (2), owners shall recalculate their Cryptosporidium bin concentration using the Cryptosporidium results reported under subdivision B 3 a (2) and following the procedures in subdivision B 3 c (1) (a)(i) through (iv) of this section. Owners shall then redetermine their bin classification using this bin concentration and the table in subdivision B 3 c (1) (b) of this section.

(d) Reporting of bin classifications

(i) Owners shall report their initial bin classification under subdivision B 3 c (1) (b) of this section to the commissioner for approval no later than six months after the waterworks is required to complete initial source water monitoring based on the schedule in subdivision B 3 a (3).

(ii) Owners shall report their bin classification under subdivision B 3 c (1) (c) of this section to the commissioner for approval no later than six months after the owner is required to complete the second round of source water monitoring based on the schedule in subdivision B 3 c (1) 3 a (3) of this section.

(iii) The bin classification report to the commissioner shall include a summary of source water monitoring data and the calculation procedure used to determine bin classification.

(e) Failure to comply with the conditions of subdivision B 3 c (1) (d) of this section is a violation of the treatment technique requirement.

(2) Waterworks additional Cryptosporidium treatment requirements.

(a) Waterworks shall provide the level of additional treatment for Cryptosporidium specified in this paragraph based on their bin classification as determined under subdivision B 3 c (1) of this section and according to the schedule in subdivision B 3 c (3) (b) of this section.

If the waterworks bin classification is...	And the waterworks uses the following filtration treatment in full compliance with 12VAC5-590-420 A and B, then the additional Cryptosporidium treatment requirements are...			
	Conventional filtration treatment (including softening)	Direct filtration	Slow sand or diatomaceous earth filtration	Alternative filtration technologies
Bin 1	No additional treatment	No additional treatment	No additional treatment	No additional treatment
Bin 2	1-log treatment	1.5-log treatment	1-log treatment	(1)
Bin 3	2-log treatment	2.5-log treatment	2-log treatment	(2)
Bin 4	2.5-log treatment	3-log treatment	2.5-log treatment	(3)
[1]As determined by the commissioner such that the total Cryptosporidium removal and inactivation is at least 4.0-log				
[2]As determined by the commissioner such that the total Cryptosporidium removal and inactivation is at least 5.0-log				
[3]As determined by the commissioner such that the total Cryptosporidium removal and inactivation is at least 5.5-log				

(b) Additional treatment

(i) Owners shall use one or more of the treatment and management options listed in subdivision B 3 d, termed the microbial toolbox, to comply with the additional Cryptosporidium treatment required in subdivision B 3 c (2) (a) of this section.

(ii) Waterworks classified in Bin 3 and Bin 4 shall achieve at least 1-log of the additional Cryptosporidium treatment required under subdivision B 3 c (2) (a) of this section using either one or a combination of the following: bag filters, bank filtration, cartridge filters, chlorine dioxide, membranes, ozone, or UV, as described in subdivision B 3 d (3) through (7) of this section.

(c) Failure by a waterworks in any month to achieve treatment credit by meeting criteria in subdivision B 3 d (3) through (7) of this section for microbial toolbox options that is at least equal to the level of treatment required in subdivision B 3 c (2) (a) of this section is a violation of the treatment technique requirement.

(d) If the commissioner determines during a sanitary survey or an equivalent source water assessment that after a waterworks completed the monitoring conducted under subdivision B 3 a (1) or (2) of this section, significant changes occurred in the waterworks' watershed that could lead to increased contamination of the source water by Cryptosporidium, the owner shall take actions specified by the commissioner to address the contamination. These actions may include additional source water monitoring and/or implementing microbial toolbox options listed in subdivision B 3 d (2) of this section.

(3) Schedule for compliance with Cryptosporidium treatment requirements.

(a) Following initial bin classification in accordance with subdivision B 3 c (1) (b) of this section, waterworks shall provide the level of treatment for Cryptosporidium required under subdivision B 3 c (2) of this section according to the schedule in subdivision B 3 c (3) (b) of this section.

(b) Cryptosporidium treatment compliance dates.

Cryptosporidium Treatment Compliance Dates Table

Waterworks that serve....	Shall comply with Cryptosporidium treatment requirements no later than[1]...
At least 100,000 people	April 1, 2012
From 50,000 to 99,999 people	October 1, 2012
From 10,000 to 49,999 people	October 1, 2013
Fewer than 10,000 people	October 1, 2014

[1]The commissioner may allow up to an additional two years for complying with the treatment requirement for waterworks making capital improvements.

(c) If the bin classification for a filtered system changes following the second round of source water monitoring, as determined under subdivision B 3 c (1) (c) of this section, the waterworks shall provide the level of treatment for Cryptosporidium required under subdivision B 3 c (2) of this section on a schedule the commissioner approves.

d. Owners of waterworks required to provide additional treatment for Cryptosporidium shall implement microbial toolbox options that are designed and operated as described in subdivision B 3 d (1) through (7) of this section.

(1) Waterworks receive the treatment credits listed in the table in subdivision B 3 d (2) of this section by meeting the conditions for microbial toolbox options described in subdivision B 3 d (3) through (7) of this section. Waterworks apply these treatment credits to meet the treatment requirements in subdivision B 3 c (2) of this section.

(2) Microbial Toolbox Summary Table: Options, Treatment Credits and Criteria

Microbial Toolbox Summary Table: Options, Treatment Credits and Criteria

Toolbox Option	Cryptosporidium treatment credit with design and implementation criteria
Source Protection and Management Toolbox Options	
Watershed control program	0.5-log credit for program approved by the commissioner comprising required elements, annual program status report to the commissioner, and regular watershed survey. Specific criteria are in subdivision B 3 d (3) (a)
Alternative source/ intake management	No prescribed credit. Owners may conduct simultaneous monitoring for treatment bin classification at alternative intake locations or under alternative intake management strategies. Specific criteria are in subdivision B 3 d (3) (b).

Pre Filtration Toolbox Options	
Presedimentation basin with coagulation	0.5-log credit during any month that presedimentation basins achieve a monthly mean reduction of 0.5-log or greater in turbidity or alternative performance criteria approved by the commissioner. To be eligible, basins shall be operated continuously with coagulant addition and all plant flow shall pass through basins. Specific criteria are in subdivision B 3 d (4) (a)
Two-stage lime softening	0.5-log credit for two-stage softening where chemical addition and hardness precipitation occur in both stages. All plant flow shall pass through both stages. Single-stage softening is credited as equivalent to conventional treatment. Specific criteria are in subdivision B 3 d (4) (b).
Bank filtration	0.5-log credit for 25-foot setback; 1.0-log credit for 50-foot setback; aquifer shall be unconsolidated sand containing at least 10% fines; average turbidity in wells shall be less than 1 NTU. Waterworks using wells followed by filtration when conducting source water monitoring shall sample the well to determine bin classification and are not eligible for additional credit. Specific criteria are in subdivision B 3 d (4) (c).
Treatment Performance Toolbox Options	
Combined filter performance	0.5-log credit for combined filter effluent turbidity less than or equal to 0.15 NTU in at least 95% of measurements each month. Specific criteria are in subdivision B 3 d (5) (a).
Individual filter performance	0.5-log credit (in addition to 0.5-log combined filter performance credit) if individual filter effluent turbidity is less than or equal to 0.15 NTU in at least 95% of samples each month in each filter and is never greater than 0.3 NTU in two consecutive measurements in any filter. Specific criteria are in subdivision B 3 d (5) (b).

Additional Filtration Toolbox Options	
Bag or cartridge filters (individual filters)	Up to 2-log credit based on the removal efficiency demonstrated during challenge testing with a 1.0-log factor of safety. Specific criteria are in subdivision B 3 d (6) (a).
Bag or cartridge filters (in series)	Up to 2.5-log credit based on the removal efficiency demonstrated during challenge testing with a 0.5-log factor of safety. Specific criteria are in subdivision B 3 d (6) (a).
Membrane filtration	Log credit equivalent to removal efficiency demonstrated in challenge test for device if supported by direct integrity testing. Specific criteria are in subdivision B 3 d (6) (b).
Second stage filtration	0.5-log credit for second separate granular media filtration stage if treatment train includes coagulation prior to first filter. Specific criteria are in subdivision B 3 d (6) (c).
Slow sand filters	2.5-log credit as a secondary filtration step; 3.0-log credit as a primary filtration process. No prior chlorination for either option. Specific criteria are in subdivision B 3 d (6) (d).
Inactivation Toolbox Options	
Chlorine dioxide	Log credit based on measured CT in relation to CT table. Specific criteria in subdivision B 3 d (7) (b).
Ozone	Log credit based on measured CT in relation to CT table. Specific criteria in subdivision B 3 d (7) (b).
UV	Log credit based on validated UV dose in relation to UV dose table; reactor validation testing required to establish UV dose and associated operating conditions. Specific criteria in subdivision B 3 d (7) (d).

(3) Source toolbox components.

(a) Watershed control program. Waterworks receive 0.5-log Cryptosporidium treatment credit for implementing a watershed control program that meets the requirements of this section.

(i) Owners that intend to apply for the watershed control program credit shall notify the commissioner of this intent no later than two years prior to the treatment

compliance date applicable to the waterworks in subdivision B 3 a (3) of this section.

(ii) Owners shall submit to the commissioner a proposed watershed control plan no later than one year before the applicable treatment compliance date in subdivision B 3 a (3) of this section. The commissioner shall approve the watershed control plan for the waterworks to receive watershed control program treatment credit. The watershed control plan shall include the following elements:

((a)) Identification of an "area of influence" outside of which the likelihood of Cryptosporidium or fecal contamination affecting the treatment plant intake is not significant. This is the area to be evaluated in future watershed surveys under subdivision B 3 d (3) (a) (v) ((b)) of this section.

((b)) Identification of both potential and actual sources of Cryptosporidium contamination and an assessment of the relative impact of these sources on the waterworks' source water quality.

((c)) An analysis of the effectiveness and feasibility of control measures that could reduce Cryptosporidium loading from sources of contamination to the waterworks' source water.

((d)) A statement of goals and specific actions the owner shall undertake to reduce source water Cryptosporidium levels. The plan shall explain how the actions are expected to contribute to specific goals, identify watershed partners and their roles, identify resource requirements and commitments, and include a schedule for plan implementation with deadlines for completing specific actions identified in the plan.

(iii) Waterworks with existing watershed control programs (i.e., programs in place on January 5, 2006) are eligible to seek this credit. Their watershed control plans shall meet the criteria in subdivision B 3 d (3) (a) (ii) of this section and shall specify ongoing and future actions that will reduce source water Cryptosporidium levels.

(iv) If the commissioner does not respond to an owner regarding approval of a watershed control plan submitted under this section and the owner meets the other requirements of this section, the watershed control program shall be considered approved and 0.5 log Cryptosporidium treatment credit shall be awarded unless and until the commissioner subsequently withdraws such approval.

(v) To maintain the 0.5-log credit, owners shall complete the following actions:

((a)) Submit an annual watershed control program status report to the commissioner. The annual watershed control program status report shall describe the owner's implementation of the approved plan and assess the adequacy of the plan to meet its goals. It shall explain how the waterworks is addressing any shortcomings in plan implementation, including those previously identified by the commissioner or as the result of the watershed survey conducted under subdivision B 3 d (3) (a) (v) ((b)) of this section. It shall also describe any significant changes that have occurred in the watershed since the last watershed sanitary survey. If an owner determines during implementation that making a significant change to the approved watershed control program is necessary, the owner shall notify the commissioner prior to making any such changes. If any change is likely to reduce the level of source water protection, the owner shall also list in the notification the actions the owners will take to mitigate this effect.

((b)) Undergo a watershed sanitary survey every three years for community waterworks and every five years for noncommunity waterworks and submit the survey report to the commissioner. The survey shall be conducted according to commissioner's guidelines and by persons the commissioner approves.

((i)) The watershed sanitary survey shall meet the following criteria: encompass the region identified in the watershed control plan approved by the commissioner as the area of influence; assess the implementation of actions to reduce source water Cryptosporidium levels; and identify any significant new sources of Cryptosporidium.

((ii)) If the commissioner determines that significant changes may have occurred in the watershed since the previous watershed sanitary survey, the waterworks shall undergo another watershed sanitary survey by a date the commissioner requires, which may be earlier than the regular date in subdivision B 3 d (3) (a) (v) ((b)) of this section.

((c)) The owner shall make the watershed control plan, annual status reports, and watershed sanitary survey reports available to the public upon request. These documents shall be in a plain language style and include criteria by which to evaluate the success of the program in achieving plan goals. The commissioner may approve an owner to withhold from the public portions of the annual status report, watershed control plan, and watershed sanitary survey based on water supply security considerations.

(vi) If the commissioner determines that an owner is not carrying out the approved watershed control plan, the commissioner may withdraw the watershed control program treatment credit.

(b) Alternative source.

(i) An owner may conduct source water monitoring that reflects a different intake location (either in the same source or for an alternate source) or a different procedure for the timing or level of withdrawal from the source (alternative source monitoring). If the commissioner approves, an owner may determine the bin classification under subdivision B 3 c (1) of this section based on the alternative source monitoring results.

(ii) If an owner conducts alternative source monitoring under subdivision B 3 d (3) (b) (i) of this section, the owner shall also monitor their current plant intake concurrently as described in subdivision B 3 a of this section.

(iii) Alternative source monitoring under subdivision B 3 d (3) (b) (i) of this section shall meet the requirements for source monitoring to determine bin classification, as described in subdivision B 3 a (1) through (13) of this section. Owners shall report the alternative source monitoring results to the commissioner, along with supporting information documenting the operating conditions under which the samples were collected.

(iv) If an owner determines the bin classification under subdivision B 3 c (1) of this section using alternative source monitoring results that reflect a different intake location or a different procedure for managing the timing or level of withdrawal from the source, the owner shall relocate the intake or permanently adopt the withdrawal procedure, as applicable, no later than the applicable treatment compliance date in subdivision B 3 c (3) of this section.

(4) Pre-filtration treatment toolbox components.

(a) Presedimentation. Waterworks receive 0.5-log Cryptosporidium treatment credit for a presedimentation basin during any month the process meets the following criteria:

(i) The presedimentation basin shall be in continuous operation and shall treat the entire plant flow taken from a surface water or groundwater under the direct influence of surface water source.

(ii) The waterworks shall continuously add a coagulant to the presedimentation basin.

(iii) The presedimentation basin shall achieve the performance criteria in either of the following.

((a)) Demonstrates at least 0.5-log mean reduction of influent turbidity. This reduction shall be determined using daily turbidity measurements in the presedimentation process influent and effluent and shall be calculated as follows: log10(monthly mean of daily influent turbidity) - log10(monthly mean of daily effluent turbidity).

((b)) Complies with performance criteria approved by the commissioner that demonstrate at least 0.5-log mean removal of micron-sized particulate material through the presedimentation process.

(b) Two-stage lime softening. Waterworks receive an additional 0.5-log Cryptosporidium treatment credit for a two-stage lime softening plant if chemical addition and hardness precipitation occur in two separate and sequential softening stages prior to filtration. Both softening stages shall treat the entire plant flow taken from a surface water or groundwater under the direct influence of surface water source.

(c) Bank filtration. Waterworks receive Cryptosporidium treatment credit for bank filtration that serves as pretreatment to a filtration plant by meeting the criteria in this paragraph. Waterworks using bank filtration when they begin source water monitoring under subdivision B 3 a (1) of this section shall collect samples as described in subdivision B 3 a (6) (d) of this section and are not eligible for this credit.

(i) Wells with a ground water flow path of at least 25 feet receive 0.5-log treatment credit; wells with a ground water flow path of at least 50 feet receive 1.0-log treatment credit. The ground water flow path shall be determined as specified in subdivision B 3 d (c) (iv) of this section.

(ii) Only wells in granular aquifers are eligible for treatment credit. Granular aquifers are those comprised of sand, clay, silt, rock fragments, pebbles or larger particles, and minor cement. A waterworks shall characterize the aquifer at the well site to determine aquifer properties. Owners shall extract a core from the aquifer and demonstrate that in at least 90% of the core length, grains less than 1.0 mm in diameter constitute at least 10% of the core material.

(iii) Only horizontal and vertical wells are eligible for treatment credit.

(iv) For vertical wells, the ground water flow path is the measured distance from the edge of the surface water body under high flow conditions (determined by the 100-year floodplain elevation boundary or by the floodway, as defined in Federal Emergency Management Agency flood hazard maps) to the well screen. For horizontal wells, the ground water flow path is the measured distance from the bed of the river under normal flow conditions to the closest horizontal well lateral screen.

(v) Owners shall monitor each wellhead for turbidity at least once every four hours while the bank filtration process is in operation. If monthly average turbidity levels, based on daily maximum values in the well, exceed 1 NTU, the owner shall report this result to the commissioner and conduct an assessment within 30 days

to determine the cause of the high turbidity levels in the well. If the commissioner determines that microbial removal has been compromised, the commissioner may revoke treatment credit until the owner implements corrective actions approved by the commissioner to remediate the problem.

(vi) Springs and infiltration galleries are not eligible for treatment credit under this section.

(vii) Bank filtration demonstration of performance. The commissioner may approve Cryptosporidium treatment credit for bank filtration based on a demonstration of performance study that meets the criteria in this paragraph. This treatment credit may be greater than 1.0-log and may be awarded to bank filtration that does not meet the criteria in subdivision B 3 d (4) (c) (i) through (v) of this section.

((a)) The study shall follow a protocol approved by the commissioner and shall involve the collection of data on the removal of Cryptosporidium or a surrogate for Cryptosporidium and related hydrogeologic and water quality parameters during the full range of operating conditions.

((b)) The study shall include sampling both from the production well(s) and from monitoring wells that are screened and located along the shortest flow path between the surface water source and the production well(s).

(5) Treatment performance toolbox components.

(a) Combined filter performance. Waterworks using conventional filtration treatment or direct filtration treatment receive an additional 0.5-log Cryptosporidium treatment credit during any month the waterworks meets the criteria in this paragraph. Combined filter effluent (CFE) turbidity shall be less than or equal to 0.15 NTU in at least 95% of the measurements. Turbidity shall be measured as described in 12VAC5-590-370 B 7 b and 12VAC5-590-370 E.

(b) Individual filter performance. Waterworks using conventional filtration treatment or direct filtration treatment receive 0.5-log Cryptosporidium treatment credit, which can be in addition to the 0.5-log credit under subdivision B 3 d (5) (a) of this section, during any month the waterworks meets the criteria in this paragraph. Compliance with these criteria shall be based on individual filter turbidity monitoring as described in 12VAC5-590-370 B 7 b (1).

(i) The filtered water turbidity for each individual filter shall be less than or equal to 0.15 NTU in at least 95% of the measurements recorded each month.

(ii) No individual filter may have a measured turbidity greater than 0.3 NTU in two consecutive measurements taken 15 minutes apart.

(iii) Any waterworks that has received treatment credit for individual filter performance and fails to meet the requirements of subdivision B 3 d (5) (b) (i) or (ii) of this section during any month does not receive a treatment technique violation under subdivision B 3 c (2) (c) if the commissioner determines the following:

((a)) The failure was due to unusual and short-term circumstances that could not reasonably be prevented through optimizing treatment plant design, operation, and maintenance.

((b)) The waterworks has experienced no more than two such failures in any calendar year.

(6) Additional filtration toolbox components.

(a) Bag and cartridge filters. Waterworks receive Cryptosporidium treatment credit of up to 2.0-log for individual bag or cartridge filters and up to 2.5-log for bag or cartridge filters operated in series by meeting the criteria in subdivision B 3 d (6) (a) (i) through (x) of this section. To be eligible for this credit, owners shall report the results of challenge testing that meets the requirements of subdivision B 3 d (6) (a)(ii) through (ix) of this section to the commissioner. The filters shall treat the entire plant flow taken from a surface water or groundwater under the direct influence of surface water source.

(i) The Cryptosporidium treatment credit awarded to bag or cartridge filters shall be based on the removal efficiency demonstrated during challenge testing that is conducted according to the criteria in subdivision B 3 d (6) (a) (ii) through (ix) of this section. A factor of safety equal to 1-log for individual bag or cartridge filters and 0.5-log for bag or cartridge filters in series shall be applied to challenge testing results to determine removal credit. Owners may use results from challenge testing conducted prior to January 5, 2006, if the prior testing was consistent with the criteria specified in subdivision B 3 d (6) (a) (ii) through (ix) of this section.

(ii) Challenge testing shall be performed on full-scale bag or cartridge filters, and the associated filter housing or pressure vessel, that are identical in material and construction to the filters and housings the waterworks will use for removal of Cryptosporidium. Bag or cartridge filters shall be challenge tested in the same configuration that the waterworks will use, either as individual filters or as a series configuration of filters.

(iii) Challenge testing shall be conducted using Cryptosporidium or a surrogate that is removed no more efficiently than Cryptosporidium. The microorganism or

surrogate used during challenge testing is referred to as the challenge particulate. The concentration of the challenge particulate shall be determined using a method capable of discreetly quantifying the specific microorganism or surrogate used in the test; gross measurements such as turbidity shall not be used.

(iv) The maximum feed water concentration that can be used during a challenge test shall be based on the detection limit of the challenge particulate in the filtrate (i.e., filtrate detection limit) and shall be calculated using the following equation:

Maximum Feed Concentration = 1 x 10^4 x (Filtrate Detection Limit)

(v) Challenge testing shall be conducted at the maximum design flow rate for the filter as specified by the manufacturer.

(vi) Each filter evaluated shall be tested for a duration sufficient to reach 100% of the terminal pressure drop, which establishes the maximum pressure drop under which the filter may be used to comply with the requirements of ~~this subpart~~ subdivision B 3 d (6) (a) of this section.

(vii) Removal efficiency of a filter shall be determined from the results of the challenge test and expressed in terms of log removal values using the following equation:

$LRV = LOG_{10}(C_f) - LOG_{10}(C_p)$

where LRV = log removal value demonstrated during challenge testing; C_f = the feed concentration measured during the challenge test; and C_p = the filtrate concentration measured during the challenge test. In applying this equation, the same units shall be used for the feed and filtrate concentrations. If the challenge particulate is not detected in the filtrate, then the term C_p shall be set equal to the detection limit.

(viii) Each filter tested shall be challenged with the challenge particulate during three periods over the filtration cycle: within two hours of start-up of a new filter; when the pressure drop is between 45 and 55% of the terminal pressure drop; and at the end of the cycle after the pressure drop has reached 100% of the terminal pressure drop. An LRV shall be calculated for each of these challenge periods for each filter tested. The LRV for the filter (LRVfilter) shall be assigned the value of the minimum LRV observed during the three challenge periods for that filter.

(ix) If fewer than 20 filters are tested, the overall removal efficiency for the filter product line shall be set equal to the lowest LRV filter among the filters tested. If 20 or more filters are tested, the overall removal efficiency for the filter product line shall be set equal to the 10th percentile of the set of LRVfilter values for the various filters tested. The percentile is defined by (i/(n+1)) where i is the rank of n individual data points ordered lowest to highest. If necessary, the 10th percentile may be calculated using linear interpolation.

(x) If a previously tested filter is modified in a manner that could change the removal efficiency of the filter product line, challenge testing to demonstrate the removal efficiency of the modified filter shall be conducted and submitted to the commissioner.

(b) Membrane filtration.

(i) Waterworks receive Cryptosporidium treatment credit for membrane filtration that meets the criteria of this paragraph. Membrane cartridge filters that meet the definition of membrane filtration in 12VAC5-590-10 are eligible for this credit. The level of treatment credit a waterworks receives is equal to the lower of the values determined as follows:

((a)) The removal efficiency demonstrated during challenge testing conducted under the conditions in subdivision B 3 d (6) (b) (ii) of this section.

((b)) The maximum removal efficiency that can be verified through direct integrity testing used with the membrane filtration process under the conditions in subdivision B 3 d (6) (b) (iii) of this section.

(ii) Challenge Testing. The membrane used by the waterworks shall undergo challenge testing to evaluate removal efficiency, and the owner shall report the results of challenge testing to the commissioner. Challenge testing shall be conducted according to the criteria in paragraphs ((a)) through ((g)) of this section as follows (owners may use data from challenge testing conducted prior to January 5, 2006, if the prior testing was consistent with the criteria):

((a)) Challenge testing shall be conducted on either a full-scale membrane module, identical in material and construction to the membrane modules used in the waterworks' treatment facility, or a smaller-scale membrane module, identical in material and similar in construction to the full-scale module. A module is defined as the smallest component of a membrane unit in which a specific membrane surface area is housed in a device with a filtrate outlet structure.

((b)) Challenge testing shall be conducted using Cryptosporidium oocysts or a surrogate that is removed no more efficiently than Cryptosporidium oocysts. The organism or surrogate used during challenge testing is referred to as the challenge particulate. The concentration of the challenge particulate, in both the feed and filtrate water, shall be determined using a method capable of discretely quantifying the specific challenge particulate

used in the test; gross measurements such as turbidity shall not be used.

((c)) The maximum feed water concentration that can be used during a challenge test is based on the detection limit of the challenge particulate in the filtrate and shall be determined according to the following equation:

Maximum Feed Concentration = 3.16×10^6 x (Filtrate Detection Limit)

((d)) Challenge testing shall be conducted under representative hydraulic conditions at the maximum design flux and maximum design process recovery specified by the manufacturer for the membrane module. Flux is defined as the throughput of a pressure driven membrane process expressed as flow per unit of membrane area. Recovery is defined as the volumetric percent of feed water that is converted to filtrate over the course of an operating cycle uninterrupted by events such as chemical cleaning or a solids removal process (i.e., backwashing).

((e)) Removal efficiency of a membrane module shall be calculated from the challenge test results and expressed as a log removal value according to the following equation:

$LRV = LOG_{10}(C_f) - LOG_{10}(C_p)$

where LRV = log removal value demonstrated during the challenge test; C_f = the feed concentration measured during the challenge test; and C_p = the filtrate concentration measured during the challenge test. Equivalent units shall be used for the feed and filtrate concentrations. If the challenge particulate is not detected in the filtrate, the term C_p is set equal to the detection limit for the purpose of calculating the LRV. An LRV shall be calculated for each membrane module evaluated during the challenge test.

((f)) The removal efficiency of a membrane filtration process demonstrated during challenge testing shall be expressed as a log removal value ($LRV_{C\text{-}Test}$). If fewer than 20 modules are tested, then $LRV_{C\text{-}Test}$ is equal to the lowest of the representative LRVs among the modules tested. If 20 or more modules are tested, then $LRV_{C\text{-}Test}$ is equal to the 10th percentile of the representative LRVs among the modules tested. The percentile is defined by (i/(n+1)) where i is the rank of n individual data points ordered lowest to highest. If necessary, the 10th percentile may be calculated using linear interpolation.

((g)) The challenge test shall establish a quality control release value (QCRV) for a nondestructive performance test that demonstrates the Cryptosporidium removal capability of the membrane filtration module. This performance test shall be applied to each production membrane module used by the waterworks that was not directly challenge tested in order to verify Cryptosporidium removal capability. Production modules that do not meet the established QCRV are not eligible for the treatment credit demonstrated during the challenge test.

((h)) If a previously tested membrane is modified in a manner that could change the removal efficiency of the membrane or the applicability of the non-destructive performance test and associated QCRV, additional challenge testing to demonstrate the removal efficiency of, and determine a new QCRV for, the modified membrane shall be conducted and submitted to the commissioner.

(iii) Direct integrity testing. Owners shall conduct direct integrity testing in a manner that demonstrates a removal efficiency equal to or greater than the removal credit awarded to the membrane filtration process and meets the requirements described in subdivision B 3 d 6 (b) (iii) ((a)) through ((f)) of this section. A direct integrity test is defined as a physical test applied to a membrane unit in order to identify and isolate integrity breaches (i.e., one or more leaks that could result in contamination of the filtrate).

((a)) The direct integrity test shall be independently applied to each membrane unit in service. A membrane unit is defined as a group of membrane modules that share common valving that allows the unit to be isolated from the rest of the system for the purpose of integrity testing or other maintenance.

((b)) The direct integrity method shall have a resolution of three micrometers or less, where resolution is defined as the size of the smallest integrity breach that contributes to a response from the direct integrity test.

((c)) The direct integrity test shall have a sensitivity sufficient to verify the log treatment credit awarded to the membrane filtration process by the commissioner, where sensitivity is defined as the maximum log removal value that can be reliably verified by a direct integrity test. Sensitivity shall be determined using the approach in either of the following as applicable to the type of direct integrity test the waterworks uses:

((i)) For direct integrity tests that use an applied pressure or vacuum, the direct integrity test sensitivity shall be calculated according to the following equation:

$LRV_{DIT} = LOG_{10}(Q_p / (VCF \times Q_{breach}))$

where LRV_{DIT} = the sensitivity of the direct integrity test;

Q_p = total design filtrate flow from the membrane unit;

Q_{breach} = flow of water from an integrity breach associated with the smallest integrity test response that can be reliably measured, and

VCF = volumetric concentration factor. The volumetric concentration factor is the ratio of the suspended solids concentration on the high pressure side of the membrane relative to that in the feed water.

((ii)) For direct integrity tests that use a particulate or molecular marker, the direct integrity test sensitivity shall be calculated according to the following equation:

$LRV_{DIT} = LOG_{10}(C_f) - LOG_{10}(C_p)$

where LRV_{DIT} = the sensitivity of the direct integrity test;

C_f = the typical feed concentration of the marker used in the test; and

C_p = the filtrate concentration of the marker from an integral membrane unit.

((d)) Owners shall establish a control limit within the sensitivity limits of the direct integrity test that is indicative of an integral membrane unit capable of meeting the removal credit awarded by the commissioner.

((e)) If the result of a direct integrity test exceeds the control limit established under subdivision B 3 d (6) (b) (iii) ((d)) of this section, the owners shall remove the membrane unit from service. Owners shall conduct a direct integrity test to verify any repairs, and may return the membrane unit to service only if the direct integrity test is within the established control limit.

((f)) Owners shall conduct direct integrity testing on each membrane unit at a frequency of not less than once each day that the membrane unit is in operation. The commissioner may approve less frequent testing, based on demonstrated process reliability, the use of multiple barriers effective for Cryptosporidium, or reliable process safeguards.

(iv) Indirect integrity monitoring. Owners shall conduct continuous indirect integrity monitoring on each membrane unit according to the criteria in ((a)) through ((e)). Indirect integrity monitoring is defined as monitoring some aspect of filtrate water quality that is indicative of the removal of particulate matter. A waterworks that implements continuous direct integrity testing of membrane units in accordance with the criteria in B 3 d (6) (b) (iv) (iii) ((a)) through ((f)) of this section is not subject to the requirements for continuous indirect integrity monitoring. Owners shall submit a monthly report to the commissioner summarizing all continuous indirect integrity monitoring results triggering direct integrity testing and the corrective action that was taken in each case.

((a)) Unless the commissioner approves an alternative parameter, continuous indirect integrity monitoring shall include continuous filtrate turbidity monitoring.

((b)) Continuous monitoring shall be conducted at a frequency of no less than once every 15 minutes.

((c)) Continuous monitoring shall be separately conducted on each membrane unit.

((d)) If indirect integrity monitoring includes turbidity and if the filtrate turbidity readings are above 0.15 NTU for a period greater than 15 minutes (i.e., two consecutive 15-minute readings above 0.15 NTU), direct integrity testing shall immediately be performed on the associated membrane unit as specified in subdivision B 3 d (6) (b) (iii) ((a)) through ((f)) of this section.

((e)) If indirect integrity monitoring includes a alternative parameter approved by the commissioner and if the alternative parameter exceeds a control limit approved by the commissioner for a period greater than 15 minutes, direct integrity testing shall immediately be performed on the associated membrane units as specified in subdivision B 3 d (6) (b) (iii) ((a)) through ((f)) of this section.

(c) Second stage filtration. Waterworks receive 0.5-log Cryptosporidium treatment credit for a separate second stage of filtration that consists of sand, dual media, GAC, or other fine grain media following granular media filtration if the commissioner approves. To be eligible for this credit, the first stage of filtration shall be preceded by a coagulation step and both filtration stages shall treat the entire plant flow taken from a surface water or groundwater under the direct influence of surface water source. A cap, such as GAC, on a single stage of filtration is not eligible for this credit. The commissioner shall approve the treatment credit based on an assessment of the design characteristics of the filtration process.

(d) Slow sand filtration (as secondary filter). Waterworks are eligible to receive 2.5-log Cryptosporidium treatment credit for a slow sand filtration process that follows a separate stage of filtration if both filtration stages treat entire plant flow taken from a surface water or ground water under the direct influence of surface water source and no disinfectant residual is present in the influent water to the slow sand filtration process. The commissioner shall approve the treatment credit based on an assessment of the design characteristics of the filtration process. This paragraph does not apply to treatment credit awarded to slow sand filtration used as a primary filtration process.

(7) Inactivation toolbox components.

(a) Calculation of CT values

(i) CT is the product of the disinfectant contact time (T, in minutes) and disinfectant concentration (C, in milligrams per liter). Owners of waterworks with treatment credit for chlorine dioxide or ozone under subdivision B 3 d (7) (b) of this section shall calculate

CT at least once each day, with both C and T measured during peak hourly flow in accordance with the procedure listed in Appendix L.

(ii) Waterworks with several disinfection segments in sequence may calculate CT for each segment, where a disinfection segment is defined as a treatment unit process with a measurable disinfectant residual level and a liquid volume. Under this approach, owners shall add the Cryptosporidium CT values in each segment to determine the total CT for the treatment plant.

(b) CT values for chlorine dioxide and ozone.

(i) Waterworks receive the Cryptosporidium treatment credit listed in the following table by meeting the corresponding chlorine dioxide CT value for the applicable water temperature, as described in subdivision B 3 d (7) (a) of this section.

CT Values (mg-min/L) for Cryptosporidium Inactivation by Chlorine Dioxide[1]

Log credit	Water Temperature, °C										
	Less than or equal to 0.5	1	2	3	5	7	10	15	20	25	30
0.25	159	153	140	128	107	90	69	45	29	19	12
0.5	319	305	279	256	214	180	138	89	58	38	24
1.0	637	610	558	511	429	360	277	179	116	75	49
1.5	956	915	838	767	643	539	415	268	174	113	73
2.0	1275	1220	1117	1023	858	719	553	357	232	150	98
2.5	1594	1525	1396	1278	1072	899	691	447	289	188	122
3.0	1912	1830	1675	1534	1286	1079	830	536	347	226	147

[1]Waterworks may use this equation to determine log credit between the indicated values:

$$\text{Log credit} = (0.001506 \times (1.09116)^{Temp}) \times CT$$

(ii) Waterworks receive the Cryptosporidium treatment credit listed in the following table by meeting the corresponding ozone CT values for the applicable water temperature, as described in subdivision B 3 d (7) (a) of this section.

CT Values (mg-min/L) for Cryptosporidium Inactivation by Ozone[1]

Log credit	Water Temperature, °C										
	Less than or equal to 0.5	1	2	3	5	7	10	15	20	25	30
0.25	6.0	5.8	5.2	4.8	4.0	3.3	2.5	1.6	1.0	0.6	0.39
0.5	12	12	10	9.5	7.9	6.5	4.9	3.1	2.0	1.2	0.78
1.0	24	23	21	19	16	13	9.9	6.2	3.9	2.5	1.6
1.5	36	35	31	29	24	20	15	9.3	5.9	3.7	2.4
2.0	48	46	42	38	32	26	20	12	7.8	4.9	3.1
2.5	60	58	52	48	40	33	25	16	9.8	6.2	3.9
3.0	72	69	63	57	47	39	30	19	12	7.4	4.7

[1]Waterworks may use this equation to determine log credit between the indicated values:

$$\text{Log credit} = (0.0397 \times (1.09757)^{Temp}) \times CT$$

(c) Ultraviolet light. Waterworks receive Cryptosporidium, Giardia lamblia, and virus treatment credits for ultraviolet (UV) light reactors by achieving the corresponding UV dose values shown in subdivision B 3 d (7) (c) (i) of this section. Waterworks shall validate and monitor UV reactors as described in subdivision B 3 d (7) (c) (ii) and (iii) of this section to demonstrate that they are achieving a particular UV dose value for treatment credit.

(i) UV dose table. The treatment credits listed in this table are for UV light at a wavelength of 254 nm as produced by a low pressure mercury vapor lamp. To receive treatment credit for other lamp types, waterworks shall demonstrate an equivalent germicidal dose through reactor validation testing, as described in subdivision B 3 d (7) (c) (ii) of this section. The UV dose values in this table are applicable only to post-filter applications of UV in filtered systems.

UV dose table for Cryptosporidium, Giardia lamblia, and virus inactivation credit

Log credit	Cryptosporidium UV dose (mJ/cm2)	Giardia lamblia UV dose (mJ/cm2)	Virus UV dose (mJ/cm2)
0.5	1.6	1.5	39
1.0	2.5	2.1	58
1.5	3.9	3.0	79
2.0	5.8	5.2	100
2.5	8.5	7.7	121
3.0	12	11	143
3.5	15	15	163
4.0	22	22	186

(ii) Reactor validation testing. Waterworks shall use UV reactors that have undergone validation testing to determine the operating conditions under which the reactor delivers the UV dose required in subdivision B 3 d (7) (c) (i) of this section (i.e., validated operating conditions). These operating conditions shall include flow rate, UV intensity as measured by a UV sensor, and UV lamp status.

((a)) When determining validated operating conditions, owners shall account for the following factors: UV absorbance of the water; lamp fouling and aging; measurement uncertainty of online sensors; UV dose distributions arising from the velocity profiles through the reactor; failure of UV lamps or other critical waterworks components; and inlet and outlet piping or channel configurations of the UV reactor.

((b)) Validation testing shall include the following: full scale testing of a reactor that conforms uniformly to the UV reactors used by the waterworks and inactivation of a test microorganism whose dose response characteristics have been quantified with a low pressure mercury vapor lamp.

(iii) Reactor monitoring.

((a)) Owners shall monitor their UV reactors to determine if the reactors are operating within validated conditions, as determined under subdivision B 3 d (7) (c) (ii) of this section. This monitoring shall include UV intensity as measured by a UV sensor, flow rate, lamp status, and other parameters the commissioner designates based on UV reactor operation. Owners shall verify the calibration of UV sensors and shall recalibrate sensors in accordance with a protocol the commissioner approves.

((b)) To receive treatment credit for UV light, waterworks shall treat at least 95% of the water delivered to the public during each month by UV reactors operating within validated conditions for the required UV dose, as described in subdivision B 3 d (7) (c) (i) and (ii) of this section. Owners shall demonstrate compliance with this condition by the monitoring required under subdivision B 3 d (7) (c) (iii)((a)) of this section.

e. Owners shall comply with the applicable recordkeeping and reporting requirements described in 12VAC5-590-530 and 12VAC5-590-550.

C. ~~Lead and copper corrosion control treatment requirements.~~ Reserved.

~~1. The owners of all community and nontransient noncommunity waterworks shall install and operate optimum corrosion control treatment by completing the corrosion control treatment requirements described below which are applicable to such waterworks owners under subdivision C 2 of this section.~~

~~a. Owners proposal regarding corrosion control treatment. Based upon the results of lead and copper tap monitoring and water quality parameter monitoring, the owners of small and medium size waterworks exceeding the lead or copper action level shall propose installation of one or more of the corrosion control treatments listed in subdivision C 1 c (1) of this section which the waterworks owner believes constitutes optimal corrosion control for that waterworks. The commissioner may require the waterworks owner to conduct additional water quality parameter monitoring in accordance with 12VAC5-590-370 B 6 b (2) of this section to assist the commissioner in reviewing the proposal.~~

~~b. Applicability of studies of corrosion control treatment (applicable to small and medium size waterworks). The commissioner may require the owner of any small or medium-size waterworks that exceeds the lead or copper action level to perform corrosion control studies under subdivision C 1 c of this section to identify optimal corrosion control treatment for the waterworks.~~

~~c. Corrosion control studies.~~

(1) The owner of any waterworks required by the commissioner to perform 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 for that waterworks:

(a) Alkalinity and pH adjustment;

(b) Calcium hardness adjustment; and

(c) The addition of a phosphate or silicate based corrosion inhibitor at a concentration sufficient to maintain an effective corrosion inhibitor residual concentration in all test tap samples.

(2) The owner 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 waterworks of similar size, water chemistry and distribution system configuration.

(3) The owner shall measure the following water quality parameters in any tests conducted under this paragraph before and after evaluating the corrosion control treatments listed above:

(a) Lead;

(b) Copper;

(c) pH;

(d) Alkalinity;

(e) Calcium;

(f) Conductivity;

(g) Orthophosphate (when an inhibitor containing a phosphate compound is used);

(h) Silicate (when an inhibitor containing a silicate compound is used);

(i) Water temperature.

(4) The owner shall identify all chemical or physical constraints that limit or prohibit the use of a particular corrosion control treatment and document such constraints with at least one of the following:

(a) Data and documentation showing that a particular corrosion control treatment has adversely affected other water treatment processes when used by another waterworks with comparable water quality characteristics; and/or

(b) Data and documentation demonstrating that the waterworks 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 owner 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 waterworks owner shall propose to the field office in writing, the treatment option that the corrosion control studies indicate constitutes optimal corrosion control treatment for that waterworks. The owner shall provide a rationale for its recommendation along with all supporting documentation specified in subdivision C 1 c (1) through (5) of this section.

d. Approval of optimal corrosion control treatment.

(1) Based upon consideration of available information including, where applicable, studies performed under subdivision C 1 c of this section and an owner's proposed treatment alternative, the commissioner shall either approve the corrosion control treatment option recommended by the owner, or designate alternative corrosion control treatment(s) from among those listed in subdivision C 1 c (1) of this section. When approving optimal treatment the commissioner shall consider the effects that additional corrosion control treatment will have on water quality parameters and on other water quality treatment processes.

(2) The commissioner shall notify the owner of the determination on optimal corrosion control treatment in writing and explain the basis for this determination. If the commissioner requests additional information to aid a review, the owner shall provide the information.

e. Installation of optimal corrosion control. Each waterworks owner shall properly install and operate throughout the waterworks the optimal corrosion control treatment approved by the commissioner under subdivision C 1 d of this section and under 12VAC5-590-190.

f. Commissioner's review of treatment and specification of optimal water quality control parameters.

(1) The commissioner shall evaluate the results of all lead and copper tap samples and water quality parameter samples submitted by the owner and determine whether the owner has properly installed and operated the optimal corrosion control treatment approved by the commissioner in subdivision C 1 d of this section. Upon reviewing the results of tap water and water quality parameter monitoring by the owner, both before and after the waterworks installs optimal corrosion control treatment, the commissioner shall designate:

(a) A minimum value or a range of values for pH measured at each entry point to the distribution system;

(b) A minimum pH value, measured in all tap samples. Such value shall be equal to or greater than 7.0, unless the commissioner determines that meeting a pH level of 7.0 is not technologically feasible or is not necessary for the owner to optimize corrosion control;

(c) 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, that the commissioner determines is necessary to form a passivating film on the interior walls of the pipes of the distribution system;

(d) 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;

(e) 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 that the commissioner determines to reflect optimal corrosion control treatment for the waterworks. The commissioner may designate values for additional water quality control parameters determined by the commissioner to reflect optimal corrosion control for the waterworks. The commissioner shall notify the owner in writing of these determinations and explain the basis for the decisions.

g. Continued operation and monitoring. The owners of all waterworks optimizing corrosion control shall continue to operate and maintain optimum corrosion control treatment, including maintaining water quality parameters at or above minimum values or within ranges designated by the commissioner under subdivision C 1 f of this section, in accordance with this paragraph for all samples collected under 12VAC5-590-370-B-6-b-(4), (5) and (6). Compliance with the requirements of this paragraph shall be determined every six months, as specified under 12VAC5-590-370-B-6-b-(4). The owner of a waterworks is out of compliance with the requirements of this paragraph for a six-month period if excursions occur for any commissioner specified parameter on more than nine days during the period. An excursion occurs whenever the daily value for one or more of the water quality parameters measured at a sampling location is below the minimum value or outside the range designated by the commissioner. Daily values shall be calculated as follows. The commissioner has discretion to delete results of obvious sampling errors from this calculation.

(1) On days when more than one measurement for the water quality parameter is collected at the sampling location, the daily value shall be the average of all results collected during the day regardless of whether they are collected through continuous monitoring, grab sampling, or a combination of both.

(2) On days when only one measurement for the water quality parameter is collected at the sampling location, the daily value shall be the result of that measurement.

(3) On days when no measurement is collected for the water quality parameter at the sampling location, the daily value shall be the daily value calculated on the most recent day on which the water quality parameter was measured at the sample site.

h. Modification of the commissioner's treatment decisions. Upon his own initiative or in response to a request by an owner or other interested party, the commissioner may modify the determination of the optimal corrosion control treatment under subdivision C 1 d of this section or optimal water quality control parameters under subdivision C 1 f of this section. A request for modification by an owner or other interested party shall be in writing, explain why the modification is appropriate, and provide supporting documentation. The commissioner may modify the determination where it is concluded that such change is necessary to ensure that the waterworks continues to optimize corrosion control treatment. A revised determination shall be made in writing, set forth the new treatment requirements, explain the basis for the commissioner's decision, and provide an implementation schedule for completing the treatment modifications.

2. Corrosion control treatment steps

a. Owners shall complete the applicable corrosion control treatment requirements described in subdivision C 1 of this section by the deadlines established in this section.

(1) Owners of large waterworks (serving greater than 50,000 persons) shall complete the corrosion control treatment steps specified in subdivision C 2 d of this section, unless the owner is deemed to have optimized corrosion control under subdivision C 2 b (2) of this section or C 2 b (3) of this section.

(2) Owners of small waterworks (serving less than 3,300 persons) and medium size waterworks (serving greater than 3,300 and less than 50,000 persons) shall complete the corrosion control treatment steps specified in subdivision C 2 e of this section, unless the owner is deemed to have optimized corrosion control under subdivision C 2 b (1) through (3) of this section.

b. An owner is deemed to have optimized corrosion control and is not required to complete the applicable corrosion control treatment steps identified in this section if the waterworks satisfies one of the criteria specified in subdivisions C 2 b (1) through (3) below. The owner of

~~any such waterworks that is deemed to have optimized corrosion control, and which has treatment in place, shall continue to operate and maintain optimal corrosion control treatment and meet any requirements that the commissioner determines appropriate to ensure optimal corrosion control treatment is maintained.~~

~~(1) The owner of a small or medium size waterworks is deemed to have optimized corrosion control if the waterworks meets the lead and copper action levels during each of two consecutive six month monitoring periods conducted in accordance with 12VAC5-590-370 B 6 a.~~

~~(2) Any owner may be deemed by the commissioner to have optimized corrosion control treatment if the owner demonstrates to the satisfaction of the commissioner that the owner has conducted activities equivalent to the corrosion control steps applicable to such waterworks under this section. If the commissioner makes this determination, the owner shall be provided with a written notice explaining the basis for the decision and the notice shall specify the water quality control parameters representing optimal corrosion control in accordance with subdivision C 1 f of this section. Any owner deemed to have optimized corrosion control under this paragraph shall operate in compliance with the specified water quality control parameters in accordance with subdivision C 1 g of this section and continue to conduct lead and copper tap and water quality parameter sampling in accordance with 12VAC5-590-370-B-6-a (4) e and 12VAC5-590-370 B 6 b (4), respectively. The owner shall provide the district engineer with the following information in order to support a determination under this paragraph:~~

~~(a) The results of all test samples collected for each of the water quality parameters in subdivision C 1 e (3) of this section.~~

~~(b) A report explaining the test methods used by the owner to evaluate the corrosion control treatments listed in subdivision C 1 e (1) of this section, the results of all tests conducted, and the basis for the owner's selection of optimal corrosion control treatment;~~

~~(c) A report explaining how corrosion control has been installed and how it is being maintained to insure minimal lead and copper concentrations at consumers' taps; and~~

~~(d) The results of tap water samples collected in accordance with 12VAC5-590-370 B 6 a at least once every six months for one year after corrosion control has been installed~~

~~(3) Any waterworks is deemed to have optimized corrosion control if the owner submits results of tap water monitoring conducted in accordance with 12VAC5-590-370 B 6 a and source water monitoring conducted in accordance with 12VAC5-590-370 B 6 e that demonstrates for two consecutive six month monitoring periods that the difference between the 90th percentile tap water lead level computed under 12VAC5-590-410 E, and the highest source water lead concentration, is less than the PQL for lead (0.005 mg/L).~~

~~(a) Any owner that submits monitoring results indicating that the highest source water lead level is below the Method Detection Limit may also be deemed to have optimized corrosion control under this paragraph if the 90th percentile tap water lead level is less than or equal to the PQL for lead for two consecutive six month monitoring periods.~~

~~(b) Any owner deemed to have optimized corrosion control under this paragraph shall continue monitoring for lead and copper at the tap no less frequently than once every three calendar years using the reduced number of sites specified in 12VAC5-590-370 B 6 a (3) and collecting the samples at times and locations specified in 12VAC5-590-370 B 6 a (4) (d) (iv). Any such owner that has not conducted a round of monitoring pursuant to 12VAC5-590-370 B 6 a (4) Since September 30, 1997, shall complete a round of monitoring pursuant to this paragraph no later than September 30, 2000.~~

~~(c) Any owner deemed to have optimized corrosion control pursuant to this paragraph shall notify the district engineer in writing pursuant to 12VAC5-590-530 D 1 e of any change in treatment or the addition of a new water source. The commissioner may require the owner of any such waterworks to conduct additional monitoring or to take other actions the commissioner deems appropriate to ensure that minimum levels of corrosion control are being maintained in the distribution system.~~

~~(d) As of July 12, 2001, an owner is not deemed to have optimized corrosion control under this paragraph, and shall implement corrosion control treatment specified in subdivision C 2 b (3) e of this section unless the copper action level is met.~~

~~(e) The owner of a waterworks triggered into corrosion control because the waterworks no longer is deemed to have optimized corrosion control under this paragraph shall implement corrosion control treatment in accordance with the deadlines in subdivision C 2 e of this section. The owner of any such large waterworks shall adhere to the schedule specified in that paragraph for medium size systems, with the time period for completing each step being triggered by the date the owner is no longer deemed to have optimized corrosion control treatment under this paragraph.~~

~~c. The owner of any small or medium size waterworks that is required to complete the corrosion control steps~~

due to the exceedance of the lead or copper action level may cease completing the treatment steps whenever the waterworks meets both action levels during each of two consecutive monitoring periods conducted pursuant to 12VAC5-590-370 B 6 a and the owner submits the results to the district engineer. If any such waterworks thereafter exceeds the lead or copper action level during any monitoring period, the owner shall recommence completion of the applicable treatment steps, beginning with the first treatment step which was not previously completed in its entirety. The commissioner may require the owner to repeat treatment steps previously completed where the commissioner determines that this is necessary to properly implement the treatment requirements of this section. The commissioner shall notify the owner in writing of such a determination and explain the basis for its decision. The requirement for the owner of any small or medium-sized waterworks to implement corrosion control treatment steps in accordance with subdivision 2 e of this subsection (including waterworks deemed to have optimized corrosion control under subdivision 2 b (1) of this subsection) is triggered whenever any small or medium-sized waterworks exceeds the lead or copper action level.

d. Treatment steps and deadlines for large waterworks. Except as provided in subdivisions C 2 b (2) and (3) of this section, owners of large waterworks shall complete the following corrosion control treatment steps (described in the referenced portions of subdivision C 1 of this section, 12VAC5-590-370 B 6 a and b) by the indicated dates.

(1) Step 1: The owner shall conduct initial monitoring (12VAC5-590-370 B 6 a (4) (a) and B 6 b (2)) during two consecutive six-month monitoring periods by January 1, 1993.

(2) Step 2: The owner shall complete corrosion control studies (12VAC5-590-420 C 1 e) and submit the study and recommendations to the commissioner (12VAC5-590-200) by July 1, 1994.

(3) Step 3: The commissioner shall approve optimal corrosion control treatment (12VAC5-590-420 C 1 d) by January 1, 1995.

(4) Step 4: The owner shall install optimal corrosion control treatment (12VAC5-590-420 C 1 e) by January 1, 1997.

(5) Step 5: The owner shall complete follow-up sampling (12VAC5-590-370 B 6 a (4) (b) and B 6 b (3)) by January 1, 1998.

(6) Step 6: The commissioner shall review installation of treatment and designate optimal water quality control parameters (12VAC5-590-420 C 1 f) by July 1, 1998.

(7) Step 7: The owner shall operate the waterworks in compliance with the commissioner-specified optimal water quality control parameters (12VAC5-590-420 C 1 g) and continue to conduct tap sampling (12VAC5-590-370 B 6 a (4) (c) and B 6 b (4)).

e. Treatment steps and deadlines for small and medium-size waterworks. Except as provided in 12VAC5-590-420 C 2 b, owners of small- and medium-size waterworks shall complete the following corrosion control treatment steps (described in the referenced portions of 12VAC5-590-420 C 1, 12VAC5-590-370 B 6 a and b) by the indicated time periods.

(1) Step 1: The owner shall conduct initial tap sampling (12VAC5-590-370 B 6 a (4) (a) and B 6 b (2)) until the waterworks either exceeds the lead or copper action level or becomes eligible for reduced monitoring under 12VAC5-590-370 B 6 a (4) (d). The owner of a waterworks exceeding the lead or copper action level shall propose optimal corrosion control treatment (12VAC5-590-420 C 1 a) within six months after it exceeds one of the action levels.

(2) Step 2: Within 12 months after a waterworks exceeds the lead or copper action level, the commissioner may require the owner to perform corrosion control studies (12VAC5-590-420 C 1 b). If the commissioner does not require the owner to perform such studies, the commissioner shall specify optimal corrosion control treatment (12VAC5-590-420 C 1 d) within the following timeframes:

(a) For medium-size waterworks, within 18 months after such waterworks exceeds the lead or copper action level;

(b) For small waterworks, within 24 months after such waterworks exceeds the lead or copper action level.

(3) Step 3: If the commissioner requires an owner to perform corrosion control studies under Step 2, the owner shall complete the studies (12VAC5-590-420 C 1 e) and submit the study and recommendations to the commissioner (12VAC5-590-200) within 18 months after the commissioner requires that such studies be conducted.

(4) Step 4: If the waterworks has performed corrosion control studies under Step 2, the commissioner shall designate optimal corrosion control treatment (12VAC5-590-420 C 1 d) within six months after completion of Step 3.

(5) Step 5: The owner shall install optimal corrosion control treatment (12VAC5-590-420 C 1 e) within 24 months after the commissioner designates such treatment.

(6) Step 6: The owner shall complete follow-up sampling (12VAC5-590-370 B 6 a (4) (b) and B 6 b (3)) within 36

~~months after the commissioner designates optimal corrosion control treatment.~~

~~(7) Step 7: The commissioner shall review the owner's installation of treatment and designate optimal water quality control parameters (12VAC5-590-420 C 1 f) within six months after completion of Step 6.~~

~~(8) Step 8: The owner shall operate in compliance with the commissioner designated optimal water quality control parameters (12VAC5-590-420 C 1 g) and continue to conduct tap sampling (12VAC5-590-370 B 6 a (4) (c) and B 6 b (4)).~~

D. ~~Water supply (source water) treatment requirements for lead and copper. The owner of any waterworks exceeding the lead or copper action level shall complete the applicable water supply monitoring and treatment requirements (described in the referenced portions of subdivision D 2 of this section, and in 12VAC5-590-370 B 6 a and c) by the following deadlines.~~ Reserved.

~~1. Deadlines for completing water supply treatment steps~~

~~a. Step 1: The owner of a waterworks exceeding the lead or copper action level shall complete lead and copper water supply monitoring (12VAC5-590-370 B 6 c (2)) and make a treatment proposal to the district engineer within six months after exceeding the lead or copper action level.~~

~~b. Step 2: The commissioner shall make a determination regarding the need for water supply treatment (12VAC5-590-420 D 2 b) within six months after submission of monitoring results under Step 1~~

~~c. Step 3: If the commissioner requires installation of water supply treatment, the waterworks owner shall install the treatment (12VAC5-590-420 D 3) within 24 months after completion of Step 2.~~

~~d. Step 4: The owner shall complete follow-up tap water monitoring (12VAC5-590-370 B 6 a (4) (b)) and water supply lead and copper monitoring (12VAC5-590-370 B 6 c (3)) within 36 months after completion of Step 2.~~

~~e. Step 5: The commissioner shall review the owner's installation and operation of water supply treatment and specify maximum permissible water supply lead and copper levels (12VAC5-590-420 D 4) within six months after completion of Step 4.~~

~~f. Step 6: The owner shall operate in compliance with the commissioner specified maximum permissible lead and copper water supply levels (12VAC5-590-420 D 4) and continue water supply monitoring (12VAC5-590-370 B 6 c (4) (a)).~~

~~2. Description of water supply treatment requirements.~~

~~a. Waterworks treatment recommendation. The owner of any waterworks which exceeds the lead or copper action level shall propose in writing to the appropriate field office, the installation and operation of one of the water supply treatments listed in subdivision D 2 b of this section. An owner may propose that no treatment be installed based upon a demonstration that water supply treatment is not necessary to minimize lead and copper levels at users' taps.~~

~~b. Commissioner's determination regarding water supply treatment. The commissioner shall complete an evaluation of the results of all water supply samples submitted by the owner to determine whether water supply treatment is necessary to minimize lead or copper levels in water delivered to users' taps. If the commissioner determines that treatment is needed, the commissioner shall either require installation and operation of the water supply treatment recommended by the waterworks (if any) or require the installation and operation of another water supply treatment from among the following: ion exchange, reverse osmosis, lime softening or coagulation/filtration. If the commissioner requests additional information to aid in the review, the owner shall provide the information by the date specified by the commissioner in the request. The commissioner shall notify the owner in writing of the determination and set forth the basis for the decision.~~

~~3. Installation of water supply treatment. Each owner shall properly install and operate the water supply treatment designated by the commissioner under subdivision D 2 b of this section.~~

~~4. Commissioner's review of water supply treatment and specification of maximum permissible water supply lead and copper levels. The commissioner shall review the water supply samples taken by the owner both before and after the owner installs water supply treatment, and determine whether the owner has properly installed and operated the water supply treatment designated by the commissioner. Based upon the review, the commissioner shall designate the 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 commissioner shall notify the owner in writing and explain the basis for the decision.~~

~~5. Continued operation and maintenance. Each waterworks shall be operated to maintain lead and copper levels below the maximum permissible concentrations designated by the commissioner at each sampling point monitored in accordance with 12VAC5-590-370 B 6 c. The waterworks is out of compliance with this subdivision if the level of lead or copper at any sampling point is greater than the~~

~~maximum permissible concentration designated by the commissioner.~~

~~6. Modification of the commissioner's treatment decisions. Upon his own initiative or in response to a request by a waterworks owner or other interested party, the commissioner may modify its determination of the water supply treatment under D 2 b of this section, or may modify the maximum permissible lead and copper concentrations for finished water entering the distribution system under subdivision D 4 of this section. A request for modification by an owner or other interested party shall be in writing, explain why the modification is appropriate, and provide supporting documentation. The commissioner may modify the determination where he concludes that such change is necessary to ensure that the waterworks continues to minimize lead and copper concentrations in water supplies. A revised determination shall be made in writing, set forth the new treatment requirements, explain the basis for the commissioner's decision, and provide an implementation schedule for completing the treatment modifications.~~

E. ~~Lead service line replacement requirements.~~ Reserved.

~~1. Owners of waterworks that fail to meet the lead action level in tap samples taken pursuant to 12VAC5-590-370 B 6 a (4) (b), after installing corrosion control and/or water supply treatment (whichever sampling occurs later), shall replace lead service lines in accordance with the requirements of this section. If a waterworks is in violation of subdivision C 2 of this section or subsection D of this section for failure to install water supply or corrosion control treatment, the commissioner may require the owner to commence lead service line replacement under this section after the date by which the owner was required to conduct monitoring under 12VAC5-590-370 B 6 a (4) (b) has passed.~~

~~2. An owner shall replace annually at least 7.0% 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 waterworks owner shall identify the initial number of lead service lines in its distribution system, including an identification of the portion or portions owned by the waterworks, based upon a materials evaluation, including the evaluation required under 12VAC5-590-370 B 6 a (1) (a) and relevant authorities (e.g., contracts, local ordinances) regarding the portion owned by the waterworks. The first year of lead service line replacement shall begin on the date the action level was exceeded in tap sampling referenced in subdivision E 1 of this section.~~

~~3. An owner 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 12VAC5-590-370 B 6 a (2) (c), is less than or equal to 0.015 mg/L.~~

~~4. An owner shall replace that portion of the lead service line that is owned by the waterworks. In cases where the waterworks owner does not own the entire lead service line, the waterworks owner shall notify the building owner, or the building owner's authorized agent, that the waterworks owner will replace that portion of the service line that is owned by the waterworks and shall offer to replace the building owner's portion of the line. The waterworks owner is not required to bear the cost of replacing the building owner's portion of the service line, nor is the waterworks owner required to replace the building owner's portion where the waterworks owner chooses not to pay the cost of replacing the building owner's portion of the line, or where replacing the building owner's portion would be precluded by state, local or common law. A waterworks owner that does not replace the entire length of the service line also shall complete the following tasks.~~

~~a. At least 45 days prior to commencing with the partial replacement of a lead service line, the waterworks owner shall provide notice to the resident or residents of all buildings served by the line explaining that they may experience a temporary increase of lead levels in their drinking water, along with guidance on measures consumers can take to minimize their exposure to lead. The commissioner may allow the waterworks owner to provide notice under the previous sentence less than 45 days prior to commencing partial lead service line replacement where such replacement is in conjunction with emergency repairs. In addition, the waterworks owner shall inform the resident or residents served by the line that the waterworks owner will, at the waterworks owner's expense, collect a sample from each partially replaced lead service line that is representative of the water in the service line for analysis of lead content, as prescribed in 12VAC5-590-370 B 6 a (2) (c), within 72 hours after the completion of the partial replacement of the lead service line. The waterworks owner shall collect the sample and report the results of the analysis to the building owner and resident or residents served by the line within three business days of receiving the results. Mailed notices post marked within three business days of receiving the results shall be considered "on time."~~

~~b. The waterworks owner shall provide the information required by subdivision E 4 a of this section to the residents of individual dwellings by mail or by other methods approved by the commissioner. In instances where multi family dwellings are served by the line, the waterworks owner shall have the option to post the information at a conspicuous location.~~

5. The commissioner shall require a waterworks owner to replace lead service lines on a shorter schedule than that required by this section, taking into account the number of lead service lines in the waterworks, where such a shorter replacement schedule is feasible. The commissioner shall make this determination in writing and notify the owner of the findings within 6 months after the waterworks is triggered into lead service line replacement based on monitoring referenced in subdivision E 1 of this section.

6. Any waterworks owner may cease replacing lead service lines whenever first draw tap samples collected pursuant to 12VAC5-590-370 B 6 a (2) (b) meet the lead action level during each of two consecutive monitoring periods and the owner submits the results to the district engineer. If the first draw tap samples collected in any such waterworks thereafter exceeds the lead action level, the owner shall recommence replacing lead service lines, pursuant to subdivision E 2 of this section.

7. To demonstrate compliance with subdivisions E 1 through E 4 of this section, a waterworks owner shall report to the district engineer the information specified in 12VAC5-590-530 D 5.

F. Lead public education requirements. The owner of a waterworks that exceeds the lead action level based on tap water samples collected in accordance with 12VAC5-590-370 B 6 a shall deliver the public education materials contained in subdivisions F 1 and 2 of this section in accordance with the requirements in subdivision F 3 of this section. Reserved.

1. Content of written public education materials. A waterworks owner shall include the following text in all of the printed materials distributed through the lead public education program.

a. Community waterworks. The owner of a community waterworks shall include the following text in all of the printed materials it distributes through the lead public education program. Waterworks owners may delete information pertaining to lead service line replacement, upon approval by the commissioner, if no lead service lines exist anywhere in the waterworks service area. Public education language in subdivisions F 1 a (4) (b) (v) and F 1 a (4) (d) (ii) of this section may be modified regarding building permit record availability and consumer access to these records, if approved by the commissioner. Waterworks owners may also continue to utilize pre-printed materials that meet the public education language requirements in 40 CFR 141.85, effective November 6, 1991, and contained in the 40 CFR Parts 100 to 149, edition revised as of July 1, 1991. Any additional information presented by a waterworks owner shall be consistent with the information below and be in plain English that can be understood by lay people.

(1) Introduction. The United States Environmental Protection Agency (EPA) and (insert name of waterworks) are concerned about lead in your drinking water. Although most homes have very low levels of lead in their drinking water, some homes in the community have lead levels above the EPA action level of 15 parts per billion (ppb), or 0.015 milligrams of lead per liter of water (mg/L). Under Federal law we are required to have a program in place to minimize lead in your drinking water by (insert date when corrosion control will be completed for your waterworks). This program includes corrosion control treatment, source water treatment, and public education. We are also required to replace the portion of each lead service line that we own if the line contributes lead concentrations of more than 15 ppb after we have completed the comprehensive treatment program. If you have any questions about how we are carrying out the requirements of the lead regulation please give us a call at (insert waterworks phone number). This brochure explains the simple steps you can take to protect you and your family by reducing your exposure to lead in drinking water.

(2) Health effects of lead. Lead is a common metal found throughout the environment in lead based paint, air, soil, household dust, food, certain types of pottery porcelain and pewter, and water. Lead can pose a significant risk to your health if too much of it enters your body. Lead builds up in the body over many years and can cause damage to the brain, red blood cells and kidneys. The greatest risk is to young children and pregnant women. Amounts of lead that will not hurt adults can slow down normal mental and physical development of growing bodies. In addition, a child at play often comes into contact with sources of lead contamination like dirt and dust that rarely affect an adult. It is important to wash children's hands and toys often, and to try to make sure they only put food in their mouths.

(3) Lead in drinking water.

(a) Lead in drinking water, although rarely the sole cause of lead poisoning, can significantly increase a person's total lead exposure, particularly the exposure of infants who drink baby formulas and concentrated juices that are mixed with water. The EPA estimates that drinking water can make up 20% or more of a person's total exposure to lead.

(b) Lead is unusual among drinking water contaminants in that it seldom occurs naturally in water supplies like rivers and lakes. Lead enters drinking water primarily as a result of the corrosion, or wearing away, of materials containing lead in the water distribution system and household plumbing. These materials include lead based solder used to join copper pipe, brass and chrome plated brass faucets, and in some cases, pipes made of lead that

~~connect your house to the water main (service lines). In 1986, Congress banned the use of lead solder containing greater than 0.2% lead, and restricted the lead content of faucets, pipes and other plumbing materials to 8.0%.~~

~~(c) When water stands in lead pipes or plumbing systems containing lead for several hours or more, the lead may dissolve into your drinking water. This means the first water drawn from the tap in the morning, or later in the afternoon after returning from work or school, can contain fairly high levels of lead.~~

~~(4) Steps you can take in the home to reduce exposure to lead in drinking water.~~

~~(a) Despite our best efforts mentioned earlier to control water corrosivity and remove lead from the water supply, lead levels in some homes or buildings can be high. To find out whether you need to take action in your own home, have your drinking water tested to determine if it contains excessive concentrations of lead. Testing the water is essential because you cannot see, taste, or smell lead in drinking water. Some local laboratories that can provide this service are listed at the end of this booklet. (The waterworks owners should contact the Division of Consolidated Laboratory Services at (804) 786-3411 for a list of certified laboratories in their area). For more information on having your water tested, please call (insert phone number of waterworks).~~

~~(b) If a water test indicates that the drinking water drawn from a tap in your home contains lead above 15 ppb, then you should take the following precautions:~~

~~(i) Let the water run from the tap before using it for drinking or cooking any time the water in a faucet has gone unused for more than six hours. The longer water resides in your home's plumbing the more lead it may contain. Flushing the tap means running the cold water faucet until the water gets noticeably colder, usually about 15-30 seconds. If your house has a lead service line to the water main, you may have to flush the water for a longer time, perhaps one minute, before drinking. Although toilet flushing or showering flushes water through a portion of your home's plumbing system, you still need to flush the water in each faucet before using it for drinking or cooking. Flushing tap water is a simple and inexpensive measure you can take to protect your family's health. It usually uses less than one or two gallons of water and costs less than (insert a cost estimate based on flushing two times a day for 30 days) per month. To conserve water, fill a couple of bottles for drinking water after flushing the tap, and whenever possible use the first flush water to wash the dishes or water the plants. If you live in a high-rise building, letting the water flow before using it may not work to lessen your risk from lead. The plumbing systems have more, and sometimes larger pipes than smaller buildings. Ask your landlord for help in locating the source of the lead and for advice on reducing the lead level.~~

~~(ii) Try not to cook with, or drink water from the hot water tap. Hot water can dissolve more lead more quickly than cold water. If you need hot water, draw water from the cold tap and heat it on the stove or microwave.~~

~~(iii) Remove loose lead solder and debris from the plumbing materials installed in newly constructed homes, or homes in which the plumbing has recently been replaced, by removing the faucet strainers from all taps and running the water from three to five minutes. Thereafter, periodically remove the strainers and flush out any debris that has accumulated over time.~~

~~(iv) If your copper pipes are joined with lead solder that has been installed illegally since it was banned in 1986, notify the plumber who did the work and request that he replace the lead solder with lead-free solder. Lead solder looks dull gray, and when scratched with a key looks shiny. In addition, notify the local building official in your city or county.~~

~~(v) Determine whether the service line that connects your home or apartment to the water main is made of lead. The best way to determine if your service line is made of lead is by either hiring a licensed plumber to inspect the line or by contacting the plumbing contractor who installed the line. You can identify the plumbing contractor by checking your localities' record of building permits which should be maintained in the files of the (insert name of department that issues building permits). A licensed plumber can at the same time check to see if your home's plumbing contains lead solder, lead pipes, or pipe fittings that contain lead. The waterworks that delivers water to your home should also maintain records of the materials located in the distribution system. If the service line that connects your dwelling to the water main contributes more than 15 ppb to drinking water, after our comprehensive treatment program is in place, we are required to replace the portion of the line we own. Since the line is only partially owned by the (insert the name of the city, county, or waterworks that owns the line), we are required to provide the owner of the privately owned portion of the line with information on how to replace the privately-owned portion of the service line, and offer to replace that portion of the line at the line owner's expense. If we replace only the portion of the line that we own, we also are required to notify you in advance and provide you with information on the steps you can take to minimize exposure to any temporary increase in lead levels that may result from the partial replacement, to take a follow-up sample at our expense from the line within 72 hours after the partial replacement, and to mail or otherwise provide you with the results of that sample within three business days of~~

~~receiving the results. Acceptable replacement alternatives include copper, steel, iron, and plastic pipes and shall comply with local plumbing codes.~~

~~(vi) 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.~~

~~(c) 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.~~

~~(i) 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.~~

~~(ii) Purchase bottled water for drinking and cooking.~~

~~(d) 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:~~

~~(i) (Insert the name of the waterworks) at (insert phone number) can provide you with information about your community's waterworks and a list of local laboratories that have been certified by Division of Consolidated Laboratory Services for testing water quality.~~

~~(ii) (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.~~

~~(iii) The Medical Director of (Insert the name of the city or county) Health Department, and the Virginia Department of Health Division of Child and Adolescent Health, Lead Safe Virginia Program Director at 1-877-668-7987 can provide you with information about the health effects of lead and how you can have your child's blood tested.~~

~~(e) The following is a list of some state 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.)~~

~~b. Nontransient noncommunity waterworks. The owner of a nontransient noncommunity waterworks shall either include the text specified in subdivision F 1 a of this section or shall include the following text in all of the printed materials it distributes through its lead public education program. The owner may delete information pertaining to lead service lines upon approval by the commissioner if no lead service lines exist anywhere in the waterworks service area. Any additional information presented by a waterworks owner shall be consistent with the information below and be in plain English that can be understood by lay people.~~

~~(1) Introduction. The United States Environmental Protection Agency (EPA) and (insert name of waterworks) are concerned about lead in your drinking water. Some drinking water samples taken from this facility have lead levels above the EPA action level of 15 parts per billion (ppb), or 0.015 milligrams of lead per liter (mg/L)of water. Under federal law we are required to have a program in place to minimize lead in your drinking water by (insert date when corrosion control will be completed for your waterworks). This program includes corrosion control treatment, water supply treatment, and public education. We are also required to replace the portion of each lead service line that we own if the line contributes lead concentrations of more than 15 ppb after we have completed the comprehensive treatment program. If you have any questions about how we are carrying out the requirements of the lead regulation, please give us a call at (insert waterworks phone number). This brochure explains the simple steps you can take to protect yourself by reducing your exposure to lead in drinking water.~~

~~(2) Health effects of lead. Lead is found throughout the environment in lead based paint, air, soil, household dust, food, certain types of pottery, porcelain and pewter, and water. Lead can pose a significant risk to your health if too much of it enters your body. Lead builds up in the body over many years and can cause damage to the brain, red blood cells and kidneys. The greatest risk is to young children and pregnant women. Amounts of lead that won't hurt adults can slow down normal mental and physical development of growing bodies. In addition, a child at play often comes into contact with sources of lead contamination like dirt and dust that rarely affect an adult. It is important to wash children's hands and toys often, and to try to make sure they only put food in their mouths.~~

~~(3) Lead in drinking water.~~

(a) Lead in drinking water, although rarely the sole cause of lead poisoning, can significantly increase a person's total lead exposure, particularly the exposure of infants who drink baby formulas and concentrated juices that are mixed with water. The EPA estimates that drinking water can make up 20% or more of a person's total exposure to lead.

(b) Lead is unusual among drinking water contaminants in that it seldom occurs naturally in water supplies like rivers and lakes. Lead enters drinking water primarily as a result of the corrosion, or wearing away, of materials containing lead in the water distribution system and household plumbing. These materials include lead based solder used to join copper pipe, brass and chrome plated brass faucets, and in some cases, pipes made of lead that connect houses and buildings to water mains (service lines). In 1986, Congress banned the use of lead solder containing greater than 0.2% lead, and restricted the lead content of faucets, pipes and other plumbing materials to 8.0%.

(c) When water stands in lead pipes or plumbing systems containing lead for several hours or more, the lead may dissolve into your drinking water. This means the first water drawn from the tap in the morning, or later in the afternoon if the water has not been used all day, can contain fairly high levels of lead.

(4) Steps you can take to reduce exposure to lead in drinking water.

(a) Let the water run from the tap before using it for drinking or cooking any time the water in a faucet has gone unused for more than six hours. The longer water resides in plumbing the more lead it may contain. Flushing the tap means running the cold water faucet for about 15 to 30 seconds. Although toilet flushing or showering flushes water through a portion of the plumbing system, you still need to flush the water in each faucet before using it for drinking or cooking. Flushing tap water is a simple and inexpensive measure you can take to protect your health. It usually uses less than one gallon of water.

(b) Do not cook with or drink water from the hot water tap. Hot water can dissolve more lead more quickly than cold water. If you need hot water, draw water from the cold tap and then heat it.

(c) The steps described above will reduce the lead concentrations in your drinking water. However, if you are still concerned, you may wish to use bottled water for drinking and cooking.

(d) 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:

(i) (Insert the name or title of facility official if appropriate) at (insert phone number) can provide you with information about your facility's water supply; and

(ii) The Medical Director of (Insert the name of the city or county Health Department), and the Virginia Department of Health, Division of Child and Adolescent Health, Lead Safe Virginia Program Director at 1-877-668-7987 can provide you with information about the health effects of lead.

2. Content of broadcast materials. An owner shall include the following information in all public service announcements submitted under the 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 $ per sample). You can contact the (insert the name of the waterworks) 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 waterworks).

3. 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. The owner of a community waterworks that exceeds the lead action level on the basis of tap water samples collected in accordance with 12VAC5-590-370 B 6 a, and that is not already repeating public education tasks pursuant to subdivisions F 3 e, F 3 g, or F 3 h of this section, shall, within 60 days:

(1) Insert notices in each customer's water utility bill containing the information in subdivision F 1 of this section, 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." The owner of a community waterworks having a billing cycle that does not include a billing within 60 days of exceeding the action level, or that cannot insert information in the water utility bill without making major changes to its billing system, may use a separate mailing to deliver the information in

~~subdivision F 1 a of this section as long as the information is delivered to each customer within 60 days of exceeding the action level. The owner of such waterworks shall also include the "alert" language specified in this paragraph.~~

~~(2) Submit the information in subdivision F 1 of this section to the editorial departments of the major daily and weekly newspapers circulated throughout the community.~~

~~(3) Deliver pamphlets and/or brochures that contain the public education materials in subdivisions F 1 b and d of this section to facilities and organizations, including the following:~~

~~(a) Public schools and/or local school boards;~~

~~(b) City or county health department;~~

~~(c) Women, Infants, and Children and/or Head Start Program(s) whenever available;~~

~~(d) Public and private hospitals and/or clinics;~~

~~(e) Pediatricians;~~

~~(f) Family planning clinics; and~~

~~(g) Local welfare agencies.~~

~~(4) Submit the public service announcement in subdivision F 2 of this section to at least five of the radio and television stations with the largest audiences that broadcast to the community served by the waterworks.~~

~~c. The owner of a community waterworks shall repeat the tasks contained in subdivisions F 3 b (1), (2), and (3) of this section every 12 months, and the tasks contained in subdivision F 3 b (4) of this section every six months for as long as the waterworks exceeds the lead action level.~~

~~d. Within 60 days after it exceeds the lead action level (unless it already is repeating public education tasks pursuant to subdivision F 3 e of this section), the owner of a nontransient noncommunity waterworks shall deliver the public education materials contained in subdivisions F 1 a or the public education materials specified by subdivision F 1 b of this section 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 waterworks; and~~

~~(2) Distribute informational pamphlets and/or brochures on lead in drinking water to each person served by the nontransient noncommunity waterworks. The commissioner may allow the waterworks owner to utilize electronic transmission in lieu of or combined with printed materials as long as it achieves at least the same coverage.~~

~~e. The owner of a nontransient noncommunity waterworks shall repeat the tasks contained in subdivision F 3 d of this section at least once during each calendar year in which the waterworks exceeds the lead action level.~~

~~f. An owner may discontinue delivery of public education materials if the waterworks has met the lead action level during the most recent six-month monitoring period conducted pursuant to 12VAC5-590-370-B-6-a. The owner shall recommence public education in accordance with this section if the waterworks subsequently exceeds the lead action level during any monitoring period.~~

~~g. The owner of a community waterworks may apply to the district engineer, in writing, (unless the commissioner has waived the requirement for prior approval) to use the text specified in subdivision F 1 b of this section in lieu of the text in subdivision F 1 a of this section and to perform the tasks listed in subdivisions F 3 d and F 3 e of this section in lieu of the tasks in subdivisions F 3 b and F 3 c of this section if:~~

~~(1) The waterworks serves a facility, such as a prison or a hospital, where the population served is not capable of or is prevented from making improvements to plumbing or installing point of use treatment devices; and~~

~~(2) The owner provides water as part of the cost of services provided and does not separately charge for water consumption.~~

~~h. The owner of a community water system serving 3,300 or fewer people may omit the task contained in subdivision F 3 b (4) of this section. As long as the owner distributes notices containing the information contained in subdivision F 1 a of this section to every household served by the waterworks, such waterworks owners may further limit their public education programs as follows:~~

~~(1) Waterworks serving 500 or fewer people may forego the task contained in subdivision F 3 b (2) of this section. Such an owner may limit the distribution of the public education materials required under subdivision F 3 b (3) of this section to facilities and organizations served by the waterworks that are most likely to be visited regularly by pregnant women and children, unless it is notified by the commissioner in writing that it must make a broader distribution.~~

~~(2) If approved by the commissioner in writing, the owner of a waterworks serving 501 to 3,300 people may omit the task in subdivision F 3 b (2) of this section and/or limit the distribution of the public education materials required under subdivision F 3 b (3) of this section to facilities and organizations served by the~~

~~waterworks that are most likely to be visited regularly by pregnant women and children.~~

~~i. The owner of a community waterworks serving 3,300 or fewer people who delivers public education in accordance with subdivision F 3 h of this section shall repeat the required public education tasks at least once during each calendar year in which the waterworks exceeds the lead action level.~~

~~4. Supplemental monitoring and notification of results. The owner of a waterworks that fails to meet the lead action level on the basis of tap samples collected in accordance with 12VAC5-590-370 B 6 a shall offer to sample the tap water of any customer who requests it. The owner is not required to pay for collecting or analyzing the sample, nor is the owner required to collect and analyze the sample itself.~~

G. Beginning January 1, 1993, each owner shall certify annually in writing to the commissioner (using third party or manufacturer's certification) that, when polymers containing acrylamide or epichlorohydrin are used by the waterworks in drinking water systems, the combination (or product) of dose and monomer level does not exceed the following specified levels: Acrylamide = 0.05% dosed at 1 ppm (or equivalent) of polymer. Epichlorohydrin = 0.01% dosed at 20 ppm (or equivalent) of polymer. Certifications may rely on manufacturers or third parties, as approved by the commissioner.

H. Treatment technique for control of disinfection byproduct (DBPP) precursors.

1. Applicability.

a. Waterworks that use surface water or groundwater under the direct influence of surface water using conventional filtration treatment shall operate with enhanced coagulation or enhanced softening to achieve the TOC percent removal levels specified in subdivision H 2 of this section unless the waterworks meets at least one of the alternative compliance criteria listed in subdivision H 1 b or c of this section.

b. Alternative compliance criteria for enhanced coagulation and enhanced softening waterworks. Owners of waterworks that use surface water or groundwater under the direct influence of surface water provided with conventional filtration treatment may use the alternative compliance criteria in subdivisions H 1 b (1) through (6) of this section to comply with this section in lieu of complying with subdivision H 2 of this section. Owners shall still comply with monitoring requirements in 12VAC5-590-370 B 3 i.

(1) The waterworks' source water TOC level, measured according to 12VAC5-590-440, is less than 2.0 mg/L, calculated quarterly as a running annual average.

(2) The waterworks' treated water TOC level, measured according to 12VAC5-590-440, is less than 2.0 mg/L, calculated quarterly as a running annual average.

(3) The waterworks' source water TOC level, measured according to 12VAC5-590-440, is less than 4.0 mg/L, calculated quarterly as a running annual average; the source water alkalinity, measured according to 12VAC5-590-440, 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 12VAC590-370 B 3 a, the owner has made a clear and irrevocable financial commitment not later than the effective date for compliance in 12VAC590-370 B 3 a 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. Owners shall 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 commissioner for approval not later than the effective date for compliance in 12VAC590-370 B 3 a. These technologies shall 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 violation of these regulations.

(4) The TTHM and HAA5 running annual averages are no greater than 0.040 mg/L and 0.030 mg/L, respectively, and the waterworks uses only chlorine for primary disinfection and maintenance of a residual in the distribution system.

(5) The waterworks' source water SUVA, prior to any treatment and measured monthly according to 12VAC5-590-440, is less than or equal to 2.0 L/mg-m, calculated quarterly as a running annual average.

(6) The waterworks' finished water SUVA, measured monthly according to 12VAC5-590-440, is less than or equal to 2.0 L/mg-m, calculated quarterly as a running annual average.

c. Additional alternative compliance criteria for softening waterworks. Waterworks practicing enhanced softening that cannot achieve the TOC removals required by subdivision H 2 b of this section may use the alternative compliance criteria in subdivisions H 1 c (1) and (2) of this section in lieu of complying with subdivision H 2 of this section. Owners shall still comply with monitoring requirements in 12VAC5-590-370 B 3 i.

(1) Softening that results in lowering the treated water alkalinity to less than 60 mg/L (as $CaCO_3$), measured monthly according to 12VAC5-590-440 and calculated quarterly as a running annual average.

(2) Softening that results in removing at least 10 mg/L of magnesium hardness (as $CaCO_3$), measured monthly according to 12VAC5-590-440 and calculated quarterly as a running annual average.

2. Enhanced coagulation and enhanced softening performance requirements.

a. Waterworks shall achieve the percent reduction of TOC specified in subdivision H 2 b of this section between the source water and the combined filter effluent, unless the commissioner approves a waterworks' request for alternate minimum TOC removal (Step 2) requirements under subdivision H 2 c of this section.

b. Required Step 1 TOC reductions, indicated in the following table, are based upon specified source water parameters measured in accordance with 12VAC5-590-440. Waterworks practicing softening are required to meet the Step 1 TOC reductions in the far-right column (Source water alkalinity greater than 120 mg/L) for the specified source water TOC:

Step 1 Required Removal of TOC by Enhanced Coagulation and Enhanced Softening for Community or Nontransient Noncommunity Waterworks That Use Surface Water or Groundwater Under the Direct Influence of Surface Water Using Conventional Treatment [1, 2]

Source-water TOC mg/L	Source-water alkalinity, mg/L as $CaCO_3$		
	0-60	greater than 60-120	greater than 120[3]
greater than 2.0 - 4.0	35.0%	25.0%	15.0%
greater than 4.0 - 8.0	45.0%	35.0%	25.0%
greater than 8.0	50.0%	40.0%	30.0%

[1]Waterworks meeting at least one of the conditions in subdivisions H 1 b (1) through (6) of this section are not required to operate with enhanced coagulation.

[2]Softening waterworks meeting one of the alternative compliance criteria in subdivision H 1 c of this section are not required to operate with enhanced softening.

[3]Waterworks practicing softening shall meet the TOC removal requirements in this column.

c. Waterworks that use surface water or groundwater under the direct influence of surface water with conventional treatment systems that cannot achieve the Step 1 TOC removals required by subdivision H 2 b of this section due to water quality parameters or operational constraints shall apply to the commissioner, within three months of failure to achieve the TOC removals required by subdivision H 2 b of this section, for approval of alternative minimum TOC (Step 2) removal requirements submitted by the waterworks. If the commissioner approves the alternative minimum TOC removal (Step 2) requirements, the commissioner may make those requirements retroactive for the purposes of determining compliance. Until the commissioner approves the alternate minimum TOC removal (Step 2) requirements, the owner shall meet the Step 1 TOC removals contained in subdivision H 2 b of this section.

d. Alternate minimum TOC removal (Step 2) requirements. Applications, made to the commissioner by waterworks using enhanced coagulation, for approval of alternative minimum TOC removal (Step 2) requirements under subdivision H 2 c of this section shall include, at a minimum, results of bench- or pilot-scale testing conducted under subdivision H 2 d (1) of this section. The submitted bench- or pilot-scale testing shall be used to determine the alternate enhanced coagulation level.

(1) Alternate enhanced coagulation level is defined as coagulation at a coagulant dose and pH as determined by the method described in subdivisions H 2 d (1) through (5) of this section such that an incremental addition of 10 mg/L of alum (or equivalent amount of ferric salt) results in a TOC removal of equal to or less than 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 waterworks. Once approved by the commissioner, this minimum requirement supersedes the minimum TOC removal required by the table in subdivision H 2 b of this section. This requirement will be effective until such time as the commissioner approves a new value based on the results of a new bench- and pilot-scale test. Failure to achieve the alternative minimum TOC removal levels set by the commissioner is a violation of these regulations.

(2) Bench- or pilot-scale testing of enhanced coagulation shall 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
greater than 60-120	6.3
greater than 120-240	7.0
greater than 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 owner shall 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 owner may operate at any coagulant dose or pH necessary (consistent with other sections of these regulations) to achieve the minimum TOC percent removal approved under subdivision H 2 c of this section.

(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 waterworks may then apply to the commissioner for a waiver of enhanced coagulation requirements.

3. Compliance calculations.

a. Owners of waterworks that use surface water or groundwater under the direct influence of surface water other than those identified in subdivision H 1 b or H 1 c of this section shall comply with requirements contained in subdivision H 2 b or H 2 c of this section. Owners shall calculate compliance quarterly, beginning after the waterworks has collected 12 months of data, by determining an annual average using the following method:

(1) Determine actual monthly TOC percent removal, equal to:

(1-(treated water TOC/source water TOC))X100

(2) Determine the required monthly TOC percent removal (from either the table in subdivision H 2 b of this section or from subdivision H 2 c of this section).

(3) Divide the value in subdivision H 3 a (1) of this section by the value in subdivision H 3 a (2) of this section.

(4) Add together the results of subdivision H 3 a (3) of this section for the last 12 months and divide by 12.

(5) If the value calculated in subdivision H 3 a (4) of this section is less than 1.00, the waterworks is not in compliance with the TOC percent removal requirements.

b. Owners may use the provisions in subdivisions H 3 b (1) through (5) of this section in lieu of the calculations in subdivisions H 3 a (1) through (5) of this section to determine compliance with TOC percent removal requirements.

(1) In any month that the waterworks' treated or source water TOC level, measured according to 12VAC5-590-440, is less than 2.0 mg/L, the owner may assign a monthly value of 1.0 (in lieu of the value calculated in subdivision H 3 a (3) of this section) when calculating compliance under the provisions of subdivision H 3 a of this section.

(2) In any month that a waterworks practicing softening removes at least 10 mg/L of magnesium hardness (as $CaCO_3$), the waterworks may assign a monthly value of 1.0 (in lieu of the value calculated in subdivision H 3 a (3) of this section) when calculating compliance under the provisions of subdivision H 3 a of this section.

(3) In any month that the waterworks' source water SUVA, prior to any treatment and measured according to 12VAC5-590-440, is equal to or less than 2.0 L/mg-m, the owner may assign a monthly value of 1.0 (in lieu of the value calculated in subdivision H 3 a (3) of this section) when calculating compliance under the provisions of subdivision H 3 a of this section.

(4) In any month that the waterworks' finished water SUVA, measured according to 12VAC5-590-440, is equal to or less than 2.0 L/mg-m, the owner may assign a monthly value of 1.0 (in lieu of the value calculated in subdivision H 3 a (3) of this section) when calculating compliance under the provisions of subdivision H 3 a of this section.

(5) In any month that a waterworks practicing enhanced softening lowers alkalinity below 60 mg/L (as $CaCO_3$), the owner may assign a monthly value of 1.0 (in lieu of the value calculated in subdivision H 3 a (3) of this section) when calculating compliance under the provisions of subdivision H 3 a of this section.

c. Waterworks that use surface water or groundwater under the direct influence of surface water and using conventional treatment may also comply with the requirements of this section by meeting the criteria in subdivision H 1 b or c of this section.

4. Enhanced coagulation or enhanced softening is the treatment technique required to control the level of DBP precursors in drinking water treatment and distribution systems for waterworks using surface water or groundwater under the direct influence of surface water and using conventional treatment.

I. The best technology, treatment techniques, or other means available for achieving compliance with the maximum contaminant levels for disinfection byproducts show in Table 2.13 are listed below:

1. The best technology, treatment techniques, or other means available for achieving compliance with the maximum contaminant levels for bromate and chlorite:

Disinfection byproduct	Best available technology
Bromate	Control of ozone treatment process to reduce production of bromate.
Chlorite	Control of treatment processes to reduce disinfectant demand and control of disinfection treatment processes to reduce disinfectant levels

2. The best technology, treatment techniques, or other means available for achieving compliance with the running annual average maximum contaminant levels for TTHM and HAA5:

Disinfection byproduct	Best available technology
Total trihalomethanes (TTHM) and Haloacetic acids (five) (HAA5)	Enhanced coagulation or enhanced softening or GAC10, with chlorine as the primary and residual disinfectant

3. The best technology, treatment techniques, or other means available for achieving compliance with the locational running annual average maximum contaminant levels for TTHM and HAA5 for all systems that disinfect their source water:

Disinfection byproduct	Best available technology
Total trihalomethanes (TTHM) and Haloacetic acids (five) (HAA5)	Enhanced coagulation or enhanced softening, plus GAC10; or nanofiltration with a molecular weight cutoff less than or equal to 1000 Daltons; or GAC20

4. The best technology, treatment techniques, or other means available for achieving compliance with the locational running annual average maximum contaminant levels for TTHM and HAA5 for consecutive systems and applies only to the disinfected water that consecutive systems buy or otherwise receive:

Disinfection byproduct	Best available technology
Total trihalomethanes (TTHM) and Haloacetic acids (five) (HAA5)	Systems serving equal to or greater than 10,000: Improved distribution system and storage tank management to reduce residence time, plus the use of chloramines for disinfectant residual maintenance Systems serving less than 10,000: Improved distribution system and storage tank management to reduce residence time

J. The best technology, treatment techniques, or other means available for achieving compliance with the maximum residual disinfectant levels identified in Table 2.12 is the control of treatment processes to reduce disinfectant demand and control of disinfection treatment processes to reduce disinfectant levels.

K. If spent filter backwash water, thickener supernatant, or liquids from dewatering processes are recycled, in any waterworks supplied by a surface water source and waterworks supplied by a groundwater source under the direct influence of surface water that employ conventional filtration or direct filtration treatment, then they are subject to the recycle treatment technique requirement. Under this requirement recycle flows shall be returned through all the processes of the treatment system, or an alternative location approved by the state, by June 8, 2004.

L. Waterworks with uncovered finished water storage facilities shall comply with the requirements to cover the facility or treat the discharge from the facility as described in this paragraph.

1. Waterworks using uncovered finished water storage facilities shall comply with the conditions of this section.

2. Owners shall notify the commissioner of the use of each uncovered finished water storage facility no later than April 1, 2008.

3. Owners shall meet the conditions of subdivision L 3 a or b of this section for each uncovered finished water storage facility or be in compliance with a State-approved schedule to meet these conditions no later than April 1, 2009.

a. All uncovered finished water storage facilities shall be covered.

b. Waterworks shall treat the discharge from the uncovered finished water storage facility to the distribution system to achieve inactivation and/or removal of at least 4-log virus, 3-log Giardia lamblia, and 2-log Cryptosporidium using a protocol approved by the commissioner.

4. Failure to comply with the requirements of this section is a violation of the treatment technique requirement.

12VAC5-590-530. Reporting.

A. The results of any required monitoring activity shall be reported by the owner (or their authorized agent) to the ODW no later than the 10th day of the month following the month during which the tests were taken. The results of any required monitoring activity shall be reported by the owner in a format prescribed by the commissioner.

1. Owners of waterworks required to sample quarterly shall report to the ODW within 10 days after the end of each quarter in which samples were collected.

2. Owners of waterworks required to sample less frequently than quarterly shall report to the district engineer within 10 days after the end of each monitoring period in which samples were collected.

B. It shall be the duty and responsibility of an owner to report to the ODW in the most expeditious manner (usually by telephone) under the following circumstances. If it is done by telephone a confirming report shall be mailed as soon as practical.

1. When a bacteriological examination shows a repeat sample is required (see 12VAC5-590-380 D), a report shall be made within 48 hours. An owner shall report a total coliform PMCL violation to the district engineer no later than the end of the next business day.

2. When the daily average of turbidity testing exceeds 5 NTU a report shall be made within 48 hours.

3. When a PMCL of an inorganic or organic chemical is exceeded for a single sample the owner shall report same within seven days. If any one sample result would cause the compliance average to be exceeded the owner shall report same in 48 hours.

4. When the average value of samples collected pursuant to 12VAC5-590-410 exceeds the PMCL of any organic or inorganic chemical the owner shall report same within 48 hours.

5. When the maximum contaminant level for radionuclides has been exceeded as determined by Table 2.5 the results shall be reported within 48 hours.

6. The owner shall report to the district engineer within 48 hours the failure to comply with the monitoring and sanitary survey requirements of this chapter.

7. The owner shall report to the district engineer within 48 hours the failure to comply with the requirements of any schedule prescribed pursuant to a variance or exemption.

8. The owner shall report a Tier 1 violation or situation, as described in 12VAC5-590-540 A 1, to the district engineer as soon as practical, but no later than 24 hours after the owner learns of the Tier 1 violation or situation. At the same time the report is made, the owner shall consult with the field office to determine the need for any additional actions to address the violation or situation.

9. The owner shall report a violation of treatment technique requirement resulting from a single exceedance of the maximum allowable turbidity limit, as described in 12VAC5-590-420 B 2 a (2), B 2 a (3) (b), B 2 b (2), B 2 c (2), and B 2 d, to the district engineer as soon as practical, but no later than 24 hours after the owner learns of the violation. At the same time the report is made, the owner shall consult with the field office to determine the need for any additional actions to address the violation or situation.

C. Reporting requirements for filtration treatment and disinfection treatment.

1. The owner of a waterworks that provides filtration treatment shall report monthly to the commissioner the following specified information beginning June 29, 1993, or when filtration is installed, whichever is later.

a. Turbidity measurements as required by 12VAC5-590-370 B 7 a shall be reported within 10 days after the end of each month the waterworks serves water to the public. Information that shall 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 12VAC5-590-420 B 2 for the filtration technology being used.

(3) The date and value of any turbidity measurements taken during the month which exceed 5 NTU.

b. The owner of a waterworks using surface water or groundwater under the direct influence of surface water that provides conventional filtration treatment or direct filtration shall report monthly to the commissioner the information specified in subdivisions C 1 a (1) and (2) of this section. Also, the owner of a waterworks that provides filtration approved under 12VAC5-590-420 B 2 d shall report monthly to the commissioner the information specified in subdivision C 1 a (1) of this section.

(1) Turbidity measurements as required by 12VAC5-590-420 B 2 a (3) shall be reported within 10 days after the end of each month the system serves water to the public. Information that shall be reported includes:

(a) The total number of filtered water turbidity measurements taken during the month.

(b) The number and percentage of filtered water turbidity measurements taken during the month that are less than or equal to the turbidity limits specified in 12VAC5-590-420 B 2 a (3) or 12VAC5-590-420 B 2 d.

(c) The date and value of any turbidity measurements taken during the month that exceed 1 NTU for systems using conventional filtration treatment or direct filtration, or that exceed the maximum level set by the commissioner under 12VAC590-420 B 2 d.

(2) The owner shall maintain the results of individual filter monitoring taken under 12VAC5-590-370 B 7 b (1) for at least three years. The owner shall report that he has conducted individual filter turbidity monitoring under 12VAC5-590-370 B 7 b (1) within 10 days after the end of each month the waterworks serves water to the public. Owners shall report individual filter turbidity measurement results taken under 12VAC5-590-370 B 7 b (1) within 10 days after the end of each month the waterworks serves water to the public only if measurements demonstrate one or more of the conditions

in subdivisions C 1 b (2) (a) or (b) of this section. The owners of waterworks that use lime softening may apply to the commissioner for alternative exceedance levels for the levels specified in subdivisions C 1 b (2) (a) or (b) of this section if they can demonstrate that higher turbidity levels in individual filters are due to lime carryover only and not due to degraded filter performance.

(a) For waterworks serving 10,000 or more people:

(i) 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 owner shall report the filter number, the turbidity measurement, and the date, or dates, on which the exceedance occurred. In addition, the owner shall either produce a filter profile for the filter within seven days of the exceedance (if the owner 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.

(ii) 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 owner shall report the filter number, the turbidity, and the date, or dates, on which the exceedance occurred. In addition, the owner shall either produce a filter profile for the filter within seven days of the exceedance (if the owner 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.

(iii) 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 of three consecutive months, the owner shall report the filter number, the turbidity measurement, and the date, or dates, on which the exceedance occurred. In addition, the owner shall conduct a self-assessment of the filter within 14 days of the exceedance and report that the self-assessment was conducted. The self-assessment shall 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.

(iv) 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 of two consecutive months, the owner shall report the filter number, the turbidity measurement, and the date, or dates, on which the exceedance occurred. In addition, the owner shall arrange for the conduct of a comprehensive performance evaluation by the commissioner or a third party approved by the commissioner no later than 30 days following the exceedance and have the evaluation completed and submitted to the commissioner no later than 90 days following the exceedance.

(b) For waterworks serving less than 10,000 people:

(i) For any individual filter (or the turbidity of combined filter effluent for systems with two filters that monitor combined filter effluent in lieu of individual filters) that has a measured turbidity level of greater than 1.0 NTU in two consecutive measurements taken 15 minutes apart, the owner shall report the filter number(s), the turbidity measurement(s), and the date, or dates, on which the exceedance occurred and the cause (if known) for the exceedance(s).

(ii) For any individual filter (or the turbidity of combined filter effluent for systems with two filters that monitor combined filter effluent in lieu of individual filters) 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 of three consecutive months, the owner shall conduct a self-assessment of the filter(s) within 14 days of the day the filter exceeded 1.0 NTU unless a comprehensive performance evaluation as specified in paragraph (iii) of this section was required. Owners of waterworks with two filters that monitor the combined filter effluent in lieu of individual filters shall conduct a self assessment on both filters. The self-assessment shall be reported to the commissioner and consist of at least the following components: date self-assessment was triggered; date the self-assessment was completed; 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. The self assessment shall be submitted within 10 days after the end of the month or 14 days after the self assessment was triggered only if it was triggered during the last four days of the month.

(iii) For any individual filter (or the turbidity of combined filter effluent for systems with two filters that monitor combined filter effluent in lieu of individual filters) 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 of two consecutive months, the owner shall arrange for a comprehensive performance evaluation by the commissioner or a third party approved by the commissioner no later than 60 days following the day the filter exceeded 2.0 NTU in two consecutive months. The owner shall report within 10 days after the end of the month that a comprehensive performance evaluation is required and the date that it

was triggered. If a comprehensive performance evaluation has been completed by the commissioner or a third party approved by the commissioner within the 12 prior months or the owner and the commissioner are jointly participating in an ongoing Comprehensive Technical Assistance project at the waterworks, a new comprehensive performance evaluation is not required. If conducted, a comprehensive performance evaluation shall be completed and submitted to the commissioner no later than 120 days following the day the filter exceeded 2.0 NTU in two consecutive measurements for the second straight month.

c. Reporting source water monitoring results.

(1) Owners shall report results from the source water monitoring required in 12VAC5-590-420 B 3 a no later than 10 days after the end of the first month following the month when the sample is collected.

(2) Owners shall report the applicable information in (a) and (b) as follows for the source water monitoring required in 12VAC5-590-420 B 3 a.

(a) Owners shall report the following data elements for each Cryptosporidium analysis:

Data element
PWS ID
Facility ID
Sample collection date
Sample type (field or matrix spike)
Sample volume filtered (L), to nearest ¼ L
Was 100% of filtered volume examined
Number of oocysts counted

(i) For matrix spike samples, the owner shall also report the sample volume spiked and estimated number of oocysts spiked. These data are not required for field samples.

(ii) For samples in which less than 10 L is filtered or less than 100% of the sample volume is examined, the owner shall also report the number of filters used and the packed pellet volume.

(iii) For samples in which less than 100% of sample volume is examined, the owner shall also report the volume of resuspended concentrate and volume of this resuspension processed through immunomagnetic separation.

(b) Owners shall report the following data elements for each E. coli analysis:

Data element
1. PWS ID
2. Facility ID
3. Sample collection date
4. Analytical method number
5. Method type
6. Source type (flowing stream, lake/reservoir, GUDI)
7. E. coli/100 mL
8. Turbidity[a]
[a]Owners of waterworks serving fewer than 10,000 people that are not required to monitor for turbidity under in 12VAC5-590-420 B 3 a are not required to report turbidity with their E. coli results.

2. Disinfection information specified below shall be reported to the district engineer within 10 days after the end of each month the waterworks serves water to the public. Information that shall be reported includes:

a. For each day, the lowest measurement of residual disinfectant concentration in mg/L in water entering the distribution system.

b. The date and duration of each period when the residual disinfectant concentration in water entering the distribution system fell below 0.2 mg/L and when the district engineer was notified of the occurrence.

c. The following information on the samples taken in the distribution system in conjunction with total coliform monitoring pursuant to 12VAC5-590-420 B.

(1) Number of instances where the residual disinfectant concentration is measured;

(2) Number of instances where the residual disinfectant concentration is not measured but HPC is measured;

(3) Number of instances where the residual disinfectant concentration is measured but not detected and no HPC is measured;

(4) Number of instances where no residual disinfectant concentration is detected and where HPC is greater than 500/mL;

(5) Number of instances where the residual disinfectant concentration is not measured and HPC is greater than 500/mL;

(6) For the current and previous month the system serves water to the public, the value of "V" in percent in the following formula:

$$V = \frac{c + d + e}{a + b} \quad X\ 100$$

a = the value in subdivision C 2 c (1) of this section

b = the value in subdivision C 2 c (2) of this section

c = the value in subdivision C 2 c (3) of this section

d = the value in subdivision C 2 c (4) of this section

e = the value in subdivision C 2 c (5) of this section

(7) If the division determines, based on site specific considerations, that a waterworks owner has no means for having a sample transported and analyzed for HPC by a certified laboratory within the requisite time and temperature conditions and that the waterworks is providing adequate disinfection in the distribution system, the requirements of subdivision C 2 c (1) through (6) of this section do not apply.

d. An owner need not report the data listed in subdivision C 2 a of this section if all data listed in subdivisions C 2 a through c of this section remain on file at the waterworks and the commissioner determines that the owner has submitted all of the information required by subdivisions C 2 a through c of this section for the last 12 months.

3. If at any time the chlorine residual falls below 0.2 mg/L in the water entering the distribution system, the owner shall notify the district engineer as soon as possible, but no later than by the end of the next business day. The owner also shall notify the district engineer by the end of the next business day whether or not the residual was restored to at least 0.2 mg/L within four hours.

D. Reporting requirements for lead and copper. All owners shall report all of the following information to the district engineer in accordance with this subsection.

1. Reporting requirements for tap water monitoring for lead and copper and for water quality parameter monitoring.

a. ~~An~~ Except as provided in subdivision D 1 a (7) of this section, an owner shall report the information specified below for all tap water samples specified in 12VAC5-90-375 B and for all water quality parameter samples specified in 12VAC5-590-375 C within the first 10 days following the end of each applicable monitoring period specified in ~~12VAC5-590-370 B 6 a, b and c (i.e., every six months, annually, or every three years)~~ 12VAC5-590-375 B and 12VAC5-590-375 C (i.e., every six months, annually, every three years, or every nine years). For monitoring periods with a duration less than six months, the end of the monitoring period is the last date samples can be collected during the period as specified in 12VAC5-590-375 B and 12VAC5-590-375 C.

(1) The results of all tap samples for lead and copper including location or a location site code and the criteria under ~~12VAC5-590-370 B 6 a (1) (c), (d), (e), (f) and/or (g)~~ 12VAC5-590-375 B 1 c through 12VAC5-590-375 B 1 f or 12VAC5-590-375 C under which the site was selected for the waterworks' sampling pool~~;~~.

(2) ~~A certification that each first draw sample collected is one-liter in volume and, to the best of their knowledge, has stood motionless in the service line, or in the interior plumbing of a sampling site, for at least six hours;~~ Documentation for each tap water lead or copper sample for which the owner requests invalidation pursuant to 12VAC5-590-375 B 6.

~~(3) Where residents collected samples, a certification that each tap sample collected by the residents was taken after the owner informed them of proper sampling procedures specified in 12VAC5-590-370 B 6 a (2) (b);~~

~~(4)~~ (3) 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 12VAC5-590-410 E 3);~~ (calculated in accordance with 12VAC5-590-385 C) unless the district engineer calculates the 90th percentile lead and copper levels under subdivision D 8 of this section.

~~(5)~~ (4) With the exception of initial tap sampling conducted pursuant to ~~12VAC5-590-370 B 6 a (4) (a)~~ 12VAC5-590-375 B 4 a, the owner shall designate any site that was not sampled during previous monitoring periods, and include an explanation of why sampling sites have changed~~;~~.

~~(6)~~ (5) The results of all tap samples for pH, and where applicable, alkalinity, calcium, conductivity, temperature, and orthophosphate or silica collected under ~~12VAC5-590-370 B 6 b (2) through (5)~~ 12VAC5-590-375 C 2 through 12VAC5-590-375 C 5~~;~~.

~~(7)~~ (6) The results of all samples collected at the entry point(s) to the distribution system for applicable water quality parameters under ~~12VAC5-590-370 B 6 b (2) through (5)~~ 12VAC5-590-375 C 2 through 12VAC5-590-375 C 5.

(7) The owner shall report the results of all water quality parameter samples collected under 12VAC5-590-375 C 3 through 12VAC5-590-375 C 6 during each six month monitoring period specified in 12VAC5-590-375 C 4 within the first ten days following the end of the monitoring period unless the commissioner has specified a more frequent reporting requirement.

b. ~~By the applicable date in 12VAC5-590-370 B 6 a (4) (a) for commencement of monitoring, the owner of each community waterworks that does not complete the~~

~~targeted sampling pool with tier 1 sampling sites meeting the criteria in 12VAC5-590-370 B 6 a (1) (c) shall send a letter to the district engineer justifying the selection of tier 2 and/or tier 3 sampling sites under 12VAC5-590-370 B 6 a (1) (d) and/or (e).~~ The owner of a nontransient noncommunity waterworks, or a community waterworks meeting the criteria of 12VAC5-590-405 D 2 e, that does not have enough taps that can provide first-draw samples, must either:

(1) Provide written documentation to the commissioner identifying standing times and locations for enough non-first-draw samples to make up the sampling pool under 12VAC5-590-375 B 2 e by the start of the first applicable monitoring period under 12VAC5-590-375 B 4, unless the commissioner has waived prior approval of non-first-draw sample sites selected by the owner pursuant to 12VAC5-590-375 B 2 e; or

(2) If the commissioner has waived prior approval of non-first-draw sample sites selected by the owner, identify, in writing, each site that did not meet the six hour minimum standing time and the length of standing time for that particular substitute sample collected pursuant to 12VAC5-590-375 B 2 e and include this information with the lead and copper sample results required to be submitted pursuant to subdivision D 1 a (1) of this section.

c. ~~By the applicable date in 12VAC5-590-370 B 6 a (4) (a) for commencement of monitoring, the owner of each nontransient, noncommunity waterworks that does not complete the sampling pool with tier 1 sampling sites meeting the criteria in 12VAC5-590-370 B 6 a (1) (f) shall send a letter to the appropriate field office justifying the selection of sampling sites under 12VAC5-590-370 B 6 a (1) (g).~~ At a time specified by the commissioner, or if no specific time is designated by the commissioner, then as early as possible prior to the addition of a new source or any long-term change in water treatment, an owner deemed to have optimized corrosion control under 12VAC5-590-405 A 2 b (3); an owner subject to reduced monitoring pursuant to 12VAC5-590-375 B 4 d; or an owner subject to a monitoring waiver pursuant to 12VAC5-590-375 B 7, shall submit written documentation to the district engineer describing the change or addition. The district engineer must review and the commissioner must approve the addition of a new source or a long-term change in treatment before it is implemented by the owner. Examples of long-term treatment changes include the addition of a new treatment process or modification of an existing treatment process. Examples of modification include switching secondary contaminants, switching coagulants (e.g., alum to ferric chloride), switching corrosion inhibitor products (e.g., orthophosphate to blended phosphate). Long-term changes can include dose changes to existing chemicals if the waterworks is planning long-term changes to its finished water pH or residual inhibitor concentration. Long-term treatment changes would not include chemical dose fluctuations associated with daily raw water quality changes.

d. ~~By the applicable date in 12VAC5-590-370 B 6 a (4) (a) for commencement of monitoring, the owner of each waterworks with lead service lines that is not able to locate the number of sites served by such lines required under 12VAC5-590-370 B 6 a (1) (b) (i) shall send a letter to the district engineer demonstrating why the owner was unable to locate a sufficient number of such sites based upon the information listed in 12VAC5-590-370 B 6 a (1) (b).~~ The owner of any small waterworks applying for a monitoring waiver under 12VAC5-590-375 B 7 or subject to a waiver granted pursuant to 12VAC5-590-375 B 7 c, shall provide the following information to the commissioner in writing by the specified deadline:

(1) By the start of the first applicable monitoring period in 12VAC5-590-375 B 4, the owner of any small waterworks applying for a monitoring waiver shall provide the documentation required to demonstrate that it meets the waiver criteria of 12VAC5-590-375 B 7 a and 12VAC5-590-375 B 7 b.

(2) No later than nine years after the monitoring previously conducted pursuant to 12VAC5-590-375 B 7 b or 12VAC5-590-375 B 7 d (1), the owner of each small waterworks desiring to maintain its monitoring waiver shall provide the information required by 12VAC5-590-375 B 7 d (1) and 12VAC5-590-375 B 7 d (2).

(3) No later than 60 days after becoming aware that it is no longer free of lead-containing or copper-containing material, the owner of each small waterworks with a monitoring waiver shall provide written notification to the district engineer, setting forth the circumstances resulting in the lead-containing or copper-containing materials being introduced into the waterworks and what corrective action, if any, the owner plans to take to remove these materials.

e. ~~Each owner who requests that the commissioner reduce the number and frequency of sampling shall provide the information required under 12VAC5-590-370 B 6 a (4) (d).~~ The owner of each groundwater-source waterworks that limits water quality parameter monitoring to a subset of entry points under 12VAC5-590-375 C 3 c shall provide, by the commencement of such monitoring, written correspondence to the district engineer that identifies the selected entry points and includes information sufficient to demonstrate that the sites are representative of water quality and treatment conditions throughout the waterworks.

2. Water supply (source water) monitoring reporting requirements.

a. An owner shall report the sampling results for all source water samples collected in accordance with ~~12VAC5-590-370 B 6 c~~ 12VAC5-590-375 D within the first 10 days following the end of each source water monitoring period (i.e., annually, per compliance period, per compliance cycle) specified in ~~12VAC5-590-370 B 6 c~~ 12VAC5-590-375 D.

b. With the exception of the first round of source water sampling conducted pursuant to ~~12VAC5-590-370 B 6 c (2)~~ 12VAC5-590-375 D 2, the owner shall specify any site which was not sampled during previous monitoring periods, and include an explanation of why the sampling point has changed.

3. Corrosion control treatment reporting requirements. By the applicable dates under ~~12VAC5-590-420 C 2~~ 12VAC5-590-405 A 2 (a), owners shall report the following information:

a. For ~~waterworks~~ owners demonstrating that they have already optimized corrosion control, information required in ~~12VAC5-590-420 C 2 b (2) or (3)~~ 12VAC5-590-405 A 2 b (2) or 12VAC5-590-405 A 2 b (3).

b. For ~~waterworks~~ owners required to optimize corrosion control, the owner's recommendation regarding optimal corrosion control treatment under ~~12VAC5-590-420 C 1 a~~ 12VAC5-590-405 A 1 a.

c. For ~~waterworks~~ owners required to evaluate the effectiveness of corrosion control treatments under ~~12VAC5-590-420 C 1 c~~ 12VAC5-590-405 A 1 c, the information required by that subdivision.

d. For ~~waterworks~~ owners required to install optimal corrosion control designated by the commissioner under ~~12VAC5-590-420 C 1 d (1)~~ 12VAC5-590-405 A 1 d, a letter certifying that the owner has completed installing that treatment.

4. Water supply source water treatment reporting requirements. By the applicable dates in ~~12VAC5-590-420 D~~ 12VAC5-590-405 B, owners shall provide the following information to the district engineer:

a. If required under ~~12VAC5-590-420 D 2 a~~ 12VAC5-590-405 B 2 a, the owner's recommendation regarding source water treatment;

b. For ~~waterworks~~ owners required to install source water treatment under ~~12VAC5-590-420 D 2 b~~ 12VAC5-590-405 B 2 b, a letter certifying that the owner has completed installing the treatment designated by the commissioner within 24 months after the commissioner designated the treatment.

5. Lead service line replacement reporting requirements. Owners shall report the following information to the district engineer to demonstrate compliance with the requirements of ~~12VAC5-590-420 E~~ 12VAC5-590-405 C:

a. ~~Within~~ No later than 12 months after the end of a monitoring period in which a waterworks exceeds the lead action level in sampling referred to in ~~12VAC5-590-420 E 1~~ 12VAC5-590-405 C 1, the owner shall ~~demonstrate in writing~~ submit written documentation to the district engineer ~~that the owner has conducted a~~ of the materials evaluation~~, including the evaluation~~ conducted as required in ~~12VAC5-590-370 B 6 a (1)~~ 12VAC5-590-375 B 1, to identify the initial number of lead service lines in the distribution system at the time the waterworks exceeds the lead action level, and ~~shall~~ provide ~~the district engineer with~~ the ~~waterworks'~~ owner's schedule for annually replacing ~~annually~~ at least 7.0% of the initial number of lead service lines in its distribution system.

b. ~~Within~~ No later than 12 months after the end of a monitoring period in which a waterworks exceeds the lead action level in sampling referred to in ~~12VAC5-590-420 E 1~~ 12VAC5-590-405 C 1, and every 12 months thereafter, the owner shall demonstrate to the district engineer in writing that the owner has either:

(1) Replaced in the previous 12 months at least 7.0% of the initial lead service lines (or a greater number of lines specified by the commissioner under ~~12VAC5-590-420 E 6)~~ 12VAC5-590-405 C 6) in the distribution system, or

(2) Conducted sampling that demonstrates that the lead concentration in all service line samples from an individual line(s), taken pursuant to ~~12VAC5-590-370 B 6 a (7) (c)~~ 12VAC5-590-375 B 2 c, is less than or equal to 0.015 mg/L. In such cases, the total number of lines replaced and/or which meet the criteria in ~~12VAC5-590-420 E 3~~ 12VAC5-590-405 C 4 shall equal at least 7.0% of the initial number of lead lines identified under subdivision D 5 a of this section (or the percentage specified by the commissioner under ~~12VAC5-590-420 E 6)~~ 12VAC5-590-405 C 6).

c. The annual letter submitted to the district engineer under subdivision D 5 b of this section shall contain the following information:

(1) The number of lead service lines scheduled to be replaced during the previous year of the waterworks' replacement schedule;

(2) The number and location of each lead service line replaced during the previous year of the waterworks' 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.

d. ~~As soon as practicable, but in no case later than three months after a waterworks exceeds the lead action level in sampling referred to in 12VAC5-590-420 E 1, any owner seeking to rebut the presumption that it has control over the entire lead service line pursuant to 12VAC5-590-420 E 4 shall submit a letter to the district engineer describing the legal authority (e.g., state statutes, municipal ordinances, public service contracts or other applicable legal authority) which limits the waterworks owner's control over the service lines and the extent of the waterworks owner's control.~~ The owner of any waterworks that collects lead service line samples following partial lead service line replacement required by 12VAC5-590-405 C shall report the results to the district engineer within the first ten days of the month following the month in which the owner receives the laboratory results, or as specified by the commissioner. Owners shall also report any additional information as specified by the commissioner, and in a time and manner prescribed by the commissioner, to verify that all partial lead service line replacement activities have taken place.

6. Public education program reporting requirements. ~~By December 31 of each year, the owner of any waterworks that is subject to the public education requirements in 12VAC5-590-420 F shall submit a letter to the district engineer demonstrating that the owner has delivered the public education materials that meet the content requirements in 12VAC5-590-420 F 1 and 2 and the delivery requirements in 12VAC5-590-420 F 3. This information shall include a list of all the newspapers, radio stations, television stations, facilities and organizations to which the owner delivered public education materials during the previous year. The owner shall submit the letter required by this subdivision annually for as long as it exceeds the lead action level.~~ Owners shall report the following information to the district engineer to demonstrate compliance with the requirements of 12VAC5-590-405 D.

a. The owner of any waterworks that is subject to the public education requirements in 12VAC5-590-405 D shall, within 10 days after the end of each period in which the owner is required to perform public education tasks in accordance with 12VAC5-590-405 D 2, send written notice to the district engineer that contains:

(1) A demonstration that the owner has delivered the public education materials that meet the content requirements of 12VAC5-590-405 D 1 and the delivery requirements of 12VAC5-590-405 D 2, and

(2) A list of all the newspapers, radio stations, television stations, and facilities and organizations to which the owner delivered public education materials during the period in which the owner was required to perform public education tasks.

b. Unless required by the commissioner, an owner who previously has submitted the information required by subdivision D 6 a (2) of this section need not resubmit the information required by subdivision D 6 a (2) of this section, as long as there has been no changes in the distribution list and the owner certifies that the public education materials were distributed to the same list submitted previously.

c. No later than three months following the end of the monitoring period, the owner shall mail a sample copy of the consumer notification of tap results to the district engineer along with a certification that the notification has bee distributed in a manner consistent with the requirements of 12VAC5-590-405 D 4.

7. Reporting of additional monitoring data. The owner of any waterworks which collects sampling data in addition to that required by ~~this subpart~~ 12VAC5-590-375 shall report the results to the district engineer within the first 10 days following the end of the applicable monitoring period under ~~12VAC5-590-370 B 6 a, b and c~~ 12VAC5-590-375 B, 12VAC5-590-375 C, and 12VAC5-590-375 D during which the samples are collected.

8. Reporting of the 90th percentile lead and copper concentrations where the district engineer calculates a waterworks' 90th percentile concentrations. An owner is not required to report the 90th percentile lead and copper concentrations measured from among all lead and copper tap samples collected during each monitoring period, as required by subdivision D 1 a (4) of this section if:

a. The commissioner has previously notified the owner that the district engineer will calculate the waterworks' 90th percentile lead and copper concentrations, based on the lead and copper tap results submitted pursuant to subdivision D 8 b (1) of this section, and has specified a date before the end of the applicable monitoring period by which the owner shall provide the results of the lead and copper tap water samples;

b. The owner has provided the following information to the district engineer by the date specified in subdivision D 8 a of this section:

(1) The results of all tap samples for lead and copper including the location of each site and the criteria under 12VAC5-590-375 B 1 c through 12VAC5-590-375 B 1 f or 12VAC5-590-375 B 1 g under which the site was selected for the waterworks sampling pool, pursuant to subdivision D 1 a (1) of this section;

(2) An identification of sampling sites utilized during the current monitoring period that were not sampled during

the previous monitoring periods, and an explanation why sampling sites have changed; and

(3) The district engineer has provided the results of the 90th percentile lead and copper calculations, in writing, to the owner before the end of the monitoring period.

E. Reporting requirements for disinfection byproducts. Owners shall report the following information in accordance with subsection A of this section. (The district engineer may choose to perform calculations and determine whether the PMCL was violated, in lieu of having the owner report that information):

1. Running Annual Average Reporting:

a. The owner of a waterworks monitoring for TTHM and HAA5 under the requirements of 12VAC5-590-370 B 3 e (1) on a quarterly or more frequent basis shall report.

(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 of this section for the last four quarters.

(5) Whether, based on 12VAC5-590-410 C 2 b (1) (a), the PMCL was violated.

b. The owner of a waterworks monitoring for TTHMs and HAA5 under the requirements of 12VAC5-590-370 B 3 e (1) less frequently than quarterly (but at least annually) shall report:

(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, based on 12VAC5-590-410 C 2 b (1) (a) the PMCL was violated.

c. The owner of a waterworks monitoring for TTHMs and HAA5 under the requirements of 12VAC5-590-370 B 3 e (1) less frequently than annually shall report:

(1) The location, date, and result of the last sample taken.

(2) Whether, based on 12VAC5-590-410 C 2 b (1) (a), the PMCL was violated.

2. Locational Running Annual Average (LRAA) Reporting:

a. Owners shall report the following information for each monitoring location to the commissioner:

(1) Number of samples taken during the last quarter.

(2) Date and results of each sample taken during the last quarter.

(3) Arithmetic average of quarterly results for the last four quarters for each LRAA, beginning at the end of the fourth calendar quarter that follows the compliance date and at the end of each subsequent quarter. If the LRAA calculated based on fewer than four quarters of data would cause the PMCL to be exceeded regardless of the monitoring results of subsequent quarters, the owner shall report this information to the commissioner as part of the first report due following the compliance date or anytime thereafter that this determination is made. If the owner is required to conduct monitoring at a frequency that is less than quarterly, the owner shall make compliance calculations beginning with the first compliance sample taken after the compliance date, unless the owner is required to conduct increased monitoring under 12VAC5-590-370 B 3 e (3) (g).

(4) Whether, based on Table 2.13, the PMCL was violated at any monitoring location.

(5) Any operational evaluation levels, under 12VAC5-590-410 C 2 b (1) (b) (iv), that were exceeded during the quarter and, if so, the location and date, and the calculated TTHM and HAA5 levels.

b. Owners of waterworks using surface water or GUDI seeking to qualify for or remain on reduced TTHM/HAA5 monitoring shall report the following source water TOC information for each treatment plant that treats surface water or ground water under the direct influence of surface water to the commissioner within 10 days of the end of any quarter in which monitoring is required:

(1) The number of source water TOC samples taken each month during last quarter.

(2) The date and result of each sample taken during last quarter.

(3) The quarterly average of monthly samples taken during last quarter or the result of the quarterly sample.

(4) The running annual average (RAA) of quarterly averages from the past four quarters.

(5) Whether the RAA exceeded 4.0 mg/L.

3. The owner of a waterworks monitoring for chlorite under the requirements of 12VAC5-590-370 B 3 f shall report:

a. The number of entry point samples taken each month for the last three months.

b. The location, date, and result of each sample (both entry point and distribution system) taken during the last quarter.

c. For each month in the reporting period, the arithmetic average of all samples taken in each three sample set taken in the distribution system.

d. Whether, based on 12VAC5-590-410 C 2 b, the PMCL was violated, in which month and how many times it was violated each month.

4. The owner of a waterworks monitoring for bromate under the requirements of 12VAC5-590-370 B 3 g shall report:

a. The number of samples taken during the last quarter.

b. The location, date, and result of each sample taken during the last quarter.

c. The arithmetic average of the monthly arithmetic averages of all samples taken in the last year.

d. Whether, based on 12VAC5-590-410 C 2 b, the PMCL was violated.

F. Reporting requirements for disinfectants. Owners shall report the information specified below in accordance with subsection A of this section. (The district engineer may choose to perform calculations and determine whether the MRDL was violated, in lieu of having the owner report that information):

1. The owner of a waterworks monitoring for chlorine or chloramines under the requirements of 12VAC5-590-370 B 3 h shall report:

a. The number of samples taken during each month of the last quarter.

b. The monthly arithmetic average of all samples taken in each month for the last 12 months.

c. The arithmetic average of all monthly averages for the last 12 months.

d. Whether, based on 12VAC5-590-410 C 2 c, the MRDL was violated.

2. The owner of a waterworks monitoring for chlorine dioxide under the requirements of 12VAC5-590-370 B 3 h shall report:

a. The dates, results, and locations of samples taken during the last quarter.

b. Whether, based on 12VAC5-590-410 C 2 c, the MRDL was violated.

c. Whether the MRDL was exceeded in any two consecutive daily samples and whether the resulting violation was acute or nonacute.

G. Reporting requirements for disinfection byproduct precursors and enhanced coagulation or enhanced softening. Owners shall report the following information in accordance with subsection A of this section. (The district engineer may choose to perform calculations and determine whether the treatment technique was met, in lieu of having the owner report that information):

1. The owner of a waterworks monitoring monthly or quarterly for TOC under the requirements of 12VAC5-590-370 B 3 i and required to meet the enhanced coagulation or enhanced softening requirements in 12VAC5-590-420 H 2 b or c shall report:

a. The number of paired (source water and treated water) samples taken during the last quarter.

b. The location, date, and results of each paired sample and associated alkalinity taken during the last quarter.

c. 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.

d. Calculations for determining compliance with the TOC percent removal requirements, as provided in 12VAC5-590-420 H 3 a.

e. Whether the system is in compliance with the enhanced coagulation or enhanced softening percent removal requirements in 12VAC5-590-420 H 2 a for the last four quarters.

2. The owner of a waterworks monitoring monthly or quarterly for TOC under the requirements of 12VAC5-590-370 B 3 i and meeting one or more of the alternative compliance criteria in 12VAC5-590-420 H 1 b or c shall report:

a. The alternative compliance criterion that the system is using.

b. The number of paired samples taken during the last quarter.

c. The location, date, and result of each paired sample and associated alkalinity taken during the last quarter.

d. The running annual arithmetic average based on monthly averages (or quarterly samples) of source water TOC for systems meeting a criterion in 12VAC5-590-420 H 1 b (1) or (3) or of treated water TOC for systems meeting the criterion in 12VAC5-590-420 H 1 b (2).

e. The running annual arithmetic average based on monthly averages (or quarterly samples) of source water SUVA for systems meeting the criterion in 12VAC5-590-420 H 1 b (5) or of treated water SUVA for systems meeting the criterion in 12VAC5-590-420 H 1 b (6).

f. The running annual average of source water alkalinity for systems meeting the criterion in 12VAC5-590-420 H 1 b (3) and of treated water alkalinity for systems meeting the criterion in 12VAC5-590-420 H 1 c (1).

g. The running annual average for both TTHM and HAA5 for systems meeting the criterion in 12VAC5-590-420 H 1 b (3) or (4).

h. The running annual average of the amount of magnesium hardness removal (as $CaCO_3$, in mg/L) for systems meeting the criterion in 12VAC5-590-420 H 1 c (2).

i. Whether the system is in compliance with the particular alternative compliance criterion in 12VAC5-590-420 H 1 b or c.

H. Reporting of analytical results to the district engineer will not be required in instances where the state laboratory performs the analysis and reports same to the district engineer.

I. Recycle flow reporting requirements. The owner of any waterworks supplied by a surface water source and waterworks supplied by a groundwater source under the direct influence of surface water that employs conventional filtration or direct filtration treatment shall notify the commissioner in writing by December 8, 2003, if the system recycles spent filter backwash water, thickener supernatant, or liquids from dewatering processes. This notification shall include, as a minimum:

1. A plant schematic showing the origin of all flows that are recycled, including but not limited to spent filter backwash water, thickener supernatant, and liquids from dewatering processes. The schematic shall also specify the hydraulic conveyance used to transport all recycle flows and the location where recycle flows are reintroduced back into the treatment plant.

2. Typical recycle flow in gallons per minute (gpm), the highest observed plant flow experienced in the previous year (gpm), design flow for the treatment plant (gpm), and state-approved operating capacity for the plant.

J. Reporting of requirements for enhanced treatment for cryptosporidium.

1. Owners shall report sampling schedules under 12VAC5-590-420 B 3 a (5) and source water monitoring results under 12VAC5-590-530 C 1 c unless they notify the commissioner that they will not conduct source water monitoring due to meeting the criteria of 12VAC5-590-420 B 3 a (4).

2. Owners shall report the use of uncovered finished water storage facilities to the commissioner as described in 12VAC5-590-420 L.

3. Owners of waterworks that provide filtration shall report their Cryptosporidium bin classification as described in 12VAC-590-420 B 3 c.

4. Owners shall report disinfection profiles and benchmarks to the commissioner as described in 12VAC5-590-420 B 3 b (1) through (2) prior to making a significant change in disinfection practice.

5. Owners shall report to the commissioner in accordance with the following table for any microbial toolbox options used to comply with treatment requirements under 12VAC5-590-420 B 3 c (2). Alternatively, the commissioner may approve a waterworks to certify operation within required parameters for treatment credit rather than reporting monthly operational data for toolbox options.

Microbial Toolbox Reporting Requirements

Toolbox option	Owners shall submit the following information	On the following schedule
Watershed control program (WCP)	Notice of intention to develop a new or continue an existing watershed control program	No later than two years before the applicable treatment compliance date in 12VAC5-590-420 B 3 c (3).
	Watershed control plan	No later than one year before the applicable treatment compliance date in 12VAC5-590-420 B 3 c (3).
	Annual watershed control program status report	Every 12 months, beginning one year after the applicable treatment compliance date in 12VAC5-590-420 B 3 c (3).
	Watershed sanitary survey report	For community waterworks, every three years beginning three years after the applicable treatment compliance date in 12VAC5-590-420 B 3 c (3). For noncommunity waterworks, every five years beginning five

		years after the applicable treatment compliance date in 12VAC5-590-420 B 3 c (3).
Alternative source/intake management	Verification that waterworks has relocated the intake or adopted the intake withdrawal procedure reflected in monitoring results	No later than the applicable treatment compliance date in 12VAC5-590-420 B 3 c (3).
Presedimentation	Monthly verification of the following: (i) Continuous basin operation (ii) Treatment of 100% of the flow (iii) Continuous addition of a coagulant (iv) At least 0.5-log mean reduction of influent turbidity or compliance with alternative performance criteria approved by the commissioner.	Monthly reporting within 10 days following the month in which the monitoring was conducted, beginning on the applicable treatment compliance date in 12VAC5-590-420 B 3 c (3).
Two-stage lime softening	Monthly verification of the following: (i) Chemical addition and hardness precipitation occurred in two separate and sequential softening stages prior to filtration (ii) Both stages treated 100% of the plant flow	Monthly reporting within 10 days following the month in which the monitoring was conducted, beginning on the applicable treatment compliance date in 12VAC5-590-420 B 3 c (3).
Bank filtration	Initial demonstration of the following: (i) Unconsolidated, predominantly sandy aquifer	No later than the applicable treatment compliance date in 12VAC5-590-420 B 3 c (3).
	(ii) Setback distance of at least 25 ft. (0.5-log credit) or 50 ft. (1.0-log credit)	
	If monthly average of daily max turbidity is greater than 1 NTU then system shall report result and submit an assessment of the cause.	Report within 30 days following the month in which the monitoring was conducted, beginning on the applicable treatment compliance date in 12VAC5-590-420 B 3 c (3).
Combined filter performance	Monthly verification of combined filter effluent (CFE) turbidity levels less than or equal to 0.15 NTU in at least 95% of the four-hour CFE measurements taken each month	Monthly reporting within 10 days following the month in which the monitoring was conducted, beginning on the applicable treatment compliance date in 12VAC5-590-420 B 3 c (3).
Individual filter performance	Monthly verification of the following: (i) Individual filter effluent (IFE) turbidity levels less than or equal to 0.15 NTU in at least 95% of samples each month in each filter (ii) No individual filter greater than 0.3 NTU in two consecutive readings 15 minutes apart	Monthly reporting within 10 days following the month in which the monitoring was conducted, beginning on the applicable treatment compliance date in 12VAC5-590-420 B 3 c (3).
Demonstration of performance	Results from testing following a protocol approved by the commissioner.	No later than the applicable treatment compliance date in 12VAC5-590-420 B 3 c (3).
	(ii) As required by the commissioner, monthly verification of operation within	Within 10 days following the month in which monitoring was conducted,

	conditions of commissioner approval for demonstration of performance credit	beginning on the applicable treatment compliance date in 12VAC5-590-420 B 3 c (3).
Bag filters and cartridge filters	Demonstration that the following criteria are met: (i) Process meets the definition of bag or cartridge filtration (ii) Removal efficiency established through challenge testing that meets criteria in 12VAC5-590-420 B 3 d (6) (a).	No later than the applicable treatment compliance date in 12VAC5-590-420 B 3 c (3).
	Monthly verification that 100% of plant flow was filtered	Within 10 days following the month in which monitoring was conducted, beginning on the applicable treatment compliance date in 12VAC5-590-420 B 3 c (3).
Membrane filtration	Results of verification testing demonstrating the following: (i) Removal efficiency established through challenge testing that meets criteria in ~~this subpart~~ subsection J of this section (ii) Integrity test method and parameters, including resolution, sensitivity, test frequency, control limits, and associated baseline	No later than the applicable treatment compliance date in 12VAC5-590-420 B 3 c (3).
	Monthly report summarizing the following: (i) All direct integrity tests above the control limit; (ii) If applicable, any turbidity or alternative indirect integrity monitoring approved by the commissioner results triggering direct integrity testing and the corrective action that was taken	Within 10 days following the month in which monitoring was conducted, beginning on the applicable treatment compliance date in 12VAC5-590-420 B 3 c (3).
Second stage filtration	Monthly verification that 100% of flow was filtered through both stages and that first stage was preceded by a coagulation step	Within 10 days following the month in which monitoring was conducted, beginning on the applicable treatment compliance date in 12VAC5-590-420 B 3 c (3).
Slow sand filtration (as secondary filter)	Monthly verification that both a slow sand filter and a preceding separate stage of filtration treated 100% of flow from surface water or groundwater under the direct influence of surface water sources.	Within 10 days following the month in which monitoring was conducted, beginning on the applicable treatment compliance date in 12VAC5-590-420 B 3 c (3).
Chlorine dioxide	Summary of CT values for each day as described in 12VAC5-590-420 B 3 d (7)(b)(i).	Within 10 days following the month in which monitoring was conducted, beginning on the applicable treatment compliance date in 12VAC5-590-420 B 3 c (3).
Ozone	Summary of CT values for each day as described in 12VAC5-590-420 B 3 d (7)(b)(ii).	Within 10 days following the month in which monitoring was conducted, beginning on the applicable treatment compliance date in

		12VAC5-590-420 B 3 c (3).
UV	Validation test results demonstrating operating conditions that achieve required UV dose	No later than the applicable treatment compliance date in 12VAC5-590-420 B 3 c (3).
	Monthly report summarizing the percentage of water entering the distribution system that was not treated by UV reactors operating within validated conditions for the required dose as specified in 12VAC5-590-420 B 3 d (7) (c).	Within 10 days following the month in which monitoring was conducted, beginning on the applicable treatment compliance date in 12VAC5-590-420 B 3 c (3).

K. Information to be included on the operation monthly report shall be determined by the commissioner for each waterworks on an individual basis. Appendix G contains suggested monthly operation report requirements.

12VAC5-590-545. Consumer confidence reports.

A. Purpose and applicability.

1. Each community waterworks owner shall deliver to his customers an annual report that contains information on the quality of the water delivered by the waterworks and characterizes the risks, if any, from exposure to contaminants detected in the drinking water.

2. For the purpose of this section, customers are defined as billing units or service connections to which water is delivered by a community waterworks.

3. For the purpose of this section, a contaminant is detected when the laboratory reports the contaminant level as a measured level and not as nondetected (ND) or less than (<) a certain level. The owner shall utilize a laboratory that complies with 12VAC5-590-340, and the laboratory's analytical and reporting procedures shall have been in accordance with 12VAC5-590-440; laboratory certification requirements of the Commonwealth of Virginia, Department of General Services, Division of Consolidated Laboratory Services; and consistent with current U. S. Environmental Protection Agency regulations found at 40 CFR Part 141.

B. Effective dates.

1. Each existing community waterworks owner shall deliver his report by July 1 annually.

2. The owner of a new community waterworks shall deliver his first report by July 1 of the year after its first full calendar year in operation and annually thereafter.

3. The owner of a community waterworks that sells water to a consecutive waterworks shall deliver the applicable information necessary to comply with the requirements contained in this section to the consecutive waterworks by April 1 annually, or on a date mutually agreed upon by the seller and the purchaser and specifically included in a contract between the parties.

C. Content.

1. Each community waterworks owner shall provide his customers an annual report that contains the information on the source of the water delivered as follows:

a. Each report shall identify the source or sources of the water delivered by the community waterworks by providing information on:

(1) The type of the water (e.g., surface water, ground water); and

(2) The commonly used name, if any, and location of the body or bodies of water.

b. Where a source water assessment has been completed, the report shall:

(1) Notify consumers of the availability of the assessment;

(2) Describe the means to obtain the assessment; and

(3) Include a brief summary of the waterworks' susceptibility to potential sources of contamination.

c. The owner should highlight in the report significant sources of contamination in the source water area if such information is readily available.

2. For the purpose of compliance with this section, each report shall include the following definitions:

a. "Maximum contaminant level goal" or "MCLG" ~~(See 12VAC5-590-10).~~ 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.

b. "Maximum contaminant level" or "MCL" ~~(See 12VAC5-590-10).~~ 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.

c. A report for a community water system operating under a variance or an exemption issued by the commissioner under 12VAC5-590-140 and 12VAC5-590-150 shall include the following definition: "Variances and exemptions" means state or EPA

permission not to meet an MCL or a treatment technique under certain conditions.

d. A report that contains data on contaminants that EPA regulates using any of the following terms shall include the applicable definitions:

(1) "Treatment technique" means a required process intended to reduce the level of a contaminant in drinking water.

(2) "Action level" means the concentration of a contaminant that, if exceeded, triggers treatment or other requirements that an owner shall follow.

(3) "Maximum residual disinfectant level goal" or "MRDLG" means the level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

(4) "Maximum residual disinfectant level" or "MRDL" means the highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

3. Information on detected contaminants.

a. This section specifies the requirements for information to be included in each report for the following contaminants:

(1) Contaminants subject to a PMCL, action level, maximum residual disinfectant level, or treatment technique as specified in 12VAC5-590-370;

(2) Unregulated contaminants subject to monitoring as specified in 12VAC5-590-370; and

(3) Disinfection byproducts or microbial contaminants, except Cryptosporidium, for which monitoring is required by Information Collection Rule (40 CFR 141.142 and 141.143 (7-1-97 Edition)), except as provided under subdivision 5 a of this subsection, and which are detected in the finished water.

b. The data relating to these contaminants shall be displayed in one table or in several adjacent tables. Any additional monitoring results that a community waterworks owner chooses to include in the report shall be displayed separately.

c. The data shall be derived from data collected to comply with EPA and state monitoring and analytical requirements during the calendar year preceding the year the report is due, except that:

(1) Where an owner is allowed to monitor for contaminants specified in subdivision 3 a (1) and (3) of this subsection less often than once a year, the table or tables shall include the date and results of the most recent sampling, and the report shall include 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) Results of monitoring in compliance with the Information Collection Rule (40 CFR 141.142 and 141.143 (7-1-97 Edition)) need only be included for five years from the date of last sample or until any of the detected contaminants becomes regulated and subject to routine monitoring requirements, whichever comes first.

d. For detected contaminants subject to a PMCL, action level, or treatment technique as specified in 12VAC5-590-370 and listed in Tables 2.1, 2.2 (Primary Maximum Contaminant Levels only), 2.3, 2.4 (Primary Maximum Contaminant Levels only), and 2.5, the table or tables shall contain:

(1) The PMCL for that contaminant expressed as a number equal to or greater than 1.0 as provided in Appendix O, with an exception for beta/photon emitters. When the detected level of beta/photon emitters has been reported in the units of pCi/L and does not exceed 50 pCi/L, the report may list the PMCL as 50 pCi/L. In this case, the owner shall include in the report the following footnote: The PMCL for beta particles is 4 mrem/year. EPA considers 50 pCi/L to be the level of concern for beta particles;

(2) The MCLG for that contaminant expressed in the same units as the PMCL as provided in Appendix O;

(3) If there is no PMCL for a detected contaminant, the table shall indicate that there is a treatment technique, or specify the action level, applicable to that contaminant, and the report shall include the definitions for treatment technique and/or action level, as appropriate, specified in subdivision 3 d of this subsection;

(4) For contaminants subject to a PMCL, except turbidity and total coliforms, the highest contaminant level used to determine compliance and the range of detected levels is as follows:

(a) When compliance with the PMCL 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 PMCL.

(b) When compliance with the PMCL 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 PMCL. For the PMCLs for TTHM and HAA5, owner shall include the highest locational running annual average and the range of individual sample results for all sampling points

expressed in the same units as the PMCL. If more than one location exceeds the TTHM or HAA5 PMCL, the owner shall include the locational running annual averages for all locations that exceed the PMCL.

(c) When compliance with the PMCL 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 PMCL. The range of detection for TTHM and HAA5 shall include individual sample results for the IDSE conducted under 12VAC5-590-370 B 3 e (2) for the calendar year that the IDSE samples were taken.

(5) For turbidity, the highest single measurement and the lowest monthly percentage of samples meeting the turbidity limits specified in 12VAC5-590-420 for the filtration technology being used. The report should include an explanation of the reasons for measuring turbidity;

(6) 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;

(7) For total coliform:

(a) The highest monthly number of positive samples for waterworks collecting fewer than 40 samples per month;

(b) The highest monthly percentage of positive samples for waterworks collecting at least 40 samples per month;

(8) For fecal coliform, the total number of positive samples;

(9) The likely source or sources of detected contaminants. Specific information regarding contaminants may be available in sanitary surveys and source water assessments, and should be used when available to the owner. If the owner lacks specific information on the likely source, the report shall include one or more of the typical sources for that contaminant listed in Appendix O that are most applicable to the system.

e. If a community waterworks owner distributes water to his customers from multiple hydraulically independent distribution systems that are fed by different raw water sources:

(1) The table shall contain a separate column for each service area and the report shall identify each separate distribution system; or

(2) The owner shall produce a separate report tailored to include data for each service area.

f. The table or tables shall clearly identify any data indicating violations of PMCLs, MRDLs, or treatment techniques and the report shall contain a clear and readily understandable explanation of the violation including:

(1) The length of the violation;

(2) The potential adverse health effects using the relevant language of Appendix O; and

(3) Actions taken by the waterworks owner to address the violation.

g. For detected unregulated contaminants subject to monitoring as specified in 12VAC5-590-370 and listed in Tables 2.6 and 2.7, for which monitoring is required, the table or tables shall 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.

4. Information on Cryptosporidium, radon, and other contaminants:

a. If the owner has performed any monitoring for Cryptosporidium, including monitoring performed to satisfy the requirements of the Informational Collection Rule (40 CFR 141.143 (7-1-97 Edition)), which indicates that Cryptosporidium may be present in the source water or the finished water, the report shall include:

(1) A summary of the results of the monitoring; and

(2) An explanation of the significance of the results.

b. If the owner has performed any monitoring for radon which indicates that radon may be present in the finished water, the report shall include:

(1) The results of the monitoring; and

(2) An explanation of the significance of the results.

c. If the owner has performed additional monitoring that indicates the presence of other contaminants in the finished water, the report should include any results that may indicate a health concern, as determined by the commissioner. Detections above a proposed MCL or health advisory level may 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.

5. Compliance with other regulations.

a. In addition to the requirements of subdivision 3 f of this subsection the report shall note any violation that occurred during the year covered by the report of a requirement listed below.

(1) Monitoring and reporting of compliance data;

(2) Filtration and disinfection prescribed by 12VAC5-590-420. For owners who 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 shall 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;

(3) Lead and copper control requirements prescribed by 12VAC5-590-370. For owners who fail to take one or more of the prescribed actions, the report shall include the applicable language of Appendix O for lead, copper, or both;

(4) Treatment techniques for Acrylamide and Epichlorohydrin prescribed by 12VAC5-590-420 G. For owners who violate the requirements of that section, the report shall include the relevant language from Appendix O;

(5) Recordkeeping of compliance data;

(6) Special monitoring requirements for unregulated contaminants prescribed by 12VAC5-590-370 B 4 and for sodium;

(7) Violation of the terms of a variance, an exemption, or an administrative or judicial order.

b. The report shall contain:

(1) A clear and readily understandable explanation of the violation;

(2) Any potential adverse health effects; and

(3) The steps the owner has taken to correct the violation.

6. Variances and exemptions. If a system is operating under the terms of a variance or an exemption issued by the commissioner under 12VAC5-590-140 and 12VAC5-590-150, the report shall contain:

a. An explanation of the reasons for the variance or exemption;

b. The date on which the variance or exemption was issued;

c. A brief status report on the steps the owner is taking to install treatment, find alternative sources of water, or otherwise comply with the terms and schedules of the variance or exemption; and

d. A notice of any opportunity for public input in the review or renewal of the variance or exemption.

7. Additional information.

a. The report shall contain a brief explanation regarding contaminants, which may reasonably be expected to be found in drinking water including bottled water. This explanation shall include the exact language of subdivisions 8 a (1), (2) and (3) of this subsection or the owner shall use his own comparable language following approval by the commissioner. The report also shall include the exact language of subdivision 8 a (4) of this subsection.

(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, in some cases, 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: (i) microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife; (ii) inorganic contaminants, such as salts and metals, which can be naturally occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming; (iii) pesticides and herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses; (iv) organic chemical contaminants, including synthetic and volatile organic chemicals, which are byproducts of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems; (v) 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, EPA prescribes regulations that limit the amount of certain contaminants in water provided by public water systems. FDA regulations establish limits for contaminants in bottled water which must provide the same protection for public health.

(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 Environmental Protection Agency's Safe Drinking Water Hotline (800-426-4791).

b. The report shall include the telephone number of the owner, operator, or designee of the community waterworks as a source of additional information concerning the report.

c. In communities with a large proportion of non-English speaking residents, as determined by the commissioner, the report shall contain information in the appropriate language or languages 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.

d. The report shall include the following information about opportunities for public participation in decisions that may affect the quality of the water. The waterworks owner should consider including the following additional relevant information:

(1) The time and place of regularly scheduled board meetings of the governing body which has authority over the waterworks.

(2) If regularly scheduled board meetings are not held, the name and telephone number of a waterworks representative who has operational or managerial authority over the waterworks.

e. The owner may include such additional information as he deems necessary for public education consistent with, and not detracting from, the purpose of the report.

D. Additional health information.

1. All reports shall 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 who are 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. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

2. ~~Starting February 22, 2002, a~~ Any waterworks owner who detects arsenic at levels above 0.005 mg/L, but equal to or below the PMCL of 0.010 mg/L, shall include in his report the following informational statement about arsenic: While your drinking water meets EPA's standard for arsenic, it does contain low levels of arsenic. EPA's standard balances the current understanding of arsenic's possible health effects against the cost of removing arsenic from drinking water. EPA continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems.

In lieu of the statement required in this subdivision, the waterworks owner may include his own educational statement after receiving approval from the commissioner.

3. A waterworks owner who detects arsenic levels above 0.010 mg/L shall include the health effects language contained in Appendix O.

~~3.~~ 4. An owner who detects nitrate at levels above 5 mg/L, but below the PMCL, shall include in his report the following informational statement about the impacts of nitrate on children: 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.

In lieu of the statement required in this subdivision, the waterworks owner may include his own educational statement after receiving approval from the commissioner.

~~4.~~ 5. All reports shall prominently display the following language: If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. [NAME OF UTILITY] is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to two minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline (800-426-4791).

In lieu of the statement required in this subdivision, the owner may include his own educational statement after receiving approval from the commissioner.

~~5.~~ 6. Community waterworks owners who detect TTHM above 0.080 mg/L, but below the PMCL, as an annual average shall include health effects language prescribed by paragraph 73 of Appendix O.

E. Report delivery and recordkeeping.

1. Each community waterworks owner shall mail or otherwise directly deliver one copy of the report to each customer.

2. The owner shall make a good faith effort that shall be tailored to the consumers who are served by the system but are not bill paying customers, such as renters and workers. This good faith effort shall include at least one, and

preferably two or more, of the following methods appropriate to the particular waterworks:

a. Posting the reports on the Internet;

b. Mailing to postal patrons in metropolitan areas;

c. Advertising the availability of the report in the news media;

d. Publication in a local newspaper;

e. Posting in public places such as libraries, community centers, and public buildings;

f. Delivery of multiple copies for distribution by single-biller customers such as apartment buildings or large private employers;

g. Delivery to community organizations.

h. Other methods as approved by the commissioner.

3. No later than July 1 of each year the owner shall deliver a copy of the report to the district engineer, followed within three months by a certification that the report has been distributed to customers and that the information in the report is correct and consistent with the compliance monitoring data previously submitted to the commissioner.

4. No later than July 1 of each year the owner shall deliver the report to any other agency or clearinghouse specified by the commissioner.

5. Each community waterworks owner shall make the report available to the public upon request.

6. The owner of each community waterworks serving 100,000 or more persons shall post the current year's report to a publicly accessible site on the Internet.

7. Each community waterworks owner shall retain copies of the report for no less than three years.

12VAC5-590-550. Recordkeeping.

All owners shall retain at their waterworks or at a convenient location near their waterworks the following records for the minimum time periods specified:

A. Records of microbiological analyses and turbidity analyses -- Five years.

B. Chemical Analyses -- 10 years.

C. Individual filter monitoring required under 12VAC5-590-530 C 1 b (2) -- Three years.

D. Results of Disinfection Profile including raw data and analysis -- Indefinitely.

E. Disinfection Benchmarking including raw data and analysis -- Indefinitely.

F. The following information shall be provided for subsections A and B of this section:

1. Date, place, and time of sampling as well as the name of the person who collected the sample;

2. Identification of sample (e.g., routine, check sample, raw water, other);

3. Date of analysis;

4. Laboratory and/or person responsible for performing analysis;

5. Analytical method/technique used; and

6. Results of the analysis.

G. Original records of all sampling data and analyses, reports, surveys, letters, evaluations, schedules, commissioner determinations, and any other information required by ~~12VAC5-590-420 C 1 and 2, D, E, and F~~ 12VAC5-590-405 A 1 and 2, B, C, and D; and ~~12VAC5-590-370 B 6 a, b, and c~~ 12VAC5-590-375 B, C, and D pertaining to lead and copper. Each waterworks owner shall retain the records required by this section for no fewer than 12 years.

H. Owners shall keep results from the initial round of source water monitoring under 12VAC5-590-420 B 3 a (1) and the second round of source water monitoring under 12VAC5-590-420 B 3 a (2) until three years after bin classification under 12VAC5-590-420 B 3 c (1) for the particular round of monitoring.

I. Owners shall keep any notification to the commissioner that they will not conduct source water monitoring due to meeting the criteria of 12VAC5-590-420 B 3 a (4) for three years.

J. Owners shall keep the results of treatment monitoring associated with microbial toolbox options under 12VAC5-590-420 B 3 d (3) through (7) and with uncovered finished water reservoirs under 12VAC5-590-420 L, as applicable, for three years.

K. Action taken to correct violations of these regulations -- three years after last action with respect to violation involved.

L. Copies of reports, summaries, or communications relating to any sanitary surveys performed -- 10 years following inspection.

M. Variance or exemptions granted (and records related thereto) -- five years following expiration of variance or exemption.

N. Cross connection control program records -- 10 years.

O. Owners of waterworks that recycle flow, as stipulated in 12VAC5-590-420 K, shall collect and retain on file recycle flow information for review and evaluation by the district engineer beginning June 8, 2004. Information shall include, as a minimum:

1. Copy of the recycle notification submitted to the district engineer under 12VAC5-590-530 I.

2. List of all recycle flows and the frequency with which they are returned.

3. Average and maximum backwash flow rate through the filters and the average and maximum duration of the filter backwash process, in minutes.

4. Typical filter run length and a written summary of how the filter run length is determined.

5. The type of treatment provided for the recycle flow.

6. Data on the physical dimensions of the equalization and/or treatment units, typical and maximum hydraulic loading rates, type of treatment chemicals used, average dose, frequency of use, and frequency at which solids are removed, if applicable.

P. Copies of monitoring plans developed pursuant to these regulations shall be kept for the same period of time as the records of analyses taken under the plan are required to be kept under paragraph A or B of this section, except as specified elsewhere in these regulations.

Q. All owners shall retain the following additional records:

1. Plant operational records.

2. Water well completion reports.

3. As-built engineering plans and specifications of facilities.

4. Shop drawings of major equipment.

5. Records of equipment repair or replacement.

6. Updated map of water distribution system.

7. All accident reports.

VA.R. Doc. No. R11-1092; Filed August 18, 2010, 12:50 p.m.

TITLE 13. HOUSING

VIRGINIA HOUSING DEVELOPMENT AUTHORITY

Proposed Regulation

REGISTRAR'S NOTICE: The Virginia Housing Development Authority is exempt from the Administrative Process Act (§ 2.2-4000 et seq. of the Code of Virginia) pursuant to § 2.2-4002 A 4; however, under the provisions of § 2.2-4031, it is required to publish all proposed and final regulations.

Title of Regulation: **13VAC10-180. Rules and Regulations for Allocation of Low-Income Housing Tax Credits (amending 13VAC10-180-60).**

Statutory Authority: § 36-55.30:3 of the Code of Virginia.

Public Hearing Information:

September 28, 2010 - 10 a.m. - Virginia Housing Development Authority, 601 South Belvidere Street, Richmond, VA

Public Comment Deadline: September 28, 2010.

Agency Contact: J. Judson McKellar, Jr., General Counsel, Virginia Housing Development Authority, 601 South Belvidere Street, Richmond, VA 23220, telephone (804) 343-5540, or email judson.mckellar@vhda.com.

Summary:

The proposed amendments (i) make elderly rehabilitation developments eligible for points awarded for creating accessible units, (ii) tier available points for level of compliance with EarthCraft of LEED requirements, (iii) revise negative point category for noncompliance to encourage compliance training, and (iv) suspend the preservation pool for credit year 2011.

13VAC10-180-60. Review and selection of applications; reservation of credits.

The executive director may divide the amount of credits into separate pools and each separate pool may be further divided into separate tiers. The division of such pools and tiers may be based upon one or more of the following factors: geographical areas of the state; types or characteristics of housing, construction, financing, owners, occupants, or source of credits; or any other factors deemed appropriate by him to best meet the housing needs of the Commonwealth.

An amount, as determined by the executive director, not less than 10% of the Commonwealth's annual state housing credit ceiling for credits, shall be available for reservation and allocation to buildings or developments with respect to which the following requirements are met:

1. A "qualified nonprofit organization" (as described in § 42(h)(5)(C) of the IRC) which is authorized to do business in Virginia and is determined by the executive director, on the basis of such relevant factors as he shall consider appropriate, to be substantially based or active in the community of the development and is to materially participate (regular, continuous and substantial involvement as determined by the executive director) in the development and operation of the development throughout the "compliance period" (as defined in § 42(i)(1) of the IRC); and

2. (i) The "qualified nonprofit organization" described in the preceding subdivision 1 is to own (directly or through a partnership), prior to the reservation of credits to the buildings or development, all of the general partnership interests of the ownership entity thereof; (ii) the executive director of the authority shall have determined that such qualified nonprofit organization is not affiliated with or

controlled by a for-profit organization; (iii) the executive director of the authority shall have determined that the qualified nonprofit organization was not formed by one or more individuals or for-profit entities for the principal purpose of being included in any nonprofit pools (as defined below) established by the executive director, and (iv) the executive director of the authority shall have determined that no staff member, officer or member of the board of directors of such qualified nonprofit organization will materially participate, directly or indirectly, in the proposed development as a for-profit entity.

In making the determinations required by the preceding subdivision 1 and clauses (ii), (iii) and (iv) of subdivision 2 of this section, the executive director may apply such factors as he deems relevant, including, without limitation, the past experience and anticipated future activities of the qualified nonprofit organization, the sources and manner of funding of the qualified nonprofit organization, the date of formation and expected life of the qualified nonprofit organization, the number of paid staff members and volunteers of the qualified nonprofit organization, the nature and extent of the qualified nonprofit organization's proposed involvement in the construction or rehabilitation and the operation of the proposed development, the relationship of the staff, directors or other principals involved in the formation or operation of the qualified nonprofit organization with any persons or entities to be involved in the proposed development on a for-profit basis, and the proposed involvement in the construction or rehabilitation and operation of the proposed development by any persons or entities involved in the proposed development on a for-profit basis. The executive director may include in the application of the foregoing factors any other nonprofit organizations which, in his determination, are related (by shared directors, staff or otherwise) to the qualified nonprofit organization for which such determination is to be made.

For purposes of the foregoing requirements, a qualified nonprofit organization shall be treated as satisfying such requirements if any qualified corporation (as defined in § 42(h)(5)(D)(ii) of the IRC) in which such organization (by itself or in combination with one or more qualified nonprofit organizations) holds 100% of the stock satisfies such requirements.

The applications shall include such representations and warranties and such information as the executive director may require in order to determine that the foregoing requirements have been satisfied. In no event shall more than 90% of the Commonwealth's annual state housing credit ceiling for credits be available for developments other than those satisfying the preceding requirements. The executive director may establish such pools (nonprofit pools) of credits as he may deem appropriate to satisfy the foregoing requirement. If any such nonprofit pools are so established, the executive director may rank the applications therein and reserve credits to such applications before ranking applications and reserving credits in other pools, and any such applications in such nonprofit pools not receiving any reservations of credits or receiving such reservations in amounts less than the full amount permissible hereunder (because there are not enough credits then available in such nonprofit pools to make such reservations) shall be assigned to such other pool as shall be appropriate hereunder; provided, however, that if credits are later made available (pursuant to the IRC or as a result of either a termination or reduction of a reservation of credits made from any nonprofit pools or a rescission in whole or in part of an allocation of credits made from such nonprofit pools or otherwise) for reservation and allocation by the authority during the same calendar year as that in which applications in the nonprofit pools have been so assigned to other pools as described above, the executive director may, in such situations, designate all or any portion of such additional credits for the nonprofit pools (or for any other pools as he shall determine) and may, if additional credits have been so designated for the nonprofit pools, reassign such applications to such nonprofit pools, rank the applications therein and reserve credits to such applications in accordance with the IRC and this chapter. In the event that during any round (as authorized hereinbelow) of application review and ranking the amount of credits reserved within such nonprofit pools is less than the total amount of credits made available therein, the executive director may either (i) leave such unreserved credits in such nonprofit pools for reservation and allocation in any subsequent round or rounds or (ii) redistribute, to the extent permissible under the IRC, such unreserved credits to such other pool or pools as the executive director shall designate reservations therefore in the full amount permissible hereunder (which applications shall hereinafter be referred to as "excess qualified applications") or (iii) carry over such unreserved credits to the next succeeding calendar year for the inclusion in the state housing credit ceiling (as defined in § 42(h)(3)(C) of the IRC) for such year. Notwithstanding anything to the contrary herein, no reservation of credits shall be made from any nonprofit pools to any application with respect to which the qualified nonprofit organization has not yet been legally formed in accordance with the requirements of the IRC. In addition, no application for credits from any nonprofit pools or any combination of pools may receive a reservation or allocation of annual credits in an amount greater than $750,000 unless credits remain available in such nonprofit pools after all eligible applications for credits from such nonprofit pools receive a reservation of credits.

Notwithstanding anything to the contrary herein, applicants relying on the experience of a local housing authority for developer experience points described hereinbelow and/or using Hope VI funds from HUD in connection with the proposed development shall not be eligible to receive a reservation of credits from any nonprofit pools.

The authority shall review each application, and, based on the application and other information available to the authority, shall assign points to each application as follows:

1. Readiness.

a. Written evidence satisfactory to the authority of unconditional approval by local authorities of the plan of development or site plan for the proposed development or that such approval is not required. (40 points; applicants receiving points under this subdivision 1 a are not eligible for points under subdivision 5 a below)

b. Written evidence satisfactory to the authority (i) of proper zoning or special use permit for such site or (ii) that no zoning requirements or special use permits are applicable. (40 points)

2. Housing needs characteristics.

a. Submission of the form prescribed by the authority with any required attachments, providing such information necessary for the authority to send a letter addressed to the current chief executive officer (or the equivalent) of the locality in which the proposed development is located, soliciting input on the proposed development from the locality within the deadlines established by the executive director. (minus 50 points for failure to make timely submission)

b. (1) A letter dated within three months prior to the application deadline addressed to the authority and signed by the chief executive officer of the locality in which the proposed development is to be located stating, without qualification or limitation, the following:

"The construction or rehabilitation of (name of development) and the allocation of federal housing tax credits available under IRC Section 42 for that development will help meet the housing needs and priorities of (name of locality). Accordingly, (name of locality) supports the allocation of federal housing tax credits requested by (name of applicant) for that development." (50 points)

(2) No letter from the chief executive officer of the locality in which the proposed development is to be located, or a letter addressed to the authority and signed by such chief executive officer stating neither support (as described in subdivision b (1) above) nor opposition (as described in subdivision b (3) below) as to the allocation of credits to the applicant for the development. (25 points)

(3) A letter in response to its notification to the chief executive officer of the locality in which the proposed development is to be located opposing the allocation of credits to the applicant for the development. In any such letter, the chief executive officer must certify that the proposed development is not consistent with current zoning or other applicable land use regulations. (0 points)

c. Documentation in a form approved by the authority from the chief executive officer (or the equivalent) of the local jurisdiction in which the development is to be located (including the certification described in the definition of revitalization area in 13VAC10-180-10) that the area in which the proposed development is to be located is a revitalization area and the proposed development is an integral part of the local government's plan for revitalization of the area. (30 points)

d. If the proposed development is located in a qualified census tract as defined in § 42(d)(5)(C)(ii) of the IRC and is in a revitalization area. (5 points)

e. Commitment by the applicant to give leasing preference to individuals and families (i) on public housing waiting lists maintained by the local housing authority operating in the locality in which the proposed development is to be located and notification of the availability of such units to the local housing authority by the applicant or (ii) on section 8 (as defined in 13VAC10-180-90) waiting lists maintained by the local or nearest section 8 administrator for the locality in which the proposed development is to be located and notification of the availability of such units to the local section 8 administrator by the applicant. (10 points; Applicants receiving points under this subdivision may not require an annual minimum income requirement for prospective tenants that exceeds the greater of $3,600 or 2.5 times the portion of rent to be paid by such tenants.)

f. Any of the following: (i) firm financing commitment(s) from the local government, local housing authority, Federal Home Loan Bank affordable housing funds, Commonwealth of Virginia Department of Behavioral Health and Developmental Services funds from Item 315-Z of the 2008-2010 Appropriation Act, or the Rural Development for a below-market rate loan or grant or Rural Development's interest credit used to reduce the interest rate on the loan financing the proposed development; (ii) a resolution passed by the locality in which the proposed development is to be located committing such financial support to the development in a form approved by the authority; or (iii) a commitment to donate land, buildings or waive tap fee waivers from the local government. (The amount of such financing or dollar value of local support will be divided by the total development sources of funds and the proposed development receives two points for each percentage point up to a maximum of 40 points.)

g. Any development subject to (i) HUD's Section 8 or Section 236 programs or (ii) Rural Development's 515 program, at the time of application. (20 points, unless the applicant is, or has any common interests with, the

current owner, directly or indirectly, the application will only qualify for these points if the applicant waives all rights to any developer's fee and any other fees associated with the acquisition and rehabilitation (or rehabilitation only) of the development unless permitted by the executive director for good cause.)

h. Any development receiving (i) a real estate tax abatement on the increase in the value of the development or (ii) new project-based subsidy from HUD or Rural Development for the greater of 5 units or 10% of the units of the proposed development. (10 points)

i. Any proposed development located in a census tract that has less than a 10% poverty rate (based upon Census Bureau data) with no other tax credit units in such census tract. (25 points)

j. Any proposed development listed in the top 25 developments identified by Rural Development as high priority for rehabilitation at the time the application is submitted to the authority. (15 points)

k. Any proposed new construction development (including adaptive re-use and rehabilitation that creates additional rental space) located in a pool identified by the authority as a pool with little or no increase in rent-burdened population. (up to minus 20 points, depending upon the portion of the development that is additional rental space, in all pools except the at-large pool, 0 points in the at-large pool. The executive director may make exceptions in the following circumstances:

(1) Specialized types of housing designed to meet special needs that cannot readily be addressed utilizing existing residential structures;

(2) Housing designed to serve as a replacement for housing being demolished through redevelopment; or

(3) Housing that is an integral part of a neighborhood revitalization project sponsored by a local housing authority.)

l. Any proposed new construction development (including adaptive re-use and rehabilitation that creates additional rental space) that is located in a pool identified by the authority as a pool with an increasing rent-burdened population and is also in an urban development area as defined in § 15.2-2223.1 of the Code of Virginia or participating in a locally adopted affordable housing dwelling unit program as described in either § 15.2-2304 or 15.2-2305 of the Code of Virginia. (up to 20 points, depending upon the portion of the development that is additional rental space, in all pools except the at-large pool, 0 points in the at-large pool)

3. Development characteristics.

a. The average unit size. (100 points multiplied by the sum of the products calculated by multiplying, for each unit type as defined by the number of bedrooms per unit, (i) the quotient of the number of units of a given unit type divided by the total number of units in the proposed development, times (ii) the quotient of the average actual gross square footage per unit for a given unit type minus the lowest gross square footage per unit for a given unit type established by the executive director divided by the highest gross square footage per unit for a given unit type established by the executive director minus the lowest gross square footage per unit for a given unit type established by the executive director. If the average actual gross square footage per unit for a given unit type is less than the lowest gross square footage per unit for a given unit type established by the executive director or greater than the highest gross square footage per unit for a given unit type established by the executive director, the lowest or highest, as the case may be, gross square footage per unit for a given unit type established by the executive director shall be used in the above calculation rather than the actual gross square footage per unit for a given unit type.)

b. Evidence satisfactory to the authority documenting the quality of the proposed development's amenities as determined by the following:

(1) The following points are available for any application:

(a) If 2-bedroom units have 1.5 bathrooms and 3-bedroom units have 2 bathrooms. (15 points multiplied by the percentage of units meeting these requirements)

(b) If a community/meeting room with a minimum of 749 square feet is provided. (5 points)

(c) Brick covering 30% or more of the exterior walls. (20 points times the percentage of exterior walls covered by brick)

(d) If all kitchen and laundry appliances meet the EPA's Energy Star qualified program requirements. (5 points)

(e) If all the windows meet the EPA's Energy Star qualified program requirements. (5 points)

(f) If every unit in the development is heated and cooled with either (i) heat pump equipment with both a SEER rating of 15.0 or more and a HSPF rating of 8.5 or more or (ii) air conditioning equipment with a SEER rating of 15.0 or more, combined with a gas furnace with an AFUE rating of 90% or more. (10 points)

(g) If the water expense is submetered (the tenant will pay monthly or bimonthly bill). (5 points)

(h) If each bathroom contains only low-flow faucets and showerheads as defined by the authority. (3 points)

(i) If each unit is provided with the necessary infrastructure for high-speed cable, DSL or wireless Internet service. (1 point)

(j) If all the water heaters meet the EPA's Energy Star qualified program requirements. (5 points)

(k) If every unit in the development is heated and cooled with a geothermal heat pump that meets the EPA's Energy Star qualified program requirements. (5 points)

(l) If the development has a solar electric system that will remain unshaded year-round, be oriented to within 15 degrees of true south, and be angled horizontally within 15 degrees of latitude. (1 point for each 2.0% of the development's electrical load that can be met by the solar electric system, up to 5 points)

(2) The following points are available to applications electing to serve elderly and/or physically disabled tenants:

(a) If all cooking ranges have front controls. (1 point)

(b) If all units have an emergency call system. (3 points)

(c) If all bathrooms have an independent or supplemental heat source. (1 point)

(d) If all entrance doors to each unit have two eye viewers, one at 48 inches and the other at standard height. (1 point)

(3) If the structure is historic, by virtue of being listed individually in the National Register of Historic Places, or due to its location in a registered historic district and certified by the Secretary of the Interior as being of historical significance to the district, and the rehabilitation will be completed in such a manner as to be eligible for historic rehabilitation tax credits. (5 points)

The maximum number of points that may be awarded under any combination of the scoring categories under subdivision 3 b of this section is 70 points.

c. Any nonelderly development or elderly rehabilitation development in which (i) the greater of 5 units or 10% of the units will be subject to federal project-based rent subsidies or equivalent assistance in order to ensure occupancy by extremely low-income persons; and (ii) the greater of 5 units or 10% of the units will conform to HUD regulations interpreting the accessibility requirements of § 504 of the Rehabilitation Act and be actively marketed to people with special needs in accordance with a plan submitted as part of the application for credits (all the units described in (ii) above must include roll-in showers and roll-under sinks and ranges, unless agreed to by the authority prior to the applicant's submission of its application). (50 points)

d. Any nonelderly development or elderly rehabilitation development in which the greater of 5 units or 10% of the units (i) have rents within HUD's Housing Choice Voucher (HCV) payment standard; (ii) conform to HUD regulations interpreting the accessibility requirements of § 504 of the Rehabilitation Act; and (iii) are actively marketed to people with mobility impairments including HCV holders in accordance with a plan submitted as part of the application for credits. (30 points)

e. Any nonelderly development or elderly rehabilitation development in which 4.0% of the units (i) conform to HUD regulations interpreting the accessibility requirements of § 504 of the Rehabilitation Act and (ii) are actively marketed to people with mobility impairments in accordance with a plan submitted as part of the application for credits. (15 points)

f. Any development located within one-half mile of an existing commuter rail, light rail or subway station or one-quarter mile of one or more existing public bus stops. (10 points, unless the development is located within the geographical area established by the executive director for a pool of credits for northern Virginia, in which case, the development will receive 20 points if the development is ranked against other developments in such northern Virginia pool, 10 points if the development is ranked against other developments in any other pool of credits established by the executive director)

g. Any development for which the applicant agrees to obtain either (i) EarthCraft certification or (ii) US Green Building Council LEED green-building certification prior to the issuance of an IRS Form 8609 with the proposed development's architect certifying in the application that the development's design will meet the criteria for such certification, provided that the proposed development's architect is on the ~~Authority's~~ authority's list of LEED/EarthCraft certified architects. (15 points for a LEED Silver development, or a new construction development that is 15% more energy efficient than the 2004 International Energy Conservation Code (IECC) as measured by EarthCraft or a rehabilitation development that is 30% more energy efficient post-rehabilitation as measured by EarthCraft; 30 points for a LEED Gold development, or a new construction development that is 20% more energy efficient than the 2004 IECC as measured by EarthCraft or a rehabilitation development that is 40% more energy efficient post-rehabilitation as measured by EarthCraft; 45 points for a LEED Platinum development, or a new construction development that is 25% more energy efficient than the 2004 IECC as measured by EarthCraft or a rehabilitation development that is 50% more energy efficient post-rehabilitation as measured by EarthCraft.) The executive director may, if needed, designate a proposed development as requiring an increase in credit in order to be financially feasible

and such development shall be treated as if in a difficult development area as provided in the IRC for any applicant receiving 30 or 45 points under this subdivision ~~and 60 points under either subdivision 7 a or b of this section~~, provided however, any resulting increase in such development's eligible basis shall be limited to 5.0% of the development's eligible basis for 30 points awarded under this subdivision and 10% for 45 points awarded under this subdivision of the development's eligible basis. ~~(30 points)~~

h. Any development for which the applicant agrees to use an authority-certified property manager to manage the development. (25 points)

i. If units are constructed to meet the authority's universal design standards, provided that the proposed development's architect is on the ~~Authority's~~ authority's list of universal design certified architects. (15 points, if all the units in an elderly development meet this requirement; 15 points multiplied by the percentage of units meeting this requirement for nonelderly developments)

j. Any development in which the applicant proposes to produce less than 100 low-income housing units. (20 points for producing 50 low-income housing units or less, minus 0.4 points for each additional low-income housing unit produced down to 0 points for any development that produces 100 or more low-income housing units.)

4. Tenant population characteristics. Commitment by the applicant to give a leasing preference to individuals and families with children in developments that will have no more than 20% of its units with one bedroom or less. (15 points; plus 0.75 points for each percent of the low-income units in the development with three or more bedrooms up to an additional 15 points for a total of no more than 30 points)

5. Sponsor characteristics.

a. Evidence that the principal or principals, as a group or individually, for the proposed development have developed, as controlling general partner or managing member, (i) at least three tax credit developments that contain at least three times the number of housing units in the proposed development or (ii) at least six tax credit developments that contain at least the number of housing units in the proposed development. (50 points; applicants receiving points under this subdivision 5 a are not eligible for points under subdivision 1 a above)

b. Evidence that the principal or principals for the proposed development have developed at least one tax credit development that contains at least the number of housing units in the proposed development. (10 points)

c. Any applicant that includes a principal that was a principal in a development at the time the authority reported such development to the IRS for an uncorrected life-threatening hazard under HUD's Uniform Physical Condition Standards. (minus 50 points for a period of three years after the violation has been corrected)

d. Any applicant that includes a principal that was a principal in a development that either (i) at the time the authority reported such development to the IRS for noncompliance had not corrected such noncompliance by the time a Form 8823 was filed by the authority or (ii) remained out-of-compliance with the terms of its extended use commitment after notice and expiration of any cure period set by the authority. (minus 15 points for a period of three calendar years after the ~~time~~ year the authority filed Form 8823 or expiration of such cure period, unless the executive director determines that such principal's attempts to correct such noncompliance was prohibited by a court, local government or governmental agency, in which case, no negative points will be assessed to the ~~applicant)~~ applicant, or 0 points, if the appropriate individual or individuals connected to the principal attend compliance training as recommended by the authority)

e. Any applicant that includes a principal that is or was a principal in a development that (i) did not build a development as represented in the application for credit (minus two times the number of points assigned to the item or items not built or minus 20 points for failing to provide a minimum building requirement, for a period of three years after the last Form 8609 is issued for the development, in addition to any other penalties the authority may seek under its agreements with the applicant), or (ii) has a reservation of credits terminated by the authority (minus 10 points a period of three years after the credits are returned to the authority).

f. Any applicant that includes a management company in its application that is rated unsatisfactory by the executive director or if the ownership of any applicant includes a principal that is or was a principal in a development that hired a management company to manage a tax credit development after such management company received a rating of unsatisfactory from the executive director during the compliance period and extended use period of such development. (minus 25 points)

6. Efficient use of resources.

a. The percentage by which the total of the amount of credits per low-income housing unit (the "per unit credit amount") of the proposed development is less than the standard per unit credit amounts established by the executive director for a given unit type, based upon the number of such unit types in the proposed development.

(180 points multiplied by the percentage by which the total amount of the per unit credit amount of the proposed development is less than the applicable standard per unit credit amount established by the executive director, negative points will be assessed using the percentage by which the total amount of the per unit credit amount of the proposed development exceeds the applicable standard per unit credit amount established by the executive director.)

b. The percentage by which the cost per low-income housing unit (the "per unit cost"), adjusted by the authority for location, of the proposed development is less than the standard per unit cost amounts established by the executive director for a given unit type, based upon the number of such unit types in the proposed development. (75 points multiplied by the percentage by which the total amount of the per unit cost of the proposed development is less than the applicable standard per unit cost amount established by the executive director.)

The executive director may use a standard per square foot credit amount and a standard per square foot cost amount in establishing the per unit credit amount and the per unit cost amount in subdivision 6 above. For the purpose of calculating the points to be assigned pursuant to such subdivision 6 above, all credit amounts shall include any credits previously allocated to the development, and the per unit credit amount for any building documented by the applicant to be located in both a revitalization area and either (i) a qualified census tract or (ii) difficult development area (such tract or area being as defined in the IRC) shall be determined based upon 100% of the eligible basis of such building, in the case of new construction, or 100% of the rehabilitation expenditures, in the case of rehabilitation of an existing building, notwithstanding any use by the applicant of 130% of such eligible basis or rehabilitation expenditures in determining the amount of credits as provided in the IRC.

7. Bonus points.

a. Commitment by the applicant to impose income limits on the low-income housing units throughout the extended use period (as defined in the IRC) below those required by the IRC in order for the development to be a qualified low-income development. Applicants receiving points under this subdivision a may not receive points under subdivision b below. (The product of (i) 50 points multiplied by (ii) the percentage of housing units in the proposed development both rent restricted to and occupied by households at or below 50% of the area median gross income; plus 1 point for each percentage point of such housing units in the proposed development which are further restricted to rents at or below 30% of 40% of the area median gross income up to an additional 10 points.)

b. Commitment by the applicant to impose rent limits on the low-income housing units throughout the extended use period (as defined in the IRC) below those required by the IRC in order for the development to be a qualified low-income development. Applicants receiving points under this subdivision b may not receive points under subdivision a above. (The product of (i) 25 points (50 points for proposed developments in low-income jurisdictions) multiplied by (ii) the percentage of housing units in the proposed development rent restricted to households at or below 50% of the area median gross income; plus 1 point for each percentage point of such housing units in the proposed development which are further restricted to rents at or below 30% of 40% of the area median gross income up to an additional 10 points.)

c. Commitment by the applicant to maintain the low-income housing units in the development as a qualified low-income housing development beyond the 30-year extended use period (as defined in the IRC). Applicants receiving points under this subdivision c may not receive bonus points under subdivision d below. (40 points for a 10-year commitment beyond the 30-year extended use period or 50 points for a 20-year commitment beyond the 30-year extended use period.)

d. Participation by a local housing authority or qualified nonprofit organization (substantially based or active in the community with at least a 10% ownership interest in the general partnership interest of the partnership) and a commitment by the applicant to sell the proposed development pursuant to an executed, recordable option or right of first refusal to such local housing authority or qualified nonprofit organization or to a wholly owned subsidiary of such organization or authority, at the end of the 15-year compliance period, as defined by IRC, for a price not to exceed the outstanding debt and exit taxes of the for-profit entity. The applicant must record such option or right of first refusal immediately after the low-income housing commitment described in 13VAC10-180-70. Applicants receiving points under this subdivision d may not receive bonus points under subdivision c above. (60 points; plus 5 points if the local housing authority or qualified nonprofit organization submits a homeownership plan satisfactory to the authority in which the local housing authority or qualified nonprofit organization commits to sell the units in the development to tenants.)

In calculating the points for subdivisions 7 a and b above, any units in the proposed development required by the locality to exceed 60% of the area median gross income will not be considered when calculating the percentage of low-income units of the proposed development with incomes

below those required by the IRC in order for the development to be a qualified low-income development, provided that the locality submits evidence satisfactory to the authority of such requirement.

After points have been assigned to each application in the manner described above, the executive director shall compute the total number of points assigned to each such application. Any application that is assigned a total number of points less than a threshold amount of 500 points (475 points for developments financed with tax-exempt bonds in such amount so as not to require under the IRC an allocation of credits hereunder) shall be rejected from further consideration hereunder and shall not be eligible for any reservation or allocation of credits.

During its review of the submitted applications, the authority may conduct its own analysis of the demand for the housing units to be produced by each applicant's proposed development. Notwithstanding any conclusion in the market study submitted with an application, if the authority determines that, based upon information from its own loan portfolio or its own market study, inadequate demand exists for the housing units to be produced by an applicant's proposed development, the authority may exclude and disregard the application for such proposed development.

The executive director may exclude and disregard any application which he determines is not submitted in good faith or which he determines would not be financially feasible.

Upon assignment of points to all of the applications, the executive director shall rank the applications based on the number of points so assigned. If any pools shall have been established, each application shall be assigned to a pool and, if any, to the appropriate tier within such pool and shall be ranked within such pool or tier, if any. The amount of credits made available to each pool will be determined by the executive director. Available credits will include unreserved per capita dollar amount credits from the current calendar year under § 42(h)(3)(C)(i) of the IRC, any unreserved per capita credits from previous calendar years, and credits returned to the authority prior to the final ranking of the applications and may include up to 10% of next calendar year's per capita credits as shall be determined by the executive director. Those applications assigned more points shall be ranked higher than those applications assigned fewer points. However, if any set-asides established by the executive director cannot be satisfied after ranking the applications based on the number of points, the executive director may rank as many applications as necessary to meet the requirements of such set-aside (selecting the highest ranked application, or applications, meeting the requirements of the set-aside) over applications with more points.

In the event of a tie in the number of points assigned to two or more applications within the same pool, or, if none, within the Commonwealth, and in the event that the amount of credits available for reservation to such applications is determined by the executive director to be insufficient for the financial feasibility of all of the developments described therein, the authority shall, to the extent necessary to fully utilize the amount of credits available for reservation within such pool or, if none, within the Commonwealth, select one or more of the applications with the highest combination of points from subdivision 7 above, and each application so selected shall receive (in order based upon the number of such points, beginning with the application with the highest number of such points) a reservation of credits. If two or more of the tied applications receive the same number of points from subdivision 7 above and if the amount of credits available for reservation to such tied applications is determined by the executive director to be insufficient for the financial feasibility of all the developments described therein, the executive director shall select one or more of such applications by lot, and each application so selected by lot shall receive (in order of such selection by lot) a reservation of credits.

For each application which may receive a reservation of credits, the executive director shall determine the amount, as of the date of the deadline for submission of applications for reservation of credits, to be necessary for the financial feasibility of the development and its viability as a qualified low-income development throughout the credit period under the IRC. In making this determination, the executive director shall consider the sources and uses of the funds, the available federal, state and local subsidies committed to the development, the total financing planned for the development as well as the investment proceeds or receipts expected by the authority to be generated with respect to the development, and the percentage of the credit dollar amount used for development costs other than the costs of intermediaries. He shall also examine the development's costs, including developer's fees and other amounts in the application, for reasonableness and, if he determines that such costs or other amounts are unreasonably high, he shall reduce them to amounts that he determines to be reasonable. The executive director shall review the applicant's projected rental income, operating expenses and debt service for the credit period. The executive director may establish such criteria and assumptions as he shall deem reasonable for the purpose of making such determination, including, without limitation, criteria as to the reasonableness of fees and profits and assumptions as to the amount of net syndication proceeds to be received (based upon such percentage of the credit dollar amount used for development costs, other than the costs of intermediaries, as the executive director shall determine to be reasonable for the proposed development), increases in the market value of the development, and increases in operating expenses, rental income and, in the case of applications without firm financing commitments (as defined hereinabove) at fixed interest rates, debt service on the proposed mortgage

loan. The executive director may, if he deems it appropriate, consider the development to be a part of a larger development. In such a case, the executive director may consider, examine, review and establish any or all of the foregoing items as to the larger development in making such determination for the development.

At such time or times during each calendar year as the executive director shall designate, the executive director shall reserve credits to applications in descending order of ranking within each pool and tier, if applicable, until either substantially all credits therein are reserved or all qualified applications therein have received reservations. (For the purpose of the preceding sentence, if there is not more than a de minimis amount, as determined by the executive director, of credits remaining in a pool after reservations have been made, "substantially all" of the credits in such pool shall be deemed to have been reserved.) The executive director may rank the applications within pools at different times for different pools and may reserve credits, based on such rankings, one or more times with respect to each pool. The executive director may also establish more than one round of review and ranking of applications and reservation of credits based on such rankings, and he shall designate the amount of credits to be made available for reservation within each pool during each such round. The amount reserved to each such application shall be equal to the lesser of (i) the amount requested in the application or (ii) an amount determined by the executive director, as of the date of application, to be necessary for the financial feasibility of the development and its viability as a qualified low-income development throughout the credit period under the IRC; provided, however, that in no event shall the amount of credits so reserved exceed the maximum amount permissible under the IRC.

Not more than 20% of the credits in any pool may be reserved to developments intended to provide elderly housing, unless the feasible credit amount, as determined by the executive director, of the highest ranked elderly housing development in any pool exceeds 20% of the credits in such pool, then such elderly housing development shall be the only elderly housing development eligible for a reservation of credits from such pool. However, if credits remain available for reservation after all eligible nonelderly housing developments receive a reservation of credits, such remaining credits may be made available to additional elderly housing developments. The above limitation of credits available for elderly housing shall not include elderly housing developments with project-based subsidy providing rental assistance for at least 20% of the units that are submitted as rehabilitation developments or assisted living facilities licensed under Chapter 17 of Title 63.2 of the Code of Virginia.

If the amount of credits available in any pool is determined by the executive director to be insufficient for the financial feasibility of the proposed development to which such available credits are to be reserved, the executive director may move the proposed development and the credits available to another pool. If any credits remain in any pool after moving proposed developments and credits to another pool, the executive director may for developments that meet the requirements of § 42(h)(1)(E) of the IRC only, reserve the remaining credits to any proposed development(s) scoring at or above the minimum point threshold established by this chapter without regard to the ranking of such application with additional credits from the Commonwealth's annual state housing credit ceiling for the following year in such an amount necessary for the financial feasibility of the proposed development, or developments. However, the reservation of credits from the Commonwealth's annual state housing credit ceiling for the following year shall be in the reasonable discretion of the executive director if he determines it to be in the best interest of the plan. In the event a reservation or an allocation of credits from the current year or a prior year is reduced, terminated or cancelled, the executive director may substitute such credits for any credits reserved from the following year's annual state housing credit ceiling.

In the event that during any round of application review and ranking the amount of credits reserved within any pools is less than the total amount of credits made available therein during such round, the executive director may either (i) leave such unreserved credits in such pools for reservation and allocation in any subsequent round or rounds or (ii) redistribute such unreserved credits to such other pool or pools as the executive director may designate or (iii) carry over such unreserved credits to the next succeeding calendar year for inclusion in the state housing credit ceiling (as defined in § 42(h)(3)(C) of the IRC) for such year.

Notwithstanding anything contained herein, the total amount of credits that may be awarded in any credit year after credit year 2001 to any applicant or to any related applicants for one or more developments shall not exceed 15% of Virginia's per capita dollar amount of credits for such credit year (the "credit cap"). However, if the amount of credits to be reserved in any such credit year to all applications assigned a total number of points at or above the threshold amount set forth above shall be less than Virginia's dollar amount of credits available for such credit year, then the authority's board of commissioners may waive the credit cap to the extent it deems necessary to reserve credits in an amount at least equal to such dollar amount of credits. Applicants shall be deemed to be related if any principal in a proposed development or any person or entity related to the applicant or principal will be a principal in any other proposed development or developments. For purposes of this paragraph, a principal shall also include any person or entity who, in the determination of the executive director, has exercised or will exercise, directly or indirectly, substantial control over the applicant or has performed or will perform

(or has assisted or will assist the applicant in the performance of), directly or indirectly, substantial responsibilities or functions customarily performed by applicants with respect to applications or developments. For the purpose of determining whether any person or entity is related to the applicant or principal, persons or entities shall be deemed to be related if the executive director determines that any substantial relationship existed, either directly between them or indirectly through a series of one or more substantial relationships (e.g., if party A has a substantial relationship with party B and if party B has a substantial relationship with party C, then A has a substantial relationship with both party B and party C), at any time within three years of the filing of the application for the credits. In determining in any credit year whether an applicant has a substantial relationship with another applicant with respect to any application for which credits were awarded in any prior credit year, the executive director shall determine whether the applicants were related as of the date of the filing of such prior credit year's application or within three years prior thereto and shall not consider any relationships or any changes in relationships subsequent to such date. Substantial relationships shall include, but not be limited to, the following relationships (in each of the following relationships, the persons or entities involved in the relationship are deemed to be related to each other): (i) the persons are in the same immediate family (including, without limitation, a spouse, children, parents, grandparents, grandchildren, brothers, sisters, uncles, aunts, nieces, and nephews) and are living in the same household; (ii) the entities have one or more common general partners or members (including related persons and entities), or the entities have one or more common owners that (by themselves or together with any other related persons and entities) have, in the aggregate, 5.0% or more ownership interest in each entity; (iii) the entities are under the common control (e.g., the same person or persons and any related persons serve as a majority of the voting members of the boards of such entities or as chief executive officers of such entities) of one or more persons or entities (including related persons and entities); (iv) the person is a general partner, member or employee in the entity or is an owner (by himself or together with any other related persons and entities) of 5.0% or more ownership interest in the entity; (v) the entity is a general partner or member in the other entity or is an owner (by itself or together with any other related persons and entities) of 5.0% or more ownership interest in the other entity; or (vi) the person or entity is otherwise controlled, in whole or in part, by the other person or entity. In determining compliance with the credit cap with respect to any application, the executive director may exclude any person or entity related to the applicant or to any principal in such applicant if the executive director determines that (i) such person or entity will not participate, directly or indirectly, in matters relating to the applicant or the ownership of the development to be assisted by the credits for which the application is submitted, (ii) such person or entity has no agreement or understanding relating to such application or the tax credits requested therein, and (iii) such person or entity will not receive a financial benefit from the tax credits requested in the application. A limited partner or other similar investor shall not be determined to be a principal and shall be excluded from the determination of related persons or entities unless the executive director shall determine that such limited partner or investor will, directly or indirectly, exercise control over the applicant or participate in matters relating to the ownership of the development substantially beyond the degree of control or participation that is usual and customary for limited partners or other similar investors with respect to developments assisted by the credits. If the award of multiple applications of any applicant or related applicants in any credit year shall cause the credit cap to be exceeded, such applicant or applicants shall, upon notice from the authority, jointly designate those applications for which credits are not to be reserved so that such limitation shall not be exceeded. Such notice shall specify the date by which such designation shall be made. In the absence of any such designation by the date specified in such notice, the executive director shall make such designation as he shall determine to best serve the interests of the program. Each applicant and each principal therein shall make such certifications, shall disclose such facts and shall submit such documents to the authority as the executive director may require to determine compliance with credit cap. If an applicant or any principal therein makes any misrepresentation to the authority concerning such applicant's or principal's relationship with any other person or entity, the executive director may reject any or all of such applicant's pending applications for reservation or allocation of credits, may terminate any or all reservations of credits to the applicant, and may prohibit such applicant, the principals therein and any persons and entities then or thereafter having a substantial relationship (in the determination of the executive director as described above) with the applicant or any principal therein from submitting applications for credits for such period of time as the executive director shall determine.

Within a reasonable time after credits are reserved to any applicants' applications, the executive director shall notify each applicant for such reservations of credits either of the amount of credits reserved to such applicant's application (by issuing to such applicant a written binding commitment to allocate such reserved credits subject to such terms and conditions as may be imposed by the executive director therein, by the IRC and by this chapter) or, as applicable, that the applicant's application has been rejected or excluded or has otherwise not been reserved credits in accordance herewith. The written binding commitment shall prohibit any transfer, direct or indirect, of partnership interests (except those involving the admission of limited partners) prior to the placed-in-service date of the proposed development unless the transfer is consented to by the executive director. The written binding commitment shall further limit the developers' fees to

the amounts established during the review of the applications for reservation of credits and such amounts shall not be increased unless consented to by the executive director.

If credits are reserved to any applicants for developments which have also received an allocation of credits from prior years, the executive director may reserve additional credits from the current year equal to the amount of credits allocated to such developments from prior years, provided such previously allocated credits are returned to the authority. Any previously allocated credits returned to the authority under such circumstances shall be placed into the credit pools from which the current year's credits are reserved to such applicants.

The executive director shall make a written explanation available to the general public for any allocation of housing credit dollar amount which is not made in accordance with established priorities and selection criteria of the authority.

The authority's board shall review and consider the analysis and recommendation of the executive director for the reservation of credits to an applicant, and, if it concurs with such recommendation, it shall by resolution ratify the reservation by the executive director of the credits to the applicant, subject to such terms and conditions as it shall deem necessary or appropriate to assure compliance with the aforementioned binding commitment issued or to be issued to the applicant, the IRC and this chapter. If the board determines not to ratify a reservation of credits or to establish any such terms and conditions, the executive director shall so notify the applicant.

Subsequent to such ratification of the reservation of credits, the executive director may, in his discretion and without ratification or approval by the board, increase the amount of such reservation by an amount not to exceed 10% of the initial reservation amount.

The executive director may require the applicant to make a good faith deposit or to execute such contractual agreements providing for monetary or other remedies as it may require, or both, to assure that the applicant will comply with all requirements under the IRC, this chapter and the binding commitment (including, without limitation, any requirement to conform to all of the representations, commitments and information contained in the application for which points were assigned pursuant to this section). Upon satisfaction of all such aforementioned requirements (including any post-allocation requirements), such deposit shall be refunded to the applicant or such contractual agreements shall terminate, or both, as applicable.

If, as of the date the application is approved by the executive director, the applicant is entitled to an allocation of the credits under the IRC, this chapter and the terms of any binding commitment that the authority would have otherwise issued to such applicant, the executive director may at that time allocate the credits to such qualified low-income buildings or development without first providing a reservation of such credits. This provision in no way limits the authority of the executive director to require a good faith deposit or contractual agreement, or both, as described in the preceding paragraph, nor to relieve the applicant from any other requirements hereunder for eligibility for an allocation of credits. Any such allocation shall be subject to ratification by the board in the same manner as provided above with respect to reservations.

The executive director may require that applicants to whom credits have been reserved shall submit from time to time or at such specified times as he shall require, written confirmation and documentation as to the status of the proposed development and its compliance with the application, the binding commitment and any contractual agreements between the applicant and the authority. If on the basis of such written confirmation and documentation as the executive director shall have received in response to such a request, or on the basis of such other available information, or both, the executive director determines any or all of the buildings in the development which were to become qualified low-income buildings will not do so within the time period required by the IRC or will not otherwise qualify for such credits under the IRC, this chapter or the binding commitment, then the executive director may (i) terminate the reservation of such credits and draw on any good faith deposit, or (ii) substitute the reservation of credits from the current credit year with a reservation of credits from a future credit year, if the delay is caused by a lawsuit beyond the applicant's control that prevents the applicant from proceeding with the development. If, in lieu of or in addition to the foregoing determination, the executive director determines that any contractual agreements between the applicant and the authority have been breached by the applicant, whether before or after allocation of the credits, he may seek to enforce any and all remedies to which the authority may then be entitled under such contractual agreements.

The executive director may establish such deadlines for determining the ability of the applicant to qualify for an allocation of credits as he shall deem necessary or desirable to allow the authority sufficient time, in the event of a reduction or termination of the applicant's reservation, to reserve such credits to other eligible applications and to allocate such credits pursuant thereto.

Any material changes to the development, as proposed in the application, occurring subsequent to the submission of the application for the credits therefor shall be subject to the prior written approval of the executive director. As a condition to any such approval, the executive director may, as necessary to comply with this chapter, the IRC, the binding commitment and any other contractual agreement between the authority and the applicant, reduce the amount of credits applied for or

reserved or impose additional terms and conditions with respect thereto. If such changes are made without the prior written approval of the executive director, he may terminate or reduce the reservation of such credits, impose additional terms and conditions with respect thereto, seek to enforce any contractual remedies to which the authority may then be entitled, draw on any good faith deposit, or any combination of the foregoing.

In the event that any reservation of credits is terminated or reduced by the executive director under this section, he may reserve, allocate or carry over, as applicable, such credits in such manner as he shall determine consistent with the requirements of the IRC and this chapter.

Notwithstanding the provisions of this section, the executive director may make a reservation of credits to any applicant that proposes a nonelderly development that (i) provides rent subsidies or equivalent assistance in order to ensure occupancy by extremely low-income persons; (ii) conforms to HUD regulations interpreting the accessibility requirements of § 504 of the Rehabilitation Act; and (iii) will be actively marketed to people with disabilities in accordance with a plan submitted as part of the application for credits and approved by the executive director for at least 50% of the units in the development. Any such reservations made in any calendar year may be up to 6.0% of the Commonwealth's annual state housing credit ceiling for the applicable credit year. However, such reservation will be for credits from the Commonwealth's annual state housing credit ceiling from the following calendar year.

Notwithstanding the provisions of this section, the executive director may, except in calendar ~~year~~ years 2010 and 2011, make a reservation of credits, to any applicant that proposes to acquire and rehabilitate a nonelderly development that the executive director determines (i) cannot be acquired within the schedule for the competitive scoring process described in this section and (ii) cannot be financed with tax-exempt bonds using the authority's normal underwriting criteria for its multifamily tax-exempt bond program. Any proposed development subject to an application submitted under this paragraph must meet the following criteria: (i) at least 20% of the units in the development must be low-income housing units for residents at 50% of the area median income or less, (ii) the development must be eligible for points under subdivision 3 b (1) (g) of this section or a combination of at least 20 points under subdivisions 3 b (1) (b) through 3 b (1) (j), excluding subdivision 3 b (1) (c), (iii) the executive director's review of the application must confirm that the portion of the developer's fee to be deferred is at least 5.0% of the total development costs, (iv) participation by the local government in the form of low-interest loan/grant moneys from such locality's affordable housing funds in an amount equal to or greater than 20% of the total development costs, and (v) the application for the development must obtain as many points as the lowest ranked development that could have received a partial reservation of credits from the geographic pool in which the applicant would have been ranked in the most recent competitive scoring round. Any such reservations made in any calendar year may be up to 15% of the Commonwealth's annual state housing credit ceiling for the applicable credit year, of which at least 10% of the Commonwealth's annual state housing credit ceiling for the applicable credit year will be reserved for developments within Arlington County, Fairfax County, Alexandria City, Fairfax City or Falls Church City. However, such reservation will be for credits from the Commonwealth's annual state housing credit ceiling from the following calendar year.

VA.R. Doc. No. R11-2571; Filed August 25, 2010, 9:49 a.m.

GUIDANCE DOCUMENTS

Sections 2.2-4008 and 2.2-4103 of the Code of Virginia require annual publication in the *Virginia Register* of guidance document lists from state agencies covered by the Administrative Process Act and the Virginia Register Act. A guidance document is defined as "…any document developed by a state agency or staff that provides information or guidance of general applicability to the staff or public to interpret or implement statutes or the agency's rules or regulations..." Agencies are required to maintain a complete, current list of all guidance documents and make the full text of such documents available to the public.

Generally, the format for the guidance document list is: document number (if any), title of document, date issued or last revised, and citation of Virginia Administrative Code regulatory authority or Code of Virginia statutory authority. Questions concerning documents or requests for copies of documents should be directed to the contact person listed by the agency.

VIRGINIA ECONOMIC DEVELOPMENT PARTNERSHIP

Copies of the following documents may be viewed during regular work days from 8:30 a.m. until 5 p.m. in the office of the Virginia Economic Development Partnership, Riverfront Plaza, 19th Floor, 901 East Byrd Street, Richmond, VA 23219. Copies may be obtained free of charge by contacting Kim Ellett at the same address, telephone (804) 545-5610, FAX (804) 545-5611, or email kellett@yesvirginia.org.

Questions regarding interpretation or implementation of this document may be directed to Sandi McNinch, General Counsel, at the address above or email smcninch@yesvirginia.org.

Guidance Documents:

Guidelines for Use of the Governor's Opportunity Fund, revised July 2010, § 2.2-115, http://www.virginiaallies.org/assets/files/incentives/GOFGuidelines.pdf

Guidelines for Use of the Virginia Investment Partnership, revised July 2010, §§ 2.2-5100 through 2.2-5104, http://www.virginiaallies.org/assets/files/incentives/VIPGuidelines.pdf

Guidelines for Use of the Major Eligible Employer Grant, revised July 2010, §§ 2.2-5100 through 2.2-5104, http://www.virginiaallies.org/assets/files/incentives/MEEGuidelines.pdf

Guidelines for Use of the Virginia Economic Development Investment Grant, revised July 2010, §§ 2.2-5100 through 2.2-5104, http://www.virginiaallies.org/assets/files/incentives/VEDIGGuidelines.pdf

DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES

2009 Annual Report, Agricultural Stewardship Act

The Commissioner of Agriculture and Consumer Services announces the availability of the annual report of the Agricultural Stewardship Act entitled "Virginia Agricultural Stewardship Act Annual Report, April 1, 2009 - March 31, 2010: A Positive Approach." Copies of this report can be obtained by contacting Joyce Knight at (804) 786-3538 or email at joyce.knight@vdacs.virginia.gov. A written request may be sent to: Virginia Department of Agriculture and Consumer Services, Office of Policy, Planning and Research, P.O. Box 1163, 102 Governor Street, Suite 219, Richmond, VA 23218. An email request is acceptable. Copies of the annual report are available without charge.

DEPARTMENT OF ENVIRONMENTAL QUALITY

Notice of Public Meeting Environmental Study - Portions of Campbell, Bedford, and Amherst Counties and the City of Lynchburg

Purpose of notice: To seek public comment and announce a public meeting on two water quality studies by the Department of Environmental Quality (DEQ) for eight stream segments that drain from portions of Campbell, Bedford, and Amherst Counties and the City of Lynchburg and are located within the James River watershed.

Public meeting: Thursday, September 30, 2010 from 6:30 p.m. to 8:30 p.m. The meeting will be held in the community room of the Lynchburg Public Library, 2315 Memorial Avenue, Lynchburg, VA.

Comment period: October 1, 2010, to November 1, 2010.

Meeting description: Virginia agencies are working to identify and eliminate sources of bacteria contamination in eight stream segments from the James River watershed in Central Virginia that currently exceed DEQ water quality standards and are listed on the "impaired," or dirty waters, list. The local streams included in the studies are: 18.43 miles of James River, 5.37 miles of Ivy Creek, 5.9 miles of Tomahawk Creek, 3.47 miles of Burton Creek, 10.55 miles of Judith Creek, 5.45 miles of Fishing Creek, 10.24 miles of Blackwater Creek, and 8.5 miles of Beaver Creek.

The pending public meeting will allow public comment and questions on two water quality studies that include:

1. An amendment to the James River total maximum daily load (TMDL) developed and adopted in 2007. The TMDL study provides a summary of the source of pollutants within the stream segments and provides a summary of the amount of pollutant that must be removed to meet water quality standards for the eight stream segments.

2. The James River TMDL implementation plan, or watershed management plan, presents an outline of voluntary actions or practices that should be utilized within the region to clean up or meet the water quality standard (TMDL) for the local streams.

How to comment: DEQ accepts written comments by email, fax, or postal mail. Written comments should include the name, address, and telephone number of the person commenting and be received by DEQ during the comment period. DEQ also accepts written and oral comments at the public meeting announced in this notice. Written comments should be directed to Paula Nash, DEQ, 7705 Timberlake Road, Lynchburg, VA 24502, email paula.nash@deq.virginia.gov, telephone (434) 582-5120 or to Kelly Hitchcock, Virginia's Region 2000 Local Government Council, 828 Main Street, 12th Floor, Lynchburg, VA 24504, email khitchcock@region2000.org, telephone (434) 845-3491.

Additional information: For additional information on the James River Basin TMDL or the James River TMDL implementation plan, contact Kelly Hitchcock, contact information above, or go to the Environmental Section of the Virginia's Region 2000 Local Government Council website at http://region2000.org/environmental-services.html, or the DEQ website at www.deq.virginia.gov.

Notice of Public Meeting - Restore Water Quality in the Little River Watershed

Public meeting: Tuesday, September 28, 2010, from 7 p.m. to 9 p.m. The meeting will be held at Sinkland Farms, 3020 Riner Road, Christiansburg, VA. Directions: From Interstate 81, take exit 114. Go South on Route 8 towards Riner/Floyd. Sinkland Farms is 2 miles on the left at 3020 Riner Road. From Floyd, take Route 8 for about 17 miles. Turn right at 3020 Riner Road.

Purpose of notice: The Virginia Department of Environmental Quality (DEQ) announces a public meeting to discuss a study to restore water quality in the Little River watershed.

Description of study: Virginia agencies are working to identify sources of bacteria, temperature, and biological impairment (general standard) in the Little River watershed. The general standard indicates the water quality does not support a natural aquatic invertebrate community.

The following is the "impaired" stream, the length of the impaired segment, location, and the reason for the impairment:

Little River, 42.71 miles, Floyd, Montgomery and Pulaski Counties, bacteria

Little River Reservoir, 60.44 acres, Pulaski and Montgomery Counties, bacteria

Little River, 16.99 miles, Montgomery County, general standard (aquatic invertebrate community)

Meadow Creek, 4.49 miles, Montgomery County, bacteria

Mill Creek, Poplar Branch, Unnamed Tributaries to Mill Creek, 15.25 miles, Montgomery County, bacteria

Brush Creek, 5.76 miles, Montgomery County, bacteria

Little River, 33.55 miles, Floyd County, temperature and bacteria

Meadow Run, 3.70 miles, Floyd County, bacteria and general standard (aquatic invertebrate community)

Pine Creek, 3.68 miles, Floyd County, bacteria and temperature

Laurel Creek, 3.26 miles, Floyd County, bacteria

Dodd Creek and West Fork Dodd Creek, 15.41 miles, Floyd County, bacteria

Dodd Creek, 6.28 miles, Floyd County, temperature

West Fork Dodd Creek, 1.17 miles, Floyd County, temperature

Big Indian Creek, 7.56 miles, Floyd County, temperature

The state agencies developed a total maximum daily load, (TMDL) for the impaired waters. A TMDL is the total amount of a pollutant a water body can contain and still meet water quality standards. To restore water quality, contamination levels have to be reduced to the TMDL amount.

How to comment: DEQ accepts written comments by email, fax, or postal mail. Written comments should include the name, address, and telephone number of the person commenting and be received by October 28, 2010. DEQ also accepts written and oral comments at the public meeting announced in this notice.

Contact for additional information: Mary Dail, Virginia Department of Environmental Quality, Blue Ridge Regional Office, 3019 Peters Creek Road, Roanoke, VA 24019, telephone (540) 562-6715, FAX (540) 562-6860, or email mary.dail@deq.virginia.gov.

Proposed Consent Order for Winchester Homes, Inc.

An enforcement action has been proposed for Winchester Homes, Inc. for alleged violations in Spotsylvania County associated with the Glenhaven South Subdivision development project. The consent order describes a settlement to resolve unpermitted impacts taken to a stream channel associated with the Glenhaven South Subdivision development project. A description of the proposed action is available at the DEQ office named below or online at www.deq.virginia.gov. Daniel Burstein will accept comments by email at daniel.burstein@deq.virginia.gov, FAX at (703) 583-3821, or postal mail at Department of Environmental Quality, Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193, from September 14, 2010, to October 14, 2010.

STATE LOTTERY DEPARTMENT

Director's Orders

The following Director's Orders of the State Lottery Department were filed with the Virginia Registrar of Regulations on August 16, 2010, and August 24, 2010. The orders may be viewed at the State Lottery Department, 900 East Main Street, Richmond, VA, or at the office of the Registrar of Regulations, 910 Capitol Street, 2nd Floor, Richmond, VA.

Director's Order Number Sixty-Seven (10)

Virginia Lottery's "Winner's Circle Sweepstakes" Final Rules for Game Operation (effective August 23, 2010)

Director's Order Number Seventy-One (10)

Virginia's Instant Game Lottery 1204; "Blackjack Showdown" Final Rules for Game Operation (effective August 12, 2010)

Director's Order Number Seventy-Two (10)

"Virginia Lottery's Redskins Legacy Stay in the Game Sweepstakes" Final Rules for Game Operation (effective August 23, 2010)

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The following Director's Order of the State Lottery Department was filed with the Virginia Registrar of Regulations on August 24, 2010.

Director's Order Number Seventy-Three (10)
Certain Virginia Instant Game Lotteries; End of Games.

In accordance with the authority granted by §§ 2.2-4002 B 15 and 58.1-4006 A of the Code of Virginia, I hereby give notice that the following Virginia Lottery instant games will officially end at midnight on September 3, 2010.

Game 1065	Jewel 7's
Game 1075	Blackjack
Game 1113	On A Roll!
Game 1120	Flying Aces
Game 1124	Double Dollars
Game 1125	Fire N' Dice
Game 1129	Wild Bill$

Game 1147	Goin' Green
Game 1148	Spades
Game 1153	Double Latte Cash
Game 1155	Classic Poker
Game 1158	Find the 9's Tripler
Game 1160	Triple Fortune
Game 1163	$15,000 Payday
Game 1169	American Idol
Game 1171	Super Lucky 8's
Game 1174	Fat Cat

The last day for lottery retailers to return for credit unsold tickets from any of these games will be October 8, 2010. The last day to redeem winning tickets for any of these games will be March 2, 2011, 180 days from the declared official end of the game. Claims for winning tickets from any of these games will not be accepted after that date. Claims that are mailed and received in an envelope bearing a postmark of the United States Postal Service or another sovereign nation of March 2, 2011, or earlier, will be deemed to have been received on time. This notice amplifies and conforms to the duly adopted State Lottery Board regulations for the conduct of lottery games.

This order is available for inspection and copying during normal business hours at the Virginia Lottery headquarters, 900 East Main Street, Richmond, Virginia; and at any Virginia Lottery regional office. A copy may be requested by mail by writing to Director's Office, Virginia Lottery, 900 East Main Street, Richmond, Virginia 23219.

This Director's Order becomes effective on the date of its signing and shall remain in full force and effect unless amended or rescinded by further Director's Order.

/s/ Paula I. Otto
Executive Director
August 23, 2010

STATE WATER CONTROL BOARD

Proposed Action for Town of Culpeper

An enforcement action has been proposed for the Town of Culpeper for alleged violations at the Town of Culpeper Wastewater Treatment Plant. The violations to be addressed include violations of Virginia Pollutant Discharge Elimination System Permit No. VA0061590. A description of the proposed action is available at the Department of Environmental Quality office named below or online at www.deq.virginia.gov. Stephanie Bellotti will accept comments by email at stephanie.bellotti@deq.virginia.gov, FAX at (703) 583-3821, or postal mail at Virginia Department of Environmental Quality, Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193, from September 14, 2010, to October 14, 2010.

VIRGINIA CODE COMMISSION

Notice to State Agencies

Contact Information: *Mailing Address:* Virginia Code Commission, 910 Capitol Street, General Assembly Building, 2nd Floor, Richmond, VA 23219; *Telephone:* Voice (804) 786-3591; FAX (804) 692-0625; *Email:* varegs@dls.virginia.gov.

Meeting Notices: Section 2.2-3707 C of the Code of Virginia requires state agencies to post meeting notices on their websites and on the Commonwealth Calendar at http://www.virginia.gov/cmsportal3/cgi-bin/calendar.cgi.

Cumulative Table of Virginia Administrative Code Sections Adopted, Amended, or Repealed: A table listing regulation sections that have been amended, added, or repealed in the *Virginia Register of Regulations* since the regulations were originally published or last supplemented in the print version of the Virginia Administrative Code is available at http://register.dls.virginia.gov/cumultab.htm.

Filing Material for Publication in the Virginia Register of Regulations: Agencies are required to use the Regulation Information System (RIS) when filing regulations for publication in the *Virginia Register of Regulations*. The Office of the Virginia Register of Regulations implemented a web-based application called RIS for filing regulations and related items for publication in the Virginia Register. The Registrar's office has worked closely with the Department of Planning and Budget (DPB) to coordinate the system with the Virginia Regulatory Town Hall. RIS and Town Hall complement and enhance one another by sharing pertinent regulatory information.

The Office of the Virginia Register is working toward the eventual elimination of the requirement that agencies file print copies of regulatory packages. Until that time, agencies may file petitions for rulemaking, notices of intended regulatory actions, and general notices in electronic form only; however, until further notice, agencies must continue to file print copies of proposed, final, fast-track and emergency regulatory packages.