

ILLINOIS POLLUTION CONTROL BOARD  
October 1, 1992

IN THE MATTER OF: )  
 )  
PROPOSED AMENDMENTS TO TITLE )  
35, SUBTITLE F: PUBLIC ) R87-37  
WATER SUPPLIES CHAPTER 1: ) (Rulemaking)  
POLLUTION CONTROL BOARD )  
35 Ill. Adm. Code 608 )  
CROSS-CONNECTION STANDARDS )

Proposed Rule. First Notice.

OPINION AND ORDER OF THE BOARD (by G. T. Girard):

On October 20, 1987, the Illinois Environmental Protection Agency (Agency) filed a draft proposal to amend the cross-connection control regulations. The purpose of these proposed amendments to the Pollution Control Board's (Board) public water supply regulations (35 Ill. Adm. Code Subpart F) is to prevent drinking water degradation by eliminating unprotected cross-connections. Cross-connections are actual or potential connections between a potable and non-potable water supply. Presently, cross-connections are regulated by Section 607.104 (amended effective September 14, 1982). The instant proposal clarifies these regulations. Section 607.104 would be repealed concurrently with the final adoption of proposed Section 608.

**PROCEDURAL HISTORY**

The instant rulemaking was filed pursuant to Sections 4 and 28 of the Environmental Protection Act (Act). Addenda or amendments to the original proposal were filed by the Agency on October 27, 1987, May 17, 1988, October 11, 1988, and May 1, 1989. Unless specified otherwise, references to the "Agency proposal" in this document refer to the last amended proposal filed by the Agency (May 1, 1989). On March 26, 1992, the Board invited public comment to update the record.

The record for making these regulations included several public hearings, extensive public comments, and an Economic Impact Study (EcIS). Four public hearings on the proposal were held by the Board: May 25, 1988 (Springfield); May 26, 1988 (Chicago); April 11, 1989 (Springfield); and May 1, 1989 (Chicago). Ninety-one public comments were received by the Board between April 4, 1988 and May 29, 1992 (listed in Appendix A). On August 4, 1988 the Department of Energy and Natural Resources (DENR) filed a letter with the Board that an Economic Impact Study (EcIS) would be undertaken. EcIS hearings were held on

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June 26, 1990 in Springfield, and on June 28, 1990 in Chicago .  
The DENR filed the EcIS on November 7, 1990.<sup>2</sup>

Today the Board sends the proposal to first notice under the Illinois Administrative Procedure Act (IAPA) (Ill. Rev. Stat. 1991, ch. 127, par. 1001-1 et seq.) The Board's action will cause the publication of the proposal in the Illinois Register and begin the minimum 45 day public comment period under the IAPA. The Board's proposal is generally similar to the last amended proposal filed by the Agency, but there are several differences which are delineated in this opinion and order. Also by today's action, the Board proposes to repeal the existing cross-connection control regulations at 35 Ill. Adm. Code 607.104 as the instant proposal (Part 608) will supersede Section 607.104.

#### CROSS-CONNECTION CONTROL PROGRAM

Current Board regulations state that control of all cross-connections to a public water supply is the responsibility of the owner or official custodian of the supply (35 Ill. Adm. Code 607.104(c)). The instant proposal clarifies the methods public water supplies can use to accomplish that mandate. Section 608.202 of the instant proposal requires the adoption of ordinances or conditions of service which prohibit unprotected cross-connections, specifies cross-connection control surveys of the public water supply distribution system, and includes a system for record keeping. The proposal clearly states that the public water supply will terminate service to any customer that fails to comply (608.202(a)(4)). In keeping with present regulations (Section 607.104(c)), the proposed regulations (608.202(d)) place responsibility for control of all cross-connections and interconnections on the owner or official custodian of the water supply.

The investor owned water supplies represented by the National Association of Water Companies and the Illinois-American

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<sup>1</sup>References to the transcripts are designated as follows: May 25 and 26, 1988 hearings - "Tr.1 at ..."; April 11 and May 1, 1989 - "Tr.2 at ..."; and June 26 and 28, 1990 hearings - "Tr.3 at ..."

<sup>2</sup>The Board notes that P.A. 87-860 removed the EcIS requirement for this type of rulemaking. However, as the EcIS has been completed the Board will consider the information provided in the EcIS in relevant portions of the opinion in evaluating the economic feasibility of the proposal.

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Water Company have presented extensive testimony and comments<sup>3</sup> regarding the proposed cross-connection standards and have suggested alternate requirements to address their concerns (P.C. 12, 16, and 39). In addition, the investor owned water supplies group<sup>4</sup> (IOWSG) has addressed the implications of the State Mandates Act on the proposed cross-connection control program requirements (P.C. 38, 43, 52, and 53). There has not been any additional participation in this rulemaking by the public water supplies owned by municipalities or local governments.

The Agency submitted several draft proposals to address the concerns of the regulated community including the IOWSG. A discussion of the IOWSG's concerns about the proposed cross-connection control program requirements is presented below.

#### Program Requirement Issues Raised by IOWSG

Ordinances and Conditions of Service. The Agency proposal at Section 608.202(a) requires all public water supplies to adopt an ordinance or condition of service which prohibits unprotected cross-connections. These ordinances or conditions of service shall include at least one of the following: a plumbing code as stringent as the Illinois Plumbing Code (Section 608.202(a)(1)(A)); or a requirement that customers provide proof that their plumbing is in accordance with a plumbing code as stringent as the Illinois Plumbing Code (Section 608.202(a)(1)(B)); or installation of cross-connection control devices at all service connections, except for single family dwellings (Section 608.202(a)(1)(C)).

In addition to the single family dwelling exemption, the instant proposal at Section 608.202(a)(1)(C) sets forth two additional exceptions to the proposed regulations. Cross-connection control devices would not be required at: institutional, commercial, or industrial establishments with only drinking water fountains, restrooms, and kitchen facilities (Section 608.302(b)); or multi-family residential dwellings (Section 608.307).

The Agency proposal did not include the exemption provided to certain institutional, commercial or industrial establishments under the third "conditions of service" option at Section

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<sup>3</sup>National Association of Water Companies: Tr.1: 210-224, Tr.2: 40-54, P.C. #16, 38, 39, and 52.

Illinois-American Water Company: Tr.1: 153-164, Tr.2: 54-72, P.C. #12, 18, 24, 41, 43, and 53.

<sup>4</sup>Includes National Association of Water Companies and Illinois-American Water Company.

608.202(a)(1)(C). The IOWSG has stated (Tr.1 at 216, Tr.2 at 43, Ex. 4, P.C. 12) that investor-owned public water supplies do not have the authority to adopt and enforce a plumbing code. Therefore when adopting "conditions of service," the group members will be forced to opt for the third choice which requires the installation of cross-connection devices at all service connections, except single family residential dwellings. Thus, IOWSG notes that the exemption provided to certain institutional, commercial or industrial establishments will not apply to investor owned water supplies. The IOWSG opined (P.C. 39) that the Agency proposal (Section 608.202(a)) was therefore discriminatory against the investor owned water supplies and their customers.

The Board believes that the IOWSG has a valid concern. The Board notes that the intent in exempting connections covered by proposed Section 608.302(b) is based on the hazard associated with such connections and not on the ownership of the public water supply. The Board finds that it is reasonable to include such an exemption in Section 608.202(a)(1)(C) to respond to the concerns of the IOWSG.

The Agency proposal did not specifically exempt or include multi-family residential dwellings. Thus, the IOWSG observed (P.C. 39) that the Agency proposal (Section 608.203(b)) would exempt certain institutional, commercial, or industrial establishments, while multi-family residential dwellings having comparable water use would not be exempt. The Board agrees that the exemption should be extended to multi-family dwellings with comparable water supplies. Therefore, the instant proposal is written to exempt multi-family residential dwellings (Section 608.307).

**Cross-Connection Control Survey.** Section 608.202(b) and (c) requires the official custodian of the public water supply to perform a cross-connection control survey of the public water supply distribution system once every two years and maintain an inventory of water uses by service connection. The IOWSG expressed concerns about these requirements (P.C. 39) which are discussed separately below.

**Frequency of the cross-connection control survey.** The IOWSG stated that the proposed 2-year frequency for conducting the cross-connection control survey would not be cost effective, and would place an undue burden on the ratepayer. The group suggested that the frequency be decreased to once every 5 years. The Board notes that the investor owned water supply group did not provide any cost information supporting the suggestion to decrease the survey frequency. The EcIS also does not provide a specific cost estimate of conducting the survey. Therefore, the Board will retain the requirement that a survey shall be conducted every two years.

Who is responsible for conducting the survey? The IOWSG noted that the language requiring the "official custodian" of the public water supply to conduct the cross-connection control survey is vague and does not accurately state who is responsible for conducting the survey. The term "official custodian" has been defined under the Board's public water supply regulations at 35 Ill. Adm. Code 601.105. The official custodian is any officer of an organization that owns or operates a public water supply, and who has direct administrative responsibility for the supply. The definition of "official custodian" shall be included in the definition section at Section 608.102.

Inclusion of industrial, commercial, and institutional establishments in the survey. The IOWSG recommended that Section 608.202(b) should require the cross-connection control survey to include all industrial, commercial, and institutional establishments which provide their own water supply, but which can have cross-connections to the public water supply. According to the instant proposal, the cross-connection control survey must account for all cross-connections to the public water supply distribution system. Thus, the proposal clearly includes all establishments which have cross-connections, whether or not they have their own water supply. No revisions are necessary.

Standards or criteria for conducting the cross-connection control survey. The IOWSG stated that the proposed cross-connection control survey requirements at Section 608.202(b) and (c) do not provide any survey standards or criteria. The IOWSG recommended that such standards or criteria be established in the regulations. Since the Agency proposal does not prescribe standards or criteria for conducting the survey, the IOWSG concerns appear valid. The only specification in the Agency proposal is that the survey shall inventory water uses by service connection.

The Agency proposed requiring the cross-connection survey of the public water supply distribution system to develop a list of all connection devices possessed by the water consumer, and dates of most recent inspection and testing (Tr.1 at 57). The Agency envisions that the water purveyor will use this information to develop an inventory of service connections, water use, and backflow protection needs within the individual premises (Tr.1 at 57). To develop and maintain a cross-connection control survey database, it would be useful to have a set of criteria which can be used by the water purveyors.

Involvement of local government agencies in conducting the cross-connection control survey. The IOWSG believes that the cross-connection control survey should be conducted by the local health departments instead of the public water supply (P.C. 39). The Agency stated (P.C. 19) that it would be inconsistent with Ill. Rev. Stat. 1987, ch. 111 1/2, par. 1018 (a) to allow investor

owned water supplies to foist the responsibility upon State or local government for the implementation of a cross-connection control program for the company's customers. Since maintenance of the water quality in the public water supply distribution system is the responsibility of the water purveyor under the Safe Drinking Water Act, the Board believes that any program requirements such as the cross-connection control survey that are implemented to fulfill the purveyor's responsibility are best carried out by the water purveyor.

**Control of Cross-Connections and Inter-Connections to Public Water Supply.** According to the instant proposal at Section 608.202(d), the owner or official custodian of a public water supply is responsible for the control of all cross-connections and interconnections to the public water supply. This is the same as the current Board regulation at 35 Ill. Adm. Code 607.104(c).

The IOWSG expressed strong objections to this requirement. The group stated that it will increase liability claims against the owner or operator of the public water supply and that this action places a broad legal duty on the public water supply (Tr.2 at 85-86). The IOWSG stated that only the installation of cross-connection control devices at all service connections will protect the public water supply from liability exposure since the users and not the public water supply have the actual control of cross-connections and interconnections (P.C. 41). The Board was requested to delete this requirement or evaluate the economic impact of the regulations under the assumption that the installation, inspection, and testing of cross-connection control devices will be required at all service connections (P.C. 12 and 41).

The liability issues associated with the proposed regulations were addressed by the Agency in testimony presented at the merit hearings (Tr.1 at 52-56, Tr.2 at 83-89). The Agency stated that the proposed requirement is an existing requirement under 35 Ill. Adm. Code 607.104 and therefore, does not place any new responsibilities on the public water supply. In addition, the Agency noted that under the Safe Drinking Water Act (42 U.S.C 300h et seq.), the public water supply has the responsibility to deliver potable water meeting the Safe Drinking Water Act standards at the consumer's tap. However, a public water supply is not responsible for any contaminant that may be introduced into the private water system by the user of the private water system. The public water supply is responsible if a contaminant from a private water system flows back in the public water supply distribution system through a cross-connection.

Therefore, whether or not proposed Section 608.202(d) is adopted by the Board, the public water supply would be liable if the requirements of the Safe Drinking Water Act are violated.

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However, a public water supply subject to a liability action can also initiate action against any person who might be responsible for causing the contamination of the system.

The instant proposal at Section 608.202(d) does not subject ~~the public water supply to any additional liability exposure~~ since the regulation is currently in effect at 35 Ill. Adm. Code 607.104(c). An argument can also be made that the instant proposal reiterates the responsibilities of the public water supply under the Safe Drinking Water Act. Therefore, the Board proposes to retain the requirement at Section 608.202(d).

### Implications of State Mandates Act

One issue raised by the IOWSG (P.C. 38,43,52 and 53) in this proceeding has been whether or not the adoption of the proposal would impose a state mandate on local governments. The State Mandates Act (Ill. Rev. Stat. 1991, ch. 85, Sec. 2201 et. seq.) defines a state mandate as any state initiated statutory or executive action that requires a local government to establish, expand or modify its activities in such a way as to necessitate additional expenditures from local revenues. The costs directly attributable to the mandate are reimbursable, except under specified circumstances.

Although the Board takes note of the State Mandates Act and will discuss the implications of the State Mandates Act, the Board must follow the mandates of the Environmental Protection Act. The Board is authorized by the Environmental Protection Act to adopt regulations which protect health or the environment from water pollution episodes as well as regulations requiring inspection of equipment which may contribute to water pollution (Section 13 of the Act). In addition, the Board is authorized to adopt regulations that ensure the maintenance of sanitary quality, mineral quality, or adequacy of the public water supply (Section 17 of the Act). However, the Board is not required by statute to enforce the provisions of the State Mandates Act, nor is the Board authorized to appropriate funds for entities who may be required to comply with Board regulations.

The requirements in the proposal that allegedly create the new service mandates have been identified in the EcIS. These requirements include cross-connection control prescribed at Sections 608.202 and 608.302, and recordkeeping specified at Sections 608.501 and 608.502. The Agency believes that the proposed regulations do not create any service mandates as they are merely a re-enactment of presently existing rules adopted prior to the effective date of the State Mandates Act (P.C. 48). The Agency specifically refers to its own Technical Policy Statements adopted in Dec. 17, 1978 under the existing Board regulations for cross-connection control (35 Ill. Adm. Code 607.104).

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The IOWSG believes (P.C. 38 and 43) that the State Mandates Act will result in arbitrary and discriminatory treatment of the investor owned water supplies and their customers. According to the IOWSG, public water supplies owned by local governments will not be required to comply with the cross-connection control program unless the legislature appropriates monies to cover compliance costs, as required by the State Mandates Act. However, the IOWSG would be required to comply with the new regulations. The IOWSG therefore maintains that adoption of the instant proposal would negate the purpose of this proceeding, which is to develop uniform regulations for cross-connection control.

The IOWSG has questioned (P.C. 52 and 53) the Agency's argument that the proposed regulations are the re-enactment of the existing regulations and stated that the policy statement adopted by the Agency is not legally binding since it has not been formally adopted by the Board. In addition, the IOWSG has noted that the provisions regarding cross-connection control adopted by the Agency prior to enactment of the State Mandates Act were only recommendations to public water supplies and none of the provisions were framed in mandatory language until 1984.

The DENR's witness, Mr. Lee Zelle, stated that the regulations create new service mandates since public water supplies are not required to implement a comprehensive cross-connection control program under the existing Board regulations at 35 Ill. Adm. Code 607.104. According to Mr. Zelle, the intent of the existing Board regulations is to control cross-connections between two or more water supply systems (defined as "interconnections" under the proposed regulations) and not all connections to the public water supply distribution system (Tr.3 at 32-33).

The Board does not agree with Mr. Zelle's contention that the intent of the existing Board regulation (Section 607.104) is to control only cross-connections between two or more water supply systems. Clearly, Mr. Zelle was referring to Section 607.104(a) which states:

"No physical connection shall be permitted between the potable portion of a supply and any other water supply not of equal or better bacteriological and chemical quality as determined by inspection and analysis by the Agency, except as provided for in subsection (d)."

However, Mr. Zelle overlooked Section 607.104(b) which clearly prohibits cross-connections:

"There shall be no arrangement or connection by which an unsafe substance may enter a supply."

The Agency maintains that its Technical Policy statements required implementation of most provisions of the proposal prior to the enactment of the State Mandates Act. The IOWSG, however, maintains that the proposal consists of numerous "new" service mandates which local governments will not need to comply with absent reimbursement from the state.

In summary, the Board is authorized by the Environmental Protection Act to adopt regulations to protect health and the environment from water pollution episodes. Presently, Section 607.104(b) prohibits cross-connections. The instant proposal attempts to clarify the current regulations. The record in this proceeding does not clearly indicate whether the adoption of this proposal would create any new service mandates. However, the Board must rely on its specific authority to promulgate regulations. Therefore, although the Board analyzed the state mandate issue raised by the IOWSG; the Board cannot fail to proceed with a regulation because it may impose such a mandate.

#### **CROSS-CONNECTION CONTROL DEVICES AND INSTALLATION REQUIREMENTS**

The instant proposal generally follows the Agency proposal (Sections 608.203 to 608.207) with regard to regulations for cross-connection control devices and installation. Cross-connection control requirements applicable to institutional, commercial, and industrial establishments, and fire safety system connections are found in Sections 608.301 to 608.305 of the instant proposal. The proposed regulations require installation of cross-connection control devices or an annual inspection, based on the hazard level (high or low) of the service connection.

The Board received a few comments from the IOWSG regarding the application of cross-connection control devices and hazard classification. On reviewing the Agency proposal, the Board found that applicability of the proposed requirements (i.e. who does what) needed clarification. In addition, retrofitting requirements for existing service connections not connected to a fire safety system were not specified in the Agency proposal. A discussion of these issues and the IOWSG's concerns is presented in the following section.

#### **General Concerns**

**Applicability.** The proposed cross-connection control requirements at Sections 608.302-305 require a number of actions that must be implemented at institutional, commercial, industrial, and fire safety system connections to public water supply public water supply distribution systems. Under the Agency proposal (Sections

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608.203-206) the owner or operator of an affected establishment appeared to be the intended party responsible for carrying out the cross-connection control requirements. However, the Agency proposal did not clearly identify the persons or entities responsible for carrying out the cross-connection control requirements, except for Section 608.203(a) which identified the owner or operator of an affected establishment as the responsible party. To avoid confusion regarding the implementation of the various cross-connection control requirements, the Board believes that the proposal must clearly identify the persons or entities responsible for complying with such requirements.

In drafting the instant proposal, the Board includes all Sections dealing with the cross-connection control requirements (Agency Proposal Sections 608.203-207) under a separate Subpart ("Subpart C"). An applicability Section was added within the new Subpart which clearly specifies the persons or entities covered by the proposed requirements. The Board proposal clarifies the Agency's intent by requiring the owner or operator of any affected establishment to meet the cross-connection control requirements.

**Retrofit Requirements.** In the instant proposal, retrofitting is not mandated for low hazard connections<sup>5</sup>. Section 608.302(a)(2) of the instant proposal provides the owner or operator of an establishment with a low hazard connection the choice of either installing a cross-connection control device or opting for an annual inspection. This follows the Agency proposal (Section 608.203(a)(2)).

Since high hazard connections<sup>6</sup> pose a greater potential threat to human health, the instant proposal (Section 608.302(a)(1)) requires installation of a cross-connection

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<sup>5</sup>"Low hazard connection" means any vessel, piping arrangement, or other direct connection to a public water supply containing any solid, liquid, or gaseous matter, any odor or form of energy which, when present in the public water supply distribution system, may cause the water to be aesthetically degraded to the senses of taste, sight or smell without tending to cause any actual physical illness or injury to persons consuming the water.

<sup>6</sup>"High hazard connection" means any vessel, piping arrangement, or other direct connection to a public water supply containing any solid, liquid, or gaseous matter, any odor or any form of energy which, when present in the public water supply distribution system, may cause the water to degrade so that the water quality standards of this Subtitle are not met or physical illness or injure to persons consuming the water could result.

control device at such connections. The proposal requires installation of a reduced pressure zone (RPZ) principle assembly at high hazard connections. More detailed discussion about space limitations and retrofitting costs for such connections is given in the following fire safety system discussions. The general concern at issue here relates to compliance scheduling specified by the regulations.

The regulations must provide a reasonable time period to plan and implement a compliance schedule which does not result in undue economic hardship. The Agency proposal (Section 608.206) specified a 60-day compliance period for retrofitting existing fire safety systems containing chemical additives with a RPZ principle backflow assembly. The National Association of Water Companies has expressed concern regarding the proposed time-frame for retrofitting an existing fire safety system (P.C. 16 & 39). The National Association of Water Companies has noted that due to the non-availability of qualified personnel required to perform the retrofit work and bidding and contractor scheduling delays, it would be difficult to comply with the proposed requirements within a 60-day period. The National Association of Water Companies suggested that the compliance time period be changed to 2 years. The Board is persuaded by the National Association of Water Companies and will propose a 2 year compliance schedule (Section 608.302(d)).

#### The IOWSG Concerns

Application of Fixed Proper Air Gap. The IOWSG opined that a fixed proper air gap<sup>7</sup> is not an appropriate cross-connection control device and therefore, all institutional, commercial, and industrial establishments must be required to install a RPZ principle backflow assembly. (Tr.1 at 219, and P.C. 16 & 39.) The IOWSG believes that a customer could easily make changes and create a cross-connection at a connection protected by a fixed proper air gap, but that the customer is unlikely to do so once a RPZ principle back flow assembly is installed.

The installation of a fixed proper air gap at service connections is a recognized method of preventing cross-connections recommended by the AWWA Manual M14 (Ex. 7) and prescribed as a cross-connection control measure under the Illinois Plumbing Code. The IOWSG's concern regarding customers' actions may affect connections protected by any device, and not

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<sup>7</sup>"Air gap" means the unobstructed vertical distance through the free atmosphere between the water discharge point and the flood level rim of the receptacle. All air gaps must be fixed proper air gaps, i.e., solidly piped; flexible couplings or spring hoses do not constitute an air gap.

just an air gap. Therefore, the Board proposes the use of a fixed proper air gap as one of the methods of providing cross-connection protection to the public water supply.

**High or Low Hazard Connections.** The IOWSG stated (R2; 71-72, P.C. 16 & 38) that the proposed classification of service connections as low or high hazard connections is ambiguous, and recommended that the proposal identify the type of customers that fit each category. The IOWSG suggested (Tr.2 at 71) that the Board consider, as a starting point, the customer hazard classification list adopted by the Foundation for Cross-Connection Control and Hydraulic Research at the University of Southern California (Ex. 14). However, upon questioning by the Agency, the IOWSG witness admitted (Tr.2 at 120) that it would be impossible to classify a connection as either a low or a high hazard connection without evaluating the hazard associated with the connection. In view of this, the Agency proposal (Section 608.203) to specify cross-connection control requirements based on classification of hazards as high or low is appropriate. Accordingly, this is incorporated in the instant proposed regulations at Section 608.302.

The Board proposes (Section 608.302(a)(3)) that the public water supply determine the hazard class of a service connection. The Agency proposal (Section 608.203) required the owner of an affected establishment to determine the hazard level of the service connection to the public water supply. The Board notes that in the instant proposal (608.202(d)) and in the current regulations (607.104(c)), control of all cross-connections is the responsibility of the owner or custodian of the public water supply. Therefore, the Board believes that the determination of hazard class (high or low) should be made by the party with ultimate responsibility for control of cross-connections.

The Board also notes that compliance with Section 608.202 of the proposed regulation will give public water supplies all the information needed to determine the hazard class of service connections. The public water supply is required to conduct a cross-connection survey of the public water supply distribution system every two years (608.202(b)). The survey shall include an inventory of water uses at each service connection (608.202(c)). The survey results and inventory of uses will allow the public water supply to classify connections as high or low hazard using the definitions in the instant proposal.

## **FIRE SAFETY SYSTEM REQUIREMENTS**

### **Background**

Present Board regulations (35 Ill. Adm. Code 607.104) do not

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specify cross-connection control requirements applicable to fire safety system connections. The Agency's original proposal (Oct. 20, 1988) required the installation of a reduced pressure zone (RPZ) principle backflow assembly at the fire safety system connections whenever: chemical additives are used in the fire safety system; water is pumped or flows by gravity into the fire safety system from another source; or there is a connection through which water can be pumped into the fire safety system from another source (Section 608.204, Original Proposal). Solid opposition to this original Agency proposal was expressed by representatives of the fire protection community (the Illinois Fire Chiefs Association (Fire Chiefs), the Illinois Fire Inspectors Association (Fire Inspectors), the Society of Fire Protection Engineers (Fire Engineers), the Chicago Association of Commerce and Industry<sup>8</sup> (CACI), the Illinois Fire Advisory Commission (Fire Commission), the National Fire Sprinkler Association (Fire Sprinkler Association) and a number of consulting fire protection engineers).

The fire protection community presented extensive testimony<sup>9</sup> at the first set of public hearings (May 25 & 26, 1988). The common theme of their testimony was that installing a RPZ device at an existing fire safety system connection would result in a significant pressure loss in the fire safety system and compromise fire suppressing ability. Testifiers maintained that redesigning existing fire safety systems to allow for the increased pressure loss would be very expensive (Tr.1 at 171, 182, 202, 233, 487, 488). To address these concerns, the fire protection community recommended that the Board consider adopting the American Water Works Association (AWWA) Manual M14 recommendations (Exhibit 7) or the amendments proposed by the CACI which are based on the AWWA recommendations (Tr.1 at 173, 234, 509, 523).

After the first set of hearings, the Agency responded to the fire protection community concerns and issued a revised proposal (Oct. 11, 1988) including cross-connection control requirements and retrofitting requirements specifically intended for fire safety system connections. The Agency made further changes after negotiations with the fire protection community and filed an "amended" proposal on May 1, 1989 which is now being considered by the Board.

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<sup>8</sup>Recently the name of this organization has been changed to Chicagoland Chamber of Commerce (see P.C. #87).

<sup>9</sup>Richard Solomon, Consulting engineer at R1:168-179; the Fire Chiefs at R1:231-234; the Fire Commission at R1:180-183; the Fire Inspectors at R2:481-493; Fire Engineers at R2:495-503; the CACI at R2:507-510; and the Fire Sprinkler Association at R2:514-516.

Among the three major groups representing the fire protection community, the Fire Chiefs (P.C. 68) and the Fire Inspectors (P.C. 35) supported the Agency's amended proposal, and the Fire Sprinkler Association (P.C. 58) opposed the amended proposal and suggested that the Board adopt the AWWA Manual M14 recommendations. In addition, a large number of individual fire protection districts expressed concerns with the Agency's proposed fire safety system requirements and instead recommended the CACI's alternate proposal based on the AWWA manual M14 (P.C. 59-67 & 69-72).

The more recent comments (P.C. 83, 86, 87, 88) filed after March 26, 1992 show that the various groups have not changed their positions, with one exception. The Fire Inspectors (P.C. 88) no longer support the Agency proposal in light of the EcIS findings, and requested that the Board draft new regulations using the EcIS as the basis.

### Discussion

Testimony and comments in this proceeding indicate that the fire protection community is not opposed to cross-connection control at fire safety system connections. However, the major fire protection groups do not appear to agree on what type of cross-connection control requirements are appropriate for fire safety system connections. As noted earlier, the Fire Chiefs supported the Agency proposal whereas the other groups recommend adoption of the AWWA's Manual M14 recommendations included in the CACI's alternate proposal. Another development that needs to be considered is the inclusion of cross-connection control requirements applicable to fire safety system connections in the Illinois Plumbing Code (amendments of Jan 10, 1990) adopted by the Illinois Department of Public Health.

The differences between the cross-connection control requirements recommended by the AWWA, the Illinois Plumbing Code, the Agency, and the CACI are given in Appendix B. The comparison indicates that the AWWA's recommendations have generally been incorporated in the Agency proposal, the CACI proposal, and the Illinois Plumbing Code. A major difference is the recommended cross-connection control for fire safety systems served solely by the public water supply (i.e., without any auxiliary connections to nonpotable water or chemical additives). For such connections, AWWA Manual M14 and CACI recommend no cross-connection control device (single weighted check valve), whereas the Agency proposal and the Illinois Plumbing Code require a double detector check valve assembly (DDCVA). Also, the fire safety system requirements prescribed by the Illinois Plumbing Code (35 Ill. Adm. Code 890.1540) are the same as the Agency proposal (608.204).

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**New Fire Safety System Connections.** The major impact of requiring cross-connection control at all new fire safety system connections would be the additional installation cost of the cross-connection control device at such connections<sup>10</sup>. However, since the proposed fire safety system requirements are the same as those specified in the Illinois Plumbing Code (35 Ill. Adm. Code 890.1540), cross-connection control requirements for new fire safety system connections in the instant proposal will not pose an additional financial burden on the regulated community. Whether or not the instant proposal is adopted by the Board, all new fire safety system connections are required to comply with the Illinois Plumbing Code. Therefore, the Board finds that the fire protection community objections to this proposed requirement are no longer valid.

The instant proposed regulations will retain the fire safety system requirements in Section 608.204 of the Agency proposal with two minor changes. The reference to the exception conditions prescribed in Section 608.205(a) of the Agency proposal will cite section(b) instead of (b)(2). The term "preventer" will be changed to "assembly" to be consistent with the terminology proposed in the definition (Section 608.102).

**Existing Fire Safety System Connections.** The Agency proposal contained retrofit requirements that are specifically intended for the existing fire safety system connections. The fire protection community has expressed concern regarding the proposed retrofit requirements and recommended that the Board instead adopt the AWWA Manual M14 recommendations. The Board reviewed both the Agency proposal and the recommendations of the fire protection community before fashioning a proposed regulation to cover existing fire safety systems with and without chemical additives.

According to the Agency proposal (Section 608.206), all existing fire safety systems which do not contain any chemical additives are required to be retrofitted with a double detector check valve assembly (DDCVA) whenever physical space for installation is available. If space is not available for installation of a DDCVA, existing fire safety system connections shall be retrofitted with a weighted detector check (WDC) and an alarm valve. Based on the information presented in the EcIS (pp: 88), DDCVA may be installed at less than one percent of the existing fire safety system connections due to lack of space.

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<sup>10</sup>In addition to the installation cost, both new and existing FSS connections are subject annual inspection and testing under the Agency's proposal. According to EcIS estimates, the inspection and testing cost for FSSs would be \$9.6 million per year plus \$ 0.26 million to account for new FSSs installed each year..

Therefore, under the Agency proposal most of the existing fire safety system connections without any chemical additives will have to be retrofitted with a WDC and an alarm valve. Under the AWWA Manual M14 recommendations, such connections would only require retrofitting with a WDC.

According to the EcIS (pp: 89-90), the cost of retrofitting existing fire safety systems with a WDC would be \$ 11.7 million<sup>11</sup>. Retrofitting existing fire safety systems with a WDC and an alarm valve connected to an approved fire receipt point would cost \$ 198 million<sup>12</sup>. A major portion (\$ 186 million) of the total cost of retrofitting is associated with installation of alarm valves and providing connections to approved fire alarm receipt points.

The alarm valve is a mechanical device designed to transmit a signal to a remote fire alarm receipt point. The alarm is activated when flow occurs through the valve in either direction and alarm valves are usually installed in each riser of the fire safety system. The alarm valve is generally used as an early warning system to alert fire fighting personnel of a potential fire, system leakage, or unauthorized use of water. The Agency has not explained how the alarm valve will prevent backflow through the WDC. It appears that when a WDC fails to shut-off in a backflow situation, the alarm valve will transmit a signal to the remote fire alarm receipt point. However, the Agency proposal did not specify appropriate action when the fire alarm is triggered as a result of backflow in the system. Therefore, the usefulness of the alarm valve for backflow prevention is questionable considering the high cost associated with its installation. The EcIS (pp: 88) stated that the alarm valve is a fringe benefit used only in top flight systems.

Section 608.206(b) of the Agency proposal requires retrofitting existing fire safety systems with a RPZ principle device only if such systems contain chemical additives such as antifreeze and fire retardants. The Agency assigned the highest priority to this type of fire safety system for retrofitting backflow prevention devices (P.C. 74). The fire protection community appears to be in agreement with the proposed requirement since the AWWA Manual M14 recommends maximum protection for any fire safety system containing anti-freeze or

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<sup>11</sup>The estimate is based on retrofitting 10 percent (4800) of the 48,000 existing fire safety system connections at an average cost of \$ 2,437.50 per retrofit. The remaining 90 percent of the existing FSS connections are already protected by a WDC.

<sup>12</sup>The estimate is based on retrofitting 90 percent (43200) of the 48,000 existing FSS connections at an average cost of \$ 4583.33 per retrofit.

other chemical additives. The potential for contaminating the water supply with dangerous chemicals justifies the retrofitting requirement for existing fire safety systems with chemical additives.

Therefore, the instant proposal at Section 608.305(b) retains the cross-connection control requirement offered at Section 608.206(b) of the Agency proposal for existing fire safety systems containing chemical additives. However, the Agency proposed (Section 608.206(a)) retrofitting existing fire safety systems with a DDCVA if chemical additives were not present in the system. The instant proposal at Section 608.305(a) will not retain the Agency language, since less than one percent of such systems have adequate space for the installation of a DDCVA.

The instant proposal (Section 608.305(a)) requires all existing fire safety systems which do not contain any chemical additives to be retrofitted with a WDC and does not require the installation of an alarm valve along with the WDC as proposed by the Agency (Section 608.206(a)). Since more than 90 percent of the estimated retrofitting cost is associated with the installation of the alarm valves and providing connections to remote fire alarm receipt points, the financial burden imposed by this option on the regulated community will be minimal compared to the Agency proposal. However, since some jurisdictions may opt for alarm valve installation, the instant proposal includes alarm valve requirements from the Agency proposal. Also, the proposed option is consistent with AWWA Manual M14 recommendations which is supported by the fire protection community.

#### **DEFINITIONS, TERMINOLOGY AND ORGANIZATION**

In the Agency proposal, there were many variations in the terms used to denote the system which distributes potable water to the public. In particular, the terms public water supply, public water supply system, public water supply distribution system, community water supply system, and potable water supply were used loosely and at times, interchangeably. The instant proposal attempts to standardize terms both within the proposal, and in relation to the Act and current Board regulations.

Participants should pay careful attention to the definition and usage of the terms "public water supply", "private water system", and "public water supply distribution system". The definition for "public water supply" is taken from the Act (citation), and includes the endpoint at the service connection which conforms to Board regulation at 35 Ill. Adm. Code 601.102. The definition of "private water system" in the instant proposal includes all structures carrying potable water which are not a

part of the public water supply. "Public water supply distribution system" as defined in the instant proposal includes all points downstream of an entry point through which potable water is distributed. Therefore, "public water supply distribution system" goes beyond the public water supply which ends at the service connection. The "public water supply distribution system" includes the public water supply, as well as all points beyond the service connection which distribute potable water. The Board notes that the definitions for these three terms in particular are different from the way the terms are defined under the SDWA regulations. However, these definitions appear to accurately reflect the intent of these regulations.

Also, the Agency proposal prescribed several types of backflow prevention devices for specific types of cross-connections. In most cases, the definitions of the terms describing such devices were provided in Section 608.102 of the Agency proposal. However, a few terms were not used consistently. At several locations in the Agency proposal, a single type of backflow prevention device was referred to by different terms. Also, some terms were not defined. A few examples from the Agency proposal are provided for illustrative purposes:

- 1) The term "Air gap" is defined in Section 608.102. However, the same term is referred to as the "fixed proper air gap" at Section 608.203(a).
- 2) The terms "RPZ principle backflow assembly" and "RPZ principle backflow device" are defined in Section 608.102. The proposed regulations refers to the same device as the "RPZ backflow preventer" at Section 608.206.
- 3) The terms "single check valve", "weighted detector check", "alarm valve", and "weighted clapper" used in Section 608.206 have not been defined.

Terms have been defined at Section 608.102 of the instant proposal. To avoid confusion and to ensure proper specification of backflow prevention devices, the instant proposal will use the various terms consistently. Participants should carefully consider the definitions and provide appropriate comments to the Board.

Many sections of the Agency proposal were used in the instant proposal with minor editing changes. These changes were necessary to clarify the rules, or to make them more acceptable to the Legislative Joint Committee on Administrative Rules.

**Requested Comments From The Participants**

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The Board requests the participants to address the following issues in any additional comment filed with the Board:

1. Standards or criteria for conducting the cross-connection control survey including what specific information the Agency will require to be included in the survey as well as what type of information the Agency is currently collecting.
2. Applicability of the proposed cross-connection control requirements, i.e. is the owner or operator responsible for carrying out the requirements (Section 608.301).
3. Who determines the presence of high or low hazard connections (Section 608.302).
4. The proposed retrofitting requirements for existing fire safety system connections at Section 608.305.
5. Should multi-family residential dwellings be exempted from the requirements (proposed at 608.307).
6. The definition of "low hazard connection" in which the term "pollutant" was substituted to insure consistent use of the word "pollutant" throughout the Board's regulation.
7. Explain more fully what the term "national consensus standard" means and explain why it is used.
8. Supply addresses for each of the organizations listed in Section 608.103 and update the incorporations in that section.
9. Is the definition of "official custodian" sufficient to ensure enforcement of the proposed regulations?
10. Is the definition of "public water supply distribution system" appropriate to achieve the goals of the cross-connection standards?

In addition to these specific areas the Board invites comments to the proposal generally.

ORDER

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The Board directs the Clerk to cause the publication in the Illinois Register of the following proposal:

TITLE 35: ENVIRONMENTAL PROTECTION

SUBTITLE F: PUBLIC WATER SUPPLIES

CHAPTER I: POLLUTION CONTROL BOARD

PART 607  
OPERATION AND RECORD KEEPING

Section

- 607.101 Protection During Repair Work (Repealed)
- 607.102 Disinfection Following Repair or Reconstruction (Repealed)
- 607.103 Emergency Operation
- 607.104 Cross Connections (Repealed)
- 607.105 Laboratory Testing Equipment (Repealed)
- 607.106 Record Maintenance (Repealed)
- APPENDIX A References to Former Rules (Repealed)

AUTHORITY: Implementing Section 17 and authorized by Section 27 of the Environmental Protection Act (Ill. Rev. Stat. 1987, ch. 111 1/2, pars. 1017 and 1027).

SOURCE: Filed with Secretary of State January 1, 1978; amended and codified at 6 Ill. Reg. 11497 effective September 14, 1982; amended in R88-26 at 14 Ill. Reg. 16512, effective September 20, 1990; amended in R87-37 at \_\_\_\_\_ Ill. Reg. \_\_\_\_\_.

Section 607.104 Cross Connections

- ~~a) No physical connection shall be permitted between the potable portion of a supply and any other water supply not of equal or better bacteriological and chemical quality as determined by inspection and analysis by the Agency, except as provided for in subsection (d).~~
- ~~b) There shall be no arrangement or connection by which an unsafe substance may enter a supply.~~
- ~~e) Control of all cross connections to a supply is the responsibility of the owner or official custodian of the supply. If a privately owned water supply source meets the applicable criteria, it may be connected to a water supply upon approval by the owner or official custodian and by the Agency. Where such connections are permitted, it is the responsibility of the public water supply officials to assure submission from such~~

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~~privately owned water supply source or sources samples and operating reports as required by 35 Ill. Adm. Code 605 and 606 as applicable to the cross-connected source.~~

- ~~d) The Agency may adopt specific conditions for control of unsafe cross-connections, which shall be complied with by the supplies of this State, as applicable. These conditions shall be adopted and/or changed by the Agency as prescribed in 35 Ill. Adm. Code 602.115.~~
- ~~e) Each community water supply exempted pursuant to 35 Ill. Adm. Code 603.103 or 604.402 shall provide an active program approved by the Agency to continually educate and inform water supply consumers regarding prevention of the entry of contaminants into the distribution system. Conditions under which the Agency will approve this active program shall be adopted or changed by the Agency as prescribed in 35 Ill. Adm. Code 602.115.~~

(Source: Repealed in R87-37 at \_\_\_\_\_ Ill. Reg. \_\_\_\_\_.)

## PART 608

### CROSS-CONNECTION STANDARDS

#### SUBPART A: INTRODUCTION

Section	
608.101	Purpose
608.102	Definitions
608.103	Incorporations by Reference

#### SUBPART B: CROSS-CONNECTION CONTROL

Section	
608.201	Prohibitions
608.202	Cross-Connection Control Program

#### SUBPART C: INSTALLATION OF CROSS-CONNECTION CONTROL DEVICES

Section	
608.301	Applicability
608.302	Cross-Connection Control Requirements for Industrial, Institutional, and Commercial Establishments
608.303	Installation Standards for Cross-Connection Control Devices

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- 608.304 Fire Safety System Requirements
- 608.305 Retrofit Requirements for Existing Fire Safety Systems
- 608.306 Exemption for Single-Family Residential Dwellings
- 608.307 Exemption for Multi-Family Residential Dwellings

SUBPART D: CROSS-CONNECTION CONTROL DEVICE INSPECTOR

Section

- 608.401 Qualifications, Applications, and Examinations
- 608.402 Annual Renewal
- 608.403 Causes for Sanctions
- 608.404 Procedure for Sanctions

SUBPART E: TESTING AND RECORDS

Section

- 608.501 Survey Update Records
- 608.502 Testing
- 608.503 Inspector's Tag and Maintenance Log
- 608.504 Records Open to Inspection

AUTHORITY: Authorized by Sections 5 and 27 of the Environmental Protection Act (Ill. Rev. Stat. 1991, ch. 111 1/2, par. 1005 and 1027).

SOURCE: Adopted in R87-37 at \_\_\_\_\_ Ill. Reg., \_\_\_\_\_, effective \_\_\_\_\_.

SUBPART A: INTRODUCTION

Section 608.101 Purpose

This Part requires the prevention of drinking water quality degradation through the elimination of unprotected connections.

Section 608.102 Definitions

Except as stated in this section, and unless a different meaning of a word or term is clear from the context, the definition of words or terms in this Part shall be the same as those used in the Act:

"Act" means the Environmental Protection Act (Ill. Rev. Stat. 1991, ch. 111 1/2, pars. 1001 et seq.).

"Agency" means the Illinois Environmental Protection Agency.

"Air gap" means the unobstructed vertical distance through

the free atmosphere between the water discharge point and the flood level rim of the receptacle. All air gaps must be solidly piped; flexible couplings or spring hoses do not constitute an air gap.

"Approved fire alarm receipt point" is a central facility constantly manned by trained personnel with equipment installed to receive a signal from a sprinkler alarm indicating that the sprinkler has been activated.

"Back flow" means flow of liquid or air in the direction opposite to the normal direction of flow in a closed conduit.

"Back pressure" means an opposing pressure on the demand side of a closed conduit which causes or tends to cause back flow.

"Back siphonage" means back flow caused by negative or reduced pressure in the supply side of a closed conduit.

"Board" means the Illinois Pollution Control Board.

"CCCDI" means cross-connection control device inspector.

"Commercial establishment" means a building or building complex which houses stores, offices, or businesses engaged in trade, sales, and services.

"COMMUNITY WATER SUPPLY" MEANS A PUBLIC WATER SUPPLY WHICH SERVES OR IS INTENDED TO SERVE AT LEAST 15 SERVICE CONNECTIONS USED BY RESIDENTS OR REGULARLY SERVES AT LEAST 25 RESIDENTS." (Section 3.05 of the Act)

"Condition of service" means all restrictions, requirements, permits, and fees required by a public water supply prior to installation or supply of water from the public water supply distribution system to a private water system.

"Containment" means the proper installation of an approved backflow device or assembly at the service connection in accordance with Section 608.303 between the public water supply and the private water system so as to contain any pollutant or contaminant within the private water system, thus preventing its entrance into the public water supply distribution system.

"Cross-connection" means any physical connection or arrangement between two otherwise separate piping systems or vessels, one of which contains potable water and the other water of unknown or questionable safety or steam, gases or chemicals whereby there may be a flow from one system to the

other.

"Cross-connection control device inspector" or "(CCCDI)" means a person who has successfully completed Agency sponsored training and certification to install and test backflow devices, in accordance with Section 608.401.

"Entry point" means a point just downstream of the final treatment operation, but upstream of the first service connection and upstream of any mixing with other water. If raw water is used without treatment, the "entry point" is the raw water source. If a public water supply receives treated water from another public water supply, the "entry point" is the point of interconnection

"Direct cross-connection" means a cross-connection formed when a potable water system is physically joined to a source of unknown or unsafe substance.

"Double check valve assembly" means an assembly which includes two independently acting in-line internally force-loaded check valves and test cocks plus two resilient-seated valves with full ports.

"Double check valve device" means a device which includes two independently acting in-line internally force-loaded check valves and test cocks.

"Double detector check valve assembly" means a double check valve assembly which includes a detector check which measures water usage for use in fire safety systems.

"Double detector check valve" means a double check valve device which includes a detector check which measures water usage for use in fire safety systems.

"Fixed proper air gap" means an air gap where the water discharge point is solidly piped and stationary, immovable or unalterable.

"High hazard connection" means any vessel, piping arrangement, or other direct connection to a public water supply containing any solid, liquid, or gaseous matter, any odor or any form of energy which, when present in the public water supply distribution system, may cause the water to degrade so that the water quality standards of this Subtitle are not met or physical illness or injury to persons consuming the water could result.

"Illinois State Plumbing Code" means 77 Ill. Adm. Code 890.

"Indirect cross-connection" means a cross-connection formed

when an unknown substance can be forced-drawn by vacuum or otherwise introduced into a potable water system.

"Industrial establishment" means a building or building complex which houses mechanical or manufacturing activities.

"Institutional establishment" means a building or building complex which houses activities for social, health, educational, or religious purposes such as hospitals, sanitariums, correctional facilities, schools, churches, or charitable organizations or agencies.

"Interconnection" means a physical connection between two or more potable water systems.

"Isolation" means the proper installation of an approved backflow device or assembly at each connection within the private water system, between the public water supply and each piping arrangement or plumbing appurtenance on those private premises.

"Low hazard connection" means any vessel, piping arrangement, or other direct connection to a public water supply containing any solid, liquid, or gaseous matter, any odor or form of energy which, when present in the public water supply distribution system, may cause the water to be aesthetically degraded to the senses of taste, sight or smell without tending to cause any actual physical illness or injury to persons consuming the water.

"National consensus standards" mean standards which are adopted by a nationally recognized organization which examines devices for such elements as the minimum requirements for the design, installation, operation and safety aspects of such devices, evaluated on the basis of sound engineering principles, test data, and field experience.

"NFPA" means the National Fire Protection Association, Batterymarch Park, Quincy, Massachusetts 02269.

"Non-potable source" is any source of water not an integral part of a public water supply or approved by the Agency to be connected to a public water supply according to Section 608.202(e).

"Official custodian" means any officer of an organization which is the owner or operator of a public water supply, and who has direct administrative responsibility for the supply.

"POTABLE" MEANS GENERALLY FIT FOR HUMAN CONSUMPTION IN ACCORDANCE WITH ACCEPTED WATER SUPPLY PRINCIPLES AND

PRACTICES. (Section 3.65 of the Act.)

"Private water system" means all pipes, structures, and plumbing appurtenances not part of a public water supply through which potable water is obtained and distributed.

"Public water supply service line" means any pipe that is used for the purpose of distributing potable water which connects a water main and the plumbing system of a property, dwelling, rental unit, or an establishment.

"PUBLIC WATER SUPPLY" MEANS ALL MAINS, PIPES AND STRUCTURES THROUGH WHICH WATER IS OBTAINED AND DISTRIBUTED TO THE PUBLIC, INCLUDING WELLS AND WELL STRUCTURE, INTAKES AND CRIBS, PUMPING STATIONS, TREATMENT PLANTS, RESERVOIRS, STORAGE TANKS AN APPURTENANCES, COLLECTIVELY OR SEVERALLY USED OR INTENDED FOR USE FOR THE PURPOSE OF FURNISHING WATER FOR DRINKING OR GENERAL DOMESTIC USE WHICH SERVE AT LEAST 15 SERVICE CONNECTIONS OR WHICH REGULARLY SERVE AT LEAST 25 PERSONS AT LEAST 60 DAYS PER YEAR. a PUBLIC WATER SUPPLY IS EITHER A "COMMUNITY WATER SUPPLY" OR A "NON-COMMUNITY WATER SUPPLY." (Section 3.28 of the Act.) The public water supply ends at the service connection. (35 Ill. Adm. Code 601.102.)

"Public water supply distribution system" means all points downstream of an "entry point" through which potable water is distributed. For the purposes of this Part, public water supply distribution system includes points beyond any service connection through which potable water is distributed.

"RPZ" means reduced pressure zone.

"Reduced pressure zone principle backflow assembly" or "RPZ principle backflow assembly" means an assembly which includes two in-line independently acting spring-loaded check valves, one differential pressure relief valve vented to atmosphere plus four test cocks and two resilient-seated valves with full ports. The RPZ principle backflow assembly is also available with a detector-check which measures water usage for use in fire safety systems .

"Reduced pressure zone principle backflow device" or "RPZ principle backflow device" means a device which includes two in-line independently acting spring-loaded check valves, one differential pressure relief valve vented to atmosphere plus four test cocks. The RPZ principle backflow device is also available with a detector-check which measures water usage for use in fire safety systems .

"Risers" are the vertical pipes in a sprinkler system. The

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system riser is the aboveground supply pipe directly connected to the water supply.

"Service connection" is the opening, including all fittings and appurtenances, at the water main through which water is supplied to the user.

"Sprinkler alarm" is an assembly of apparatus approved according to Section 608.305(d) and installed so that any flow of water in either direction from a sprinkler system which is equal to or greater than the flow from a single automatic sprinkler of the smallest orifice size installed on the system will result in an audible alarm on the premises and transmission of a signal to an approved fire alarm receipt point.

"UL" means Underwriters Laboratories, Inc., 333 Pfingsten Road, Northbrook, Illinois 60062.

"WATER MAIN" MEANS ANY PIPE THAT IS TO BE USED FOR THE PURPOSE OF DISTRIBUTING POTABLE WATER WHICH SERVES OR IS ACCESSIBLE TO MORE THAN ONE PROPERTY, DWELLING OR RENTAL UNIT, AND THAT IS EXTERIOR TO BUILDINGS. (Section 16.1 of the Act)

"Weighted detector check valve" means an assembly which includes a weighted disc that is hinged on one edge such that it opens in the direction of normal flow and closes when flow is reversed. This assembly is equipped with a detector-check which measures water usage for use in fire safety systems.

#### Section 608.103 Incorporations by Reference

- a) The following National Consensus Standards are incorporated by reference:
- 1) NFPA 13-3-17 (1987);
  - 2) NFPA 71 (1987);
  - 3) NFPA 72B (1986);
  - 4) NFPA 72C (1986);
  - 5) NFPA 72D (1986);
  - 6) UL 193 (1988); and
  - 7) UL 753 (1982).
- b) These incorporations by reference contain no later

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amendments or editions.

**SUBPART B: CROSS-CONNECTION CONTROL PROGRAM**

**Section 608.201 Prohibitions**

- a) No physical connection shall be permitted between the potable portion of a supply and any other water supply that does not meet the finished water quality standards of this Subtitle. Except as provided for in this Part, water quality shall be determined by inspection and analysis by the Agency pursuant to Section 4 of the Act.
- b) There shall be no arrangement or connection by which a pollutant or contaminant may enter a public water supply distribution system.

**Section 608.202 Cross-Connection Control Program**

- a) Ordinances and Conditions of Service
  - 1) An active cross-connection control program shall be adopted by all public water supplies and shall include an ordinance or condition of service which prohibits unprotected cross-connections and which:
    - A) Includes a plumbing code at least as stringent as the Illinois State Plumbing Code;
    - B) Requires the customer to provide proof that the customer's water supply plumbing is plumbed in accordance with a plumbing code at least as stringent as the Illinois State Plumbing Code; or
    - C) Requires installation of a backflow device at all service connections, except as provided otherwise in Sections 608.302(b), 608.306, or 608.307.
  - 2) Adoption of Ordinances and Conditions of Service
    - A) Except as provided otherwise in subsection (a)(2)(B), public water supplies which do not have ordinances or conditions of service consistent with subsection (a)(1) shall adopt and implement such requirements within 120 days of the effective date of this Part.

- B) Public water supplies subject to the jurisdiction of the Illinois Commerce Commission shall file with the Commission tariffs containing conditions of service consistent with subsection (a)(1) within 60 days of the effective date of this Part.
- 3) Draft ordinances or conditions of service may be submitted to the Agency for review. A copy of the final adopted ordinance or condition of service shall be filed with the Agency.
- 4) The public water supply shall terminate service to any customer who fails to comply with any ordinance or condition of service adopted pursuant to this section.
- 5) Existing ordinances or conditions of service prohibiting cross-connections shall meet the requirements of this Section.
- b) A cross-connection control survey of the public water supply distribution system shall be conducted at least every two years by the official custodian of the public water supply.
- c) This survey shall be an inventory of water uses at each service connection. This survey is not intended to include an actual visual inspection of piping or plumbing systems.
- d) Control of all cross-connections and interconnections to a public water supply is the responsibility of the owner or official custodian of the supply.
- e) If a private water system meets all finished water quality standards of this Subtitle, it may be interconnected to a public water supply upon written approval by both the Agency and the owner or official custodian of the public water supply. Where such interconnections are permitted, the public water supply officials shall assure submission of samples and operating reports from the private water system as required by this Subtitle.
- f) Each community water supply exempted from chlorination or operator certification, pursuant to 35 Ill. Adm. Code 603.104 or 604.402 shall provide an active program to continually educate and inform water supply consumers regarding prevention of the entry of contaminants or pollutants into the public water supply distribution system. Such a program shall be approved

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by the Agency in accordance with conditions adopted by the Agency pursuant to 35 Ill. Adm. Code 602.115.

- g) Cross-connection control programs shall include a recordkeeping system which will maintain data on installations, inspections, reinspections, repairs, alterations and tests.
- h) Only cross-connection control devices listed in Section 608.303 and approved by the Agency shall be installed. The Agency shall maintain a list of approved devices based upon national consensus standards for backflow protection devices on file for public inspection.

#### SUBPART C: INSTALLATION OF CROSS-CONNECTION CONTROL DEVICES

##### Section 608.301 Applicability

- a) The requirements of this Subpart shall apply to:
  - 1) Any institutional, commercial, or industrial establishment that has a connection to a public water supply distribution system; or
  - 2) Any establishment equipped with a fire safety system which is connected to a public water supply distribution system.
- b) The owner or operator of any establishment identified in subsection (a) shall comply with the requirements of this Subpart.

##### Section 608.302 Cross-Connection Control Requirements for Industrial, Institutional, and Commercial Establishments

- a) The owner or operator of any industrial, institutional or commercial establishment shall install a fixed proper air gap between the public water supply service line and the establishment; or
  - 1) If the establishment contains any high hazard connections, install a RPZ principle backflow assembly on the public water supply service line into the establishment or;
  - 2) If the establishment contains only low hazard connections install:
    - A) A RPZ principle backflow assembly on the public water supply service line into the

establishment; or

- B) A double check valve assembly on the public water supply service line into the establishment; or
  - C) Perform an inspection at least annually to assure that isolation of all connections to the public water supply distribution system exists. Inspection shall include inspection of piping arrangements to ensure that backflow devices have not been bypassed, that new devices have been properly installed where needed and shall include testing of all existing devices to ensure that all connections to the public water supply distribution system are equipped with functioning backflow devices. Such annual inspection shall be carried out by a CCCDI and be conducted in accordance with Ill. Rev. Stat. 1991, ch. 111, pars. 1101-1140.
    - i) All detected improper installations of plumbing or plumbing appurtenances shall be corrected within 30 days to ensure that all connections to the public water supply distribution system are properly protected from the entrance of contaminants or pollutants through backflow. If the CCCDI or the public water supply finds that an unprotected connection poses an immediate hazard to the public water supply distribution system, the CCCDI or the public water supply may require installation of a protective device within less than 30 days or may require immediate disconnection of the hazard until an appropriate backflow protection device has been installed.
    - ii) When cross-connection protection by isolation is used, device installation must comply with the requirements of this section.
- 3) The public water supply shall determine whether the establishment contains any high or low hazard connections.
- b) Any industrial, institutional or commercial establishment which includes only drinking fountains,

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restrooms and kitchen facilities need not be equipped with a backflow protection device on the public water supply service line under the following conditions:

- 1) Vessels, piping arrangements, or other connections to the public water supply distribution system containing gases, liquids or dry substances are properly installed and protected in accordance with a plumbing code at least as stringent as the Illinois State Plumbing Code. Proper installation and protection shall be verified by a cross-connection inspection conducted by a CCCDI, in accordance with Ill. Rev. Stat. 1991, ch. 111, pars. 1101-1140.
- 2) A complete report of the cross-connection inspection, including deficiencies and documentation of corrections, shall be submitted to and maintained by the public water supply. Records shall be maintained for the duration of the water service connection and reinspections shall be conducted whenever a change in tenants or occupants for those premises occurs.
- c) A system or vessel containing substances which can cause deterioration of the backflow device or assembly must be protected by a fixed proper air gap or a RPZ principle backflow assembly when connected to a public water supply distribution system.
- d) The owner or operator of any existing institutional, commercial, or industrial establishment that has a connection to a public water supply distribution system shall comply with the requirements of this Part within two years of the effective date of this Part.

Section 608.303            Installation Standards for Cross-Connection Control Devices

- a) Fixed proper air gaps shall be installed at least twice the diameter of the supply pipe, measured vertically from the lowest end of the potable water outlet to the flood level rim of the vessel, fixture, or receptacle into which it discharges, and in no case less than one inch.
- b) RPZ principle backflow assemblies shall be installed subject to the following conditions:
  - 1) Installation shall comply with the manufacturer's instructions. Units shall be readily accessible for maintenance and testing.

- 2) All assemblies shall be protected against freezing and flooding. Installation in a pit or an area subject to flooding is prohibited.
  - 3) Relief ports shall not be plugged or reduced in size. A drain sized to accept maximum outfall which will remain free flowing under all conditions shall be provided.
  - 4) Bypass lines or auxiliary lines shall also require protection. A second RPZ principle assembly shall be installed parallel to the first if there is only one service line and the water service cannot be interrupted.
- c) Double check valve assemblies shall be installed and must meet both of the following conditions:
- 1) Installation shall comply with the manufacturer's instructions. Units shall be accessible for maintenance and testing.
  - 2) Bypass lines or auxiliary lines shall also require protection. A second double check valve device or assembly shall be installed parallel to the first if there is only one service line and the water service cannot be interrupted.
- e) All backflow devices must bear a permanent tag or be permanently cast or inscribed with the make, model number, serial number and standard under which the device was installed in accordance with Section 608.202(h).

Section 608.304 Fire Safety System Requirements

- a) Fire safety systems connected to a public water supply distribution system shall be equipped with a double detector check valve assembly located at the point of connection between the fire safety system and the public water supply service line to protect the public water supply distribution system against backflow and backsiphonage except under the conditions described in subsection (b).
- b) A fixed proper air gap with a break tank or other storage vessel or a RPZ principle backflow assembly shall be installed at the point of connection between the fire safety system and the public water supply service line to protect the public water supply distribution system against backflow and backsiphonage

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when:

- 1) The fire safety system contains additives such as antifreeze, fire retardant or other chemicals. The RPZ assembly may be located at the point of connection to the section of the system containing such additives when the connection to the public water supply service line is protected by a double detector check valve assembly; or
  - 2) Water is pumped into the fire safety system from a non-potable source capable of serving the fire safety system. A non-potable source of water shall be considered capable of serving the fire safety system under the following conditions: it must be capable of year-round use, maintained with not less than 50,000 gallons of usable water not subject to freezing, and accessible to fire fighting pumper equipment; or
  - 3) Water flows into the fire safety system by gravity from a non-potable source; or
  - 4) There is a permanent or emergency connection whereby water can be pumped into the fire safety system from any other non-potable source.
- c) Fire department connections served solely by the public water supply without any non-potable connections or chemical additives shall require installation of a double detector check valve assembly on unmetered fire lines and a double check valve assembly on metered fire lines.

Section 608.305      Retrofit Requirements for Existing Fire Safety Systems

- a) Existing fire safety systems other than those subjected to subsection (b) shall be retrofitted with a weighted detector check located at the point of connection between the fire safety system and the public water supply service line within 2 years of the effective date of this Part. If an alarm valve is connected to a remote fire alarm receipt point it shall be installed in accordance with subsections (c), (d), and (e) to allow early notification of a possible cross-connection contamination event.
- b) Existing fire safety systems which contain additives such as antifreeze, fire retardant or other chemicals shall be retrofitted with a fixed proper air gap with a

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break tank or other storage vessel, or a RPZ principle backflow assembly located at the point of connection between the fire safety system and the public water supply service line within two years of the effective date of this Part. The RPZ principle assembly may be located at the point of connection to the section of the system containing such additives when the connection to the public water supply service line is protected by a double detector check valve assembly.

- c) Alarm valves shall be approved under UL Standard 193 with alarm accessories approved under UL Standard 753. Alarm valves shall be equipped with a connection to transmit a signal to a remote monitoring station which is an approved fire alarm receipt point. Alarm valves shall be tested annually using methods described in NFPA 13-3-17.6.3.
- d) Sprinkler alarms installed in accordance with this section shall be installed so that any flow of water in either direction from a sprinkler system which is equal to or greater than the flow from a single automatic sprinkler of the smallest orifice size installed on the system will result in an audible alarm on the premises and transmission of a signal to an approved fire alarm receipt point. Installation of sprinkler alarm systems shall be in accordance with NFPA 13-3-17, Installation of Sprinkler Systems; or NFPA 71, Standard for the Installation, Maintenance, and Use of Signaling Systems for Central Station Service; or NFPA 72B, Standard for Auxiliary Protective Signaling Systems; or NFPA 72C, Standard for Remote Station Protective Signaling Systems; or NFPA 72D, Standard for Proprietary Protective Signaling Systems.
- e) Approved Fire Alarm Receipt Points shall include equipment installed to meet the requirements of NFPA 71, Standard for Central Station Signaling Systems; or NFPA 72B, Standard for Auxiliary Protective Signaling Systems; or NFPA 72C, Standard for Remote Station Protective Signaling Systems; or NFPA 72D, Standard for Proprietary Protective Signaling Systems.
- f) When an existing fire safety system is expanded to the extent that an additional riser is required, the entire system must be brought into compliance with existing regulations and equipped with a backflow protection device according to Section 608.304.

Section 608.306

Exemption for Single-Family Residential Dwellings

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Public water supply service line protection under this Subpart is not required for single-family residential dwellings whose water supply plumbing is plumbed in accordance with a plumbing code at least as stringent as the Illinois State Plumbing Code. Nothing in this section shall preclude a local government or a public water supply from requiring service line protection on single-family residential dwellings.

**Section 608.307            Exemption for Multi-Family Residential Dwellings**

- a) Public water supply service line protection under this Subpart is not required for multi-family residential dwellings whose water supply plumbing:
- 1) Is plumbed in accordance with a plumbing code at least as stringent as the Illinois State Plumbing Code, and
  - 2) Meets the same requirements as those for institutional, commercial, or industrial establishments at Section 608.302(b), and
  - 3) Is not equipped with a fire safety system connected to a public water supply distribution system.

**SUBPART D: CROSS-CONNECTION CONTROL DEVICE INSPECTOR**

**Section 608.401            Qualifications, Applications, and Examinations**

In order to ensure that water quality within the public water supply distribution system is protected, the Agency shall establish a cross-connection control device inspector (CCCDI) approval program to qualify persons as competent to test backflow devices for proper operation. Each applicant for CCCDI approval must meet the following requirements:

- a) Must be a licensed plumber in the State of Illinois, in accordance with Ill. Rev. Stat. 1991, ch. 111, pars. 1101-1140, and provide documentation of valid licensing by entering the Illinois Department of Public Health Plumber License Number on the application form provided by the Agency. Except that water supply personnel who successfully complete cross-connection control device inspection training pursuant to Section 608.401 will receive an authorization number which authorizes them to test only those devices located in a public water supply treatment plant, well house or booster station.

- b) Must be physically capable of inspecting, locating, testing, maintaining, and repairing cross-connection control devices in-line, as located throughout each system which connects to a public water supply distribution system;
- c) Must complete and submit an application for approval at least thirty days prior to the examination date. The application must be made on forms provided by the Agency;
- d) Must receive written admission to the examination and submit that admission to the examination proctor before being admitted to actual testing;
- e) Must successfully complete both written and performance examinations demonstrating an understanding of the principles of backflow and backsiphonage, and the hazards presented to a potable water system; identifying locations which require installation of cross-connection control devices; identifying, locating, inspecting, testing, maintaining and repairing cross-connection control methods and devices;
- f) Must successfully complete the written examination with a minimum score of 75%; and
- g) Must successfully complete a performance based examination with a score of "pass" on at least five devices at the examination center.

Section 608.402 Annual Renewal

- a) A CCCDI who is required to have a Plumber License pursuant Section 608.401(a) shall submit along with the CCCDI renewal application a copy of such a license. An application for renewal of CCCDI approval must be submitted to the Agency within thirty days of the renewal of the Plumber License. Failure to renew a plumber license issued by the Illinois Department of Public Health or the City of Chicago will cause a CCCDI approval to lapse.
- b) Each CCCDI must accrue during each twenty-four month period after initial examination, two continuing education credits in cross-connection control inspection and testing as provided by the Agency.

Section 608.403 Causes for Sanctions

- a) A CCCDI approval or admission to examination for CCCDI approval shall be suspended, revoked or not issued by

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the Agency for any one or more of the following causes:

- 1) Practice of any fraud or deceit in obtaining or attempting to obtain CCCDI approval, including misrepresentation of approval:
  - 2) Any repeated, flagrant, or willful negligence, incompetence or misconduct in the inspection, testing or maintenance of cross-connection control devices;
  - 3) Falsification of reports or records required by this Part; or
  - 4) Willful violation of the Act or any regulations adopted thereunder.
- b) Length of Suspension or Revocation
- 1) Suspensions shall be for less than five years. A person may seek reinstatement after the period of suspension. If the period of suspension exceeds one year, a person seeking reinstatement must file a new application, meeting the requirements set forth in Section 608.401, and successfully complete a new written and performance examination.
  - 2) Revocations shall be for a minimum of five years. A person may seek reinstatement after the period of revocation. A person seeking reinstatement must file a new application, meeting the requirements set forth in Section 608.401, and successfully complete a new written and performance examination.

Section 608.404 Procedure for Sanctions

- a) The Agency shall initiate the suspension/revocation procedure.
- b) Any person may initiate the procedure for suspension or revocation of any CCCDI by filing a sworn written complaint with the Agency. If the Agency determines that the complaint is duplicitous or frivolous, it shall notify the person filing the complaint but shall take no further action.
- c) When the suspension/revocation procedure is warranted, the Agency shall notify the CCCDI by certified mail that suspension/revocation is being sought. Such notice shall specify the cause upon which

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suspension/revocation is sought and include the procedures for requesting a hearing before the Agency.

- d) Should a hearing be requested, the Director shall appoint one or more Agency employees to chair the proceedings. The hearing shall be conducted in accordance with hearing requirements of the Illinois Administrative Procedures Act, Ill. Rev. Stat. 1991, ch. 127, pars. 1010-1016.
- e) The Director shall make a decision within 30 days after receiving the hearing transcript. The Director shall give written notice of that decision and reasons for the decision to the CCCDI by certified mail.
- f) Within 30 days of receipt of a notice of suspension/revocation from the Agency, the CCCDI may appeal the suspension/revocation to the Pollution Control Board. The suspension/revocation of the CCCDI's approval shall be stayed pending a final decision on the appeal by the Pollution Control Board.

#### SUBPART E: TESTING AND RECORDS

##### Section 608.501 Survey Update Records

- a) Water supply consumers required to install backflow protection in accordance with this Part shall submit records of each backflow device installed to the owner or official custodian of the public water supply. Information must be submitted to the public water supply each time a backflow device is installed or replaced. All double check valve assemblies and RPZ principle backflow assemblies installed to protect the public water supply distribution system from contamination or pollution due to backflow shall be inventoried. The following information shall be included:
  - 1) Information identifying and locating the device or assembly in accordance with Section 608.502(b); and,
  - 2) Results of initial testing by an approved CCCDI to document proper device or assembly operation following installation or annual inspection as performed in accordance with Section 608.502(b).
- b) The information described in subsection (a) must be submitted to the public water supply within thirty days following installation.

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- c) Public water supplies which do not require cross-connection control devices on the service line shall require submission of the information pursuant to subsection (a) for each double check valve and RPZ principle backflow device which protects the public water supply distribution system by isolation from contamination or pollution due to backflow.
- d) The owner or operator of each establishment which has an existing double check valve assembly or RPZ backflow assembly installed prior to the effective date of this section shall file the required survey inventory information within 180 days after the effective date of this section, and shall file testing forms required by Section 608.502 annually thereafter.

Section 608.502          Testing

- a) Cross-connection control devices shall be inspected and tested upon installation and at least annually unless the manufacturer recommends more frequent inspection, in which case the devices must be inspected at the recommended frequency. The inspection of mechanical devices shall include physical testing in accordance with the manufacturer's instructions.
- b) At a minimum, the following information shall be required on the testing form:
  - 1) Location of the device shall be provided. The name and street address of the establishment served by the public water supply shall be provided. The name of the owner or operator of the establishment shall also be provided. A brief description of the location of the devices which protect the public water supply distribution system on those establishments shall be included.
  - 2) The device assembly serial number, manufacturer, approval standard, date installed, test result information regarding performance of each check valve and operational element of the device, and the name and license number of the CCCDI shall be provided on forms available from or approved by the Agency. If a device fails to test as properly operational, repairs/servicing shall be performed and recorded in the maintenance log and on the inspector's tag attached to the device. Subsequent tests shall be performed until proper operation of the device can be documented.
- c) A completed test form which shows that the backflow

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device is properly operating must be submitted to the public water supply from the owner or operator of the establishment within fifteen days after testing. If the completed form has not been received, the owner or official custodian of the public water supply may notify the customer that test results have not been received and that disconnection may result, as water quality and protection from contamination or pollution can no longer be documented.

- d) Test results shall be maintained by the public water supply for a minimum of five years.
- e) Testing shall be performed by a person who has been approved by the Agency as competent to test the device according to Section 608.401. Proof of approval shall be in writing.
- f) Cross-connection control devices located in the treatment plant, well house or booster station of the public water supply facilities shall be inspected at least annually by an approved CCCDI.

Section 608.503            Inspector's Tag and Maintenance Log

- a) Records must be kept by the owner or operator of the establishment on the site containing the cross-connection control device to document the testing required by Section 608.502 and must be signed by an approved CCCDI.
- b) Each device shall have an inspector's tag attached listing the date of the most recent test or visual inspection, name and authorization number of the CCCDI who performed the test, type and date of maintenance or repairs, and test results.
- c) A maintenance log shall be maintained to document continuous protection of the service connection and shall include:
  - 1) Date of each test and/or visual inspection;
  - 2) Name and approval number of person performing the test and/or visual inspection;
  - 3) Test results;
  - 4) Repairs or servicing required;
  - 5) Repairs and date completed; and

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6) Servicing performed and date completed.

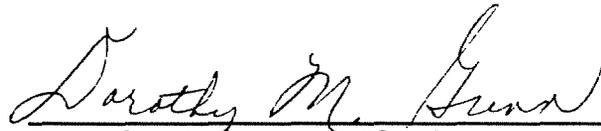
Section 608.504      Records Open to Inspection

The testing and maintenance records required by Section 608.503 shall be available for reasonable inspection by the Agency pursuant to Section 4 of the Act, and the public.

IT IS SO ORDERED.

Board Members J. Anderson and B. Forcade concurred.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, do hereby certify that the above opinion and order was adopted on the 1<sup>st</sup> day of October, 1992, by a vote of 7-0.

  
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Dorothy M. Gunn, Clerk  
Illinois Pollution Control Board

## APPENDIX A

## PUBLIC COMMENTS (R87-37)

Proposed Amendments to Title 35, Subtitle F:  
Public Water Supplies, Chapter 1: Part 608

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PC	DATE	BY:
1.	4-8-88	Richard H. Solomon, Fire Protection Engineer, Naperville, Illinois
2.	4-20-88	Richard H. Solomon, Fire Protection Engineer, Naperville, Illinois
2(a)	4-29-88	City of Galesburg submitted by Garold Fields
3.	5-17-88	Illinois Environmental Protection Agency by Thomas Davis
4.	5-23-88	Dean Thady, Plumbing Code Consultant, Division of Environmental Health
5.	5-23-88	Richard R. Osman, Vice President, Schirmer Engineering Corporation
6.	5-27-88	DuPage County Fire Chiefs' Association by David W. Fleege, President
7.	5-31-88	Flex Fire Protection, Inc. by Mark Bromann, President
8.	6-2-88	Richard H. Solomon, P.E., Naperville, Illinois
9.	6-6-88	Flex Fire Protection, Inc. by Mark Bromann
10.	6-13-88	Miller Sales, Inc. by Harold Miller, Representing Wilkins Backflow Preventers
11.	7-25-88	Comments of the Illinois Steel Group submitted by Heidi E. Hanson
12.	9-20-88	Illinois-American Water Company's counterproposal submitted by Thomas J. Conlon, Risk Manager
13.	10-18-88	Richard H. Solomon
14.	10-24-88	Letter from Illinois Plumbers (unsigned)
15.	10-26-88	Louallyn Byres, IEPA

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16. 11-2-88 Comments and Counter Proposals of National Association of Water Companies, Illinois-Missouri Chapter, ~~Illinois Section, on Revised Proposal~~
17. 11-3-88 American Water Works Association Comments on Revised Proposal submitted by Ira M. Markwood, Chairman, ISAWWA Water Utility Council
18. 11-4-88 Illinois-American Water Company submitted by Thomas J. Conlon, Risk Manager
19. 11-7-88 Illinois Environmental Protection Agency submitted by Scott O. Phillips
20. 11-7-88 Flex Fire Protection, Inc. submitted by Mark Bromann, CET, President
21. 11-10-88 Illinois Plumbing Inspectors Association submitted by David J. Grum, President
22. 11-17-88 Fire Protection Engineer, Richard H. Solomon, P.E.
23. 11-17-88 Ten individual postcards sent to Hearing Officer (all unsigned)
24. 1-3-89 Response to Illinois Environmental Protection Agency's Comments filed Herein on or About November 4, 1988 submitted by John Cassisdey on behalf of Illinois-American Water Company
25. 2-17-89 Agency's Response and Comments Regarding Hearing Officer order Entered January 18, 1989 submitted by Scott O. Phillips
26. 3-6-89 City of Breese submitted by Donald Thomas, Water Plant Operator
27. 3-13-89 City of Centralia submitted by Philip Sutton, City Engineer and Kenny Oestreich, Superintendent Water Plant
28. 3-13-89 City of Flora submitted by David L. Thompson, Utilities Superintendent
29. 3-13-89 City of Pinckneyville submitted by Don Wilkin, Utility Superintendent
30. 4-13-89 Illinois Plumbing Inspectors Association submitted by David J. Grum, President

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31. 4-13-89 Richard H. Solomon
32. 4-17-89 ~~Illinois Fire Chiefs Association~~ submitted by Vicent L. Calcagno, Fire Marshal
33. 5-1-89 Group of three (3) printouts submitted (all unsigned)
34. 5-18-89 Building Officials & Code Administrators International, Inc. submitted by Julius Ballanco, PE, Senior Staff Engineer
35. 5-31-89 Illinois Fire Inspectors Association submitted by Jim Feit, President
36. 6-6-89 North Park Public Water District submitted by Dennis R. Leslie, General Manager
37. 6-6-89 Printout submitted by unknown person
38. 6-8-89 Comments of the National Association of Water Companies, Illinois-Missouri Chapter, Illinois Section, on the State Mandates Act submitted by Daniel J. Kurcera
39. 6-8-89 Comments and Counter Proposals of the National Association of Water Companies, Illinois-Missouri Chapter, Illinois Section, on the Second Revised Proposal submitted by Daniel J. Kurcera
40. 6-9-89 United States Environmental Protection Agency submitted by Joseph F. Harrison, Chief, Safe Drinking Water Branch
41. 6-12-89 Illinois-American Water Company Requested Pursuant to Hearing Officer Order Dated May 3, 1989
42. 6-15-89 The Village of Winnetka submitted by Ben Bryan McInturff, Jr., Director Water and Electric
43. 11-21-89 Illinois-American Water Company submitted by T. J. Conlon, Risk Manager
44. 11-22-89 Richard H. Solomon
45. 12-8-89 Chicago Association of Commerce and Industry submitted by Samuel R. Mitchell, President
46. 12-13-89 Creative Industries, Inc. submitted by Connie Lake, Vice President

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47. 12-15-89 American Association of Insurance Services by T.T. Singer, Executive Vice-President
48. 12-18-89 Agency Comments by Bobella Glatz
49. 12-19-89 City of Galesburg submitted by Donald G. Crose, Plumbing Inspector, Planning & Environmental Services Department
50. 12-21-89 American Association of Insurance Services submitted by T. T. Singer, Executive Vice President (same as P.C. 47 filed 12/15/89)
51. 12-26-89 Richard H. Solomon, P.E., Naperville, Illinois
52. 12-27-89 Reply Comments of National Association of Water Companies, Illinois-Missouri Chapter, Illinois Section, on State Mandates Act submitted by Chapman and Cutler
53. 1-4-90 Illinois-American Water Company submitted by T. J. Conlon, Risk Manager
54. 1-31-90 Letter of comment from A Concerned Citizen (unsigned)
55. 5-24-90 North Park Public Water District submitted by Dennis R. Leslie, General Manager
56. 7-12-90 Comments from Richard H. Solomon
57. 8-14-90 Village of Morton Grove submitted by Ed Hildebrandt, Deputy Fire Marshal/Building Commissioner
58. 8-22-90 National Fire Sprinkler Association, Inc. submitted by Thomas J. O'Connell, Midwest Regional Manager
59. 8-22-90 Captain Ralph E. Perricone, Wheeling Fire Prevention Bureau
60. 8-22-90 Kurt Boggs, Chief, Channahon Fire Protection District
61. 8-23-90 Kurt Van Dahm, Director, Fire Prevention Bureau, Downers Grove Fire Department
62. 8-24-90 Captain Daniel A. Tholotowsky, Director, Pleasantview Fire Protection District Fire

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## Prevention Bureau

63. 8-28-90 Gregory T. Riddle, Captain, Fire Prevention Bureau, Elk Grove Village
64. 8-29-90 George K. Michehl, Director, Fire Prevention Bureau, Glenbrook Fire District
65. 8-29-90 James D. MacArthur, Chief, Elk Grove Village Fire Department
66. 8-29-90 Janet B. Yates, Fire Inspector, Fire Prevention Bureau, City of Rolling Meadows
67. 8-29-90 Addison Fire Protection District No. 1 (Group of five letters)
68. 8-30-90 Final Comments of the Illinois Fire Chiefs Association submitted by Vincent L. Calcagno, Fire Marshall of Bolingbrook
69. 8-30-90 Countryside Fire Protection District submitted by Jeff Steingart, Fire Prevention Officer
70. 8-30-90 Elk Grove Village Fire Department submitted by William F. Clark, Deputy Chief
71. 8-30-90 Chicago Heights Fire Department submitted by Lt. Thomas Martello, Fire Prevention Bureau
72. 8-31-90 Final Comments of the Chicago Association of Commerce and Industry submitted by James Werner, Chairman
73. 8-31-90 Department of Energy and Natural Resources submitted by Stanley Yonkauski
74. 8-31-90 Agency Comments submitted by Stephen C. Ewart
75. 8-31-90 Aqua-Tech Backflow Prevention, Inc. submitted by Steve Ranieri
76. 9-6-90 Richard H. Solomon, P.E., Fire Protection Engineer
77. 2-1-91 Chicago Association of Commerce and Industry submitted by Samuel R. Mitchell, President
78. 5-8-91 Copy of letter to Dean Thady, Illinois Department of Public Health from Mark Bromann, President Flex Fire Protection Design

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79. 7-1-91 Village of Morton Grove submitted by Ed Hildebrandt, Deputy Fire Marshal/Building Commissioner
80. 10-31-91 Chicago Association of Commerce and Industry, submitted by Joseph J. Bollentino, Chairman, Fire Prevention Committee
81. 4-15-92 Comments from Flex Fire Protection Design submitted by Mark Bromann, SET, President
82. 4-22-91 Comments from Ed Hildebrandt, Building Commissioner, Village of Morton Grove
83. 4-28-92 Comments from Vince Calcagno, Fire Marshal, Village of Bolingbrook
84. 5-07-92 Comments from Richard H. Solomon, P.E., Fire Protection Engineer
85. 5-11-92 Department of Energy and Natural Resources Comments submitted by Stanley Yonkauski, General Counsel
86. 5-12-92 National Fire Sprinkler Association, Inc. submitted by Thomas J. O'Connell, Midwest Regional Manager, National Fire Sprinkler Association
87. 5-14-92 Comments of the Chicagoland Chamber of Commerce submitted by Joseph J. Bollentino, Chairman, Fire Prevention Committee
88. 5-15-92 Comments from the Illinois Fire Inspectors Association submitted by Richard A. Piccolo, Chairman, Codes & Standards Committee
89. 5-21-92 Comments from Environmental Planning and Economics, Inc. submitted by Stephen F. John, President
90. 5-29-92 Comments from the Illinois Environmental Protection Agency submitted by Stephen C. Ewart

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## APPENDIX B

### A Comparison of the Cross-Connection Control Requirements for Fire Safety Systems Recommended by the American Water Works Association (AWWA), Specified in the Illinois Plumbing Code (IPC) and those Proposed in R87-37

AWWA M14	Agency's Proposal (35 IAC 608.205)	CACI Proposal (35 IAC 608.204)	Illinois Plumbing Code (35 IAC 890.1540)
<p>1. Class 1--direct connections from public water mains only; no pumps, tanks, or reservoirs; no physical connection from other water supplies; no antifreeze or other additives of any kind; all sprinkler drains discharging to atmosphere, dry wells, or other safe outlets.</p> <p>2. Class 2--same as Class 1, except that booster pumps may be installed in the connections from the street mains (Booster pumps do not affect the potability of the system; it is necessary, however, to avoid drafting so much water that pressure in the water main is reduced below 10 psi.)</p> <p>Generally, fire protection systems of Classes 1 and 2 will not require backflow protection at the service connection. Pumper connections of automotive fire department equipment to street hydrants are not ordinarily health hazards.</p> <p>3. Class 3--direct connection from public water supply main plus one or more of the following: elevated storage tanks; fire pumps taking suction from above-ground covered reservoirs or</p>	<p>a) Fire safety systems connected to a public water supply shall be equipped with a double detector check valve assembly located at the point of connection between the fire safety system and the public water supply service line to protect the community public water supply against backflow and backsiphonage except under the conditions described in subsection (b)(2).</p> <p>b) A fixed proper air gap with a break tank or other storage vessel or a reduced pressure principle backflow preventer shall be installed at the point of connection between the fire safety system and the public water supply service line to protect the community water public supply against backflow and backsiphonage when:</p> <p>1) The fire safety system contains additives such as antifreeze, fire retardant or other chemicals. The RPZ assembly may be located at the point of connection to the section of the system containing such additives when the connection to the public water supply is protected by a double detector check valve assembly; or</p>	<p>b) 5) A reduced pressure zone assembly shall be installed to protect the community water supply against backflow and backsiphonage in fire lines or fire safety systems connected to the public water distribution system when:</p> <p>A) the fire safety system contains antifreeze, fire retardant, or other chemicals. The RPZ assembly may be located at the point of connection to the portion of the system containing such additives; or</p> <p>B) water is pumped into the fire line or fire safety system from an auxiliary non-potable source dedicated for fire service use; or</p> <p>C) water flows into the fire Line or fire safety system by gravity from an auxiliary non-potable source dedicated@d for fire service use.</p>	<p>d) Fire safety systems shall be equipped with a double detector check valve assembly located at the point of connection between the fire safety system and the water supply line to protect the water supply against backflow and backsiphonage except under the condition described in subsection (A) (2).</p> <p>1) A fixed proper air gap with a break tank or other storage vessel or a reduced pressure principle backflow preventer shall be installed at the point of connection between tile fire safety system and the water supply service line to protect the water supply against backflow and backsiphonage when):</p> <p>A) The fire safety system contains additives such as antifreeze, fire retardant or other chemicals. The RPZ assembly may be located at the point of connection to the section of the system containing such additives when the connection to the water supply is protected by a double detector check valve assembly; or</p>

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**APPENDIX B (Continued)**

**A Comparison of the Cross-Connection Control Requirements for Fire Safety Systems**

AWWA M14	Agency's Proposal	CACI Proposal	Illinois Plumbing Code
<p>tanks; and pressure tanks (All storage facilities are filled or connected to public water only, the water in the tanks to be maintained in a potable condition. Otherwise, Class 3 systems are the same as Class 1.)</p> <p>Class 3 systems will generally require minimum protection (approved double-check valves) to prevent stagnant waters from backflowing into the public potable-water system.</p> <p>4. Class 4--directly supplied from public mains similar to Classes 1 and 2, and with an auxiliary water supply on or available to the premises; or an auxiliary supply may be located within 1,700 ft of the pumper connection.</p> <p>5. Class 5--directly supplied from public mains, and interconnected with auxiliary supplies, such as: pumps taking suction from reservoirs exposed to contamination, or rivers and ponds; driven wells; mills or other industrial water systems; or where antifreeze or other additives are used.</p> <p>Classes 4 and 5 systems normally would need maximum protection (air gap or reduced pressure) to protect the public potable-water system.</p> <p>6. Class 6--combined industrial and fire protection systems supplied from the public water mains only, with or without gravity storage or pump suction tanks.</p> <p>Class 6 system protection would depend on the requirements of both industry and fire protection, and could only be determined by a survey of the premises.</p>	<p>2) Water is pumped into the fire safety system from a non-potable source capable of serving the fire safety system. A non-potable source of water shall be considered capable of serving the fire safety system under the following conditions: it must be capable of year-round use, maintained with not less than 50,000 gallons of usable water not subject to freezing, and accessible to fire fighting pumper equipment; or</p> <p>3) Water flows into the fire safety system by gravity from a non-potable source; or</p> <p>4) There is a permanent or emergency connection whereby water can be pumped into the fire safety system from any other non-potable source.</p> <p>c) Fire department connections served solely by the public water system without any non-potable connections or chemical additives shall require installation of a double detector check valve assembly on unmetered fire lines and a double check valve assembly on metered fire lines.</p>	<p>c) 3) A double check valve assembly shall be installed to protect the community water supply against pollutants in fire lines or fire safety systems connected to the public water distribution system when:</p> <p>A) the fire safety system includes elevated storage tanks, or</p> <p>B) the fire safety system includes a fire pump taking suction from above ground covered reservoirs or tanks; or</p> <p>C) the fire safety system includes pressure tanks.</p> <p>4) All fire safety system storage facilities shall be filled with or connected to potable water only. Water in all storage facilities is to be maintained in a potable condition.</p> <p>e) Fire lines and fire safety systems with direct connections from potable water mains only, with or without a booster pump installed in the connection, shall require a single rubber faced check valve. Pumper connections for automotive fire department equipment to hydrants supplied with potable water shall not be considered a health hazard.</p>	<p>B) Water is pumped into the fire safety system from a non-potable source capable of serving the fire safety system. A non-potable source of water shall be considered capable of serving the fire safety system under the following conditions. It must be capable of year use, maintained with not less than 50,000 gallons of usable water not subject to freezing, accessible to fire fighting pumper equipment, located within 1700 feet of the facility.</p> <p>C) Water flows into the fire safety system by gravity from a non-potable source; or</p> <p>D) There is a permanent or emergency connection whereby water can be pumped into the fire safety system from any non-potable source.</p> <p>2) Fire Department connections served solely by a water system without any non-potable connections or chemical additives shall require installation of a double detector check valve assembly.</p>

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