CHAPTER 4720
DEPARTMENT OF HEALTH
PUBLIC WATER SUPPLIES

4720.0010 WATER SUPPLY AND SEWERAGE SYSTEMS.

No system of water supply or system for the disposal of sewage, industrial waste, garbage, or refuse, in case any such system is for public use or for the use of any considerable number of persons, or in case any such system affects or tends to affect the public health in any manner, shall be installed by any public agency or by any person or corporation, nor shall any such existing system be materially altered or extended, until complete plans and specifications for the installation, alteration, or extension, together with such information as the commissioner of health may require, have been submitted in duplicate and approved by the commissioner of health insofar as any features thereof affect or tend to affect the public health, and no construction shall take place except in accordance with the approved plans.

Statutory Authority: *MS s 144.08; 144.12 subd 1; 144.383*

History: *L 1977 c 305 s 39*

4720.0015 FEES FOR REVIEW OF PLANS.

All plans for water supply system construction, alteration, or extension submitted for review and approval to the Department of Health as required in part 4720.0010 shall be accompanied by the appropriate fees, as prescribed below:

A. Watermains, $150;

B. Wells, $250;

C. Pumphouses, $150;

D. Chemical feed, $150;

E. Treatment plants (new), $1,000;

F. Treatment plants (renovation), $250;

G. Storage (installation), $300;

H. Storage (coating), $100; and

I. Booster stations, $150.

The appropriate fees shall be paid by check made payable to "Minnesota Department of Health."

Statutory Authority: *MS s 144.383*

History: *10 SR 1687*

4720.0020 UNSAFE WATER CONNECTIONS.

There shall be no physical connection between water supply systems that are safe for domestic use and those that are unsafe for domestic use.

There shall be no provision for such a connection or arrangement by which unsafe water may be discharged or drawn into a safe water supply system.

Statutory Authority: *MS s 144.08; 144.12 subd 1; 144.383*

4720.0030 FLUORIDATION.

Subpart 1. **Application.** This part shall be applicable to all municipal water supplies, as required by Minnesota Statutes, section 144.145.

Subp. 2. **Fluoride content.** The fluoride content of the water shall be controlled to maintain an average concentration of 1.2 milligrams per liter; the concentration shall be neither less than 0.9 milligrams per liter nor more than 1.5 milligrams per liter.

Subp. 3. **Chemical feeder.** The chemical feeder apparatus for introducing fluoride to the water supply shall conform to the standards of the commissioner of health.

Subp. 4. **Testing.** Equipment for the adequate and reliable testing of the fluoride content shall be furnished for each installation. The method of testing the fluoride content of the water shall be approved by the commissioner of health. Approval shall require either a photometric colorimetric procedure, preceded when necessary by distillation or other treatment to remove interfering materials, or a fluoride-specific electrode and an associated potential measuring device. Continuous monitoring systems shall be approved when they can be installed to monitor a representative portion of the entire supply.

Subp. 5. **Samples collected daily.** Samples shall be collected daily at a point(s) in the distribution system representative of the entire supply. Sampling point(s) shall be located downstream sufficiently distant from the point(s) at which fluoride is fed into the water supply to ensure that the distance traversed and the time elapsed since the introduction of the fluoride concentrate is adequate to allow its complete mixing with the water. At least once each three months, at a time designated by the commissioner of health, a duplicate of the usual daily sample(s) shall be collected in containers furnished by the commissioner of health and sent to the Department of Health for comparative analysis.

Subp. 6. **Records of fluoridation.** Daily records of water fluoridation plant

operations shall be maintained by the owners, officials, or their representatives. These records shall show the amount of water pumped, amount of fluoride chemical fed, fluoride test results, and any other pertinent information required by the commissioner of health. A report of the operation of each water fluoridation plant shall be submitted monthly to the commissioner of health on forms furnished by them.

Statutory Authority: *MS s 144.12 subd 1; 144.145; 144.383*

History: *L 1977 c 305 s 39*

4720.0040 MUNICIPALITY APPROVAL OF WATER SUPPLY CONTRACTS.

No governing body of any municipality shall enter into any contract or agreement or renewal thereof for the furnishing and distribution, either or both, of water to be used for domestic purposes within the municipality until the approval of the commissioner of health, insofar as the sanitary features of the water supply system are concerned, has been obtained.

Statutory Authority: *MS s 144.12 subd 1; 144.383*

History: *L 1977 c 305 s 39*

4720.0100 DEFINITIONS.

Subpart 1. **Scope.** The following definitions apply to parts 4720.0100 to 4720.3900, unless the context indicates otherwise.

Subp. 1a. **Best available technology.** "Best available technology" means the best technology, treatment, techniques, or other means which the administrator of the United States Environmental Protection Agency finds are available, after examination for efficacy under field conditions and not solely under laboratory conditions, taking cost into consideration. For the purposes of setting maximum contaminant levels for synthetic organic chemicals, the best available technology must be at least as effective as granular activated carbon.

Subp. 1b. **Central water treatment.** "Central water treatment" means providing treatment at a common location or facility and subsequently delivering it to the consumer of the public water supply.

Subp. 2. **Commissioner.** "Commissioner" means the commissioner of health, or his or her authorized representative.

Subp. 2a. **Composite.** "Composite" means a sampling technique in which two or more samples are combined before an analysis is performed.

Subp. 3. **Disinfectant.** "Disinfectant" means any oxidant, including but not limited to chlorine, chlorine dioxide, chloramines, and ozone added to water in any part of the treatment or distribution process, that is intended to kill or inactivate pathogenic microorganisms.

Subp. 3a. **Distribution system.** "Distribution system" means a network of pipes, valves, storage reservoirs, and pumping stations that delivers water to homes, businesses, and industries for drinking and other uses.

Subp. 4. **Dose equivalent.** "Dose equivalent" means the product of the absorbed dose from ionizing radiation and such factors as account for differences in biological effectiveness due to the type of radiation and its distribution in the body as specified by the International Commission on Radiological Units and Measurements (ICRU).

Subp. 4a. **Entry point samples.** "Entry point samples" means water samples collected at a location after any application of treatment but before the water is delivered to any consumer.

Subp. 4b. **Environmental Protection Agency methods.** "Environmental Protection Agency methods" means methods contained in "Methods for the Determination of Organic Compounds in Finished Drinking Water and Raw Source

Water," September 1986. These methods are issued by the Environmental Monitoring and Support Laboratory (EMSL) of the United States Environmental Protection Agency, Cincinnati, Ohio 45268. The methods described in part 4720.1510, subparts 1, item J; and 3, item G, are incorporated by reference and are not subject to frequent change. The methods are available through the Minitex interlibrary loan system.

Subp. 5. **Exemption.** "Exemption" means a waiver which may be granted by the commissioner to a supply which is in operation on June 24, 1977:

A. when a maximum contaminant level or required treatment cannot be complied with because of economic or other compelling factors; and

B. if granting the waiver will not result in an unreasonable risk to health.

Such an exemption must be conditioned upon a schedule for compliance with these rules by the dates specified in part 4720.3500.

Subp. 6. **Federal act.** "Federal act" means the Safe Drinking Water Act of 1974, Public Law Number 93-523, title 42, United States Code, section 300, clause f, and amendments thereto.

Subp. 7. **Federal regulations.** "Federal regulations" means regulations dealing with public water supplies and drinking water quality, promulgated by the Administrator of the United States Environmental Protection Agency pursuant to the federal act.

Subp. 8. **Gross alpha particle activity.** "Gross alpha particle activity" means the total radioactivity due to alpha particle emission as inferred from measurements on a dry sample.

Subp. 9. **Gross beta particle activity.** "Gross beta particle activity" means the total radioactivity due to beta particle emission as inferred from measurements on a dry sample.

Subp. 9a. **Groundwater.** "Groundwater" means the water in the zone of saturation in which all of the pore spaces of the subsurface material are filled with water. The water that supplies a well is groundwater.

Subp. 10. **Halogen.** "Halogen" means one of the chemical elements chlorine, bromine, or iodine.

Subp. 11. **Man-made beta particle and photon emitters.** "Man-made beta particle and photon emitters" means all radionuclides emitting beta particles or photons listed in "Maximum Permissible Body Burdens and Maximum Permissible Concentration of Radionuclides in Air or Water for Occupational Exposure," NBS Handbook 69, except the daughter products of thorium-232, uranium-235, and uranium-238.

Subp. 12. **Maximum contaminant level.** "Maximum contaminant level" means the maximum permissible level of a contaminant (any physical, chemical, biological, or radiological substance or matter) in water which is delivered to the free flowing outlet of the ultimate user of a public water supply; except in the case of turbidity where the maximum permissible level is measured at the point of entry to the distribution system. Contaminants added to the water under circumstances controlled by the user, except for those resulting from corrosion of piping and plumbing caused by water quality, are excluded from this definition.

Subp. 13. **Maximum total trihalomethane potential.** "Maximum total trihalomethane potential" means the maximum concentration of total trihalomethanes produced in a given water containing a disinfectant residual after seven days at a temperature of 25 degrees Celsius or above.

Subp. 13a. **Performance evaluation sample.** "Performance evaluation sample" means a reference sample provided to a laboratory to demonstrate that the laboratory can successfully analyze the sample within limits of performance specified by the United States Environmental Protection Agency or other laboratory accreditation organization. The true value of the concentration of the reference material is unknown to the laboratory at the time of the analysis.

Subp. 14. **Person.** "Person" means an individual, partnership, copartnership, cooperative, public or private association or corporation, public subdivision, agency of the state or federal government or any other legal entity or its legal representative, agent, or assigns.

Subp. 15. **Picocurie.** "Picocurie (pCi)" means that quantity of radioactive material producing 2.22 nuclear transformations per minute.

Subp. 15a. **Point-of-entry treatment device.** "Point-of-entry treatment device" is a device that treats the drinking water entering a house or building to reduce contaminants in the drinking water distributed throughout the house or building.

Subp. 15b. **Point-of-use treatment device.** "Point-of-use treatment device" is a treatment device applied to a single tap used to reduce contaminants in drinking water at that one tap.

Subp. 16. **Public water supply or supply.** "Public water supply" or "supply" means a system providing piped water for human consumption, and either containing a minimum of 15 service connections or 15 living units, or serving at least 25 persons daily for 60 days of the year. The term includes:

A. Any collection, treatment, storage, and distribution facilities under control of the operator of the supply and used primarily in connection with the supply.

B. Any collection or pretreatment storage facilities used primarily in connection with the supply but not under control of the operator. A public water supply is either a community or a noncommunity water supply.

(1) "Community water supply" means a public water supply or system which serves at least 15 service connections or living units used by year-round residents, or regularly serves at least 25 year-round residents.

(2) "Noncommunity water supply" means any public water supply that is not a community water supply. The following are given as examples of noncommunity water supplies and are in no way meant to be an exhaustive list: seasonal facilities such as children's camps, recreational camping areas, resorts, or year-round facilities which serve at least 25 persons who are not residents thereof, such as churches, entertainment facilities, factories, gasoline service stations, marinas, migrant labor camps, office buildings, parks, restaurants, schools.

(3) "Nontransient, noncommunity water supply" means a public water supply that is not a community water supply and that regularly serves at least 25 of the same persons over six months per year. Factories, office buildings, day care centers, and schools are examples of nontransient, noncommunity water supplies.

Subp. 17. **Rem.** "Rem" means the unit of dose equivalent from ionizing radiation to the total body or any internal organ or organ system. A "millirem (mrem)" is 1/1000 of a rem.

Subp. 18. **Sanitary survey.** "Sanitary survey" means an on-site review of the water source, facilities, equipment, operation, and maintenance of a public water supply for the purpose of evaluating the adequacy of the source, facilities, equipment, operation, and maintenance for producing and distributing safe drinking water.

Subp. 19. **Standard sample.** "Standard sample" means the aliquot of finished drinking water that is examined for the presence of coliform bacteria.

Subp. 20. **Supplier.** "Supplier" means any person who owns, manages, or operates a public water supply, whether or not the supplier is an operator certified under Minnesota Statutes, sections 115.71 to 115.82.

Subp. 20a. **Surface water.** "Surface water" means water that rests or flows on the surface of the ground such as lakes and rivers.

Subp. 21. **Total trihalomethanes.** "Total trihalomethanes" means the sum of

the concentration in milligrams per liter of the trihalomethane compounds of trichloromethane (chloroform), dibromochloromethane, bromodichloromethane, and tribromomethane (bromoform), rounded to two significant figures.

Subp. 22. **Trihalomethane.** "Trihalomethane" means one of the family of organic compounds named as derivatives of methane, wherein three of the four hydrogen atoms in methane are each substituted by a halogen atom in the molecular structure.

Subp. 23. **Turbidity unit.** "Turbidity unit" means an amount of turbidity equivalent to that in a solution composed of .000125 percent hydrazine sulfate and .00125 percent hexamethylenetetramine in distilled and filtered (100 μ pore size membrane) water, as measured by a nephelometric turbidimeter.

Subp. 24. **Variance.** "Variance" means a waiver which may be granted by the commissioner to a supply:

A. which, due to the raw water quality reasonably available, cannot comply with a maximum contaminant level, despite application of the best known and available technology for treatment or other means; and

B. if granting the waiver will not result in an unreasonable risk to health.

Such a variance must be conditioned upon a schedule for implementation of control measures, and may specify an indefinite time period for compliance with the maximum contaminant level or required treatment.

Subp. 25. **Year round resident.** "Year round resident" means a person who resides in the area served by the public water supply for more than six months of the year.

Statutory Authority: *MS s 144.383*

History: *13 SR 2824*

4720.0200 JUSTIFICATION.

Parts 4720.0100 to 4720.3900 are adopted pursuant to legislative authority granted in Laws of Minnesota 1977, chapter 66, section 3, clause (e), which requires that the commissioner of health adopt for all public water supplies rules which are at least as stringent as the federal regulations dealing with public water supplies adopted by the United States Environmental Protection Agency, in order for the commissioner to be able to assume the primary responsibility for enforcing the federal act.

Statutory Authority: *MS s 144.383*

4720.0300 SCOPE AND COVERAGE.

Parts 4720.0100 to 4720.3900 prescribe standards for water supply siting and construction, set maximum contaminant levels for turbidity, microbiological constituents, organic and inorganic chemicals, and radioactivity, prescribe a frequency for monitoring the levels of these constituents and sodium and corrosivity, and prescribe the procedures for reporting results, notifying the public and for maintaining records.

The standards and procedures adopted in parts 4720.0100 to 4720.3900 inclusive shall apply to all public drinking water supplies, pursuant to authority granted by existing statutes and amendments thereto, notwithstanding any other water quality standards or regulations.

A water supply which meets all of the following requirements shall not be a public supply for the purpose of parts 4720.0100 to 4720.3900:

A. consists only of distribution and storage facilities;

B. obtains all of its water from, but is not owned or operated by a public water supply to which such regulations apply;

C. does not sell water to any person; and

D. is not a carrier which conveys passengers in intrastate commerce.

Statutory Authority: *MS s 144.383*

4720.0400 MAXIMUM CONTAMINANT LEVELS.

The levels in parts 4720.0500 to 4720.0900 shall be the enforceable maximum contaminant levels for all public water supplies in the state.

Statutory Authority: *MS s 144.383*

4720.0500 MAXIMUM LEVEL OF MICROBIOLOGICAL CONTAMINANTS.

Subpart 1. **Maximum contaminant levels.** The maximum contaminant levels for coliform bacteria, applicable to both community and noncommunity water supplies, are as follows in subparts 2 to 6.

Subp. 2. **Use of membrane filter.** When the membrane filter technique pursuant to part 4720.1200, subpart 1, item A is used, the number of coliform bacteria shall not exceed any of the following:

A. One per 100 milliliters as the arithmetic mean of all samples examined per compliance period pursuant to part 4720.1200, subpart 2 or 3, except that systems required to take ten or fewer samples per month may exclude one positive routine sample per month from the monthly calculation if:

(1) the commissioner determines and indicates in writing to the public water supply that no unreasonable risk to health existed, after having considered the following factors: the system provided and had maintained an active disinfectant residual in the distribution system; the potential for contamination as indicated by a sanitary survey; and the history of the water quality at the public water supply;

(2) the supplier initiates a check sample on each of two consecutive days from the same sampling point within 24 hours after notification that the routine sample is positive, and each of these check samples is negative; and

(3) the original positive routine sample is reported and recorded by the supplier pursuant to parts 4720.3600 and 4720.3700.

The supplier shall report to the commissioner its compliance with the conditions specified in this item and a summary of the corrective action taken to resolve the prior positive sample result. If a positive routine sample is not used for the monthly calculation, another routine sample must be analyzed for compliance purposes. This provision may be used only once during two consecutive compliance periods.

B. Four per 100 milliliters in more than one sample when less than 20 are examined per month; or

C. Four per 100 milliliters in more than five percent of the samples when 20 or more are examined per month.

Subp. 3. **Use of fermentation tube and ten-milliliter standard.** When the fermentation tube method and ten-milliliter standard portions pursuant to part 4720.1200, subpart 1, item B are used, coliform bacteria shall not be present in any of the following:

A. More than ten percent of the portions in any month pursuant to part 4720.1200, subpart 2 or 3, except that systems required to take ten or fewer samples per month may exclude one positive routine sample resulting in one or more positive tubes per month from the monthly calculation if:

(1) the commissioner determines that the supply maintains an active disinfectant residual in the distribution system, or the commissioner determines in writing to the public water system that no unreasonable risk to health existed under the circumstances;

(2) the supplier initiates a check sample on each of two consecutive days from the sampling point within 24 hours after notification that the routine sample is positive, and each of these check samples is negative; and

(3) the original positive routine sample is reported and recorded by the supplier pursuant to parts 4720.3600 and 4720.3700.

The supplier shall report to the commissioner its compliance with the conditions specified in item A and a summary of the action taken to resolve the prior positive sample result. If a positive routine sample is not used for the monthly calculation, another routine sample must be analyzed for compliance purposes. This provision may be used only once during two consecutive compliance periods.

B. Three or more portions in more than one sample when less than 20 samples are examined per month; or

C. Three or more portions in more than five percent of the samples when 20 or more samples are examined per month.

Subp. 4. **Use of fermentation tube and 100 milliliter standard.** When the fermentation tube method and 100 milliliter standard portions pursuant to part 4720.1200, subpart 1, item B are used, coliform bacteria shall not be present in any of the following:

A. More than 60 percent of the portions in any month pursuant to part 4720.1200, subpart 2 or 3; except that systems required to take ten or fewer samples per month may exclude one positive routine sample resulting in one or more positive tubes per month from the monthly calculation if:

(1) the commissioner determines that the supplier maintains an active disinfectant residual in the distribution system, or the commissioner determines in writing to the public water system that no unreasonable risk to health existed under the circumstances;

(2) the supplier initiates two consecutive daily check samples from the same sampling point within 24 hours after notification that the routine sample is positive, and each of these check samples is negative; and

(3) the original positive routine sample is reported and recorded by the supplier pursuant to parts 4720.3600 and 4720.3700.

The supplier shall report to the state its compliance with the conditions specified in item A and a summary of the corrective action taken to resolve the prior positive sample result. If a positive routine sample is not used for the monthly calculation, another routine sample must be analyzed for compliance purposes. This provision may be used only once during two consecutive compliance periods.

B. Five portions in more than one sample when less than five samples are examined per month; or,

C. Five portions in more than 20 percent of the samples when five or more samples are examined per month.

Subp. 5. **Compliance.** For community or noncommunity supplies that are required to sample at a rate of less than four per month, compliance with subpart 2, 3, or 4 shall be based upon sampling during a three-month period, except that, at the discretion of the commissioner compliance may be based upon sampling during a one-month period.

Subp. 6. **Average violation caused by single sample.** If an average maximum contaminant level violation is caused by a single sample maximum contaminant level violation, then the case shall be treated as one violation with respect to the public notification requirements of part 4720.3900.

Statutory Authority: *MS s 144.383*

4720.0600 MAXIMUM CONTAMINANT LEVELS OF TURBIDITY.

The maximum contaminant levels for turbidity are applicable to both community and noncommunity water supplies using surface water sources in whole or in part. The maximum contaminant levels for turbidity in drinking water, measured at a representative entry point(s) to the distribution system, are:

A. one turbidity unit (t.u.) rounded off to the nearest whole number, as determined by a monthly average pursuant to part 4720.1300;

B. five turbidity units based on an average for two consecutive days, pursuant to part 4720.1300; and

C. a variance or exemption may be granted according to the procedure described in parts 4720.2600 to 4720.3500, to permit the supplier to provide water which contains five or less turbidity units, if the supplier can demonstrate to the commissioner that the higher turbidity does not do any of the following: interfere with disinfection; prevent maintenance of an effective disinfectant agent throughout the distribution system; or interfere with microbiological determinations.

Statutory Authority: *MS s 144.383*

4720.0700 MAXIMUM LEVEL OF INORGANICS.

Subpart 1. **Maximum levels in community water supplies.** The following are the maximum contaminant levels in milligrams per liter, for inorganic chemicals applicable to community water supplies:

A. arsenic, 0.05;

B. barium, 1.0;

C. cadmium, 0.010;

D. chromium, 0.05;

E. fluoride, 4.0;

F. lead, 0.05;

G. mercury, 0.002;

H. nitrate (as N), 10.0;

I. selenium, 0.01; and

J. silver, 0.05.

Subp. 2. **Compliance.** Compliance with maximum contaminant levels for inorganic chemicals shall be calculated in accordance with part 4720.1400, subparts 3 to 7.

Subp. 3. **Noncommunity water supplies.** The maximum contaminant level for nitrate listed in subpart 1 also applies to noncommunity water supplies, except that a nitrate level not in excess of 20 milligrams per liter may be allowed in a noncommunity water supply if the supplier demonstrates to the satisfaction of the commissioner that:

A. the water will not be available to children under six months of age;

B. there will be continuous posting of the fact that nitrate levels exceed ten milligrams per liter and the potential health effects of exposure;

C. local public health authorities and the commissioner will be notified annually of nitrate levels that exceed ten milligrams per liter; and

D. no adverse health effects shall result.

Statutory Authority: *MS s 144.383*

History: *13 SR 2824*

4720.0800 MAXIMUM CONTAMINANT LEVEL OF ORGANIC CHEMICALS.

Subpart 1. **Levels for community water supplies.** The following are the maximum contaminant levels for synthetic organic chemicals. They apply only to community water supplies. Compliance with maximum contaminant levels for synthetic organic chemicals is calculated pursuant to part 4720.1500, subparts 2, 3, and 4.

A. Chlorinated hydrocarbons:

(1) Endrin (1,2,3,4,10, 10-hexachloro-6,7-epoxy-1, 4, 4a,5,6,7,8,8a-octa-hydro- 1,4-endo, endo-5,8-dimethano-naphthalene), 0.0002 milligrams per liter;

(2) Lindane (1,2,3,4,5,6-hexachloro-cyclohexane, gamma isomer), 0.004 milligrams per liter;

(3) Methoxychlor (1,1,1-Trichloro 2,2-bis [p-methoxyphenyl] ethane), 0.1 milligrams per liter;

(4) Toxaphene ($C_{10}H_{10}Cl_8$-Technical chlorinated camphene, 67-69 percent chlorine), 0.005 milligrams per liter.

B. Chlorophenoxys:

(1) 2,4-D, (2,4-Dichlorophenoxyacetic acid), 0.1 milligrams per liter;

(2) 2,4,5-TP Silvex (2,4,5-Trichloro- phenoxypropionic acid), 0.01 milligrams per liter.

Subp. 2. **Maximum level for trihalomethane.** The maximum contaminant level for total trihalomethane is 0.10 milligrams per liter. This maximum contaminant level applies only to public water supplies which serve a population of 10,000 or more persons, and which add a disinfectant (oxidant) to the water in any part of the drinking water treatment process. Compliance with the maximum contaminant level for total trihalomethane shall be calculated in accordance with part 4720.1600.

Subp. 3. **Maximum levels for volatile organic chemicals.** The following are the maximum contaminant levels, in milligrams per liter, for volatile organic chemicals applicable to community and nontransient, noncommunity water supplies:

A. benzene, 0.005;

B. vinyl chloride, 0.002;

C. carbon tetrachloride, 0.005;

D. 1,2-dichloroethane, 0.005;

E. trichloroethylene, 0.005;

F. 1,1-dichloroethylene, 0.007;

G. 1,1,1-trichloroethane, 0.20; and

H. para-dichlorobenzene, 0.075.

Compliance with maximum contaminant levels for volatile organic chemicals is calculated according to part 4720.1510, subpart 1, item I.

Statutory Authority: *MS s 144.383*

History: *13 SR 2824*

4720.0900 MAXIMUM LEVEL OF RADIOLOGICAL CONTAMINANTS.

Subpart 1. **Community water supplies.** Maximum contaminant levels for radiological materials shall apply only to community water supplies.

Subp. 2. **Levels for radium 226, radium 228, gross alpha particle radioactivity.** Maximum contaminant levels for radium-226, radium-228, and gross alpha particle radioactivity:

A. combined radium-226 and radium-228, 5 pCi/l; and

B. gross alpha particle activity (including radium-226 but excluding radon and uranium), 15 pCi/l.

Subp. 3. **Levels for beta particle and photon radioactivity.** Maximum contaminant levels for beta particle and photon radioactivity from man-made radionuclides:

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/year.

B. Except for the radionuclides listed in item C, the concentration of man-made radionuclides causing four or more millirem 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 millirem/year.

C. Table A: the following table shows average annual concentrations assumed to produce a total body or organ dose of four millirem/year.

Radionuclide	Critical Organ	pCi/l
Tritium	Total body	20,000
Strontium-90	Bone marrow	8

Statutory Authority: *MS s 144.383*

4720.1000 MONITORING AND ANALYTICAL REQUIREMENTS.

It shall be the responsibility of the supplier of water to monitor the quality of the water in his supply, according to the sampling schedules and testing procedures prescribed in parts 4720.1000 to 4720.2500. Where a supplier has the capability for on-site testing for turbidity and/or maintains a laboratory approved to test for coliform bacteria, such supplier shall follow the relevant procedures in the appropriate parts of parts 4720.1000 to 4720.2500. If an approved on-site laboratory is not available, the supplier of water shall send his water samples to an appropriate approved testing laboratory, according to procedures prescribed by the commissioner. Such procedures shall be prescribed for each supplier, and shall include a description of the type of container to be used, the manner in which the container shall be handled and delivered to the laboratory, and the date by which a sample must be sent to the approved laboratory for testing.

Statutory Authority: *MS s 144.383*

4720.1100 REFERENCES FOR ANALYTICAL PROCEDURES.

Subpart 1. **Scope.** The following terms, which are used in parts 4720.1200 to 4720.2500, shall have the meanings given them. The department will make available to the public any analytical method referenced in this rule if the method is not available for lending from a public library.

Subp. 2. **ASTM.** "ASTM" means "Annual Book of ASTM Standards," Part 31 Water, 1979, American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103.

Subp. 3. **EPA chemical.** "EPA chemical" means Methods of Chemical Analysis of Water and Wastes, United States Environmental Protection Agency, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio 45268 (EPA-600/4-79-020), March 1979, available from ORD Publications, CERI, Environmental Protection Agency, Cincinnati, Ohio 45268. For approved analytical procedures for metals, the technique applicable to total metals must be used.

Subp. 4. **EPA microbiological.** "EPA microbiological" means Microbiological Methods for Monitoring the Environment, Water and Wastes, United States Environmental Protection Agency, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio 45268 (EPA-600/8-78-017), December 1978, available from ORD Publications, CERI, United States Environmental Protection Agency, Cincinnati, Ohio 45268.

Subp. 5. **EPA Organochlorine methods.** "EPA organochlorine methods" means Methods for Organochlorine Pesticides and Chlorophenoxy Acid Herbicides in Drinking Water and Raw Source Water, available from ORD Publications, CERI, United States Environmental Protection Agency, Cincinnati, Ohio 45268.

Subp. 6. **Standard methods.** "Standard methods" means Standard Methods for the Examination of Water and Wastewater, 14th Edition, American Public Health Association, 1015 15th Street NW, Washington, D.C. 20005.

Subp. 7. **USGS 1972.** "USGS 1972" means Techniques of Water Resources Investigation of the United States Geological Survey, Chapter A-3, "Methods of Analysis of Organic Substances in Water," Book 5, 1972, stock #2401-1227, available from Superintendent of Documents, United States Government Printing Office, Washington, D.C. 20402.

Subp. 8. **USGS 1979.** "USGS 1979" means Techniques of Water Resources Investigation of the United States Geological Survey, Chapter A-1, Methods for Determination of Inorganic Substances in Water and Fluvial Sediments, Book 5, 1979, stock #024-001-03177-9, available from Superintendent of Documents, United States Government Printing Office, Washington, D.C. 20402.

Statutory Authority: *MS s 144.383*

4720.1200 MICROBIOLOGICAL CONTAMINANT SAMPLING AND ANALYTICAL REQUIREMENTS.

Subpart 1. **Analysis.** Analyses for coliform bacteria shall be made for the purpose of determining compliance with part 4720.0500. Analyses shall be conducted in accordance with the analytical recommendations set forth in Standard Methods, Method 908A, Paragraphs 1, 2, and 3; or Method 908D, Table 908:I; or Method 909A; or EPA Microbiological Methods Part III, Section B 1.0 to 2.6.2, 2.7 to 2.7.2(c); or Part III, Section B 4.0 to 4.6.4(c), except that a standard sample size as referred to in items A and B shall be employed. See part 4720.1100, subparts 4 and 6 for complete title of reference sources.

A. The standard sample used in the membrane filter procedure shall be 100 milliliters.

B. The standard sample used in the five tube most probable number (MPN) procedure (fermentation tube method) shall be five times the standard portion. The standard portion is ten milliliters if compliance is to be determined according to the maximum contaminant level prescribed in part 4720.0500, subpart 3, and it is 100 milliliters if compliance is to be determined according to the maximum contaminant level prescribed in part 4720.0500, subpart 4. The samples shall be taken at points which are representative of the conditions within the distribution system.

Subp. 2. **Sampling frequency.** The supplier of water for a community water supply shall take samples to be analyzed for coliform density. The samples shall be taken at regular time intervals, and in number proportionate to the population served by the supply. In no event shall the frequency be less than as set forth below:

Population served:	Minimum number of samples per month
25 to 1,000	1
1,001 to 2,500	2
2,501 to 3,300	3
3,301 to 4,100	4
4,101 to 4,900	5
4,901 to 5,800	6
5,801 to 6,700	7
6,701 to 7,600	8
7,601 to 8,500	9
8,501 to 9,400	10
9,401 to 10,300	11
10,301 to 11,100	12

11,101 to 12,000	13
12,001 to 12,900	14
12,901 to 13,700	15
13,701 to 14,600	16
14,601 to 15,500	17
15,501 to 16,300	18
16,301 to 17,200	19
17,201 to 18,100	20
18,101 to 18,900	21
18,901 to 19,800	22
19,801 to 20,700	23
20,701 to 21,500	24
21,501 to 22,300	25
22,301 to 23,200	26
23,201 to 24,000	27
24,001 to 24,900	28
24,901 to 25,000	29
25,001 to 28,000	30
28,001 to 33,000	35
33,001 to 37,000	40
37,001 to 41,000	45
41,001 to 46,000	50
46,001 to 50,000	55
50,001 to 54,000	60
54,001 to 59,000	65
59,001 to 64,000	70
64,001 to 70,000	75
70,001 to 76,000	80
76,001 to 83,000	85
83,001 to 90,000	90
90,001 to 96,000	95
96,001 to 111,000	100
111,001 to 130,000	110
130,001 to 160,000	120
160,001 to 190,000	130
190,001 to 220,000	140
220,001 to 250,000	150
250,001 to 290,000	160
290,001 to 320,000	170
320,001 to 360,000	180
360,001 to 410,000	190
410,001 to 450,000	200
450,001 to 500,000	210
500,001 to 550,000	220
550,001 to 600,000	230
600,001 to 660,000	240
660,001 to 720,000	250
720,001 to 780,000	260
780,001 to 840,000	270
840,001 to 910,000	280
910,001 to 970,000	290
970,001 to 1,050,000	300
1,050,001 to 1,140,000	310
1,140,001 to 1,230,000	320
1,230,001 to 1,320,000	330
1,320,001 to 1,420,000	340
1,420,001 to 1,520,000	350

1,520,001 to 1,630,000	360
1,630,001 to 1,730,000	370
1,730,001 to 1,850,000	380
1,850,001 to 1,970,000	390
1,970,001 to 2,060,000	400
2,060,001 to 2,270,000	410
2,270,001 to 2,510,000	420
2,510,001 to 2,750,000	430
2,750,001 to 3,020,000	440
3,020,001 to 3,320,000	450
3,320,001 to 3,620,000	460
3,620,001 to 3,960,000	470
3,960,001 to 4,310,000	480
4,310,001 to 4,690,000	490
4,690,001 or more	500

Such sampling shall begin on June 24, 1977.

Based on a history of no coliform bacterial contamination and on a sanitary survey by the commissioner showing the water system to be supplied solely by a protected groundwater source and free of sanitary defects, a community water supply serving 25 to 1,000 persons, with written permission from the commissioner, may reduce this sampling frequency, except that in no case shall it be reduced to less than one per quarter. Such permission may be withdrawn at any time if changed conditions warrant monthly sampling.

Subp. 3. **Special frequency for sampling noncommunity supply.** The supplier of water for a noncommunity water supply shall sample for coliform bacteria at least once in each calendar quarter during which the supply provides water to the public. Such sampling shall begin before June 24, 1979. If the commissioner determines, on the basis of a sanitary survey which includes a determination of compliance with the Minnesota Water Well Construction Code, parts 4725.0100 to 4725.7600, that it is more appropriate for the supply to sample on a frequency other than quarterly, the commissioner shall impose a special sampling frequency. Such special frequency shall then be the frequency required under parts 4720.0100 to 4720.3900 and shall be confirmed or changed on the basis of subsequent surveys.

Subp. 4. **Daily samples when coliform bacteria are found.** Whenever any coliform bacteria are found in a single standard sample, at least two consecutive daily check samples shall be collected and examined from the same sampling point.

Additional check samples shall be collected daily until the results obtained from at least two consecutive daily check samples show no coliform bacteria in the case of the 100 milliliter membrane filter portions, or show no positive tubes in the case of the ten or 100 milliliter portions analyzed by the fermentation method.

The location at which the check samples were taken pursuant to this subpart shall not be eliminated from future sampling without approval of the commissioner.

Subp. 5. **Determination of compliance.** The results from all coliform bacterial analyses performed pursuant to parts 4720.0100 to 4720.3900, except those obtained from check samples as referred to in subpart 4 and special purpose samples as referred to in subpart 8, shall be used to determine compliance with the maximum contaminant level for coliform bacteria as established in part 4720.0500. Check samples shall not be included in calculating the total number of samples taken each month to determine compliance with part 4720.0500.

Subp. 6. **Notification of supplier and commissioner of presence of coliform bacteria.** When the presence of coliform bacteria in water taken from a particular sampling point has been confirmed by any check samples examined as directed

in the second paragraph of subpart 4, the analytical laboratory shall notify the supplier and the commissioner within 24 hours.

Subp. 7. **Notification to the public.** As soon as a maximum contaminant level set forth in part 4720.0500 is exceeded, the supplier of water shall report to the commissioner and notify the public as prescribed in part 4720.3900.

Subp. 8. **Special purpose samples.** Special purpose samples, such as those taken to determine whether disinfection practices following pipe placement, replacement, or repair have been sufficient, shall not be used to determine compliance with subparts 2 and 3.

Subp. 9. **Substitute use of free chlorine residual monitoring.** A supplier of water of either a community or noncommunity water supply may, with the approval of the commissioner and based upon a sanitary survey, substitute the use of free chlorine residual monitoring for not more than 75 percent of the samples required to be taken by subparts 2 and 3. A supplier of water who is allowed to substitute chlorine residual sampling must take such samples at points which are representative of the conditions within the distribution system at the frequency of at least four for each substituted microbiological sample required to be taken by subparts 2 and 3. There shall be at least daily determinations of chlorine residual. When the supplier of water exercises the option of substituting chlorine residual samples, he shall maintain no less than 0.2 mg/l free chlorine throughout the public water distribution system. When a particular sampling point has been shown to have a free chlorine residual less than 0.2 mg/l, the water at that location shall be retested as soon as practicable and in any event within one hour. If the original analysis is confirmed, this fact shall be reported to the commissioner within 48 hours. Also, if the analysis is confirmed, a sample for coliform bacterial analysis must be collected from that sampling point as soon as practicable and preferably within one hour, and the results of such analysis reported to the commissioner within 48 hours. Analyses for residual chlorine shall be made in accordance with Standard Methods for the Examination of Water and Wastewater, 13th Edition, pages 129 to 132. Compliance with the maximum contaminant levels for coliform shall be determined on the monthly mean or quarterly mean basis specified in part 4720.0500 including those samples taken as a result of failure to maintain the required chlorine residual level. The commissioner may withdraw his or her approval of the use of chlorine residual substitution at any time.

Statutory Authority: *MS s 144.383*

4720.1300 TURBIDITY SAMPLING AND ANALYTICAL REQUIREMENTS.

Subpart 1. **Sampling.** All public water supplies, whether community or noncommunity, which use water obtained in whole or in part from surface sources must be sampled for turbidity. Such samples shall be taken by suppliers at representative points of entry into the water distribution system at least once per day, for the purpose of making turbidity measurements to determine compliance with part 4720.0600.

The commissioner may reduce the sampling frequency for a noncommunity water supply if he determines that this reduced sampling frequency will not pose a risk to the public health and notifies the noncommunity water supply of this determination in writing. Such a reduction may be granted only if the noncommunity water supply practices disinfection and maintains an active disinfectant residual in the distribution system.

The measurement shall be made by the Nephelometric Method in accordance with the recommendations set forth in Standard Methods or EPA Chemical, Nephelometric Method, 180.1.1., as further described in part 4720.1100, subparts 3 and 6.

Sampling by community water supplies shall begin before June 24, 1977. Sampling by noncommunity water supplies shall begin before June 24, 1979.

Subp. 2. **Results.** If the result of a turbidity analysis indicates that the maximum allowable limit has been exceeded, the sampling and measurement shall be confirmed by resampling as soon as practicable and preferably within one hour. If the repeat sample confirms that the maximum allowable limit has been exceeded, the supplier of water shall report to the commissioner within 48 hours. The repeat sample shall be the sample used for the purpose of calculating the monthly average. If the monthly average of the daily samples exceeds the maximum allowable limit, or if the average of two samples taken on consecutive days exceeds five turbidity units, the supplier of water shall report to the commissioner as prescribed in part 4720.3700 and shall notify the public as prescribed in part 4720.3900.

Statutory Authority: *MS s 144.383*

4720.1400 INORGANIC CHEMICAL CONTAMINANT SAMPLING AND ANALYTICAL REQUIREMENTS.

Subpart 1. **Analyses for inorganic chemical contaminant.** Analyses for the purpose of determining compliance with part 4720.0700 are required as follows: Analyses for all community water supplies utilizing surface water sources shall be completed before June 24, 1978. These analyses shall be repeated at yearly intervals. Analyses for all community water supplies utilizing only groundwater sources shall be completed before June 24, 1979. These analyses shall be repeated at three year intervals. For noncommunity water supplies, whether supplied by surface or ground water sources, analyses for nitrate shall be completed before June 24, 1979. These analyses shall be repeated at least once every five years after the initial determination. The commissioner may order more frequent sampling depending upon the geological formation, the level of nitrate present and the size of the population being served.

Subp. 2. **Data required.** For the initial analyses required by subpart 1, data for surface waters acquired within one year prior to June 24, 1977, and data for ground waters acquired within three years prior to June 24, 1977, may be substituted at the discretion of the commissioner.

Subp. 3. **Methods of analysis.** Analyses conducted to determine compliance with part 4720.0700 shall be made in accordance with items A to J. See part 4720.1100 for complete title of reference sources.

A. Arsenic: EPA Chemical, Method 206.2, or Method 206.3, or Method 206.4; or Standard Methods, Method 404-A and 404-B(4), or Method 301.A VII; or USGS 1979, Method I-1062-78; or ASTM, Method D-2972-78A, or D-2972-78B.

B. Barium: EPA Chemical, Method 208.1, or 208.2; or Standard Methods, Method 301-A IV.

C. Cadmium: EPA Chemical, Method 213.1, or 213.2; or Standard Methods, Method 301-A II or III; or ASTM, Method 3447-78A.

D. Chromium: EPA Chemical, Method 218.1, or 218.2; or Standard Methods, Method 301-A II or III; or ASTM, Method D-1687-77D.

E. Fluoride: EPA Chemical, Method 340.1 or 340.2, or 340.3; or Standard Methods, Method 413-A and 413-C, or 413-B, or 413-E; or USGS 1979, Method I-3325-78; or ASTM, Method D-1179-72A, or D-1179-72B; or Industrial Method #129-71W, Fluoride in Water and Wastewater, Technicon Industrial Systems, Tarrytown, New York 10591, December 1972; or Industrial Method #380-75WE, Automated Electrode Method, Fluoride in Water and Wastewater, Technicon Industrial Systems, Tarrytown, New York, February 1976.

F. Lead: EPA Chemical, Method 239.1 or 239.2; or Standard Methods, Method 301-A II or III; or ASTM, Method D-3559-79A or B.

G. Mercury: EPA Chemical, Method 245.1 or 245.2; or Standard Methods, Method 301-A VI; or ASTM, Method D-3223-79.

H. Nitrate: EPA Chemical, Method 352.1, or 353.1 or 353.2 or 353.3; or Standard Methods, Method 419-D, or 419-C, or 605; or ASTM, Method D-992-71, or D-3867-79A or D-3867-79B.

I. Selenium: EPA Chemical, Method 270.2 or 270.3; or Standard Methods, Method 301-A VII; or USGS 1979, Method I-1667-78; or ASTM, Method D-3859-79.

J. Silver: EPA Chemical, Method 272.1 or 272.2; or Standard Methods, Method 301-A II.

Subp. 4. **Notification of commissioner when maximum contaminant level exceeded.** If the result of an analysis made pursuant to subpart 1 indicates that the level of any contaminant listed in part 4720.0700 exceeds the maximum contaminant level, the supplier of water shall report to the commissioner within seven days from the time the supplier receives the results and shall collect and submit for analysis three additional samples taken at the same sampling point within one month from the time the commissioner is notified.

Subp. 5. **When average of analyses exceeds maximum contaminant level.** When the average of four analyses made pursuant to subpart 4, rounded to the same number of significant figures as the maximum contaminant level for the substance in question, exceeds the maximum contaminant level prescribed in part 4720.0700, the supplier of water shall notify the commissioner within 48 hours pursuant to part 4720.3700 and give notice to the public pursuant to part 4720.3900. Monitoring after public notification shall be at a frequency designated by the commissioner and shall continue until the maximum contaminant level has not been exceeded in two successive samples or until a new monitoring schedule prescribed as a condition to a variance, exemption, or enforcement action shall become effective.

Subp. 6. **Compliance.** The provisions of subparts 4 and 5 notwithstanding, compliance with the maximum contaminant level for nitrate shall be determined on the basis of the mean of two analyses. When a level exceeding the maximum contaminant level for nitrate is found, a second analysis shall be initiated within 24 hours, and if the mean of the two analyses exceeds the maximum contaminant level, the supplier of water shall report any findings to the commissioner within 48 hours pursuant to part 4720.3700 and shall notify the public pursuant to part 4720.3900.

Subp. 7. **Fluoride monitoring.** In addition to complying with subparts 1 to 6, public water supplies that monitor for fluoride must comply with this subpart.

A. Sampling of water sources must comply with the following procedures:

(1) If the public water supply draws water from one source, the supplier shall take one sample at the entry point to the distribution system.

(2) If the public water supply draws water from more than one source, the supplier must sample each source at the entry points to the distribution system.

(3) If the public water supply draws water from more than one source and sources are combined before distribution, the supplier must take one sample at an entry point to the distribution system during periods representative of the maximum fluoride levels occurring under normal operating conditions.

B. The commissioner may alter the frequencies for fluoride monitoring in subpart 1 to increase or decrease the frequency considering the following factors:

(1) reported concentrations from previously required monitoring;

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

(3) other factors which may affect fluoride concentration such as changes in pumping rates in groundwater supplies or significant changes in the

system's configuration, operating procedures, source of water, and changes in stream flows.

C. Monitoring may be decreased from the frequencies in subpart 1 upon application in writing by the supplier if the commissioner determines in writing that the supply is unlikely to exceed the maximum contaminant level, considering the factors in item B. The determination must state the basis for the determination. Monitoring must not be reduced to less than one sample every ten years. For public water supplies that monitor once every ten years, the commissioner shall review the monitoring results every ten years to determine whether more frequent monitoring is necessary.

D. Analyses for fluoride under this part shall only be used for determining compliance with maximum contaminant levels if conducted by laboratories that have analyzed performance evaluation samples to within plus or minus ten percent of the references value at fluoride concentrations from 1.0 mg/l to 10.0 mg/l, within the last 12 months.

E. Compliance with the maximum contaminant level is determined based on each sampling point. If any sampling point is determined to be out of compliance, the public water supply is considered out of compliance.

Statutory Authority: *MS s 144.383*

History: *13 SR 2824*

4720.1500 SYNTHETIC ORGANIC CHEMICAL CONTAMINANT SAMPLING AND ANALYTICAL REQUIREMENTS.

Subpart 1. **Analysis.** An analysis of substances for the purpose of determining compliance with part 4720.0800 shall be made as follows:

A. For all community water supplies utilizing surface water sources, analyses shall be completed before June 24, 1978. Samples analyzed shall be collected during the period of the year designated by the commissioner as the period when contamination by pesticides is most likely to occur. These analyses shall be repeated at intervals specified by the commissioner but in no event less frequently than at three-year intervals.

B. For community water supplies utilizing only groundwater sources, analyses shall be completed by those supplies specified by the commissioner.

Subp. 2. **Analytical requirements.** Analytical requirements for compliance with part 4720.0800, subpart 1, items A and B shall be as described in items A and B:

A. Analyses made to determine compliance with part 4720.0800, subpart 1, item A shall be made in accordance with EPA Organochlorine Methods; or Standard Methods, Method 509-A; or ASTM, Method D-3086-79; or USGS 1972, Gas Chromatographic Methods for Analysis of Organic Substances in Water, Chapter A-3. See part 4720.1100 for complete title of reference sources.

B. Analyses made to determine compliance with part 4720.0800, subpart 1, item B shall be conducted in accordance with EPA Organochlorine Methods; or Standard Methods, Method 509-B; or ASTM, Method D-3478-79; or USGS 1972, Gas Chromatographic Methods for Analysis of Organic Substances in Water, Chapter A-3. See part 4720.1100 for complete title of reference sources.

Subp. 3. **Notification of commissioner when maximum contaminant level exceeded.** If the result of an analysis made pursuant to subpart 1 indicates that the level of any contaminant listed in part 4720.0800 exceeds the maximum contaminant level, the supplier of water shall report to the commissioner within seven days and collect and submit for analysis three additional samples taken at the same sampling point within one month from the time the commissioner is notified.

Subp. 4. **Average of analyses exceeds maximum contaminant level.** When the average of four analyses made pursuant to part 4720.1400, subpart 3, rounded

to the same number of significant figures as the maximum contaminant level for the substance in question, exceeds the maximum contaminant level, the supplier of water shall report to the commissioner pursuant to part 4720.3700 and give notice to the public pursuant to 4720.3900. Monitoring after public notification shall be at a frequency designated by the commissioner and shall continue until the maximum contaminant level has not been exceeded in two successive samples or until a monitoring schedule as a condition to a variance or exemption or enforcement action shall become effective.

Statutory Authority: *MS s 144.383*

4720.1510 VOLATILE ORGANIC CHEMICALS CONTAMINANT SAMPLING AND ANALYTICAL REQUIREMENTS.

Subpart 1. **Analysis.** Analysis of the contaminants listed in part 4720.0800, subpart 3, to determine compliance with maximum levels allowed in part 4720.0800, subpart 3, must follow the procedures in items A to M.

A. A supplier of groundwater must take samples at points of entry to the distribution system representative of each well after any application of treatment. Sampling must be conducted at the same locations or more representative locations every three months for one year except as provided in item H, subitem (1).

B. A supplier of surface water must take samples at points in the distribution system representative of each source or at entry points to the distribution system after any application of treatment. Each source of surface water supply must be sampled every three months except as provided in item H, subitem (2). Sampling must be conducted at the same location or a more representative location each quarter.

C. If the supply draws water from more than one source and sources are combined before distribution, the supplier must sample at an entry point to the distribution system during periods of normal operating conditions.

D. The supplier of a community water supply and nontransient, noncommunity water supply as defined in part 4720.0100, subpart 16, serving more than 10,000 people shall analyze all distribution or entry-point samples, as appropriate, representing all source waters beginning no later than January 1, 1988. A supplier of a community water supply and nontransient, noncommunity water supply serving from 3,300 to 10,000 people shall analyze all distribution or entry-point samples, as required in this subpart, representing source waters no later than January 1, 1989. All other community and nontransient, noncommunity water suppliers shall analyze distribution or entry-point samples, as required in this subpart, representing all source waters beginning no later than January 1, 1991.

E. The commissioner may require samples to confirm positive or negative results. If a confirmation sample is required, then the confirmation sample result is averaged with the first sampling result and used for compliance determination in accordance with item I. The commissioner may delete results of obvious sampling errors from this calculation.

F. Analysis for vinyl chloride is required only for groundwater supplies that have detected one or more of the following two-carbon organic compounds: trichloroethylene, tetrachloroethylene, 1,2-dichloroethane, 1,1,1-trichloroethane, cis-1,2-dichloroethylene, trans-1,2-dichloroethylene, or 1,1-dichloroethylene. The groundwater supplier must analyze for vinyl chloride at each distribution or entry point where one or more of the two-carbon organic compounds were found. If the first analysis does not detect vinyl chloride, vinyl chloride monitoring must be conducted every three years for that sample location or other sample locations which are more representative of the same source. If vinyl chloride is detected in the first analysis, monitoring shall be conducted according to item A. Surface water suppliers must analyze for vinyl chloride, when the commissioner determines the supply may be vulnerable to vinyl chloride contamination.

G. The public water suppliers may composite up to five samples from one or more public water supplies for analysis under this subpart. Composite samples must be analyzed within 14 days of collection. If any volatile organic contaminant listed in part 4720.0800, subpart 3, is detected in the composite sample, a sample from each source that made up the composite sample must be reanalyzed individually. The sample for reanalysis must be a duplicate sample from each source, taken when the sample for the composite sample was taken. If a duplicate sample is not available, new samples must be taken from each source and analyzed for volatile organic contaminants. Reanalysis must be accomplished within 14 days of the collection of the duplicate sample or new sample.

H. The commissioner may reduce the monitoring frequency specified in items A and B as explained in this item:

(1) Monitoring frequency for groundwater supplies is as follows:

(a) When volatile organic contaminants are not detected in the first sample, or any subsequent samples, and the supply is not determined to be vulnerable under subitem (4), monitoring may be reduced to one sample and must be repeated every five years.

(b) When volatile organic contaminants are not detected in the first sample, or any subsequent sample, and the supply is determined to be vulnerable under subitem (4):

(i) monitoring must be repeated every three years for a supply with more than 500 service connections; and

(ii) monitoring must be repeated every five years for a supply with less than 500 service connections.

(c) If volatile organic contaminants are detected in the first sample, or any subsequent sample, regardless of vulnerability, monitoring must be repeated every three months, as required under item A.

(2) Monitoring frequency for surface water supplies is as follows:

(a) When volatile organic contaminants are not detected in samples taken during the first year of sampling, or in subsequent samples, and the supply is not determined to be vulnerable under subitem (4), monitoring is required if the commissioner determines that monitoring is necessary to protect the public health.

(b) When volatile organic contaminants are not detected in samples taken during the first year of sampling, or in subsequent samples, and the supply is vulnerable as defined in subitem (4):

(i) monitoring must be repeated every three years for a supply with more than 500 service connections; and

(ii) monitoring must be repeated every five years for a supply with less than 500 service connections.

(c) When volatile organic contaminants are detected in samples taken during the first year of quarterly sampling, or in subsequent samples, regardless of vulnerability, monitoring must be repeated every three months, as required under item B.

(3) Monitoring may be reduced to once per year for a groundwater supply or surface water supply that has volatile organic contaminants at levels consistently less than the maximum contaminant levels for three consecutive years.

(4) The commissioner shall determine whether each public water supply is vulnerable to contamination, assessing the following factors:

(a) previous monitoring results;

(b) number of persons served by public water supply;

(c) proximity of a smaller public water supply to a larger supply;

(d) proximity to commercial or industrial use, disposal, or storage of volatile synthetic organic chemicals; and

(e) protection of the water source.

(5) A supply is considered vulnerable for a period of three years after any positive measurement of one or more contaminants listed in part 4720.0800, subpart 3, or 4720.1510, subpart 3, item E, except for trihalomethanes or other demonstrated disinfection by-products.

I. Compliance with contaminant levels allowed in part 4720.0800, subpart 3, is determined based on the running annual average of the results of quarterly sampling for each sampling location. If one location's average is greater than the maximum contaminant level, the supply is considered out of compliance. If a public water supply has a distribution system that is separate from other parts of the distribution system with no interconnections, only that part of the supply that has a contaminant level that exceeds the maximum levels in part 4720.0800, subpart 3, is considered out of compliance. The commissioner may authorize that the public notice required in part 4720.3900 need only be given to the area served by the portion of the supply that is out of compliance. If a sample result causes the annual average to be exceeded, then the supply is considered out of compliance immediately. For supplies that only take one sample per location because no volatile organic contaminants were detected, compliance is based on that sample. If a supply does not comply with a maximum contaminant level allowed in part 4720.0800, subpart 3, the supplier must report to the commissioner according to part 4720.3700 and notify the public according to part 4720.3900.

J. A supplier must conduct analysis under this item, using the following Environmental Protection Agency methods or their equivalent, as approved by the Environmental Protection Agency.

(1) Method 502.1, "Volatile Halogenated Organic Chemicals in Water by Purge and Trap Gas Chromatography."

(2) Method 503.1, "Volatile Aromatic and Unsaturated Organic Compounds in Water by Purge and Trap Gas Chromatography."

(3) Method 524.1, "Volatile Organic Compounds in Water by Purge and Trap Gas Chromatography/Mass Spectrometry."

(4) Method 524.2, "Volatile Organic Compounds in Water by Purge and Trap Capillary Column Gas Chromatography/Mass Spectrometry."

(5) Method 502.2, "Volatile Organic Compounds in Water by Purge and Trap Capillary Gas Chromatography with Photoionization and Electrolytic Conductivity Detectors in Series."

Subp. 2. **Reporting and public notification for certain unregulated contaminants.** The requirements of this subpart apply only to the contaminants listed in subpart 3, item E.

A. A supplier of a community water supply or nontransient, noncommunity water supply who is required to monitor under subpart 3 must send to the commissioner a copy of the results of the monitoring within 30 days of receipt and provide public notice under item C.

B. The supplier of a community water supply or a nontransient, noncommunity water supply must give the following information to the commissioner for each sample analyzed under subpart 3:

(1) results of all analytical methods, including negatives;

(2) name and address of the supply from which the sample was taken and location from which it was taken;

(3) contaminants found;

(4) analytical methods used;

(5) date of sample; and

(6) date of analysis.

C. The supplier must notify, in writing, persons served by the supply of the availability of the results of sampling conducted under subpart 3. The supplier must include the notice in the first set of water bills issued by the supplier after the receipt of the results or must give persons a written notice within three months after receipt of the results. The notice must tell people whom to contact and what telephone number to call for information about the monitoring results.

For surface water systems, public notification is required only after the first quarter's monitoring. The notice must include a statement that additional monitoring will be conducted for three more quarters and that the results will be available upon request.

Subp. 3. **Special monitoring for organic chemicals.**

A. Suppliers of community and nontransient, noncommunity water supplies must monitor the supplies for the contaminants listed in item E as specified in subitems (1) to (3):

(1) for supplies serving over 10,000 persons, sampling must begin no later than January 1, 1988;

(2) for supplies serving 3,300 to 10,000 persons, sampling must begin no later than January 1, 1989; and

(3) for supplies serving less than 3,300 persons, sampling must begin no later than January 1, 1991.

B. All community and nontransient, noncommunity water supplies must conduct the monitoring required in this subpart at least every five years from the dates specified in item A.

C. Suppliers of surface water shall take samples in the distribution system representative of each water source or at entry points to the distribution system after any application of treatment. At least one sample per water source must be taken every three months.

D. Suppliers of groundwater shall take samples at points of entry to the distribution system representative of each well after any application of treatment. At least one sample per entry point to the distribution system must be taken.

E. Community water suppliers and nontransient, noncommunity water suppliers shall monitor for the following contaminants except as provided in item F:

(1) Chloroform;
(2) Bromodichloromethane;
(3) Chlorodibromomethane;
(4) Bromoform;
(5) trans-1,2-Dichloroethylene;
(6) Chlorobenzene;
(7) m-Dichlorobenzene;
(8) Dichloromethane;
(9) cis-1,2-Dichloroethylene;
(10) o-Dichlorobenzene;
(11) Dibromomethane;
(12) 1,1-Dichloropropene;
(13) Tetrachloroethylene;
(14) Toluene;
(15) p-Xylene;
(16) o-Xylene;
(17) m-Xylene;
(18) 1,1-Dichloroethane;

(19) 1,2-Dichloropropane;
(20) 1,1,2,2-Tetrachloroethane;
(21) Ethylbenzene;
(22) 1,3-Dichloropropane;
(23) Styrene;
(24) Chloromethane;
(25) Bromomethane;
(26) 1,2,3-Trichloropropane;
(27) 1,1,1,2-Tetrachloroethane;
(28) Chloroethane;
(29) 1,1,2-Trichloroethane;
(30) 2,2-Dichloropropane;
(31) o-Chlorotoluene;
(32) p-Chlorotoluene;
(33) Bromobenzene;
(34) 1,3-Dichloropropene;
(35) Ethylene dibromide (EDB); and
(36) 1,2-Dibromo-3-chloropropane (DBCP).

F. Community water suppliers and nontransient, noncommunity water suppliers must monitor supplies for EDB and DBCP only if the commissioner determines the supplies are vulnerable to contamination by either or both of these substances. For the purpose of this item, a "vulnerable supply" is a supply that has the potential to be contaminated by EDB and DBCP. Vulnerable supply includes surface water supplies where these two compounds are applied, manufactured, stored, disposed of, or shipped upstream; groundwater supplies where the compounds are applied, manufactured, stored, disposed of, or shipped in the groundwater recharge basin; and groundwater supplies that are close to underground storage tanks that contain leaded gasoline.

G. Analysis under this subpart shall be conducted using Environmental Protection Agency methods listed in subitems (1) to (5), or other equivalent methods as determined by the Environmental Protection Agency.

(1) 502.1, "Volatile Halogenated Organic Compounds in Water by Purge and Trap Gas Chromatography";

(2) 503.1, "Volatile Aromatic and Unsaturated Organic Compounds in Water by Purge and Trap Gas Chromatography";

(3) 524.1, "Volatile Organic Compounds in Water by Purge and Trap Gas Chromatography/Mass Spectrometry";

(4) 524.2, "Volatile Organic Compounds in Water by Purge and Trap Capillary Column Gas Chromatography/Mass Spectrometry";

(5) 502.2, "Volatile Organic Compounds in Water by Purge and Trap Gas Chromatography with Photoionization and Electrolytic Conductivity Detectors in Series"; or

(6) Analysis of 1,2-dibromo-3-chloropropane (DBCP) and 1,2-dibromoethane (EDB) shall be conducted by Method 504, "Measurement of 1,2-Dibromoethane (EDB) and 1,2-Dibromo-3-chloropropane (DBCP) in Drinking Water by Microextraction and Gas Chromatography."

H. Instead of performing the monitoring required by this subpart, the supplier of a community water supply or nontransient, noncommunity water supply serving fewer than 150 service connections may send a letter to the commissioner stating that its supply is available for sampling. This letter must be sent no later than January 1, 1991. The supplier shall not send such samples unless requested to do so by the commissioner.

I. The public water suppliers may composite up to five samples from one or more public water supplies for analysis under this subpart. Composite samples must be analyzed within 14 days of collection. If any volatile organic contaminant listed in item D is detected in the composite sample, a sample from each source that made up the composite sample must reanalyzed individually. The sample for reanalysis must be a duplicate sample from each source, taken when the sample for the composite sample was taken. If a duplicate sample is not available, new samples must be taken from each source and analyzed for volatile organic contaminants. Reanalysis must be accomplished within 14 days of the collection of the duplicate sample or new sample.

Statutory Authority: *MS s 144.383*

History: *13 SR 2824*

4720.1600 TRIHALOMETHANE SAMPLING.

Subpart 1. **Requirements.** Total trihalomethanes sampling, analytical, and other requirements shall be as described in subparts 2 to 10.

Subp. 2. **Community water supplies serving a population of 10,000 or more.** Community water supplies which serve a population of 10,000 or more individuals and which add a disinfectant (oxidant) to the water in any part of the drinking water treatment process shall analyze for total trihalomethanes in accordance with this part. For systems serving 75,000 or more individuals, sampling and analyses shall begin not later than May 10, 1982. For systems serving 10,000 to 74,999 individuals, sampling and analyses shall begin not later than January 1, 1983. For the purpose of this part, the minimum number of samples required to be taken by the system shall be based on the number of treatment plants used by the system, except that multiple wells drawing raw water from a single aquifer are considered one treatment plant for determining the minimum number of samples. All samples taken within an established frequency shall be collected within a 24-hour period.

Subp. 3. **Community water supplies utilizing surface water sources.** For all community water supplies utilizing surface water sources in whole or in part, and for all community water supplies utilizing only groundwater sources that have not been determined by the commissioner to qualify for the monitoring requirements of subparts 6 and 7, analyses for total trihalomethanes shall be performed at quarterly intervals on at least four water samples for each treatment plant used by the supply. At least 25 percent of the samples shall be taken at locations within the distribution system reflecting the maximum residence time of the water in the system. The remaining 75 percent shall be taken at representative locations in the distribution system, taking into account number of persons served, different sources of water and different treatment methods employed. The results of all analyses per quarter shall be arithmetically averaged and reported to the commissioner within 30 days of the supply's receipt of such results. All samples collected shall be used in the computation of the average, unless the analytical results are invalidated for technical reasons. Sampling and analyses shall be conducted in accordance with the methods listed in subpart 9.

Subp. 4. **Written request for reduction in monitoring frequency for community water system.** Upon the written request of a community water system, the monitoring frequency required by subpart 3 may be reduced by the commissioner to a minimum of one sample analyzed for total trihalomethanes 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 commissioner that the data from at least one year of monitoring in accordance with subpart 3 and local conditions demonstrate that total trihalomethane concentrations will be consistently below the maximum contaminant level.

Subp. 5. **Reduced monitoring and change in analysis.** If at any time during which the reduced monitoring frequency prescribed under subpart 4 applies, the

results from any analysis exceed 0.10 milligrams per liter of total trihalomethanes and such results are confirmed by at least one check sample taken promptly after such results are received, or if the supply makes any significant change to its source of water or treatment program, the supply shall immediately begin monitoring in accordance with the requirements of subpart 3 and shall continue that monitoring for at least one year before the frequency may be reduced again.

Subp. 6. **Written request for reduction in monitoring frequency in communities using ground water sources.** Upon written request to the commissioner, a community water supply utilizing only groundwater sources may seek to have the monitoring frequency required by subpart 3 reduced to a minimum of one sample for maximum total trihalomethane potential per year for each treatment plant used by the supply taken at a point in the distribution system reflecting maximum residence time of the water in the system. The supply shall submit to the commissioner the results of at least one sample analyzed for maximum total trihalomethane potential for each treatment plant used by the supply taken at a point in the distribution system reflecting the maximum residence time of the water in the system. The supply's monitoring frequency may only be reduced upon a written determination by the commissioner that, based upon the data submitted by the supply, the supply has a maximum total trihalomethane potential of less than 0.10 milligrams per liter and that, based upon an assessment of the local conditions of the supply, the supply is not likely to approach or exceed the maximum contaminant level for total trihalomethanes. All samples collected shall be used for determining whether the supply must comply with the monitoring requirements of subparts 3 to 5, unless the analytical results are invalidated for technical reasons. Sampling and analyses shall be conducted in accordance with the methods listed in subpart 9.

Subp. 7. **Change in analysis, on a reduced monitoring of ground water sources.** If at any time during which the reduced monitoring frequency prescribed under subpart 6 applies, the results from any analysis taken by the supply for maximum total trihalomethane potential are equal to or greater than 0.10 milligrams per liter, and those results are confirmed by at least one check sample taken promptly after such results are received, the supply shall immediately begin monitoring in accordance with the requirements of subparts 3 to 5. The monitoring shall continue for at least one year before the frequency may be reduced again. In the event of any significant change to the supply's raw water or treatment program, the supply shall immediately analyze an additional sample for maximum total trihalomethane potential taken at a point in the distribution system reflecting maximum residence time of the water in the system for the purpose of determining whether the supply must comply with the monitoring requirements of subparts 3 to 5.

Subp. 8. **Compliance.** Compliance with part 4720.0800, subpart 2 shall be determined based on a running annual average of quarterly samples collected by the supply as prescribed in subparts 3 and 4. If the average of samples covering any 12-month period exceeds the maximum contaminant level prescribed in part 4720.0800, subpart 2, the supplier of water shall report to the state pursuant to part 4720.3700 and notify the public pursuant to part 4720.3900. Monitoring after public notification shall be at a frequency designated by the commissioner and shall continue until a monitoring schedule as a condition to a variance, exemption or enforcement action shall become effective.

Subp. 9. **Methods of sampling and analyses.** Sampling and analyses made pursuant to this part shall be conducted by one of the following methods:

A. The Analysis of Trihalomethanes in Finished Waters by the Purge and Trap Method, Method 501.1, Environmental Monitoring and Support Laboratory, United States Environmental Protection Agency, Cincinnati, Ohio 45268.

B. The Analysis of Trihalomethanes in Drinking Water by Liquid/

Liquid Extraction, Method 501.2, Environmental Monitoring and Support Laboratory, United States Environmental Protection Agency, Cincinnati, Ohio 45268.

Samples for total trihalomethane shall be dechlorinated upon collection to prevent further production of trihalomethanes, according to the procedures described in items A and B. Samples for maximum total trihalomethane potential should not be dechlorinated, and should be held for seven days at 25 degrees Celsius prior to analysis, according to the procedures described in items A and B.

Subp. 10. **Commissioner approval of modification.** Before a community water supply makes any significant modifications to its existing treatment process for the purposes of achieving compliance with part 4720.0800, subpart 2, such supply must submit to the commissioner and obtain the commissioner's approval of a detailed plan setting forth its proposed modification and those safeguards that it will implement to ensure that the bacteriological quality of the drinking water served by such supply will not be adversely affected by such modification. Each supply shall comply with the provisions set forth in the plan as approved. At a minimum, an approved plan shall require the system modifying its disinfection practice to:

A. evaluate the water supply for sanitary defects and evaluate the source water for biological quality;

B. evaluate its existing treatment practices and consider improvements that will minimize disinfectant demand and optimize finished water quality throughout the distribution system;

C. provide baseline water quality survey data of the distribution system (such data shall include the results from monitoring for coliform and fecal coliform bacteria, standard plate counts at 35 degrees Celsius and 20 degrees Celsius, phosphate, ammonia nitrogen, and total organic carbon);

D. conduct additional monitoring to assure continued maintenance of optimal biological quality in finished water, for example, when chloramines are introduced as disinfectants or when prechlorination is being discontinued; and

E. demonstrate an active disinfectant residual throughout the distribution system at all times during and after the modification.

Statutory Authority: *MS s 144.383*

4720.1700 MONITORING REQUIREMENTS FOR GROSS ALPHA PARTICLE ACTIVITY, RADIUM-226, AND RADIUM-228.

Subpart 1. **Initial sampling.** Initial sampling to determine compliance with part 4720.0900, subpart 2, shall begin before June 24, 1979, and the analysis shall be completed before June 24, 1980. Compliance shall be based on the analysis of an annual composite of four consecutive quarterly samples or the average of the analyses of four samples obtained at quarterly intervals.

A gross alpha particle activity measurement may be substituted for the required radium-226 and radium-228 analyses provided that the measured gross alpha particle activity does not exceed five pCi per liter at a confidence level of 95 percent (1.65 σ where σ is the standard deviation of the net counting rate of the sample).

In localities where radium-228 may be present in drinking water, analyses for radium-226 and/or radium-228 are required when the gross alpha particle activity exceeds two pCi per liter at a confidence level of 95 percent.

When the gross alpha particle activity exceeds five PCi per liter, the same or an equivalent sample shall be analyzed for radium-226. If the concentration of radium-226 exceeds three pCi per liter, the same or an equivalent sample shall be analyzed for radium-228.

Subp. 2. **Monitoring of water.** Suppliers of water shall monitor at least once every four years following the procedure required by subpart 1. When an annual

record taken in conformance with subpart 1 has established that the average annual concentration is less than half the maximum contaminant levels established by part 4720.0900, subpart 2, analysis of a single sample may be substituted for the quarterly sampling procedure required by subpart 1.

More frequent monitoring shall be conducted when ordered by the commissioner in the vicinity of mining or other operations which may contribute alpha particle radioactivity to either surface or ground water sources of drinking water.

A supplier of water shall monitor in conformance with subpart 1 within one year of the introduction of a new water source for a community water supply. More frequent monitoring shall be conducted when ordered by the commissioner in the event of possible contamination or when changes in the distribution system or treatment process occur which may increase the concentration of radioactivity in finished water.

A community water supply using two or more sources having different concentrations of radioactivity shall monitor source water, in addition to water from a free-flowing tap, when ordered by the commissioner.

Monitoring for compliance with part 4720.0900, subpart 2 after the initial period need not include radium-228 except when required by the commissioner, provided that the average annual concentration of radium-228 has been assayed at least once using the quarterly sampling procedure required by subpart 1.

Suppliers of water shall conduct annual monitoring of any community water supply in which the radium-226 concentration exceeds three pCi per liter, when ordered by the commissioner.

Subp. 3. **Notification of commissioner of maximum contaminant level exceeded.** If the average annual maximum contaminant level for gross alpha particle activity or total radium as set forth in part 4720.0900, subpart 2 is exceeded, the supplier of a community water system shall give notice to the commissioner pursuant to part 4720.3700 and notify the public as required by part 4720.3900. 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.

Statutory Authority: *MS s 144.383*

4720.1800 MONITORING REQUIREMENTS FOR MAN-MADE RADIOACTIVITY.

Subpart 1. **Monitoring.** Before June 24, 1979, community water supplies using surface sources and serving more than 100,000 persons, and such other community water supplies as are designated by the commissioner shall be monitored for compliance with part 4720.0900, subpart 3 by analysis of a composite of four consecutive quarterly samples or analysis of four quarterly samples. Compliance with part 4720.0900, subpart 3 may be assumed without further analysis if the average annual concentration of gross beta particle activity is less than 50 pCi per liter and if the average annual concentrations of tritium and strontium-90 are less than those listed in part 4720.0900, subpart 3, item C, provided that if both radio nuclides are present the sum of their annual dose equivalents to bone marrow shall not exceed four millirem/year.

If the gross beta particle activity exceeds 50 pCi per liter, 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 part 4720.0900, subpart 3.

Suppliers of water shall conduct additional monitoring, as ordered by the commissioner, to determine the concentration of man-made radioactivity in principal watersheds designated by the commissioner.

At the discretion of the commissioner suppliers of water utilizing only ground waters may be required to monitor for man-made radioactivity.

After the initial analysis required by this subpart, these suppliers shall monitor at least every four years following the procedure given in this subpart.

Subp. 2. **Quarterly monitoring.** Before June 24, 1979, the supplier of any community water supply which is found by the commissioner to be 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.

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 per liter, the same or an equivalent sample shall be analyzed for strontium-89 and cesium-134. If the gross beta particle activity exceeds 50 pCi per liter, 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 part 4720.0900, subpart 3.

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

Annual monitoring for strontium-90 and tritium shall be conducted by means of the analysis of four quarterly samples.

The commissioner 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 commissioner determines such data is applicable to a particular community water supply.

Subp. 3. **Notification of commissioner of annual maximum contaminant level exceeded.** If the average annual maximum contaminant level for man-made radioactivity set forth in part 4720.0900, subpart 3 is exceeded, the supplier of a community water supply shall give notice to the commissioner pursuant to part 4720.3700 and to the public as required by part 4720.3900. Monitoring at monthly intervals shall be initiated and 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.

Statutory Authority: *MS s 144.383*

4720.1900 ANALYTICAL METHODS.

Subpart 1. **Measurements.** Measurements made to determine compliance with part 4720.0900 shall be made in accordance with the following methods:

A. Gross Alpha and Beta: Section 302, Gross Alpha and Beta Radioactivity in Water "Standard Methods for the Examination of Water and Wastewater," 13th edition, American Public Health Association, New York, N.Y., 1975.

B. Total Radium: Section 304, Radium in Water by Precipitation, ibid.

C. Radium-226: Section 305, Radium-226 by Radon in Water, ibid.

D. Strontium-89, 90: Section 303, Total Strontium and Strontium-90 in Water, ibid.

E. Tritium: Section 306, Tritium in Water, ibid.

F. Cesium-134: ASTM D-2459, Gamma Spectrometry in Water, 1975 "Annual Book of ASTM Standards," Water and Atmospheric Analysis, Part 31, American Society for Testing and Materials, Philadelphia, PA, 1975.

G. Uranium: ASTM D-2907, Microquantities of Uranium in Water by Fluorometry, ibid.

When the identification and measurement of radionuclides other than those listed above is required, the following references are to be used, except in cases where alternative methods have been approved in accordance with part 4720.2000.

H. "Procedures for Radiochemical Analysis of Nuclear Reactor Aqueous Solutions," H. L. Krieger and S. Gold, EPA-R4-73-014. USEPA, Cincinnati, Ohio, May 1973.

I. HASL Procedure Manual, edited by John H. Harley. HASL 300, ERDA Health and Safety Laboratory, New York, N.Y., 1973.

Subp. 2. **Detection limit of radioanalysis.** For the purpose of monitoring radioactivity concentrations in drinking water, the required sensitivity of the radioanalysis is defined in terms of a detection limit. The detection limit shall be that concentration which can be counted with a precision of plus or minus 100 percent at the 95 percent confidence level (1.96 σ where σ is the standard deviation of the net counting rate of the sample).

To determine compliance with part 4720.0900, subpart 2, item A the detection limit shall not exceed one pCi per liter. To determine compliance with part 4720.0900, subpart 2, item B, the detection limit shall not exceed three pCi per liter.

To determine compliance with part 4720.0900, subpart 3 the detection limits shall not exceed the concentrations listed in subpart 3.

Subp. 3. **Detection limits for man-made beta particle and photon emitters.**

Radionuclide	Detection Limit
Tritium	1,000 pCi per liter
Strontium-89	10 pCi per liter
Strontium-90	2 pCi per liter
Iodine-131	1 pCi per liter
Cesium-134	10 pCi per liter
Gross beta	4 pCi per liter
Other radionuclides	1/10 of the applicable limit

To judge compliance with the maximum contaminant levels listed in part 4720.0900, subparts 2 and 3, averages of data shall be used and shall be rounded to the same number of significant figures as the maximum contaminant level for the substance in question.

Statutory Authority: *MS s 144.383*

4720.2000 ALTERNATIVE ANALYTICAL TECHNIQUES.

With the written permission of the commissioner, an alternative analytical technique may be employed. An alternative technique shall be acceptable only if it is substantially equivalent to the prescribed test in both precision and accuracy as it relates to the determination of compliance with any maximum contaminant level. The use of the alternative analytical technique shall not decrease the frequency of monitoring required by these rules.

Statutory Authority: *MS s 144.383*

4720.2100 APPROVED LABORATORIES.

For the purpose of determining compliance with parts 4720.1000 to 4720.1900, samples may be considered only if they have been analyzed by a laboratory approved by the commissioner, except that measurements for temperature, pH, turbidity, and free chlorine residual may be performed by any person acceptable to the commissioner.

Statutory Authority: *MS s 144.383*

4720.2200 MONITORING CONSECUTIVE SYSTEMS.

When a public water supply provides water to one or more other public water supplies, the monitoring requirements imposed by parts 4720.1000 to 4720.1900

may be superseded by a special monitoring schedule prescribed by the commissioner. Such a special monitoring schedule may be imposed to the extent that the interconnection justifies treating them as a single supply for monitoring purposes, and is enforceable just as any other monitoring requirement imposed by these rules. Such a special monitoring schedule shall include an agreement which names the supply or supplies responsible for monitoring, reporting, giving public notice, and maintaining records.

Statutory Authority: *MS s 144.383*

4720.2300 ADDITIONAL MONITORING REQUIREMENTS.

The commissioner may impose additional monitoring requirements if the results of a sanitary survey indicate that a public health risk may exist. The commissioner may impose a requirement for more frequent sampling if the analytical results of water tests show that a previously measured contaminant is approaching a maximum contaminant level as prescribed in parts 4720.0400 to 4720.0900.

Statutory Authority: *MS s 144.383*

4720.2400 SPECIAL MONITORING FOR SODIUM.

Subpart 1. **Samples.** Community public water supplies shall collect and analyze one sample per treatment plant at the entry point of the distribution system for the determination of sodium concentration levels. Samples must be collected and analyzed annually for supplies utilizing surface water sources in whole or in part, and at least every three years for supplies utilizing solely groundwater sources. The minimum number of samples required to be taken by the supply shall be based on the number of treatment plants used by the supply, except that multiple wells drawing raw water from a single aquifer will be considered one treatment plant for determining the minimum number of samples.

Subp. 2. **Results.** The supplier of water shall report the results of the analyses for sodium within the first ten days of the month following the month in which the sample results were received or within the first ten days following the end of the required monitoring period as stipulated by the commissioner whichever of these is first. If more than annual sampling is required, the supplier shall report the average sodium concentration within ten days of the month following the month in which the analytical results of the last sample used for the annual average were received.

Subp. 3. **Analyses.** Analyses for sodium shall be performed by the flame photometric method in accordance with the procedures described in Standard Methods, Method 320A; or EPA Chemical, Method 273.1 or 273.2; or ASTM, Method D-1428-64A. See part 4720.1100 for complete title of reference sources.

Statutory Authority: *MS s 144.383*

4720.2500 SPECIAL MONITORING FOR CORROSIVITY CHARACTERISTICS.

Subpart 1. **Samples.** Community public water supplies shall collect samples from a representative entry point to the water distribution system for the purpose of analysis to determine the corrosivity characteristics of the water.

The supplier shall collect for analysis for each treatment plant using surface water sources in whole or in part, one sample during midwinter and one sample during midsummer. The supplier of the water shall collect for analysis one sample per treatment plant for each treatment plant using ground water sources. The minimum number of samples required to be taken by the supply shall be based on the number of treatment plants used by the supply, except that multiple wells drawing raw water from a single aquifer may be considered one treatment plant for determining the minimum number of samples.

Determination of the corrosivity characteristics of the water shall include

measurement of pH, calcium hardness, alkalinity, temperature, total dissolved solids or total filterable residue, and calculation of the Langelier Index in accordance with subpart 3. The determination of corrosivity characteristics shall only include one round of sampling. One round of sampling consists of two samples per treatment plant for surface water and one sample per treatment plant for ground water sources.

Subp. 2. **Results.** The supplier of water shall report the results of the analyses for the corrosivity characteristics within the first ten days of the month following the month in which the sample results were received. If more frequent sampling is required the supplier can accumulate the data and report each value within ten days of the month following the month in which the analytical results of the last sample were received.

Subp. 3. **Analysis.** Analyses conducted to determine the corrosivity of the water shall be made in accordance to the methods described in items A to F. See part 4720.1100 for complete title of reference sources.

A. Langelier Index: Standard Methods, Method 203.

B. Total Filterable Residue: Standard Methods, Method 208B; or EPA Chemical, Method 160.1.

C. Temperature: Standard Methods, Method 212.

D. Calcium: Standard Methods, Method 306C; or ASTM, Method D-1126-67B.

E. Alkalinity: Standard Methods, Method 403; or ASTM, Method D-1067-70B; or EPA Chemical, Method 310.1.

F. pH: Standard Methods, Method 424; or EPA Chemical, Method 150.1; or ASTM, Method D-1293-78 A or B.

Subp. 4. **Report of construction materials in the distribution system.** Community water supplies shall identify whether the following construction materials are present in their distribution system and report to the commissioner the existence of any of the following materials:

A. lead from piping, solder, caulking, interior lining of distribution mains, alloys, and home plumbing;

B. copper from piping and alloys, service lines, and home plumbing;

C. galvanized piping, service lines, and home plumbing;

D. ferrous piping materials such as cast iron and steel;

E. asbestos cement pipe;

F. vinyl-lined asbestos cement pipe; or

G. coal tar lined pipes and tanks.

Statutory Authority: *MS s 144.383*

4720.2600 VARIANCES.

Subpart 1. **General conditions.** The commissioner may grant one or more variances from a maximum contaminant level prescribed in parts 4720.0400 to 4720.0900 or from a treatment required by these rules, pursuant to authority granted in Laws of Minnesota 1977, chapter 66, section 3, clause (e), according to the procedure described in this part.

Subp. 2. **Request for variance.** A supplier may request a variance whenever he determines that his supply is exceeding or will exceed a maximum contaminant level. A supplier who has not requested a variance or has not taken corrective action to bring his supply into compliance by the date specified in the notification of violation shall be subject to the penalties of Laws of Minnesota 1977, chapter 66, section 3, clause (e).

Subp. 3. **Matters to be considered.** In deciding whether to grant a variance from a maximum contaminant level, the commissioner shall consider: the avail-

ability and effectiveness of treatment methods for the contaminant for which the variance is requested; and cost and other economic considerations such as implementing treatment, improving the quality of the source water or using an alternative source.

Subp. 4. **Specific conditions for variance.** The commissioner may grant a variance from a maximum contaminant level upon finding that:

A. because of the characteristics of the raw water sources which are reasonably available to the supply, the supply cannot meet the requirements respecting the maximum contaminant levels prescribed in parts 4720.0400 to 4720.0900 despite the application of the best known and economically feasible technology for treatment or other means; and

B. the variance will not result in an unreasonable risk to health.

The commissioner may grant a variance from any required treatment upon finding that the supply has demonstrated that such treatment is not necessary to meet a maximum contaminant level or to protect the health of persons, because of the nature of the raw water source of the supply.

Statutory Authority: *MS s 144.383*

4720.2700 APPLICATION PROCEDURE FOR VARIANCE.

A request for a variance shall be submitted to the commissioner in writing and shall contain the following information:

A. The nature and duration of the variance being requested.

B. Relevant analytical results of water quality sampling of the supply, including results of relevant tests conducted pursuant to the requirements of parts 4720.0100 to 4720.3900.

C. For any request for a variance from a maximum contaminant level, the notice shall also contain:

(1) An explanation in full and evidence of the best available treatment.

(2) Economic and legal factors relevant to the ability to comply.

(3) Analytical results of raw water quality relevant to the variance request.

(4) A proposed compliance schedule, including the date each step toward compliance will be achieved. Such a schedule shall include as a minimum the following dates:

(a) a date by which arrangement for alternative raw water source or improvement of existing raw water source will be completed;

(b) a date for initiation of the connection of the alternative raw water source or improvement of existing raw water source; and

(c) a date by which final compliance is to be achieved.

(5) A plan for the provision of safe drinking water in the case of an excessive rise in the contaminant level for which the variance is requested.

(6) A plan for interim control measures during the effective period of variance.

D. For any request for a variance from a required treatment, the notice shall include a statement that the supply will perform monitoring and other reasonable requirements prescribed by the commissioner as a condition to the variance.

E. Such other information as the commissioner may require.

F. Any information which the supplier believes is pertinent to the request.

Statutory Authority: *MS s 144.383*

4720.2800 DISPOSITION OF A REQUEST FOR A VARIANCE.

Upon receipt of an application for a variance the commissioner shall initiate, within 90 days, the procedure for a contested case. Notice and opportunity for hearing shall be given according to Minnesota Statutes, chapter 14 and the rules of the Office of Administrative Hearings.

The commissioner shall within one year after the variance is granted, impose a schedule for compliance with parts 4720.0100 to 4720.3900, after notice and opportunity for hearing have been given.

Statutory Authority: *MS s 144.383*

4720.2900 TERMINATION OF A VARIANCE.

A variance from a maximum contaminant level may be terminated by the commissioner when the supply comes into compliance with the applicable rule, and may be terminated by the commissioner upon a finding that the supply has failed to comply with any requirement of a final schedule imposed by the commissioner pursuant to these rules.

A variance from a required treatment may be terminated at any time upon a finding by the commissioner that the nature of the raw water source is such that the required treatment for which the variance was granted is necessary to protect the health of persons, or upon a finding by the commissioner that the supply has failed to comply with monitoring and other requirements prescribed as a condition to the granting of the variance.

Statutory Authority: *MS s 144.383*

4720.3000 COMPLIANCE WITH VARIANCE.

A compliance schedule imposed by the commissioner pursuant to the grant of a variance shall be enforceable as if it were a rule of the commissioner.

Statutory Authority: *MS s 144.383*

4720.3100 EXEMPTIONS.

The commissioner may grant one or more exemptions from a maximum contaminant level prescribed in parts 4720.0400 to 4720.0900 or from a treatment required by these rules, pursuant to authority granted in Laws of Minnesota 1977, chapter 66, section 3, clause (e), according to the procedure described below.

A supplier may request an exemption whenever he determines that his supply is exceeding or will exceed a maximum contaminant level. A supplier who has not requested an exemption or has not taken corrective action to bring his supply into compliance by the date specified in the notification of violation shall be subject to the penalties of Laws of Minnesota 1977, chapter 66, section 3, clause (e).

The commissioner may grant an exemption from a maximum contaminant level or from a required treatment:

A. after having considered the following: construction, installation, or modification of treatment equipment or systems; the time needed to put into operation a new treatment facility to replace an existing supply which is not in compliance; economic feasibility of compliance; and

B. upon finding that, due to compelling factors (which may include economic factors), the supply is unable to comply with such contaminant level or required treatment; the supply was in operation on the date on which such contaminant level or required treatment went into effect; and the granting of the exemption will not result in an unreasonable risk to health.

Statutory Authority: *MS s 144.383*

4720.3200 APPLICATION PROCEDURE FOR EXEMPTION.

A request for an exemption shall be submitted to the commissioner in writing and shall contain the following information:

A. the nature and duration of the exemption being requested;

B. relevant analytical results of water quality sampling of the supply, including results of relevant tests conducted pursuant to the requirements of parts 4720.0100 to 4720.3900.

C. an explanation of the compelling factors such as time or economic factors which prevent the supply from complying with a maximum contaminant level or required treatment on the effective date of the applicable standard;

D. a proposed compliance schedule, including the date when each step toward compliance will be achieved;

E. such other information as the commissioner may require; and

F. any other information which the applicant believes is pertinent to the request.

Statutory Authority: *MS s 144.383*

4720.3300 DISPOSITION OF A REQUEST FOR AN EXEMPTION.

Upon receipt of an application for an exemption the commissioner shall initiate within 90 days, the procedure for a contested case. Notice and opportunity for hearing shall be given according to Minnesota Statutes, chapter 14 and the rules of the Office of Administrative Hearings.

The commissioner shall within one year after the exemption is granted, impose a schedule for compliance with parts 4720.0100 to 4720.3900 after notice and opportunity for hearing have been given.

Statutory Authority: *MS s 144.383*

4720.3400 TERMINATION OF AN EXEMPTION.

An exemption may be terminated by the commissioner when the supply comes into compliance with the applicable rule, and may be terminated by the commissioner of health upon a finding by the commissioner that the supply has failed to comply with any requirement of a final schedule imposed pursuant to parts 4720.0100 to 4720.3900.

Statutory Authority: *MS s 144.383*

History: *L 1977 c 305 s 39*

4720.3500 COMPLIANCE WITH EXEMPTION.

Any compliance schedule issued pursuant to an exemption shall require compliance with parts 4720.0100 to 4720.3900 before January 1, 1981. Compliance with the requirements of revised federal regulations will have to be achieved within seven years of the date on which such federal regulations become effective.

If the supply which seeks the exemption has entered into an enforceable agreement to become a part of a regional system, as determined by the commissioner, the compliance schedule shall require compliance by the supply with each maximum contaminant level or required treatment prescribed by parts 4720.0100 to 4720.3900 before January 1, 1983. For such a supply (which will become part of a regional system) compliance with the requirements of the revised federal regulations shall be required within nine years of the effective date of the revised federal regulations.

A compliance schedule imposed by the commissioner pursuant to the grant of an exemption shall be enforceable as if it were a rule of the commissioner.

Statutory Authority: *MS s 144.383*

4720.3510 STANDARDS FOR ALTERNATIVE COMPLIANCE TECHNOLOGIES.

Subpart 1. **Criteria and procedures for public water supplies using point-of-entry devices.** The criteria and procedures for public water supplies using point-of-entry devices are described in items A to E.

A. A public water supply may use point-of-entry devices to comply with maximum contaminant levels only if they meet the requirements of this subpart.

B. The supplier must operate and maintain the point-of-entry treatment system.

C. The supplier must develop and obtain approval from the commissioner for a monitoring plan before point-of-entry devices are installed for compliance. Under the approved plan, point-of-entry devices must provide health protection equivalent to central water treatment. "Equivalent" means that the water would meet all maximum contaminant levels contained in this chapter and would be of acceptable quality similar to water distributed by a well-operated central treatment plant. In addition to providing for monitoring of volatile organic contaminants, the plan must also include monitoring of physical measurements and observations such as total flow treated and mechanical condition of the treatment equipment.

D. Effective technology must be properly applied under a plan approved by the commissioner and the microbiological safety of the water must be maintained.

(1) The plan must include methods to ensure proper performance of point-of-entry devices, field testing, and an engineering design review of the point-of-entry devices.

(2) The design and application of the point-of-entry devices must address the tendency for increase in heterotrophic bacteria concentrations in water treated with activated carbon and allow frequent backwashing, postcontractor disinfection, and heterotrophic plate count monitoring to ensure the microbiological safety of the water.

E. Every building connected to the supply must have a point-of-entry device installed, maintained, and adequately monitored. The public water supply must provide documentation to the commissioner that every building is subject to treatment and monitoring, and that the rights and responsibilities of the public water supply customer convey with title upon sale of property.

Subp. 2. **Bottled water; point-of-use devices; limitations.** Public water supplies shall not use bottled water or point-of-use devices to achieve compliance with a maximum contaminant level. Bottled water or point-of-use devices may be used on a temporary basis to avoid an unreasonable risk to health, or as provided under subpart 3.

Subp. 3. **Bottled water and point-of-use devices.**

A. A public water supply may be required to use bottled water or point-of-use devices as a condition for receiving an exemption or variance from the requirements of part 4720.0800, subpart 3.

B. A public water supply that uses bottled water as a condition of obtaining an exemption or variance from the requirements of part 4720.0800, subpart 3, must meet the requirements in either subitem (1) or (2), in addition to requirements in subitem (3).

(1) The commissioner must approve a monitoring program for bottled water. The supplier must develop and use a monitoring program that provides reasonable assurances that the bottled water contains contaminants that are below the maximum contaminant level for all contaminants regulated under part 4720.0800, subpart 3. Notice of the results of this monitoring shall be provided to the commissioner during the first quarter that it supplies the bottled water to the public. After the first quarter, the supplier shall provide the commissioner with notice of the results of this monitoring on an annual basis.

(2) The public water supply must receive a certification from the bottled water company that the bottled water supplied has been taken from an approved source as defined in Code of Federal Regulations, title 21, section 129.3, paragraph (a); the bottled water company has conducted monitoring in accordance with Code of Federal Regulations, title 21, section 129.80, paragraph (g), clauses (1) to (3); and the bottled water does not exceed any maximum contaminant levels or quality limits in Code of Federal Regulations, title 21, sections 103.35, 110, and 129. The public water supply shall provide the certification to the commissioner during the first quarter it supplies bottled water. After the first quarter, the supplier shall provide the commissioner with the certification on an annual basis.

(3) The supplier must provide sufficient quantities of bottled water to every person supplied by the public water supply, by door-to-door bottled water delivery.

C. Public water supplies that use point-of-use devices for an exemption or variance from the requirements of part 4720.0800, subpart 3, must meet the following requirements:

(1) The supplier must operate and maintain the point-of-use treatment system.

(2) The supplier must develop a monitoring plan and obtain approval from the commissioner for the plan before point-of-use devices are installed for compliance. This monitoring plan must include health protection equivalent to a monitoring plan for central water treatment.

(3) The plan must provide for effective technology to maintain the microbiological safety of the water.

(4) The design and application of the point-of-use devices must consider the tendency for increase in heterotrophic bacteria concentrations in water treated with activated carbon. It may be necessary to use frequent backwashing, postcontractor disinfection, and heterotrophic plate count monitoring to maintain the microbiological safety of the water.

(5) The plan must include methods to ensure proper performance of point-of-use devices, field testing, and rigorous review of the engineering design of the point-of-use devices.

(6) Every building connected to the supply must have a point-of-use device installed, maintained, and adequately monitored. The plan must include procedures the supplier must follow to assure the commissioner that every building is subject to treatment and monitoring, and that the rights and responsibilities of the public water supply customer convey with title upon sale of property.

Statutory Authority: *MS s 144.383*

History: *13 SR 2824*

RECORD MAINTENANCE; REPORTING; PUBLIC NOTIFICATION

4720.3600 RECORD MAINTENANCE.

Subpart 1. **Records to be maintained.** Any owner or operator of a public water supply shall retain on its premises or at a convenient location near the premises, and shall make available for public inspection, the following records for the specified period of time:

A. Records of bacteriological analyses and turbidity measurements made pursuant to parts 4720.1200 and 4720.1300 shall be kept for not less than five years.

B. Records of chemical analyses made pursuant to parts 4720.1400 to 4720.1900 shall be kept for not less than ten years.

Subp. 2. **Laboratory reports.** Actual laboratory reports may be kept, or data may be transferred to tabular summaries, provided that the following information is included:

A. the date, place, and time of sampling, and the name of the person who collected the sample;

B. identification of the sample as to whether it was a routine distribution system sample, check sample, raw or process water sample, or other special purpose sample;

C. date of analysis;

D. laboratory and person responsible for performing analysis;

E. the analytical technique or method used; and

F. the results of the analysis.

Subp. 3. **Records of actions.** Records of action taken by the supply to correct violations of rules dealing with public water supplies shall be kept for a period not less than three years after the last action taken with respect to the particular violation involved.

Subp. 4. **Copies of reports.** Copies of any written reports, summaries, or communications relating to sanitary surveys of the supply conducted by the supply itself, by a private consultant, or by any local, state, or federal agency, shall be kept for a period of not less than ten years after completion of the sanitary survey involved.

Subp. 5. **Records of variance or exceptions.** Records concerning a variance or exemption granted to the supply shall be kept for a period ending not less than five years following the expiration of such variance or exemption.

Statutory Authority: *MS s 144.383*

4720.3700 REPORTING REQUIREMENTS.

Subpart 1. **Results of analysis on sample.** All the results of analyses performed on samples which are to be tested pursuant to these rules shall be reported as follows:

A. The approved laboratory shall submit all analytical results on reporting forms to be prescribed by the commissioner. These forms shall be prepared in triplicate, with one copy being sent to the supplier, one copy being sent to the state Department of Health, Division of Environmental Health, Section of Public Water Supplies, and the third being retained by the laboratory.

B. Results of turbidity and chlorine residual measurements shall be submitted by the supplier on the prescribed reporting forms.

Subp. 2. **Reporting forms.** Except when a shorter reporting period is specified, all results of tests, analyses, or measurements shall be submitted on prescribed reporting forms to the commissioner within the time period specified in item A or B, whichever is shorter:

A. the first ten days following the month in which the result is received by the supplier; or

B. the first ten days following the end of the required monitoring period as stipulated by the commissioner.

Subp. 3. **Reporting positive test results.** A laboratory performing microbiological analyses pursuant to parts 4720.0100 to 4720.3900 shall report to the supplier and to the commissioner any positive test results within 24 hours of the time the positive result becomes available.

The supplier shall report to the commissioner a positive bacteriological test result within 24 hours of the time the supplier learns of such a result.

Subp. 4. **Reporting failure to comply with rules.** The supplier of water shall report to the commissioner within 48 hours the failure to comply with any of the rules relating to public water supplies, including the failure to comply with a monitoring requirement, as set forth in parts 4720.1000 to 4720.2500.

Statutory Authority: *MS s 144.383*

4720.3800 RIGHT OF INSPECTION.

The commissioner, or one of its authorized representatives, upon presenting appropriate credentials to any water supplier, is authorized to enter and inspect any establishment, facility, or other property of such supplier, in order to determine whether such supplier has acted or is acting in compliance with the rules of the commissioner relating to water supplies, including for this purpose the inspection of records, files, papers, processes, controls, and facilities, or in order to test any feature of a public water supply, including its raw water source.

Statutory Authority: *MS s 144.383*

4720.3900 PUBLIC NOTIFICATION OF VIOLATIONS OF MAXIMUM CONTAMINANT LEVELS, TREATMENT TECHNIQUES, OR VARIANCES.

Subpart 1. [Repealed, 13 SR 2824]

Subp. 2. [Repealed, 13 SR 2824]

Subp. 3. [Repealed, 13 SR 2824]

Subp. 4. [Repealed, 13 SR 2824]

Subp. 5. [Repealed, 13 SR 2824]

Subp. 6. [Repealed, 13 SR 2824]

Subp. 7. **Notice of violations and exemptions required.** If a supplier fails to comply with a maximum contaminant level, variance or exemption, or monitoring or testing technique, or receives an exemption under part 4720.3100, the supplier must notify persons served by the supply of the violation, failure, or exemption. Subparts 2 to 8 describe requirements for notice under this part.

Subp. 8. **Notice of violation of a maximum contaminant level, variance, or exemption.** The supplier must issue notice of a violation of a maximum contaminant level, variance, or exemption according to the procedures in items A to D.

A. Except as provided in item C, the owner or operator of a public water supply must:

(1) Publish the notice in a daily newspaper of general circulation in the area served by the supply as soon as possible, but no later than 14 days after the violation or failure is determined. If the area served by a public water supply is not served by a daily newspaper of general circulation, notice must be published in a weekly newspaper of general circulation serving the area;

(2) Mail or hand deliver the notice not later than 45 days after the violation or failure is determined. The notice may be mailed separate from or along with the water bill. Mail or hand delivery may be waived if the commissioner determines in writing that the supplier has corrected the violation or failure within the 45-day period. The commissioner must issue the waiver within the 45-day period; and

(3) For violations of the maximum contaminant levels of contaminants that may pose an acute risk to human health, furnish a copy of the notice to the radio and television stations in the area served by the public water supply as soon as possible but in no case later than 72 hours after the violation or failure is determined. The following violations require radio and television notices as required under this subitem:

(a) violations specified by the commissioner as posing an acute risk to human health; and

(b) violation of the maximum contaminant level for nitrate as defined in part 4720.0700, subpart 1, and determined according to part 4720.1400, subpart 6.

B. Except as provided in item C, following the initial notice given under item A, the owner or operator of the public water supply must give notice at least once every three months by mail delivery or by hand delivery, for as long as the

violation or failure exists. The notice may be mailed separate from or along with the water bill.

C. In place of the requirements of item A, subitem (1), the owner or operator of a community water supply in an area that is not served by either a daily or weekly newspaper of general circulation must give notice by hand delivery or by continuous posting in conspicuous places in the area served by the supply. The notice must be given within 14 days after the violation or failure is determined. Posting must continue for as long as the violation or failure exists. Notice by hand delivery must be repeated at least every three months for as long as the violation or failure exists.

D. In place of the requirements of items A and B, the owner or operator of a noncommunity water supply may give notice by hand delivery or by continuous posting in conspicuous places within the area served by the supply. The notice must be given within 14 days after the violation or failure is determined. Posting must continue for as long as the violation or failure exists. Notice by hand delivery must be repeated at least every three months for as long as the violation or failure exists.

Subp. 9. **Notice of a violation of monitoring or testing techniques or issuance of an exemption.** A supplier who fails to perform monitoring according to parts 4720.1000 to 4720.2500, fails to comply with an applicable testing method established in parts 4720.1000 to 4720.2500, or is granted an exemption under part 4720.3100, must notify persons served by the supply as follows:

A. Except as provided in item C, D, or E, the supplier must publish notice of the violation, variance, or exemption in a daily newspaper of general circulation in the area served by the supply. The notice must be published within three months after the violation is determined or a variance or exemption is granted. If the area served by a public water supply is not served by a daily newspaper of general circulation, the supplier must publish the notice in a weekly newspaper of general circulation serving the area.

B. Except as provided in item C, D, or E, after the notice under item A, the supplier must, at least once every three months, notify persons served by the supply of the violation, or the granting of the exemption or variance. Notice may be mailed or hand delivered. Notice must be given for as long as the violation exists or the variance or exemption is in effect.

C. In place of the requirements of items A and B, the supplier of a community water supply in an area that is not served by a daily or weekly newspaper of general circulation must hand deliver the notice or post the notice in conspicuous places in the area served by the supply. The notice must be issued within three months after the violation is determined or the variance or exemption is granted. Posting must continue for as long as the violation exists in a variance or exemption remains in effect. Notice by hand delivery must be repeated at least every three months for as long as the violation exists or a variance or exemption is in effect.

D. In place of the requirements of items A and B, the supplier of a noncommunity water supply must hand deliver the notice or post the notice in conspicuous places in the area served by the supply. The notice must be issued within three months after the violation is determined or the variance or exemption is granted. Posting must continue for as long as the violation exists, or a variance or exemption remains in effect. Notice by hand delivery must be repeated at least every three months for as long as the violation exists or a variance or exemption remains in effect.

E. In place of the requirements of items A to D, the supplier of a public water supply, at the discretion of the commissioner, may provide less frequent notice for minor monitoring violations as defined by the commissioner, if EPA has approved the commissioner's application for a program revision under Code

of Federal Regulations, title 40, section 142.16. Notice of violations must be given at least annually.

Subp. 10. **Notice to new consumers.** A supplier of a community water supply must give to new consumers of the supply a copy of the most recent public notice required under this part. The notice must be given to new consumers before or when service begins.

Subp. 11. **General content of public notice.** A notice required by this part must provide a clear and readily understandable explanation of the violation, potential adverse health effects, the population at risk, the steps that the supplier is taking to correct the violation, the need to seek alternative water supplies, if any, and preventive measures the consumer should take until the violation is corrected. A notice must be conspicuous and written in plain language and readable print. Each notice must include the telephone number of the supplier as a source of additional information concerning the notice. When appropriate, the notice shall be multilingual.

Subp. 12. **Mandatory health effects language.** If a variance, violation, or exemption involves one of the contaminants described in items A to H, the notice required under this part must include the language in items A to H for the particular contaminant involved.

A. Trichloroethylene. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that trichloroethylene is a health concern at certain levels of exposure. This chemical is a common metal cleaning and dry cleaning fluid. It generally gets into drinking water by improper waste disposal. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed at lower levels over long periods of time. The EPA has set forth the enforceable drinking water standard for trichloroethylene at 0.005 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water which meets this standard is associated with little to none of the risk and should be considered safe.

B. Carbon tetrachloride. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that carbon tetrachloride is a health concern at certain levels of exposure. This chemical was once a popular household cleaning fluid. It generally gets into drinking water by improper waste disposal. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed at lower levels over long periods of time. The EPA has set the enforceable drinking water standard of carbon tetrachloride at 0.005 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which may have been observed in laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.

C. 1,2-Dichloroethane. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that 1,2-dichloroethane is a health concern at certain levels of exposure. This chemical is used as a cleaning fluid for fats, oils, waxes, and resins. It generally gets into drinking water from improper waste disposal. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed at lower levels over long periods of time. The EPA has set the enforceable drinking water standard for 1,2-dichloroethane at 0.005 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in lab-

oratory animals. Drinking water which meets this standard is associated with little to none of the risk and should be considered safe.

D. Vinyl chloride. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that vinyl chloride is a health concern at certain levels of exposure. This chemical is used in industry and is found in drinking water as a result of the breakdown of related solvents. The solvents are used as cleaners and degreasers of metals and generally get into drinking water by improper waste disposal. This chemical has been associated with significantly increased risks of cancer among certain industrial workers who were exposed to relatively large amounts of this chemical during their working careers. This chemical has also been shown to cause cancer in laboratory animals when the animals are exposed at high levels over their lifetimes. Chemicals that cause increased risk of cancer among exposed industrial workers and in laboratory animals also may increase the risk of cancer in humans who are exposed at lower levels over long periods of time. The EPA has set the enforceable drinking water standard for vinyl chloride at 0.002 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in humans and laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.

E. Benzene. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that benzene is a health concern at certain levels of exposure. This chemical is used as a solvent and degreaser of metals. It is also a major component of gasoline. Drinking water contamination generally results from leaking underground gasoline and petroleum tanks or improper waste disposal. This chemical has been associated with significantly increased risks of leukemia among certain industrial workers who were exposed to relatively large amounts of this chemical during their working careers. This chemical has also been shown to cause cancer in laboratory animals when the animals are exposed at high levels over their lifetimes. Chemicals that cause increased risk of cancer among exposed industrial workers and in laboratory animals also may increase the risk of cancer in humans who are exposed at lower levels over long periods of time. The EPA has set the enforceable drinking water standard for benzene at 0.005 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in humans and laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.

F. 1,1-Dichloroethylene. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that 1,1-dichloroethylene is a health concern at certain levels of exposure. This chemical is used in industry and is found in drinking water as a result of the breakdown of related solvents. The solvents are used as cleaners and degreasers of metals and generally get into drinking water by improper waste disposal. This chemical has been shown to cause liver and kidney damage in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals which cause adverse effects in laboratory animals also may cause adverse effects in humans who are exposed at lower levels over long periods of time. The EPA has set the enforceable drinking water standard for 1,1-dichloroethylene at 0.007 parts per million (ppm) to reduce the risk of these adverse health effects which have been observed in laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.

G. Para-dichlorobenzene. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that para-dichlorobenzene is a health concern at certain levels of exposure. This chemical is a component of deodorizers, moth balls, and pesticides. It generally gets into drinking water by improper waste disposal. This chemical has been shown to

cause liver and kidney damage in laboratory animals such as rats and mice when the animals are exposed to high levels over their lifetimes. Chemicals which cause adverse effects in laboratory animals also may cause adverse health effects in humans who are exposed at lower levels over long periods of time. The EPA has set the enforceable drinking water standard for para-dichlorobenzene at 0.075 parts per million (ppm) to reduce the risk of these adverse health effects which have been observed in laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.

H. 1,1,1-Trichloroethane. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that the 1,1,1-trichloroethane is a health concern at certain levels of exposure. This chemical is used as a cleaner and degreaser of metals. It generally gets into drinking water by improper waste disposal. This chemical has been shown to damage the liver, nervous system, and circulatory system of laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Some industrial workers who were exposed to relatively large amounts of this chemical during their working careers also suffered damage to the liver, nervous system, and circulatory system. Chemicals which cause adverse effects among exposed industrial workers and in laboratory animals may also cause adverse health effects in humans who are exposed at lower levels over long periods of time. The EPA has set the enforceable drinking water standard for 1,1,1-trichloroethane at 0.2 parts per million (ppm) to protect against the risk of these adverse health effects which have been observed in humans and laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.

Subp. 13. **Public notices for fluoride.** A notice of violations of the maximum contaminant level for fluoride, a notice of a variance or exemption from the maximum contaminant level for fluoride, and a notice of failure to comply with variance and exemption schedules for the maximum contaminant level for fluoride must describe steps the supplier is taking to comply with standards and must use the following language:

Public Notice

Dear User:

The United States Environmental Protection Agency requires that we send you this notice on the level of fluoride in your drinking water. The drinking water in your community has a fluoride concentration of (insert the test result) milligrams per liter (mg/l).

Federal regulations require that fluoride, which occurs naturally in your water supply, not exceed a concentration of 4.0 mg/l in drinking water. This is an enforceable standard called a Maximum Contaminant Level (MCL), and it has been established to protect the public health. Exposure to drinking water levels above 4.0 mg/l for many years may result in some cases of crippling skeletal fluorosis, which is a serious bone disorder.

Your water supplier can lower the concentration of fluoride in your water so that you will still receive the benefits of cavity prevention while the possibility of stained and pitted teeth is minimized. Removal of fluoride may increase your water costs. Treatment systems are also commercially available for home use. Information on such systems is available at the address given below. Low fluoride bottled drinking water that would meet all standards is also commercially available.

For further information contact (insert the name, address, and telephone number of the supplier and the name of contact person) at your public water supply.

Subp. 14. **Public notification by the commissioner.** The commissioner may

give notice required by this part to the public on behalf of the supplier. A notice given by the commissioner must meet the requirements of this part. However, the supplier is legally responsible for ensuring that the requirements of this part are met.

Statutory Authority: *MS s 144.383*

History: *13 SR 2824*

4720.3910 TYPHOID FEVER.

Subpart 1. **Patient's room.** The patient's room shall be carefully screened throughout the course of the disease and during convalescence, if any flies or insects are about.

Subp. 2. **Handling milk or other foods.** No person convalescent from typhoid fever or paratyphoid fever, or suffering from "walking typhoid," or proven by proper laboratory tests to be a carrier of bacillus typhosus or bacillus paratyphosus, shall be permitted to handle in any capacity milk, cream, butter, other food or food products, liable to be eaten without being cooked after handling, if such foods are offered for sale, until the agent of a board of health as authorized under Minnesota Statutes, section 145A.04, with the approval of the commissioner of health, shall state in writing, with the circumstances indicated, that danger of infection from such person no longer exists.

Subp. 3. **Water supplies.** Any drinking water supply known to be a positive or probable source of typhoid fever or other disease, shall be condemned either by the board of health as defined in Minnesota Statutes, section 145A.02, subdivision 2, or by the commissioner of health, and when so condemned, shall not be used again as a drinking water supply until declared safe by the condemning party.

Subp. 4. **Reporting of cases in hospitals and sanatoria.** On discharge from any hospital or sanatorium of any person suffering or convalescent from typhoid fever or paratyphoid fever or of any person known to be a carrier of typhoid organisms or paratyphoid organisms, it shall be the duty of the superintendent of such hospital, or sanatorium to report the discharge in writing to the Division of Disease Prevention and Control of the Minnesota Department of Health within a period of 24 hours, giving the destination of such person.

Statutory Authority: *MS s 144.05; 144.12 subd 1; 144.383*

History: *L 1977 c 305 s 39; 9 SR 2584; L 1987 c 309 s 24*

WATER HAULERS

4720.4000 PURPOSE.

Parts 4720.4000 to 4720.4600 are adopted for the purpose of assuring that sanitary procedures are followed by those who distribute drinking water by tank truck and that the public health is thereby preserved. The authority for adopting parts 4720.4000 to 4720.4600 may be found in Minnesota Statutes 1976, section 144.12, subdivision 1, clause (5) as amended by Laws of Minnesota 1977, chapter 66, section 10 which states that the commissioner of health may regulate the "distribution of water by persons."

Statutory Authority: *MS s 144.12 subd 1; 144.383*

4720.4100 DEFINITIONS.

Subpart 1. **Accessible.** "Accessible" means capable of being exposed for cleaning and inspection.

Subp. 2. **Approved source.** "Approved source" means a public water supply which is in compliance with state rules relating to water supplies, and is equipped with a permanent overhead delivery system designed to prevent the introduction of biological or chemical contaminants.

Subp. 3. **Commissioner.** "Commissioner" means the commissioner of health or his or her authorized representative.

Subp. 4. **Corrosion-resistant.** "Corrosion-resistant" means capable of maintaining original surface characteristics under the prolonged influence of the use environment, including the expected water contact and normal use of cleaning compounds and sanitizing solutions.

Subp. 5. **Easily cleanable.** "Easily cleanable" means readily accessible, and of such material and finish and so fabricated that cleaning can be accomplished by hand scrubbing.

Subp. 6. **Sanitize.** "Sanitize" means the bactericidal treatment of the interior surfaces of the tank by a process which has proven effective and does not leave a toxic residue.

Subp. 7. **Smooth.** "Smooth" means a surface free of pits and inclusions.

Subp. 8. **Toxic.** "Toxic" means having an adverse physiological effect on man.

Subp. 9. **Water hauler.** "Water hauler" or "hauler" means a person engaged in bulk vehicular transportation of water to other than the hauler's household, which is intended for use or used for drinking or domestic purposes.

Statutory Authority: *MS s 144.12 subd 1; 144.383*

4720.4200 WATER HAULER.

A water hauler shall be free of any infectious or communicable disease.

The water hauler shall consult with regional district personnel of the Minnesota Department of Health before implementing any questionable procedures.

Dipping into the filled tank is prohibited.

Statutory Authority: *MS s 144.12 subd 1; 144.383*

4720.4300 TANK REQUIREMENTS.

The tank shall be constructed of stainless steel or be lined with glass or other acceptable, corrosion resistant and nontoxic material, with rounded corners and a smooth surface so that the interior may be thoroughly cleaned and sanitized.

The system shall be completely closed except for vents which are properly constructed and screened.

Caps on inlets and outlets shall be hinged or chained to provide a permanent attachment.

The inlets and outlets shall be easy to clean and so located and protected as to minimize the hazard of contamination.

Filters shall not be used.

The tank shall be filled only from the top.

The outlet hose from the tank shall be maintained in a sanitary condition at all times, shall be flushed clean prior to every delivery, and shall not impart any taste or odor to the water.

The tank shall be accessible internally, for proper cleaning, disinfection, and inspection.

The tank shall never have been used to haul any materials which might have a deleterious effect on health or on the quality of the water being transported. If the tank has been used for transporting any materials other than water, the hauler shall obtain the approval of the commissioner before using the tank to haul water for drinking or domestic use.

Statutory Authority: *MS s 144.12 subd 1; 144.383*

4720.4400 CLEANING AND DISINFECTION.

The tank and all fittings shall be cleaned and sanitized according to the following procedures before they can be used to haul water, and thereafter once per

week: the tank shall be cleaned by scrubbing manually with brushes and noncorrosive detergents, or by automation using a spray ball within the tank which provides cleaning solution with sufficient velocity to remove all soil from the tank interior; the tank and fittings shall then be rinsed.

The tank and fittings shall be sanitized by any of the following methods:

A. filling with water from an approved source to which 50 parts per million chlorine has been added, mixing and allowing it to stand for three to four hours; or 100 parts per million chlorine for not less than 20 minutes; or

B. the commissioner may approve the use of an alternate sanitizing method if the supplier can show that the use of the alternate method assures a level of biocidal activity comparable to that provided by the use of chlorine.

The tank may be cleaned and sanitized in a single step by using a commercial detergent sanitizer according to the manufacturer's directions.

After sanitizing, the tank shall be drained, and the tank and fittings shall be rinsed with water from an approved source.

The sanitized tank shall be filled with water from an approved source.

The hauler shall add sufficient chlorine to assure that there is one part per million free chlorine residual when the last remaining quantity of water is delivered to a user. The hauler shall test the chlorine residual in each tankful of water using the DPD method.

Statutory Authority: *MS s 144.12 subd 1; 144.383*

4720.4500 TESTING.

Once each month the hauler shall collect a sample of water from each tank and shall submit the water sample to the state Department of Health laboratory for a bacteriological analysis. Sample collecting bottles for this purpose may be obtained from any Minnesota Department of Health regional district office or by writing to the Minnesota Department of Health, Section of Analytical Services, 717 Delaware Street SE, Minneapolis, Minnesota 55440.

Statutory Authority: *MS s 144.12 subd 1; 144.383*

4720.4600 RECORDS.

The hauler shall retain a written log for each tank and shall record therein:

A. the date when the tank is sanitized;

B. the date on which the tank is filled and the name of the approved source from which the water is obtained;

C. the chlorine residual and date on which it is measured;

D. date on which water samples are sent for analysis; and

E. customer's name, address, date, and quantity delivered.

Statutory Authority: *MS s 144.12 subd 1; 144.383*

4720.5000 LABORATORY ANALYSIS FEES.

Subpart 1. **Fees set by commissioner.** The commissioner shall set fees for analysis of water samples by the department's environmental health laboratory.

Utility Contract Costs

Analysis	Cost Per Analysis	Surface Water Source by Population: less than 10,000 Frequency	Surface Water Source by Population: less than 10,000 45-Month Cost	Surface Water Source by Population: 10,000 & greater Frequency	Surface Water Source by Population: 10,000 & greater 45-Month Cost	Ground Water Source by Population: 1,000 or less Frequency	Ground Water Source by Population: 1,000 or less 45-Month Cost	Ground Water Source by Population: greater than 1,000 & less than 10,000 Frequency	Ground Water Source by Population: greater than 1,000 & less than 10,000 45-Month Cost	Ground Water Source by Population: 10,000 & greater Frequency	Ground Water Source by Population: 10,000 & greater 45-Month Cost
total coliform	$ 9.20*	1/month	$414.00	1/month	$ 414.00	1/3 mos.	$138.00	1/month	$414.00	1/month	$414.00
arsenic	7.60										
barium	6.30										
cadmium	5.50										
chromium	5.50										
flouride	5.20	1/15 mos.	247.50	1/15 mos.	247.50	1/45 mos.	82.50	1/45 mos.	82.50	1/45 mos.	82.50
lead	6.30										
mercury	29.40										
nitrate-Nitrogen	4.10										
selenium	7.10										
silver	5.50										
radio-chemicals	97.00**	1/45 mos.	96.99	1/45 mos.	96.99	1/45 mos.	96.99	1/45 mos.	96.99	1/45 mos.	96.99
organics	72.30			1/3 mos.	1084.50					1/15 mos.	216.90
TOTAL			$758.49		$1842.99		$317.49		$593.49		$810.39
Payment Due Every 15 months =			$252.83		$ 614.33		$105.83		$197.83		$270.13

*No charge for resampling
**Includes alpha, uranium and prorated radium -226 and -228

Number of utilities in each category	16	8	700	240	35
Estimated revenue from each category/15 mos.	$4045.28	$4914.64	$74081.00	$47479.20	$9454.55

Subp. 2. Mandatory analyses fees. The following fees are for the mandatory analyses of water samples in compliance with the Minnesota Safe Drinking Water Act, Minnesota Statutes, sections 144.381 to 144.387.

Subp. 3. **Optional analyses fees.** The following fees are for the optional analyses performed by the department's environmental health laboratory.

Group A		
	Total Solids	$ 9.70
	Turbidity	4.50
	Color	2.50
	pH	3.20
	Chloride	6.40
	Sulfate	9.70
	Potassium	5.50
	Total Cost	$41.50
Group D		
	Iron	$ 4.30
	Manganese	4.30
	Total Cost	$ 8.60
Group E		
	Total Hardness	no charge
	Alkalinity	$ 6.40
	Calcium as $CaCO_3$	4.60
	Magnesium as $CaCO_3$	5.10
	Total Cost	$16.10
Total Coliform		$ 9.20

Statutory Authority: *MS s 16A.128*