

The Texas Natural Resource Conservation Commission (TNRCC or commission) proposes amendments to §290.38, Definitions; §290.39, General Provisions; §290.41, Water Sources; §290.44, Water Distribution; §290.45, Minimum Water System Capacity Requirements; and §290.47, Appendices; the repeal of §290.42, Water Treatment; §290.46, Minimum Acceptable Operating Practices for Public Drinking Water Systems; and §§290.101-290.106, 290.108-121; new §290.42, Water Treatment; §290.46, Minimum Acceptable Operating Practices for Public Drinking Water Systems; §§290.101, Purpose; 290.102, General Applicability; 290.103, Definitions; 290.104, Summary of Maximum Contaminant Levels, Maximum Residual Disinfectant Levels, Treatment Techniques, and Action Levels, 290.105, Secondary Standards; 290.106, Inorganic Contaminants; 290.107, Organic Contaminants; 290.108, Radiological Sampling and Analytical Requirements; 290.109, Microbial Contaminants; 290.110, Disinfectant Residuals; 290.111, Turbidity; 290.112, Total Organic Carbon (TOC); 290.113, Disinfection By-products (TTHM AND HAA5); 290.114, Disinfection By-products Other than TTHM and HAA5; 290.115, Transition Rule for Disinfection By-products; §290.117, Regulation of Lead and Copper; §290.118, Secondary Constituents; §290.119, Analytical Procedures; §290.121, Monitoring Plans; and §290.122, Public Notification.

BACKGROUND AND SUMMARY OF THE FACTUAL BASIS FOR THE PROPOSED RULES

This rule implements the federal Stage 1 Disinfectants and Disinfection By-products Rule (DBP1R), 63 Fed Reg 69390 (1998) and the federal Interim Enhanced Surface Water Treatment Rule (IESWTR), 63 Fed Reg 69478 (1998). The rule will also make changes to the state design criteria for drinking water treatment plants and clarify existing regulatory requirements.

The sections of the rule relating to the federal Stage 1 DBP1R will apply to all community water systems and nontransient, non-community systems regardless of the number of people they serve. Certain requirements of the rule related to chlorine dioxide will also apply to transient non-community water systems. The proposed rule establishes maximum residual disinfectant levels or maximum contaminant levels for certain disinfectants used to treat drinking water and their by-products by January 1, 2002. The rule would implement National Primary Drinking Water Regulations for three disinfectants (chlorine, chloramines, and chlorine dioxide), two groups of organic disinfection by-products (total trihalomethanes and haloacetic acids), and two inorganic disinfection by-products (chlorite and bromate). These rules also include monitoring, reporting and public notification requirements for these compounds.

Those sections of the rule related to the federal Interim Enhanced Surface Water Treatment Rule apply to public water systems operating surface water treatment plants and treatment plants for groundwater under the direct influence of surface water (GUI). A well is under the direct influence of surface water if water from the surface can flow into the well. For an example, the presence of surface-water dwelling microbes in the water from the well would indicate that the well is under the direct influence of surface water. The rule strengthens combined filter effluent turbidity performance standards, and establishes individual filter turbidity provisions and disinfection benchmark provisions that must be achieved by January 1, 2002.

The federal requirements for IESWTR apply to public water systems that service at least 10,000 people and utilize surface water or GUI. The commission specifically invites comments on its proposal to apply to IESWTR requirements to surface water and GUI systems that serve less than 10,000 people. This provision would be applied to these smaller systems with the exception that a small system could be granted

a waiver delaying their compliance date for up to two years, until 2004. Should these standards be required of small systems before a related federal rule is promulgated?

The rules also include monitoring and reporting requirements. Those sections of the rule relating to state design criteria apply to all public water systems. However, some of the changes to the design criteria apply to specific unit processes and therefore will only affect water treatment plants utilizing those specific unit processes. If a plant does not have a specific unit process that is covered by the rule, the plant is not affected by the rules regarding that specific unit process.

SECTION BY SECTION DISCUSSION

In keeping with present agency usage and the definitions in 30 TAC Chapter 3, relating to definitions, the term “commission” refers to the commissioners acting in their official capacity. The term “executive director” is used to refer to the executive director and any authorized individual or individuals designated to act for the executive director (i.e. staff). This usage has prompted a number of proposed changes to Chapter 290, generally to change “commission” to “executive director,” in order to clarify that the staff, not the commissioners acting as the deliberative body, will be taking the action. In a number of instances, the rules require certain requests or reports be sent to the staff for some action. In order to get those requests or reports to the appropriate staff as quickly as possible, some provisions of the proposed rules specify that documents be submitted directly to the public drinking water program rather than to the executive director.

Section 290.38, Definitions, is proposed to be amended to incorporate the definition of public drinking water program which is a term used in various sections of the proposed regulations. Because of proposed changes to various rules related to backflow protection and cross-connection control, the definitions for ABPA, ASSE, and high health hazard are proposed to be eliminated. The definition of health hazard is proposed to be amended, and definitions for air gap, nonhealth hazard, potential contamination hazard and L/d ratio are proposed to be added. Other definitions in this section are renumbered to keep them in alphabetical order.

Section 290.39, General Provisions, is proposed to be amended to incorporate two new provisions. This section provides that a person proposing to install a public drinking water system near a city, district, or a certificated service area of another water service provider must file a written application for service with that other service provider and pay all application fees.

Section 290.39(c)(2) is proposed to be amended and moved to new paragraph (3) of this subsection. Section 290.39(c)(2) is proposed to be amended to provide a hardship exception for the requirement to apply for service from an adjacent water supply. If this provision is adopted in the final rule, the executive director will evaluate any request for this hardship exception using criteria found in the agency's regulatory guidance document, "The Feasibility of Regionalization, Water Utilities Program."

Section 290.39(e)(3)-(4) is proposed to be amended to replace the word "commission" with the words "executive director."

Section 290.39(e)(5) is proposed to be added to clarify that construction features and facility siting for new water systems and major improvements must be in conformity with applicable commission rules.

Section 290.41, Water Sources, is proposed to be amended to update the reference to the current American Water Works Association (AWWA) standard for water well pressure cementation methods. That section is also proposed to be amended to add a provision that expressly states the water quality data that must be provided by the design engineer to the staff in order to obtain approval for a new surface water source.

Section 290.41(c)(3)(C), is proposed to be amended to update the reference to the current AWWA standard for water well pressure cementation methods.

Section 290.41(c)(3)(H) is proposed to be amended to move the requirement regarding well location to §290.41(c)(3)(K). This change has been made in order to make it clear that well installation must be done in such a way that the public water supply well is protected from contamination due to flooding.

Section 290.41(e)(1)(F) is proposed to add a provision that expressly states the water quality data that must be provided by the design engineer to the executive director in order to obtain approval for a new surface water source.

The existing §290.42, Water Treatment, is proposed to be repealed and replaced by new §290.42. Proposed new §290.42 contains the state design criteria for drinking water treatment plants. The existing

requirements have been reworded for clarity and resequenced to clarify the importance of existing requirements. New provisions as required by the new federal rules are also incorporated into the section.

Proposed new §290.42(a) provides for the capacity of the public water system's production and treatment facilities. New subsection (b) provides the standards for groundwater sources. Both subsections are unchanged from the existing regulations.

Proposed new §290.42(c) addresses standards for springs and other water sources. New paragraph (1) incorporates the new federal requirement, under 40 CFR §141.170(a)(1), that treatment facilities achieve a 2-log (99%) removal of *Cryptosporidium* oocysts from water sources that may be vulnerable to contamination from surface water.

Proposed new §290.42(d) addresses standards for surface water sources. The majority of the proposed changes from the existing requirements add the new federal requirement that treatment facilities achieve a 2-log (99%) removal of *Cryptosporidium* oocysts from surface water sources from 40 CFR §141.170(a)(1). Some changes clarify the existing requirements for review and approval of plans and specifications for drinking water treatment plants. Proposed new paragraph (5) requires surface water treatment plants to have flow metering devices to monitor the flow rate of water in separate treatment trains, recycled decant water, and treated water used to backwash filters, in addition to the requirement that flow metering devices be provided for raw and finished water. This will provide the water plant operator with basic operational data with which to operate the plant effectively given the new turbidity requirements of 40 CFR §141.173(a)(1).

Proposed new §290.42(d)(6), relating to the design of chemical storage facilities at surface water treatment plants, has been reordered from the existing requirements to better represent the importance of the various provisions, reworded to clarify that the rule relates to design rather than operation of such facilities, and expanded to enumerate the specific requirements concerning the design of these facilities. Proposed new subparagraph (A) requires that the system be designed with the capability to store a 15-day supply of chemicals at the design capacity of the surface water treatment plant. This clarifies the existing requirement and addresses the fact that resupply in Texas may be accomplished with more rapidity than that which was achievable at the time the current rule was promulgated. Proposed new subparagraph (B) contains the requirements for day tanks and provides for process control to ensure that no overfeed of chemicals occurs. Proposed new subparagraph (C) requires that all chemical tanks be clearly labeled with the tank's contents and new subparagraph (D) contains the requirements for storage of dry chemicals. Proposed new subparagraph (E) requires bulk storage facilities, day tanks, and their containment facilities be designed to minimize the possibility of leaks and spills. Proposed new subparagraph (F) requires that the pumps and control systems used in contact with a chemical be designed to minimize the possibility of leaks and spills. Proposed new subparagraph (G) requires the piping and valves associated with the storage of a chemical be constructed of materials compatible with that chemical.

Proposed new §290.42(d)(7), relating to the facilities used to feed water treatment chemicals, has been reworded from the existing regulations to clarify that this is a design requirement rather than an operational requirement, expanded to make the requirements more specific, and reworded for clarity. The paragraph contains requirements that will allow chemicals to be applied in a manner that will maximize reliability, facilitate maintenance, and ensure optimal finished water quality. Subparagraph (A) requires each chemical

feeder to have a standby or reserve unit. Subparagraph (B) addresses chemical feed equipment dosage. Subparagraph (C) requires the materials used for chemical feeders be compatible with the chemical being fed and subparagraph (D) requires that the design of chemical feed systems prevent chemical back-siphoning. Subparagraph (E) addresses enclosed feed lines, subparagraph (F) addresses dry chemical feeders, subparagraph (G) addresses coagulant feed systems, subparagraph (H) addresses the separation of chlorine and ammonia feed equipment, and subparagraph (I) requires chemical feed points be provided to achieve acceptable finished water quality, adequate taste and odor control, corrosion control, and disinfection.

Proposed new §290.42(d)(8) addresses flash mixing equipment, distinct from flocculation, and has been reworded from the existing regulations for clarity and reorganized and expanded to better represent the importance of the requirements. Two sets of mechanical flash mixing equipment are required for plants treating more than 3.0 million gallons per day. Public water systems with other sources of potable water, with which they can meet average daily water demand, are exempted from the requirement for redundant equipment. Flash mixing equipment is to be sized to account for the range of flows likely to be treated at the plant.

Proposed new §290.42(d)(9) contains provisions for flocculation equipment. Subparagraph (A) allows public water systems treating over 3.0 million gallons per day with other sources of potable water, with which they can meet average daily water demand, to design a new plant with one set of flocculation equipment. Subparagraph (B) addresses the design of coagulation to achieve settleable floc. Flocculation facilities are to be designed with a minimum theoretical detention time of at least 20 minutes when operated

at the design flow rate to correspond with currently acceptable engineering practice. However, facilities constructed prior to October 1, 2000 are exempt from this requirement if the settled water turbidity of each sedimentation basin remains below 10.0 Nephelometric Turbidity Units (NTU) and meets the requirements of §290.111. Flocculation facilities are to be designed with decreasing mixing energy from the inlet to outlet. Subparagraph (C) requires coagulated water be transported without destruction of floc.

Proposed new §290.42(d)(10) contains the requirements for surface water treatment plant clarification facilities. Subparagraph (A) allows public water systems treating over 3.0 million gallons per day, with other sources of potable water with which they can meet average daily water demand, to design a new plant to have one set of clarification equipment. Subparagraph (B) requires design to prevent short-circuiting and coagulated water flow through the sedimentation basins without destruction of floc. Subparagraph (C) enumerates the specific design parameters needed for adequate sedimentation, and adds surface overflow rate as a design parameter. This subparagraph uses current standard engineering practice regarding surface overflow rate as a design parameter for clarification facilities. Subparagraph (D) requires clarification basins be designed to prevent the accumulation of settled solids and has been reorganized based on the relative importance of the provisions and expanded for specificity. Sedimentation basins must be designed to be capable of complete draining in six hours, if the system has no other sources of potable water with which to meet average daily demand.

Proposed new §290.42(d)(11) contains provisions related to gravity or pressure type filters. Plants must have filtration facilities. Subparagraph (A) requires that the use of pressure filters be limited to installations with a treatment capacity of less than 0.50 million gallons per day. Subparagraph (B) specifies that surface

water treatment plants are to be designed with sufficient filter capacity to meet maximum daily demand with the largest filter out of service. This conforms with current industry design practices and ensures an adequate supply of potable water to the system's customers during periods of routine filter maintenance. Subparagraph (C) requirements have been expanded to make the design options for filter beds clearer, to incorporate current engineering practice for alternative filter bed designs, and to enable systems to meet the provisions of 40 CFR §141.173(a). Filter media purity and filter media grain size must conform to American Water Works Association standards. The depth of filter media should be 24 inches or greater and provide an L/d ratio of at least 1,000. Standards for rapid sand filters are specified and require the uniformity coefficient for filter media not to exceed 1.6 in order to operate the plant effectively given the new turbidity requirements of 40 CFR §141.173(a). Specifications for high-rate dual-media gravity filters, high-rate multi-media gravity filters, and high-rate mono-media anthracite or granular activated carbon gravity filters are provided and conform to current standards of engineering design. Subparagraph (D) contains requirements for filter support gravel design and subparagraph (E) provides acceptable filtration rates of various types of filters. Proposed new subparagraph (F) contains the design requirements for monitoring equipment used in conjunction with filters and incorporates provisions of 40 CFR §141.74(a) relating to individual filter monitoring. Proposed new subparagraph (G) contains provisions relating to filter backwashing facilities and contains provisions resulting from 40 CFR §141.175(b). Proposed new subparagraph (H) allows the continued operation of a drinking water treatment plant during any special studies performed as part of the requirements of 40 CFR §141.175(b) relating to special monitoring on individual filters.

Proposed new §290.42(d)(12) contains requirements for pipe galleries.

Proposed new §290.42(d)(13) contains specifications for plant piping paint color schemes to aid in identification. Subparagraph (A) lists the acceptable color code for piping for plants build or repainted after October 1, 2000, and adds required pipe paint colors for additional process piping colors for chlorine dioxide solution, ferric chloride, ferric sulfate, polymer, liquid caustic, caustic solution, fluoride, and ozone process piping. Figure 30 TAC §290.42(d)(13) which contains the labeling standards appears in the Tables and Graphics section of this issue of the *Texas Register*. Subparagraph (B) allows deviation from the provisions of subparagraph (A) for plants repainted before October 1, 2000, if those plants provide clear visual distinction between process streams. Subparagraph (C) requires that the process piping color scheme be documented and that the documentation be accessible to plant personnel.

Proposed new paragraph §290.42(d)(14) requires surface water treatment plants to be designed with sampling taps for raw, settled, filtered and finished water.

Proposed new §290.42(d)(15) contains requirements for an adequately equipped laboratory to be available locally so that daily microbiological and chemical tests can be conducted. Provisions required under 40 CFR §141.131(c) are included. Subparagraph (A) requires that any system wishing to perform microbial analysis in an on-site laboratory must obtain certification to perform this analysis from the Texas Department of Health. Subparagraph (B) provides that systems not having on-site microbial analysis facilities may send samples to a certified lab, as long as this can be accomplished within the requisite time period. Subparagraph (C) requires labs to include equipment for required measurements for pH,

temperature, disinfectant residual, alkalinity, turbidity, jar tests for determining the optimum coagulant dose, and any other analyses deemed necessary to monitor specific water quality or treatment processes. Subparagraph (D) incorporates the requirement of 40 CFR §141.131(c) that systems using chlorine dioxide have an amperometric titrator with platinum-platinum electrodes. Subparagraph (E) requires systems with sludge blanket clarifier to have a sludge depth measuring device. Subparagraph (F) requires systems using solids recirculation be equipped to measure slurry solids concentration. Subparagraph (G) requires after January 1, 2002, that surface water treatment plants have a computer and software for recording performance data, maintaining records, and submitting reports. This is proposed to assist surface water plants in complying with new data collection and reporting requirements of both the IESWTR and the Stage 1 DBPIR. The agency's public drinking water program will distribute spreadsheet templates to public water systems when the rule is promulgated. The spreadsheet templates will assist the water treatment plant in collecting data, calculating results, and reporting results to the public drinking water program.

Proposed new §290.42(e), relating to disinfection, has been reorganized from the existing provisions to better represent the relative priority of the requirements and to group related requirements together. Paragraph (1) requires water from surface water sources or groundwater under the direct influence of surface water to be disinfected consistent with requirements of §290.110. Paragraph (2) requires that all groundwater must be disinfected prior to distribution and specifies the application point. Paragraph (3) provides standards for disinfection equipment. Paragraph (4) clarifies the placement of safety equipment when chlorine gas is used. Paragraph (5) requires that by January 1, 2001, housing for all gas chlorination equipment and cylinders be in a separate building and meet certain safety standards. Paragraph (6) specifies

ventilation requirements. Paragraph (7) contains standards for hypochlorination solution containers and pumps. Paragraph (8) contains standards for the use of anhydrous ammonia feed equipment.

Proposed new §290.42(f) addresses other treatment processes. Proposed new §290.42(g) contains provisions for sanitary facilities for water works installations. Proposed new subsection (h) requires a permit from the agency for discharging wastes from water treatment processes. Proposed new subsection (i) requires that all chemicals and any additional or replacement process media must conform to American National Standards Institute/National Sanitation Foundation Standard 60 for direct additives and Standard 61 for indirect additives. Proposed new subsection (j) contains safety requirements and references the applicable safety standards of the Occupational Safety and Health Administration and the Texas Hazards Communication Act, Health and Safety Code, Title 5, Chapter 502. The system is required to comply with the U.S. Environmental Protection Agency (EPA) requirements for risk management plans. Proposed new subsection (k) requires a thorough plant operations manual be compiled and kept up to date.

Section 290.44(h), Backflow, Siphones, is proposed to be amended to clarify the existing rules related to backflow prevention and to avoid conflict with other commission rules regarding the certification and licensing requirements for backflow prevention device testers. Some proposed text has been reworded for clarity.

New §290.44(h)(1)(A) is proposed to be added to incorporate the requirements of existing §290.44(h)(1) relating to residential air gaps or backflow prevention and reworded to clarify that the requirements shall be dependent upon the specific type of potential hazard.

New §290.44(h)(1)(B) is proposed to be added to incorporate the requirements of existing §290.44(h)(1) relating to residential air gaps or backflow prevention, reworded to clarify that residences or establishments that have an adequate cross connection control program in place are not required to have backflow prevention at the meter, and expanded to specify the requirements relating to adequacy of a cross connection control program. New clause (i) is proposed to be added to clarify the requirements for inspection and testing and to establish an adequate cross connection control program. New clause (ii) is proposed to be added to clarify the requirements for reporting and record keeping for an adequate cross connection control program. New clause (iii) is proposed to be added to place responsibility for cross connection control programs on the water purveyor.

Proposed amendments to §290.44(h)(4) clarify which backflow prevention assemblies are required to be tested. Proposed amendments to subparagraph (A) clarify and update references regarding qualifications for backflow prevention device testers to avoid conflict with other rules regarding certification. Clause (i) is proposed to be deleted to eliminate the reference to “General Tester” to avoid conflict with other rules regarding certification. Clause (ii) is proposed to be deleted to eliminate the reference to “Fireline Tester” to avoid conflict with other rules regarding certification.

Existing §290.44(h)(4)(B) is proposed to be deleted to eliminate references that conflict with other rules regarding certification. Existing §290.44(h)(4)(C) is proposed to be deleted and moved to §290.44(h)(4)(B). Existing §290.44(h)(4)(D) is proposed to be deleted and moved to §290.44(h)(4)(C). Existing §290.44(h)(4)(E) is proposed to be deleted and moved to §290.46(f).

Proposed new §290.44(h)(4)(B) is amended to incorporate the provisions of §290.44(h)(4)(C) relating to gauges used to test backflow prevention devices. Proposed new §290.44(h)(4)(C) is proposed to be amended to incorporate the provisions of §290.44(h)(4)(D) relating to the reporting requirements for backflow prevention assemblies, and to be reworded for clarity.

Section 290.45, Minimum Water System Capacity Requirements, is proposed to be amended to update the requirements for redundancy in service pumps for small community and noncommunity water systems in order to help ensure continuous uninterrupted operation of those systems. Redundancy means the provision of two pumps so that, if the main water pump fails, a second pump is available and may be installed quickly so that customers are not without water for extended periods. Some proposed text has been reworded for clarity.

Proposed §290.45(b)(1)(F)(iii) has been amended to require at least two service pumps for all groundwater systems with 100 connections and greater or groundwater systems with fewer than 100 connections that have ground storage. Proposed §290.45(d)(2)(B)(iii) has been amended to require a pump with a total capacity of 2.0 gallons per minute at systems with a maximum demand less than 15 gallons per minute. Existing §290.45(d)(2)(B)(iv) has been moved to §290.45(d)(2)(B)(v). Proposed new clause (iv) has been amended to require at least two pumps at systems with a maximum demand greater than 15 gallons per minute.

The existing §290.46, Minimum Acceptable Operating Practices for Public Drinking Water Systems, is proposed to be repealed and replaced by new §290.46. Proposed new §290.46 contains the minimum

acceptable operating practices for public drinking water systems. It incorporates the existing regulations and current engineering standards. Some text existing provisions have been reorganized and reworded for clarity. New provisions required by the new federal rules are also incorporated into the section.

Proposed new §290.46(a) contains general requirements for a public drinking water system and is unchanged from the existing requirements. Proposed new §290.46(b) addresses microbiological analysis submission and requirements. Proposed new subsection (c) requires samples for chemical analysis to be submitted as directed by the agency.

Proposed new §290.46(d) contains requirements for disinfectant residuals and monitoring. It requires systems be operated in such a manner that the disinfectant residuals be acceptable and continuously maintained during the treatment process and throughout the distribution system. New paragraph (1) requires compliance with §290.110 and new paragraph (2) specifies the minimum disinfectant residuals in the finished water storage tank and in the far reaches of the distribution system at all times. Systems using free chlorine must operate the disinfection equipment to achieve a free chlorine residual of 0.2 milligrams per liter. Systems using chloramines must operate the disinfection equipment in such manner to achieve a total chlorine residual of 0.5 milligrams per liter.

Proposed new §290.46(e) provides the conditions under which a system must be under the direct supervision of a certified water works operator. New paragraph (1) provides requirements for systems which utilize groundwater or purchased water and provides the grade of certification required for the water works operator. A system using only groundwater or purchased water with 250 or fewer connections must

be operated by an operator holding minimum of a Grade “D” certificate. A system using only groundwater or purchased water serving more than 250 connections must be operated by an operator holding minimum of a Grade “C” certificate. A system using only groundwater or purchased water serving more than 1,000 connections must be operated by two operators holding minimum of a Grade “C” certificate. A system using surface water must employ an operator holding minimum of a Grade “B” surface water certificate after January 1, 2004 to correspond with the changes in operator certification requirements. Until January 1, 2004, a system using surface water must employ an operator holding minimum of a Grade “B” surface water certificate or a Grade “C” surface water certificate and having completed a 20-hour lab class.

Proposed new §290.46(e)(2) requires that a surface water treatment plant must have at least a Grade “C” surface water operator on the premises at any time the plant is in operation or the plant must be equipped with continuous turbidity and disinfectant residual monitors with automatic shutdowns and alarms.

Proposed new §290.46(e)(3) requires systems which are classified as groundwater under the direct influence of surface water to be under the supervision of either an operator who has at least a Grade “C” groundwater certificate and has had additional training or who has at least a Grade “C” surface water certificate. Systems that utilize cartridge filters must be under the supervision of at least a Grade “C” groundwater operator who has completed a 8-hour training course on monitoring and reporting requirements. Systems that utilize coagulant addition and direct filtration must be under the supervision of at least a Grade “C” groundwater operator who has completed a 20-hour Surface Water Protection course and an 8-hour training course on monitoring and reporting requirements. Systems which utilize complete surface water treatment must comply with the requirements of §290.46(e)(2).

Proposed new §290.46(e)(4) requires certified operators to provide written notice of the public water systems which they operate to the agency when applying for, renewing, or upgrading their certification or within ten days of any change in responsibility. Proposed new §290.46(e)(5) provides that the training programs for all chemicals used in the water treatment must meet applicable standards established by OSHA or the Texas Hazard Communications Act, Health and Safety Code, Title 5, Chapter 502.

Proposed new §290.46(f) contains all the requirements for public water systems relating to reporting and record keeping. The proposed subsection has been expanded from the current rules to make the requirements regarding reporting and record keeping clearer and more specific and to establish consistency between operating records and reports required from investor owned utilities and other public water systems. Paragraph (1) discusses the organization of records and maintenance of copies either being kept on file or stored electronically. Paragraph (2) provides that the operating records be accessible for review during inspections.

Proposed new §290.46(f)(3) specifies the retention schedule for record keeping. New subparagraph (A) requires that for at least two years records must be retained for the amount of chemical used daily; volume of water treated each day; complaints with respect to water quality, low pressure, or outages and results of investigations; dates that dead-end mains were flushed; dates that storage tanks and other facilities were cleaned; and maintenance records for water system equipment and facilities. Under new subparagraph (B), three year retention is required for records of violation and corrective action, records of all public notices issued by the system, records of special filter monitoring performed as part of the requirements of §290.111 resulting from the incorporation of 40 CFR §141.175(b), calibration records, and records of backflow

prevention programs. New subparagraph (C) requires water systems retain certain records for a period of five years after they are no longer in effect for records regarding a variance or exemption granted to the system and concentration-time (CT) studies. New subparagraph (D) requires the results of microbiological analyses to be retained by the system for five years. New subparagraph (E) requires a 10 year retention for copies of Monthly Operating Reports and supporting documentation including turbidity monitoring results of the combined filter effluent; the results of chemical analyses; written reports, summaries, or communications relating to sanitary surveys; copies of the Customer Service Inspection Reports; and other pertinent data.

Proposed new §290.46(f)(4) requires water systems to submit any monthly or quarterly reports that are required by the executive director. Systems must submit their reports to the public drinking water program's address, and the report must be submitted by the tenth day of the month following the period of time that the report covers (as per federal provision under 40 CFR §141.175(a)). The reports must contain all the information required by the drinking water standards and the results of any special monitoring test which have been required. This specifically includes reports resulting from 40 CFR §141.175(b)(1). The reports must be completed in ink, typed, or computer printed and signed by the certified water works operator.

Proposed new §290.46(g)-(i) contain the same requirements as the existing rule. New subsection (g) provides when disinfection of new or repaired facilities is necessary. New subsection (h) requires that a supply of calcium hypochlorite be kept on hand and used when making repairs, setting meters, and disinfecting new mains prior to placing them in service. New subsection (i) address the adoption of

plumbing ordinances, regulations or services agreements by the public water system to insure that neither cross-connections nor other unacceptable plumbing practices are permitted and the use of pipes, fittings, solders, and flux is regulated.

Proposed new §290.46(j) contains customer service inspections requirements. The subsection specifies when an inspection certificate should be completed and who is capable of conducting the customer service inspection certification. New paragraph (2) requires the prompt elimination of potential contaminant hazards as they are discovered. The existence of a health hazard is sufficient grounds for immediate termination of water service. Service can not be restored until the hazard either no longer exist or is isolated. The inspections under this subsection are not acceptable substitutes for and do not apply to sanitary control requirements under §290.102(a)(5). A customer service inspection is limited and the inspector has no authority nor obligation beyond the scope of these regulations. A customer service inspection is not a plumbing inspection as defined and regulated by the Texas State Board of Plumbing Examiners and a customer service inspector is not permitted to perform plumbing inspections.

Proposed new §290.46(k) prohibits interconnection between a public drinking water supply distribution system and any other water supply unless the other water is of a safe, sanitary quality and the interconnection is approved by the executive direction. Proposed new §290.46(l) contains requirements for the flushing of dead-end mains at monthly intervals or more frequently if the disinfectant residuals fall below acceptable levels.

Proposed new §290.46(m) requires that the maintenance and housekeeping practices used by a public water system ensure the reliability and general appearance of the system's facilities and equipment. New paragraph (1) requires the inspection of ground, elevated and pressure tanks annually. Specific determinations must be made for ground and elevated storage tanks and for pressure tanks during the inspection. The instrumentation and controls on tanks must also be inspected to insure they are working properly. New paragraph (2) specifies the inspection requirements for pressure filters. New paragraph (3) requires that the cartridges in cartridge filters be changed as specified by the manufacturer. New paragraph (4) requires that the storage facilities, distribution system lines and related appurtenances be maintained in a watertight condition and free of excessive solids. New paragraph (5) requires that sedimentation basins be maintained free of excessive solids.

Proposed new §290.46(n) contains the specifications for engineering plans, specifications, maps and other pertinent information and requires these documents to be maintained to facilitate the operation and maintenance of the facilities and equipment. New paragraph (1) requires public water systems maintain an accurate and up-to-date set of as-built plans and specifications. This requirement will aid the system in complying with regulations and operating its system and will assist the agency's field inspectors when they perform sanitary surveys of an individual water system. New paragraph (2) requires an accurate and up-to-date map of the distribution system be available so that valves and mains can be easily located during emergencies. New paragraph (3) requires that copies of well construction data, disinfection information, microbiological sample results and a representative chemical analysis report be kept on file for as long as the well remains in service.

Proposed new §290.46(o) contains specifications for filter backwashing at surface water treatment plants. Filters are required to be backwashed when loss of head differential of six to ten feet is experienced between the influent and effluent loss of head gauges. Backwashing of filters is also required when the turbidity level of the filter effluent reaches 1.0 NTU to facilitate compliance with the 40 CFR §141.173(a).

Proposed new §290.46(p) specifies the information regarding water system ownership and management that must be provided to the agency. New paragraph (1) provides for notice when a water system changes ownership. New paragraph (2) requires annual written notice from each certified operator who supervised more than one system to contain the certificate number, address and telephone number, and the name and identification number of each public water system they supervise.

Proposed new §290.46(q) specifies special precautions to be instituted by the system in event of low distribution pressures, water outages, microbiological samples found to contain *E.coli* or fecal coliform organisms, failure to maintain adequate chlorine residuals, elevated finished water turbidity levels, or other conditions which indicate that the potability of the drinking water supply has been compromised. New paragraph (1) contains specifications for the boil water notifications which must be issued to the customers within 24-hours. New paragraph (2) specifies how to determine if a boil water notification must be issued in the event of the loss of distribution system pressure and how long it shall remain in effect. New paragraph (3) specifies that a boil water notification shall be issued if the turbidity of the finished water produced by a surface water treatment plant exceeds 5.0 NTU and specifies how long it shall remain in effect. New paragraph (4) specifies that other protective measure may be required at the discretion of the executive director.

Proposed new §290.46(r) contains provisions for minimum acceptable distribution system operating pressures of 35 pollutant standard index (psi) throughout the distribution system under normal conditions and 20 psi during emergencies such as fire fighting.

Proposed new §290.46(s) contains requirements for testing equipment, and requires this equipment or some other means of monitoring the effectiveness of any chemical treatment process to be used by the system be provided. New paragraph (1) requires flow meters to be calibrated once every 12-months. New paragraph (2) provides for the proper calibration of laboratory equipment. pH meters are to be calibrated once each day and checked with at least one buffer when samples are run. Benchtop turbidimeters are to be calibrated with primary standards once every 90 days and checked with secondary standards every time a series of samples is run. On-line turbidimeters are to be calibrated with primary standards once every 90 days and checked weekly by comparison with a calibrated benchtop turbidimeter. Disinfectant residual analyzers are to be calibrated to enable systems to achieve compliance with the provisions of 40 CFR §141.173(a). Manual disinfectant residual analyzers are to be checked every 30 days using chlorine solutions of known concentrations. Continuous disinfectant residual analyzers are to be calibrated every 90 days using chlorine solutions of known concentrations and are to be checked at least once each month by comparing the results from the on-line analyzer with the results of approved benchtop amperometric, spectrophotometric, or titration method.

Proposed new §290.46(t) provides system ownership signage requirements.

Proposed new §290.46(u) requires abandoned public water supply wells owned by the system to be plugged. Wells that are not in use and are non-deteriorated must be tested every five years or as required by the executive director to prove that they are in a non-deteriorated condition. Test results must be sent to the agency. Deteriorated wells must be plugged or repaired to a non-deteriorated condition.

Proposed new §290.46(v) requires all electrical wiring to be installed in a securely mounted conduit in compliance with a local or national electrical code.

Section 290.47(d) is proposed to be amended to incorporate provisions of §290.46(j)(3)(A)-(E) in Appendix D, Customer Service Inspection Certificate, and to add a space to denote the reason for the inspection and a remarks section. Changes appear on Figure 30 TAC §290.47(d) in the Tables and Graphics section of this issue of the *Texas Register*.

Section 290.47(f) is proposed to be amended to require that a system provide additional information on the test device used and the firm that is conducting the test when completing Appendix F, Backflow Prevention Assembly Test and Maintenance Report, and to add a new area for remarks. Changes appear on Figure 30 TAC §290.47(f) in the Tables and Graphics section of this issue of the *Texas Register*.

Section 290.47(i) is proposed to be added to incorporate Appendix I, Assessment of Hazards and Selection of Assemblies to provide for clarification of the backflow prevention and cross-connection control rules contained in §290.44(h). Changes appear on Figure 30 TAC §290.47(i) in the Tables and Graphics section of this issue of the *Texas Register*.

Subchapter F, Drinking Water Standards Governing Drinking Water Quality and Reporting Requirements for Public Water Systems is proposed to be substantially reorganized in order to incorporate the new federal rule requirements and the existing Texas rule requirements in a logical sequence. Therefore, it is proposed that the current sections be repealed in their entirety, and that those sections be replaced with the new language. The proposed changes to the organization of this subchapter are necessary to contain information regarding each constituent of concern in a single section dealing with that constituent, to standardize the internal organization of sections dealing with these constituents, to add summaries of maximum contaminants and treatment techniques for reference, to clarify public notification requirements, and to clarify procedural requirements in individual sections. In the proposed organizational structure, provisions that are general to all systems and contaminants will be at the beginning of the subchapter. These are proposed to be followed by sections that cover each of the constituents of concern. After the sections giving detailed regulations for each chemical or contaminant, sections are proposed to be added to contain general analytical, monitoring, and notification requirements. All proposed tables and figures can be found in the Tables and Graphics section of this issue of the *Texas Register*.

Proposed new §290.101, Purpose, explains that the purpose of the rule is to assure the safety of public water supplies through control test, laboratory checks, operating records and reports.

Proposed new §290.102, General Applicability, provides that the subchapter applies to all public water systems unless the system meets the provisions found in this section. Variances and exceptions may be granted by the executive director. Requirements for these variances and exceptions for one or more of the

Maximum Contaminant Levels (MCLs) or treatment technique and the application procedures for these are discussed. Modified monitoring may be granted by the executive director.

Proposed new §290.103, Definitions, provides definitions for technical terms contained in this subchapter. New definitions that have been added to the currently applicable definitions include, “comprehensive performance evaluation”, “enhanced softening”, “filter profile”, “filter assessment, haloacetic acids (HAA5)”, “maximum residual disinfectant level (MRDL), minimum acceptable disinfectant level”, “specific ultraviolet absorption at 254 nanometers (SUVA)”, and “total organic carbon (TOC)” as required by 40 CFR §141.2.

Proposed new §290.104; Summary of Maximum Contaminant Levels, Maximum Residual Disinfectant Levels, Treatment Techniques, and Action Levels; summarizes the primary maximum contaminant levels, maximum residual disinfectant levels, treatment techniques and action levels. This section provides a listing of all regulated contaminants in a single location. MCLs for inorganic compounds, organic compounds, volatile organic contaminants, radiological contaminants, microbial contaminants, minimum and maximum residual disinfectant levels, turbidity, disinfection by-product precursors, disinfection by-products, and lead and copper action levels are specified. All proposed figures can be found in the Tables and Graphics section of this issue of the *Texas Register*.

Proposed new §290.105, Summary of Secondary Standards, summarizes the secondary constituents and their maximum levels. Figure 30 TAC §290.105(b) can be found in the Tables and Graphics section of this issue of the *Texas Register*

Proposed new §290.106, contains the requirement for inorganic contaminants (IOCs). The applicability, maximum contaminant levels or treatment technique requirements, monitoring requirements, analytical requirements, reporting requirements, compliance determination, and public notice requirements for inorganic contaminants, and best available technology for treatment are discussed in this section. Requirements for nickel are not proposed because the Environmental Protection Agency no longer requires the regulation of this metal. Figure 30 TAC §290.106(b) can be found in the Tables and Graphics section of this issue of the *Texas Register*

Proposed new §290.107, Organic Contaminants, contains the applicability, maximum contaminant levels or treatment techniques requirements for synthetic organic contaminants and volatile organic contaminants, monitoring requirements, analytical requirements, reporting requirements, compliance determination, public notice requirements for organic contaminants, and best available technology for treatment for these compounds. Requirements for aldicarb, aldicarb sulfoxide, and aldicarb sulfone are not proposed. Figure 30 TAC §290.107(b)(1) and (b)(2) can be found in the Tables and Graphics section of this issue of the *Texas Register*

Proposed new §290.108, Radiological Sampling and Analytical Requirements, contains the applicability, maximum contaminant levels, monitoring requirements, analytical requirements, reporting requirements, compliance determination, and public notification requirements. Figure 30 TAC §290.108(b)(2)(B) can be found in the Tables and Graphics section of this issue of the *Texas Register*

Proposed new §290.109, Microbial Contaminants, contains provisions for the applicability, maximum contaminant levels, monitoring requirements, analytical requirements, reporting requirements, compliance determination, and public notification requirements related to these contaminants. Figure 30 TAC §290.109(c)(2)(A) can be found in the Tables and Graphics section of this issue of the *Texas Register*

Proposed new §290.110, Disinfection Residuals, contains the applicability, minimum and maximum acceptable disinfectant concentrations, monitoring requirements, analytical requirements, reporting requirements, compliance determination, and public notification requirements. The portions of this section that incorporate federal provisions are subsections (b)(3), (b)(5), (c)(2), (f)(5), (f)(7), (f)(8), (g)(1), and (g)(4). Subsection (b)(3) incorporates the maximum residual disinfectant level for the disinfectant chlorine dioxide of 40 CFR §141.65(a). Subsection (b)(5) incorporates the federally imposed maximum residual disinfectant level for chlorine and chloramines of 40 CFR §141.65(a). Subsection (c)(2) incorporates the federally imposed chlorine dioxide monitoring requirements of 40 CFR §141.132(c)(2). Subsection (f)(5) incorporates requirements relating to chlorine dioxide compliance determination in response to 40 CFR §141.133(c)(2). Subsection (f)(7) incorporates requirements relating to chlorine and chloramine compliance determination in response to 40 CFR §141.133(c)(1). Subsection (f)(8) provides that systems shall increase residual disinfectant levels of chlorine or chloramines (but not chlorine dioxide) in the distribution system to a level and for a time necessary to protect public health to address specific microbiological contamination problems caused by circumstances such as distribution line breaks, storm runoff events, source water contamination, or cross-connections as required by 40 CFR §141.130(d). Subsection (g)(1) contains the requirement for public notice in the event of an exceedance of the maximum residual disinfectant residual for chlorine dioxide as required by 40 CFR §141.133(2). Subsection (g)(4) is proposed to be added to

contain the requirement for public notice in the event of an exceedance of the maximum residual disinfectant residual for chlorine and chloramines as required by 40 CFR §141.133(1). Figure 30 TAC §290.110(c)(3)(A) and (f)(6) can be found in the Tables and Graphics section of this issue of the *Texas Register*.

Proposed new §290.111, Turbidity, contains the applicability, treatment technique requirements, monitoring requirements, analytical requirements, reporting requirements, compliance determination, and public notification requirements. The section includes federal requirements of the IESWTR which apply to public water systems that service at least 10,000 people and utilize surface water or groundwater under the direct influence of surface water. The state rule is proposed to apply to all surface water systems and groundwater systems under the direct influence of surface water regardless of the population served.

The commission invites comments on its proposal to apply the IESWTR combined filter effluent turbidity requirements on surface water systems and groundwater systems under the direct influence of surface water for systems that serve less than 10,000 people and alternate regulatory strategies. Should the final rule apply the treatment technique requirements to all systems regardless of size without the proposed provision for compliance flexibility? Should the turbidity treatment technique standards not be required of small systems until required by federal rules?

Proposed §290.111(b)(2)(C) provides that the executive director may extend the proposed compliance date for the turbidity standards for systems serving fewer than 10,000 people but not beyond January 1, 2004. Subsection (b)(3) contains the new treatment technique requirements for individual filter effluent at plants

serving 10,000 people and treating surface water or groundwater under the direct influence of surface water as required under of 40 CFR §141.173(a). Subsection (b)(3)(A) requires that, beginning January 1, 2002, the turbidity from each individual filter at plants serving 10,000 people or more and treating surface water or groundwater under the direct influence of surface water should not exceed 0.5 NTU at four hours after the individual filter is returned to service after backwash or shut down as part of the requirements under 40 CFR §141.175(b)(2). Subsection (b)(3)(B) requires that, beginning January 1, 2002, the turbidity from each individual filter should never exceed 1.0 NTU at plants serving fewer than 10,000 people and treating surface water or groundwater under the direct influence of surface water as part of the requirements of 40 CFR §141.175(b)(1).

Proposed §290.111(c) contains turbidity monitoring requirements as required by 40 CFR §141.175(a). Subsection (c)(3) contains the individual filter turbidity monitoring requirements for individual filters at plants serving 10,000 or more people and treating surface water or groundwater under the direct influence of surface water as required by 40 CFR §141.174. Subsection (c)(4) contains individual filter turbidity monitoring requirements for individual filters at plants serving fewer than 10,000 people and treating surface water or groundwater under the direct influence of surface water. Subsection (c)(5) contains special individual filter turbidity monitoring and analysis requirements for individual filters at plants serving 10,000 or more people and treating surface water or groundwater under the direct influence of surface water as required by 40 CFR §141.175(b). Subsection (c)(5)(A) incorporates the requirement that each time a filter exceeds 1.0 NTU anytime during a filter run, or exceeds 0.5 NTU at four hours after backwash, for two consecutive 15-minute readings, the system must either identify the cause of the exceedance or complete a filter profile on the filter as provided in 40 CFR §141.175(b)(2). Subsection (c)(5)(B) incorporates the

requirement that each time a filter exceeds 1.0 NTU anytime during a filter run, or exceeds 0.5 NTU at four hours after backwash, for two consecutive 15-minute readings, on three separate occasions during any consecutive three month period, the public water system must conduct a filter assessment on the filter as provided in 40 CFR §141.175(b)(1). Subsection (c)(5)(C) incorporates the requirement that each time that any combination of filters exceeds 2.0 NTU on two consecutive 15-minute readings during two consecutive months, the public water system must participate in a third-party Comprehensive Performance Evaluation as provided in 40 CFR §141.175(b)(2)(4).

Proposed §290.111(d)(3) requires that plants serving 10,000 or more people and treating surface water or groundwater under the direct influence of surface water must measure turbidity using continuous on-line turbidimeters on each filter as provided in 40 CFR §141.174(a). Subsection (d)(4) requires that individual filter turbidity at plants serving fewer than 10,000 people and treating surface water or groundwater under the direct influence of surface water must be measured using grab sampling and bench-top turbidimeters.

Proposed §290.111(e) incorporates the reporting requirements for turbidity as provided in 40 CFR §141.175. Subsection (e)(3) requires that plants serving 10,000 or more people and treating surface water or groundwater under the direct influence of surface water which are required to do a filter profile must submit a Filter Profile Report for Individual Filters with their Monthly Operating Report (MOR) as provided in 40 CFR §141.175(b)(1) and (2). Subsection (e)(4) requires that plants serving 10,000 people or more and treating surface water or groundwater under the direct influence of surface water that are required to do a filter assessment must submit a Filter Assessment Report for Individual Filters with their MOR as provided in 40 CFR §141.175(b)(3). Subsection (e)(5) is proposed to be added to require that

plants serving 10,000 people or more and treating surface water or groundwater under the direct influence of surface water that are required to do a Comprehensive Performance Evaluation (CPE), they must submit a Request for Compliance CPE with their MOR as provided in 40 CFR §141.175(b)(4).

Proposed §290.112, Total Organic Carbon (TOC), contains the provisions needed to implement the provisions of the Stage 1 DBP1R pertaining to the monitoring and control of disinfection by-product precursors. Regulations regarding applicability, treatment technique, monitoring requirements, analytical requirements, reporting requirements, compliance determination, and publication notification are specified. Figure 30 TAC §290.112(b)(1) can be found in the Tables and Graphics section of this issue of the *Texas Register*.

Proposed new §290.113, Disinfection By-products (TTHM and HAA5), incorporates the provisions of the Stage 1 DBP1R relating to disinfection by-products (TTHM and HAA5). Regulations regarding applicability, maximum contaminant level, monitoring requirements, analytical requirements, reporting requirements, compliance determination, and publication notification are specified. Figure 30 TAC §290.113(c)(3) and (c)(4) can be found in the Tables and Graphics section of this issue of the *Texas Register*.

Proposed new §290.114, Disinfection By-products Other than TTHM and HAA5, incorporates the provisions of the Stage 1 DBP1R relating to disinfection by-products other than TTHM and HAA5 and contains regulations for chlorite and bromate. Subsection (a), Chlorite, contains provisions for maximum contaminant level, monitoring requirements, analytical requirements, reporting requirements, compliance

determination, and publication notification. Subsection (b), Bromate, contains provisions for maximum contaminant level, monitoring requirements, analytical requirements, reporting requirements, compliance determination, and publication notification.

Proposed new §290.115, Transition Rule for Disinfection By-products, applies to all public water systems serving at least 10,000 people until January 1, 2002 if a system uses surface water or groundwater under the direct influence of surface water and until January 1, 2004 if the system uses only groundwater sources that are not under the direct influence of surface water. After those dates, it is proposed that the systems be required to comply with §290.113, relating to disinfection by-products (TTHM and HAA5). Regulations regarding applicability, maximum contaminant level, and sampling and analytical requirements for total trihalomethanes are specified.

Proposed new §290.117, Regulation of Lead and Copper, contains provisions for general requirements, site selection and material survey, tap sampling, computing 90th percentile lead and copper levels, reduced tap monitoring, monitoring requirements for water quality parameters and source water, public education procedures, corrosion control, lead service line replacement, analytical and sample preservation methods, and reporting and recordkeeping requirements. Figure 30 TAC §290.117(c)(6), (c)(8), and (f)(1)(D) can be found in the Tables and Graphics section of this issue of the *Texas Register*.

Proposed new §290.118, Secondary Constituent Levels, contains provisions for applicability, secondary constituent levels, analytical requirements, reporting requirements, compliance determination, and public

notification. Figure 30 TAC §290.118(b) can be found in the Tables and Graphics section of this issue of the *Texas Register*.

Proposed new §290.119, Analytical Procedures, contains provisions for acceptable laboratories, acceptable analytical methods, and process control tests.

Proposed new §290.121, Monitoring Plans, contains provisions for applicability, monitoring plan requirements, reporting requirements, compliance determination, and public notification.

Proposed new §290.122, Public Notification, incorporates the provisions of the Stage 1 DBP1R relating to monitoring plans. The section contains provisions for public notification requirements for acute violations; public notification requirements for other MCL or treatment technique violations; public notification requirements for other violations, variances, and exemptions; notice to new billing units, and proof of public notification.

FISCAL NOTE

Jeffrey Horvath, with Strategic Planning and Appropriations, has determined that for the first five-year period the proposed amendments are in effect there will be no significant fiscal implications for the TNRCC. However, there will be costs, in some cases significant costs, for certain units of state and local government and investor owned utilities as a result of administration or enforcement of the proposed amendments. The proposed rulemaking implements the federal Stage 1 DBP1R and the federal IESWTR.

The proposed rule will make changes to the state design criteria for some water treatment plant processes and clarify existing regulatory requirements.

The federal IESWTR affects the treatment of surface water or groundwater under the direct influence of surface water used for drinking water, and is aimed at reducing the incidence of *Cryptosporidium* in drinking water. The IESWTR and Stage 1 DBP1R were published in the Federal Register in 1998. The TNRCC has two years to adopt the rules, or by December 16, 2000.

The sections of the proposed rule relating to the Stage 1 DBP1R establishes maximum residual disinfectant levels for certain disinfectants (chlorine, chlorine dioxide, and chloramines), establishes maximum contaminant levels for certain of their by-products (trihalomethanes, haloacetic acids, chlorite, and bromate), requires systems treating surface water or groundwater under the direct influence of surface water to control disinfection by-product precursors (total organic carbon), and requires all systems to produce a monitoring plan describing their sampling protocols. The sections of the proposed rule relating to backflow prevention and backsiphonage do not represent a substantive change to current practice and therefore no fiscal impact is anticipated to systems. The sections of the proposed rule relating to the IESWTR strengthen combined filter effluent turbidity performance standards and establish individual filter turbidity provisions, and disinfection profile and benchmark provisions. The proposed rule will also make changes to state design criteria for some water treatment plant processes and include additional monitoring and reporting requirements.

Those sections of the proposed rule related to the federal Stage 1 DBP1R apply to all community water systems and nontransient, non-community water systems regardless of the number of people they serve. Certain requirements of the rule related to chlorine dioxide also apply to transient non-community water systems. Those sections of the proposed rule related to the federal IESWTR apply to public water systems serving at least 10,000 people and operating surface water treatment plants or treatment plants for groundwater under the direct influence of surface water. It is proposed that one of the provisions of the federal rule also be applied to systems serving less than 10,000 people and treating surface water or groundwater under the direct influence of surface water. Those sections of the proposed rule relating to design criteria apply to public water systems utilizing those unit processes.

The majority of the public water systems covered by the proposed rule are operated by units of local governments, including cities, water districts which are also local governments, and state agencies such as Texas Parks and Wildlife and the Texas Department of Criminal Justice. Some public water systems are operated by quasi-governmental entities such as water supply corporations, river authorities and some water districts. Other public water systems are operated by investor owned utilities, commercial entities, or industrial facilities. This last class of public water systems may include small businesses. The Texas Department of Health will have increased costs due to analyzing additional water samples and performing additional laboratory certifications. It is assumed these costs will be offset by additional fee revenue collected for analyzing additional water samples.

The state of Texas owns a total of eleven small plants that will incur costs to comply with the new standard. All of these systems serve fewer than 10,000 people. The IESWTR will result in annual costs to those

systems treating surface water, or groundwater under the direct influence of surface water, of \$3,040. Three state systems may require minor plant modifications with an estimated per-plant cost of \$25,000 to meet the new standard. One state system may require more extensive plant modifications with an estimated per-plant cost of \$39,781. Two state systems may require an entirely new treatment plant, estimated to cost \$427,800 per plant.

There will be an increase in the number of water samples required, along with changes in design criteria and increased capital costs.

Stage 1 Disinfectants and Disinfection By-products Rule

Public water systems will incur annual recurring costs due to increased monitoring for disinfection by-products under the Stage 1 DBP1R. For a typical surface water system, or groundwater under the direct influence of surface water system, serving a population of 10,000 or more, these annual costs are anticipated to range from \$4,160 to \$6,120. For a typical surface water system, or groundwater under the direct influence of surface water system, serving fewer than 10,000 people, these annual costs are anticipated to range from \$1,400 to \$5,920. For a typical groundwater system serving 10,000 or more people, the annual recurring costs are anticipated to range from \$1,040 to \$1,200. For a typical groundwater system serving fewer than 10,000 people, the annual recurring costs are anticipated to range from \$350 to \$390. The annual increased monitoring costs for typical systems are shown in the following series of tables. Figure 30 TAC §290-Preamble regarding Estimated Annual Sampling Costs for Systems Not Using Chlorine Dioxide or Ozone can be found in the Tables and Graphics section of this issue of the *Texas Register*.

Figure 30 TAC §290 - Preamble

Estimated Annual Sampling Costs for Systems Not Using Chlorine Dioxide or Ozone

Typical Surface Water/Groundwater Under the Direct Influence Systems Serving At

Least 10,000 People

TYPE OF SAMPLE	NUMBER AND COST OF SAMPLES	YEARLY COST (per system)
Trihalomethanes (TTHM)	16 samples/\$50-\$60 per sample	\$800-\$960
Haloacetic Acids (HAA5)	16 samples/\$180-\$210 per sample	\$2,880-\$3,360
Total Organic Carbon (TOC)	24 samples/\$15-\$70 per sample	\$360-\$1,680
Monitoring	\$120	\$120
	Total Estimated Cost Range	\$4,160-\$6,120/Year

Typical Surface Water/Groundwater Under the Direct Influence Systems Serving Between 500

and 9,999 People

TYPE OF SAMPLE	NUMBER AND COST OF SAMPLES	YEARLY COST (per system)
Trihalomethanes (TTHM)	4 samples/\$50-\$60 per sample	\$200-\$240
Haloacetic Acids (HAA5)	4 samples/\$180-\$210 per sample	\$720-\$840
Total Organic Carbon (TOC)	24 samples/\$15-\$70 per sample	\$360-\$1,680
Monitoring	\$120	\$120
	Total Estimated Cost Range	\$1,400-\$2,880

Typical Surface Water/Groundwater Under the Direct Influence Systems Serving Fewer Than 500 People

TYPE OF SAMPLE	NUMBER AND COST OF SAMPLES	YEARLY COST (per system)
Trihalomethanes (TTHM)	1 sample/\$50-\$60 per sample	\$50-\$60
Haloacetic Acids (HAA5)	1 sample/\$180-\$210 per sample	\$180-\$210
Total Organic Carbon (TOC)	24 samples/\$15-\$70 per sample	\$360-\$1,680
Monitoring	\$120	\$120
	Total Estimated Cost Range	\$610-\$2,070

Typical Ground Water Systems Serving At Least 10,000 People

TYPE OF SAMPLE	NUMBER AND COST OF SAMPLES	YEARLY COST (per system)
Trihalomethanes (TTHM)	4 samples/\$50-\$60 per sample	\$200-\$240
Haloacetic Acids (HAA5)	4 samples/\$180-\$210 per sample	\$720-\$840
Monitoring	\$120	\$120
	Total Estimated Cost Range	\$1,040-\$1,200

Typical Ground Water Systems Serving Fewer Than 10,000 People

TYPE OF SAMPLE	NUMBER AND COST OF SAMPLES	YEARLY COST (per system)
Trihalomethanes (TTHM)	1 sample/\$50-\$60 per sample	\$50-\$60
Haloacetic Acids (HAA5)	1 sample/\$180-\$210 per sample	\$180-\$210
Monitoring	\$120	\$120
	Total Estimated Cost Range	\$350-\$390

It is assumed that many systems will be able to reduce monitoring as they will be able to meet established criteria for acceptable levels of trihalomethanes and haloacetic acids. There would be no reduced monitoring for total organic carbon. Approximately 55% of the large ground water systems will be able to reduce monitoring from one sample per quarter to one sample per year. About 22% of the large surface water/groundwater under the influence systems will be able to reduce monitoring from four samples per quarter to one sample per quarter. Of the small groundwater systems, about 26% should be able to reduce monitoring from one per quarter to one per year. About 6.0% of the small surface water/groundwater under the influence systems will be able to reduce monitoring from one sample per quarter to one sample per year. In addition, about 34% of the small groundwater systems will be able to reduce monitoring after the second year of full monitoring from one sample per year to one sample per three years.

Systems using chlorine dioxide must also sample for chlorite. Currently, systems using chlorine dioxide must take one distribution system chlorite sample monthly. Under the new rule, these systems

will be required to take three distribution system samples monthly. There are currently about 50 systems that use chlorine dioxide. Each sample costs between \$40 and \$70 each. The annual increased cost of chlorite monitoring for each system using chlorine dioxide will likely be between \$960 and \$1,680. The aggregate costs to these systems are estimated between \$48,000 and \$84,000 each year. There would be no reduced chlorite monitoring for systems using chlorine dioxide.

Systems using ozone must also sample for bromate. For systems using ozone, one additional sample would be required each month estimated to cost between \$40 and \$70. There are currently about five systems in Texas using ozone. The annual increased cost for each affected system would range from \$480 to \$840. The aggregate costs to these systems are estimated to be between \$2,400 and \$4,200 each year. There would be no reduced bromate monitoring for systems using ozone.

The Stage 1 DBP1R requires that all public water systems that treat surface water or groundwater under the direct influence of surface water and use conventional treatment achieve certain levels of removal of naturally occurring TOC. It is estimated that 67 systems serving at least 10,000 people will incur additional chemical costs as a result of this requirement. For those 67 large systems that are expected to incur some additional annual cost associated with increased chemicals, assuming a 10% increase in chemicals at three cents per 1,000 gallons of water treated, and assuming typical water flow rates, the average annual cost to comply will be approximately \$191,625 starting in 2002. Some systems serving less than 10,000 people will incur chemical costs starting in 2004 in order to comply with this requirement. Approximately 209 plants may incur an increased chemical cost in order to meet the new total organic carbon costs requirements starting in 2004. Assuming a 10% increase in chemicals at

three cents per 1,000 gallons water usage for these 209 plants and assuming typical values for water usage, the average annual cost to comply for these systems is \$3,040 per year.

The Stage 1 DBP1R requires that all public water systems produce and maintain a monitoring plan describing all sampling protocols for the plant and potable water distribution system. Approximately 6,000 water systems will be affected. The one-time administrative cost of this provision will range from \$480 to \$600 for each system. The aggregate costs to these systems are estimated to be between \$2,880,000 and \$3,600,000.

Interim Enhanced Surface Water Treatment Rule

The federal IESWTR applies to public water systems serving at least 10,000 people and treating surface water or groundwater under the direct influence of surface water. The requirements of this rule include strengthened combined filter effluent turbidity requirements, new individual filter turbidity monitoring and reporting requirements, and new disinfection profiling and bench marking requirements.

Of the 95 large systems affected by the federal rule, it is anticipated that none will have any increase in annual operational costs associated with the combined filter effluent rule provision.

It is proposed that the combined filter effluent turbidity provision of the federal rule be applied to systems serving fewer than 10,000 people and treating surface water or groundwater under the direct influence of surface water. This provision would be applied with the exception that, if a small system required capital improvement to meet the new combined filter effluent turbidity limits, the system

would be granted a waiver delaying their compliance date for up to two years, until 2004, thus delaying the impact of estimated capital costs. It is anticipated that 196 of the 299 small systems would be able to meet the new combined filter effluent turbidity limits with no additional cost to the system.

Approximately 50 plants may incur increased chemical costs in order to meet the new turbidity requirements for the years of 2002 and 2003. Starting in 2004, the federal total organic carbon removal requirements will cause systems to incur additional chemical costs; the additional chemical usage will result in compliance with both the combined filter effluent turbidity requirements and the total organic carbon removal requirements. Assuming a 10% increase in chemicals at three cents per 1,000 gallons water usage for these 50 plants and assuming typical values for water usage, the average annual cost to comply for these systems is \$3,040 per year for 2002 and 2003.

Capital Costs

Capital Costs of the Stage 1 Disinfectants and Disinfection By-products Rule

It is also assumed that certain capital costs will be required to meet requirements of the rules. The Stage 1 DBP1R will result in additional capital costs to some systems as a result of modifications to disinfection equipment. It is anticipated that none of the systems treating groundwater only will incur capital costs as a result of the Stage 1 DBP1R. Sixty-six systems treating surface water or groundwater under the direct influence of surface water and serving between 3,300 people and 10,000 people are expected to incur one-time capital costs of approximately \$5,915 per system. Two hundred and thirty three systems serving fewer than 3,300 people are expected to incur one-time capital costs of approximately \$530 per system.

Capital Costs of the Interim Enhanced Surface Water Treatment Rule

The combined filter effluent provisions of the IESWTR will result in additional capital costs to some plants that treat surface water or groundwater under the direct influence of surface water. Of the 12 large systems that are expected to require capital improvement, four will need minor changes and eight will need major changes. The eight large systems needing major changes are estimated to require capital expenditures of approximately \$124,171. Capital costs for the large systems that require minor changes are estimated at \$62,086. Approximately 53 small plants may have the need to incur capital expenses to comply with the new rules. Twenty-one small public water systems may require minor plant modifications estimated to cost \$25,000 to meet the new standard. Twenty-two small public water systems may require more extensive plant modifications with an estimated per-plant cost of \$39,781. Ten small systems were judged to require an entirely new treatment plant beginning in 2004 at an average cost of about \$800,000 per system. Plant costs for large systems were estimated based on EPA estimates provided in the IESWTR. Plant costs for small systems were based on estimates developed by TNRCC staff.

Capital Costs of the New Design Requirements

Each plant treating surface water or groundwater under the direct influence of surface water and serving 10,000 or more people will be required to have an on-line turbidimeter and recorder on each individual filter. In developing the cost estimates, it is assumed that a large plant has, on average, seven filters. Adding the required monitoring equipment is estimated to cost between \$2,000 and \$4,000 for each filter. Therefore, the one-time capital cost for each of these systems would range between \$14,000 and \$28,000.

Certain design requirements of the rules will be updated to support both the IESWTR and the Stage 1 DBP1R and to reflect current acceptable engineering practice. Each surface water system must have a computer and printer for monitoring and other requirements. It is estimated that about 182 systems would be required to make this purchase at an estimated one-time cost for each affected system of \$1,000, for an aggregate cost of \$182,000. Some surface systems would also be required to upgrade their containment areas for chemical spills. There are an estimated 220 systems which would require an upgrade to their containment area. The containment areas are estimated to cost between \$2,000 and \$5,000. Total costs for all systems would therefore range between \$440,000 and \$1.1 million. In addition, about 275 surface systems would be required to install additional water flow meters at their treatment plant. Costs to each system that must install additional water meters are estimated to be between \$500 and \$1,000; the aggregate one-time cost for all systems would be between \$137,500 and \$275,000.

PUBLIC BENEFIT

It has also been determined that for the first five years these sections as proposed are in effect, the public benefit anticipated as a result of enforcement of, and compliance with these amendments, will be to safeguard public health by increasing the level of protection from exposure to *Cryptosporidium* and other pathogens, and by reducing the levels of disinfection by-products and their precursors. The benefits will be to decrease the likelihood of endemic incidences of cryptosporidiosis, giardiasis, and other waterborne disease, decrease the risk of cancer, and avoid the related health costs. The amendments will also allow the state to maintain primary enforcement authority under the Safe Drinking Water Act.

There are approximately 5,570 groundwater systems and 470 surface water or groundwater under the direct influence of surface water systems that are subject to the rule. Of these, about 800 systems are investor owned utilities. Twenty of these investor owned utilities serve a population of 10,000 or more, the rest serve less than 10,000 people. Costs for small investor owned utilities will be the same as costs for small municipalities.

Some small systems may require new plants. These systems may seek less costly alternatives to constructing a new plant, such as connecting into a larger regional water system.

The commission has estimated the average cost to the public for extending the turbidity standard to small systems is 72 cents per household per month. The public will be subject to a range of possible cost effects of this rule. The majority of the small systems, will see little increase in costs. Customers of these systems should not experience any increase in their monthly water bill as a result of this new turbidity standard. For small systems building new plants and passing all of these costs on to their customers, the public can expect increases to their monthly water utility bill. The commission's estimates for costs to the public were based on the assumptions that all costs would be passed on to customers, an average of three persons per household, and that annual costs would be spread evenly over all households. Based on these assumptions and the costs developed, the cost to the public for the extension of the turbidity standard to small systems is expected to range from no increase in the monthly water utility bill to an \$8 per household per month increase. The high end of the range might be estimated too low because an average value for plant cost for small plants was used. The smallest plants would incur costs higher than the average cost. The high end of the range might be estimated too

high because the commission has assumed that all costs for any new plant is due to the rule, when most of any new plant cost must be incurred even without the rule. The average monthly increase for the customers of all small public water systems is expected to be 72 cents per household per month.

SMALL BUSINESS AND MICRO-BUSINESS ANALYSES

Economic effects are anticipated to small business and micro-business as a result of implementing the proposed amendments. Small businesses affected by the proposed rule would be investor owned utilities. The fiscal implications will vary with the size of the business. The fiscal implications for these small businesses are the same as for local governments.

There are approximately 5,570 groundwater systems and 470 surface water or groundwater under the direct influence of surface water systems that are subject to the rule. Of these, about 800 systems are investor owned utilities. Twenty of these investor owned utilities serve a population of 10,000 or more, the rest serve less than 10,000 people. Costs for small investor owned utilities will be the same as costs for small municipalities.

Costs to comply with the sections of the rule relating to regulation of disinfection by-products are anticipated to be annual recurring costs due to increased monitoring for disinfection by-products. For a typical surface water system, or groundwater under the direct influence of surface water system, serving a population over 10,000 these annual costs are anticipated to range from \$4,160 to \$6,120. For a typical surface water system, or groundwater under the direct influence of surface water system, serving less than 10,000, these annual costs are anticipated to range from \$1,400 to \$2,880. For a

typical groundwater system serving over 10,000 people, the annual recurring costs are anticipated to range from \$1,040 to \$1,200. For a typical groundwater system serving under 10,000 people, the annual recurring costs are anticipated to range from \$350 to \$390.

For the regulations relating to the surface water treatment, and treatment of groundwater under the direct influence of surface water, the costs for equipment necessary to comply with the rule for typical systems serving more than 10,000 people are estimated to range from \$14,000 to \$28,000.

Cost estimates for a typical system to comply with changes to the design criteria range from \$3,000 to \$7,000.

For investor owned utilities to implement the IESWTR, if they are a small or micro-business, the following assumptions could be made. For the first year (2002) that small public water systems will have to comply with the proposed new turbidity standard, of the 299 small systems subject to the proposed rule, the commission estimates 196 systems will comply with the new standards with no significant costs. Approximately 50 systems will be able to comply with some problems. The commission estimates the total costs of compliance with the new standard for these systems to be \$152,000. Assuming a 10% increase in chemicals at three cents per 1,000 gallons water usage for 50 plants near compliance and assuming typical values for water usage, the average cost to comply for these systems is \$3,040 (50 systems by \$3,040 equals a total of 152,000). These costs include chemicals only and do not include capital costs. Approximately 53 systems will have major problems complying. The commission anticipates that the executive director will grant compliance waivers under

provision of the new rule to systems that will require capital improvements. Therefore no capital costs are anticipated to be incurred by systems in the year 2002.

All systems serving 10,000 or more people, regardless of the size of the business, will have to comply with the federal standards by January 1, 2002. The proposed rules provide that for systems serving fewer than 10,000 people the executive director may extend the compliance date for the new standards from January 1, 2002 to January 1, 2004. This extended compliance date will allow small systems to seek funding through state and federal loan and grant programs, and construct new facilities that would come on-line by January 1, 2004. Some small systems will have to undertake capital improvements ranging from installation of new filters to complete construction of new water treatment plants in order to comply with the new standard. The commission therefore is estimating that these capital improvements will occur in 2003 so that the improvements will be in place before the January 1, 2004 compliance deadline. Therefore cost estimates starting in 2003 include capital costs.

For the year 2003 and each year thereafter, total costs for all small systems to comply with the new standard is estimated by the commission at \$1,900,000. In addition to the chemical costs estimated as described for the year 2002, capital costs were included. Based on monitoring data, 22 small systems were judged to be capable of complying with the new standard by major operation and maintenance changes or minor plant modifications, such as replacement of filter media and changes to flow control devices. Calculation of costs for these plants to comply is difficult because the true costs depends on plant specific modifications. The commission assumed a typical repair cost of \$25,000 per system and annualized that cost over an assumed six year useful life for a filter.

Ten systems were judged to require an entirely new treatment plant. A new plant was estimated to cost \$768,268. Plant costs were estimated at \$1.20 per gallon per day of plant capacity. Average population served for these systems, typical values for housing occupancy, water consumption and 6.0% cost of capital for 20 years were used to arrive at an estimated average annual cost per plant of \$67,000. With the addition of chemical costs, the average annual cost for these systems with the worst compliance history are estimated at \$70,651. Total costs for the 10 systems would be \$7,719,190.

There are 21 small public water systems that fall in between those systems that will require new plants and those systems that will be able to comply by minor modifications to their plants. The estimated average cost for one of these plants to comply was \$39,781. An average annual cost mid-range between the cost of a new plant and \$25,000 per system was used to estimate the cost for these systems to comply with the proposed rule. Total costs for these 21 systems is estimated to be \$835,401.

Those systems building new plants are, in large part, systems who plants have reached the end of their useful lives or that have not performed routine maintenance to keep their plants in good repair and operation. The need for new plants, in many cases, would still be required to come into compliance with the current drinking water standards. The highest costs are estimated for small systems requiring new plants.

Some of those systems may seek less costly alternatives, such as connecting into a larger regional water system, which may be the only alternative for many.

The commission has estimated the average cost to the public for extending the turbidity standard to small systems is 72 cents per household per month. The public will be subject to a range of possible cost effects of this rule. The majority of the small systems, will see little increase in costs. Customers of these systems should not experience any increase in their monthly water bill as a result of this new turbidity standard. For small systems building new plants and passing all of these costs on to their customers, the public can expect increases to their monthly water utility bill. The commission's estimates for costs to the public were based on the assumptions that all costs would be passed on to customers, an average of three persons per household, and that annual costs would be spread evenly over all households. Based on these assumptions and the costs developed, the cost to the public for the extension of the turbidity standard to small systems is expected to range from no increase in the monthly water utility bill to an \$8 per household per month increase. The high end of the range might be estimated too low because an average value for plant cost for small plants was used. The smallest plants would incur costs higher than the average cost. The high end of the range might be estimated too high because the commission has assumed that all costs for any new plant is due to the rule, when most of any new plant cost must be incurred even without the rule. The average monthly increase for the customers of all small public water systems is expected to be 72 cents per household per month.

DRAFT REGULATORY IMPACT ANALYSIS

The commission has reviewed the proposed rulemaking in light of the regulatory analysis requirements of Texas Government Code, §2001.022, and has determined that, except as described below, the rulemaking is not subject to §2001.0225 because it does not meet any of the four applicability requirements listed in §2001.0225(a). The portions of the rule implementing the federal IESWTR and

the Stage 1 DBP1R are required by federal law (the Safe Drinking Water Act) and the regulations under 40 CFR Parts 9, 141 and 142.

The portion of the rules which would extend a removal requirement for *Cryptosporidium* oocysts to small public water systems, serving under 10,000 people and utilizing surface water or groundwater under the direct influence of surface water, are not covered under the federal rule. This portion of the rules are proposed pursuant to Texas Health and Safety Code, §341.031, 341.0315, and 341.035.

Because this portion of the rule may meet the requirement for a regulatory impact analysis under Texas Government Code, §2001.0225, the commission has prepared a draft regulatory impact analysis.

Those portions of the rule that do not implement the federal rules, do not exceed any express requirement of state law. Those requirements are adopted pursuant to the Texas Health and Safety Code, §341.0315 and 341.035. The proposal does not exceed a requirement of any delegation agreement or contract between the state, the TNRCC, and an agency or representative of the federal government. The rule is not adopted solely under the general powers of the agency; the rule is adopted pursuant to the Texas Health and Safety Code, §341.031, which allows the commission to adopt rules to implement the federal Safe Drinking Water Act, 42 U.S.C. §300f et. seq; the Texas Health and Safety Code, §341.0315, which requires public water supply systems to meet the requirements of commission rules, and the Texas Health and Safety Code, §341.035, which requires the executive director of the commission to approve plans and specifications for public water supplies. The rule is not proposed or adopted on an emergency basis.

The current state rule for all public water systems treating surface water or groundwater under the direct influence of surface water requires removal or inactivation of *Giardia lamblia* cysts and removal or inactivation of virus before the water is supplied to any consumer. Those removal standards will be deemed to be met by systems using conventional media filtration if the system achieves a combined filter effluent turbidity that never exceeds 5.0 NTU, a measure of the presence of suspended material in water, and the combined filter effluent is 0.5 NTU or less in at least 95% of the samples tested each month. The new federal IESWTR would require systems that serve more than 10,000 people, beginning January 1, 2002, to achieve at least a 2-log removal of *Cryptosporidium* oocysts. Under the federal rule, for systems using conventional media filtration, that standard will be deemed to be achieved if the combined filter effluent turbidity never exceeds 1.0 NTU and the combined filter effluent is 0.3 NTU or less in at least 95% of the samples tested each month. The federal rule would also require, beginning January 1, 2002, systems that serve 10,000 people or more to continuously monitor the turbidity of the filtered water of each individual filter with a continuous on-line turbidimeter and a continuous recorder. Under the federal requirements of the IESWTR, systems serving under 10,000 people would continue under the existing turbidity standards. The rule proposed by the commission would strengthen the turbidity standards for small public water systems by requiring, beginning January 1, 2002, small systems treating surface water or groundwater under the direct influence of surface water to also achieve removal of *Cryptosporidium* oocysts. For plants using conventional media filtration, removal would be demonstrated by a combined filter effluent turbidity that never exceeds 1.0 NTU and is 0.3 NTU or less in at least 95% of the samples tested each month. Small systems would be required to measure individual filter turbidity at the effluent of each individual filter and record the turbidity value at least once each day that the plant is in operation. Small systems

would be allowed to monitor individual filter turbidity by measuring the turbidity level in grab samples with a benchtop turbidimeter. The proposed rule also provides that for systems serving fewer than 10,000 people, the executive director could extend the compliance date for the new turbidity treatment levels up to January 1, 2004.

The new turbidity treatment levels for public water systems treating surface water or groundwater under the direct influence of surface water are intended to address the risk of *Cryptosporidium* oocysts in drinking water supplies. Ingestion of active *Cryptosporidium* oocysts is the cause of the disease *Cryptosporidiosis*. Symptoms of *Cryptosporidiosis* include diarrhea, abdominal discomfort, nausea, and vomiting. While otherwise healthy persons may expect a complete recovery from *Cryptosporidiosis*, it can be very serious in immuno-compromised persons. Immuno-compromised persons include infants, pregnant women, the elderly, cancer patients undergoing chemotherapy, HIV/AIDS patients, and people on immunosuppressant drugs. There is no effective therapeutic drug to cure *Cryptosporidiosis*. Therefore, the prevention and avoidance of infection is central to minimizing the risks of outbreaks. Humans and other animals may excrete *Cryptosporidium* oocysts. Transmission of the disease often occurs through ingestion of the oocysts from contaminated water or food, but may also result from the direct or indirect contact with infected persons or animals. *Cryptosporidium* appears to be common in the environment. Runoff from watersheds allows transport of these microorganisms to water bodies used as intake sites for drinking water treatment plants.

The commission has determined that the new turbidity treatment levels are necessary to address the problem. The current turbidity treatment standards are inadequate to assure adequate removal of

Cryptosporidium oocysts. Increasing the current disinfection treatment levels with common disinfectants does not appear to be an effective control strategy because the *Cryptosporidium* oocysts are especially resistant to those common disinfectants. Not extending the new turbidity treatment levels to small systems would continue to expose approximately 660,000 Texas residents to the risk of *Cryptosporidiosis*.

The commission anticipates the benefits from adoption and implementation of the rule will be improved public health by increasing the level of protection from exposure to *Cryptosporidium* and other pathogens and the avoidance of resulting health costs and avoidance of possible deaths due to *Cryptosporidiosis*.

The commission anticipates that most small public water systems that the proposed rule would require to move to the combined filter turbidity treatment standard will be able to meet the new standard with existing personnel and equipment by changes to operating procedures. These changes may increase the operational cost of the plant due to additional chemicals needed. In some cases, the amount of chemicals used to treat the water may be reduced, with a corresponding reduction in chemical costs. A few small public water systems will have to renovate their water treatment plants to comply with the new combined filter turbidity treatment standard. In those cases, the commission anticipates that the executive director will extend the compliance date for the new turbidity treatment levels to January 1, 2004. This extended compliance date is to allow those small systems to seek funding, and construct new facilities that would come on-line by January 1, 2004. Therefore, capital costs associated with

small system compliance are not anticipated to be incurred until 2003 when systems are building new facilities to be in compliance by January 1, 2004.

The estimates of the population served by small water systems was obtained from a database of public drinking water systems maintained by the TNRCC. Exposure of that population to *Cryptosporidium* oocysts is estimated at 8.0%. That estimate was obtained from the EPA database on the Information Collection Rule and is based on the December 1997 information of *Cryptosporidium* detects in Texas. The commission used information from a single month because exposure anytime during the year could result in an incidence of *Cryptosporidiosis*. Use of information from other months was not used because a lack of detection of *Cryptosporidium* in a sample does not indicate an absence of *Cryptosporidium* in the source water due to limitations of the analytical methods used. The 8.0% figure was used because it represents occurrence data specific to Texas. It is much lower than the reported national estimate of 60% *Cryptosporidium* occurrence in source water. The exposure estimate was further reduced by the estimate that only 10% of detected *Cryptosporidium* oocysts would be viable. The probability of occurrence of disease given an exposure to *Cryptosporidium* was estimated at 39% and at that probability, it is estimated there would be one death every five years. The probability of mortality was estimated based on the Milwaukee outbreak data of 50 deaths per 400,000 illnesses. An average cost of medical treatment per illness of \$2,000 was used to estimate health damages avoided. This estimate was developed by the Centers for Disease Control. An average value of \$5.6 million per life saved was used to estimate the benefits of death avoided. This national average was developed by the EPA and is used by the EPA for a number of different rules.

The commission has estimated the costs for state agencies, local governments, the public and the regulated community for the first five years that small public water systems, those serving fewer than 10,000 people, are subject to the new turbidity standard. There are 299 small systems subject to the proposed rule. Most of these systems are owned and operated by local governments. Sixty-one of the small systems are investor owned utilities. The cost for these small investor owned utilities to comply with the proposed new turbidity standard do not differ from other small public water systems. Eleven of the small public water systems subject to the proposed new standard are owned and operated by the state.

For the first year (2002) that small public water systems will have to comply with the proposed new turbidity standard, of the 299 small systems subject to the proposed rule, the commission estimates 196 systems will comply with the new standards with no significant costs. Approximately 50 systems will be able to comply with some problems. The commission estimates the total costs of compliance with the new standard for these systems to be \$152,000. Assuming a 10% increase in chemicals at three cents per 1,000 gallons water usage for 50 plants near compliance and assuming typical values for water usage, the average cost to comply for these systems is \$3,040 ($50 \times \$3,040 = \$152,000$). These costs include chemicals only and do not include capital costs. Approximately 53 systems will have major problems complying. The commission anticipates that the executive director will grant compliance waivers under provision of the new rule to systems that will require capital improvements. Therefore, no capital costs are anticipated to be incurred by systems in the year 2002.

The state of Texas operates three plants in this category. The estimated cost to the state to comply with the proposed new standard in the year 2002 is \$3,600 for chemicals, based upon water usage.

The proposed new standard would require all small public water systems to achieve removal by January 1, 2004. Some small systems will have to undertake capital improvements ranging from installation of new filters to complete construction of new water treatment plants in order to comply with the new standard. The commission therefore is estimating that these capital improvements will occur in 2003 so that the improvements will be in place before the January 1, 2004 compliance deadline. Therefore, cost estimates starting in 2003 include capital costs.

For the year 2003 and each year thereafter, total costs for all systems to comply with the new standard is estimated by the commission at \$1,900,000. In addition to the chemical costs estimated as described for the year 2002, capital costs were included. Based on monitoring data, 22 small systems were judged to be capable of complying with the new standard by major operation and maintenance changes or minor plant modifications, such as replacement of filter media and changes to flow control devices. Calculation of costs for these plants to comply is difficult because the true costs depends on plant specific modifications. The commission assumed a typical repair cost of \$25,000 per system and annualized that cost over an assumed six year useful life for a filter.

Ten systems were judged to require an entirely new treatment plant. A new plant was estimated to cost \$768,268. Plant costs were estimated at \$1.20 per gallon per day of plant capacity. Average population served for these systems, typical values for housing occupancy, water consumption and

6.0% cost of capital for 20 years were used to arrive at an estimated average annual cost per plant of \$67,000. With the addition of chemical costs, the average annual cost for these systems with the worst compliance history are estimated at \$70,651.

There are 21 small public water systems that fall in between those systems that will require new plants and those systems that will be able to comply by minor modifications to their plants. The estimated average cost for one of these plants to comply was \$39,781. An average annual cost mid-range between the cost of a new plant and a \$25,000 per system was used to estimate the cost for these systems to comply with the proposed rule.

The state of Texas owns a total of eleven small plants that will incur capital costs to comply with the new standard. The annual cost to the state to comply is estimated, using the assumptions previously mentioned, at \$154,000. These cost figures have not been adjusted for inflation in future years. These costs overstate the cost to comply with the new turbidity standard because the costs for new water treatment plants are not simply to comply with the new standard. Those systems building new plants are in large part systems who plants have reached the end of their useful lives or that have not performed routine maintenance to keep their plants in good repair and operation. The need for new plants, in many cases, would still be required to come into compliance with the current drinking water standards. The highest costs are estimated for small systems requiring new plants.

Some of those systems may seek less costly alternatives, such as connecting into a larger regional water system, which may be the only alternative for many.

The commission has estimated the average cost to the public for extending the turbidity standard to small systems is 72 cents per household per month. The public will be subject to a range of possible cost effects of this rule. Well operated and maintained public water systems, the majority of the small systems, will see little increase in costs. Customers of these systems should not experience any increase in their monthly water bill as a result of this new turbidity standard. Other systems that incur small increased costs may be in a financial condition where they are able to avoid passing increased costs on to their customers. At the other end of the spectrum, for small systems building new plants and passing all of these costs on to their customers, the public can expect increases to their monthly water utility bill. The commission's estimates for costs to the public were based on the assumptions that all costs would be passed on to customers, an average of three persons per household, and that annual costs would be spread evenly over all households. Based on these assumptions and the costs developed, the cost to the public for the extension of the turbidity standard to small systems is expected to range from no increase in the monthly water utility bill to an \$8 per household per month increase. The high end of the range might be estimated too low because an average value for plant cost for small plants was used. The smallest plants would incur costs higher than the average cost. The high end of the range might be estimated too high because the commission has assumed that all costs for any new plant is due to the rule, when most of any new plant cost must be incurred even without the rule. The average monthly increase for the customers of all small public water systems is expected to be 72 cents per household per month.

The commission believes the proposed rule to physically remove, to the specified level, *Cryptosporidium* oocysts is the most reasonable method to reduce the risk of ingestion of

Cryptosporidium oocysts from drinking water. *Cryptosporidium* oocysts are especially resistant to disinfection practices commonly used at water treatment plants. Simply increasing existing disinfection levels above those most commonly practiced in Texas does not appear to be an effective control strategy for *Cryptosporidium*. The proposed rule would strengthen the effectiveness and reliability of physical removal for particulate matter and microorganisms in general, thereby reducing the likelihood of the disinfection barrier being over challenged. Waterborne disease outbreaks have been associated with a high level of particles passing through a water treatment plant. Hence there is a need to optimize treatment reliability and to enhance physical removal efficiencies to minimize the *Cryptosporidium* levels in finished water. This rule is formulated to address these public health concerns.

The commission based its facts and cost estimates set out in this draft regulatory impact analysis on sources that it believes to be reliable. Much of the information on *Cryptosporidium* is from the preamble to the final federal IESWTR. Additional information was obtained from *Benefits and Costs of the IESWTR*, 91 AWWA Journal 148 (April 1999); *Assessing the Risk Posed by Oocysts in Drinking Water*, 88 AWWA Journal 131 (September 1996). *Giardia and Cryptosporidium in Raw and Finished Water*, 87 AWWA Journal 54 (September 1995). The information on the occurrence of *Cryptosporidiosis* was obtained from the Information Collection Rule database maintained by the EPA. The estimate of the monetary benefits of forgone occurrences of that disease are from the Center for Disease Control and were reported in the preamble to the federal rule. The information on the number of systems and population potentially effected by the proposed rule was obtained from databases that the TNRCC maintains on public drinking water systems in Texas. The judgments of the level of effort necessary for small systems to comply with this rule and associated costs are necessarily estimates.

Those estimates are based on staff's experience, particularly with the Texas Optimization Program that has provided technical assistance to over fifty-five surface water and groundwater systems under the direct influence of surface water in Texas with the aim to lower their system turbidity to levels that will meet or exceed the proposed rule.

The commission considers the proposed turbidity standards for public water systems serving under 10,000 people and utilizing surface water or groundwater under the direct influence of surface water to be a performance-oriented method of compliance. Systems subject to the regulation are granted the regulatory flexibility to select their own method of achieving removal of *Cryptosporidium* oocysts. The tests necessary to demonstrate removal of *Cryptosporidium* oocysts are inaccurate, unreliable and expensive. Therefore, the commission is also proposing a surrogate standard that the commission will accept as demonstrating the appropriate level of removal. For systems using conventional media filtration, the commission will recognize the 0.3 NTU or less in at least 95% of the samples tested each month test and no measurements above 1.0 NTU as a demonstration that the system is meeting the removal standard. For those systems wishing to utilize membrane treatment methods, the executive director will approve site specific treatment technique standards. A more specific surrogate test was not proposed for membrane systems because the technology is changing so rapidly that the commission does not want to exclude from use scientifically acceptable surrogate standards that may be developed shortly. Those systems wishing to utilize other innovative or alternative treatment methods to achieve the removal standards will be allowed to do so using executive director approved alternatives, which is the current practice for innovative or alternative treatment technologies.

There is an opportunity for public comment on this draft regulatory impact analysis. Instructions for how to make public comments are contained in this preamble under the heading "SUBMITTAL OF COMMENTS." Comments on this draft regulatory impact analysis may be included with other comments on the proposed rule. All comments on this draft regulatory impact analysis will be addressed in the publication of the final regulatory analysis as a part of any final rule adoption.

TAKINGS IMPACT ASSESSMENT

The commission has prepared a Takings Impact Assessment for these rules pursuant to Texas Government Code Annotated, §207.043. The following is a summary of that Assessment. The specific purpose of the rule is to implement the federal IESWTR, and the Stage 1 DBP1R, 40 CFR Parts 9, 141, and 142. The rule also will make changes to the state design criteria for some water treatment plant processes and clarify existing regulatory requirements. The rules will substantially advance these specific purposes by adopting provisions that implement the federal rules cited and by adopting amendments to the state design criteria for water treatment plants. Promulgation and enforcement of these rules will not significantly burden private real property because private real property is not subject to these rules. Moreover, the rule proposal is in response to a real and substantial threat to public health and safety, the proposal is designed to significantly advance the health and safety purpose and does not pose a greater burden than is necessary to achieve the health and safety purpose.

COASTAL MANAGEMENT PROGRAM CONSISTENCY REVIEW

The executive director has reviewed the proposed rulemaking and found that the rule is neither identified in Coastal Coordination Act Implementation Rules, 31 TAC §505.11, relating to Actions and Rules Subject to the Texas Coastal Management Program (CMP), nor will it affect any action or authorization identified in Coastal Coordination Act Implementation Rules, 31 TAC §505.11.

Therefore, the proposed rule is not subject to the CMP.

PUBLIC HEARING

A public hearing on this proposal will be held in Austin on May 12, 2000 in Building E, Room 201S at 9:00 a.m. of the commission's central office, located at 12100 North IH-35, Park 35 Technical Center, Austin, Texas 78753. The hearing is structured for the receipt of oral or written comments by interested persons. Individuals may present oral statements when called upon in order of registration. Open discussions will not occur during the hearing; however, an agency staff member will be available to discuss the proposal 30 minutes prior to the hearing and will answer questions before and after the hearing.

Persons with disabilities who have special communication or other accommodation needs who are planning to attend the hearings should contact the agency at (512) 239-4900. Requests should be made as far in advance as possible.

SUBMITTAL OF COMMENTS

Comments may be submitted to Angela Slupe, Office of Environmental Policy, Analysis, and Assessment, MC205, P.O. Box 13087, Austin, Texas 78711-3087, or faxed to (512) 239-4712. All comments should reference Rule Log Number 1999-015-290-WT. Comments must be received by 5:00pm., May 22, 2000. For further information contact Jack Schulze, P. E., Office of Permitting, Water Permits and Water Resource Management, (512) 239-6046.

STATUTORY AUTHORITY

The amended, repeal, and new sections are proposed under the Texas Water Code, §5.103, which provide the commission the authority to adopt and enforce rules necessary to carry out its powers and duties under the laws of this state; under Texas Health and Safety Code, §341.031, which allows the commission to adopt rules to implement the federal Safe Drinking Water Act, 42 U.S.C. §300f et. seq.; under Texas Health and Safety Code, §341.0315, which requires public water supply systems to meet the requirements of commission rules; and under Texas Health and Safety Code, §341.035, which requires the executive director of the commission to approve plans and specifications for public water supplies.

The proposed sections implement Texas Health and Safety Code, §341.031, which allows the commission to adopt rules to implement the federal Safe Drinking Water Act, 42 U.S.C. §300f et.seq.; and Texas Health and Safety Code, §341.035, which requires the executive director to approve plans and specifications for public water supplies. No other codes or statutes are will be affected by this proposal.

SUBCHAPTER D : RULES AND REGULATIONS FOR PUBLIC WATER SYSTEMS

§§290.38-290.41, 290.43-290.45, 290.47

§290.38. Definitions.

The following words and terms, when used in this chapter shall have the following meanings, unless the context clearly indicates otherwise. If a word or term used in this chapter [title] is not contained in the following list, its definition shall be as shown in Title 40 Code of Federal Regulations (CFR) §141.2. Other technical terms used shall have the meanings or definitions listed in the latest edition of "Glossary, Water and Wastewater Control Engineering," prepared by a joint editorial board representing the American Public Health Association, American Society of Civil Engineers, American Water Works Association, and the Water Pollution Control Federation.

(1) **Air gap** - The unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe or faucet conveying water to a tank, fixture, receptor, sink, or other assembly and the flood level rim of the receptacle. The vertical, physical separation must be at least twice the diameter of the water supply outlet, but never less than 1.0 inch. [ABPA - The American Backflow Prevention Association, P.O. Box 1563, Akron, Ohio 44309-1563.]

(2) - (4) (No change.)

(5) **APSE** - The American Society of Sanitary Engineering, P.O. Box 40362, Bay Village, Ohio 44140.]

(5) [(6)] **ASTM standards** - The standards of the American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania 19102.

(6) [(7)] **Auxiliary power** - Either mechanical power or electric generators which can enable the system to provide water under pressure to the distribution system in the event of a local power failure. With the approval of the executive director, dual primary electric service may be considered as auxiliary power in areas which are not subject to large scale power outages due to natural disasters.

(7) [(8)] **AWWA standards** - The latest edition of the applicable standards as approved and published by the American Water Works Association, 6666 West Quincy Avenue, Denver, Colorado 80235.

(8) [(9)] **Community water system** - A public water system which has a potential to serve at least 15 residential service connections on a year-round basis or serves at least 25 residents on a year-round basis.

(9) [(10)] **Connection** - A single family residential unit or each commercial or industrial establishment to which drinking water is supplied from the system. As an example, the number of service connections in an apartment complex would be equal to the number of individual apartment units. When enough data is not available to accurately determine the number of connections to be served or being served, the population served divided by three will be used as the number of connections for calculating system capacity requirements. Conversely, if only the number of connections is known, the connection total multiplied by three will be the number used for population served. For the purposes of this definition, a dwelling or business which is connected to a system that delivers water by a constructed conveyance other than a pipe shall not be considered a connection if:

(A) the water is used exclusively for purposes other than those defined as human consumption (see human consumption definition);

(B) the executive director [commission] determines that alternative water to achieve the equivalent level of public health protection provided by the drinking water standards is provided for residential or similar human consumption, including, but not limited to, drinking and cooking; or

(C) the executive director [commission] determines that the water provided for residential or similar human consumption is centrally treated or is treated at the point of entry by a provider, a pass through entity, or the user to achieve the equivalent level of protection provided by the drinking water standards.

(10) [(11)] **Contamination** - The presence of any foreign substance (organic, inorganic, radiological or biological) in water which tends to degrade its quality so as to constitute a hazard or impair the usefulness of the water.

(11) [(12)] **Cross-connection** - A physical connection between a public water system and either another supply of unknown or questionable quality, any source which may contain contaminating or polluting substances, or any source of water treated to a lesser degree in the treatment process.

(12) [(13)] **Disinfectant** - Any oxidant, including but not limited to chlorine, chlorine dioxide, chloramines, and ozone added to the water in any part of the treatment or distribution process, that is intended to kill or inactivate pathogenic microorganisms.

(13) [(14)] **Disinfection** - A process which inactivates pathogenic organisms in the water by chemical oxidants or equivalent agents.

(14) [(15)] **Drinking water** - All water distributed by any agency or individual, public or private, for the purpose of human consumption or which may be used in the preparation of foods or beverages or for the cleaning of any utensil or article used in the course of preparation or consumption of food or beverages for human beings. The term "Drinking Water" shall also include all water supplied for human consumption or used by any institution catering to the public.

(15) [(16)] **Drinking water standards** - The commission rules covering drinking water standards in Subchapter F [§§290.101 - 290.121] of this chapter [title] (relating to Drinking Water Standards Governing Drinking Water Quality and Reporting Requirements for Public Water Supply Systems).

(16) [(17)] **Elevated storage capacity** - That portion of water which can be stored at least 80 feet above the highest service connection in the pressure plane served by the storage tank.

(17) [(18)] **Emergency power** - Either mechanical power or electric generators which can enable the system to provide water under pressure to the distribution system in the event of a local power failure. With the approval of the executive director, dual primary electric service may be considered as emergency power in areas which are not subject to large scale power outages due to natural disasters.

(18) [(19)] **Ground water under the direct influence of surface water** - Any water beneath the surface of the ground with:

(A) significant occurrence of insects or other macroorganisms, algae, or large-diameter pathogens such as *Giardia lamblia* or *Cryptosporidium*, or

(B) significant and relatively rapid shifts in water characteristics such as turbidity, temperature, conductivity, or pH which closely correlate to climatological or surface water conditions.

(19) [(20)] **Health hazard** - A cross-connection, potential contamination hazard, or other situation involving any substance that can cause death, illness, spread of disease, or has a high probability of causing such effects if introduced into the potable drinking water supply. [Any conditions, devices or practices in the water supply system and/or its operation which create, or may create, a danger to the public health and well-being of the water consumer. An example of a health hazard is a structural defect in the water supply system, whether of location, design, or construction, which may regularly or occasionally prevent satisfactory purification of the water supply or cause it to be contaminated from extraneous sources.]

(20) [(22)] **Human consumption** - Uses by humans in which water can be ingested into or absorbed by the human body. Examples of these uses include, but are not limited to drinking, cooking, brushing teeth, bathing, washing hands, washing dishes, and preparing foods.

(21) [(23)] **Interconnection** - A physical connection between two public water supply systems.

(21) **High health hazard** - A cross-connection, potential cross-connection or other situation involving any substance that could cause death, illness, spread of disease, or has a high probability of causing such effects if introduced into the potable drinking water supply.]

(22) [(24)] **Intruder-resistant fence** - A fence six feet or greater [more] in height, constructed of wood, concrete, masonry, or metal with three strands of barbed wire extending outward from the top of the fence at a 45 degree angle with [and have] the smooth side of the fence on the outside wall. In lieu of the barbed wire, the fence must be eight feet in height. The fence must be in good repair and close enough to surface grade to prevent intruder passage.

(23) **L/d Ratio** - The dimensionless value that is obtained by dividing the length (depth) of a granular media filter bed by the weighted effective diameter of the filter media. The weighted effective diameter of the media is calculated based on the percentage of the total bed depth contributed by each media layer.

(24) [(25)] **Licensed Professional Engineer** - An engineer who maintains a current license through the Texas Board of Professional Engineers in accordance with its requirements for professional practice.

(25) [(26)] **Maximum daily demand** - In the absence of verified historical data, maximum daily demand means 2.4 times the average daily demand of the system.

(26) [(27)] **MCL** - Maximum Contaminant Level.

(27) [(28)] **mg/l** - Milligrams per liter, a measure of concentration, equivalent to and replacing parts per million (ppm) in the case of dilute solutions.

(28) [(29)] **Monthly reports of water works operations** [**Monthly Reports of Water Works Operations**] - The daily record of data relating to the operation of the system facilities compiled in a monthly report.

(29) [(30)] **NFPA standards** - The standards of the National Fire Protection Association, 1 Batterymarch Park, Quincy, Massachusetts, 02269-9101.

(30) [(31)] **NSF** - The National Sanitation Foundation or reference [and refers] to the listings developed by the Foundation, P.O. Box 1468, Ann Arbor, Michigan 48106.

(31) [(32)] **Noncommunity water system** - Any public water system which is not a community system.

(32) **Nonhealth hazard** - A cross-connection, potential contamination hazard, or other situation involving any substance that generally will not be a health hazard, but will constitute a nuisance, or be aesthetically objectionable, if introduced into the public water supply.

(33) - (37) (No change.)

(38) **Potential contamination hazard** - A condition which, by its location, piping or configuration, has a reasonable probability of being used incorrectly, through carelessness, ignorance, or negligence, to create or cause to be created a backflow condition by which contamination can be introduced into the water supply. Examples of potential contamination hazards are: bypass arrangements, jumper connections, removable sections or spools, and swivel or changeover assemblies.

(39) **Public drinking water program** - Agency staff designated by the executive director to administer the Safe Drinking Water Act and state statutes related to the regulation of public drinking water. The public drinking water program may be contacted at: Texas Natural Resource Conservation Commission, Water Permitting and Resource Management Division, MC 155, P.O. Box 13087, Austin, Texas 78711-3087

(40) [(38)] **Public health engineering practices** - Requirements in these sections or guidelines promulgated by the executive director. [commission]

(41) [(39)] **Public water system** - A system for the provision to the public of water for human consumption through pipes or other constructed conveyances, which includes all uses described under the definition for drinking water. Such a system must have at least 15 service connections or serve at least 25 individuals at least 60 days out of the year. This term includes: any collection, treatment, storage, and distribution facilities under the control of the operator of such system and used

primarily in connection with such system; and any collection or pretreatment storage facilities not under such control which are used primarily in connection with such system. Two or more systems with each having a potential to serve less than 15 connections or less than 25 individuals but owned by the same person, firm, or corporation and located on adjacent land will be considered a public water system when the total potential service connections in the combined systems are 15 or greater or if the total number of individuals served by the combined systems total 25 or greater [more] at least 60 days out of the year. Without excluding other meanings of the terms "individual" or "served," an individual shall be deemed to be served by a water system if he lives in, uses as his place of employment, or works in a place to which drinking water is supplied from the system.

(42) [(40)] **Sanitary control easement** - A legally binding document securing all land, within 150 feet of a public water supply well location, from pollution hazards. This document must fully describe the location of the well and surrounding lands and must be filed in the county records to be legally binding.

(43) [(41)] **Sanitary survey** - An onsite review of the water source, facilities, equipment, operation and maintenance of a public water system, for the purpose of evaluating the adequacy for producing and distributing safe drinking water.

(44) [(42)] **Service pump** - Any pump that takes treated water from storage and discharges to the distribution system.

(45) [(43)] **Transfer pump** - Any pump which conveys water from one point to another within the treatment process or which conveys water to storage facilities prior to distribution.

(46) [(44)] **Transient noncommunity water system** - A public water system that is not a community water system and serves at least 25 persons at least 60 days out of the year, yet by its characteristics, does not meet the definition of a nontransient noncommunity water system.

[(46)] **Water Supply Protection Specialist** - Any person who holds a license endorsement issued by the Texas State Board of Plumbing Examiners to engage in the inspection, in connection with health and safety laws and ordinances, of the plumbing work or installation of a public water system distribution facility or of customer owned plumbing connected to that system's water distribution lines.]

(47) [(45)] **Uniform Fire Code** - The standards of the International Conference of Building Officials, 5360 Workman Mill Road, Whittier, California, 90601-2298.

§290.39. General Provisions.

(a) - (b) (No change.)

(c) Required actions and approvals prior to construction. A person may not begin construction of a public drinking water supply system unless the executive director determines the following requirements have been satisfied and approves construction of the proposed system.

(1) (No change.)

(2) A person may submit a request for an exception to the requirements of paragraph (1) of this subsection if the application fees will create a hardship on the person. The request must be accompanied by evidence documenting the financial hardship. [If a person is not required to complete the steps in paragraph (1) of this subsection or if a person completes the steps in paragraph (1) of this subsection, and is denied service or determines that the existing provider's cost estimate is not feasible for the development to be served, the person shall submit to the executive director:]

[(A) plans and specifications for the system; and]

[(B) a business plan for the system.]

(3) A person who is not required to complete the steps in paragraph (1) of this subsection, or who completes the steps in paragraph (1) of this subsection and is denied service or determines that the existing provider's cost estimate is not feasible for the development to be served, shall submit to the executive director:

(A) plans and specifications for the system; and

(B) a business plan for the system.

(d) (No change.)

(e) Submission of planning material. In general, the planning material submitted shall conform to the following requirements.

(1) - (2) (No change.)

(3) Specifications for construction of facilities shall accompany all plans. If a process or equipment which may be subject to probationary acceptance because of limited application or use in Texas is proposed, the executive director [commission, at its discretion,] may give limited approval. In such a case, the owner must be given a bonded guarantee from the manufacturer covering acceptable performance. The specifications shall include a statement that such a bonded guarantee will be provided to the owner and shall also specify those conditions under which the bond will be forfeited. Such a bond will be transferrable. The bond shall be retained by the owner and transferred when a change in ownership occurs.

(4) Copies of each fully executed sanitary control easement shall be provided to the executive director [commission] prior to placing the well into service. Each original easement

document must be recorded in the deed records at the county courthouse. See §290.47(c) of this title (relating to Appendices) for a suggested form.

(5) Construction features and siting of all facilities for new water systems and for major improvements to existing water systems must be in conformity with applicable commission rules.

(f) - (i) (No change.)

(j) Changes in existing systems or supplies. Public water systems shall notify the executive director prior to making any significant change or addition to the system's production, treatment, storage, or distribution facilities. Public water systems shall submit plans and specifications for the proposed changes upon request.

(1) Changes or additions to existing systems which result in an increase in production, treatment, or storage capacity shall require written notice to the executive director.

(2) Systems that use surface water sources or groundwater sources that are under the direct influence of surface water shall notify the executive director of any proposed change to the disinfection process used at the treatment plant including changes involving the disinfectants used, the disinfectant application points, or the disinfectant monitoring points.

(3) Changes to the type of disinfectant used to maintain a disinfectant residual in the distribution system shall require written notice to the executive director.

(4) Changes or additions in existing distribution systems shall require written notification to the executive director when the change or addition is greater than 10% of the existing distribution capacity or 250 connections, whichever is smaller, or results in the water system's inability to comply with any of the applicable capacity requirements of §290.45 of this title (relating to Minimum Water System Capacity Requirements).

(5) The executive director shall determine whether engineering plans and specifications will be required after reviewing the initial notification regarding the nature and extent [initial notification of the extent] of the modifications.

(A) Upon the request of the executive director, the water system shall submit plants and specifications in accordance with the requirements of subsection (d) of this section. [The owner shall submit plans and specifications as determined by the executive director in accordance with subsection (c) of this section.]

(B) The executive director [commission] will not require planning material on distribution line improvements when the entity has its own internal engineering staff or is required, by local ordinance, to submit the material to another political entity for review and approval. The review staff must be separate and apart from the engineering staff or firm charged with the design of the

distribution extension under review. The planning material must be reviewed and certified to be in compliance with §290.44 of this title (relating to Water Distribution) by a [licensed] registered professional engineer in the employ of the review entity. The effect of the distribution system improvements on compliance with §290.45 of this title (relating to Minimum Water System Capacity Requirements) must be evaluated. Should the proposed improvements result in an exceedance of the capacity requirements, written notice of the extent of the proposed improvements must be submitted to the executive director.

(k) - (n) (No change.)

§290.41. Water Sources.

(a) - (b) (No change.)

(c) Groundwater [Ground water] sources and development.

(1) - (2) (No change.)

(3) Special attention must be given to the construction, disinfection, protection, and testing of a well to be used as a public water supply source.

(A) - (B) (No change.)

(C) The space between the casing and drill hole shall be sealed by using enough cement under pressure to completely fill and seal the annular space between the casing and the drill hole. The well casing shall be cemented in this manner from the top of the shallowest formation to be developed to the earth's surface. The driller will utilize a [the following] pressure cementation method [methods] in accordance with the AWWA Standard for Water Wells (A100-97) [(A100-90)], Appendix C: Section C.3 (Positive Displacement – Exterior Method); Section C.4 (Interior Method – Without Plug); Section C.5 (Positive Placement, Interior Method, Drillable Plug); Section C.6 (Placement Through Float Shoe Attached to Bottom of Casing). [B: Section B.3 (Positive displacement - exterior method); Section B.4 (Interior method - without a plug); Section B.5 (Positive placement - interior method - drillable plug); or Section B.6 (Placement through float shoe attached to the bottom of the casing).] Cementation methods other than those listed in this subparagraph must be approved by the executive director prior to the construction of the well. A cement bonding log, as well as any other documentation deemed necessary, may be required by the executive director to assure complete sealing of the annular space.

(D) - (G) (No change.)

(H) Below ground-level pump rooms and pump pits will not be allowed in connection with water supply installations. [The pump room floor shall be at least two feet above the

highest known watermark or 100-year flood elevation, if available, or adequately protected from possible flood damage by levees.]

(I) - (J) (No change.)

(K) Wellheads and pump bases shall be sealed by a gasket or sealing compound and properly vented to prevent the possibility of contaminating the well water. A well casing vent shall be provided with an opening that is covered with 16-mesh or finer corrosion-resistant screen, facing downward, elevated and located so as to minimize the drawing of contaminants into the well.

Wellheads and well vents shall be at least two feet above the highest known watermark or 100-year flood elevation, if available, or adequately protected from possible flood damage by levees.

(L) - (Q) (No change.)

(4) (No change.)

(d) (No change.)

(e) Surface water sources and development.

(1) To determine the degree of pollution from all sources within the watershed, an evaluation shall be made of the proposed surface water impoundment or flowing supply in the area of diversion and its tributary streams.

(A) - (E) (No change.)

(F) Before approval of a new surface water source, the system shall provide the executive director with information regarding specific water quality parameters of the potential source water. These parameters are total coliform, fecal coliform, turbidity, alkalinity, hardness, bromide, total organic carbon, temperature, color, taste and odor, regulated volatile organic compounds, regulated synthetic organic compounds, regulated inorganic compounds, and possible sources of contamination. If data on the incidence of *Giardia* cysts and *Cryptosporidium* oocysts has been collected, the information shall be provided to the executive director. This data shall be provided to the executive director as part of the approval process for a new surface water source.

(2) - (3) (No change.)

SUBCHAPTER D : RULES AND REGULATIONS FOR PUBLIC WATER SYSTEMS

§290.42, §290.46

STATUTORY AUTHORITY

The repealed sections are proposed under the Texas Water Code, §5.103, which provide the commission the authority to adopt and enforce rules necessary to carry out its powers and duties under the laws of this state; and under Texas Health and Safety Code §341.031, which allows the commission to adopt rules to implement the federal Safe Drinking Water Act, 42 U.S.C. §300f et. seq.

The proposed sections implement Texas Health and Safety Code, §341.031, which allows the commission to adopt rules to implement the federal Safe Drinking Water Act, 42 U.S.C. §300f et.seq.; and Texas Health and Safety Code, §341.035, which requires the executive director to approve plans and specifications for public water supplies. No other codes or statutes are will be affected by this proposal.

§290.42. Water Treatment.

§290.46. Minimum Acceptable Operating Practices for Public Drinking Water Systems.

SUBCHAPTER D : RULES AND REGULATIONS FOR PUBLIC WATER SYSTEMS

§290.42, §290.46

STATUTORY AUTHORITY

The new sections are proposed under the Texas Water Code, §5.103, which provide the commission the authority to adopt and enforce rules necessary to carry out its powers and duties under the laws of this state; under Texas Health and Safety Code, §341.031, which allows the commission to adopt rules to implement the federal Safe Drinking Water Act, 42 U.S.C. §300f et. seq.; under Texas Health and Safety Code, §341.0315, which requires public water supply systems to meet the requirements of commission rules, and under Texas Health and Safety Code, §341.035, which requires the executive director of the commission to approve plans and specifications for public water supplies.

The proposed sections implement Texas Health and Safety Code, §341.031, which allows the commission to adopt rules to implement the federal Safe Drinking Water Act, 42 U.S.C. §300f et.seq.; and Texas Health and Safety Code, §341.035, which requires the executive director to approve plans and specifications for public water supplies. No other codes or statutes are will be affected by this proposal.

§290.42. Water Treatment.

(a) Capacity. Based on current acceptable design standards, the total capacity of the public water system's production and treatment facilities must always be greater than its anticipated maximum daily demand.

(b) Groundwaters.

(1) Disinfection facilities shall be provided for all groundwater supplies for the purpose of microbiological control and distribution protection and shall be in conformity with applicable disinfection requirements in subsection (e) of this section.

(2) Treatment facilities shall be provided for ground water if the water does not meet the drinking water standards. The facilities provided shall be in conformance with established and proven methods.

(A) Filters provided for turbidity and microbiological quality control shall be preceded by coagulant addition and shall conform to the requirements of subsection (d)(10) of this section. Filtration rates for iron and manganese removal, regardless of the media or type of filter, shall be based on a maximum rate of five gallons per square foot per minute.

(B) The removal of iron and manganese may not be required if it can be demonstrated that these metals can be sequestered so that the discoloration problems they cause do not exist in the distribution system.

(C) All processes involving exposure of the water to atmospheric contamination shall provide for subsequent disinfection of the water ahead of ground storage tanks. Likewise, all exposure of water to atmospheric contamination shall be accomplished in a manner such that insects, birds, and other foreign materials will be excluded from the water. Aerators and all other such openings shall be screened with 16-mesh or finer corrosion resistant screen.

(3) Any proposed change in the extent of water treatment required will be determined on the basis of geological data, well construction features, nearby sources of contamination, and on qualitative and quantitative microbiological and chemical analyses.

(4) Appropriate laboratory facilities shall be provided for controls as well as to check the effectiveness of disinfection or any other treatment processes employed.

(c) Springs and other water sources.

(1) Water obtained from springs, infiltration galleries, wells in fissured areas, wells in carbonate rock formations, or wells that do not penetrate an impermeable strata or any other source subject to surface or near surface contamination of recent origin shall be evaluated for the provision of treatment facilities. Minimum treatment shall consist of coagulation with direct filtration and adequate disinfection. In all cases, the treatment process shall be designed to achieve at least a 3-log removal or inactivation of Giardia cysts and a 4-log removal or inactivation of viruses before the water is supplied to any consumer. Effective January 1, 2002, the treatment process shall also be designed to provide a

2-log removal of *Cryptosporidium* oocysts. Treatment facilities constructed after October 1,2000 shall be designed to achieve at least a 2-log removal of *Cryptosporidium* oocysts. The executive director may require additional levels of treatment in cases of poor source water quality.

(A) Filters provided for turbidity and microbiological quality control shall conform to the requirements of subsection (d)(11) of this section.

(B) All processes involving exposure of the water to atmospheric contamination shall provide for subsequent disinfection of the water ahead of ground storage tanks. Likewise, all exposure of water to atmospheric contamination shall be accomplished in a manner such that insects, birds, and other foreign materials will be excluded from the water. Aerators and all other such openings shall be screened with 16-mesh or finer corrosion resistant screen.

(2) Any proposed change in the extent of water treatment required will be determined on the basis of geological data, well construction features, nearby sources of contamination, and qualitative and quantitative microbiological and chemical analyses.

(3) Appropriate laboratory facilities shall be provided for controls as well as for checking the effectiveness of disinfection or any other treatment processes employed.

(d) Surface water.

(1) All water secured from surface sources shall be given complete treatment at a plant which provides facilities for pretreatment disinfection, taste and odor control, continuous coagulation, sedimentation, filtration, covered clearwell storage and terminal disinfection of the water with chlorine or suitable chlorine compounds. In all cases, the treatment process shall be designed to achieve at least a 3-log removal or inactivation of Giardia cysts and a 4-log removal or inactivation of viruses before the water is supplied to any consumer. Effective January 1, 2002, the treatment process shall also be designed to achieve at least a 2-log removal of *Cryptosporidium* oocysts. Treatment facilities constructed after October 1, 2000 shall be designed to achieve at least a 2-log removal of *Cryptosporidium* oocysts. The executive director may require additional levels of treatment in cases of poor source water quality.

(2) No cross-connection or interconnection shall be permitted to exist in a filtration plant between a conduit carrying filtered or post-chlorinated water and another conduit carrying raw water or water in any prior stage of treatment.

(3) All plant piping shall be constructed so as to be thoroughly tight against leakage.

Return of the decanted water or sludge to the raw water shall be adequately controlled so that there will be a minimum of interference with the treatment process. Any discharge of wastewater shall be in accordance with the appropriate statutes and regulations.

(4) Reservoirs for pretreatment or selective quality control shall be provided where complete treatment facilities fail to operate satisfactorily at times of maximum turbidities or other abnormal raw water quality conditions exist. Recreational activities at such reservoirs shall be prohibited.

(5) Flow measuring devices shall be provided to measure the raw water supplied to the plant, the recycled decant water, the treated water used to backwash the filters, and the treated water discharged from the plant. Additional metering devices shall be provided as appropriate to monitor the flow rate through specific treatment processes. Metering devices shall be located to facilitate use and to assist in the determination of chemical dosages, the accumulation of water production data, and the operation of plant facilities.

(6) Chemical storage facilities shall be designed to ensure a reliable supply of chemicals to the feeders, minimize the possibility and impact of accidental spills, and facilitate good housekeeping.

(A) Bulk storage facilities at the plant shall be adequate to store at least 15 days supply of chemicals at design capacity. However, the executive director may require a larger stock of chemicals based on local resupply ability.

(B) Day tanks shall be provided to minimize the possibility of severely overfeeding liquid chemicals. Day tanks will not be required if adequate process control instrumentation and procedures are employed to prevent chemical overfeed incidents.

(C) All chemical bulk storage facilities and day tanks shall be clearly labeled to indicate each tank's contents.

(D) Dry chemicals shall be stored off the floor in a dry room that is located above ground and protected against flooding or wetting from floors, walls, and ceilings.

(E) Bulk storage facilities and day tanks must be designed to minimize the possibility of leaks and spills.

(i) The materials used to construct bulk storage and day tanks must be compatible with the chemicals being stored and resistant to corrosion.

(ii) Adequate containment facilities shall be provided for all liquid chemical storage tanks.

(I) Containment facilities must be large enough to hold the maximum amount of chemicals that can be stored in the tanks with a minimum freeboard of six inches.

(II) The materials used to construct containment structures must be compatible with the chemicals stored in the tanks.

(III) Incompatible chemicals shall not be stored within the same containment structure.

(F) Chemical transfer pumps and control systems must be designed to minimize the possibility of leaks and spills.

(G) Piping, pumps, and valves used for chemical storage and transfer must be compatible with the chemical being fed.

(7) Chemical feed and metering facilities shall be designed so that chemicals shall be applied in a manner which will maximize reliability, facilitate maintenance, and ensure optimal finished water quality.

(A) Each chemical feeder shall have a standby or reserve unit. Common standby feeders are permissible, but, generally, more than one standby feeder must be provided due to the incompatibility of chemicals or the state in which they are being fed (solid, liquid or gas).

(B) Chemical feed equipment shall be sized to provide proper dosage under all operating conditions.

(i) Devices designed for determining the chemical feed rate shall be provided for all chemical feeders.

(ii) The capacity of the chemical feeders shall be such that accurate control of the dosage can be achieved at the full range of feed rates expected to occur at the facility.

(iii) Chemical feeders shall be provided with tanks for chemical dissolution when applicable.

(C) Chemical feeders, valves, and piping must be compatible with the chemical being fed.

(D) Chemical feed systems shall be designed to minimize the possibility of leaks and spills and provide protection against backpressure and siphoning.

(E) If enclosed feed lines are used, they shall be designed and installed so as to prevent clogging and be easily maintained.

(F) Dry chemical feeders shall be located in a separate room that is provided with facilities for dust control.

(G) Coagulant feed systems shall be designed so that coagulants are applied to the water prior to or within the mixing basins or chambers so as to permit their complete mixing with the water.

(i) Coagulant feed points shall be located downstream of the raw water sampling tap.

(ii) Coagulants shall be applied continuously during treatment plant operation.

(H) Chlorine feed units, ammonia feed units, and storage facilities shall be separated by solid, sealed walls.

(I) Chemical application points shall be provided to achieve acceptable finished water quality, adequate taste and odor control, corrosion control and disinfection.

(8) Flash mixing equipment shall be provided.

(A) Plants with a design capacity greater than 3.0 million gallons per day must provide at least one hydraulic mixing unit or at least two sets of mechanical flash mixing equipment designed to operate in parallel. Public water systems with other surface water treatment plants, interconnections with other systems, or wells that can meet the system's average daily demand are exempt from the requirement for redundant mechanical flash mixing equipment.

(B) Flash mixing equipment shall have sufficient flexibility to ensure adequate dispersion and mixing of coagulants and other chemicals under varying raw water characteristics and raw water flow rates.

(9) Flocculation equipment shall be provided.

(A) Plants with a design capacity greater than 3.0 million gallons per day must provide at least two sets of flocculation equipment which are designed to operate in parallel. Public water systems with other surface water treatment plants, interconnections with other systems, or wells that can meet the system's average daily demand are exempt from the requirement for redundant flocculation equipment.

(B) Flocculation facilities shall be designed to provide adequate time and mixing intensity to produce a settleable floc under varying raw water characteristics and raw water flow rates.

(i) Flocculation facilities for straight-flow and up-flow sedimentation basins shall provide a minimum theoretical detention time of at least 20 minutes when operated at their design capacity. Flocculation facilities constructed prior to October 1, 2000 are exempt from this requirement if the settled water turbidity of each sedimentation basin remains below 10.0 NTU and the treatment plant meets with turbidity requirements of §290.111 of this title (relating to Turbidity).

(ii) The mixing intensity in multiple-stage flocculators shall decrease as the coagulated water passes from one stage to the next.

(C) Coagulated water or water from flocculators shall flow to sedimentation basins in such a manner as to prevent destruction of floc. Piping, flumes and troughs shall be designed to provide a flow velocity of 0.5 to 1.5 feet per second. Gates, ports and valves shall be designed at a maximum flow velocity of 4.0 feet per second in the transfer of water between units.

(10) Clarification facilities shall be provided.

(A) Plants with a design capacity greater than 3.0 million gallons per day must provide at least two sedimentation basins or clarification units which are designed to operate in parallel. Public water systems with other surface water treatment plants, interconnections with other systems, or wells that can meet the system's average daily demand are exempt from the requirement for redundant sedimentation basins or clarification units.

(B) The inlet and outlet of clarification facilities shall be designed to prevent short-circuiting of flow or the destruction of floc.

(C) Clarification facilities shall be designed to remove flocculated particles effectively.

(i) When operated at their design capacity, basins for straight-flow or up-flow sedimentation of coagulated waters shall provide either a theoretical detention time of at least six hours in the flocculation and sedimentation chambers or a maximum surface overflow rate of 0.6 gallons per minute per square foot of surface area in the sedimentation chamber.

(ii) When operated at their design capacity, basins for straight-flow or up-flow sedimentation of softened waters shall provide either a theoretical detention time of at least 4.5 hours in the flocculation and sedimentation chambers or a maximum surface overflow rate of 1.0 gallon per minute per square foot of surface area in the sedimentation chamber.

(iii) When operated at their design capacity, sludge-blanket and solids-recirculation clarifiers shall provide either a theoretical detention time of at least two hours in the flocculation and sedimentation chambers or a maximum surface overflow rate of 1.0 gallons per minute per square foot in the settling chamber.

(iv) A side wall water depth of at least 12 feet shall be provided in clarification basins that are not equipped with mechanical sludge removal facilities.

(v) The effective length of a straight-flow sedimentation basin shall be at least twice its effective width.

(D) Clarification facilities shall be designed to prevent the accumulation of settled solids.

(i) At treatment plants with a single clarification basin, facilities shall be provided to drain the basin within six hours. In the event that the plant site topography is such that gravity draining cannot be realized, a permanently installed electric powered pump station shall be provided to dewater the basin. Public water systems with other potable water sources that can meet the system's average daily demand are exempt from this requirement.

(ii) Facilities for sludge removal shall be provided by mechanical means or by hopper-bottomed basins with valves capable of complete draining of the units.

(11) Gravity or pressure type filters shall be provided.

(A) The use of pressure filters shall be limited to installations with a treatment capacity of less than 0.50 million gallons per day.

(B) The design capacity of filtration facilities shall be based on the filter capacity with the largest filter out of service. Public water systems with other surface water treatment plants, interconnections with other systems, or wells that can meet the system's average daily demand are exempt from this requirement.

(C) The depth and condition of the media and support material shall be sufficient to provide effective filtration.

(i) The filtering material shall conform to AWWA standards and be free from clay, dirt, organic matter and other impurities.

(ii) The grain size distribution of the filtering material shall be as prescribed by AWWA standards.

(iii) The depth of filter sand, anthracite, granular activated carbon, or other filtering materials shall be 24 inches or greater and provide an L/d ratio of at least 1,000.

(I) Rapid sand filters typically contain a minimum of eight inches of fine sand with an effective size of 0.35 to 0.45 mm, eight inches of medium sand with an effective size of 0.45 to 0.55 mm, and eight inches of coarse sand with an effective size of 0.55 to 0.65 mm. The uniformity coefficient of each size range should not exceed 1.6.

(II) High-rate dual media filters typically contain a minimum of twelve inches of sand with an effective size of 0.45 to 0.55 mm and twenty-four inches of anthracite with an effective size of 0.9 to 1.1 mm. The uniformity coefficient of each material should not exceed 1.6.

(III) High-rate multi-media filters typically contain a minimum of three inches of garnet media with an effective size of 0.2 to 0.3 mm, nine inches of sand with an effective size of 0.5 to 0.6 mm, and twenty-four inches of anthracite with an effective size of 0.9 to 1.1 mm. The uniformity coefficient of each size range should not exceed 1.6.

(IV) High-rate mono-media anthracite or granular activated carbon filters typically contain a minimum of 48 inches of anthracite or granular activated carbon with an effective size of 1.0 to 1.2 mm. The uniformity coefficient of each size range should not exceed 1.6.

(D) Under the filtering material, at least 12 inches of support gravel shall be placed varying in size from 1/16 inch to 2.5 inches. The gravel may be arranged in three to five layers such that each layer contains material about twice the size of the material above it. Other support material may be approved on an individual basis.

(E) The filter shall be provided with facilities to regulate the filtration rate.

(i) The design of gravity rapid sand filters shall be based on a maximum design filtration rate of 2.0 gallons per square foot per minute. At the beginning of filter runs for declining rate filters, a maximum filtration rate of 3.0 gallons per square foot per minute is allowed.

(ii) Where high-rate gravity filters are used, a maximum design filtration rate of 5.0 gallons per square foot per minute must be used. At the beginning of filter runs for declining rate filters, a maximum filtration rate of 6.5 gallons per square foot per minute is allowed.

(iii) The design of pressure filters shall be based on a maximum filtration rate of 2.0 gallons per square foot per minute.

(iv) With the exception of declining rate filters, each filter unit shall be equipped with a manually adjustable rate-of-flow controller with rate-of-flow indication or flow control valves with indicators.

(v) Each declining rate filter shall be equipped with a rate-of-flow limiting device or an adjustable flow control valve with a rate-of-flow indicator.

(vi) The effluent line of each filter installed after January 1, 1996, must be equipped with a slow opening valve or another means of automatically preventing flow surges when the filter begins operation.

(F) The filters shall be provided with facilities to monitor the performance of the filter. Monitoring devices shall be designed to provide the ability to measure and record turbidity as required by §290.111 of this title (relating to Turbidity).

(i) Each filter shall be equipped with a sampling tap so that the effluent turbidity of the filter can be individually monitored.

(ii) Each filter with a capacity of 1.0 million gallons per day or more shall be equipped with an on-line turbidimeter.

(iii) Each filter operated by a public water system that serves at least 10,000 people shall be equipped with an on-line turbidimeter and recorder which will allow the operator to determine the turbidity at 15-minute intervals.

(iv) Each filter installed after October 1, 2000 shall be equipped with an on-line turbidimeter and recorder which will allow the operator to determine the turbidity at 15-minute intervals.

(v) Each filter unit shall be equipped with a device to indicate loss of head through the filter. In lieu of loss-of-head indicators, declining rate filter units may be equipped with rate-of-flow indicators.

(G) Filters shall be designed to ensure adequate cleaning during the backwash cycle.

(i) Only filtered water shall be used to backwash the filters. This water may be supplied by elevated wash water tanks, by the effluent of other filters, or by pumps which take suction from the clearwell and are provided for backwashing filters only. For installations having a treatment capacity no greater than 150,000 gallons per day, water for backwashing may be secured directly from the distribution system if proper controls and rate-of-flow limiters are provided.

(ii) The rate of filter backwashing shall be regulated by a rate-of-flow controller or flow control valve.

(iii) The rate of flow of backwash water shall not be less than 20 inches vertical rise per minute (12.5 gpm/sq. ft.) and usually not more than 35 inches vertical rise per minute (21.8 gpm/sq. ft.).

(iv) The backwash facilities shall be capable of expanding the filtering bed during the backwash cycle.

(I) For facilities equipped with air scour, the backwash facilities shall be capable of expanding the filtering bed at least 15% during the backwash cycle.

(II) For mixed-media filters without air scour, the backwash facilities shall be capable of expanding the filtering bed at least 25% during the backwash cycle.

(III) For mono-media sand filters without air scour, the backwash facilities shall be capable of expanding the filtering bed at least 40% during the backwash cycle.

(v) The filter freeboard in inches shall exceed the wash rate in inches of vertical rise per minute.

(vi) When used, surface filter wash systems shall be installed with an atmospheric vacuum breaker or a reduced pressure principle backflow assembly in the supply line. If an atmospheric vacuum breaker is used it shall be installed in a section of the supply line through which all the water passes and which is located above the overflow level of the filter.

(vii) Gravity filters installed after January 1, 1996 shall be equipped with air scour backwash or surface wash facilities.

(H) Each filter installed after October 1, 2000 shall be equipped with facilities that allow the filter to be completely drained without removing other filters from service.

(12) Pipe galleries shall provide ample working room, good lighting and good drainage provided by sloping floors, gutters and sumps. Adequate ventilation to prevent condensation and to provide humidity control is also required.

(13) The identification of influent, effluent, waste backwash, and chemical feed lines shall be accomplished by the use of labels or various colors of paint. Where labels are used, they shall be placed along the pipe at no greater than five foot intervals. Color coding must be by solid color or banding. If bands are used, they shall be placed along the pipe at no greater than five foot intervals.

(A) A plant that is built or repainted after October 1, 2000 must use the following color code. The color code to be used in labeling pipes is as follows:

Figure 30 TAC §290.42(d)(13)

<u>LETTERS</u>	<u>COLOR OF PIPE</u>
<u>Potable Water</u>	<u>Light Blue</u>
<u>Compressed Air</u>	<u>Light Green</u>
<u>Instrument Air</u>	<u>Light Green with Dark Green Bands</u>
<u>Chlorine (gas, liquid, or vent)</u>	<u>Yellow</u>
<u>Chlorine (solution)</u>	<u>Yellow with Red Bands</u>
<u>Liquid Alum</u>	<u>Yellow with Orange Bands</u>

<u>Alum (solution)</u>	<u>Yellow with Green Bands</u>
<u>Ammonia</u>	<u>Yellow with Brown Bands</u>
<u>Chlorine Dioxide (solution)</u>	<u>Yellow with Blue Bands</u>
<u>Ferric chloride</u>	<u>Brown with Red Bands</u>
<u>Ferric sulfate</u>	<u>Brown with Yellow Bands</u>
<u>Polymers</u>	<u>White with Green Bands</u>
<u>Liquid caustic</u>	<u>White with Red Bands</u>
<u>Caustic (solution)</u>	<u>White with Orange Bands</u>
<u>Fluoride</u>	<u>White with Yellow Bands</u>
<u>Ozone</u>	<u>Stainless Steel with White Bands</u>
<u>Settled Water</u>	<u>Green</u>
<u>Filter Effluent</u>	<u>Light Blue</u>
<u>Backwash Supply</u>	<u>Light Blue</u>
<u>Drain</u>	<u>Dark Grey</u>
<u>Raw Water</u>	<u>Tan</u>

(B) A plant that was repainted before October 1, 2000 may use an alternate color code. The alternate color code must provide clear visual distinction between process streams.

(C) The system must maintain clear, current documentation of its color code in a location easily accessed by all personnel.

(14) All surface water treatment plants shall provide sampling taps for raw, settled, individual filter effluent, and clearwell discharge. Additional sampling taps shall be provided as appropriate to monitor specific treatment processes.

(15) An adequately equipped laboratory shall be available locally so that daily microbiological and chemical tests can be conducted.

(A) For plants serving 25,000 persons or more, the local laboratory used to conduct the required daily microbiological analyses must be certified by the Texas Department of Health to conduct coliform analyses.

(B) For plants serving populations of less than 25,000, the facilities for making microbiological tests may be omitted if the required microbiological samples can be submitted to one of the Texas Department of Health's certified laboratories on a timely basis.

(C) All surface water treatment plants shall be provided with equipment for making at least the following determinations:

(i) pH;

(ii) temperature;

(iii) disinfectant residual;

(iv) alkalinity;

(v) turbidity;

(vi) jar tests for determining the optimum coagulant dose; and

(vii) other tests deemed necessary to monitor specific water quality problems or to evaluate specific water treatment processes.

(D) An amperometric titrator with platinum-platinum electrodes shall be provided at all surface water treatment plants that use chlorine dioxide.

(E) Each surface water treatment plant that uses sludge-blanket clarifiers shall be equipped with facilities to monitor the depth of the sludge blanket.

(F) Each surface water treatment plant that uses solids-recirculation clarifiers shall be equipped with facilities to monitor the solids concentration in the slurry.

(G) Effective January 1, 2002, each surface water treatment plant shall be provided with a computer and software for recording performance data, maintaining records and submitting reports to the executive director.

(e) Disinfection.

(1) All water obtained from surface sources or groundwater sources that are under the direct influence of surface water must be disinfected in a manner consistent with the requirements of §290.110 of this title (relating to Disinfectant Residuals).

(2) All groundwater must be disinfected prior to distribution. The point of application must be ahead of the water storage tank(s) if storage is provided prior to distribution. Permission to use alternate disinfectant application points must be obtained in writing from the executive director.

(3) Disinfection equipment shall be selected and installed so that continuous and effective disinfection can be secured under all conditions.

(A) Disinfection equipment shall have a capacity at least 50% greater than the highest expected dosage to be applied at any time. It shall be capable of satisfactory operation under every prevailing hydraulic condition.

(B) Automatic proportioning of the disinfectant dosage to the flow rate of the water being treated shall be provided at plants where the treatment rate varies automatically, and at all plants where the treatment rate varies more than 50% above or below the average flow. Manual control shall be permissible at surface water treatment plants or plants treating groundwater under the direct influence of surface water only if an operator is always on hand to make adjustments promptly.

(C) All disinfecting equipment in surface water treatment plants shall include at least one functional standby unit of each capacity for ensuring uninterrupted operation. Common standby units are permissible, but, generally, more than one standby unit must be provided because of the differences in feed rates or the physical state in which the disinfectants are being fed (solid, liquid, or gas).

(D) Facilities shall be provided for determining the amount of disinfectant used daily as well as the amount of disinfectant remaining for use.

(E) When used, solutions of calcium hypochlorite shall be prepared in a separate mixing tank and allowed to settle so that only a clear supernatant liquid is transferred to the hypochlorinator container.

(F) Provisions shall be made for both pretreatment disinfection and post-disinfection in all surface water treatment plants. Additional application points shall be installed if they are required to adequately control the quality of the treated water.

(G) The use of disinfectants other than chlorine will be considered on a case-by-case basis under the exception guidelines of §290.39(1) of this title (relating to General Provisions).

(4) When chlorine gas is used, a full-face self-contained breathing apparatus or supplied air respirator that meets Occupational Safety and Health Administration (OSHA) standards for construction and operation, and a small bottle of fresh ammonia solution (or approved equal) for testing for chlorine leakage shall be readily accessible outside the chlorinator room and immediately available to the operator in the event of an emergency.

(5) Beginning January 1, 2001, housing for gas chlorination equipment and cylinders of chlorine shall be in separate buildings or separate rooms with impervious walls or partitions separating all mechanical and electrical equipment from the chlorine facilities. Housing shall be located above ground level as a measure of safety.

(6) Adequate ventilation, which includes both high level and floor level screened vents, shall be provided for all enclosures in which gas chlorine is being stored or fed. Enclosures containing more than one open 150 pound cylinder of chlorine shall also provide forced air ventilation which includes: screened and louvered floor level and high level vents; a fan which is located at and draws air in through the top vent and discharges to the outside atmosphere through the floor level vent; and a fan switch located outside the enclosure. Alternately, systems may install negative pressure ventilation as

long as the facilities also have gas containment and treatment as prescribed by the current Uniform Fire Code (UFC).

(7) Hypochlorination solution containers and pumps must be housed in a secure enclosure to protect them from adverse weather conditions and vandalism. The solution container top must be completely covered to prevent the entrance of dust, insects, and other contaminants.

(8) Where anhydrous ammonia feed equipment is utilized, it must be housed in a separate enclosure equipped with both high and low level ventilation to the outside atmosphere. The enclosure must be provided with forced air ventilation which includes: screened and louvered floor level and high level vents; a fan which is located at and draws air in through the floor vent and discharges through the top vent; and a fan switch located outside the enclosure. Alternately, systems may install negative pressure ventilation as long as the facilities also have gas containment and treatment as prescribed by the current Uniform Fire Code (UFC).

(f) Other treatment processes. The adjustment of fluoride ion content, special treatment for iron and manganese reduction, special methods for taste and odor control, demineralization, corrosion control processes, and other proposals covering other treatment processes will be considered on an individual basis, pursuant to §290.39(g) of this title (relating to General Provisions). Package-type treatment systems and their components shall be subject to all applicable design criteria in this section. Where innovative/alternate treatment systems are proposed, the licensed professional engineer must provide pilot test data or data collected at similar full-scale operations demonstrating that the system

will produce water that meets the requirements of Subchapter F of this title (relating to Drinking Water Standards Governing Drinking Water Quality and Reporting Requirements for Public Drinking Water Supply Systems). Pilot test data must be representative of the actual operating conditions which can be expected over the course of the year. The executive director may require proof of a one-year manufacturers performance warrantee or guarantee assuring that the plant will produce treated water which meets minimum state and federal standards for drinking water quality.

(g) Sanitary facilities for water works installations. Toilet and hand washing facilities provided in accordance with established standards of good public health engineering practices shall be available at all installations requiring frequent visits by operating personnel.

(h) Permits for waste discharges. Permits for discharging wastes from water treatment processes shall be obtained from the agency, if necessary.

(i) Treatment chemicals and media. All chemicals and any additional or replacement process media used in treatment of water supplied by public water systems must conform to American National Standards Institute/National Sanitation Foundation (ANSI/NSF) Standard 60 for direct additives and ANSI/NSF Standard 61 for indirect additives. Conformance with these standards must be obtained by certification of the product by an organization accredited by ANSI.

(j) Safety.

(1) Safety equipment for all chemicals used in water treatment shall meet applicable standards established by the Occupational Safety and Health Administration (OSHA) or the Texas Hazard Communications Act, Health and Safety Code, Title 5, Chapter 502.

(2) Systems must comply with United States Environmental Protection Agency (EPA) requirements for Risk Management Plans.

(k) Plant operations manual. A thorough plant operations manual must be compiled and kept up to date for operator review and reference. This manual should be of sufficient detail to provide the operator with routine maintenance and repair procedures as well as provide telephone numbers of water system personnel, system officials, and local/state/federal agencies to be contacted in the event of an emergency.

§290.44. Water Distribution.

(a)-(g) (No change.)

(h) Backflow, siphonage.

(1) No water connection from any public drinking water supply system shall be allowed [made] to any residence or establishment where an actual or potential contamination [or system] hazard exists unless the public water facilities are protected from contamination. [without an

air gap separation between the drinking water supply and the source of potential contamination. The containment air gap is sometimes impractical and, instead, reliance must be placed on individual "internal" air gaps or mechanical backflow prevention devices. Under these conditions, additional protection shall be required at the meter in the form of a backflow prevention device (in accordance with AWWA Standards C510 and C511, and AWWA Manual M14) on those establishments handling substances deleterious or hazardous to the public health. The water purveyor need not require backflow protection at the water service entrance if an adequate cross-connection control program is in effect that includes an annual inspection and testing by a certified backflow prevention device tester. It will be the responsibility of the water purveyor to ensure that these requirements are met.]

(A) At any residence or establishment where an actual or potential contamination hazard exists, additional protection shall be required at the meter in the form of an air gap or backflow prevention assembly. The type of backflow prevention assembly required shall be determined by the specific potential hazard identified in §290.47(i) of this title (relating to Appendices).

(B) At any residence or establishment where an actual or potential contamination hazard exists and an adequate internal cross-connection control program is in effect, backflow protection at the water service entrance or meter is not required.

(i) An adequate internal cross-connection control program shall include an annual inspection and testing by a certified backflow prevention assembly tester on all backflow prevention assemblies used for health hazard protection.

(ii) Copies of all such inspection and test reports must be obtained and kept on file by the water purveyor.

(iii) It will be the responsibility of the water purveyor to ensure that these requirements are met.

(2) No water connection from any public drinking water supply system shall be allowed [made] to any condensing, cooling or industrial process or any other system of nonpotable usage over which the public water supply system officials do not have sanitary control, unless the said connection is made in accordance with the requirements of paragraph (1) of this subsection. Water from such systems cannot be returned to the potable water supply.

(3) (No change.)

(4) All [Effective January 1, 1996, all] backflow prevention assemblies that are required according to this section and associated table §290.47(i) of this title shall be tested upon installation by a recognized backflow prevention assembly tester and certified to be operating within specifications. Backflow prevention assemblies which are installed to provide protection against [high] health hazards must also be tested and certified to be operating within specifications at least annually by a recognized backflow prevention assembly [device] tester.

(A) Recognized backflow prevention assembly testers shall have completed a executive director [Commission] approved course on cross-connection control and backflow prevention assembly testing, [and] pass an examination administered by the TNRCC or its designated agent and hold current professional certification as a backflow prevention assembly tester. [The accredited tester classification shall be broken down into two categories:]

[(i) The "General Tester" is qualified to test and repair backflow prevention assemblies on any domestic, commercial, industrial or irrigation service. (Exception- Firelines - See "Fireline Tester" in §290.44(h)(A)(ii).)]

[(ii) The "Fireline Tester" is qualified to test and repair backflow prevention assemblies on firelines only. The State Fire Marshall's office requires that a person performing maintenance on firelines must be employed by an Approved Fireline Contractor.]

(B) Gauges used in the testing of backflow prevention assemblies shall be tested for accuracy annually in accordance with the University of Southern California's Manual of Cross-Connection Control or the American Water Works Association Recommended Practice for Backflow Prevention and Cross-Connection Control (Manual M14). Public water systems shall require testers to include test gauge serial numbers on "Test and Maintenance" report forms and ensure testers have gauges tested for accuracy. [Individuals that can show proof of completion of a course and passage of an exam based on the ABPA or APSE National exam, prior to the effective date of these

regulations, may be recognized as accredited for the term of their current certification (not to exceed 3 years).]

(C) A Test Report must be completed by the recognized backflow prevention assembly tester for each assembly tested. The signed and dated original must be submitted to the public water supplier for record keeping purposes. Any form which varies from the format specified in Appendix F of this title (relating to Backflow Prevention Assembly Test and Maintenance Report) must be approved by the executive director prior to being placed in use. [Gauges used in the testing of backflow prevention assemblies shall be tested for accuracy annually in accordance with the University of Southern California's Foundation of Cross Connection Control and Hydraulic Research and/or the American Water Works Association Manual of Cross Connection Control (Manual M-14). Public water systems shall require testers to include test gauge serial numbers on "Test and Maintenance" report forms and ensure testers have gauges tested for accuracy.]

[(D) A Test Report must be completed by the recognized backflow prevention assembly tester for each assembly tested. The signed and dated original must be submitted to the public water supplier for record keeping purposes. Should the tester choose to use a report format which differs from that found in Appendix F of this title, it must minimally contain all information required by the report form.]

[(E) Test and maintenance reports shall be retained for a minimum of three years. The public water supplier must provide these records to commission staff for inspection upon request.]

(5) The use of a backflow prevention assembly [device] at the service connection shall be considered as additional backflow protection and shall not negate the use of backflow protection on internal hazards as outlined and enforced by local plumbing codes.

(6) At any residence or establishment where there is no actual or potential contamination hazard, a backflow prevention assembly is not required.

(i) (No change.)

§290.45. Minimum Water System Capacity Requirements.

(a) (No change.)

(b) Community Water Systems.

(1) Groundwater [Ground water] supply requirements are as follows:

(A)-(E) (No change.)

(F) Mobile home parks and apartment complexes which supply 100 connections or greater [more connections], or fewer than 100 connections and utilize ground storage must meet the following requirements:

(i)-(ii) (No change.)

(iii) At least two service pumps with a total capacity of 2.0 gallons per minute per connection must be provided. [A service pump capacity of 2.0 gallons per minute per connection must be provided. Systems with 250 or more connections must have two or more service pumps with a combined capacity of at least 2.0 gallons per minute per connection.]

(iv) (No change.)

(2) (No change.)

(c) (No change.)

(d) Noncommunity water systems serving other than transient accommodation units.

(1) (No change.)

(2) Groundwater supply requirements are as follows.

(A) (No change.)

(B) If 300 or more persons per day are served, the system must have the following:

(i)-(ii) (No change.)

(iii) if the maximum daily demand is less than 15 gpm, at least one service pump with a capacity of 2.0 gallons per minute per connection must be provided; [a service pump capacity of at least three times the maximum daily demand; and]

(iv) if the maximum daily demand is 15 gpm or more, at least two service pumps with a total capacity of 2.0 gallons per minute per connection; and [a minimum pressure tank capacity of 220 gallons with additional capacity, if necessary, based on a sanitary survey conducted by the commission.]

(v) a minimum pressure tank capacity of 220 gallons with additional capacity, if necessary, based on a sanitary survey conducted by the executive director.

(3) (No change.)

(e)-(g) (No change.)

§290.46. Minimum Acceptable Operating Practices for Public Drinking Water Systems.

(a) General. When a public drinking water supply system is to be established, plans shall be submitted to the executive director for review and approval prior to the construction of the system. All public water systems are to be constructed in conformance with these sections and maintained and operated in accordance with the following minimum acceptable operating practices. Owners and operators shall allow entry to members of the commission and employees and agents of the commission onto any public or private property at any reasonable time for the purpose of inspecting and investigating conditions relating to public water systems in the state. Members, employees, or agents acting under this authority shall observe the establishment's rules and regulations concerning safety, internal security, and fire protection, and if the property has management in residence, shall notify management or the person then in charge of his presence and shall exhibit proper credentials.

(b) Microbiological. Submission of samples for microbiological analysis shall be as required by Subchapter F of this title (relating to Drinking Water Standards Governing Drinking Water Quality and Reporting Requirements for Public Water Supply Systems). Microbiological samples may be required by the executive director for monitoring purposes in addition to the routine samples required by the drinking water standards. These samples shall be submitted to the Texas Department of Health

Bureau of Laboratories or one of its approved laboratories. (A list of the approved laboratories can be obtained by contacting the Texas Department of Health Bureau of Laboratories).

(c) Chemical. Samples for chemical analysis shall be submitted as directed by the public drinking water program.

(d) Disinfectant residuals and monitoring. An acceptable disinfectant residual must be continuously maintained during the treatment process and throughout the distribution system.

(1) Disinfection facilities shall be operated and monitored in a manner that will assure compliance with the requirements of §290.110 of this title (relating to Disinfectant Residuals).

(2) The disinfection equipment shall be operated to maintain the following minimum disinfectant residuals in each finished water storage tank and in the far reaches of the distribution system at all times:

(A) a free chlorine residual of 0.2 mg/l; or

(B) a chloramine residual of 0.5 mg/l (measured as total chlorine) for those systems that feed ammonia.

(e) Operation by certified personnel. All systems, except transient noncommunity systems which utilize ground or purchased water, must be under the direct supervision of a certified water works operator. The operator shall ensure that the water system complies with the requirements of this section.

(1) No district, municipality, firm, corporation, or individual, except transient noncommunity systems which utilize groundwater or purchased water, shall furnish to the public any drinking water unless the production, processing, treatment, and distribution are at all times under the direct daily supervision of a competent water works operator holding a valid certificate of competency issued under the direction of the executive director.

(A) A Grade "D" certificate is valid for systems with 250 or fewer connections.

(B) Systems serving in excess of 250 connections must employ an operator with a Grade "C" or higher certificate.

(C) Systems serving in excess of 1,000 connections must employ at least two Grade "C" certified operators.

(D) Beginning January 1, 2004, systems that treat surface water must employ at least one operator who holds a Grade "B" or higher surface water certificate.

(E) Until January 1, 2004, systems that treat surface water must employ at least one operator who holds a Grade "B" or higher surface water certificate or who holds a Grade "C" surface water certificate and has completed an executive director recognized 20-hour water laboratory course.

(2) Each surface water treatment plant must have at least a Grade "C" surface water operator on duty at the plant when it is in operation or the plant must be provided with continuous turbidity and disinfectant residual monitors with automatic plant shutdown and alarms to summon operators so as to ensure that the water produced continues to meet the commission's drinking water standards during periods in which the plant is unattended.

(3) Systems that have sources which are classified as groundwater under the direct influence of surface water must be under the supervision of either an operator who has at least a Grade C Groundwater certificate and has completed additional training as designated in the following subparagraphs or an operator who has at least a Grade C surface water certificate.

(A) Those systems which utilize cartridge filters must be under the supervision of at least a Grade C Groundwater operator who has completed an agency recognized 8-hour training course on monitoring and reporting requirements.

(B) Those systems which utilize coagulant addition and direct filtration must be under the supervision of at least a Grade C Groundwater operator who has completed an agency

recognized 20-hour Surface Water Production course and an agency recognized 8-hour training course on monitoring and reporting requirements.

(C) Those systems which utilize complete surface water treatment must comply with the requirements of 30 TAC §290.46(e)(2).

(4) Certified operators must provide the public drinking water program with written, dated and signed notice of the public water systems which they operate or where they are employed when applying for, renewing, or upgrading their certification. This notice must be amended in writing within ten days of any change in responsibility.

(5) Training programs for all chemicals used in water treatment shall meet applicable standards established by the Occupational Safety and Health Administration (OSHA) or the Texas Hazard Communications Act, Health and Safety Code, Title 5, Chapter 502.

(f) Operating records and reports. Water systems must maintain a daily record of water works operation and maintenance activities and submit periodic operating reports.

(1) The public water system's operating records must be organized, and copies must be kept on file or stored electronically.

(2) The public water system's operating records must be accessible for review during inspections.

(3) The public water system shall maintain a record of operations.

(A) The following records shall be retained for at least two years:

(i) the amount of chemicals used each day;

(ii) the volume of water treated each day;

(iii) the date, location, and nature of water quality, pressure, or outage complaints received by the system and the results of any subsequent complaint investigation;

(iv) the dates that dead-end mains were flushed;

(v) the dates that storage tanks and other facilities were cleaned; and

(vi) the maintenance records for water system equipment and facilities.

(B) The following records shall be retained for at least three years:

(i) copies of notices of violation and any resulting corrective actions.

The records of the actions taken to correct violations of primary drinking water regulations must be retained for at least three years after the last action taken with respect to the particular violation involved;

(ii) copies of any public notice issued by the water system;

(iii) the turbidity monitoring results and exception reports for individual filters as required by §290.111 of this title (relating to Turbidity);

(iv) the calibration records for laboratory equipment, flow meters, rate-of-flow controllers, on-line turbidimeters, and on-line disinfectant residual analyzers; and

(v) the records of backflow prevention device programs.

(C) The following records shall be retained for a period of five years after they are no longer in effect:

(i) the records concerning a variance or exemption granted to the system; and

(ii) Concentration Time (CT) studies for surface water treatment plants.

(D) The results of microbiological analyses shall be retained for at least five years.

(E) The following records shall be retained for at least 10 years:

(i) copies of Monthly Operating Reports and any supporting documentation including turbidity monitoring results of the combined filter effluent;

(ii) the results of chemical analyses;

(iii) any written reports, summaries, or communications relating to sanitary surveys of the system conducted by the system itself, by a private consultant, or by the executive director shall be kept for a period not less than 10 years after completion of the survey involved;

(iv) copies of the Customer Service Inspection reports required by subsection (j) of this section; and

(v) other pertinent data.

(4) Water systems shall submit any monthly or quarterly reports required by the executive director.

(A) The reports must be submitted to the Texas Natural Resource Conservation Commission, Water Permitting and Resource Management Division, MC 155, P.O. Box 13087, Austin, Texas 78711-3087 by the 10th day of the month following the end of the reporting period.

(B) The reports must contain all the information required by the drinking water standards and the results of any special monitoring tests which have been required.

(C) The reports must be completed in ink, typed, or computer-printed and must be signed by the certified water works operator.

(g) Disinfection of new or repaired facilities. Disinfection by or under the direction of water system personnel must be performed when repairs are made to existing facilities and before new facilities are placed into service. Disinfection must be performed in accordance with AWWA requirements and water samples must be submitted to a laboratory approved by the Texas Department of Health. The sample results must indicate that the facility is free of microbiological contamination before it is placed into service. When it is necessary to return repaired mains to service as rapidly as possible, doses may be increased to 500 mg/l and the contact time reduced to one-half hour.

(h) Calcium hypochlorite. A supply of calcium hypochlorite disinfectant shall be kept on hand for use when making repairs, setting meters, and disinfecting new mains prior to placing them in service.

(i) Plumbing ordinance. Public water systems must adopt an adequate plumbing ordinance, regulations, or service agreement with provisions for proper enforcement to insure that neither cross-connections nor other unacceptable plumbing practices are permitted. See §290.47(b) of this title (relating to Appendices). Should sanitary control of the distribution system not reside with the purveyor, the entity retaining sanitary control shall be responsible for establishing and enforcing adequate regulations in this regard. The use of pipes and pipe fittings that contain more than 8.0% lead or solders and flux that contain more than 0.2% lead is prohibited for installation or repair of any public water supply and for installation or repair of any plumbing in a residential or nonresidential facility providing water for human consumption and connected to a public drinking water supply system. This requirement may be waived for lead joints that are necessary for repairs to cast iron pipe.

(j) Customer service inspections. A customer service inspection certificate shall be completed prior to providing continuous water service to new construction, on any existing service when the water purveyor has reason to believe that cross-connections or other potential contaminant hazards exist, or after any material improvement, correction, or addition to the private water distribution facilities. Any customer service inspection certificate form which varies from the format found in §290.47(d) of this title (relating to Customer Service Inspection Certificate) must be approved by the executive director prior to being placed in use.

(1) Individuals with the following credentials shall be recognized as capable of conducting a customer service inspection certification.

(A) Plumbing Inspectors and Water Supply Protection Specialists licensed by the Texas State Board of Plumbing Examiners.

(B) Customer service inspectors who have completed a commission approved course, passed an examination administered by the TNRCC or its designated agent and hold current professional certification or endorsement as a customer service inspector.

(2) As potential contaminant hazards are discovered, they shall be promptly eliminated to prevent possible contamination of the water supplied by the public water system. The existence of a health hazard, as identified in §290.47(i) of this title, shall be considered sufficient grounds for immediate termination of water service. Service can be restored only when the health hazard no longer exists, or until the health hazard has been isolated from the public water system in accordance with §290.44(h) of this title (relating to Water Distribution).

(3) These customer service inspection requirements are not considered acceptable substitutes for and shall not apply to the sanitary control requirements stated in §290.102(a)(5) of this title (relating to Definitions).

(4) A customer service inspection is an examination of the private water distribution facilities for the purpose of providing or denying water service. This inspection is limited to the identification and prevention of cross connections, potential contaminant hazards and illegal lead materials. The customer service inspector has no authority, and no obligation, beyond the scope of the commission's regulations. A customer service inspection is not a plumbing inspection as defined and regulated by the Texas State Board of Plumbing Examiners (TSBPE). A customer service inspector is not permitted to perform plumbing inspections. State statutes and TSBPE adopted rules require that TSBPE licensed plumbing inspectors perform plumbing inspections of all new plumbing and alterations or additions to existing plumbing within the municipal limits of all cities, towns and villages with 5000 or more inhabitants or within smaller, like entities which have adopted the Plumbing License Law by ordinance. Such entities may stipulate that the customer service inspection be performed by the plumbing inspector as a part of the more comprehensive plumbing inspection. Where such entities permit customer service inspectors to perform customer service inspections, the customer service inspector shall report any violations immediately to the local entity's plumbing inspection department.

(k) Interconnection. No physical connection between the distribution system of a public drinking water supply and that of any other water supply shall be permitted unless the other water supply is of a safe, sanitary quality and the interconnection is approved by the executive director.

(l) Flushing of mains. All dead-end mains must be flushed at monthly intervals or more frequently if water quality complaints are received from water customers or if disinfectant residuals fall below acceptable levels as specified in §290.110 of this title (relating to Disinfectant Residuals).

(m) Maintenance and housekeeping. The maintenance and housekeeping practices used by a public water system shall ensure the reliability and general appearance of the system's facilities and equipment.

(1) Each of the system's ground, elevated and pressure tanks shall be inspected annually by water system personnel or a contracted inspection service.

(A) Ground and elevated storage tank inspections must determine that the vents are in place and properly screened, the roof hatches closed and locked, flap valves and gasketing provide adequate protection against insects, rodents and other vermin, the interior and exterior coating systems are continuing to provide adequate protection to all metal surfaces, and the tank remains in a watertight condition.

(B) Pressure tank inspections must determine that the pressure release device and pressure gauge are working properly, the air-water ratio is being maintained at the proper level, the exterior coating systems are continuing to provide adequate protection to all metal surfaces, and the tank remains in watertight condition. Pressure tanks provided with an inspection port must have the interior surface inspected every five years.

(C) All tanks shall be inspected annually to determine that instrumentation and controls are working properly.

(2) When pressure filters are used, a visual inspection of the filter media and internal filter surfaces shall be conducted annually to ensure that the filter media is in good condition and the coating materials continue to provide adequate protection to internal surfaces.

(3) When cartridge filters are used, filter cartridges shall be changed at the frequency required by the manufacturer, or more frequently if needed.

(4) All water storage facilities, distribution system lines and related appurtenances shall be maintained in a watertight condition and be free of excessive solids.

(5) Basins used for water clarification shall be maintained free of excessive solids to prevent possible carryover of sludge and the formation of tastes and odors.

(n) Engineering plans and maps. Plans, specifications, maps and other pertinent information shall be maintained to facilitate the operation and maintenance of the system's facilities and equipment.

(1) Accurate and up-to-date detailed as-built plans or record drawings and specifications for each treatment plant, pump station, and storage tank shall be maintained at the public water system until the facility is decommissioned. As-built plans of individual projects may be used to fulfill this requirement if the plans are maintained in an organized manner.

(2) An accurate and up-to-date map of the distribution system shall be available so that valves and mains can be easily located during emergencies.

(3) Copies of well material setting data, geological log, sealing information (pressure cementing and surface protection), disinfection information, microbiological sample results and a chemical analysis report of a representative sample of water from the well shall be kept on file for as long as the well remains in service.

(o) Filter backwashing at surface water treatment plants. Filters must be backwashed when a loss of head differential of six to ten feet is experienced between the influent and effluent loss of head gauges or when the turbidity level at the effluent of the filter reaches 1.0 NTU.

(p) Data on water system ownership and management. The agency shall be provided with information regarding water system ownership and management.

(1) When a water system changes ownership, a written notice of the transaction must be provided to the executive director. When applicable, notification shall be in accordance with Chapter 291 of this title (relating to Water Rates). Those systems not subject to Chapter 291 of this title shall notify the executive director of changes in ownership by providing the name of the current and prospective owner or responsible official, the proposed date of the transaction, and the address and phone number of the new owner or responsible official. The information listed in this paragraph and the system's public drinking water supply identification number, and any other information necessary to

identify the transaction shall be provided to the executive director 120 days before the date of the transaction.

(2) On an annual basis, each certified operator who supervises more than one water system shall provide the public drinking water program written notices containing their certificate number, address and telephone number, and the name and identification number of each public water system which they supervise. Each operating company shall provide this information for itself and for each of its operators. See §290.47(g) of this title (relating to Appendices).

(q) Special precautions. Special precautions must be instituted by the water system owner or responsible official in the event of low distribution pressures (below 20 psi), water outages, microbiological samples found to contain *E.coli* or fecal coliform organisms, failure to maintain adequate chlorine residuals, elevated finished water turbidity levels, or other conditions which indicate that the potability of the drinking water supply has been compromised.

(1) Boil water notifications must be issued to the customers within 24-hours using the prescribed notification format as specified in §290.47(e) of this title (relating to Appendices). A copy of this notice shall be provided to the public drinking water program. Bilingual notification may be appropriate based upon local demographics. Once the boil water notification is no longer in effect, the customers must be notified in a manner similar to the original notice.

(2) The flowchart found in §290.47(h) of this title shall be used to determine if a boil water notification must be issued in the event of a loss of distribution system pressure. If a boil water notice is issued pursuant to this section, it shall remain in effect until water distribution pressures in excess of 20 psi can consistently be maintained, a minimum of 0.2 mg/l free chlorine residual or 0.5 mg/l chloramine residual (measured as total chlorine) is present throughout the system, and water samples collected for microbiological analysis are found negative for coliform organisms.

(3) A boil water notification shall be issued if the turbidity of the finished water produced by a surface water treatment plant exceeds 5.0 NTU. The boil water notice shall remain in effect until the water entering the distribution system has a turbidity level below 1.0 NTU, the distribution system has been thoroughly flushed, a minimum of 0.2 mg/l free chlorine residual or 0.5 mg/l chloramine residual (measured as total chlorine) is present throughout the system, and water samples collected for microbiological analysis are found negative for coliform organisms.

(4) Other protective measures may be required at the discretion of the executive director.

(r) Minimum pressures. All public water systems shall be operated to provide a minimum pressure of 35 psi throughout the distribution system under normal operating conditions. The system shall also be operated to maintain a minimum pressure of 20 psi during emergencies such as fire fighting.

(s) Testing equipment. Accurate testing equipment or some other means of monitoring the effectiveness of any chemical treatment processes used by the system must be provided.

(1) Flow measuring devices and rate-of-flow controllers shall be calibrated at least once every 12-months.

(2) Laboratory equipment shall be properly calibrated.

(A) pH meters shall be calibrated according to manufacturers specifications at least once each day. The calibration of the pH meter shall be checked with at least one buffer each time a series of samples are run.

(B) Turbidimeters shall be properly calibrated.

(i) Benchtop turbidimeters shall be calibrated with primary standards at least once every 90 days. Each time the turbidimeter is calibrated with primary standards, the secondary standards shall be restandardized.

(ii) The calibration of benchtop turbidimeters shall be checked with secondary standards each time a series of samples is tested and, if necessary, recalibrated with primary standards.

(iii) On-line turbidimeters shall be calibrated with primary standards at least once every 90 days.

(iv) The calibration of online turbidimeters shall be checked at least once each week by comparing the results of the on-line unit with the results of a properly calibrated benchtop unit and, if necessary, recalibrated with primary standards.

(C) Disinfectant residual analyzers shall be properly calibrated.

(i) The accuracy of manual disinfectant residual analyzers shall be verified at least once every 30 days using chlorine solutions of known concentrations.

(ii) Continuous disinfectant residual analyzers shall be calibrated at least once every 90 days using chlorine solutions of known concentrations.

(iii) The calibration of continuous disinfectant residual analyzers shall be checked at least once each month by comparing the results from the on-line analyzer with the result of approved benchtop amperometric, spectrophotometric, or titration method.

(t) System ownership. All community water systems shall post a legible sign at each of its production, treatment, and storage facilities. The sign shall be located in plain view of the public and

shall provide the name of the water supply and an emergency telephone number where a responsible official can be contacted.

(u) Abandoned wells. Abandoned public water supply wells owned by the system must be plugged with cement according to 16 TAC Chapter 76 (relating to Water Well Drillers and Water Well Pump Installers). Wells that are not in use and are non-deteriorated as defined in those rules must be tested every five years or as required by the executive director to prove that they are in a non-deteriorated condition. The test results shall be sent to the commission's public drinking water program for review and approval. Deteriorated wells must be either plugged with cement or repaired to a non-deteriorated condition.

(v) Electrical wiring. All water system electrical wiring must be installed in a securely mounted conduit in compliance with a local or national electrical code.

§290.47. Appendices.

(a)-(c) (No change.)

(d) Appendix D. Customer [Sample] Service Inspection Certification.

Figure 30 TAC §290.47(d)

Appendix D: Customer Service Inspection Certificate

Customer Service Inspection Certificate

Name of PWS _____ PWS I.D.# _____

Location of Service _____

- Reason for Inspection: New construction.
- Existing service where contaminant hazards are suspected
- Major renovation or expansion of distribution facilities

I _____, upon inspection of the private water distribution facilities connected to the aforementioned public water supply do hereby certify that, to the best of my knowledge:

- | | Compliance | Non-Compliance |
|---|--------------------------|--------------------------|
| (1) No direct connection between the public drinking water supply and a potential source of contamination exists. Potential sources of contamination are isolated from the public water system by an air gap or an appropriate backflow prevention assembly in accordance with Commission regulations. | <input type="checkbox"/> | <input type="checkbox"/> |
| (2) No cross-connection between the public drinking water supply and a private water system exists. Where an actual air gap is not maintained between the public water supply and a private water supply, an approved reduced pressure-zone backflow prevention assembly is properly installed and a service agreement exists for annual inspection and testing by a certified backflow prevention assembly tester. | <input type="checkbox"/> | <input type="checkbox"/> |
| (3) No connection exists which would allow the return of water used for condensing, cooling or industrial processes back to the public water supply. | <input type="checkbox"/> | <input type="checkbox"/> |
| (4) No pipe or pipe fitting which contains more than 8.0% lead exists in private water distribution facilities installed on or after July 1, 1988. | <input type="checkbox"/> | <input type="checkbox"/> |
| (5) No solder or flux which contains more than 0.2% lead exists in private water distribution facilities installed on or after July 1, 1988. | <input type="checkbox"/> | <input type="checkbox"/> |

I further certify that the following materials were used in the installation of the private water distribution facilities:

Service lines	Lead	<input type="checkbox"/>	Copper	<input type="checkbox"/>	PVC	<input type="checkbox"/>	Other	<input type="checkbox"/>
Solder	Lead	<input type="checkbox"/>	Lead Free	<input type="checkbox"/>	Solvent Weld	<input type="checkbox"/>	Other	<input type="checkbox"/>

I recognize that this document shall become a permanent record of the aforementioned Public Water System and that I am legally responsible for the validity of the information I have provided.

Remarks: _____

Signature of Inspector

Registration Number

Title

Type of Registration

Date

(e) (No change.)

(f) Appendix F. Sample Backflow Prevention Assembly Test and Maintenance Report.

Figure 30 TAC §290.47(f)

Appendix F: Sample Backflow Prevention Assembly Test and Maintenance Report

The following form must be completed for each assembly tested. A signed and dated original must be submitted to the public water supplier for record keeping purposes:

BACKFLOW PREVENTION ASSEMBLY TEST AND MAINTENANCE REPORT*

NAME OF PWS: _____

PWS I.D. # _____

MAILING ADDRESS: _____

CONTACT PERSON/PHONE: _____

LOCATION OF SERVICE: _____

The backflow prevention assembly detailed below has been tested and maintained as required by
TNRCC regulations and is certified to be operating within acceptable parameters.

TYPE OF ASSEMBLY

- Reduced Pressure Principle Pressure Vacuum Breaker
 Double Check Valve

Manufacturer _____

Size _____

Model Number _____

Located At _____

Serial Number _____

	Reduced Pressure Principle Assembly			Pressure Vacuum Breaker	
	Double Check Valve Assembly		Relief Valve	Air Inlet	Check Valve
	1st Check	2nd Check		Opened at _____psid	_____psid
Initial Test	DC-Closed Tight <input type="checkbox"/>	Closed Tight <input type="checkbox"/>	Opened at _____psid	_____psid	Leaked <input type="checkbox"/>
	RP- _____psid	Leaked <input type="checkbox"/>	Did not Open <input type="checkbox"/>	Did not Open <input type="checkbox"/>	Leaked <input type="checkbox"/>
Repairs and Materials Used**					

Test After	DC-Closed	Tight	<input type="checkbox"/>	Closed Tight	<input type="checkbox"/>	Opened at	Opened at	_____psid
Repair	RP_____psid					_____psid	_____psid	

TEST GAUGE USED: (MAKE/MODEL) _____ S/N: _____ CALIBRATION

DATE _____

REMARKS

The above is certified to be true.

Firm Name _____ Certified Tester _____

Firm Address _____ Cert. Tester No. _____ Date _____

Firm Phone _____

* TEST RECORDS MUST BE KEPT FOR AT LEAST THREE YEARS

** USE ONLY MANUFACTURER'S REPLACEMENT PARTS

(g)-(h) (No change.)

(i) Appendix I. Assessment of Hazard and Selection of Assemblies.

Figure 30 TAC §290.47(i)

Appendix I: Assessment of Hazards and Selection of Assemblies

Premises Isolation - Description of Premises	Assessment of Hazard	Required Assembly
Aircraft and missile plants	Health	RPBA or AG
Animal feedlots	Health	RPBA or AG
Automotive plants	Health	RPBA or AG
Breweries	Health	RPBA or AG
Canneries, packing houses and rendering plants	Health	RPBA or AG
Commercial car wash facilities	Health	RPBA or AG
Commercial laundries	Health	RPBA or AG
Cold storage facilities	Health	RPBA or AG
Connection to sewer pipe	Health	AG
Dairies	Health	RPBA or AG
Docks and dockside facilities	Health	RPBA or AG
Dye works	Health	RPBA or AG
Food and beverage processing plants	Health	RPBA or AG
Hospitals, morgues, mortuaries, medical clinics,		

autopsy facilities, sanitariums, and medical labs	Health	RPBA or AG
Metal manufacturing, cleaning, processing, and fabrication plants	Health	RPBA or AG
Microchip fabrication facilities	Health	RPBA or AG
Paper and paper products plants	Health	RPBA or AG
Petroleum processing or storage facilities	Health	RPBA or AG
Photo and film processing labs	Health	RPBA or AG
Plants using radioactive material	Health	RPBA or AG
Plating or chemical plants	Health	RPBA or AG
Pleasure-boat marinas	Health	RPBA or AG
Reclaimed water systems	Health	RPBA or AG
Restricted, classified or other closed facilities	Health	RPBA or AG
Rubber plants	Health	RPBA or AG
Sewage lift stations	Health	RPBA or AG
Sewage treatment plants	Health	RPBA or AG
Slaughter houses	Health	RPBA or AG
Steam plants	Nonhealth	RPBA or AG
Tall buildings or elevation differences where the highest outlet is 80 ft. or more above the meter	Nonhealth	DCVA

Internal Protection - Description of Cross Connection Assessment of Hazard Required Assembly

Aspirators	Nonhealth†	AVB
Aspirator (medical)	Health	AVB or PVB
Autoclaves	Health	RPBA
Autopsy and mortuary equipment	Health	AVB or PVB

Bedpan washers	Health	AVB or PVB
Connection to industrial fluid systems	Health	RPBA
Connection to plating tanks	Health	RPBA
Connection to salt-water cooling systems	Health	RPBA
Connection to sewer pipe	Health	AG
Cooling towers with chemical additives	Health	AG
Cuspidors	Health	AVB or PVB
Degreasing equipment	Nonhealth†	DCVA
Domestic space-heating boiler	Nonhealth†	RPBA
Dye vats or machines	Health	RPBA
Fire-fighting system (toxic liquid foam concentrates)	Health	RPBA
Flexible shower heads	Nonhealth†	AVB or PVB
Heating equipment		
Commercial	Nonhealth†	RPBA
Domestic	Nonhealth†	DCVA
Hose bibbs	Nonhealth†	AVB
Irrigation systems		
With chemical additives	Health	RPBA
Without chemical additives	Nonhealth†	DCVA, AVB, or PVB
Kitchen equipment - Commercial	Nonhealth†	AVB
Lab bench equipment	Health or Nonhealth†	AVB or PVB
Ornamental fountains	Nonhealth†	DCVA , AVB or PVB
Swimming pools		

Private	Nonhealth†	PVB or AG
Public	Nonhealth†	RPBA or AG
Sewage pump	Health	AG
Sewage ejectors	Health	AG
Shampoo basins	Nonhealth†	AVB
Specimen Tanks	Health	AVB or PVB
Steam generators	Nonhealth†	RPBA
Steam tables	Nonhealth†	AVB
Sterilizers	Health	RPBA
Tank vats or other vessels containing toxic substances	Health	RPBA
Trap primers	Health	AG
Vending machines	Nonhealth†	RPBA or PVB

NOTE: AG = air gap; AVB = atmospheric vacuum breaker; DCVA = double check valve backflow prevention assembly;

PVB = pressure vacuum breaker; RPBA = reduced-pressure principle backflow prevention assembly.

*AVBs and PVBs may be used to isolate health hazards under certain conditions, that is, backsiphonage situations.

Additional area of premises isolation may be required.

†Where a greater hazards exists (due to toxicity or other potential health impact) additional area protection with RPBA is required.

**SUBCHAPTER F: DRINKING WATER STANDARDS GOVERNING DRINKING
WATER QUALITY AND REPORTING REQUIREMENTS FOR
PUBLIC WATER SUPPLY SYSTEMS**

§§290.101-290.121

STATUTORY AUTHORITY

The repealed sections are proposed under the Texas Water Code, §5.103, which provide the commission the authority to adopt and enforce rules necessary to carry out its powers and duties under the laws of this state; and under Texas Health and Safety Code §341.031, which allows the commission to adopt rules to implement the federal Safe Drinking Water Act, 42 U.S.C. §300f et. seq.

The proposed sections implement Texas Health and Safety Code, §341.031, which allows the commission to adopt rules to implement the federal Safe Drinking Water Act, 42 U.S.C. §300f et.seq.; and Texas Health and Safety Code, §341.035, which requires the executive director to approve plans and specifications for public water supplies. No other codes or statutes are will be affected by this proposal.

§290.101. Purpose.

§290.102. Definitions.

§290.103. Standards of Chemical Quality.

§290.104. Control Tests.

§290.105. Maximum Contaminant Levels (MCLs) for Microbiological Contaminants.

§290.106. Bacteriological Monitoring.

§290.108. Inorganic Chemical Monitoring and Analytical Requirements.

§290.109. Organic Chemical (Other Than Trihalomethanes) Monitoring, Analytical Requirements and Treatment Techniques.

§290.110. Radiological Sampling and Analytical Requirements.

§290.111. Construction and Siting Requirements.

§290.112. Recordkeeping and Reporting Required of Water Systems.

§290.113. Secondary Constituent Levels.

§290.114. Modified Monitoring.

§290.115. Exceptions to these Standards.

§290.116. Control of Trihalomethanes in Drinking Water.

§290.117. Disinfection.

§290.118. Filtration.

§290.119. Monitoring Requirements Relating to Turbidity and Disinfection for Systems Using Surface Water Treatment.

§290.120. Regulation of Lead and Copper.

§290.121. Laboratory Analyses.

**SUBCHAPTER F : DRINKING WATER STANDARDS GOVERNING
DRINKING WATER QUALITY AND REPORTING REQUIREMENTS
FOR PUBLIC WATER SUPPLY SYSTEMS
§§290.101-290.115, 290.117-290.119, 290.121-122**

STATUTORY AUTHORITY

The new sections are proposed under the Texas Water Code, §5.103, which provide the commission the authority to adopt and enforce rules necessary to carry out its powers and duties under the laws of this state; and under Texas Health and Safety Code, §341.031, which allows the commission to adopt rules to implement the federal Safe Drinking Water Act, 42 U.S.C., §300f et. seq.

The proposed sections implement Texas Health and Safety Code, §341.031, which allows the commission to adopt rules to implement the federal Safe Drinking Water Act, 42 U.S.C. §300f et.seq.; and Texas Health and Safety Code, §341.035, which requires the executive director to approve plans and specifications for public water supplies. No other codes or statutes are will be affected by this proposal.

§290.101. Purpose.

The purpose of these standards is to assure the safety of public water supplies with respect to microbiological, chemical and radiological quality and to further efficient processing through control

tests, laboratory checks, operating records and reports of public water supply systems. These standards are written to comply with the requirements of the Federal "Safe Drinking Water Act," 42 U.S.C. §300f et. seq., and the "Primary Drinking Water Regulations" which have been promulgated by the EPA.

§290.102. General Applicability.

(a) General Applicability. This subchapter shall apply to all public water systems as described in each section, unless the system:

(1) consists only of distribution and storage facilities (and does not have any production and treatment facilities);

(2) obtains all of its water from, but is not owned or operated by, a public water system to which such standards apply;

(3) does not sell water to any person;

(4) is not a carrier which conveys passengers in interstate commerce; and

(5) is subject to plumbing restrictions and inspections by the public water system which provides the water.

(b) Variances and exemptions. Variances and exemptions may be granted at the discretion of the executive director.

(1) A variance may be granted to one or more of the MCLs or treatment technique requirements if all of the following conditions apply:

(A) the system's raw water is such that the maximum allowable level cannot be met despite the application of the best available treatment techniques (taking costs into consideration) subject to the following conditions:

(B) the public water system requesting the variance was in operation on the date the MCL or treatment technique requirement became effective;

(C) the granting of the variance will not result in an unreasonable risk to public health; and

(D) a schedule, including increments of progress, is established to bring the system into compliance with the standard in question.

(2) An exemption may be granted to one or more of the MCLs or treatment technique requirements when a system is unable to comply with a specified allowable level because of

compelling factors (which may include economic). An exemption may be granted only under the following circumstances:

(A) the public water system requesting the exemption was in operation on the date the MCL or treatment technique requirement became effective or for a system that was not in operation by that date, if no reasonable alternative source of drinking water is available to such new system;

(B) the granting of the exemption will not result in an unreasonable risk to public health; and

(C) a schedule is established to bring the system into compliance with the standard in question.

(3) Applications for such variances or exemptions must be submitted to the executive director in writing by the owner of the water system. The request must include the following:

(A) a statement of the standard which is not met;

(B) an estimate of the risk involved to public health with supporting evidence from physicians or dentists in the area;

(C) a long range plan for the correction of the problem. This plan or compliance schedule must be submitted within one year following written notification that a variance or exemption has been granted; and

(D) a detailed economic evaluation of the current and future situation.

(4) A variance or exemption covering a group or class of systems with a common standard which is not met may be issued by the executive director without individual application. However, individual compliance schedules will be required for each such system within one year following written notification by the executive director that such a variance or exemption has been granted. After receiving notification from the executive director that a group or class variance or exemption has been issued to their system, each system must submit the above items in accordance with paragraph (3) of this subsection.

(5) The executive director is required to act upon all requests for variances or exemptions within 90 days.

(6) Procedures for public comment and public hearings on variances, exemptions, and compliance schedules as a condition of a variance or exemption will be as stated in the EPA National Primary Drinking Water Regulations, 40 CFR §§141.4 and 142.20.

(c) Modified Monitoring. When a public water system supplies water to one or more other public water systems, the executive director may modify the monitoring requirements imposed by this chapter to the extent that the interconnection of the systems justifies treating them as a single system for monitoring purposes. Any modified monitoring shall be conducted pursuant to a schedule specified by the executive director in concurrence with the requirements of the administrator of the EPA.

§290.103. Definitions.

The following definitions shall apply in the interpretation and enforcement of this subchapter. If a word or term used in this subchapter is not contained in the following list, its definition shall be as shown in §290.38 of this title (relating to Definitions) or in Title 40 Code of Federal Regulations (CFR) §141.2. Other technical terms used shall have the meanings or definitions listed in the latest edition of "Glossary, Water and Wastewater Control Engineering," prepared by a joint editorial board representing the American Public Health Association, American Society of Civil Engineers, American Water Works Association, and the Water Pollution Control Federation.

(1) **Compliance cycle** - The nine-year (calendar year) cycle during which public water systems must monitor. Each compliance cycle consists of three, three-year compliance periods. The first compliance cycle begins January 1, 1993, and ends December 31, 2001. The second begins January 1, 2002, and ends December 31, 2010. The third begins January 1, 2011, and ends December 31, 2019. The cycle continues thereafter in a similar pattern.

(2) **Compliance period** - A three-year (calendar year) period within a compliance cycle. Each compliance cycle has three, three-year compliance periods. Within the first compliance cycle, the first compliance period is called the initial compliance period and runs from January 1, 1993 to December 31, 1995. The second period from January 1, 1996, to December 31, 1998. The third period from January 1, 1999, to December 31, 2001. Compliance periods in subsequent compliance cycles follow the same pattern.

(3) **Comprehensive performance evaluation (CPE)** - A thorough review and analysis of a treatment plant's performance-based capabilities and the associated administrative, operation and maintenance practices. It is conducted to identify factors that may be adversely impacting a plant's capability to achieve compliance and to emphasize approaches that can be implemented without significant capital improvements. The comprehensive performance evaluation consists of the following components: assessment of plant performance; evaluation of major unit processes; identification and prioritization of performance limiting factors; assessment of the applicability of comprehensive technical assistance; and preparation of a CPE report.

(4) **Disinfection profile** - A summary of daily *Giardia lamblia* and viral inactivation obtained through disinfection at the treatment plant.

(5) **Disinfection by-products (DBP)** - Chemical compounds formed by the reaction of a disinfectant with the natural organic matter present in water.

(6) **Enhanced coagulation** - The addition of sufficient coagulant for improved removal of disinfection by-product precursors by conventional filtration treatment.

(7) **Enhanced softening** - The improved removal of disinfection by-product precursors by precipitative softening.

(8) **Entry point to the distribution system** - Any point where freshly treated water enters the distribution system. Entry points to the distribution system may include points where chlorinated well water, treated surface water, rechlorinated water from storage, or water purchased from another supplier enters the distribution system.

(9) **Filter assessment** - An in-depth evaluation of an individual filter, including the analysis of historical filtered water turbidity from the filter, development of a filter profile, identification and prioritization of factors limiting filter performance, appraisal of the applicability of corrections, and preparation of a filter self-assessment report.

(10) **Filter profile** - A graphical representation of individual filter performance, based on continuous turbidity measurements or total particle counts versus time for an entire filter run. The filter profile must include all the data collected from the time that the filter placed into service until the time that the backwash cycle is complete and the filter is restarted. The filter profile must also include data collected as another filter is being backwashed.

(11) **Haloacetic acids (five) (HAA5)** - The sum of the monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid concentrations in milligrams per liter, rounded to two significant figures after summing.

(12) **Halogen** - One of the chemical elements chlorine, bromine, or iodine.

(13) **Maximum contaminant level (MCL)** - A level of a contaminant that may not be exceeded at a customer's tap. An acute MCL may be based on an instantaneous concentration. A chronic or nonacute MCL may be based on the level of a contaminant over a prolonged period of time.

(14) **Maximum residual disinfectant level (MRDL)** - The disinfectant concentration that may not be exceeded in the distribution system. There is convincing evidence that addition of a disinfectant is necessary for control of waterborne microbial contaminants.

(15) **Minimum acceptable disinfectant residual** - The lowest disinfectant concentration allowed in the distribution system for microbial control.

(16) **Specific ultraviolet absorption at 254 nanometers (nm) (SUVA)** - An indirect indicator of whether the organic carbon in water is humic or non-humic. It is calculated by dividing a sample's ultraviolet absorption at a wavelength of 254 nm (UV₂₅₄) (in m⁻¹) by its concentration of dissolved organic carbon (DOC) (in mg/L).

(17) Total organic carbon (TOC) - The concentration of total organic carbon, in milligrams per liter, measured using heat, oxygen, ultraviolet irradiation, chemical oxidants, or combinations of these oxidants that convert organic carbon to carbon dioxide, rounded to two significant figures. TOC is a surrogate measure for precursors to formation of disinfection by-products.

(18) Total trihalomethanes (TTHM) - The sum of the chloroform, dibromochloromethane, bromodichloromethane, and bromoform concentrations in milligrams per liter, rounded to two significant figures after summing.

(19) Trihalomethane (THM) - One of the family of organic compounds named as derivatives of methane, wherein three of the four hydrogen atoms in methane are each substituted by a halogen atom in the molecular structure.

§290.104. Summary of Maximum Contaminant Levels, Maximum Residual Disinfectant Levels, Treatment Techniques, and Action Levels.

(a) Summary table purpose. These tables are provided in order to list all MCLs in a single location. The constituents and MCLs are repeated in each section of this rule.

(b) Maximum contaminant levels (MCLs) for inorganic compounds. The maximum contaminant levels for inorganic contaminants listed below apply to public water systems as provided in §290.106 of this title (relating to Inorganic Contaminants).

Figure 30 TAC §290.104(b)

<u>Contaminant</u>	<u>MCL (mg/l)</u>
<u>Antimony</u>	<u>0.006</u>
<u>Arsenic</u>	<u>0.05</u>
<u>Asbestos</u>	<u>7 million fibers/liter (longer than 10μm)</u>
<u>Barium</u>	<u>2.0</u>
<u>Beryllium</u>	<u>0.004</u>
<u>Cadmium</u>	<u>0.005</u>
<u>Chromium</u>	<u>0.1</u>
<u>Cyanide</u>	<u>0.2 (as free Cyanide)</u>
<u>Fluoride</u>	<u>4.0</u>
<u>Mercury</u>	<u>0.002</u>
<u>Nitrate</u>	<u>10.0 (as Nitrogen)</u>
<u>Nitrite</u>	<u>1.0 (as Nitrogen)</u>
<u>Nitrate & Nitrite (Total)</u>	<u>10.0 (as Nitrogen)</u>

<u>Selenium</u>	<u>0.05</u>
<u>Thallium</u>	<u>0.002</u>
<u>Fluoride</u>	<u>4.0 mg/l</u>

(c) Maximum contaminant levels (MCLs) for organic compounds. The following maximum contaminant levels for synthetic organic contaminants and volatile organic contaminants apply to public water systems as provided in §290.107 of this title (relating to Organic Contaminants).

(1) The following are the maximum contaminant levels for synthetic organic contaminants.

Figure 30 TAC §290.104(c)(1)

<u>Contaminant</u>	<u>MCL (mg/l)</u>
<u>Alachlor</u>	<u>0.002</u>
<u>Atrazine</u>	<u>0.003</u>
<u>Benzo[a]pyrene</u>	<u>0.0002</u>
<u>Carbofuran</u>	<u>0.04</u>
<u>Chlordane</u>	<u>0.002</u>
<u>Dalapon</u>	<u>0.2</u>
<u>Dibromochloropropane</u>	<u>0.0002</u>

<u>Di(2-ethylhexyl)adipate</u>	<u>0.4</u>
<u>Di(2-ethylhexyl)phthalate</u>	<u>0.006</u>
<u>Dinoseb</u>	<u>0.007</u>
<u>Diquat</u>	<u>0.02</u>
<u>Endothall</u>	<u>0.1</u>
<u>Endrin</u>	<u>0.002</u>
<u>Ethylene dibromide</u>	<u>0.00005</u>
<u>Glyphosate</u>	<u>0.7</u>
<u>Heptachlor</u>	<u>0.0004</u>
<u>Heptachlor epoxide</u>	<u>0.0002</u>
<u>Hexachlorobenzene</u>	<u>0.001</u>
<u>Hexachlorocyclopentadiene</u>	<u>0.05</u>
<u>Lindane</u>	<u>0.0002</u>
<u>Methoxychlor</u>	<u>0.04</u>
<u>Oxamyl (Vydate)</u>	<u>0.2</u>
<u>Pentachlorophenol</u>	<u>0.001</u>
<u>Picloram</u>	<u>0.5</u>
<u>Polychlorinated biphenyls (PCB)</u>	<u>0.0005</u>
<u>Simazine</u>	<u>0.004</u>
<u>Toxaphene</u>	<u>0.003</u>
<u>2,3,7,8-TCDD (Dioxin)</u>	<u>3 X 10⁻⁸</u>
<u>2,4,5-TP</u>	<u>0.05</u>

2,4-D 0.07

(2) The following are the maximum contaminant levels for volatile organic
contaminants.

Figure 30 TAC §290.104(c)(2)

<u>Contaminant</u>	<u>MCL (mg/l)</u>
<u>1,1-Dichloroethylene</u>	<u>0.007</u>
<u>1,1,1-Trichloroethane</u>	<u>0.2</u>
<u>1,1,2-Trichloroethane</u>	<u>0.005</u>
<u>1,2-Dichloroethane</u>	<u>0.005</u>
<u>1,2-Dichloropropane</u>	<u>0.005</u>
<u>1,2,4-Trichlorobenzene</u>	<u>0.07</u>
<u>Benzene</u>	<u>0.005</u>
<u>Carbon tetrachloride</u>	<u>0.005</u>
<u>cis-1,2-Dichloroethylene</u>	<u>0.07</u>
<u>Dichloromethane</u>	<u>0.005</u>
<u>Ethylbenzene</u>	<u>0.7</u>
<u>Monochlorobenzene</u>	<u>0.1</u>
<u>o-Dichlorobenzene</u>	<u>0.6</u>
<u>para-Dichlorobenzene</u>	<u>0.075</u>

<u>Styrene</u>	<u>0.1</u>
<u>Tetrachloroethylene</u>	<u>0.005</u>
<u>Toluene</u>	<u>1.0</u>
<u>trans-1,2-Dichloroethylene</u>	<u>0.1</u>
<u>Trichloroethylene</u>	<u>0.005</u>
<u>Vinyl chloride</u>	<u>0.002</u>
<u>Xylenes (total)</u>	<u>10.0</u>

(d) Maximum contaminant levels for radiological contaminants. Maximum contaminant levels for radiological contaminants apply to public water systems as provided in §290.108 of this title (relating to Radiological Sampling and Analytical Requirements). The maximum contaminant levels for beta particle and photon radioactivity from man-made radionuclides in drinking water are as follows.

(1) The maximum contaminant level for combined radium-226 and radium-228 is 5 pCi/l.

(2) The maximum contaminant level for gross alpha particle activity (including radium-226 but excluding radon and uranium) is 15 pCi/l.

(3) The average annual concentration of beta particle and photon radioactivity from man-made radionuclides in drinking water shall not produce an annual dose equivalent to the total body or any internal organ greater than four millirem (mrem)/year.

(4) If two or more radionuclides other than tritium or strontium-90 are present, the sum of their annual dose equivalent to the total body or to any organ shall not exceed four mrem/year. Average annual concentrations of tritium or strontium-90 assumed to produce a total body or organ dose of four mrem/year are as follows:

Figure 30 TAC §290.104(d)(4)

<u>Radionuclide</u>	<u>Critical Organ</u>	<u>pCi Per Liter</u>
<u>Tritium</u>	<u>Total Body</u>	<u>20,000</u>
<u>Strontium-90</u>	<u>Bone Marrow</u>	<u>8</u>

(e) Microbial contaminants. The MCL for microbial or bacteriological contaminants applies to public water systems as provided in §290.109 of this title (relating to Microbial Contaminants). The MCL for microbiological contaminants is based on the presence or absence of total coliform bacteria in a sample.

(f) Minimum and maximum residual disinfectant levels. Minimum and maximum residual disinfectant levels apply to public water systems as provided in §290.110 of this title (relating to Disinfectant Residuals).

(1) The minimum residual disinfectant concentration in the water entering the distribution system is 0.2 mg/L free chlorine or 0.5 mg/L chloramine.

(2) The minimum residual disinfectant concentration in the water within the distribution system is 0.2 mg/L free chlorine or 0.5 mg/L chloramine.

(3) The maximum residual disinfectant level of chlorine dioxide in the water entering the distribution system is 0.8 mg/L.

(4) The maximum residual disinfectant level of free chlorine or chloramine in the water within the distribution system is 4.0 mg/L based on a running annual average.

(g) Turbidity. Systems must meet the turbidity treatment technique requirements as provided in §290.111 of this title (relating to Turbidity).

(1) Until January 1, 2002, the turbidity level of the combined filter effluent must never exceed 5.0 NTU and the turbidity level of the combined filter effluent must be 0.5 NTU or less in at least 95% of the samples tested each month.

(2) Effective January 1, 2002 the turbidity level of the combined filter effluent must never exceed 1.0 NTU and the turbidity level of the combined filter effluent must be 0.3 NTU or less in at least 95% of the samples tested each month.

(3) Systems are subject to individual filter turbidity provisions of §290.111 of this title.

(h) Disinfection by-product precursors. The treatment technique requirements for disinfection by-product precursors apply to water systems as provided in §290.112 of this title (relating to Total Organic Carbon (TOC)).

(i) Disinfection by-products (TTHM and HAA5). The MCLs for TTHM and HAA5 apply to water systems as provided in §290.113 of this title (relating to Disinfection By-products (TTHM and HAA5)). The MCLs for TTHM and HAA5 are:

(1) the MCL for TTHM is 0.080 milligrams/liter; and

(2) the MCL for HAA5 is 0.060 milligrams/liter.

(j) Disinfection by-products other than TTHM and HAA5. The maximum contaminant levels for chlorite and bromate apply to water systems as provided in §290.114 of this title (relating to Disinfection By-products Other than TTHM and HAA5). The MCLs for chlorite and bromate are as follows:

(1) the MCL for chlorite is 1.0 mg/L; and

(2) the MCL for bromate is 0.010 mg/L.

(k) Lead and copper action levels. The action levels for lead and copper apply to water systems as provided in §290.117 of this title (relating to Regulation of Lead and Copper). Action levels for lead and copper are as follows:

(1) the action level for lead is 0.015 mg/l; and

(2) the action level for copper is 1.3 mg/l.

§290.105. Summary of Secondary Standards.

(a) Summary table purpose. This table is provided in order to list the secondary standards in a single location.

(b) Secondary standards. The secondary standards apply to all public water systems as provided in §290.118 of this title (relating to Secondary Constituent Levels). The maximum levels for secondary constituents are listed in the following table:

Figure 30 TAC §290.105(b)

CONTAMINANT

LEVEL

(mg/l except where otherwise stated)

<u>Aluminum</u>	<u>0.05 to 0.2</u>
<u>Chloride</u>	<u>300</u>
<u>Color</u>	<u>15 color units</u>
<u>Copper</u>	<u>1.0</u>
<u>Corrosivity</u>	<u>Non-corrosive</u>
<u>Fluoride</u>	<u>2.0</u>
<u>Foaming agents</u>	<u>0.5</u>
<u>Hydrogen sulfide</u>	<u>0.05</u>
<u>Iron</u>	<u>0.3</u>
<u>Manganese</u>	<u>0.05</u>
<u>Odor</u>	<u>3 Threshold Odor Number</u>
<u>pH</u>	<u>>7.0</u>

<u>Silver</u>	<u>0.1</u>
<u>Sulfate</u>	<u>300</u>
<u>Total Dissolved Solids</u>	<u>1,000</u>
<u>Zinc</u>	<u>5.0</u>

§290.106. Inorganic Contaminants.

(a) Applicability. All public water systems are subject to the requirements of this section.

(1) Community and nontransient non-community systems shall comply with the requirements of this section regarding monitoring, reporting, and MCLs for all inorganic contaminants listed in this section.

(2) Transient non-community systems shall comply with the requirements of this section regarding monitoring, reporting, and MCL for nitrate and nitrite.

(3) For purposes of this section, systems using groundwater under the direct influence of surface water shall meet the inorganic sampling requirements given for surface water systems.

(b) Maximum contaminant levels for inorganic contaminants (IOCs). The maximum contaminant levels for inorganic contaminants listed in the following table apply to community and

nontransient, non-community water systems. The maximum contaminant levels for nitrate, nitrite, and total nitrate and nitrite also apply to transient non-community water systems.

Figure 30 TAC §290.106(b)

<u>Contaminant</u>	<u>MCL (mg/l)</u>
<u>Antimony</u>	<u>0.006</u>
<u>Arsenic</u>	<u>0.05</u>
<u>Asbestos</u>	<u>7 million fibers/liter (longer than 10μm)</u>
<u>Barium</u>	<u>2.0</u>
<u>Beryllium</u>	<u>0.004</u>
<u>Cadmium</u>	<u>0.005</u>
<u>Chromium</u>	<u>0.1</u>
<u>Cyanide</u>	<u>0.2 (as free Cyanide)</u>
<u>Fluoride</u>	<u>4.0</u>
<u>Mercury</u>	<u>0.002</u>
<u>Nitrate</u>	<u>10.0 (as Nitrogen)</u>
<u>Nitrite</u>	<u>1.0 (as Nitrogen)</u>
<u>Nitrate & Nitrite (Total)</u>	<u>10.0 (as Nitrogen)</u>
<u>Selenium</u>	<u>0.05</u>
<u>Thallium</u>	<u>0.002</u>

(c) Monitoring requirements for inorganic contaminants. Public water systems shall monitor for inorganic contaminants at the locations and specified by the executive director. All monitoring conducted pursuant to the requirements of this section must be conducted at sites designated in the public water system's monitoring plan. Each public water system shall monitor at the time designated during each compliance period.

(1) Monitoring locations for IOCs except asbestos. Antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nitrate, nitrite, selenium, and thallium shall be monitored at each point of entry to the distribution system.

(A) If a system draws water from more than one source and the sources are combined before distribution, the system must sample at a point of entry that is representative of all sources and during periods of normal operating conditions when water is representative of all sources being used.

(B) Systems shall take all subsequent samples at the same point of entry to the distribution system unless the executive director determines that conditions make another point of entry more representative of the source or treatment plant being monitored.

(C) The executive director may approve the use of composite samples.

(i) Compositing must be done in the laboratory or in the field by persons designated by the executive director.

(ii) Compositing shall be allowed only at groundwater points of entry to the distribution system.

(iii) Compositing shall be allowed only within a single system. Samples from different systems shall not be included in a composite sample.

(iv) No more than five individual samples shall be included in a composite sample.

(v) The maximum number of individual samples allowed in a composite sample shall not exceed the number obtained by dividing the MCL for the contaminant by the detection limit of the analytical method and rounding the quotient to the next lowest integer. Detection limits for each analytical method are as listed in 40 CFR §141.23(a)(4)(i).

(vi) If the concentration in the composite sample is greater than or equal to the proportional contribution of the MCL (e.g., 20% of MCL when five points are composited) for any inorganic chemical, then a follow-up sample must be collected from each sampling point included in the composite sample.

(I) Follow-up samples must be collected within 14 days of receipt of the composite sample results.

(II) If duplicates of the original sample taken from each point of entry to the distribution system used in the composite are available, the system may use these instead of resampling. The duplicates must be analyzed within 14 days of the composite.

(III) The follow-up or duplicate samples must be analyzed for the contaminant(s) which were excessive in the composite sample.

(2) Monitoring locations for asbestos. Asbestos shall be monitored at locations where asbestos contamination is most likely to occur.

(A) A system vulnerable to asbestos contamination due solely to source water shall sample at the point of entry to the distribution system.

(B) A system vulnerable to asbestos contamination due solely to corrosion of asbestos-cement pipe shall sample at a tap served by asbestos-cement pipe, under conditions where asbestos contamination is most likely to occur.

(C) A system vulnerable to asbestos contamination due both to its source water supply and corrosion of asbestos-cement pipe shall sample at a tap served by asbestos-cement pipe, under conditions where asbestos contamination is most likely to occur.

(D) The executive director may require additional sampling locations based on the size, length, age, and location of asbestos-cement pipe in the distribution system. The system must provide information regarding the size, length, age, and location of asbestos-cement pipe in the distribution system to the executive director upon request.

(3) Monitoring frequency for IOCs except asbestos, nitrate, and nitrite. Community and nontransient non-community public water systems shall monitor for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium, and thallium at the following frequency.

(A) A public water system shall routinely monitor for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium, and thallium.

(i) Each groundwater source shall be sampled once every three years at the point of entry to the distribution system.

(ii) Each surface water source shall be sampled annually at the point of entry to the distribution system.

(iii) Each of the sampling frequencies listed in paragraph (3) of this subsection constitute one round of sampling for groundwater and surface water systems, respectively.

(B) The executive director may reduce the monitoring frequency for a system that has completed a minimum of three rounds of sampling by granting a waiver to the routine monitoring frequency for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium, and thallium.

(i) Systems that use a new water source are not eligible for a waiver until three rounds of sampling from the new source have been completed.

(ii) To be considered for a waiver, systems shall demonstrate that all previous analytical results were less than the MCL. At least one sample shall have been taken since January 1, 1990.

(iii) In determining the appropriate reduced monitoring frequency, the executive director shall consider:

(I) the reported contaminant concentrations from all previous samples;

(II) the degree of variation in reported concentrations; and

(III) other factors which may affect contaminant concentrations such as changes in groundwater pumping rates, changes in the system's configuration, changes in the system's operating procedures, or changes in the flow or characteristics of a reservoir or stream used as the water source.

(iv) If the executive director grants a waiver, it shall be made in writing and shall set forth the basis for the determination. The determination may be initiated by the executive director. The executive director shall review and, where appropriate, revise the waiver of monitoring frequency when other data relevant to the system becomes available.

(v) The term during which the waiver is effective shall not exceed one compliance cycle (i.e., nine years).

(vi) A system must take a minimum of one sample during each compliance cycle while the waiver is effective.

(C) The executive director may increase the monitoring frequency for public water systems with sources that exceed the MCL for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium, or thallium.

(i) Systems shall sample quarterly beginning in the next quarter after the violation occurs.

(ii) After the initiation of quarterly monitoring, the executive director may return a system to the routine monitoring frequency if monitoring shows that the system is reliably and consistently below the MCL.

(I) The executive director shall not decrease the quarterly sampling requirement until a groundwater system has taken a minimum of two quarterly samples.

(II) The executive director shall not decrease the quarterly sampling requirement until a surface water system has taken a minimum of four quarterly samples.

(4) Asbestos monitoring frequency. Community and nontransient non-community water systems shall monitor for asbestos at the following frequency.

(A) A public water system shall routinely monitor for asbestos once during the first three years of each compliance cycle.

(B) The executive director may waive the routine monitoring frequency requirements for asbestos.

(i) When determining if a waiver should be granted, the executive director shall consider:

(I) the potential for asbestos contamination of the water source;

(II) the use of asbestos-cement pipe for finished water distribution;

and

(III) the corrosivity of the water.

(ii) If the executive director grants a waiver, it shall be made in writing and shall set forth the basis for the determination. The determination may be initiated by the executive director. The executive director shall review and, where appropriate, revise the waiver of monitoring frequency when other data relevant to the system becomes available.

(iii) The term during which the waiver is effective shall not exceed one compliance cycle (i.e., nine years).

(C) The executive director may increase the monitoring frequency for asbestos.

(i) A system which exceeds the MCL for asbestos shall sample quarterly beginning in the next quarter after the violation occurs.

(ii) After the initiation of quarterly sampling, the executive director may return a system to the routine monitoring frequency if monitoring shows that the system is reliably and consistently below the MCL.

(I) The executive director shall not decrease the quarterly sampling requirement until a groundwater system has taken a minimum of two quarterly samples.

(II) The executive director shall not decrease the quarterly sampling requirement until a surface (or combined surface water and groundwater) water system has taken a minimum of four quarterly samples.

(5) Nitrate monitoring frequency. All public water systems shall monitor for nitrate at the following frequency.

(A) A public water system shall routinely monitor for nitrate.

(i) All public water systems shall annually sample each ground water source at the point of entry to the distribution system.

(ii) A community or non-transient non-community water system shall sample each surface water source quarterly at the point of entry to the distribution system.

(iii) A transient non-community water system shall annually sample each surface water source at the point of entry to the distribution system.

(B) The executive director may reduce the monitoring frequency for community or non-transient, non-community water systems using surface water sources by granting a waiver to the routine monitoring frequency.

(i) To be considered for a waiver, a system shall demonstrate that the nitrate concentration in each sample collected during the previous four consecutive quarters was less than 50% of the nitrate MCL.

(ii) If the executive director grants a waiver, it shall be made in writing and shall set forth the basis for the determination. The determination may be initiated by the executive director. The executive director shall review and, where appropriate, revise the waiver of monitoring frequency when other data relevant to the system becomes available.

(iii) A system that receives a waiver to the routine nitrate monitoring frequency must sample annually for nitrate. The annual sample must be collected in the quarter that previously resulted in the highest nitrate concentration.

(iv) A system that is sampling annually shall return to routine quarterly monitoring if the nitrate concentration in any sample is equal to or greater than 50% of the nitrate MCL.

(C) The executive director may increase the nitrate monitoring frequency for community or non-transient, non-community water systems using groundwater sources.

(i) A system that is sampling annually shall begin quarterly nitrate sampling if the nitrate concentration in any sample is equal to or greater than 50% of the nitrate MCL. Quarterly sampling must begin the first quarter after the elevated nitrate level was detected.

(ii) After the initiation of quarterly sampling, the executive director may return a system to the routine annual nitrate monitoring frequency if quarterly sampling shows that the system is reliably and consistently below the nitrate MCL for a minimum of four consecutive quarters.

(6) Nitrite monitoring frequency. All public water systems shall monitor for nitrite at the following frequency.

(A) All public water systems shall routinely take one nitrite sample during the first three years of each compliance cycle.

(B) The executive director may reduce the monitoring frequency for nitrite by granting a waiver to the routine monitoring frequency.

(i) To be considered for a waiver, a system shall demonstrate that the nitrite concentration in the initial sample was less than 50% of the nitrite MCL.

(ii) If the executive director grants a waiver, it shall be made in writing and shall set forth the basis for the determination. The determination may be initiated by the executive director. The executive director shall review and, where appropriate, revise the waiver of monitoring frequency when other data relevant to the system becomes available.

(iii) A system that receives a waiver to the routine nitrite monitoring frequency must sample at a frequency specified by the executive director.

(C) The executive director may increase the monitoring frequency for nitrite.

(i) A system shall sample quarterly for at least one year following any sample in which the nitrite concentration is greater than or equal to 50% of the MCL.

(ii) The executive director may allow a system to return to the routine monitoring frequency after determining the system is reliably and consistently less than the MCL.

(7) Confirmation sampling. The executive director may require a public water system to confirm the results of any individual sample.

(A) If a sample result exceeds the MCL, a public water system shall collect one additional sample to confirm the results of the initial test.

(i) Confirmation samples must be collected at the same point of entry to the distribution system as the sample that exceeded the MCL.

(ii) Confirmation samples for IOCs except nitrate and nitrite shall be collected as soon as possible after the system receives the analytical results of the first sample.

(iii) Confirmation samples for nitrate and nitrate shall be collected within 24 hours of the system's receipt of notification of the analytical results of the first sample. Systems unable to comply with the 24-hour sampling requirement must immediately notify the consumers served by the public water system in accordance with subsection (f) of this section. Systems exercising this option must take and analyze a confirmation sample within two weeks of notification of the analytical results of the first sample.

(B) The executive director may require a confirmation sample for any sample with questionable results.

(8) The executive director may require more frequent monitoring than specified in paragraphs (3)-(6) of this subsection.

(d) Analytical requirements for inorganic contaminants. Analytical procedures shall be performed in accordance with §290.119 of this title (relating to Analytical Procedures). Testing for inorganic contaminants shall be performed at a laboratory certified by the Texas Department of Health (TDH) Bureau of Laboratories.

(e) Reporting requirements for inorganic contaminants. Any owner or operator of a public water system subject to the provisions of this section is required to report to the executive director the results of any inorganic constituent analyses, measurement, or analysis required to be made by these standards within ten days following such test, measurement, or analysis.

(f) Compliance determination for inorganic contaminants. Compliance with this section shall be determined using the following criteria.

(1) Compliance with the MCL for each inorganic contaminant shall be based on the analytical results obtained at each individual sampling point.

(2) A public water system that exceeds the levels for nitrate, nitrite, or the sum of nitrate and nitrite specified in subsection (b) of this section commits an acute MCL violation.

(A) For systems that are sampling annually or less frequently, compliance shall be based on the results of the single sample. If a confirmation sample is collected, the compliance will be based on the average result of the original and confirmation samples.

(B) For systems that are sampling more frequently than annually, compliance is based on the running annual average for each sampling point.

(C) If any one sample would cause the running annual average to be exceeded, then the system is out of compliance immediately.

(3) A public water system that exceeds the levels of antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium, or thallium (i.e., any inorganic contaminant except nitrate and nitrite) specified in subsection (b) of this section commits an MCL violation.

(A) If a confirmation sample is not collected, compliance shall be based on the results of each original sample.

(B) If a confirmation sample is collected, the compliance will be based on the average result of the original and confirmation samples.

(4) Any result below the method detection limit shall be considered to be zero for the purpose of calculating compliance.

(5) The executive director may exclude the results of obvious sampling errors from the compliance calculations.

(g) Public notice for inorganic contaminants. A public water system that violates the requirements of this section must notify the executive director and the system's customers.

(1) A public water system that violates the MCL for nitrate, nitrite, or the sum of nitrate and nitrite shall notify the executive director by the next business day and the water system customers of this acute violation in accordance with the requirements of §290.122(a) of this title (relating to Public Notification).

(2) A public water system that violates the MCL for nitrate, nitrite, or the sum of nitrate and nitrite that is unable to comply with the 24-hour confirmation sampling requirement must immediately notify the consumers served by the public water system in accordance with §290.122(a) of this title.

(3) A public water system that fails to meet the MCL for any of the regulated inorganic contaminants except nitrate and nitrite (i.e., antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium and thallium) shall notify the executive

director by the end of the next business day and the water system customers in accordance with the requirements of §290.122(b) of this title.

(4) A public water system which fails to conduct the monitoring required by this section must notify its customers of the violation in accordance with the requirements of §290.122(c) of this title.

(5) If a public water system has a distribution system separable from other parts of the distribution system with no interconnections, the executive director may allow the system to give public notice to only the area served by that portion of the system which is out of compliance.

(h) Best Available Technology (BAT) for inorganic contaminants. Best available technology for treatment of violations of MCLs in subsection (b) of this section are listed in 40 CFR §141.62.

§290.107. Organic Contaminants.

(a) Applicability. All community and nontransient, non-community water systems shall comply with the requirements of this section regarding organic contaminants. For purposes of this section, systems using groundwater under the direct influence of surface water shall meet the organic sampling requirements given for surface water systems.

(b) Maximum contaminant levels (MCLs) for organic contaminants. The concentration of synthetic and volatile organic chemicals shall not exceed the maximum contaminant levels specified in this section.

(1) The following are MCLs for synthetic organic contaminants (SOCs).

Figure 30 TAC §290.107(b)(1).

<u>Contaminant</u>	<u>MCL (mg/l)</u>
<u>Alachlor</u>	<u>0.002</u>
<u>Atrazine</u>	<u>0.003</u>
<u>Benzo[a]pyrene</u>	<u>0.0002</u>
<u>Carbofuran</u>	<u>0.04</u>
<u>Chlordane</u>	<u>0.002</u>
<u>Dalapon</u>	<u>0.2</u>
<u>Dibromochloropropane</u>	<u>0.0002</u>
<u>Di(2-ethylhexyl)adipate</u>	<u>0.4</u>
<u>Di(2-ethylhexyl)phthalate</u>	<u>0.006</u>
<u>Dinoseb</u>	<u>0.007</u>
<u>Diquat</u>	<u>0.02</u>
<u>Endothall</u>	<u>0.1</u>

<u>Endrin</u>	<u>0.002</u>
<u>Ethylene dibromide</u>	<u>0.00005</u>
<u>Glyphosate</u>	<u>0.7</u>
<u>Heptachlor</u>	<u>0.0004</u>
<u>Heptachlor epoxide</u>	<u>0.0002</u>
<u>Hexachlorobenzene</u>	<u>0.001</u>
<u>Hexachlorocyclopentadiene</u>	<u>0.05</u>
<u>Lindane</u>	<u>0.0002</u>
<u>Methoxychlor</u>	<u>0.04</u>
<u>Oxamyl (Vydate)</u>	<u>0.2</u>
<u>Pentachlorophenol</u>	<u>0.001</u>
<u>Picloram</u>	<u>0.5</u>
<u>Polychlorinated biphenyls (PCB)</u>	<u>0.0005</u>
<u>Simazine</u>	<u>0.004</u>
<u>Toxaphene</u>	<u>0.003</u>
<u>2,3,7,8-TCDD (Dioxin)</u>	<u>3 X 10⁻⁸</u>
<u>2,4,5-TP</u>	<u>0.05</u>
<u>2,4-D</u>	<u>0.07</u>

(2) The following are MCLs for volatile organic contaminants (VOCs).

Figure 30 TAC §290.107(b)(2)

<u>Contaminant</u>	<u>MCL (mg/l)</u>
<u>1,1-Dichloroethylene</u>	<u>0.007</u>
<u>1,1,1-Trichloroethane</u>	<u>0.2</u>
<u>1,1,2-Trichloroethane</u>	<u>0.005</u>
<u>1,2-Dichloroethane</u>	<u>0.005</u>
<u>1,2-Dichloropropane</u>	<u>0.005</u>
<u>1,2,4-Trichlorobenzene</u>	<u>0.07</u>
<u>Benzene</u>	<u>0.005</u>
<u>Carbon tetrachloride</u>	<u>0.005</u>
<u>cis-1,2-Dichloroethylene</u>	<u>0.07</u>
<u>Dichloromethane</u>	<u>0.005</u>
<u>Ethylbenzene</u>	<u>0.7</u>
<u>Monochlorobenzene</u>	<u>0.1</u>
<u>o-Dichlorobenzene</u>	<u>0.6</u>
<u>para-Dichlorobenzene</u>	<u>0.075</u>
<u>Styrene</u>	<u>0.1</u>
<u>Tetrachloroethylene</u>	<u>0.005</u>
<u>Toluene</u>	<u>1.0</u>
<u>trans-1,2-Dichloroethylene</u>	<u>0.1</u>

<u>Trichloroethylene</u>	<u>0.005</u>
<u>Vinyl chloride</u>	<u>0.002</u>
<u>Xylenes (total)</u>	<u>10.0</u>

(3) Each public water system must certify annually to the executive director (using third party or manufacturer's certification) that when acrylamide or epichlorohydrin are used in drinking water systems, the combination (or product) of dose and monomer level does not exceed 0.05% dosed at 1 ppm (or equivalent) for acrylamide and 0.01% dosed at 20 ppm (or equivalent) for epichlorohydrin.

(c) Monitoring requirements for organic contaminants. Public water systems shall monitor for organic contaminants at the locations and frequency in paragraphs (1) and (2) of this subsection. All monitoring conducted pursuant to the requirements of this section must be conducted at sites designated in the public water system's monitoring plan. All samples must be taken during periods of normal operation when water representative of all sources used by the system is being used.

(1) SOC monitoring requirements. Monitoring of the SOC contaminants shall be conducted at the frequency and locations given in this paragraph.

(A) SOC monitoring locations. Monitoring of the SOC contaminants shall be conducted at the following locations.

(i) Systems treating only groundwater shall sample for SOCs at every point of entry to the distribution system which is representative of each well after treatment.

Subsequent samples must be taken at the same point of entry to the distribution system unless a change in conditions makes another point of entry to the distribution system more representative of each source or treatment plant. The executive director must approve any change in sampling location.

(ii) Systems using surface water and systems treating groundwater under the direct influence of surface water shall sample for SOCs at points in the distribution system that are representative of each source or at each entry point to the distribution system. Subsequent samples must be taken at the same points of entry to the distribution system unless a change in conditions makes another point of entry to the distribution system more representative of each source or treatment plant. The executive director must approve any change in sampling location.

(B) SOC monitoring frequency. Monitoring of the SOC contaminants shall be conducted at the following frequency.

(i) Community and nontransient noncommunity water systems shall take four consecutive quarterly samples for each SOC contaminant listed in subsection (b)(1) of this section during each compliance period beginning with the initial compliance period.

(ii) Community and nontransient noncommunity water systems serving more than 3,300 persons that do not detect a contaminant in the initial compliance period may reduce

the sampling frequency to a minimum of two consecutive quarterly samples in one year during each repeat compliance period.

(iii) Community and nontransient noncommunity water systems serving 3,300 persons or fewer that do not detect a contaminant in the initial compliance period may reduce the sampling frequency to a minimum of one sample during each repeat compliance period.

(iv) Each public water system shall monitor at the time designated by the executive director within each compliance period.

(C) Increased SOC monitoring. The executive director may change the monitoring frequency for SOCs.

(i) Systems which violate the SOC MCL's of subsection (b)(1) of this section as determined by subsection (f) of this section must monitor quarterly. After a minimum of four quarterly samples shows the system is in compliance and the executive director determines the system is reliably and consistently below the MCL, as determined by the methods specified in subsection (f) of this section, the executive director may allow the system to monitor annually. Systems which monitor annually must monitor during the quarter that previously yielded the highest analytical result.

(ii) The executive director may change the monitoring frequency if an organic SOC contaminant is detected in any sample.

(I) If an organic SOC contaminant is detected in any sample, the system must monitor quarterly at each point of entry to the distribution system at which a detection occurs.

(II) After a groundwater system collects a minimum of two consecutive quarterly samples, the executive director may decrease the quarterly monitoring requirement specified in subclause (I) of this clause, if the system is reliably and consistently below the MCL.

(III) After a surface water system or system treating groundwater under the direct influence of surface water collects a minimum of four consecutive quarterly samples, the executive director may decrease the quarterly monitoring requirement specified in subclause (I) of this clause, if the system is reliably and consistently below the MCL.

(IV) After the executive director determines that a system is reliably and consistently below the MCL, the executive director may allow the system to monitor annually. Systems which monitor annually must monitor during the quarter that previously yielded the highest analytical result.

(V) Systems which have three consecutive annual samples with no detection of a contaminant may be granted a waiver at the discretion of the executive director. The executive director will consider the waiver for each compliance period.

(VI) If monitoring results in detection of one or more of certain related contaminants (i.e., heptachlor, and heptachlor epoxide), then subsequent monitoring shall analyze for all related contaminants.

(iii) The executive director may increase the required SOC monitoring frequency, where necessary, to detect variations within the system (e.g., fluctuations in concentration due to seasonal use, changes in water source, etc.).

(iv) The executive director may require a confirmation sample for positive or negative results. If a confirmation sample is required by the executive director, the result must be averaged with the first sampling result and the average used for the compliance determination as specified by subsection (f) of this section. The executive director has discretion to delete results of obvious sampling errors from this calculation.

(D) Waivers for SOC monitoring. The executive director may grant a waiver to reduce the SOC monitoring frequency from the monitoring frequency requirements of subsection (c)(1)(B) of this section, based on previous use of the contaminant within the watershed or zone of influence of the water source. Examples of use of a contaminant include transport, storage, or disposal. If a determination by the executive director reveals no previous use of the contaminant within the watershed or zone of influence, a waiver may be granted. If the executive director cannot determine whether the contaminant has been used in the watershed or if the contaminant has been used previously, then the following factors shall be used to determine whether a waiver is granted:

(i) previous analytical results;

(ii) the proximity of the system to a potential point or non-point source of contamination. Point sources include spills and leaks of chemicals at or near a water treatment facility or at drinking water sources, manufacturing, distribution, or storage facilities, or from hazardous and municipal waste landfills and other waste handling or treatment facilities. Non-point sources include the use of pesticides to control insects, weeds, or pests on agricultural areas, forest lands, home and garden property, or other land application uses;

(iii) the environmental persistence and transport of the pesticide herbicide or contaminant;

(iv) how well the water source is protected against contamination due to such factors as depth of the well, type of soil and the integrity of well construction. Surface water systems must consider watershed vulnerability and protection;

(v) elevated nitrate levels at the water supply source; and

(vi) use of PCBs in equipment used in the production, storage, or distribution of water (i.e., PCBs used in pumps, transformers, etc.).

(E) Compositing for SOC monitoring. The executive director may reduce the total number of samples required from a system for analysis by allowing the use of compositing. Composite samples from a maximum of five points of entry to the distribution system are allowed. Compositing of samples must be done in the laboratory and analyzed within 14 days of sample collection.

(i) If, in the composite sample, a detection of one or more SOC contaminants listed in subsection (b)(1) of this section occurs, then a follow-up sample must be taken from each point of entry to the distribution system included in the composite and analyzed within 14 days of collection.

(ii) If duplicates of the original SOC sample taken from each point of entry to the distribution system used in the composite are available, the executive director may use these duplicates instead of resampling. The duplicate must be analyzed within 14 days of collection and the results reported to the executive director.

(iii) Compositing may only be permitted at points of entry to the distribution system within a single system.

(F) Initial SOC monitoring. If monitoring data are generally consistent with the requirements of this subsection (c)(1) of this section, then the executive director may allow systems to use that data to satisfy the monitoring requirement for the initial compliance period.

(2) VOC monitoring requirements. Monitoring of the VOC contaminants shall be conducted at the frequency and locations given in this paragraph.

(A) VOC monitoring locations. Monitoring of the VOC contaminants shall be conducted at the following locations.

(i) Systems that use only groundwater shall sample for VOCs at every entry point to the distribution system which is representative of each well after treatment. Subsequent samples must be taken at the same point of entry to the distribution system unless a change in conditions makes another point of entry to the distribution system more representative of each source or treatment plant. The executive director must approve any change in sampling location.

(ii) Surface water systems, systems using groundwater under the direct influence of surface water, and systems blending groundwater and surface water shall sample for VOCs at points in the distribution system that are representative of each source or at each point of entry to the

distribution system. Subsequent samples must be taken at the same points of entry to the distribution system unless a change in conditions makes another point of entry to the distribution system more representative of each source or treatment plant. The executive director must approve any change in sampling location.

(B) VOC monitoring frequency. Monitoring of the VOC contaminants shall be conducted at the following frequency.

(i) Community and nontransient noncommunity water systems shall take four consecutive quarterly samples for each VOC contaminant listed in subsection (b)(2) of this section during each compliance period, beginning with the initial compliance period.

(ii) If the initial monitoring for VOC contaminants has been completed by December 31, 1992, and the system did not detect any VOC contaminant listed in subsection (b)(2) of this section, the system shall take one sample annually beginning with the initial compliance period.

(iii) After a minimum of three years of annual sampling, the executive director may allow groundwater systems with no previous detection of any VOC contaminant listed in subsection (b)(2) of this section to take one sample during each compliance period.

(iv) Each community and nontransient groundwater system which does not detect a VOC contaminant listed in subsection (b)(2) of this section may be granted a waiver from

the annual or triannual requirements of subsection (c)(2)(B)(ii) and (c)(2)(B)(iii) of this section after completing the initial monitoring. For the purposes of this section, detection is defined as ≥ 0.0005 mg/l. A waiver shall be effective for no more than six years (two compliance periods).

(v) Each public water system shall monitor at the time designated by the executive director within each compliance period.

(C) Increased VOC monitoring. The executive director may change the monitoring frequency for VOCs.

(i) Systems which violate the VOC MCLs of subsection (b)(2) of this section, as determined by subsection (f) of this section, must monitor quarterly. After a minimum of four consecutive quarterly samples that show the system is in compliance as specified in subsection (f) of this section and after the executive director determines that the system is reliably and consistently below the MCL, the executive director may allow the system to monitor annually during the quarter that previously yielded the highest analytical result.

(ii) The executive director may require a confirmation sample for positive or negative results. If a confirmation sample is required by the executive director, the result must be averaged with the first sampling result and the average is used for the compliance determination as specified by subsection (f) of this section. The executive director has discretion to delete results of obvious sampling errors from this calculation.

(iii) If a VOC contaminant listed in subsection (b)(2) of this section is detected at a level exceeding 0.0005 mg/l in any sample, then:

(I) the system must monitor quarterly at each point of entry to the distribution system which resulted in a detection;

(II) the executive director may decrease the quarterly monitoring requirement specified in subsection (c)(2)(C)(iii)(I) of this section provided it has determined that the system is reliably and consistently below the maximum contaminant level. In no case shall the executive director make this determination unless a groundwater system takes a minimum of two quarterly samples and a surface water system takes a minimum of four quarterly samples;

(III) If the executive director determines that the system is reliably and consistently below the MCL, the executive director may allow the system to monitor annually. Systems which monitor annually must monitor during the quarter which previously yielded the highest analytical result;

(IV) Systems which have three consecutive annual samples with no detection of a contaminant may be granted a waiver as specified in subsection (c)(2)(D) of this section; and

(V) Groundwater systems which have detected one or more of the following two-carbon organic compounds: trichloroethylene, tetrachloroethylene, 1,2-dichloroethane, 1,1,1-trichloroethane, cis-1,2-dichloroethylene, trans-1,2-dichloroethylene, or 1,1-dichloroethylene shall monitor quarterly for vinyl chloride. A vinyl chloride sample shall be taken at each point of entry to the distribution system at which one or more of the two-carbon organic compounds was detected. If the result of the first analysis does not detect vinyl chloride, the executive director may reduce the quarterly monitoring frequency for vinyl chloride to one sample during each compliance period. Surface water systems are required to monitor for vinyl chloride as specified by the executive director.

(iv) The executive director may increase the required SOC monitoring frequency, where necessary, to detect variations within the system (e.g., fluctuations in concentration due to seasonal use, changes in water source, etc.).

(D) Waivers for VOC monitoring. The executive director may grant a waiver after evaluating the previous use (including transport, storage, or disposal) of the contaminant within the watershed or zone of influence of the water sources. If a determination by the executive director reveals no previous use of the contaminant within the watershed or zone of influence, a waiver may be granted. If previous use of the contaminant is unknown or it has been used previously, then the following factors shall be used to determine whether a waiver is granted:

(i) previous analytical results;

(ii) the proximity of the system to a potential point or non-point source of contamination. Point sources include spills and leaks of chemicals at or near a water treatment facility or at drinking water sources manufacturing, distribution, or storage facilities, or from hazardous and municipal waste landfills and other waste handling or treatment facilities;

(iii) the environmental persistence and transport of the contaminants;

(iv) the number of persons served by the public water system and the proximity of a smaller system to a larger system;

(v) how well the water source is protected against contamination (e.g., is it a surface or groundwater system). Groundwater systems must consider factors such as depth of the well, the type of soil, and well construction. Surface water systems must consider watershed protection;

(vi) As a condition of the waiver a groundwater system must take one sample at each point of entry to the distribution system during the time the waiver is effective (i.e., one sample during two compliance periods or six years) and update its vulnerability assessment considering the factors listed in this paragraph. Based on this updated vulnerability assessment the executive director must reconfirm that the system is not vulnerable. If the executive director does not make this

reconfirmation within three years of the initial determination, then the waiver is invalid and the system is required to sample annually; and

(vii) Community and nontransient surface water systems which do not detect a VOC contaminant listed in subsection (b)(2) of this section may be considered by the executive director for a waiver from the annual sampling requirements of subsection (c)(2)(B)(ii) of this section after completing the initial monitoring. Systems meeting this criteria must be determined by the executive director to be non-vulnerable based on a vulnerability assessment during each compliance period. Each system receiving a waiver shall sample at the frequency specified by the executive director (if any).

(E) Compositing for VOC monitoring. The executive director may reduce the total number of samples a system must analyze by allowing the use of compositing. Composite samples from a maximum of five points of entry to the distribution system are allowed. Compositing of samples must be done in the laboratory and analyzed within 14 days of sample collection.

(i) If the VOC concentration in the composite sample is ≥ 0.0005 mg/l for any contaminant listed in subsection (b)(2) of this section, then a follow-up sample must be taken and analyzed within 14 days from each point of entry to the distribution system included in the composite.

(ii) If duplicates of the original sample taken from each point of entry to the distribution system used in the composite are available, the system may use these instead of resampling. The duplicate must be analyzed and the results reported to the public drinking water program within 14 days of collection.

(iii) Compositing may only be permitted by the executive director at points of entry to the distribution system within a single system.

(iv) Procedures for compositing VOC samples are as stated in 40 CFR §141.24 (f)(14)(iv).

(d) Analytical requirements for organic contaminants. Analytical procedures shall be performed in accordance with §290.119 of this title (relating to Analytical Procedures). Testing for organic contaminants shall be performed at a laboratory certified by the TDH Bureau of Laboratories.

(e) Reporting requirements for organic contaminants. Any owner or operator of a public water system subject to the provisions of this section is required to report to the public drinking water program the results of any test, measurement, or analysis required to be made by this section within ten days following such test, measurement, or analysis.

(f) Compliance determination for organic contaminants. Compliance with the MCLs of subsection (b)(1) and (2) of this section shall be determined based on the analytical results obtained at each point of entry to the distribution system.

(1) For systems which are sampling more than once a year, compliance is determined by a running annual average of all samples taken at each point of entry to the distribution system. If the annual average at any point of entry to the distribution system is greater than the MCL, the system commits an MCL violation. If the initial sample or a subsequent sample would cause the annual average to be exceeded, then the system is out of compliance immediately. Any samples below the detection limit shall be considered to be zero for purposes of calculating the annual average.

(2) For systems which are sampling once a year or less, compliance is based on a single sample. If the level of a contaminant at any point of entry to the distribution system is greater than the MCL, the system commits an MCL violation. If a confirmation sample is required by the executive director, the determination of compliance will be based on the average of the two samples.

(3) The executive director has the authority to determine compliance or initiate enforcement action based upon analytical results and other information compiled by their sanctioned representatives and agencies.

(g) Public notification requirements for organic contaminants. A public water system that violates the requirements of this section must notify the public drinking water program and the system's

customers. If a public water system has a distribution system separate from other parts of the distribution system with no interconnections, the executive director may allow the system to give public notice to only that portion of the system which is out of compliance.

(1) A system that violates an MCL given in subsection (b) of this section, shall report to the public drinking water program and notify the public as provided under §290.122(b) of this title (relating to Public Notification).

(2) A public water system which fails to conduct the monitoring required by this section must notify its customers of the violation in accordance with the requirements of §290.122(c) of this title (relating to Public Notification).

(h) Best available technology (BAT) for organic contaminants. Best available technology for treatment of violations of MCLs in subsection (b) of this section are listed in 40 CFR §141.61. Copies are available for review in the Water Permitting and Resource Management Division, Texas Natural Resource Conservation Commission, P. O. Box 13087 Austin, Texas 78711-3087.

§290.108. Radiological Sampling and Analytical Requirements.

(a) Applicability. All community and nontransient, noncommunity water systems shall comply with the requirements of this section regarding radiological contaminants. Public water systems treating

groundwater under the direct influence of surface water must comply with the radiological requirements for surface water systems.

(b) Maximum contaminant levels (MCLs). The concentration of radiological contaminants in the water entering the distribution system shall not exceed the following maximum contaminant levels.

(1) MCLs for radium-226, radium-228 and gross alpha particle radioactivity for community systems are as follows:

(A) the MCL for combined radium-226 and radium-228 is 5 pCi/l; and

(B) the MCL for gross alpha particle activity (including radium-226 but excluding radon and uranium) is 15 pCi/l.

(2) Maximum contaminant levels for beta particle and photon radioactivity from man-made radionuclides in drinking water in community water systems are as follows:

(A) The average annual concentration of beta particle and photon radioactivity from man-made radionuclides in drinking water shall not produce an annual dose equivalent to the total body or any internal organ greater than four millirem (mrem)/year.

(B) Except for the radionuclides listed in Table A, the concentration of man-made radionuclides causing four mrem total body or organ dose equivalents shall be calculated on the basis of a two-liter-per-day drinking water intake using the 168 hour data listed in "Maximum Permissible Body Burdens and Maximum Permissible Concentration of Radionuclides in Air or Water for Occupational Exposure," NBS Handbook 69 as amended August 1963, U.S. Department of Commerce. If two or more radionuclides are present, the sum of their annual dose equivalent to the total body or to any organ shall not exceed four mrem/year.

Figure 30 TAC §290.108(b)(2)(B)

Table A - Average annual concentrations assumed to produce a total body or organ dose of four mrem/year.

<u>Radionuclide</u>	<u>Critical Organ</u>	<u>pCi Per Liter</u>
<u>Tritium</u>	<u>Total Body</u>	<u>20,000</u>
<u>Strontium-90</u>	<u>Bone Marrow</u>	<u>8</u>

(c) Monitoring requirements. Public water systems shall measure the concentration of radiochemicals at locations and frequencies specified in the system's monitoring plan. All samples must be collected during normal operating conditions.

(1) The monitoring frequency requirements for gross alpha particle activity, radium-226 and radium-228 are as follows. Suppliers of water shall monitor at least once every four

years following the procedure required by subsection (f)(1) of this section. At the discretion of the executive director, when an annual record taken in conformance with subsection (f)(1) of this section has established that the average annual concentration is less than one-half the maximum contaminant levels established by subsection (b) of this section, analysis of a single sample may be substituted for the quarterly sampling procedure required by subsection (f)(1) of this section.

(A) More frequent monitoring shall be conducted when required by the executive director in the vicinity of mining or other operations which may contribute alpha particle radioactivity to either surface or groundwater sources of drinking water, or when changes in the distribution system or treatment processing occur which may increase the concentration of radioactivity in the finished water.

(B) A supplier of water shall monitor in conformance with subsection (c)(1)(A) of this section within one year of the introduction of a new water source for a community water system.

(C) A community water system using two or more sources having different concentrations of radioactivity shall monitor the source of water, in addition to water from a free-flowing tap, when required by the executive director.

(D) Monitoring for compliance with subsection (b) of this section after the initial period need not include radium-228 provided that the average concentration of radium-228 has been assayed at least once using the quarterly sampling procedure required by this subsection.

(E) Suppliers of water shall conduct annual monitoring of any community water system in which the radium 226 concentration exceeds three pCi/l when required by the executive director.

(2) The monitoring frequency requirements for man-made radioactivity in community water systems are as follows:

(A) Systems using surface water sources and serving more than 100,000 persons and such other community water systems as are designated by the executive director shall be monitored for compliance with the subsection (b) of this section by analysis of four quarterly samples. Compliance with subsection (b) of this section may be assumed without further analysis if the average annual concentration of gross beta particle activity is less than 50 pCi/l and if the average annual concentrations of tritium and strontium-90 are less than those listed in Table A of subsection (b)(2)(B) of this section, provided that if both radionuclides are present, the sum of their annual dose equivalents to bone marrow shall not exceed four mrem/year.

(i) If the gross beta particle activity exceeds 50 pCi/l, an analysis of the sample must be performed to identify the major radioactive constituents present and the appropriate

organ and total body doses shall be calculated to determine compliance with subsection (b) of this section.

(ii) Suppliers of water shall conduct additional monitoring as required by the executive director to determine the concentration of man-made radioactivity in principal watersheds designated by the executive director.

(iii) At the discretion of the executive director, suppliers of water utilizing only groundwater may be required to monitor for man-made radioactivity.

(B) After the initial analysis required by subsection (c)(2)(A) of this section, suppliers of water shall monitor at least every four years following the procedure given in subsection (c)(2)(A) of this section.

(C) The supplier of any community water system designated by the executive director as utilizing waters contaminated by effluents from nuclear facilities shall initiate quarterly monitoring for gross beta particle and iodine-131 radioactivity and annual monitoring for strontium-90 and tritium.

(i) Quarterly monitoring for gross beta particle activity shall be based on the analysis of monthly samples. If the gross beta particle activity in a sample exceeds 15 pCi/l, the same or an equivalent sample shall be analyzed for strontium-89 and cesium-134. If the gross beta

particle activity exceeds 50 pCi/L, an analysis of the sample must be performed to identify the major radioactive constituents present and the appropriate organ and total body doses shall be calculated to determine compliance with subsection (b) of this section.

(ii) For iodine-131, a composite of five consecutive daily samples shall be analyzed once each quarter. When iodine-131 is identified in the finished water more frequent monitoring shall be conducted as required by the executive director.

(iii) Annual monitoring for strontium-90 and tritium shall be conducted by the analysis of four quarterly samples.

(iv) The executive director may allow the substitution of environmental surveillance data taken in conjunction with a nuclear facility for direct monitoring of man-made radioactivity by the supplier of water where the executive director determines such data is applicable to a particular community water system.

(d) Analytical requirements for radiological contaminants. Analytical procedures shall be performed in accordance with §290.119 of this title (relating to Analytical Procedures). Testing for radiological contaminants shall be performed at a laboratory certified by the TDH Bureau of Laboratories.

(e) Reporting requirements. Any owner or operator of a public water system subject to the provisions of this section is required to report to the executive director the results of any test, measurement, or analysis required to be made by this section within ten days following such test, measurement, or analysis.

(f) Compliance determination. Compliance with the requirements of this section shall be determined as follows.

(1) If the average annual MCL for gross alpha particle activity or total radium as set forth in subsection (b) of this section is exceeded, the system has committed a MCL violation. Monitoring at quarterly intervals shall be continued until the annual average concentration no longer exceeds the maximum contaminant level or until a monitoring schedule as a condition to a variance, exemption or enforcement action shall become effective. Compliance with subsection (b) of this section shall be based on the analysis or analyses of four quarterly samples.

(A) A gross alpha particle activity measurement may be substituted for the required radium-226 and radium-228 analysis provided that the measured gross alpha particle activity does not exceed five pCi/l at a confidence level of 95% (1.65θ where θ is the standard deviation of the net counting rate of the sample).

(B) When the gross alpha particle activity exceeds five pCi/l, the same or an equivalent sample shall be analyzed for radium-226. If the concentration of radium-226 exceeds three pCi/l the same or an equivalent sample shall be analyzed for radium- 228.

(2) If the average annual maximum contaminant level for man-made radioactivity set forth in subsection (b) of this section is exceeded, the system has committed a MCL violation.

Monitoring at monthly intervals shall be continued until the concentration no longer exceeds the maximum contaminant level or until a monitoring schedule as a condition to a variance, exemption or enforcement action shall become effective.

(3) A public water system that fails to conduct the monitoring tests required by this subsection commits a monitoring violation.

(4) A public water system that fails to report the results of the monitoring tests required by this subsection commits a reporting violation.

(g) Public notification. A public water system that violates the requirements of this subsection must notify the public drinking water program and the system's customers.

(1) A public water system that violates the MCL for gross alpha particle activity or total radium shall give notice to the public drinking water program and notify the public as required by §290.122(b) of this title (relating to Public Notification).

(2) The operator of a community water system that violates the MCL for man-made radioactivity shall give notice to the public drinking water program and to the public as required by §290.122(b) of this title.

(3) A public water system which fails to conduct the monitoring required by this subsection must notify its customers of the violation in accordance with the requirements of §290.122(c) of this title.

§290.109. Microbial Contaminants.

(a) Applicability. All public water systems must produce and distribute water that meets the provisions of this section regarding microbial contaminants.

(b) Maximum contaminant levels for microbial contaminants. The MCL for microbial contaminants is based on the presence or absence of total coliform bacteria in a sample.

(1) For a system which collects at least 40 bacteriological samples per month, the MCL is 5.0 % total coliform-positive samples, of the samples collected during the month.

(2) For a system which collects fewer than 40 samples/month, the MCL is one total coliform-positive sample, of the samples collected during the month.

(c) Monitoring requirements for microbial contaminants. Public water systems shall collect samples for total coliform and for fecal coliform or *Escherichia coli*. All compliance samples must be collected during normal operating conditions.

(1) Routine microbial sampling locations. Public water systems shall routinely monitor for microbial contaminants at the following locations.

(A) Public water systems must collect routine bacteriological samples at active service connections which are representative of water throughout the distribution system. Other sampling sites may be used if located adjacent to service connections.

(B) Public water systems shall monitor for microbial contaminants at locations specified in the system's monitoring plan.

(2) Routine microbial sampling frequency. Public water systems must sample for microbiological contaminants at the following frequency.

(A) Community and noncommunity public water systems must collect routine bacteriological samples at a frequency based on the population served by the system:

(i) the population for noncommunity systems will be based on the maximum number of persons served on any given day during the month;

(ii) the population of community systems will be based on the data reported during the most recent sanitary survey of the public water system; and

(iii) the minimum sampling frequency for public water systems is

shown in the following table.

Figure 30 TAC §290.109(c)(2)(A)

<u>Population Served</u>	<u>per Month</u>
<u>1 to 1,000</u>	<u>1</u>
<u>1,001 to 2,500</u>	<u>2</u>
<u>2,501 to 3,300</u>	<u>3</u>
<u>3,301 to 4,100</u>	<u>4</u>
<u>4,101 to 4,900</u>	<u>5</u>
<u>4,901 to 5,800</u>	<u>6</u>
<u>5,801 to 6,700</u>	<u>7</u>
<u>6,701 to 7,600</u>	<u>8</u>
<u>7,601 to 8,500</u>	<u>9</u>
<u>8,501 to 12,900</u>	<u>10</u>
<u>12,901 to 17,200</u>	<u>15</u>
<u>17,201 to 21,500</u>	<u>20</u>
<u>21,501 to 25,000</u>	<u>25</u>
<u>25,001 to 33,000</u>	<u>30</u>
<u>33,001 to 41,000</u>	<u>40</u>
<u>41,001 to 50,000</u>	<u>50</u>
<u>50,001 to 59,000</u>	<u>60</u>

<u>59,001 to 70,000</u>	<u>70</u>
<u>70,001 to 83,000</u>	<u>80</u>
<u>83,001 to 96,000</u>	<u>90</u>
<u>96,001 to 130,000</u>	<u>100</u>
<u>130,001 to 220,000</u>	<u>120</u>
<u>220,001 to 320,000</u>	<u>150</u>
<u>320,001 to 450,000</u>	<u>180</u>
<u>450,001 to 600,000</u>	<u>210</u>
<u>600,001 to 780,000</u>	<u>240</u>
<u>780,001 to 970,000</u>	<u>270</u>
<u>970,001 to 1,230,000</u>	<u>300</u>
<u>1,230,001 to 1,520,000</u>	<u>330</u>
<u>1,520,001 to 1,850,000</u>	<u>360</u>
<u>1,850,001 to 2,270,000</u>	<u>390</u>
<u>2,270,001 to 3,020,000</u>	<u>420</u>
<u>3,020,001 to 3,960,000</u>	<u>450</u>
<u>3,960,001 or more</u>	<u>480</u>

(B) A public water system which uses surface water or groundwater under the direct influence of surface water must collect samples at regular time intervals throughout the month.

(C) A public water system which uses only purchased water or groundwater not under the direct influence of surface water and serves more than 4,900 persons must collect samples at regular time intervals throughout the month.

(D) A public water system which uses only purchased water or groundwater not under the direct influence of surface water and serves 4,900 persons or fewer may collect all required samples on a single day if they are taken from different sites.

(E) A total coliform-positive sample invalidated under this subsection does not count towards meeting the minimum routine monitoring requirements of this subsection.

(F) If a system collecting fewer than five routine samples per month has one or more total coliform-positive samples and the executive director does not invalidate the sample(s) in accordance with subsection (c)(4) of this section, it must collect at least five routine samples during the next month the system provides water to the public.

(3) Repeat microbial monitoring requirements. Systems shall conduct repeat monitoring if one or more of the routine samples is found to contain coliform organisms.

(A) If a routine sample is total coliform-positive, the public water system must collect a set of repeat samples within 24 hours of being notified of the positive result, or as soon as possible if the local laboratory is closed.

(i) A system which collects more than one routine sample per month must collect no fewer than three repeat samples for each total coliform-positive sample found.

(ii) A system which collects one routine sample per month must collect no fewer than four repeat samples for each total coliform-positive sample found.

(B) The system must collect all repeat samples on the same day, except that a system with a single service connection may collect daily repeat samples until the required number of repeat samples has been collected.

(C) The system must collect at least one repeat sample from the sampling tap where the original total coliform-positive sample was taken, and at least one repeat sample at a tap within five service connections upstream and at least one repeat sample at a tap within five service connections downstream of the original sampling site. If a fourth repeat sample is required, it must be collected within five service connections upstream or downstream. If the positive routine sample was collected at the end of the distribution line, one repeat sample must be collected at that point and all other samples must be collected within five connections upstream of that point.

(D) If one or more repeat samples in the set is total coliform-positive, the public water system must collect an additional set of repeat samples in the manner specified in subparagraphs (A)-(C) of this paragraph. The additional samples must be collected within 24-hours of being notified of the positive result or as soon as possible if the local laboratory is closed. The system

must repeat this process until either total coliforms are not detected in one complete set of repeat samples or the system determines that the MCL for total coliforms has been exceeded.

(E) After a system collects a routine sample and before it learns the results of the analysis of that sample, if it collects another routine sample(s) from within five adjacent service connections of the initial sample, and the initial sample is found to contain total coliform bacteria, then the system may count the subsequent sample(s) as a repeat sample instead of as a routine sample.

(4) Sample invalidation. The executive director may invalidate a total coliform-positive sample if one of the following conditions is met.

(A) The executive director may invalidate a sample if the laboratory establishes that improper sample analysis caused the total coliform-positive result.

(B) The executive director may invalidate a sample if the results of repeat samples collected as required by this section determines that the total coliform-positive sample resulted from a domestic or other non-distribution system plumbing problem. The executive director cannot invalidate a sample on the basis of repeat sample results unless all repeat sample(s) collected at the same tap as the original total coliform-positive sample are also total coliform-positive, and all repeat samples collected within five service connections of the original tap are total coliform-negative. Under those circumstances, the system may cease resampling and request that the executive director invalidate the sample. The system must provide copies of the routine positive and all repeat samples.

(C) The executive director may invalidate a sample if there are substantial grounds to believe that the total coliform-positive result is due to a circumstance or condition which does not reflect water quality in the distribution system. In this case, the system must still collect all repeat samples required by this section, and use them to determine compliance with the MCL for total coliforms in subsection (f) of this section. The system must provide written documentation which must state the specific cause of the total coliform-positive sample, and the action the system has taken, or will take, to correct this problem. The executive director may not invalidate a total coliform-positive sample solely on the grounds that all repeat samples are total coliform-negative.

(D) The executive director may invalidate a sample if the laboratory establishes that the sample was unsuitable for analysis.

(E) If a sample is invalidated, the system must collect another sample from the same location as the original sample within 24-hours of being notified, or as soon as possible if the laboratory is closed, and have it analyzed for the presence of total coliforms. The system must continue to resample within 24 hours and have the samples analyzed until it obtains a valid result.

(5) Culture analysis. If any routine or repeat sample is total coliform-positive, that total coliform-positive culture medium will be analyzed to determine if fecal coliforms or *E. coli* bacteria are present. If fecal coliforms or *E. coli* are present, the system must notify the public drinking water program by the end of the day in accordance with subsection (g) of this section.

(d) Analytical requirements for microbial contaminants. Analytical procedures shall be performed in accordance with §290.119 of this title (relating to Analytical Procedures). Testing for microbial contaminants shall be performed at a laboratory certified by the TDH Bureau of Laboratories.

(e) Reporting requirements for microbial contaminants. Any owner or operator of a public water system subject to the provisions of this section is required to report to the public drinking water program the results of any test, measurement, or analysis required to be made by this section within ten days following such test, measurement, or analysis.

(f) Compliance determination for microbial contaminants. Compliance with the requirements of this section shall be determined using the following criteria each month that the system is in operation.

(1) A system commits an acute MCL violation if:

(A) A repeat sample is fecal coliform-positive or *Escherichia coli*-positive; or

(B) A total coliform-positive repeat sample follows a fecal coliform-positive or *Escherichia coli*-positive routine sample.

(2) A system that collects at least 40 bacteriological samples per month commits a nonacute MCL violation if more than 5.0 % of the samples collected during a month are total

coliform-positive, but none of the initial or repeat samples are fecal coliform-positive or *Escherichia coli*-positive.

(3) A system that collects fewer than 40 samples per month commits a nonacute MCL violation if more than one sample collected during a month is total coliform-positive, but none of the initial or repeat samples are fecal coliform-positive or *Escherichia coli*-positive.

(4) A public water system that fails to provide the required number of suitable samples commits a monitoring violation.

(5) A public water system that fails to report the results of the monitoring tests required by this section commits a reporting violation.

(6) Results of all routine and repeat samples not invalidated by the executive director must be included in determining compliance with the MCL for total coliforms.

(7) Samples invalidated by the executive director shall not be included in determining compliance with the MCL for total coliforms.

(8) Special purpose samples, such as those taken to determine whether disinfection practices are sufficient following pipe placement, replacement, or repair, shall not be used to determine compliance with the MCL for microbiological contaminants.

(i) Public notification for microbial contaminants. A system that is out of compliance with the requirements described in this section must notify the public using the procedures described in §290.122 of this title (relating to Public Notification) for microbial contamination.

(1) A public water system that commits an acute MCL violation for microbial contaminants must notify the water system customers in accordance with the requirements of §290.46(s)(3) of this title (relating to Minimum Acceptable Operating Practices for Public Drinking Water Systems) and §290.122(a) of this title.

(2) A public water system that has fecal coliforms or *E. coli* present must notify the public drinking water program by the end of the day when the system is notified of the test result, unless the system is notified of the result after the public drinking water program's office is closed, in which case the system must notify the public drinking water program before the end of the next business day.

(3) A public water system which commits an MCL violation must report the violation to the public drinking water program immediately after it learns of the violation, but no later than the end of the next business day, and notify the public in accordance with §290.122(b) of this title.

(4) A public water system which has failed to comply with a coliform monitoring requirement must report the monitoring violation to the public drinking water program within ten days

after the system discovers the violation and notify the public in accordance with §290.122(c) of this title.

§290.110. Disinfectant Residuals.

(a) Applicability. All public water systems shall properly disinfect water before it is distributed to any customer and shall maintain acceptable disinfectant residuals within the distribution system.

(b) Minimum and maximum acceptable disinfectant concentrations. Public water systems shall provide the minimum levels of disinfectants in accordance with the provisions of this section. Public water systems shall not exceed the maximum residual disinfectant concentrations (MRDLs) provided in this section. The disinfection process at a system treating surface water or groundwater under the direct influence of surface water shall meet the treatment technique requirements provided in this section.

(1) The disinfection protocols used by public water systems with surface water sources or groundwater sources that are under the direct influence of surface water must ensure that the total treatment process achieves at least 99.9% (3-log) inactivation or removal of *Giardia lamblia* cysts and at least 99.99% (4-log) inactivation or removal of viruses before the water is supplied to any consumer. The executive director may require additional levels of treatment in cases of poor source water quality.

(A) The disinfection process at a surface water treatment plant that uses coagulation, flocculation, sedimentation, and filtration facilities shall provide at least a 0.5-log inactivation of *Giardia lamblia* cysts and a 2-log inactivation of viruses.

(B) The disinfection process at a surface water treatment plant or a plant treating groundwater under the direct influence of surface water that uses microfiltration or ultrafiltration processes shall provide at least a 4-log inactivation of viruses.

(C) The disinfection process at other types of treatment plants shall provide the level of disinfection required by the executive director.

(2) The residual disinfectant concentration in the water entering the distribution system shall be at least 0.2 mg/L free chlorine or 0.5 mg/L chloramine.

(3) The chlorine dioxide residual of the water entering the distribution system shall not exceed an MRDL of 0.8 mg/L.

(4) The residual disinfectant concentration in the water within the distribution system shall be at least 0.2 mg/L free chlorine or 0.5 mg/L chloramine.

(5) The running annual average of the free chlorine or chloramine residual of the water within the distribution system shall not exceed an MRDL of 4.0 mg/L.

(A) Effective January 1, 2002, public water systems that serve at least 10,000 people and use surface water sources or groundwater sources that are under the influence of surface water must comply with the MRDL for chlorine and chloramine.

(B) Effective January 1, 2004, systems that serve fewer than 10,000 people and those that serve at least 10,000 people and use groundwater sources must comply with the MRDL for chlorine and chloramine.

(c) Monitoring requirements. Public water systems shall monitor the performance of the disinfection facilities to ensure that appropriate disinfectant levels are maintained. All monitoring conducted pursuant to the requirements of this section must be conducted at sites designated in the public water system's monitoring plan.

(1) Public water systems that treat surface water sources or groundwater sources under the direct influence of surface water must verify that they meet the disinfection requirements of subsection (b)(1) of this section.

(A) The disinfectant residual, pH, temperature, and flow rate of the water in each disinfection zone must be measured at least once each day during a time when peak hourly raw water flow rates are occurring.

(B) Disinfection contact time will be based on tracer study data or a theoretical analysis submitted by the system owner or their designated agent and approved by the executive director and the actual flow rate that is occurring at the time that monitoring occurs.

(C) Treatment plants that fail to demonstrate an appropriate level of treatment must repeat these tests at four-hour or shorter intervals until compliance has been reestablished.

(2) Public water systems that sell treated water on a wholesale basis or serve more than 3,300 people must continuously monitor and record the disinfectant residual of the water entering the distribution system. If there is a failure in the continuous monitoring equipment, grab sampling every four hours may be conducted in lieu of continuous monitoring, but for no more than five working days following the failure of the equipment.

(3) Public water systems that serve 3,300 or fewer people and do not sell treated water on a wholesale basis must monitor and record the disinfectant residual of the water entering the distribution system with either continuous monitors or grab samples.

(A) If a system uses grab samples, the samples must be collected on an ongoing basis at the frequency prescribed in the following table.

Figure 30 TAC §290.110(c)(3)(A)

<u>System Size by Population</u>	<u>Samples/day</u>
<u>500</u>	<u>1</u>
<u>501 to 1,000</u>	<u>2</u>
<u>1,001 to 2,500</u>	<u>3</u>
<u>2,501 to 3,300</u>	<u>4</u>

(B) The grab samples cannot be taken at the same time and the sampling interval is subject to the executive director's review and approval.

(C) Treatment plants that use grab samples and fail to detect an appropriate disinfectant residual must repeat the test at four-hour or shorter intervals until compliance has been reestablished.

(4) Each treatment plant using chlorine dioxide must monitor and record the chlorine dioxide residual of the water entering the distribution system at least once each day. If the chlorine dioxide residual in the water entering the distribution system exceeds the MRDL contained in subsection (b)(3) of this section, the treatment plant must conduct additional tests.

(A) If the public water system does not have additional chlorination facilities in the distribution system, it must conduct three additional tests at the service connection nearest the treatment plant where an elevated chlorine dioxide residual was detected. The first additional test must

be conducted within two hours after detecting an elevated chlorine dioxide residual at the entry point to the distribution system. The two subsequent tests must be conducted at six-hour to eight-hour intervals thereafter.

(B) If the public water system has additional chlorination facilities in the distribution system, it must conduct an additional test at the service connection nearest the treatment plant where an elevated chlorine dioxide residual was detected, an additional test at the first service connection after the point where the water is rechlorinated, and an additional test at a location in the far reaches of the distribution system. The additional test at the location nearest the treatment plant must be conducted within two hours after detecting an elevated chlorine dioxide residual at the entry point to the distribution system. The two other tests must be conducted at six-hour to eight-hour intervals thereafter.

(5) Public water systems shall monitor the disinfectant residual at various locations throughout the distribution system.

(A) Public water systems must conduct daily disinfectant residual tests at representative locations in the distribution system unless they use groundwater or purchased water sources only and serve fewer than 250 connections or 750 people daily.

(B) Public water systems which use groundwater or purchased water sources only and serve fewer than 250 connections or 750 people daily must test the disinfectant residual at representative locations in the distribution system at least once every seven days.

(C) The residual disinfectant concentration must be measured at least at the same points in the distribution system and at the same time as bacteriological samples are collected, as specified in §290.109 of this title (relating to Microbial Contaminants).

(d) Analytical requirements. All monitoring required by this section must be conducted at a facility approved by the executive director and using methods that conform to the requirements of §290.119 of this title (relating to Analytical Procedures).

(1) The pH analysis must be conducted using a pH meter with a minimum accuracy of plus or minus 0.1 pH units.

(2) The temperature of the water must be measured using a thermometer or thermocouple with a minimum accuracy of plus or minus 0.5 degrees Celsius.

(3) The free chlorine residual must be measured to a minimum accuracy of plus or minus 0.1 mg/L using one of the following methods:

(A) Amperometric titration;

(B) DPD Ferrous titration; or

(C) DPD colorimetric.

(i) The free chlorine residual within the treatment plant and at the point where the treated water enters the distribution system must be measured with a colorimeter or spectrophotometer.

(ii) The free chlorine residual within the distribution system must be measured with a colorimeter, spectrophotometer, or color comparator test kit.

(D) Springaldizine (FACTS)

(4) The chloramine residual must be measured to a minimum accuracy of plus or minus 0.1 mg/L using one of the following methods:

(A) Amperometric titration;

(B) DPD Ferrous titration; or

(C) DPD colorimetric.

(i) The chloramine residual within the treatment plant and at the point where the treated water enters the distribution system must be measured with a colorimeter or spectrophotometer.

(ii) The chloramine residual within the distribution system must be measured with a colorimeter, spectrophotometer, or color comparator test kit.

(5) The chlorine dioxide residual must be measured to a minimum accuracy of plus or minus 0.05 mg/L using an amperometric titrator with platinum-platinum electrodes.

(e) Reporting requirements. Any owner or operator of a public water system subject to the provisions of this section is required to report to the public drinking water program the results of any test, measurement, or analysis required to be made by this section within ten days following such test, measurement, or analysis.

(1) The reports must be submitted to the Texas Natural Resource Conservation Commission, Water Permitting and Resource Management Division, P.O. Box 13087, MC 155, Austin, Texas 78711-3087 by the tenth day of the month following the end of the reporting period.

(2) Public water systems that use surface water sources or groundwater sources under the direct influence of surface water must submit a Monthly Operating Report for Surface Water Treatment Plants each month.

(3) Public water systems that use chlorine dioxide must submit a Monthly Report for Chlorine Dioxide Installations each month.

(4) Effective January 1, 2004, public water systems that use purchased water or groundwater sources only must submit a Quarterly Distribution Report for Public Water Systems each quarter.

(f) Compliance determinations. Compliance with the requirements of this section shall be determined using the following criteria.

(1) All samples used for compliance must be obtained at sampling sites designated in the monitoring plan.

(A) All samples collected at sites designated in the monitoring plan as microbiological and disinfectant residual monitoring sites shall be included in the compliance determination calculations.

(B) Samples collected at sites in the distribution system not designated in the monitoring plan shall not be included in the compliance determination calculations.

(2) A public water system that fails to conduct the monitoring tests required by this section commits a monitoring violation.

(3) A public water system that fails to report the results of the monitoring tests required by this section commits a reporting violation.

(4) A public water system that uses surface water sources or groundwater sources under the direct influence of surface water and fails to meet the requirements of subsection (b)(1) or (2) of this section for a period longer than four consecutive hours commits a nonacute treatment technique violation. A public water system that fails to conduct the additional testing required by subsection (c)(1)(C) and (c)(3)(C) of this section also commits a nonacute treatment technique violation.

(5) A public water system that uses chlorine dioxide and exceeds the level specified in subsection (b)(3) of this section violates the MRDL for chlorine dioxide.

(A) If a public water system violates the MRDL for chlorine dioxide and any of the three additional distribution samples exceeds the MRDL, the system commits an acute MRDL violation for chlorine dioxide.

(B) If a public water system violates the MRDL for chlorine dioxide and fails to collect each of the three additional distribution samples required by subsection (c)(2) of this section, the system commits an acute MRDL violation for chlorine dioxide.

(C) If a public water system violates the MRDL for chlorine dioxide but none of the three additional distribution samples violates the MRDL, the system commits a nonacute MRDL violation for chlorine dioxide.

(6) A public water system that fails to meet the requirements of subsection (b)(4) of this section, in more than 5.0% of the samples collected each month, for any two consecutive months, commits a nonacute treatment technique violation. Specifically, the system commits a nonacute violation if the value "V" in the following formula exceeds 5.0% per month for any two consecutive months:

Figure 30 TAC §290.110(f)(6)

$$V = \frac{b}{a} \times 100$$

Where:

a = number of instances where the residual disinfectant concentration is measured during the month;

b = number of instances during the month where
the residual disinfectant concentration is
measured but is detected at less than 0.2 mg/L
free chlorine or less than 0.5 mg/L chloramine.

(7) A public water system violates the MRDL for chlorine or chloramine if, at the end of any quarter, the running annual average of monthly averages exceeds the level specified in subsection (b)(5) of this section.

(8) Notwithstanding the MRDLs listed in subsection (b) of this section, operators shall increase residual disinfectant levels of chlorine or chloramines (but not chlorine dioxide) in the distribution system to a level and for a time necessary to protect public health to address specific microbiological contamination problems caused by circumstances such as distribution line breaks, storm runoff events, source water contamination, or cross-connections.

(g) Public notification requirements. The owner or operator of a public water system that violates the requirements of this section must notify the public drinking water program and the people served by the system.

(1) A public water system that fails to meet the requirements of subsection (b)(3) of this section, shall notify the public drinking water program by the end of the next business day and the customers in accordance with the requirements of §290.122 of this title (relating to Public Notification).

(A) A public water system that has an acute violation of the MRDL for chlorine dioxide must notify the customers in accordance with the requirements of §290.122(a) of this title.

(B) A public water system that has a non-acute violation of the MRDL for chlorine dioxide must notify the customers in accordance with the requirements of §290.122(b) of this title (relating to Public Notification).

(2) A public water system that uses surface water sources or groundwater sources under the direct influence of surface water and fails to meet the minimum disinfection requirements of subsection (b)(1) or (b)(2) of this section shall notify the public drinking water program by the end of the next business day and the customers in accordance with the requirements of §290.122(b) of this title.

(3) A public water system that fails to meet the requirements of subsection (b)(4) of this section in more than 5.0% of the samples collected each month for two consecutive months must notify its customers.

(A) A public water system that uses surface water or groundwater under the direct influence of surface water must notify its customers in accordance with the requirements of §290.122(b) of this title.

(B) A public water system that uses only groundwater or purchased water must notify its customers when it issues its annual consumer confidence report.

(4) A public water system that fails to meet the requirements of subsection (b)(5) of this section shall notify the public drinking water program by the end of the next business day and the customers in accordance with the requirements of §290.122(b) of this title.

(5) A public water system which fails to conduct the monitoring required by this section must notify its customers of the violation in accordance with the requirements of §290.122(c) of this title.

§290.111. Turbidity.

(a) Applicability. A public water system that treats surface water or groundwater under the direct influence of surface water must comply with the requirements of this section. A public water system that uses groundwater under the direct influence of surface water must comply with the requirements of this section by a date specified by the executive director. This compliance date shall not exceed 18 months from the date that the executive director first notifies the system that the groundwater source is under the direct influence of surface water.

(b) Treatment technique requirements for turbidity. The filtration techniques used by public water systems treating surface water or groundwater under the direct influence of surface water must ensure the system meets the following treatment technique requirements and criteria.

(1) Through December 31, 2001, the treatment process used by public water systems treating surface water or groundwater under the direct influence of surface water must achieve at least a 3-log removal or inactivation of *Giardia lamblia* cysts and a 4-log removal or inactivation of viruses before the water is supplied to any consumer. The executive director may require additional levels of treatment in cases of poor source water quality.

(A) Treatment plants using conventional media filtration must achieve the following turbidity levels.

(i) The turbidity level of the combined filter effluent must never exceed 5.0 NTU.

(ii) The turbidity level of the combined filter effluent must be 0.5 NTU or less in at least 95% of the samples tested each month. The executive director may allow a turbidity level of up to 1.0 NTU in at least 95% of the samples if the system can achieve the required 3-log removal or inactivation of *Giardia lamblia* cysts and 4-log removal or inactivation of viruses at that higher turbidity level.

(B) Membrane facilities must meet site-specific performance standards

approved by the executive director.

(2) Beginning January 1, 2002, the treatment process must achieve at least a 2-log removal of *Cryptosporidium* oocysts, a 3-log removal or inactivation of *Giardia lamblia* cysts, and a 4-log removal or inactivation of viruses before the water is supplied to any consumer. The executive director may require additional levels of treatment in cases of poor source water quality.

(A) Treatment plants using conventional media filtration must achieve the following turbidity levels.

(i) The turbidity level of the combined filter effluent must never exceed 1.0 NTU.

(ii) The turbidity level of the combined filter effluent must be 0.3 NTU or less in at least 95% of the samples tested each month.

(B) Membrane facilities must meet site-specific performance standards

approved by the executive director.

(C) The executive director may extend the compliance date for systems serving fewer than 10,000 people.

(i) The compliance date may not be extended beyond January 1, 2004.

(ii) During any extension that is granted, the turbidity level of the combined filter effluent must meet the requirements of subsection (b)(1) of this section.

(3) The filtration techniques used by public water systems that serve 10,000 people or more and treat surface water or groundwater under the direct influence of surface water must ensure the system meets the following criteria.

(A) Beginning January 1, 2002, the turbidity from each individual filter should not exceed 0.5 NTU at four hours after the individual filter is returned to service after backwash or shut down.

(B) Beginning January 1, 2002, the turbidity from each individual filter should never exceed 1.0 NTU.

(c) Monitoring requirements for turbidity. Public water systems with surface water sources or groundwater sources that are under the direct influence of surface water shall monitor the performance of their filtration facilities.

(1) Public water systems that serve fewer than 500 people must monitor the turbidity of the combined filter effluent at least once each day that the system serves water to the public.

(2) Public water systems that serve 500 people or more must monitor the turbidity of the combined filter effluent at least every four hours that the system serves water to the public.

(3) Beginning January 1, 2002, public water systems that serve 10,000 people or more must continuously monitor the filtered water turbidity at the effluent of each individual filter and record the turbidity value every 15 minutes.

(4) Beginning January 1, 2002, public water systems that serve fewer than 10,000 people and use surface water or groundwater under the direct influence of surface water must measure and record the filtered water turbidity level at the effluent of each individual filter at least once each day that the plant is in operation.

(5) Special monitoring requirements. Beginning January 1, 2002, public water systems which serve 10,000 people or more and fail to meet the turbidity criteria specified in subsection (b)(3) of this section must conduct additional monitoring. The executive director can waive these special monitoring requirements for systems that have a corrective action schedule approved by the executive director.

(A) Each time that a filter exceeds either of the filtered water turbidity levels specified in subsection (b)(3) of this section for two consecutive 15-minute readings, the public water system must either identify the cause of the exceedance or complete a Filter Profile Report on the filter.

(B) Each time that a specific filter exceeds the filtered turbidity level specified in subsection (b)(3) of this section for two consecutive 15-minute readings on three separate occasions during any consecutive three month period, the public water system must conduct a filter assessment on the filter.

(C) Each time that the filtered water turbidity level for a specific filter or any combination of individual filters exceeds 2.0 NTU on two consecutive 15-minute readings during two consecutive months, the public water system must participate in a third-party Comprehensive Performance Evaluation.

(d) Analytical requirements for turbidity. All monitoring required by this section must be conducted by a facility approved by the executive director and using methods that conform to the requirements of §290.119 of this title (relating to Analytical Procedures). Equipment used for compliance measurements must be maintained and calibrated in accordance with §290.46(s) of this title (relating to Minimum Acceptable Operating Practices for Public Drinking Water Systems).

(1) Turbidity must be measured with turbidimeters that use nephelometric methods or Great Lakes Instruments Method 2.

(2) Monitoring of combined filter effluent may be conducted by either continuously monitoring turbidity levels with an on-line turbidimeter or measuring the turbidity level in grab samples with a benchtop turbidimeter.

(3) Beginning January 1, 2002, systems serving 10,000 or more people must monitor the turbidity of the water produced by individual filters with a continuous, on-line turbidimeter and a continuous recorder.

(A) Continuous individual filter turbidity may be recorded electronically by a SCADA system or on a strip chart. Circular strip charts, if used, must be set to record no more than one day's readings per chart.

(B) If there is a failure in the continuous turbidity monitoring equipment, the system must conduct grab sampling every four hours in lieu of continuous monitoring but for no more than five working days following the failure of the equipment.

(4) Beginning January 1, 2002, systems serving fewer than 10,000 people must monitor the turbidity of the water produced by individual filters by continuously monitoring turbidity levels with an on-line turbidimeter or measuring the turbidity level in grab samples with a benchtop turbidimeter.

(e) Reporting requirements for turbidity. Public water systems shall properly complete and submit periodic reports to demonstrate compliance with this section.

(1) The reports must be submitted to the Texas Natural Resource Conservation Commission, Water Permitting and Resource Management Division MC 155, P.O. Box 13087, Austin, Texas 78711-3087 by the tenth day of the month following the end of the reporting period.

(2) Public water systems must submit a Monthly Operating Report for Surface Water Treatment Plants each month.

(3) Public water systems that must complete the additional monitoring required by subsection (c)(5)(A) of this section must submit a Filter Profile Report for Individual Filters with their MOR.

(4) Public water systems that must complete the additional monitoring required by subsection (c)(5)(B) of this section must submit a Filter Assessment Report for Individual Filters with their MOR.

(5) Public water systems that must complete the additional monitoring required by subsection (c)(5)(C) of this section must submit a Request for Compliance CPE with their MOR.

(f) Compliance determination. Compliance with the requirements of this section shall be determined using the following criteria.

(1) A public water system that fails to conduct the combined filter effluent or individual filter monitoring tests required by this section commits a monitoring violation.

(2) A public water system that fails to report the results of the combined filter effluent or individual filter monitoring tests required by this section commits a reporting violation.

(3) Beginning on January 1, 2002, a public water system that serves 10,000 or more people and fails to submit the reports required by subsection (e)(3)-(5) of this section commits a reporting violation.

(4) A public water system that has a turbidity level exceeding 5.0 NTU in the combined filter effluent commits an acute treatment technique violation.

(5) Until December 31, 2001, a public water system that violates the requirements of subsection (b)(1)(A)(ii) of this section commits a treatment technique violation.

(6) Beginning January 1, 2002, a public water system that violates the requirements of subsection (b)(2)(A) of this section commits a treatment technique violation.

(7) Beginning January 1, 2002, a system that fails to correct the performance-limiting factors identified in a CPE conducted pursuant to the requirements of subsection (c)(5)(C) of this section commits a violation.

(g) Public notification for turbidity. The owner or operator of a public water system that violates the requirements of this section must notify the public drinking water program and the people served by the system.

(1) A public water system that has a turbidity level exceeding 5.0 NTU in the combined filter effluent shall notify the public drinking water program by the next business day and the water system customers of the acute violation in accordance with the requirements of §290.46(s)(4) of this title (relating to Minimum Acceptable Operating Practices for Public Drinking Water Systems) and §290.122(a) of this title (relating to Public Notification).

(2) A public water system that fails to meet the treatment technique requirements of subsection (b)(1) or (2) of this section shall notify the public drinking water program by the end of the next business day and the water system customers in accordance with the requirements of §290.122(b) of this title.

(3) A public water system which fails to conduct the monitoring required by this section must notify its customers of the violation in accordance with the requirements of §290.122(c) of this title.

§290.112. Total Organic Carbon (TOC).

(a) Applicability. All community and nontransient, noncommunity public water systems treating surface water or groundwater under the direct influence of surface water must meet the provisions of this section.

(1) Systems serving 10,000 or more people must comply with the monitoring and reporting requirements beginning January 1, 2001. Systems serving fewer than 10,000 people must comply with the monitoring and reporting requirements beginning January 1, 2003.

(2) Systems serving 10,000 or more people must comply with the treatment technique requirements for TOC beginning January 1, 2002. Systems serving fewer than 10,000 people must comply with the treatment technique requirements for TOC beginning January 1, 2004.

(b) Treatment technique. Systems must achieve the Step 1 removal requirements in paragraph (1) of this subsection, meet one of the alternative compliance criteria described in paragraph (2) of this subsection, or apply for the alternative Step 2 removal requirements described in paragraph (3) of this subsection.

(1) Systems must determine their ability to meet the Step 1 removal requirements given in the following table. A water treatment plant's Step 1 TOC required percent removal is based upon plant's source water TOC and alkalinity. Step 1 TOC percent removal requirements are indicated in the

following table. Systems practicing softening are evaluated based on the Step 1 TOC removal in the far-right column (Source water alkalinity > 120 mg/L) for the specified source water TOC.

Figure 30 TAC §290.112(b)(1)

Step 1 TOC Removal Requirements

<u>Source-water TOC [mg/L]</u>	<u>Source-water alkalinity [mg/L as CaCO₃]</u>		
	<u>Less than or Equal to...</u>		
	<u>0 - 60</u>	<u>≥60 - 120</u>	<u>≥120</u>
<u>≥ 2.0 - 4.0</u>	<u>35.0% Removal</u>	<u>25.0% Removal</u>	<u>15.0% Removal</u>
<u>≥ 4.0 - 8.0</u>	<u>45.0% Removal</u>	<u>35.0% Removal</u>	<u>25.0% Removal</u>
<u>≥ 8.0</u>	<u>50.0% Removal</u>	<u>40.0% Removal</u>	<u>30.0% Removal</u>

(2) Systems may determine their ability to meet one of the eight alternative compliance criteria listed in this paragraph.

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(A) A system meets alternative compliance criteria Number 1 if the system's source water TOC level is less than 2.0 mg/L, calculated quarterly as a running annual average.

(B) A system meets alternative compliance criteria Number 2 if the system's treated water TOC level is less than 2.0 mg/L, calculated quarterly as a running annual average.

(C) A system meets alternative compliance criteria Number 3 if: the system's source water TOC level is less than 4.0 mg/L, calculated quarterly as a running annual average; the source water alkalinity is greater than 60 mg/L (as CaCO₃), calculated quarterly as a running annual average; and the TTHM and HAA5 running annual averages are no greater than 0.040 mg/L and 0.030 mg/L, respectively.

(D) The system meets alternative compliance criteria Number 4 if the TTHM and HAA5 running annual averages are no greater than 0.040 mg/L and 0.030 mg/L, respectively, and the system uses only chlorine for primary disinfection and maintenance of a residual in the distribution system.

(E) The system meets alternative compliance criteria Number 5 if the system's source water SUVA, prior to any treatment, measured monthly, is less than or equal to 2.0 L/mg-m, calculated quarterly as a running annual average.

(F) The system meets alternative compliance criteria Number 6 if the system's finished water SUVA, measured monthly at a point prior to any disinfection, is less than or equal to 2.0 L/mg-m, calculated quarterly as a running annual average.

(G) The system meets alternative compliance criteria Number 7 if the system practices softening, cannot achieve the Step 1 TOC removals required by paragraph (b)(1) of this

subsection, and has treated water alkalinity less than 60 mg/L (as CaCO₃) and calculated quarterly as a running annual average.

(H) The system meets alternative compliance criteria Number 8 if the system practices softening, cannot achieve the Step 1 TOC removals required by paragraph (1) of this subsection, and has magnesium hardness removal greater than or equal to 10 mg/L (as CaCO₃), measured monthly calculated quarterly as a running annual average.

(3) If a system fails to meet the Step 1 TOC removal requirement required by paragraph (1) of this subsection and does not meet one of eight alternative compliance criteria described in paragraph (2) of this subsection, the system must apply to the public drinking water program for approval of Step 2 removal requirements.

(A) The plant must perform Step 2 jar testing to determine the coagulant dose at which the removal of TOC is less than 0.3 mg/L for an increase in coagulant of 10 mg/L alum or its equivalent. This dose is referred to as the point of diminishing returns (PODR).

(B) The system must submit the results of the Step 2 jar testing to the public drinking water program for approval of the alternative removal requirements at least 15 days before the end of the applicable quarter.

(C) The executive director may approve Step 2 alternative removal requirements.

(i) If approved, the removal achieved at the PODR becomes the alternative full-scale TOC removal requirement for the plant.

(ii) The alternate removal requirements may be applied to the quarter in which the jar test results are received and for the following quarter.

(c) TOC monitoring requirements. Systems must conduct required TOC monitoring during normal operating conditions at sites and at the frequency designated in the system's monitoring plan.

(1) Systems must monitor for TOC and alkalinity in the source water prior to any treatment. Within one hour of taking the source water sample, systems must measure each treatment plant TOC after filtration in the combined filter effluent stream. These samples (source water alkalinity, source water TOC, and treated water TOC) are referred to as a TOC sample set.

(2) Systems must take one TOC sample set monthly at a time representative of normal operating conditions and influent water quality.

(A) Systems with a running annual average treated water TOC of less than 2.0 mg/L for two consecutive years may reduce monitoring to one TOC sample set per plant per quarter.

The system must revert to routine monitoring in the month following the quarter when the running annual average treated water TOC is greater than or equal to 2.0 mg/L.

(B) Systems with a running annual average treated water TOC of less than 1.0 mg/L for one year may reduce monitoring to one TOC sample set per plant per quarter. The system must revert to routine monitoring in the month following the quarter when the running annual average treated water TOC is greater than or equal to 2.0 mg/L.

(3) A public water system attempting to meet the treatment technique requirements for TOC using alternative compliance criteria Number 5 (as defined in subsection (b)(2)(E) of this section) must collect at monitor for SUVA in the source water prior to any treatment at least once each month.

(4) A public water system attempting to meet the treatment technique requirements for TOC using alternative compliance criteria Number 7 (as defined in subsection (b)(2)(G) of this section) must collect at monitor for alkalinity in the treated water at any point prior to distribution system at least once each month.

(5) A public water system attempting to meet the treatment technique requirements for TOC using alternative compliance criteria Number 8 (as defined in subsection (b)(2)(H) of this section) must collect at monitor for magnesium in both the source water prior to any treatment at and the treated water at any point prior to the distribution system least once each month.

(d) Analytical requirements for TOC treatment. Analytical procedures required by this section must be conducted at a facility approved by the executive director and using methods that conform to the requirements of §290.119 of this title (relating to Analytical Procedures).

(e) Reporting requirements for TOC. Systems treating surface water or groundwater under the direct influence of surface water shall properly complete and submit periodic reports to demonstrate compliance with this section.

(1) The reports must be submitted to the Texas Natural Resource Conservation Commission, Water Permitting and Resource Management Division MC 155, P.O. Box 13087, Austin, Texas 78711-3087 by the 20th day of the month following the end of the reporting period.

(2) Public water systems must submit a Monthly Operational Report for Total Organic Carbon Control each month.

(A) Systems treating surface water or groundwater under the direct influence of surface water and serving 10,000 or more people must comply with these reporting requirements starting January 1, 2001.

(B) Systems treating surface water or groundwater under the direct influence of surface water must and serving less than 10,000 people must comply with these reporting requirements starting January 1, 2003.

(3) A system that does not meet the Step 1 removal requirements must submit a Request for Alternate TOC Requirements at least 15 days before the end of the quarter.

(A) If the system meets alternative compliance criterion Number 3, subsection (b)(2)(C) of this section, the system must report the running annual average TTHM and HAA5 concentrations as determined under the requirements of §290.113 of this title (relating to Disinfection By-products (TTHM and HAA5)).

(B) If the system meets alternative compliance criterion Number 4, subsection (b)(2)(D) of this section, the system must report the running annual average TTHM and HAA5 concentrations as determined under the requirements of §290.113 (relating to Disinfection By-products (TTHM and HAA5)), and report all disinfectants used by the system during last 12 months.

(C) If the system meets alternative compliance criterion Number 5, subsection (b)(2)(E) of this section, the system must report the running annual average source water SUVA for each of the preceding 12 months.

(D) If the system meets alternative compliance criterion Number 6, subsection (b)(2)(F) of this section, the system must report the treated water SUVA for each of the preceding 12 months.

(E) If the system practices softening and meets alternative compliance criterion Number 8, subsection (b)(2)(H) of this section, the system must report the running source water magnesium concentration, the treated water magnesium concentration, and the average percent magnesium removal for each of the preceding 12 months.

(F) A system that does not meet any of the alternative compliance criteria must apply for the Step 2 alternative removal requirements and must submit the results of Step 2 jar testing.

(f) Compliance determination. Compliance with the requirements of this section shall be based on the following criteria:

(1) A system that fails to conduct the monitoring tests required by this section commits a monitoring violation. Failure to monitor will be treated as a violation for the entire period covered by the annual average.

(2) A system that fails to report the results of monitoring tests required by this section commits a reporting violation. Systems may use only data collected under the provisions of this section to qualify for reduced monitoring.

(3) A system that does not meet any of the alternative compliance criteria and does not achieve the required TOC removal commits a treatment technique violation. Compliance shall be determined quarterly by determining an annual average removal ratio using the following method:

(A) The actual monthly TOC percent removal must be determined for each month. The actual monthly percent removal is calculated by taking the ratio of the average monthly treated water TOC to the average monthly source water TOC, subtracting that ratio from 1, and multiplying the result by 100. The actual monthly percent removal is equal to: $(1 - (\text{treated water TOC}/\text{source water TOC}))$ by 100.

(B) The required monthly Step 1 or Step 2 TOC percent removal must be determined as provided in subsection (b) of this section. The executive director will approve or disapprove Step 2 requirements based on jar or pilot data. Until the executive director approves the Step 2 TOC removal requirements, the system must meet the Step 1 TOC removals contained in subsection (b)(1) of this section.

(C) The monthly removal ratio must be determined. The monthly removal ratio is determined by dividing the actual monthly TOC percent removal for each month by the required monthly Step 1 or approved Step 2 TOC percent removal for the month. The alternative compliance criteria may be used on a monthly basis as described in clauses (i)-(iv) of this subparagraph.

(i) If the monthly average source or treated water TOC is less than 2.0 mg/L, a monthly removal ratio value of 1.0 may be assigned (in lieu of the value calculated in subsection (f)(3)(C) of this section) when calculating compliance under the provisions of this section.

(ii) If the monthly average water source or treated SUVA level is less than 2.0 L/mg-m, a monthly removal ratio value of 1.0 may be assigned (in lieu of the value calculated in subsection (f)(3)(C) of this section) when calculating compliance under the provisions of this section.

(iii) In any month that a softening system lowers alkalinity below 60 mg/L (as CaCO₃), a monthly removal ratio value of 1.0 may be assigned (in lieu of the value calculated in subsection (f)(3)(C) of this section) when calculating compliance under the provisions of this section.

(iv) In any month that a softening system removes at least 10 mg/L of magnesium hardness (as CaCO₃) a monthly value of 1.0 may be assigned (in lieu of the value calculated in subsection (f)(3)(C) of this section) when calculating compliance under the provisions of this section.

(D) The yearly removal ratio must be determined. The yearly removal ratio is determined by adding the monthly removal ratio for the last 12 months and dividing by 12.

(E) If the yearly removal ratio is less than 1.00, the system commits a treatment technique violation.

(g) Public Notification. A public water system that violates the treatment technique requirements of this section must notify the public drinking water program and the system's customers.

(1) A public water system that commits a TOC treatment technique violation shall notify the public drinking water program and the water system customers in accordance with the requirements of §290.122(b) of this title (relating to Public Notification).

(2) A public water system which fails to conduct the monitoring required by this section must notify its customers of the violation in accordance with the requirements of §290.122(c) of this title.

§290.113. Disinfection By-products (TTHM and HAA5).

(a) Applicability for TTHM and HAA5. All community and nontransient, noncommunity water systems shall comply with the requirements of this section.

(1) Effective January 1, 2002, community and nontransient, noncommunity public water systems that serve at least 10,000 people and use surface water sources or groundwater sources that are under the direct influence of surface water must comply with the maximum contaminant levels (MCLs) for total trihalomethanes (TTHM) and haloacetic acids (five) (HAA5).

(2) Effective January 1, 2004, community and nontransient, noncommunity public water systems that serve fewer than 10,000 persons and those that serve at least 10,000 persons and use groundwater sources must comply with the MCL for TTHM and HAA5.

(3) Until January 1, 2004, public water systems using groundwater as a supply source and serving at least 10,000 people will be regulated in accordance with §290.115 of this title (relating to Transition Rule for Disinfection By-products).

(4) Until January 1, 2002, public water systems using surface water sources or groundwater sources that are under the direct influence of surface water must comply with the requirements of §290.115 of this title (relating to Transition Rule for Disinfection By-products).

(b) Maximum contaminant level for TTHM and HAA5. The running annual average concentration of total trihalomethanes (TTHM) and haloacetic acids (five) (HAA5) shall not exceed the maximum contaminant levels.

(1) The MCL for TTHM is 0.080 milligrams/liter.

(2) The MCL for HAA5 is 0.060 milligrams/liter.

(c) Monitoring requirements for TTHM and HAA5. Systems must take all TTHM and HAA5 samples during normal operating conditions. Monitoring shall be performed at locations and frequency specified in the system's monitoring plan.

(1) The minimum number of samples required to be taken shall be based on the number of treatment plants used by the system, except that multiple wells drawing raw water from a

single aquifer shall be considered as one treatment plant for determining the minimum number of samples.

(2) All samples taken within one sampling period shall be collected within a 24-hour period.

(3) Systems must routinely sample at the frequency and locations given in the following table entitled "Routine Monitoring Frequency and Locations for TTHM and HAA5".

Figure 30 TAC §290.113(c)(3)

ROUTINE MONITORING FREQUENCY AND LOCATIONS FOR TTHM AND HAA5

<u>Type of system</u>	<u>Minimum Monitoring Frequency</u>	<u>Sample Location in the distribution system</u>
<u>Surface water or groundwater under the direct influence of surface water system serving at least 10,000 persons</u>	<u>four water samples per quarter per treatment plant</u>	<u>At least 25 % of all samples collected each quarter at locations representing maximum residence time. Remaining samples taken at locations representative of at least average residence time in the distribution system and representing the entire distribution system, taking into account number of persons served, different sources of water, and different treatment methods¹.</u>

<u>Surface water or groundwater under the direct influence of surface water system serving from 500 to 9,999 persons</u>	<u>one water sample per quarter per treatment plant</u>	<u>Locations representing maximum residence time¹.</u>
<u>Surface water or groundwater under the direct influence of surface water system serving fewer than 500 persons</u>	<u>one sample per year per treatment plant during month of warmest water temperature</u>	<u>Locations representing maximum residence time¹. If the sample (or average of annual samples, if more than one sample is taken) exceeds MCL, system must increase monitoring to one sample per treatment plant per quarter, taken at a point reflecting the maximum residence time in the distribution system, until system meets reduced monitoring criteria in subsection (c) of this section.</u>
<u>System using only ground water not under direct influence of surface water using chemical disinfectant and serving at least 10,000 persons</u>	<u>one water sample per quarter per treatment plant²</u>	<u>Locations representing maximum residence time¹.</u>
<u>System using only ground water not under direct influence of surface water using chemical disinfectant and serving fewer than 10,000 persons</u>	<u>one sample per year per treatment plant² during month of warmest water temperature</u>	<u>Locations representing maximum residence time¹. If the sample (or average of annual samples, if more than one sample is taken) exceeds MCL, system must increase monitoring to one sample per treatment plant per quarter, taken at a point reflecting the maximum residence time in the distribution system, until system meets criteria in</u>

subsection (c) of this section for reduced
monitoring.

- 1 If a system elects to sample more frequently than the minimum required, at least 25 % of all samples collected each quarter (including those taken in excess of the required frequency) must be taken at locations that represent the maximum residence time of the water in the distribution system. The remaining samples must be taken at locations representative of at least average residence time in the distribution system.
- 2 With approval of the executive director, multiple wells drawing water from a single aquifer may be considered one treatment plant for determining the minimum number of samples required.

(4) The executive director may reduce the monitoring frequency for TTHM and HAA5 as indicated in the following table entitled “Reduced Monitoring Frequency and Locations for TTHM and HAA5”.

Figure 30 TAC §290.113(c)(4)

REDUCED MONITORING FREQUENCY AND LOCATIONS FOR TTHM AND HAA5

<u>IF YOU ARE A...</u>	<u>YOU MAY REDUCE MONITORING IF YOU HAVE MONITORED AT LEAST ONE YEAR AND YOUR...</u>	<u>TO THIS LEVEL</u>
<u>Surface water or groundwater under the direct influence of surface water system serving at least 10,000 persons which has a source water annual average TOC</u>	<u>TTHM annual average less than or equal to 0.040 mg/L and HAA5 annual average less than or equal to 0.030mg/L</u>	<u>one sample per treatment plant per quarter at distribution system location reflecting maximum residence time</u>

level, before any treatment, less

than or equal to 4.0 mg/L

Surface water or groundwater
under the direct influence of
surface water system serving from
500 to 9,999 people which has a
source water annual average TOC
level, before any treatment, less

than or equal to 4.0 mg/L

Surface water or groundwater
under the direct influence of
surface water system serving fewer
than 500 people

TTHM annual average less than
or equal to 0.040 mg/L and
HAA5 annual average less than or
equal to 0.030mg/L

one sample per treatment plant per
year at distribution system location
reflecting maximum residence time
during month of warmest water
temperature.

Any surface water or groundwater
under the direct influence of surface
water system serving fewer than 500
persons may not reduce its monitoring
to less than one sample per treatment
plant per year.

System using only groundwater not
under direct influence of surface
water using chemical disinfectant
and serving at least 10,000 persons

TTHM annual average less than
or equal to 0.040 mg/L and
HAA5 annual average less than or
equal to 0.030mg/L

one sample per treatment plant per
year at distribution system location
reflecting maximum residence time
during month of warmest water
temperature

System using only groundwater not
under direct influence of surface
water using chemical disinfectant
and serving fewer than 10,000

TTHM annual average less
than or equal to 0.040 mg/L
and
HAA5 annual average less

one sample per treatment plant per
three year monitoring cycle at
distribution system location reflecting
maximum residence time during

persons than or equal to 0.030mg/L month of warmest water temperature,
for two consecutive years OR with the three-year cycle beginning on
TTHM annual average less January 1 following quarter in which
than or equal to 0.020 mg/L system qualifies for reduced
and HAA5 annual average monitoring.
less than or equal to
0.015mg/L for one year

(A) The executive director may not reduce the routine monitoring requirements for TTHM and HAA5 until a system has completed one year of routine monitoring in accordance with the provisions of paragraph (3) of this subsection.

(B) A system that is on reduced monitoring and collects quarterly samples for TTHM and HAA5 may remain on reduced monitoring as long as the running annual average of quarterly averages for TTHM and HAA5 is no greater than 0.060 mg/L and 0.045 mg/L, respectively.

(C) A system that is on a reduced monitoring and monitors no more frequently than once each year may remain on reduced monitoring as long as TTHM and HAA5 concentrations are no greater than 0.060 mg/L and 0.045 mg/L, respectively.

(5) The executive director may require a system to return to the routine monitoring frequency described in paragraph (3) of this subsection.

(A) A system that does not meet the requirements of paragraph (4)(B) or (C) of this subsection must return to routine monitoring in the quarter immediately following the quarter in which the results exceed 0.060 mg/L or 0.045 mg/L for TTHMs and HAA5, respectively.

(B) A system that is on reduced monitoring and makes any significant change to its source of water or treatment program shall return to routine monitoring in the quarter immediately following the quarter when the change was made.

(C) If a system is returned to routine monitoring, routine monitoring shall continue for at least one year before a reduction in monitoring frequency may be considered.

(d) Analytical requirements for TTHM and HAA5. Analytical procedures required by this section shall be performed in accordance with §290.119 of this title (relating to Analytical Procedures). Testing for TTHM and HAA5 shall be performed at a laboratory certified by the TDH Bureau of Laboratories.

(e) Reporting requirements for TTHM and HAA5. Any owner or operator of a public water system subject to the provisions of this section is required to report to the public drinking water program the results of any test, measurement, or analysis required to be made by this section within ten days following such test, measurement, or analysis.

(f) Compliance determination for TTHM and HAA5. Compliance with the provisions of this section shall be determined as follows.

(1) A system that fails to monitor in accordance with this section commits a monitoring violation. Failure to monitor will be treated as a violation for the entire period covered by the annual average.

(2) A public water system that fails to report the results of the monitoring tests required by subsection (e) of this section commits a reporting violation.

(3) Compliance with the MCLs for TTHM and HAA5 shall be based on the running annual average of all samples collected during the preceding 12 months.

(A) A public water system that samples for TTHM and HAA5 each quarter must calculate the running annual average of the quarterly averages.

(B) A public water system that samples for TTHM and HAA5 no more frequently than once each year must calculate the annual average of all samples collected during the year.

(C) All samples collected at the sampling sites designated in the public water system's shall be used to compute the quarterly and annual averages unless the analytical results are invalidated by the executive director for technical reasons.

(4) A public water system violates the MCL for TTHM if the running annual average for TTHM exceeds the MCL specified in subsection (b)(1) of this section.

(5) A public water system violates the MCL for HAA5 if the running annual average for HAA5 exceeds the MCL specified in subsection (b)(2) of this section.

(6) If a public water system is routinely sampling in accordance with the requirements of subsection (c)(3) of this section and an individual sample or quarterly average will cause the system to exceed the MCL for TTHM or HAA5, the system is in violation of the respective MCL at the end of that quarter.

(7) If a public water system's failure to monitor makes it impossible to determine compliance with the MCL for TTHM or HAA5, the system commits an MCL violation.

(g) Public Notification Requirements for TTHM and HAA5. A public water system that violates the requirements of this section of must notify the public drinking water program and the system's customers.

(1) A system that violates an MCL given in subsection (b)(1) or (2) of this section shall report to the public drinking water program within 30 days after receiving analytical results and notify the public as provided under §290.122(b) of this title (relating to Public Notification).

(2) A public water system which fails to conduct the monitoring required by subsection (c) of this section must notify its customers of the violation in accordance with the requirements of §290.122(c) of this title.

§290.114. Disinfection By-products Other than TTHM and HAA5.

(a) Chlorite. All public water systems that use chlorine dioxide must comply with the requirements of this subsection.

(1) Maximum contaminant level (MCL) for chlorite. The chlorite concentration in the water in the distribution system shall not exceed an MCL of 1.0 mg/L.

(2) Monitoring requirements for chlorite. Public water systems shall measure the chlorite concentration at locations and intervals specified in the system's monitoring plan. All samples must be collected during normal operating conditions.

(A) Each plant using chlorine dioxide must monitor the chlorite concentration in the water entering the distribution system at least once each day. The monitoring frequency at the entry point to the distribution system may not be reduced.

(B) Each plant using chlorine dioxide must monitor the chlorite concentration in the water within the distribution system at each of the following three locations: at a location near the first customer of a plant using chlorine dioxide; at a location representative of the average residence time in the distribution system; and at a location reflecting maximum residence time in the distribution system. The group of three samples must be collected on the same day and is called a “three-sample set.”

(i) Each system must collect at least one three-sample set each month.

(ii) If the chlorite concentration entering the distribution system exceeds 1.0 mg/L, the system must collect a three-sample set within 24 hours.

(iii) The frequency of chlorite monitoring in the distribution system may be reduced to one three-sample set per quarter if none of the entry point or distribution system samples tested during the preceding 12 months contained a chlorite concentration above 1.0 mg/L. A system must revert to the monthly monitoring frequency if the chlorite concentration exceeds 1.0 mg/L in any sample.

(iv) Public water systems that serve fewer than 10,000 people are exempt from the requirements of subsection (a) of this section until January 1, 2004 if the public water system signs and complies with the requirements set forth by the executive director in a bilateral agreement.

(v) Public water systems that serve at least 10,000 people are exempt from the requirements of subsection (a) of this section until January 1, 2002 if the public water system signs and complies with the requirements set forth by the executive director in a bilateral agreement.

(3) Analytical requirements for chlorite. Analytical procedures required by this section shall be performed in accordance with the requirements of §290.119 of this title (relating to Analytical Procedures).

(A) The chlorite concentration of the water entering the distribution system must be analyzed at a facility approved by the executive director. The analysis must have a minimum accuracy of 0.05 mg/L and use one of the following methods:

(i) amperometric titration using a unit with platinum-platinum electrodes; or

(ii) ion chromatography.

(B) Before January 1, 2002, systems using chlorine dioxide in accordance with a bilateral compliance agreement with the executive director must have the chlorite concentration of the water within the distribution system analyzed using ion chromatography at a facility approved by the executive director.

(C) Beginning January 1, 2002, the chlorite concentration of the water within the distribution system must be analyzed using ion chromatography at a facility certified by the TDH Bureau of Laboratories.

(4) Reporting requirements for chlorite. Public water systems using chlorine dioxide shall properly complete and submit periodic report to demonstrate compliance with this subsection.

(A) Systems using chlorine dioxide must submit a Chlorine Dioxide Monthly Operating Report within ten days after the end of each month. The report must be submitted to the Texas Natural Resource Conservation Commission, Water Permitting and Resource Management Division, P.O. Box 13087, MC 155, Austin, Texas 78711-3087.

(B) The results of all samples collected at points designated in the monitoring plan must be reported.

(5) Compliance determination for chlorite. Compliance with the requirements of this subsection shall be based on the following criteria.

(A) A public water system that fails to conduct the monitoring tests required by this subsection commits a monitoring violation.

(B) A public water system that fails to report the results of the monitoring tests required by this subsection commits a reporting violation.

(C) A public water system commits an MCL violation if the arithmetic average of any three-sample set collected in the distribution system exceeds the MCL for chlorite.

(6) Public notification requirements for chlorite. A public water system that violates the requirements of this subsection must notify the public drinking water program and the system's customers.

(A) A public water system that violates the MCL for chlorite shall notify the public drinking water program by the end of the next business day and the customers in accordance with the requirements of §290.122(b) of this title (relating to Public Notification).

(B) A public water system which fails to conduct the monitoring required by this subsection must notify its customers of the violation in accordance with the requirements of §290.122(c) of this title.

(b) Bromate. Community and nontransient, noncommunity public water systems that use ozone must comply with the requirements of this subsection beginning on January 1, 2002.

(1) Maximum contaminant level for bromate. The concentration of bromate at the entry point to the distribution system shall not exceed an MCL of 0.010 mg/L.

(2) Monitoring requirements for bromate. Each plant using ozone must measure the bromate concentration in the water entering the distribution system at least once each month. The monitoring frequency at the entry point to the distribution system may not be reduced. Samples shall be collected when the ozonation system is operating under normal conditions and at locations and intervals specified in the system's monitoring plan.

(3) Analytical requirements for bromate. Analytical procedures required by this section shall be performed in accordance with §290.119 of this title (relating to Analytical Procedures). Testing for bromate shall be performed at a laboratory certified by the TDH Bureau of Laboratories.

(4) Compliance determination for bromate. Compliance with the requirements of this subsection shall be determined using the following criteria.

(A) A system that fails to monitor in accordance with this section commits a monitoring violation. Failure to monitor will be treated as a violation for the entire period covered by the annual average.

(B) A public water system that fails to report the results of the monitoring tests required by this subsection commits a reporting violation.

(C) A public water system violates the MCL for bromate if, at the end of any quarter, the running annual average of monthly averages, computed quarterly, exceeds the maximum contaminant level specified in paragraph (1) of this subsection.

(i) All samples collected and analyzed in accordance with the monitoring plan must be included when calculating each monthly average and the running annual average, even if the total number of samples collected during the month is greater than the minimum required.

(ii) If a public water system fails to complete 12 consecutive months of monitoring, compliance with the MCL for the last four-quarter compliance period must be based on an average of the available data.

(iii) If, during the first year of bromate monitoring, any individual quarter's average will cause the running annual average of that plant to exceed the MCL, the system is out of compliance at the end of that quarter.

(5) Public notification requirements for bromate. A public water system that violates the requirements of this subsection must notify the water system's customers and the public drinking water program.

(A) A public water system that violates the MCL for bromate shall notify the customers in accordance with the requirements of §290.122(b) of this title (relating to Public Notification).

(B) A public water system which fails to conduct the monitoring required by this subsection must notify its customers of the violation in accordance with the requirements of §290.122(c) of this title.

§290.115. Transition Rule for Disinfection By-products.

(a) Applicability. All community and non-transient noncommunity public water systems that serve at least 10,000 people must comply with the requirements of this section.

(1) A public water system that uses groundwater sources and serves at least 10,000 people shall comply with this section until January 1, 2004.

(2) A public water system that uses surface water sources or groundwater sources that are under the direct influence of surface water and serves at least 10,000 people shall comply with this section until January 1, 2002.

(b) The maximum contaminant level (MCL) for total trihalomethanes shall be 0.10 milligrams/liter. The MCL shall apply only to those systems which serve a population of 10,000 or more individuals.

(c) Sampling and analytical requirements for total trihalomethanes:

(1) For the purpose of this section, the minimum number of samples required to be taken shall be based on the number of treatment plants used by the system, except that multiple wells drawing raw water from a single aquifer shall be considered as one treatment plant for determining the minimum number of samples. All samples taken within one sampling period shall be collected within a 24-hour period.

(2) For all community water systems utilizing surface water sources in whole or in part, and for all water systems utilizing only groundwater sources that have not been determined to qualify for the reduced monitoring requirements of paragraph (4) of this subsection, analyses for total trihalomethanes shall be performed on at least four samples of water per quarter from each treatment plant used by the system. At least 25% of the samples shall be taken at locations within the distribution system reflecting the maximum residence time of the water in the system. The remaining 75% shall be

taken at representative locations in the distribution system, taking into account number of persons served, different sources of water, and different treatment methods employed. The results of all analyses per quarter shall be arithmetically averaged and reported to the public drinking water program within 30 days of the system's receipt of such results. All samples collected shall be used in computing the average, unless the analytical results are invalidated for technical reasons.

(3) Upon the written request of a community water system, the monitoring frequency required by paragraph (2) of this subsection may be reduced by the public drinking water program to a minimum of one sample analyzed for TTHMs per quarter taken at a point in the distribution system reflecting the maximum residence time of the water in the system, upon a written determination by the public drinking water program that the data from at least one year of monitoring in accordance with paragraph (2) of this subsection and local conditions demonstrate that total trihalomethane concentrations will be consistently below the maximum contaminant level.

(A) If at any time during which the reduced monitoring frequency prescribed under this paragraph applies, the results from any analysis exceed 0.10 milligrams/liter of TTHMs and such results are confirmed by at least one check sample taken promptly after such results are obtained, or if the system makes any significant change to its source of water or treatment program, the system shall immediately begin monitoring in accordance with the requirements of paragraph (2) of this subsection.

(B) If a system is required to begin monitoring in accordance with paragraph (2) of this subsection, such monitoring shall continue for at least one year before a reduction in monitoring frequency may be considered.

(4) Upon the written request to the public drinking water program, a community water system utilizing only groundwater sources may seek to have the monitoring frequency reduced to a minimum of one sample for maximum TTHM potential per year taken at a point in the distribution system reflecting maximum residence time of the water in the system. The system shall submit to the public drinking water program the results of at least one sample analyzed for maximum TTHM potential taken at a point in the distribution system reflecting the maximum residence time of the water in the system. The system's monitoring frequency may only be reduced upon a written determination by the public drinking water program that, based upon the data submitted by the system, the system has a maximum TTHM potential of less than 0.10 milligrams/liter and that, based upon an assessment of the local conditions of the system, the system is not likely to approach or exceed the maximum contaminant level for TTHM's. The results of all analyses shall be reported to the public drinking water program within 30 days of the system's receipt of such results. All samples collected shall be used for determining whether the system must comply with the monitoring requirements of paragraph (2) of this subsection, unless the analytical results are invalidated for technical reasons.

(A) If at any time during which the reduced monitoring frequency prescribed under this paragraph is in effect, the result from any analysis taken by the system for the maximum TTHM potential is equal to or greater than 0.10 milligrams/liter, and such results are confirmed by at

least one check sample taken promptly after such results are received, the system shall begin immediately to monitor in accordance with the requirements of paragraph (2) of this subsection.

(B) If it becomes necessary to begin monitoring in accordance with paragraph (2) of this subsection, such monitoring shall continue for at least one year before the monitoring frequency may be reduced.

(C) In the event of any significant change to the system's raw water or treatment program, the system shall immediately analyze an additional sample for maximum TTHM potential taken at a point in the distribution system reflecting the maximum residence time of the water in the system for the purpose of determining whether the system must comply with the monitoring requirement of paragraph (2) of this subsection.

(5) Compliance with the MCL of 0.10 milligrams/liter for total trihalomethanes shall be determined based on a running annual average of quarterly samples collected by the system as prescribed in paragraph (2) of this subsection. If the average of samples covering any 12-month period exceeds the maximum contaminant level, the supplier of water shall report to the public drinking water program within 30 days and notify the public as required under §290.122(b) of this title (relating to Public Notification). Monitoring after public notification shall be at a frequency designated by the public drinking water program and shall continue until a monitoring schedule as a condition of a variance, exemption, or enforcement action shall become effective.

(6) Before a community water system makes any significant modification to its existing treatment process for the purpose of achieving compliance with this subsection, the system must submit and obtain approval from the public drinking water program of a detailed plan setting forth its proposed modifications and those safeguards that it will implement to ensure that the bacteriological quality of the drinking water served by such system will not be adversely affected by such modifications.

(7) All analyses for determining compliance with the provisions of this section shall be conducted in accordance with the procedures required by the EPA.

§290.117. Regulation of Lead and Copper.

(a) General requirements

(1) Applicability - The requirements of this section apply to community and nontransient noncommunity water systems. New water systems will be required to meet the requirements of this section when notified by the executive director.

(2) Compliance - The water system is not in compliance if it fails to meet any reporting, monitoring, public education, or other requirement in this section relating to the regulation of lead and/or copper.

(A) All applicable water systems shall determine compliance based on monitoring and reporting requirements for lead and copper established in this section or contained in 40 CFR §§141.85, 141.86, 141.87, 141.88, or 141.90.

(B) Failure to satisfactorily conduct or satisfactorily report any requirements of this section shall constitute a monitoring, reporting or treatment technique violation and shall be a violation of these standards.

(3) Action levels for lead and copper are 0.015 mg/l and 1.3 mg/l respectively. The action levels are exceeded if the concentration of lead and/or copper in more than 10% of the first draw tap water samples collected during any monitoring period is greater than 0.015 mg/l for lead or 1.3 mg/l for copper.

(b) Site Selection and Material Survey

(1) By the applicable date for commencement of tap sample monitoring, each system shall complete a materials survey of its distribution system to identify a pool of tap sampling sites that meet the requirements of this section. All first draw tap samples are to be collected from this pool of sites. Sampling sites may not include faucets that have point-of-use or point-of-entry treatment devices.

(2) Information for conducting a materials survey and selecting sampling sites are provided to each system by the public drinking water program before initial tap sampling is initiated in

accordance with the time schedule shown on Table Number 2, subsection (c)(8) of this section.

Procedural requirements set forth in 40 CFR §141.86 will be followed for site selection activities except that reporting of tap sampling sites to the public drinking water program shall be conducted using the materials survey and site selection forms supplied by the executive director. Supplemental explanatory correspondence from the system will be considered as part of the materials survey document. Systems must make a good faith effort to conduct a thorough and complete materials survey and submit a valid sample site selection form before initial tap sampling may be conducted.

(c) Tap sampling.

(1) A first draw tap sample means a one-liter sample of tap water collected from a cold water, frequently used interior tap, after the water has been standing in the plumbing for at least six hours and is collected without first flushing the tap. It is recommended that the water not be allowed to stand in the plumbing for more than 18 hours prior to collection.

(2) Sample collection may be conducted by either water system personnel or the residents. If the resident is allowed to collect samples for lead and copper monitoring, the water system must provide written instructions for sample collection procedures and the system may not challenge, based on alleged errors in the sample collection process, the accuracy of the sampling results.

(3) A water system shall collect each tap sample from the same sampling site from which it collected a previous sample. If this is not possible, written explanation to the public drinking

water program shall be provided. An alternate site from the system's sampling pool must be selected which meets similar criteria and is within reasonable proximity to the original site.

(4) Monitoring approved by the executive director and conducted by systems in addition to the minimum requirements of this section shall be considered by the executive director in making any determination of compliance.

(5) Number of Tap Samples - Initial Monitoring - Systems shall collect at least one set of tap samples during each of two consecutive six-month monitoring periods.

(6) The minimum number of sample sites required for initial monitoring are listed in Table Number 1, as well as the number of sites required of each system conducting reduced monitoring.

Figure 30 TAC §290.117(c)(6)

Table No. 1

<u>SYSTEM SIZE</u> <u>(No. of People</u> <u>Served)</u>	<u>INITIAL</u> <u>MONITORING</u> <u>SITES</u>	<u>REDUCED</u> <u>MONITORING</u> <u>SITES</u>
<u>> 100,000</u>	<u>100</u>	<u>50</u>
<u>10,001 - 100,000</u>	<u>60</u>	<u>30</u>
<u>3,301 - 10,000</u>	<u>40</u>	<u>20</u>
<u>501 - 3,300</u>	<u>20</u>	<u>10</u>
<u>101 - 500</u>	<u>10</u>	<u>5</u>
<u>< 101</u>	<u>5</u>	<u>5</u>

(7) Initial tap sampling shall be conducted only after the executive director has determined that a system has successfully completed a materials survey and has obtained approval of its sample site selection form which is required to be submitted by subsection (b)(2) of this section.

(8) The first six-month initial monitoring period begins on the dates listed in Table Number 2.

Figure 30 TAC §290.117(c)(8)

Table No. 2

<u>SYSTEM SIZE</u> (No. of People Served)	<u>FIRST SIX-MONTH MONITORING</u> <u>PERIODS BEGIN</u>
<u>> 50,000</u>	<u>January 1, 1992</u>
<u>3,301 - 50,000</u>	<u>July 1, 1992</u>
<u>< 3,301</u>	<u>July 1, 1993</u>

(d) Computing 90th Percentile Lead and Copper Levels - Determination of 90th percentile levels shall be obtained by ranking the results of lead and copper samples collected during a monitoring period in ascending order (lowest concentration equal sample Number 1; highest concentration equal sample Numbers 10, 20, 30, 40, 50, etc), up to the total number of samples collected. The number of samples collected during the monitoring period shall be multiplied by 0.9 and the concentration of lead and copper in the numbered sample yielded by this calculation is the 90th percentile sample contaminant level. The system is in compliance with the lead and/or copper action levels if the 90th percentile sample contaminant level is equal to or less than the action levels specified in subsection (a)(2) of this section. For water systems serving fewer than 101 people, the 90th percentile level is computed by taking the average of the highest two sample results.

(e) Reduced tap monitoring.

(1) The executive director shall notify each water system that it is eligible for reduced monitoring of first draw tap samples if it is in compliance with the 90th percentile lead and copper action levels after completion of two six-month periods of initial tap sampling.

(2) Reduced monitoring shall be conducted annually during June, July, August, or September by collecting one set of samples from the appropriate number of reduced monitoring sites, after notification.

(3) The number of reduced monitoring sites required for each system are found in Table Number 1 located in subsection (c)(6) of this section, if not otherwise specified by the executive director.

(4) If the system exceeds an action level for lead or copper during any reduced monitoring period, it must follow public education requirements applicable to action level exceedances during initial monitoring found in subsection (g) of this section. It must also collect the remaining number of samples as required for initial monitoring within 60 days. The results of all samples related to reduced monitoring will be used to determine action level exceedance. Should an exceedance of lead or copper action levels be verified, then procedures of this section applicable to action level exceedances during initial monitoring will be followed.

(5) If after three annual periods of reduced monitoring the system continues to be in compliance with the lead and copper action levels, then the system will be notified to conduct reduced monitoring once every three years.

(f) Monitoring requirements for water quality parameters (WQP's) and source water.

(1) Water quality parameters.

(A) All large water systems (serving populations greater than 50,000) are required to conduct water quality parameters (WQP) monitoring beginning with the initial period of first draw tap samples and continuing until corrosion control is optimized.

(B) All medium and small systems (serving populations of 3,301 to 50,000 and less than 3,301, respectively) that exceed the lead or copper action level shall conduct WQP monitoring beginning in the first calendar quarter following the end of the period in which the exceedance of the lead and/or copper action level took place and continue as long as the system exceeds the lead or copper action level.

(C) WQP monitoring shall be conducted quarterly for the following parameters: pH; alkalinity; calcium; conductivity; water temperature; orthophosphate (when an inhibitor containing a phosphate compound is used); and silica (when an inhibitor containing a silicate

compound is used). Temperature and pH must be measured at the sampling site at the same time of sample collection.

(D) Large systems must conduct WQP monitoring at all entry points and at the number of distribution sites specified in Table Number 3. Small and medium systems that are required to conduct WQP monitoring must monitor at all points of entry and at the required number of distribution sites as shown in the Table Number 3.

Figure 30 TAC §290.117(f)(1)(D)

Table No. 3

<u>SYSTEM SIZE</u> (# of people served)	<u>INITIAL WQP</u> <u>DISTRIBUTION SITES</u>	<u>REDUCED WQP</u> <u>DISTRIBUTION SITES</u>	<u>NO. OF SITES FOR</u> <u>WQP MONITORING</u>
<u>> 100,000</u>	<u>25</u>	<u>10</u>	<u>25</u>
<u>10,001 - 100,000</u>	<u>10</u>	<u>7</u>	<u>10</u>
<u>3,301 - 10,000</u>	<u>3</u>	<u>3</u>	<u>3</u>
<u>501 - 3,300</u>	<u>2</u>	<u>2</u>	<u>2</u>
<u>101 - 500</u>	<u>1</u>	<u>1</u>	<u>1</u>
<u>< 101</u>	<u>1</u>	<u>1</u>	<u>1</u>

(E) WQP distribution sites (exclusive of entry points) may be sites normally used for bacteriological monitoring and samples need not be collected inside the home. These sites shall be representative of water quality throughout the distribution system.

(F) After corrosion control treatment is installed, water quality parameters shall be measured at the initial number of distribution sites as indicated in Table Number 3 quarterly and also at entry points biweekly.

(G) WQP monitoring after corrosion control treatment is installed shall be conducted for the following parameters: pH; alkalinity; orthophosphate (when an inhibitor containing a phosphate compound is used); silica (when an inhibitor containing a silicate compound is used); and calcium (when calcium carbonate stabilization is used as part of the treatment). These parameters must be measured at all points of entry and initial distribution sites.

(H) Any water system that maintains the range of values for WQP's reflecting optimum corrosion control as approved by the executive director for one year may collect quarterly distribution samples at the reduced number of distribution sites indicated in Table Number 3. WQP samples shall continue to be measured at points of entry on a biweekly basis and results submitted to the public drinking water program.

(I) Any water system that reflects optimal corrosion control treatment during three consecutive years may reduce the frequency at which it collects distribution samples for applicable WQP's to annually.

(J) Any water system that reflects optimal corrosion control treatment during three consecutive years of annual WQP distribution monitoring may reduce the frequency at which it collects the number of WQP distribution samples for applicable WQP's to once every three years.

(K) Water quality parameter testing must be conducted at a laboratory that uses the methods described in 40 CFR §141.89, and it is the responsibility of the water system to collect, submit and report these values. If a water system fails to meet the WQP values or ranges specified by the executive director, it is out of compliance with this section. WQP values may be confirmed by the system in accordance with 40 CFR §141.82(g). The state requires that the values be reported, but is not responsible for supplying sample bottles and testing services to the water system.

(L) Any water system subject to the reduced monitoring frequency that fails to operate within the approved range of WQP values shall resume distribution sampling in accordance with the number and frequency requirements in subparagraph (F) of this paragraph.

(2) Entry point water sampling.

(A) Entry point water sampling for lead and copper shall be conducted by systems that exceed the lead or copper action levels in order to determine the lead or copper content of source water. Entry point water samples shall be collected in accordance with the requirements of this section regarding sample location, number of samples, and collection methods as specified in §290.106 of this title (relating to Inorganic Contaminants) except that one sample shall be collected from each entry point to the distribution system (no compositing) within six months after notification of the exceedance of the lead and/or copper action level. If acceptable entry point water data is not available for large systems, the entry point water lead level shall be considered as zero for purposes of determining whether a corrosion control study is required.

(B) The executive director shall complete an evaluation of all entry point water sample results, along with the corrosion control study, to determine if source water treatment is necessary. If source water treatment is deemed necessary by the executive director, the system must install it in accordance with the scheduling requirements specified in 40 CFR §141.83(a).

(C) Any system that installs entry point water treatment shall collect an additional round of source water samples as described in subparagraph (A) of this paragraph during two consecutive six-month periods within 36 months after source water treatment begins.

(D) The monitoring frequency for lead and copper in source water, after the executive director determines that source water treatment is not required, or after the executive director has specified the maximum permissible source water levels for lead and copper, shall be in accordance

with inorganic chemical monitoring practices and procedures as stated in §290.106 of this title (relating to Inorganic Contaminants).

(E) Reduced source water monitoring procedures as specified in 40 CFR §141.88(e) for lead and copper will be followed by the executive director. Source water samples will be submitted by the water system in addition to other inorganic chemical monitoring requirements of these standards.

(g) Public education procedures.

(1) A water system that exceeds the lead action level based on first draw tap water sampling shall deliver to the public the public education materials as listed in 40 CFR §141.85(a), in accordance with the requirements stated in paragraphs (2) and (3) of this subsection.

(2) A community water system must, within 60 days of notification by the executive director:

(A) Insert notices in each customer's utility bill that includes the information in 40 CFR §141.85(a) and print the following alert on the water bill itself or on a bill insert in large print:
"SOME HOMES IN THIS COMMUNITY HAVE ELEVATED LEAD LEVELS IN THEIR DRINKING WATER. LEAD CAN POSE A SIGNIFICANT RISK TO YOUR HEALTH. PLEASE READ THE ENCLOSED NOTICE FOR FURTHER INFORMATION."

(B) Submit the required information in 40 CFR §141.85(a) to the editorial departments of the major local daily or weekly newspaper circulated throughout the system;

(C) Deliver pamphlets or brochures that contain the public education materials as specified in 40 CFR §141.85(a)(2) and (4) to city or county health departments, to public schools or local school boards, Women, Infants and Children (WIC) or Head Start Programs when available, public and private hospitals or clinics, pediatricians, family planning clinics, and local welfare agencies, within their service area; and

(D) Submit the public service announcement in 40 CFR §141.85(b) to at least five radio or television stations broadcasting to the area served by the water system.

(E) A community water system must repeat the tasks contained in subparagraphs (A), (B), and (C) of this paragraph every 12 months and the tasks listed in subparagraph (D) of this paragraph every six months for as long as the system exceeds the action level.

(F) Certain requirements of subparagraphs (C) and (D) of this paragraph may be modified by the executive director if justified by local circumstances.

(3) A nontransient noncommunity water system must within 60 days of notification by the executive director deliver the public education materials in 40 CFR §141.85(c)(4) as follows:

(A) post informational posters on lead in drinking water in a public place or common area in each of the buildings served by the system;

(B) distribute pamphlets or brochures on lead in drinking water to each person served by the water system; and.

(C) A nontransient noncommunity water system must repeat the tasks contained in paragraph (3)(A) and (B) of this subsection at least once during each calendar year in which the system exceeds the lead action level.

(4) A water system may discontinue delivery of public education materials if the system has met the lead action level during the most recent six-month monitoring period. Such a system shall recommence public education in accordance with this section if it subsequently exceeds the lead action level during any monitoring period.

(5) A water system that fails to meet the lead action level as stated in subsection (a)(3) of this section shall make available to any customer who requests it, information as to how and where water samples may be submitted for lead and copper analysis.

(h) Corrosion control.

(1) All applicable water systems shall install and operate optimal corrosion control treatment, which means the corrosion control treatment that minimizes lead and copper concentrations at users' taps while insuring that the treatment does not cause the system to violate any other drinking water standard.

(2) Large water systems (serving greater than 50,000 people) are required to conduct corrosion control studies unless they can demonstrate that corrosion control is already optimized to the satisfaction of the executive director. If required to conduct a corrosion control study, a large system must complete it by July 1, 1994, and the executive director shall designate optimal corrosion control treatment and parameters by January 1, 1995. The system shall install corrosion control treatment by January 1, 1997. Large systems that exceed lead and/or copper action levels must conduct a demonstration study as described in paragraph (4)(B) of this subsection.

(3) Small and medium water systems (serving fewer than 3,301 or serving between 3,301 and 50,000 people, respectively) are deemed to have optimized corrosion control if the system meets the lead and copper action levels during each of two consecutive six-month monitoring periods. These systems will be required to conduct a desk-top corrosion control study to optimize corrosion control if at anytime the 90th percentile action level for lead and/or copper is exceeded. The study must be conducted and submitted within 18 months after exceedance notification by the executive director for medium-sized water systems and within 24 months after exceedance notification for small water systems.

(4) Performance for corrosion control studies.

(A) Any public water system performing a corrosion control study shall evaluate the effectiveness of each of the following treatments (or combinations of treatments) to identify the optimal control treatment:

(i) alkalinity and pH adjustments;

(ii) calcium hardness adjustment; and

(iii) addition of phosphate or silicate corrosion inhibitor.

(B) The water system shall conduct this evaluation using either pipe rig/loop tests, metal coupon tests, partial systems tests (demonstration study), or analyses based on treatments in documented analogous systems (desk-top study). Analogous system means a system of similar size, water chemistry, and distribution system configuration.

(C) The water system shall measure the parameters listed in subsection (f)(1)(C) of this section.

(D) On the basis of the evaluation stated in paragraph (4)(A) and (B) of this subsection, the water system shall recommend to the public drinking water program, in writing, the

treatment option that constitutes optimum corrosion control or treatment along with sufficient documentation as required by the state to establish the validity of the evaluation procedure. Operational WQP ranges shall be proposed to the state where applicable.

(E) The executive director will, within six months after submittal of the corrosion control study by the water system, review the study and designate optimal corrosion control treatment and parameters.

(F) The water system shall install optimal corrosion control treatment within 24 months after the executive director designates optimal corrosion control treatment and notifies the system.

(G) Large systems that install corrosion control treatment shall conduct first-draw lead and copper tap sample monitoring as an initial monitoring during each of two consecutive six-month periods by January 1, 1998. Small and medium systems shall complete the above stated monitoring within 36 months after the executive director designates optimal corrosion control treatment. Small and medium systems are deemed to have optimized corrosion control if action levels for lead and copper are not exceeded in two rounds of subsequent tap sample monitoring. Large systems are deemed to have optimized corrosion control if they have demonstrated through first-draw tap monitoring conducted after treatment installation and water quality parameter sampling conducted in compliance with standards set by the executive director for optimum corrosion control that they are operating within executive director-designated parameters.

(H) Any system that has installed corrosion control treatment and demonstrates optimal corrosion control and operates in compliance with the executive director-designated optimal water quality parameters, may conduct reduced tap sampling as described in subsection (e) of this section, when written permission is granted by the executive director after the executive director has evaluated all pertinent data. Systems that do not meet the action levels for lead and copper after installing corrosion control treatment must continue to operate in accordance with WQP requirements established by the executive director and follow procedures specified in subsection (e)(4) of this section.

(I) The executive director may modify, upon his own initiative or in response to a water system request or a request from interested parties, his designated corrosion control treatment or parameters. The request and executive director response pursuant to modification shall be in writing.

(5) Optimization of corrosion control.

(A) Any water system may be deemed by the executive director to have optimized corrosion control treatment if the system demonstrates, to the satisfaction of the executive director, that it has conducted activities equivalent to the corrosion control steps listed in paragraph (4) of this subsection.

(B) Any large water system is deemed to have optimized corrosion control if it submits results of lead and copper tap water monitoring and entry point water monitoring in accordance

with this section which demonstrates for two consecutive six-month monitoring periods that the 90th percentile tap sample lead level is less than 0.005 mg/l.

(i) Lead service line replacement.

(1) Systems that fail to meet the lead action level in first-draw tap sampling after installing corrosion control and/or source water treatment (whichever occurs last) shall immediately begin to replace annually 7% of the lead service lines identified during its materials survey process unless otherwise instructed by the executive director.

(2) If the system is in violation for failure to install source water or corrosion control treatment, the executive director may require the system to commence lead service line replacement after the date by which the system was required to conduct follow-up monitoring as specified in subsection (h)(4)(G) of this section.

(3) The water system shall replace the entire service line (up to the building inlet) unless it demonstrates to the satisfaction of the executive director in writing that it controls less than the entire service line. The written statement must indicate that the water system has none of the following forms of control over the service line: municipal ordinances; public service contracts or applicable legal authority; authority to set standards for construction; repair or maintenance; or ownership. In such a case, the system shall replace that portion of the lead service line that it controls and notify the

owner that it will also replace the building owner's portion of the line. The system is not required to bear the cost of replacing the building owner's portion of the line.

(4) Lead service line means a service line which is made all or in part of lead and connects the water main to the building inlet including any lead pigtail, gooseneck, or other fitting which is connected to such line.

(5) The system may cease replacing lead service lines whenever subsequent 90th percentile first-draw-tap sampling in two consecutive monitoring periods is less than the lead action level. Lead service line replacement shall immediately resume if first-draw-tap samples exceed the 90th percentile lead action/level.

(j) Analytical and sample preservation methods

(1) Analysis for lead and copper shall be conducted using methods stated in 40 CFR §141.89, in laboratories certified by the Texas Department of Health Bureau of Laboratories. Analysis for pH, conductivity, calcium, alkalinity, or the phosphate, silica, and temperature may be conducted in any laboratory utilizing EPA methods prescribed in 40 CFR §141.89.

(2) The Practical Quantitation Limits (PQL) and the Method Detection Limits (MDL) shall be as stated in 40 CFR §141.89.

(3) The executive director has the authority to allow the use of previously collected monitoring data if the data were collected in accordance with 40 CFR §141.89.

(4) All lead levels measured between the PQL and the MDL must be reported as measured, and all lead levels measured below the MDL must be reported as zero.

(5) First-draw-tap samples must be received in the laboratory within 14 days after the collection date along with correctly completed laboratory submission forms supplied by the executive director.

(6) Bottles supplied by the executive director or the certified laboratory must be used for collecting the tap samples.

(k) Reporting and recordkeeping requirements.

(1) Reporting requirements.

(A) Report all results of Water Quality Parameter (WQP) analyses including the location/address of each distribution system sampling point. This report must include each WQP specified in subsection (f) of this section, as well as all sample results from entry points to the distribution system.

(B) Where applicable, the first draw tap monitoring shall be reported within ten days following the end of each monitoring period as specified by the executive director. (Analysis results from the TDH laboratory are normally provided simultaneously to the water system and the executive director.) The water system's report shall include an explanation as to why a sampling site was changed from the previous round of sampling, if applicable.

(C) As part of the site selection form, each water system shall justify the selection of sites other than Tier 1 sampling sites as defined on the site selection form and, if lead service lines are present, why the system was not able to locate a sufficient number to make up at least 50% of its required number of sampling sites, should this condition arise.

(D) Where applicable, the system must certify that source water treatment has been installed as recommended by the executive director and that installation was done in accordance with the specified time requirements.

(E) Where applicable, the water system must certify that lead service lines have been replaced in accordance with directives of the executive director and in accordance with time schedules specified in subsection (i) of this section.

(F) Where applicable, the water system must provide copies of public education materials and certification that distribution of said materials is being conducted in accordance with subsection (g) of this section.

(G) When required by the executive director, the system must report any sampling data collected by the water system in addition to the items listed in subparagraphs (A) - (F) of this paragraph.

(H) Corrosion control treatment data shall be reported as required by the executive director for systems that:

(i) have demonstrated optimum corrosion control;

(ii) are required to specify optimum corrosion control treatment (as part of the corrosion control study);

(iii) install corrosion control treatment as designated by the executive director; and

(iv) are required to evaluate effectiveness of corrosion control treatments.

(2) Recordkeeping requirements. Records of all sampling site data, sample submission forms, analysis results, reports, surveys, letters, evaluations, schedules, executive director recommendations, requirements or determinations, and any other information deemed appropriate by

the water system shall be retained by the water system for a minimum of 12 years. These records include, but are not limited to, the following items:

(A) tap water monitoring results including the location of each site and date of collection;

(B) certification of the volume and validity of first-draw-tap sample criteria via a copy of the laboratory analysis request form;

(C) where residents collected the sample, certification that the water system informed the resident of proper sampling procedures;

(D) the analytical results for lead and copper concentrations (provided to each system by the executive director) at each tap sample site; and

(E) designation of any substitute site not used in previous monitoring periods.

§290.118. Secondary Constituent Levels.

(a) Applicability for secondary constituents. The requirements for secondary constituents apply to all public water systems. Water that does not meet the secondary constituent levels may not be used for public drinking water without written approval from the executive director. When drinking

water that does not meet the secondary constituent levels is accepted for use by the executive director, such acceptance is valid only until such time as water of acceptable chemical quality can be made available at reasonable cost to the area(s) in question.

(b) Secondary constituent levels. The maximum secondary constituent levels are as follows

Figure 30 TAC §290.118(b)

<u>CONSTITUENT</u>	<u>LEVEL</u>
	<u>(mg/l except where otherwise stated)</u>
<u>Aluminum</u>	<u>0.05 to 0.2</u>
<u>Chloride</u>	<u>300</u>
<u>Color</u>	<u>15 color units</u>
<u>Copper</u>	<u>1.0</u>
<u>Corrosivity</u>	<u>Non-corrosive</u>
<u>Fluoride</u>	<u>2.0</u>
<u>Foaming agents</u>	<u>0.5</u>
<u>Hydrogen sulfide</u>	<u>0.05</u>
<u>Iron</u>	<u>0.3</u>
<u>Manganese</u>	<u>0.05</u>
<u>Odor</u>	<u>3 Threshold Odor Number</u>

<u>pH</u>	<u>>7.0</u>
<u>Silver</u>	<u>0.1</u>
<u>Sulfate</u>	<u>300</u>
<u>Total Dissolved Solids</u>	<u>1,000</u>
<u>Zinc</u>	<u>5.0</u>

(c) Analytical requirements for secondary constituents. All analyses for determining compliance with the provisions of this subsection shall be conducted in accordance with §290.119 of this title (relating to Analytical Procedures) at a facility certified by the Texas Department of Health Bureau of Laboratories.

(d) Reporting requirements for secondary constituents. Any owner or operator of a public water system subject to the provisions of this section is required to report to the executive director the results of any test, measurement, or analysis required to be made by this section within ten days following such test, measurement, or analysis.

(e) Compliance determination for secondary constituents. Compliance with the requirements of this subsection shall be based on the following criteria:

(1) A public water system that fails to conduct the monitoring tests required by this subsection commits a monitoring violation;

(2) A public water system that fails to report the results of the monitoring tests required by this subsection commits a reporting violation; and

(3) A public water system that exceeds the secondary constituent levels in subsection (b) of this section commits a violation.

(f) Public notification for secondary constituents. Public notification must be consistent with the requirements of §290.122 of this title (relating to Public Notification).

(1) Community and nontransient, noncommunity water systems that exceed the secondary maximum constituent level for fluoride but are below the maximum constituent level listed in §290.106 of this title (relating to Inorganic Constituents) must notify the public. The notice must be made annually by including it with the water bill or by separate mailing to all customers. The form and content of the notice shall be as prescribed by the executive director.

(2) If a system exceeds the secondary constituent levels, notice must be given to new customers and in the annual consumer confidence report.

§290.119. Analytical Procedures.

(a) Acceptable laboratories. Samples collected to determine compliance with the requirements of this subchapter shall be analyzed at certified or approved laboratories.

(1) Samples used to determine compliance with the MCLs, and action levels requirements of this subchapter must be analyzed by a laboratory certified by the Texas Department of Health Bureau of Laboratories. These samples include:

(A) compliance samples for SOCs;

(B) compliance samples for VOCs;

(C) compliance samples for inorganic contaminants;

(D) compliance samples for radiological contaminants;

(E) compliance samples for microbial contaminants;

(F) compliance samples for TTHM;

(G) compliance samples for HAA5;

(H) compliance samples for chlorite;

(I) compliance samples for bromate; and

(J) compliance samples for lead and copper.

(2) Samples used to determine compliance with the treatment technique requirements and maximum residual disinfectant levels of this subchapter must be analyzed by a laboratory approved by the executive director. These samples include:

(A) compliance samples for turbidity treatment technique requirements;

(B) compliance samples for the chlorine MRDL;

(C) compliance samples for the chlorine dioxide MRDL;

(D) compliance samples for the combined chlorine (chloramine) MRDL;

(E) compliance samples for the disinfection by-product precursor treatment technique requirements, including alkalinity, total organic carbon, and specific ultraviolet absorbance;

(F) samples used to monitor chlorite levels at the point of entry to the distribution system; and

(G) samples used to determine pH.

(3) Non-compliance tests, such as control tests taken to operate the system, may be run in the plant or at a laboratory of the system's choice.

(b) Acceptable analytical methods. Methods of analysis shall be as specified in 40 Code of Federal Regulations or by any alternative analytical technique as specified by the executive director and approved by the Administrator under 40 CFR §141.27. Copies are available for review in the Water Permitting and Resource Management Division, MC-155, Texas Natural Resource Conservation Commission, P. O. Box 13087, Austin, Texas 78711-3087. The following National Primary Drinking Water Regulations set forth in Title 40 CFR are adopted by reference:

(1) section 141.21(f) for microbiological analyses;

(2) section 141.22(a) for turbidity analyses;

(3) section 141.23(f) for inorganic analyses;

(4) Section 141.24(e), (f), and (g) for organic analyses;

(5) section 141.25 for radionuclide analyses;

(6) section 141.131(b) for disinfection by-product analyses;

(7) section 141.131(c) for disinfectant analyses;

(8) section 141.131(d) for alkalinity analyses, specific ultraviolet absorbance analyses, and pH analyses; and

(9) section 141.89 for lead and copper analyses and for water quality parameter analyses that are performed as part of the requirements for lead and copper.

(c) Process control tests. Process control tests may be conducted by the operator of the system to judge variations in water quality, to identify objectionable water characteristics, and to detect the presence of foreign substances which may adversely affect the potability of the water. These control tests shall be performed in accordance with procedures approved by the executive director. Operators of water treatment plants at all public water systems utilizing coagulation, settling, softening or filtration shall perform daily chemical control tests on the filtered water for turbidity, pH, alkalinity and chlorine residuals; list results on the Monthly Report of Water Works Operation and submit a copy to the public drinking water program after each month of operation in accordance with §290.46(f) of this title (relating to Minimum Acceptable Operating Practices for Public Drinking Water Systems).

§290.121. Monitoring Plans.

(a) Applicability. All public water systems shall maintain an up-to-date chemical and microbiological monitoring plan. Monitoring plans are subject to the review and approval of the executive director. A copy of the monitoring plan must be maintained at each water treatment plant and at a central location.

(b) Monitoring plan requirements. The monitoring plan shall identify all sampling locations, describe the sampling frequency, and specify the analytical procedures and laboratories that the public water system will use to comply with the monitoring requirements of this subchapter.

(1) Monitoring locations. The monitoring plan shall include information on the location of all required sampling points in the system. Required sampling locations for regulated chemicals are provided in §290.106 of this title (relating to Inorganic Contaminants), §290.107 of this title (relating to Organic Contaminants), §290.108 of this title (relating to Radiological Sampling and Analytical Requirements), §290.109 of this title (relating to Microbial Contaminants), §290.110 of this title (relating to Disinfectant Residuals), §290.111 of this title (relating to Turbidity), §290.112 of this title (relating to Total Organic Carbon (TOC)), §290.113 of this title (relating to Disinfection By-products (TTHM and HAA5), §290.114 of this title (relating to Disinfection By-products other than TTHM and HAA5), §290.115 of this title (relating to Transition Rule for Disinfection By-products), §290.117 of this title (relating to Regulation of Lead and Copper), and §290.118 of this title (relating to Secondary Constituent Levels).

(A) The location of each sampling site at a treatment plant or pump station must be designated on a plant schematic. The plant schematic must show all water pumps, flow meters, unit processes, chemical feed points, and chemical monitoring points.

(B) Each point of entry to the distribution system shall be identified in the monitoring plan as follows:

(i) a written description of the physical location of each point of entry to the distribution system shall be provided; or

(ii) the location of each point of entry shall be indicated clearly on a distribution system or treatment plant schematic.

(C) The address of each sampling site in the distribution system shall be included in the monitoring plan or the location of each distribution system sampling site shall be designated on a distribution system schematic. The distribution system schematic shall clearly indicate the following:

(i) the location of all pump stations in the distribution system;

(ii) the location of all ground and elevated storage tanks in the distribution system; and

(iii) the location of all chemical feed points in the distribution system.

(D) The system must revise its monitoring plan if changes to a plant or distribution system require changes to the sampling locations.

(2) Monitoring frequency. The monitoring plan must include a written description of sampling frequency and schedule.

(A) The monitoring plan must include a list of all routine samples required on a daily, weekly, monthly, quarterly, and annual basis and identify the sampling location where the samples will be collected.

(B) The system must maintain a current record of the sampling schedule.

(3) The monitoring plan must identify the analytical procedures that will be used to perform each of the required analyses.

(4) The monitoring plan must identify all laboratory facilities that may be used to analyze samples required by this chapter.

(5) The monitoring plan shall include a written description of the methods used to calculate compliance with all MCLs and treatment techniques that apply to the system.

(c) Reporting requirements. All public water systems shall maintain a copy of the current monitoring plan at each treatment plant and at a central location. The system must update the monitoring plan when the system's sampling requirements or protocols change.

(1) Public water systems that treat surface water or groundwater under the direct influence of surface water and serve greater than 3,300 people must submit a copy of the monitoring plan to the public drinking water program by January 1, 2001.

(2) Public water systems that treat surface water or groundwater under the direct influence of surface water and serve 3,300 people or fewer must submit a copy of the monitoring plan to the public drinking water program by January 1, 2003.

(3) Public water systems that treat groundwater and serve at least 10,000 people must submit a copy of the monitoring plan to the public drinking water program by January 1, 2004.

(4) All water systems must provide the public drinking water program with any revisions to the plan upon request.

(d) Compliance determination. Compliance with the requirements of this section shall be determined using the following criteria.

(1) A public water system that fails to submit an administratively complete monitoring plan by the required date or fails to submit updates to a plan upon request commits a reporting violation.

(2) A public water system that fails to maintain an up-to-date monitoring plan commits a monitoring violation.

(e) Public notification. A system that commits a violation described in §290.122(d) of this title (relating to Public Notification) shall notify its customers of the violation in the next consumer confidence report that is issued by the system.

§290.122. Public Notification.

(a) Public notification requirements for acute violations. The owner or operator of a public water system must notify persons served by their system of any MCL or treatment technique violation that poses an acute threat to public health. Each notice required by this section must provide a clear and readily understandable explanation of the violation, any potential adverse health effects, the population at risk, the steps that the public water system is taking to correct such violation, the necessity for seeking alternative water supplies, if any, and any preventive measures the consumer should take until the violation is corrected.

(1) Violations that pose an acute threat to public health include:

(A) A violation of the acute MCL for microbial contaminants as defined in §290.109(f)(1) of this title (relating to Microbial Contaminants);

(B) A treated water turbidity level above 5.0 NTU in the combined filter effluent of a treatment plant that is treating surface water or groundwater under the direct influence of surface water;

(C) A violation of the MCL for nitrate or nitrite as defined in §290.106(b) of this title (relating to Inorganic Contaminants);

(D) A violation of the acute MRDL for chlorine dioxide as defined in §290.110(f)(5)(A) or §290.110(f)(5)(B) of this title (relating to Disinfectant Residuals); and

(E) Other violations deemed by the executive director to pose an acute risk to human health.

(2) The public notice for an acute MCL and treatment technique violation shall include the contaminant-specific language contained in 40 CFR §141.32 and other pertinent information specified by the executive director.

(A) The owner or operator of a system with an acute microbiological or turbidity violation as described in paragraph (1)(A) and (B) of this subsection shall include a boil water notice issued in accordance with the requirements of §290.46(s) of this title (relating to Minimum Acceptable Operating Practices for Public Drinking Water Systems).

(B) Each notice shall be conspicuous and shall not contain unduly technical language, unduly small print, or similar items that frustrate the purpose of the notice.

(C) Each notice shall include the telephone number of the owner, operator, or designee of the public water system as a source of additional information concerning the notice.

(D) Where appropriate, the notice shall be multilingual.

(3) The acute public notice and boil water notice required by paragraph (2)(A) of this subsection shall be issued as soon as possible but in no case later than 24 hours after the violation is identified. The initial public notice for other acute MCL or treatment technique violations shall be issued as soon as possible but in no case later than 72 hours after the violation is identified. The initial public notice for an acute violation shall be issued in the following manner.

(A) The owner or operator of a community water system shall furnish a copy of the notice to the radio and television stations serving the area served by the public water system.

(B) The owner or operator of a community water system shall publish the notice in a daily newspaper of general circulation in the area served by the system. If the area is not served by a daily newspaper of general circulation, notice shall instead be issued by hand delivery or by continuous posting in conspicuous places within the area served by the system.

(C) The owner or operator of a noncommunity water system shall issue the notice violation by hand delivery or by continuously posting the notice in conspicuous places within the area served by the system.

(4) The owner or operator of a system required to issue an initial notice for an acute MCL or treatment technique violation shall issue additional notices. The additional public notices for acute violations shall be issued in the following manner.

(A) Not later than 45 days after the violation, the owner or operator of a community water system shall notify persons served by the system using mail (by direct mail or with the water bill) or hand delivery. The executive director may waive mail or hand delivery if it is determined that the violation was corrected within the 45-day period. The executive director must make the waiver in writing and within the 45-day period.

(B) The owner or operator of a community water system must issue a notice at least once every three months by mail delivery (by direct mail or with the water bill) or by hand delivery, for as long as the violation exists.

(C) If the owner or operator of a noncommunity water system issued the initial notice by continuous posting, posting must continue for as long as the violation exists. If the owner or operator of a noncommunity water system issued the initial notice by hand delivery, notice by hand delivery must be repeated at least every three months for as long as the violation exists.

(5) The owner or operator of the public water system must issue a notice when the public water system has corrected the acute violation. This notice must be issued in the same manner as the original notice was issued.

(b) Public notification requirements for other MCL or treatment technique violations. The owner or operator of a public water system must notify persons served by their system of any MCL or treatment technique violation other than those described in subsection (a)(1) of this section. Each notice required by this section must provide a clear and readily understandable explanation of the violation, any potential adverse health effects, the population at risk, the steps that the public water system is taking to correct such violation, the necessity for seeking alternative water supplies, if any, and any preventive measures the consumer should take until the violation is corrected.

(1) The violation notice for an MCL or treatment technique violation shall include the contaminant-specific language contained in 40 CFR §141.32 and other pertinent information specified by the executive director.

(A) Each notice shall be conspicuous and shall not contain unduly technical language, unduly small print, or similar items that frustrate the purpose of the notice.

(B) Each notice shall include the telephone number of the owner, operator, or designee of the public water system as a source of additional information concerning the notice.

(C) Where appropriate, the notice shall be multilingual.

(2) The initial public notice for an MCL or treatment technique violation that does not pose an immediate threat to public health must be issued as soon as possible but in no case later than 14 days after the violation is identified. The initial public notice shall be issued in the following manner.

(A) The owner or operator of a community water system shall publish the notice in a daily newspaper of general circulation in the area served by the system. If the area served by the public water system is not served by a daily newspaper of general circulation, the notice shall be published in a weekly newspaper of general circulation serving the area. If the area is not served by a either a daily or weekly newspaper of general circulation, notice shall instead be issued by hand delivery or by continuous posting in conspicuous places within the area served by the system.

(B) The owner or operator of a noncommunity water system shall issue the notice by hand delivery or by continuously posting the notice in conspicuous places within the area served by the system.

(3) The owner or operator of a system required to issue an initial violation notice shall issue additional notices. The additional notices shall be issued in the following manner.

(A) Not later than 45 days after the violation, the owner or operator of a community water system shall notify persons served by the system using mail (by direct mail or with the water bill) or hand delivery. The executive director may waive mail or hand delivery if it is determined the violation was corrected within the 45-day period. The executive director must make the waiver in writing and within the 45-day period.

(B) The owner or operator of a community water system must issue a notice at least once every three months by mail delivery (by direct mail or with the water bill) or by hand delivery, for as long as the violation exists.

(C) If the owner or operator of a noncommunity water system issued the initial notice by continuously posting the notice, the posting must continue for as long as the violation exists. If the owner or operator of a noncommunity water system issued the initial notice by hand delivery, notice by hand delivery must be repeated at least every three months for as long as the violation exists.

(4) The owner or operator of the public water system must issue a notice when the public water system has corrected the violation. This notice must be issued in the same manner as the original notice was issued.

(c) Public notification requirements for other violations, variances, exemptions. The owner or operator of a public water system which fails to perform monitoring required by these standards, fails to comply with a testing procedure established by this chapter, or is subject to a variance or exemption granted under §290.102(b) of this title (relating to General Applicability) shall notify persons served by the system.

(1) Each notice required by this section must provide a clear and readily understandable explanation of any violation variance, or exemption, any potential adverse health effects, the population at risk, the steps that the public water system is taking to correct such violation, the necessity for seeking alternative water supplies, if any, and any preventive measures the consumer should take until the violation is corrected.

(A) Each notice shall be conspicuous and shall not contain unduly technical language, unduly small print, or similar items that frustrate the purpose of the notice.

(B) Each notice shall include the telephone number of the owner, operator, or designee of the public water system as a source of additional information concerning the notice.

(C) Where appropriate, the notice shall be multilingual.

(2) The initial public notice issued pursuant to this section shall be issued within three months of the violation or the granting of a variance or exemption. The initial public notice shall be issued in the following manner.

(A) The owner or operator of a community water system shall publish the notice in a daily newspaper of general circulation in the area served by the system. If the area served by the public water system is not served by a daily newspaper of general circulation, the notice shall instead be published in a weekly newspaper of general circulation serving the area. If the area is not served by either a daily or weekly newspaper of general circulation, notice shall instead be given by hand delivery or by continuous posting in conspicuous places within the area served by the system.

(B) The owner or operator of a noncommunity water system shall issue the notice by hand delivery or by continuously posting the notice in conspicuous places within the area served by the system.

(3) The owner or operator of a system required to issue an initial violation notice shall issue additional notices. The additional notices shall be issued in the following manner.

(A) The owner or operator of a community water system shall issue repeat notices at least once every three months by mail delivery (by direct mail or with the water bill) or by hand delivery, for as long as the violation exists or variance or exemption remains in effect.

(B) If the owner or operator of a noncommunity water system issued the initial notice by continuously posting the notice, the posting must continue for as long as the violation exists. If the owner or operator of a noncommunity water system issued the initial notice by hand delivery, notice by hand delivery must be repeated at least every three months for as long as the violation exists.

(4) The owner or operator of the public water system must issue a notice when the public water system has corrected the violation. This notice must be issued in the same manner as the original notice was issued.

(d) Notice to new billing units. The owner or operator of a community water system must give a copy of the most recent public notice for any outstanding violation of any maximum contaminant level, or any treatment technique requirement, or any variance or exemption schedule to all new billing units or new hookups prior to or at the time service begins.

(e) Proof of public notification. Example copies of all notifications required under this paragraph must be submitted to the executive director within ten days of its distribution as proof of public notification.