(f) Dust Control

(i) Provisions shall be made for the transfer of dry fluoride compounds from shipping containers to storage bins or hoppers in such a way as to minimize the quantity of fluoride dust which may enter the room in which the equipment is installed. The enclosure shall be provided with an exhaust fan and dust filter to the outside atmosphere of the building.

(ii) Provisions shall be made for disposing of empty bags, drums and barrels in a manner which will minimize exposure to fluoride dusts. A floor drain shall be provided to facilitate the washing of floors.

(9) Corrosion Control - Water that is corrosive due either to natural causes or to treatment given the water shall be rendered non-corrosive, and nonaggressive before being pumped to the distribution system.

(a) Alkali Feed - Corrosive water due to natural occurrence, created by the addition of alum or other coagulant, shall be treated by an alkali feed. Alkali feed can consist of lime, soda ash, bicarbonate, caustic soda, or a combination of any of the above. Lime feed systems shall include a mechanism for flushing the feed lines, including suction and pumping equipment, if used.

(b) Phosphates - The feeding of phosphates may be applicable for corrosion control. Phosphate chemicals shall meet the requirements of chemical additives in R.61-58.3(E)(3).

(c) Carbon dioxide addition

(i) Recarbonation basin design shall provide:

(A) a total detention time of at least twenty (20) minutes.

(B) two (2) compartments, each with a depth of eight (8) feet, consisting of a mixing compartment having a detention time of at least three (3) minutes, and a reaction compartment.

(ii) Adequate precautions shall be taken to prevent the possibility of carbon monoxide entering the plant from recarbonation compartments.

(iii) Provisions shall be made for draining the recarbonation basin and removing sludge.

(d) Other Treatment - Other treatment for controlling corrosive waters will be considered on a case by case basis. All chemicals must meet the requirements in R.61-58.3(E)(3). Any proprietary compound must receive the specific approval of the Department before use.

(e) Control - Laboratory equipment, acceptable to the Department, shall be provided to test for the compounds being fed.

(10) Taste and Odor Control - Provision shall be made for the addition of taste and odor control chemicals at all surface water treatment plants. These chemicals shall be added sufficiently ahead of other treatment processes to ensure adequate contact time for an effective and economical use of the

chemicals.

(a) Flexibility - Plants treating water that is known to have taste and odor problems shall be provided with equipment that makes several of the control processes available to allow the operator flexibility in operation.

(b) Chlorination - Chlorination can be used for the removal of some objectionable odors. Adequate contact time must be provided to complete the chemical reactions involved. Consideration shall be given to disinfection by-products if this method is used.

(c) Chlorine Dioxide - Chlorine dioxide may be used in the treatment of taste or odor. Provision shall be made for the proper storing and handling of sodium chlorite, so as to eliminate any danger of explosion. Consideration shall be given to disinfection by-products if this method is used.

(d) Powdered Activated Carbon - Where added, powder activated carbon feed systems shall meet the following criteria:

(i) Powdered activated carbon may be added prior to coagulation to provide maximum contact time, but shall not be added near the point of chlorine application.

(ii) Provisions shall be made for adequate dust control.

(iii) Provision shall be made for adding at least forty (40) milligrams per liter.

(e) Granular Activated Carbon Absorption Units - Rates of flow shall be consistent with the type and intensity of the problem. The rate used shall be supported by the results of pilot plant studies and shall be accordance with the requirements of R.61-58.3(D)(5).

(f) Copper Sulfate and Other Copper Compounds - Continuous or periodic treatment of water with copper compounds to kill algae or other growths shall be controlled to prevent copper in excess of one (1) milligrams per liter as copper in the plant effluent or distribution system. Care shall be taken in obtaining a uniform distribution. Department approval shall be obtained prior to the use of any such compound.

(g) Aeration - Aeration units used for taste and odor removal shall be designed in accordance with R.61-58.3(D)(7).

(h) Potassium Permanganate - The application of potassium permanganate may be considered, provided that dosages are determined by permanganate demand testing.

(11) Membrane Technology - All applications for projects involving membrane technology must be preceded by an engineering report and may require a pilot study. The engineering report must meet the requirements of R.61-58.1.C.

(a) General Requirements

(i) Membrane material - No membrane material shall be used in a public water system unless the material or product has been tested and certified as meeting the specifications of the American National Standard Institute/National Sanitation Foundation Standard 61, Drinking Water System Components - Health Effects. This requirement shall be met under testing conducted by a third party

product certification organization accredited for this purpose by the American National Standards Institute.

(ii) Loading rates must be determined by pilot testing and/or manufacturers recommendations.

(iii) Scale Inhibitors and Cleaning Solutions - Where required, scale inhibitors and cleaning solutions must meet the requirements of chemical additives R.61-58.3.E(3).

(b) Electrodialysis Reversal - Electrodialysis reversal treatment shall not be used on surface water or groundwater under the direct influence of surface water.

E. Chemical Application.

(1) General - No chemical shall be applied to treat drinking waters unless specifically approved by the Department.

(a) Plans and specifications - Plans and Specifications shall be submitted for review and approval, as required by in R.61-58.1, and shall include:

(i) descriptions of feed equipment, including maximum and minimum feed ranges and pump curves for solution feeders,

(ii) location of feeders, piping layout and points of chemical application;

(iii) storage and handling facilities;

(iv) specifications for chemicals to be used;

(v) operating and control procedures including proposed application rates;

(vi) descriptions of testing equipment and procedures; and,

(vii) locations of sampling taps for testing.

(b) Chemical application - Chemicals shall be applied to the water at such points and by such means as to:

(i) provide maximum efficiency of treatment;

(ii) ensure maximum safety to consumer;

(iii) provide maximum safety to operators;

(iv) ensure satisfactory mixing of the chemicals with the water;

(v) provide maximum flexibility of operation through various points of application, when appropriate,

(vi) prevent backflow or back-siphonage between multiple points of feed through the use of separate feed equipment for each point and backflow preventers where a manifold system is used for standby, multiple feed use;

(vii) provide a separate injection point and a separate feed line for each chemical application that is added and spacing to prevent inter-reaction of chemicals; and,

(viii) provide chemical injection points which are readily accessible. All below-grade injection points shall be housed in a vault or similar structure.

(c) General equipment design - General equipment design shall be such that:

(i) chemical-contact materials and surfaces are corrosion resistant;

(ii) corrosive chemicals are introduced in such a manner as to minimize potential for corrosion; and,

(iii) chemicals that are incompatible are not fed, stored or handled together.

(2) Facility Design

(a) Chemical feeders

(i) A separate feeder shall be used for each separate chemical applied, and for each injection point.

(ii) Spare parts shall be available for all feeders to replace parts which are subject to wear and damage.

(iii) Dry chemical feeds shall:

(A) measure chemicals volumetrically or gravimetrically;

(B) provide adequate solution water and agitation of the chemical in the solution pot;

(C) provide gravity feed from solution pots; and,

(D) completely enclose chemicals to prevent emission of dust into the operating room and/or provide dust collection units.

(iv) When a booster pump is required, duplicate equipment shall be provided; and, when necessary, standby power shall be provided. Where chemical feed is necessary for the protection of the supply, such as chlorination, coagulation, or other essential processes:

(A) A minimum of two (2) feeders shall be provided; and,

(B) The standby unit or a combination of units of sufficient capacity shall be available to replace the largest unit during shut-downs.

(v) Chemical feed equipment shall be located in a separate room to reduce hazards and dust problems; shall be conveniently located near points of application to minimize length of feed lines; and, shall be readily accessible for servicing, repair, and observation of operation.

(vi) Feeders shall be able to supply, at all times, the necessary amount of chemicals at an accurate rate.

(b) Control

(i) Feeders with automatic controls shall be designed so as to allow override by manual controls.

(ii) Chemical feed rates shall be proportional to flow.

(iii) Meters, scales, calibration columns, or other acceptable means to measure chemicals being fed must be provided in order to determine chemical feed rates.

(iv) Provisions shall be made for measuring the quantities of chemicals used.

(c) Cross-connection control

(i) Cross connection control shall be provided to ensure that liquid chemical solutions cannot be siphoned through solution feeders into the water supply.

(ii) The service water lines discharging to the solution tanks shall be properly protected from backflow as required by the Department.

(iii) No direct connection shall exist between any sewer and a drain or overflow from the feeder, solution chamber or tank. All drains shall terminate at least six (6) inches or two (2) pipe diameters, whichever is greater, above the overflow rim of a receiving sump, conduit or waste receptacle.

(d) Service Water Supply - Service water supply shall be ample in supply and adequate in pressure; shall be properly treated potable water; shall be properly protected against backflow; and, a means shall be provided to measure the quantity of water used in preparing specific solution concentrations by dilution;.

(e) Storage of chemicals

(i) Space shall be provided for at least thirty (30) days of chemical supply and provide for convenient, efficient and safe handling of chemicals. Dry storage conditions must be maintained for dry chemicals.

(ii) Storage tanks and pipelines for liquid chemicals shall be designed specifically for each chemical used.

(iii) Chemicals shall be stored in covered or unopened shipping containers, unless the chemical is transferred into an approved covered storage unit.

(iv) Liquid chemical storage tanks shall have:

(A) a liquid level indicator;

(B) an overflow; and,

(C) secondary containment capable of receiving and containing accidental spills or overflows. Consideration must be given to reactivity of chemicals stored in a single containment area.

(f) Solution tanks

(i) A means which is consistent with the nature of the chemical solution shall be provided in a solution tank to maintain a uniform strength of solution. Continuous agitation shall be provided to maintain slurries in suspension.

(ii) Two solution tanks of adequate volume may be required for a chemical to ensure continuity of supply in servicing a solution tank.

(iii) Means shall be provided to measure the solution level in the tank.

(iv) Chemical solutions shall be kept covered. Large tanks with access openings shall have such openings curbed and fitted with tight overhanging covers.

(v) Surface locations for solution tanks shall:

(A) be free from sources of possible contamination; and,

(B) ensure positive drainage from ground waters, accumulated water, chemical spills and overflows from around tank.

(vi) Overflow pipes, when provided, shall:

(A) be turned downward, with the end screened;

(B) have an air gap of two (2) pipe diameters or six (6) inches, whichever is greater; and,

(C) be located where noticeable.

(vii) Acid storage tanks shall be independently vented to the outside atmosphere.

(viii) Each tank shall be provided with a valved drain, protected against backflow in accordance with R.61-58.3(E)(2)(c)(iii).

(ix) Solution tanks shall be provided with protective curbing, drains or other secondary containment capable of receiving and containing accidental spills or overflows.

(g) Day tanks

(i) Day tanks shall be provided where bulk storage of liquid chemical is provided.

(ii) Day tanks shall meet all the requirements of R.61-58.3.E(2)(f).

(iii) Day tanks shall be scale-mounted, or have a calibrated gauge painted or

mounted on the side so liquid level can be observed in a gauge tube or through translucent sidewalls of the tank. In opaque tanks, a gauge rod extending above a reference point at the top of the tank, attached to a float may be used. The ratio of the area of the tank to its height shall be such that unit readings are meaningful in relation to the total amount of chemical fed during a day.

(iv) Hand pumps may be provided for transfer from a carboy or drum. A tip rack may be used to permit withdrawal into a bucket from a spigot. Where motor-driven transfer pumps are provided, a liquid level limit switch and an overflow from the day tank, which will drain back into the bulk storage tank or other approved location, shall be provided.

(v) Tanks shall be properly labeled to designate the chemical contained.

(h) Feed lines

(i) Feed lines shall be as short as possible in length of run, and of durable, corrosion resistant material. They shall be easily accessible throughout the entire length, protected against freezing, and readily cleanable.

(ii) Feed lines shall be designed consistent with scale-forming or solids depositing properties of the water, chemical, solution or mixture conveyed.

(iii) Feed lines shall be color coded and labeled .

(iv) Where lime is added, a spare feed line equal in length to the longest run of feed line, shall be provided.

(i) Handling

(i) Carts, elevators and other appropriate means shall be provided for lifting chemical containers.

(ii) Provisions shall be made for disposing of empty bags, drums or barrels by an approved procedure which will minimize exposure to dust.

(iii) Provision shall be made for the proper transfer of dry chemicals from shipping containers to storage bins or hoppers, in such a way as to minimize the quantity of dust which may enter the room in which the equipment is installed.

(iv) Provision shall be made for measuring quantities of chemicals used to prepare feed solutions.

(j) Housing

(i) Floor surfaces shall be smooth, impervious, slip-proof and well-drained.

(ii) Vents from feeders, storage facilities and equipment exhaust shall discharge to the outside atmosphere above grade and remote from air intakes.

(iii) Feeders used in conjunction with dry lime or carbon shall be housed in separate, individual rooms equipped with dust control systems.

(iv) Sufficient lighting for operator safety and sufficient heating to provide for proper operation of the chemical feed equipment shall be provided for all chemical feed rooms.

(3) Chemicals Specifications - All chemicals and products added to a public water supply as part of the treatment process shall be certified as meeting the specifications of the American National Standards Institute/National Sanitation Foundation Standard 60, Drinking Water Treatment Chemicals - Health Effects. The certifying party shall be accredited by the American National Standards Institute.

F. Waste Handling and Disposal.

Waste handling and disposal practices shall meet all applicable rules and regulations of the Department. Provisions must be made for proper disposal of water treatment plant waste such as sanitary, laboratory, clarification sludge, softening sludge, iron sludge, filter backwash water, filter to waste, and brine waste. In locating waste disposal facilities, due consideration shall be given to preventing potential contamination of the water supply. For projects involving a surface water discharge of water treatment residuals or waste water, a National Pollutant Discharge Elimination System (NPDES) permit must be obtained from the Department. For projects involving land application of water treatment residuals or waste water, a No Discharge (ND) permit must be obtained from the Department.

(1) Sanitary Waste - The sanitary waste from water treatment plants, pumping stations, etc., must receive treatment. Waste from these facilities must be discharged directly to a sanitary sewer system, when feasible, or to an adequate on-site waste treatment facility.

(2) Alum Sludge - Mechanical concentration or lagooning may be used as a method of handling alum sludge. Acid treatment of sludge for alum recovery may be a possible alternative. Alum sludge can be discharged to a sanitary sewer only if acceptable to the receiving sewer system and approved by the Department before final designs are made.

(a) Lagoons shall be designed to meet the following requirements:

(i) A minimum of two (2) lagoons are required for handling alum sludge.

(ii) The location shall be such that the top of the dike is at least one (1) foot above the one hundred (100) year flood plain;

(iii) Where necessary, dikes, deflecting gutters or other means of diverting surface water runoff shall be provided so that it does not flow into the lagoon;

(iv) A minimum usable depth of five (5) feet with adequate freeboard shall be provided so as not to interfere with normal plant operation;

(v) Dikes shall be constructed of relatively impervious material and compacted to at least ninety (90) percent Standard Proctor Density to form a stable structure. Vegetation and other unsuitable materials shall be removed. Minimum dike width shall be eight (8) feet. Dike slopes shall not be steeper than one (1) foot vertical to three (3) feet horizontal;

(vi) A minimum separation of four (4) feet between the bottom of the lagoon and the maximum groundwater elevation shall be maintained;

(vii) A synthetic liner of at least twenty (20) mil (0.20 inches) thickness or a natural liner consisting of one foot of compacted clay having a hydraulic

conductivity (coefficient of permeability) of no more than .0000001 centimeters per second shall be used;

(viii) A monitoring system shall be constructed to measure the water quality in the upper most aquifer. One (1) upgradient monitoring well and an adequate number of down gradient monitoring wells, so as to fully define any potential leacheate plume, shall be provided;

(ix) An adjustable decanting device must be provided;

(x) Effluent sampling point and flow measurement device must be provided;

(xi) Erosion control through grassing, rip-rap, or other means is required on both the inside and outside dike surfaces; and,

(xii) Adequate safety provisions must be installed.

(b) Mechanical concentration or de-watering - A pilot study is required before the design of a mechanical de-watering installation. Provisions shall be made for holding basins so as to maintain continuity of service of the water plant. Vacuum filters, centri-fuges, filter presses, belt presses, or other devices will be considered.

(3) Lime softening sludge - Methods of treatment and disposal are as follows:

(a) Lagoons

(i) Temporary lagoons which must be cleaned periodically shall be designed on the basis of seven tenths (0.7) acres per million gallons per day per one hundred (100) milligrams per liter of hardness removed based on a usable lagoon depth of five (5) feet. At least two (2) lagoons must be provided in order to give flexibility in operation. An acceptable means of final sludge disposal must be provided. Provisions must be made for convenient cleaning.

(ii) Permanent lagoons shall have a volume of at least four (4) times that for temporary lagoons.

(iii) The design of both temporary lagoons and permanent lagoons shall meet the requirements for lagoons in paragraph 2(a) above.

(b) Discharge of lime sludge to sanitary sewers shall be avoided if possible since it may cause both liquid volume and sludge volume problems at the sewage treatment plant. This method shall be used only when the sewer system has the capability to adequately handle the lime sludge and is acceptable to both the sewer system and the Department.

(c) Mechanical de-watering of sludge may be considered. Pilot studies on a particular plant waste are required.

(d) Calcination of sludge may be considered. Pilot studies on a particular plant waste are required.

R.61-58.4 FINISHED WATER PUMPING, STORAGE AND DISTRIBUTION FACILITIES

A. Applicability.

This regulation applies to all new construction and all expansions or modifications of existing public water systems. If the Department can reasonably demonstrate that safe delivery of potable water to the public is jeopardized, a system may have to upgrade its existing facilities in order for an expansion or modification to meet the requirements of this regulation. This regulation prescribes minimum design standards for the construction of finish water pumping, storage, and distribution facilities.

B. Pumping Facilities.

(1) Requirements for Pump Stations - Pumping facilities shall be designed to maintain the sanitary quality of pumped water.

(a) Location -

(i) The pumping station shall be located so that the site will meet the requirements for sanitary protection of water quality, hydraulics of the system and protection against interruption of service by fire, flood or any other hazard.

(ii) The station shall be elevated to a minimum of one (1) foot above the one hundred (100) year flood elevation, or protected to such elevation, shall be readily accessible at all times unless permitted to be out of service for the period of inaccessibility, shall be graded around the station so as to lead surface drainage away from the station, and shall be protected to prevent vandalism and entrance by animals and unauthorized persons.

(b) General Design Considerations - Pump stations shall be of durable construction, fire and weather resistant and with outward-opening doors. The floor elevation of pump stations shall be at least six (6) inches above finished grade, have waterproofed underground structure, and have all floors drained in such a manner that the quality of the potable water will not be endangered. All floors shall slope to a suitable drain and provide a suitable outlet for drainage from pump glands without discharging onto the floor.

(c) Pumping Equipment -

(i) At least two (2) pumping units shall be provided. The pumping station shall be sized adequately to supply the maximum daily demand with any pump out of service. The pumping units shall:

(A) Be driven by a prime mover able to operate against the maximum head and air temperature which may be encountered;

(B) Have spare parts and tools readily available;

(C) Be equipped with elapsed time hour meters for each pump or another acceptable mechanism to monitor run times; and.

(D) Be sized to operate from minimum to maximum pumping conditions without overloading the motor.

(ii) Prime water must not be of lesser sanitary quality than that of the water being pumped. Means shall be provided to prevent back-siphonage. When an air-operated ejector is used, the screened intake shall draw clean air from a point at least ten (10) feet above the ground or other source of possible contamination, unless the air is filtered by an apparatus approved by the Department. Vacuum priming may be used.

(iii) For pumps designed so that bearing lubrication fluids come into contact with the water being pumped, only water lubricated pumps may be used unless otherwise approved by the Department.

(d) Equipment Servicing - Pump stations shall be designed so that proper maintenance of the equipment can be provided.

(e) Operator Access - Pump stations shall be designed for easy access by stairs or ladders when necessary.

(f) Heating - In pump houses not occupied by personnel, only enough heat need be provided to prevent freezing of equipment or treatment process.

(g) Ventilation - Ventilation shall conform to existing local, federal, and/or state codes. Adequate ventilation shall be provided for all pumping stations.

(h) Lighting - Pump stations shall be adequately lighted throughout. All electrical work shall conform to the requirements of the National Electric Code or applicable state and local codes.

(i) Auxiliary Power - Where elevated storage equals less than one half maximum daily demand, portable or in-place auxiliary power shall be provided for all systems serving three hundred (300) or more service connections. An air quality permit may be required for the air emissions from the auxiliary generators. Auxiliary power requirements may be waived if one or more of the following are applicable:

(i) a verifiable history of worst case power outages and verification that the available elevated storage can provide for a similar time period of outage;

(ii) two (2) or more independent sources from the serving electrical utility are available; or,

(iii) an alternate water source is available via connections with other systems.

Auxiliary power shall be sized to provide for sufficient pumping capacity to meet the one half (1/2) of the maximum daily demand or to supplement the existing storage to meet one half (1/2) of the maximum daily demand.

(j) Protection From Trespassers - Fencing, locks on doors, and other necessary precautions shall be provided to prevent trespassing, vandalism, and sabotage.

(2) Booster Pump Stations - Booster pump stations shall meet all applicable portions of R.61-58.4(B)(1)Paragraph in addition to the requirements below.

(a) Booster pumps shall be located or controlled so that they will not produce less than twenty-five (25) pounds per square inch anywhere in the affected distribution system

when the pump is in normal operation. An automatic cutoff switch or throttling valve shall be installed to prevent the pressure anywhere in the affected distribution system from dropping below twenty (20) pounds per square inch. Automatic or remote control devices shall have a range between the start and cutoff pressure which will prevent excessive cycling, and a bypass line shall be provided. Fire booster pumps must have a device to monitor suction pressure and throttle the output of the pump to maintain the suction pressure above twenty (20) pounds per square inch anywhere in the affected distribution system, but, not shut the pump off.

(b) In-line booster pumps shall be accessible for servicing and repairs.

(3) Automatic Pump Stations - All automatic pump stations shall be provided with a warning light or telemetry system which will report when the station is out of service. All remote controlled stations shall be electrically operated and controlled and shall have signaling apparatus of proven performance. Installation of electrical equipment shall conform with the applicable state and local electrical codes and the National Electrical Code. A sign with a twenty-four (24) hour telephone number for emergencies shall be displayed on the outside of the station in a visible location, unless the system has twenty-four (24) hour monitoring.

(4) Appurtenances -

(a) Valves - Pumps shall be adequately valved to permit satisfactory operation, maintenance and repair of the equipment. Each pump shall have a positive-acting check valve on the discharge side between the pump and the shut-off valve.

(b) Piping - In general, suction and discharge piping shall:

(i) be designed so that the friction losses will be minimized;

(ii) not be subject to contamination;

(iii) be sloped in one direction to drain;

(iv) have watertight joints;

(v) have adequate clean-outs;

(vi) be protected against surge or water hammer; and,

(vii) be manifolded or have an individual suction line to ensure similar hydraulic and operating conditions.

(c) Gauges - Each pump shall:

(i) Have a standard pressure gauge on its discharge line; and,

(ii) Have a compound gauge on its suction line;

(d) Water Seals - Water seals shall not be supplied with water of a lesser sanitary quality than that of the water being pumped. Where pumps are sealed with potable water and are pumping water of lesser sanitary quality the seal shall be provided with a back-flow preventer appropriate for the degree of hazard in question.

(e) Controls - Pumps, their prime movers and accessories, shall be controlled in such a manner that they will operate at rated capacity without dangerous overload. Where two or more pumps are installed, provision shall be made for alternation. Provision shall be made to prevent energizing the motor in the event of a backspin cycle. Electrical controls shall be located above grade.

(f) Water Pre-lubrication - When automatic pre-lubrication of pump bearings is necessary and an auxiliary power supply is provided, the pre-lubrication line shall be provided with a valved bypass around the automatic control so that the bearings can, if necessary, be lubricated manually before the pump is started.

C. Finished Water Storage.

(1) General -

(a) Sizing - Where fire flows are provided, tanks shall be sized to provide two (2) hours of supply for a combined flow of peak hour domestic plus fire flow; or, the storage capacity (or equivalent capacity) shall equal one half (1/2) the maximum daily consumption, whichever is greater. Either requirement may be reduced when the source and treatment facilities have sufficient capacity with auxiliary power to supplement peak demands of the system.

(b) Isolation of Tank - Storage structures shall be designed so they can be isolated from the distribution system for the purpose of draining, maintenance and repair. A sample tap shall be provided on the tank or on the tank side of the isolation valve.

(c) Level controls - Adequate controls shall be provided to automatically maintain levels in distribution system storage structures. Where telemetry is not provided for water level measurement, a float type level gauge and visible target shall be provided. Altitude valves or equivalent controls may be required for a second and subsequent structures on the system.

(d) All tanks shall be readily accessible at all times for inspection and maintenance.

(2) Atmospheric Ground Storage, Elevated Tanks, and Standpipes.

(a) General - The materials and designs used for finished water storage structures shall provide stability and protection of the stored water. Steel structures shall be designed in accordance with current American Waterworks Association (AWWA) Standard D-100 concerning steel tanks, standpipes, reservoirs, and elevated tanks whenever they are applicable. Other materials of construction are acceptable when properly designed to meet the requirements of this Section.

(b) Location of ground-level reservoirs

(i) The bottom of reservoirs and standpipes shall be above the one hundred (100) year flood level.

(ii) When the bottom must be below normal ground surface, it shall be placed above the ground water table. Sewers, drains, standing water, and similar sources of possible contamination must be kept at least fifty (50) feet from the reservoir. Water main pipe, pressure tested in place to fifty (50) pounds per square inch without leakage, may be used for gravity sewers at distances greater

than twenty (20) feet and less than fifty (50) feet.

(iii) The top of a reservoir shall not be less than two (2) feet above normal ground surface. Clearwells constructed under filters may be exempted from this requirement when the total design gives the same protection.

(c) Sanitary Protection - All finished ground level or elevated water storage structures shall have suitable watertight roofs which exclude birds, animals, insects, and excessive dust.

(d) Protection from trespassers - Fencing, locks on access manholes, and other necessary precautions shall be provided to prevent trespassing, vandalism, and sabotage.

(e) Drains - Adequately sized drains shall be provided. No drain on a water storage structure may have a direct connection to a sewer or storm drain. A flap valve or other means of covering the open outlet of the drain shall be provided.

(f) Overflow - The overflow pipe shall be of sufficient diameter to permit the discharge of water equal to or greater than the filling rate; but shall not be less than four (4) inches in diameter. All atmospheric storage structures shall be provided with an overflow which is brought down to an elevation between twelve (12) and twenty-four (24) inches above the ground surface, and discharges over a drainage inlet structure or a splash pad. A flap valve or number four (4) mesh non-corrodible screen shall be provided on the outlet. No overflow may be connected directly to a sewer or storm drain. All overflow pipes shall be located so that any discharge is visible.

(g) Access - Finished water storage structures shall be designed with reasonably convenient access to the interior for cleaning and maintenance. Manholes above the water-line shall:

(i) be framed at least four (4) inches above the surface of the roof at the opening on ground-level structures;

(ii) be fitted with a solid watertight cover which overlaps the framed opening and extends down around the frame at least two (2) inches; and,

(iii) have a locking device.

(h) Vents - Finished water atmospheric storage structures shall be vented. Overflows shall not be considered as vents. Open construction between the sidewall and roof is not permissible. Twenty-four (24) mesh non-corrodible screens, or equivalent, shall be used on all vents. Vents shall be constructed to:

(i) prevent the entrance of surface water and rainwater;

(ii) exclude birds and animals;

(iii) exclude insects and dust, as much as this function can be made compatible with effective venting; and

(iv) prevent imploding of the tank during a rapid discharge of water from the tank.

(i) Roof and sidewall - The roof and sidewalls of all structures must be watertight with no openings except properly constructed vents, manholes, overflows, risers, drains, pump mountings, control ports, or piping for inflow and outflow.

(i) Any pipes running through the roof or sidewall of a finished water storage structure must be welded, or properly gasketed in metal tanks. In concrete tanks, these pipes shall be connected to standard wall castings which were poured in place during the forming of the concrete. These wall castings should have seepage rings imbedded in the concrete.

(ii) Openings in a storage structure roof or top, designed to accommodate control apparatus or pump columns, shall be curbed and sleeved with proper additional shielding to prevent the access of surface or floor drainage water into the structure.

(iii) Valves and controls shall be located outside the storage structure so that the valve stems and similar projections will not pass through the roof or top of the reservoir.

(j) Drainage of roof - The roof of the storage structure shall be well drained. Downspout pipes shall not enter or pass through the reservoir. Parapets, or similar construction which would tend to hold water and snow on the roof, will not be approved unless adequate waterproofing and drainage are provided.

(k) Safety - The safety of employees must be considered in the design of the storage structure.

(i) Ladders, ladder guards, balcony railings, and safely located entrance hatches shall be provided where applicable.

(ii) A platform at the top of the ladder to provide a place for the climber to stand on while unhooking the safety harness shall be provided.

(iii) Elevated tanks with riser pipes over eight (8) inches in diameter shall have protective bars over the riser opening inside the tank.

(l) Freezing - All finished water storage structures and their appurtenances, especially the riser pipes, overflows, and vents, shall be designed to prevent freezing which will interfere with proper functioning.

(m) Internal catwalk - Every catwalk over finished water in a storage structure shall have a solid floor with raised edges so designed that shoe scrapings and dirt will not fall into the water.

(n) Silt stop - The discharge pipes from all reservoirs shall be located in a manner that will prevent the flow of sediment into the distribution system. Removable silt stops should be provided where feasible.

(o) Grading - The area surrounding a ground-level structure shall be graded in a manner that will prevent surface water from standing within a fifty (50) foot radius.

(p) Painting and/or cathodic protection - Proper protection shall be given to metal surfaces by paints or other protective coatings, by cathodic protective devices, or by both.

All paint coatings which come into contact with drinking water shall be certified as meeting the specifications of the American National Standard Institute/National Sanitation Foundation Standard 61, Drinking Water System Components - Health Effects. The certifying party shall be accredited by the American National Standards Institute. Hot applied wax, cold applied wax, grease, and coal tar coatings are not acceptable.

(q) Disinfection - Finished water storage structures shall be disinfected in accordance with current American Waterworks Association (AWWA) Standard for the disinfection of water storage facilities. Prior to sampling, the chlorine residual must be reduced to normal system residual levels or be non-detectable in those systems not chlorinating. A minimum of two (2) samples must be collected and analyzed for total coliform bacteria. These samples must be collected at least twenty-four (24) hours apart and the results must show the absence of total coliform bacteria. The chlorine residual must also be measured and reported. If the membrane filter method of analysis is used for the coliform analysis, non-coliform growth must also be reported. If the non-coliform growth is greater than eighty (80) colonies per one hundred (100) ml, the sample result is invalid and must be repeated. All samples must be analyzed by a certified laboratory. The Department may request that heterotrophic plate count analyses be conducted on a case-by-case basis where disinfection problems are suspected.

(3) Washwater Tanks - Washwater tanks shall be designed in accordance with R.61-58.4(C)(1) and shall be sized, in conjunction with available pump units and finished water storage, to provide the backwash water required by R.61-58.3(D)(5)(a)(xi). Consideration must be given to the backwashing of several filters in rapid succession.

(4) Clearwell -

(a) Clearwell storage shall be sized, in conjunction with distribution system storage, to relieve the filters from having to follow fluctuations in water use.

(b) When finished water storage is used to provide the contact time for chlorine, special attention shall be given to size and baffling.

(c) An overflow shall be provided.

(d) Finished water must not be stored or conveyed in a compartment adjacent to unsafe water when the two compartments are separated by a single wall.

(5) Hydropneumatic (Pressure) tanks - Hydropneumatic (pressure) tanks, when provided as the only storage facility, are acceptable only in small water systems. For systems serving more than three hundred (300) taps or more than one thousand (1000) people, elevated storage shall be provided. Pressure tank storage shall not be considered for fire protection purposes, unless standby power is provided and the pumping capacity from wells or ground storage exceeds the fire flow demand with the largest well or pump out of service. Pressure tanks five hundred (500) gallons and larger shall meet the requirements of the American Society of Mechanical Engineers for the construction and installation of unfired pressure vessels and shall carry its approval stamp.

(a) The tank shall be located above normal ground surface and shall be fenced to protect it from vandalism.

(b) Sizing - For surface and ground water systems where the pump yield equals or exceeds the instantaneous demand, the tank shall be sized so the pump cycles a maximum

of six (6) times per hour. Where the pump yield is less than the instantaneous demand the tank shall be sized to provide the difference for a minimum twenty (20) minute demand period based on the actual usable volume of the tank.

(c) Bypass Piping - A flow through arrangement is required for all hydropneumatic storage tanks. However, the tank shall also be equipped with bypass piping to permit the tank to be removed from service for repairs or painting without removing well(s) or booster pump(s) from service. Bypass piping is not required for tanks less than 500 gallons.

(d) Appurtenances - All hydropneumatic tanks shall be equipped with a drain, isolation valves, sample tap, pressure gauge, air make-up system (except for bladder tanks), pressure relief valve, and pressure operated start and stop controls for the pump. Each tank five hundred (500) gallons and larger shall have an access manhole, a minimum two (2) inch diameter drain, and a vacuum relief valve. An air compressor is required on tanks two thousand (2000) gallons and larger.

(e) Freezing - All hydropneumatic storage tanks and their appurtenances shall be designed to prevent freezing which will interfere with proper functioning.

(f) Painting and/or cathodic protection - Proper protection shall be given to metal surfaces by paints or other protective coatings, by cathodic protective devices, or by both. All paint coatings which come into contact with drinking water shall be certified as meeting the specifications of the American National Standard Institute/National Sanitation Foundation Standard 61, Drinking Water System Components - Health Effects. The certifying party shall be accredited by the American National Standards Institute. Hot applied wax, cold applied wax, grease, and coal tar coatings are not acceptable.

(g) Disinfection - Hydropneumatic storage tanks shall be disinfected in accordance with current American Waterworks Association (AWWA) Standard for the disinfection of water storage facilities. Prior to sampling, the chlorine residual must be reduced to normal system residual levels or be non-detectable in those systems not chlorinating. A minimum of two (2) samples must be collected and analyzed for total coliform bacteria. These samples must be collected at least twenty-four (24) hours apart and results must show the absence of total coliform bacteria. The chlorine residual must also be measured and reported. If the membrane filter method of analysis is used for the coliform analysis, non-coliform growth must also be reported. If the non-coliform growth is greater than eighty (80) colonies per one hundred (100) ml, the sample result is invalid and must be repeated. All samples must be analyzed by a certified laboratory. The Department may request that heterotrophic plate count analyses be conducted on a case-by-case basis where disinfection problems are suspected.

(h) The pressure range of hydropneumatic tanks shall not exceed twenty (20) pounds per square inch.

D. Distribution Systems.

(1) Materials Standards - Pipe, fittings, packing, jointing materials, valves and fire hydrants shall conform to Section C of the American Water Works Association (AWWA) Standards. All materials or products which come into contact with drinking water shall be certified as meeting the specifications of the American National Standard Institute/National Sanitation Foundation Standard 61, Drinking Water System Components - Health Effects. The certifying party shall be accredited by the American National

Standards Institute. In the absence of American Water Works Association (AWWA) Standards, materials meeting applicable Product Standards and acceptable to the Department may be selected. SD 26 Class 160 and SD 21 Class 200 PVC pipe meeting ASTM Standard D1785 or D2241 are acceptable in sizes twelve (12) inches and smaller. Asbestos cement pipe shall not be used in potable water systems except in the repair of existing asbestos cement lines. Metallic pipe and fittings shall be lead free in accordance with R.61-58.4(F). Thermoplastic pipe shall not be used above grade.

(2) Used Materials - Water mains which have been used previously for conveying potable water may be reused provided they meet the above standards and have been thoroughly cleaned and restored practically to their original condition.

(3) Gaskets and Joints - Gaskets, O-rings, and other products used for jointing pipes, setting meters or valves, or other appurtenances which will expose the material to the water shall comply with the requirements of R.61-58.4(D)(1) and shall not be made of natural rubber or any other material which will support microbiological growth. Lubricants which will support microbiological growth shall not be used for slip-on joints. The use of vegetable shortening to lubricate joints is prohibited. The use of solvent-weld PVC pipe and fittings in water mains four (4) inches and larger is prohibited.

(4) Line Sizing -

(a) Pressure - The minimum pressure in all public water mains under conditions of maximum instantaneous demand shall be twenty-five (25) pounds per square inch at every customer's tap. Twenty (20) pounds per square inch will be acceptable at any tap when fire flows or flushing flows are provided in excess of maximum peak hourly flow.

(b) Diameter - The minimum size of water mains for providing fire protection and serving fire hydrants shall be six (6) inches in diameter. Larger size mains will be required if necessary to allow the withdrawal of the required fire flow while maintaining the minimum residual pressure specified in R.61-58.4(D)(4)(a).

(5) No line extension shall be made of an existing line when the existing line does not meet the minimum pressure and flow requirements of this regulation.

(6) Dead ends -

(a) Dead ends shall be minimized by looping of all mains whenever practical.

(b) The lengths of small dead end lines shall not exceed the following:

(i) One (1) inch diameter --- 150 ft.

(ii) One and one quarter (1 1/4) inch --- 200 ft.

(iii) One and one half (1 1/2) inch --- 300 ft.

(iv) Two inches (2) --- 1500 ft.

Conditions may warrant having less than the above maximum lengths in order to meet the twenty-five (25) pounds per square inch pressure requirement.

(7) Flushing - The design shall provide for a readily accessible means of flushing all water lines at a minimum velocity of 2.5 feet per second. This does not apply to service lines.

(a) Where dead-end lines occur they shall be provided with a fire hydrant if flow and pressure are sufficient, or with a post hydrant or readily accessible blow-off valve in a box for flushing purposes, except for the following cases:

(i) Lines one and one half (1-1/2) inches in diameter and smaller will not require blow-offs. Two inch lines shorter than two hundred (200) feet will not require a blow-off. However, a service connection shall be installed at the end of the line or another acceptable means of bleeding chlorine through the lines must be provided.

(b) Blow-offs shall be sized to provide a minimum velocity of 2.5 feet per second in the line and maintain a residual pressure of twenty-five (25) pounds per square inch.

(c) Post-type hydrants are acceptable for flushing purposes on lines four (4) inch through eight (8) inch and can be used on three (3) inch lines where the design flow is increased to one hundred (100) gallons per minute in excess of peak hourly flow.

(d) Design head loss calculations, including elevation changes shall show twenty-five (25) pounds per square inch minimum residual when instantaneous demand occurs or twenty (20) pounds per square inch minimum residual when either fire flow or flushing flow in excess of peak hourly flow occurs, whichever is greater.

(e) Lines ten (10) inches and larger require flows in excess of five hundred (500) gallons per minute to achieve a two and a half (2.5) feet per second scouring velocity. This would require a standard fire hydrant or other approved blow-off, for flushing which must be designed to provide at least five hundred (500) gallons per minute in excess of peak hourly flow and a minimum residual pressure of twenty (20) pounds per square inch.

(f) No flushing device shall be directly connected to any sewer.

(8) Valves - Sufficient valves shall be provided on water mains so that customer inconvenience and sanitary hazards will be minimized during repairs.

(9) Hydrants -

(a) Where standard four (4) to six (6) inch diameter hydrants are proposed, the design flow shall not be less than five hundred (500) gallons per minute over and above peak hourly flow. Standard hydrants shall not be placed on systems using only hydropneumatic storage, unless standby power is provided and the pumping capacity from wells or ground storage exceeds the fire flow demand with the largest well or pump out of service. Standard hydrants shall not be connected to lines not designed to carry fire flows.

(i) Hydrant Leads - The hydrant leads shall be a minimum of six (6) inches in diameter. Auxiliary gate valves shall be installed in all hydrant leads.

(ii) Drainage - A gravel pocket or dry well shall be provided unless the natural soils will provide adequate drainage. Hydrant drains shall not be connected to or located within ten (10) feet of sanitary sewers.

(b) Where Post-type hydrants are proposed, they must meet the flow requirements for blow-offs in R.61-58.4.D(7). Post hydrants shall not be used on lines smaller than

three (3) inches. Design calculations must be submitted when utilizing post hydrants on three (3) inch lines. These calculations must show one hundred (100) gallons per minute in excess of peak hourly flow can be maintained, and provide a residual pressure greater than or equal to twenty (20) pounds per square inch.

(10) Air Relief Valves, Valve, Meter and Blow-Off Chambers

(a) Air relief valves - Air relief valves shall be provided in accordance with sound engineering practice at high points in water mains as required. Automatic air relief valves shall not be used in situations where flooding of the manhole or chamber may occur.

(b) Air relief valve piping - The open end of an air relief pipe from automatic valves or from a manually operated valve shall be extended to the top of the pit and provided with a screened downward facing elbow.

(c) Chamber drainage - Chambers, pits or manholes containing valves, blow-off, meters, air release valves, or other such appurtenances to a distribution system, shall not be connected directly to any storm drain or sanitary sewer.

(11) Installation of Mains -

(a) Standards - Construction specifications shall incorporate the provisions of Section C of the American Waterworks Association (AWWA) Standards and/or manufacturer's recommended installation procedures.

(b) Bedding - A continuous and uniform bedding shall be provided in the trench for all buried pipe. Back-fill material shall be tamped in layers around the pipe and to a sufficient height above the pipe to adequately support and protect the pipe. Stones, other than crushed bedding, shall not come in contact with the pipe and shall not be within six (6) inches of the pipe.

(c) Cover - All water mains shall be provided with a minimum thirty (30) inches of cover. Where this is not possible, pipe shall be steel, concrete, ductile iron, or other approved material and method approved by the Department, and, when necessary, insulated to prevent freezing.

(d) Blocking - All tees, bends, plugs and hydrants on lines two and one half inches in diameter and larger shall be provided with reaction blocking, tie rods or other approved restraining methods to prevent movement.

(e) Pressure and leakage testing - All newly installed pipe shall be pressure tested and leakage tested in accordance with American Water Works Association (AWWA) Standard C600.

(f) Disinfection - Disinfection of all new water mains shall be in accordance with current American Water Works Association (AWWA) Standard C651 for the disinfection of water mains. In general one approved method referred to as "continuous feed method" is as follows: Before being placed in service, all new mains shall be thoroughly flushed then chlorinated with not less than twenty-five (25) milligrams per liter of available chlorine. Water from the existing distribution system or other source of supply shall be controlled so as to flow slowly into the newly laid pipeline during the application of chlorine. The solution shall be retained in the pipeline for not less than twenty-four (24)

hours and then flushed thoroughly with a potable water of satisfactory bacteriological quality before starting the sampling program.

The contractor or owner shall collect a minimum of two (2) samples from each sampling site for total coliform analysis. The number of sites depends on the amount of new construction but must include all dead-end lines and be representative of the water in the newly constructed mains. Prior to sampling, the chlorine residual must be reduced to normal system residual levels or be non-detectable in those systems not chlorinating. These samples must be collected at least twenty-four (24) hours apart and must show the water line to be absent of total coliform bacteria. The chlorine residual must also be measured and reported. If the membrane filter method of analysis is used for the coliform analysis, non-coliform growth must also be reported. If the non-coliform growth is greater than eighty (80) colonies per one hundred (100) milliliters, the sample result is invalid and must be repeated. All samples must be analyzed by a certified laboratory. The Department may request that heterotrophic plate count analyses be conducted on a case-by-case basis where disinfection problems are suspected.

(g) Detection of mains - All mains shall be detectable within three (3) feet with electronic locating equipment. Non-metallic pipes shall be installed with copper wire or other means of detection.

(h) Contaminated Areas - All water mains shall be located out of all contaminated areas. If the main must run through a contaminated site, the main material must protect the water system from being contaminated (e.g. Ductile Iron Pipe with chemical resistant gaskets).

(12) Separation of Water Mains and Sewers -

(a) Parallel installation - Water mains shall be laid at least ten (10) feet horizontally from any existing or proposed sewer. The distance shall be measured edge to edge. In cases where it is not practical to maintain a ten foot separation, the Department may allow deviation on a case-by-case basis, if supported by data from the design engineer. Such deviation may allow installation of the water main closer to a sewer, provided that the water main is laid in a separate trench or on an undisturbed earth shelf located on one side of the sewer at such an elevation that the bottom of the water main is at least eighteen (18) inches above the top of the sewer.

(b) Crossings - Water mains crossing sewers shall be laid to provide a minimum vertical separation of eighteen (18) inches between the outside of the water main and the outside of the sewer. This shall be the case whether the water main is either above or below the sewer line. Whenever possible, the water main shall be located above the sewer line. Where a new water main crosses a new sewer line, a full length of pipe shall be used for both the water main and sewer line and the crossing shall be arranged so that the joints of each line will be as far as possible from the point of crossing and each other. Where a new water main crosses an existing sewer line, one full length of water pipe shall be located so both joints will be as far from the sewer line as possible. Where a water main crosses under a sewer, adequate structural support shall be provided for the sewer line to prevent damage to the water main.

(c) Special Conditions - When it is impossible to obtain the distances specified in R.61-58.4(D)(12)(a) and (b) the Department may allow an alternative design. Any alternative design shall:

(i) maximize the distances between the water main and sewer line and the joints of each;

(ii) use materials which meet the requirements R.61-58.4(D)(1) for the sewer line; and,

(iii) allow enough distance to make repairs to one of the lines without damaging the other.

(d) Force mains - There shall be at least a ten (10) foot horizontal separation between water mains and sanitary sewer force mains. There shall be an eighteen (18) inch vertical separation at crossing as required in R.61-58.4(D)(12)(a) and (b).

(e) Sewer manholes - No water pipe shall pass through or come in contact with any part of a sewer manhole. Water lines may come in contact with storm sewers or catch basins if there is no other practical alternative, provided that ductile iron is used, no joints of the water line are within the storm sewer or catch basin and the joints are located as far as possible from the storm sewer or catch basin.

(f) Drain-fields and Spray-fields - Potable water lines shall not be laid less than twenty-five (25) feet horizontally from any portion of a waste-water tile-field or spray-field, or shall be otherwise protected by an acceptable method approved by the Department.

(13) Surface Water Crossings -

(a) Above-water crossings - The pipe shall be adequately supported and anchored, protected from damage and freezing, and accessible for repair or replacement.

(b) Underwater crossings - A minimum cover of two (2) feet shall be provided over the pipe. When crossing water courses which are greater than fifteen (15) feet in width, the following shall be provided:

(i) The pipe material and joints shall be designed appropriately;

(ii) Valves shall be located so that the section can be isolated for testing or repair; the valves shall be easily accessible, and not subject to flooding; and,

(iii) A blow-off shall be provided on the side opposite the supply service, sized in accordance with R.61-58.4(D)(7).

(iv) Blow-offs shall not be directed toward creeks or other water bodies without proper precaution being taken to dechlorinate prior to discharge.

(14) Cross Connections and Interconnections -

(a) Cross connections - There shall be no connection between the distribution system and any pipes, pumps, hydrants, or tanks whereby unsafe water or other contamination materials may be discharged or drawn into the system.

(b) Cooling water - Neither steam condensate nor cooling water from engine jackets or other heat exchange devices shall be returned to the potable water supply.

(c) Interconnections - The approval of the Department shall be obtained for interconnections between potable water supplies.

(15) Water Services and Plumbing -

(a) Plumbing - Water services and plumbing shall conform to relevant local plumbing codes or to the National Plumbing Code.

(b) Booster pumps - Individual home booster pumps shall not be allowed to meet the twenty-five (25) pounds per square inch minimum pressure at the service connection.

(16) Water Loading Stations - To prevent contamination of the public supply, the following criteria shall be met:

(a) Air Gap - A device shall be installed on the fill line to provide an air break and prevent a submerged discharge line.

(b) Hose length - The fill hose and cross connection control device must be constructed so that when hanging freely it will terminate at least two (2) feet above the ground surface.

(c) Fill line terminus - The discharge end of the fill line must be unthreaded and constructed to prevent the attachment of additional hose, piping or other appurtenances.

E. Public Buildings.

Water supply facilities in public buildings shall be designed to provide safe potable water to employees, customers, and guests.

(1) Source of Supply -

(a) Where a separate independent source is provided, it must be constructed in accordance with R.61-58.2 for groundwater systems or R.61-58.3 for surface water systems and treatment must be provided where necessary to meet the Water Quality Standards in R.61-58.5.

(b) Where an emergency or standby source is provided in addition to a service from a public water supply, it must be constructed in accordance with R.61-58.4(E)(1)(a) and maintained in operating condition. Where the main source of supply is from a public system, an approved double check assembly shall be installed after the meter in the main service line.

(c) Non-potable supplies shall not be connected to the potable water system.

(2) Quantity of Supply -

(a) The source of supply where service is provided from a public water system, shall be adequate to provide the instantaneous demand based on the number of fixtures to be provided.

(b) Where a separate source is provided, it must be designed to provide the maximum daily demand.

(3) On-Site Storage -

(a) On-site storage will be considered only where necessary to provide instantaneous demand or fire protection. In either case, the source of supply must be adequate to provide maximum daily demand.

(b) On-site storage, where used, must meet the requirements of R.61-58.4(C).

(4) Cross Connection Control - Public buildings shall be free of cross connections and be designed to meet applicable portions of R.61-58.7(F).

F. Lead Ban.

(1) Any pipe, solder, or flux which is used in the installation or repair of any public water system shall be lead free.

(2) Any pipe, solder, or flux which is used in any plumbing in a residential or nonresidential facility which provides water, through connection to a public water system, for human consumption shall be lead free.

(3) Lead free shall be defined, when used with respect to solders and flux, as those containing not more than two-tenths (0.2) percent lead.

(4) Lead free shall be defined, when used with respect to pipes and pipe fittings, as those containing not more than eight (8.0) percent lead.

(5) Leaded joints necessary for the repair of cast iron pipes shall be exempt from the lead free requirement.

(6) No person may import, manufacture, process, or distribute in commerce a new plumbing fitting or fixture, intended by the manufacturer to dispense water for human ingestion, that contains more than four (4) percent lead by dry weight.

G. Aquifer Storage and Recovery (ASR).

This section applies to the construction of new ASR wells and the modification of existing public water supply wells to allow its use as an ASR well.

(1) ASR Well Design, Construction, and Initial Development.

(a) All ASR wells must be designed, constructed and initially developed in accordance with all applicable sections of R.61-58.2.B.

(b) Underground Injection Control (UIC) Construction Permit: An UIC construction permit pursuant to State Regulation R.61-87 is required for all ASR wells.

(c) Preliminary Engineering Report (PER): A PER must be submitted and reviewed by the Department for all ASR wells in accordance with applicable portions of R.61-58.1.C prior to submission of the construction application.

(d) ASR Wellhead Piping must meet the following minimum requirements:

(i) A properly sized injection line must be provided.

(ii) The injection by-pass line, or main wellhead piping, must be provided with a means of recording instantaneous and totalized flows both in and out of the well.

(iii) A properly placed check valve must be provided in the injection by-pass line.

(iv) A means must be provided to manually isolate the injection line.

(v) Calculations must be provided to show the system can maintain pressure requirements at all services taps during injection.

(2) ASR Water Treatment: All ASR water treatment must be in accordance with all applicable portions of R.61-58.2.D. In addition, all water withdrawn from ASR wells must be properly disinfected in accordance with all applicable requirements of its source water (i.e., groundwater or surface water).

(3) ASR Well Final Development. An UIC permit for the operation of an ASR well must be obtained in accordance with R.61-87.

(a) Well Development Report: A well development report must be submitted and reviewed by the Department under R.61-87 which outlines the findings of the final ASR well development (e.g., injection and withdrawal rates, cycle testing, water quality data).

(b) Location of Discharge: All pumping discharge must be done in accordance with R.61-58.2.B(12)(c).

R.61-58.5 MAXIMUM CONTAMINANT LEVELS IN DRINKING WATER

A. Applicability.

This regulation shall apply to each public water system, unless the water system meets all of the following conditions:

(1) Consists only of distribution and storage facilities (and does not have any collection and treatment facilities);

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

(3) Does not sell water to any person; and

(4) Is not a carrier which conveys passengers in interstate commerce.

B. Maximum Contaminant Levels for Inorganic Chemicals.

(1) The Maximum Contaminant Levels (MCLs) for inorganic contaminants specified in R.61-58.5(B)(2) shall apply to all public water systems. Compliance with maximum contaminant levels for inorganic chemicals are calculated pursuant to Section (C) below:

(2) The maximum contaminant levels for inorganic chemicals are as follows:

	Contaminant	Level (mg/L)
(a)	Arsenic	0.010**
(b)	Asbestos	7 Million Fibers/liter (longer than 10μm)
(c)	Barium	2.0
(d)	Cadmium	0.005
(e)	Chromium	0.1
(f)	Fluoride	4.0
(g)	Mercury	0.002
(h)	Nitrate (as Nitrogen)	10
(i)	Nitrite (as Nitrogen)	1
(j)	Total Nitrate and Nitrite (as Nitrogen)	10
(k)	Selenium	0.05
(l)	Antimony	0.006
(m)	Beryllium	0.004
(n)	Cyanide (as free Cyanide)	0.2
(o)	Thallium	0.002

** The MCL for arsenic is 0.05 milligrams per liter (mg/L) for all public water systems until January 23, 2006.

(3) At the discretion of the Department, nitrate levels not to exceed twenty milligrams per liter may be allowed in a non-community water system if the supplier of water demonstrates to the satisfaction of the Department that:

(a) Such water will not be available to children under six months of age; and,

(b) The non-community water system is meeting the public notification requirements under R.61-58.6(E)(9), including continuous posting of the fact that nitrate levels exceed ten (10) milligrams per liter and the potential health effects of exposure; and,

(c) No adverse health effects shall result from the consumption of this water.

C. Primary Inorganic Chemical Sampling and Analytical Requirements.

(1) The monitoring requirements for inorganic contaminants specified in Section B (2)(b), (c), (d), (e), (g), (k), (l), (m), (n), and (o) above apply to community water systems and non-transient non-community water systems. The monitoring requirements for inorganic contaminants specified in Section B (2)(a) and (f) above only apply to community water systems. Beginning January 22, 2004, the monitoring requirements for the inorganic contaminant specified in Section B (2)(a) above will apply to community water systems and non-transient, non-community water systems. The monitoring required for inorganic contaminants specified in Section B (2)(h), (i) and (j) above apply to community, non-transient non-community and transient non-community water systems.

(2) Analytical methods used to comply with Section B above, shall be made using EPA-approved methods listed in 40 CFR 141. Analyses for the purpose of determining compliance with Section B above are required as follows:

(a) Analyses for all community water systems utilizing surface water sources, in whole or in part, shall be completed within one year following the effective date of this regulation. These analyses shall be repeated at yearly intervals.

(b) Analyses for all community water systems utilizing only groundwater sources shall be completed within two years following the effective date of this regulation. These analyses shall be repeated at three-year intervals.

(c) For non-community water systems, whether supplied by surface or groundwater sources, analyses for nitrate shall be completed within two years following the effective date of this regulation. These analyses shall be repeated at intervals determined by the Department.

(d) The Department shall have the authority to determine compliance or to initiate enforcement action based upon analytical results and other information compiled by the Department.

(3) If the result of an analysis made pursuant to subsection (2) above indicates that the level of any contaminant listed in Section B above exceeds the maximum contaminant level, the supplier of water shall report to the Department within seven days.

(4) When the maximum contaminant level for any contaminant listed in Section B above is exceeded as determined in accordance with subsection (15) below, the supplier of water shall notify the Department and give notice to the public pursuant to R. 61-58.6, Reports, Record Retention, and Public Notification, Sections B and E. Monitoring after public notification shall be at a frequency designated by the Department 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, exemption, or enforcement action shall become effective.

(5) The provisions of subsections (3) and (4) above notwithstanding, compliance with the maximum contaminant level for nitrate and nitrite shall be determined in accordance with subsection (12)(b) below.

(6) For the initial analyses required by items (2)(a), (b), or (c) above, data for surface waters acquired within one year prior to the effective date and data for groundwater acquired within three years prior to the effective date of this regulation may be substituted at the discretion of the Department. Analyses conducted to determine compliance with Section B above shall be made in accordance with the analytical methods adopted by the Department.

(7) Monitoring for the purpose of determining compliance with the maximum contaminant levels specified in Section B (2) above, shall be conducted as follows:

(a) Groundwater systems shall take a minimum of one sample at every entry point to the distribution system which is representative of each well after treatment (hereafter called a sampling point) beginning in the initial compliance period. The system shall take each sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

(b) Surface water systems shall take a minimum of one sample at every entry point to the distribution system after any application of treatment or in the distribution system at a point which is representative of each source after treatment (hereafter called a sampling point) beginning in the initial compliance period. The system shall take each sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant. [Note: For purposes of this paragraph, surface water systems include systems with a combination of surface and ground sources.]

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

(d) The Department may reduce the total number of samples which must be analyzed by allowing the use of compositing. Composite samples from a maximum of five samples are allowed, provided that the detection limit of the method used for analysis is less than one-fifth of the MCL. Compositing of samples must be done in the laboratory.

(i) If the concentration in the composite sample is greater than or equal to one-fifth of the MCL of any inorganic chemical, then a follow-up sample must be taken within 14 days at each sampling point included in the composite. These samples must be analyzed for the contaminants which exceeded one-fifth of the MCL in the composite sample. Detection limits for each analytical method and inorganic contaminant shall be in accordance with those listed in 40 CFR 141

(ii) If the population served by the system is greater than 3,300 persons, then compositing may only be permitted by the Department at sampling points within a single system. In systems serving 3,300 persons or less, the Department may permit compositing among different systems provided the 5-sample limit is maintained.

(e) The frequency of monitoring for asbestos shall be in accordance with paragraph (8) of this section; the frequency of monitoring for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium and thallium shall be in accordance with paragraph (9) of this section; the frequency of monitoring for nitrate shall be in accordance with paragraph

(10) of this section; and the frequency of monitoring for nitrite shall be in accordance with paragraph (11) of this section.

(8) The frequency of monitoring conducted to determine compliance with the maximum contaminant level for asbestos specified in Section B(2) above shall be conducted as follows:

(a) Each community and non-transient, non-community water system is required to monitor for asbestos during the first three-year compliance period of each nine-year compliance cycle beginning in the compliance period starting January 1, 1993.

(b) If the system believes it is not vulnerable to either asbestos contamination in its source water or due to corrosion of asbestos-cement pipe, or both, it may apply to the Department for a waiver of the monitoring requirement in paragraph (8)(a) of this section. If the Department grants the waiver, the system is not required to monitor.

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

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

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

(d) A waiver remains in effect until the completion of the three-year compliance period. Systems not receiving a waiver must monitor in accordance with the provisions of paragraph (8)(a) of this section.

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

(f) A system vulnerable to asbestos contamination due solely to source water shall monitor in accordance with the provision of paragraph (7) of this section.

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

(h) A system which exceeds the maximum contaminant levels as determined in paragraph (15) of this section shall monitor quarterly beginning in the next quarter after the violation occurred.

(i) The Department may decrease the quarterly monitoring requirement to the frequency specified in paragraph (8)(a) of this section provided the Department has determined that the system is reliably and consistently below the maximum contaminant level. In no case can the Department make this determination unless a groundwater system takes a minimum of two quarterly samples and a surface (or combined surface/ground) water system takes a minimum of four quarterly samples.

(j) If monitoring data collected after January 1, 1990 are generally consistent with the requirements of paragraph (8) of this section, then the Department may allow systems to use that data to satisfy the monitoring requirement for the initial compliance period

beginning January 1, 1993.

(9) The frequency of monitoring conducted to determine compliance with the maximum contaminant levels in Section B(2) above for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium, and thallium shall be as follows:

(a) Groundwater systems shall take one sample at each sampling point during each compliance period. Surface water systems (or combined surface/ground) shall take one sample annually at each sampling point.

(b) The system may apply to the Department for a waiver from the monitoring frequencies specified in paragraph (9)(a) of this section. The Department may grant a public water system a waiver for monitoring of cyanide, provided that the Department determines that the system is not vulnerable due to lack of any industrial source of cyanide.

(c) A condition of the waiver shall require that a system shall take a minimum of one sample while the waiver is effective. The term during which the waiver is effective shall not exceed one compliance cycle (i.e., nine years).

(d) The Department may grant a waiver provided surface water systems have monitored annually for at least three years and groundwater systems have conducted a minimum of three rounds of monitoring. (At least one sample shall have been taken since January 1, 1990.) Both surface and groundwater systems shall demonstrate that all previous analytical results were less than the maximum contaminant level. Systems that use a new water source are not eligible for a waiver until three rounds of monitoring from the new source have been completed.

(e) In determining the appropriate reduced monitoring frequency, the Department shall consider:

(i) Reported concentrations from all previous monitoring;

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

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

(f) A decision by the Department to grant a waiver shall be made in writing and shall set forth the basis for the determination. The determination may be initiated by the Department or upon an application by the public water system. The public water system shall specify the basis for its request. The Department shall review and, where appropriate, revise its determination of the appropriate monitoring frequency when the system submits new monitoring data or when other data relevant to the system's appropriate monitoring frequency become available.

(g) Systems which exceed the maximum contaminant levels as calculated in paragraph (15) of this section shall monitor quarterly beginning in the next quarter after the violation occurred.

(h) The Department may decrease the quarterly monitoring requirement to the

frequencies specified in paragraphs (9)(a) and (9)(c) of this section provided it has determined that the system is reliably and consistently below the maximum contaminant level. In no case can the Department make this determination unless a groundwater system takes a minimum of two quarterly samples and a surface water system takes a minimum of four quarterly samples.

(i) All new systems or systems that use a new source of water that begin operation after January 22, 2004 must demonstrate compliance with the MCL within a period of time specified by the Department. The system must also comply with the initial sampling frequencies specified by the Department to ensure a system can demonstrate compliance with the MCL. Routine and increased monitoring frequencies shall be conducted in accordance with the requirements in this section.

(10) All public water systems (community; non-transient, non-community; and transient, non-community) shall monitor to determine compliance with the maximum contaminant level for nitrate in Section B above.

(a) Community and non-transient, non-community water systems served by groundwater systems shall monitor annually beginning January 1, 1993; systems served by surface water shall monitor quarterly beginning January 1, 1993.

(b) For community and non-transient, non-community water systems, the repeat monitoring frequency for ground water systems shall be quarterly for at least one year following any one sample in which the concentration is 50 percent or more of the MCL. The Department may allow a groundwater system to reduce the sampling frequency to annually after four consecutive quarterly samples are reliably and consistently less than the MCL.

(c) For community and non-transient, non-community water systems, the Department may allow a surface water system to reduce the sampling frequency to annually if all analytical results from four consecutive quarters are less than 50 percent of the MCL. A surface water system shall return to quarterly monitoring if any one sample is 50 percent or more of the MCL.

(d) Each transient non-community water system shall monitor annually beginning January 1, 1993.

(e) After the initial round of quarterly sampling is completed, each community and non-transient non-community system which is monitoring annually shall take subsequent samples during the quarter(s) which previously resulted in the highest analytical result.

(11) All public water systems (community; non-transient, non-community; and transient, non-community systems) shall monitor to determine compliance with the maximum contaminant level for nitrite in Section B above.

(a) All public water systems shall take one sample at each sampling point in the compliance period beginning January 1, 1993 and ending December 31, 1995

(b) After the initial sample, systems where an analytical result for nitrite is less than 50 percent of the MCL shall monitor at the frequency specified by the Department.

(c) For community, non-transient, non-community, and transient non-community water systems, the repeat monitoring frequency for any water system shall be quarterly for at least one year following any one sample in which the concentration is 50 percent or more of the MCL. The Department may allow a system to reduce the sampling frequency to annually after determining the system is reliably and consistently less than the MCL.

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

(12) Confirmation samples:

(a) Where the results of sampling for asbestos, antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium or thallium indicate an exceedance of the maximum contaminant level, the Department may require that one additional sample be collected as soon as possible after the initial sample was taken (but not to exceed two weeks) at the same sampling point.

(b) Where nitrate or nitrite sampling results indicate an exceedance of the maximum contaminant level, the system shall take a confirmation sample within twenty-four (24) hours of the system's receipt of notification of the analytical results of the first sample. Systems unable to comply with the twenty (24) hour sampling requirement must immediately notify the consumers served by the area served by the public water system in accordance with R.61-58.6.B and E and meet other Tier 1 public notification requirements under this regulation. Systems exercising this option must take and analyze a confirmation sample within two weeks of notification of the analytical results of the first sample.

(c) If a Department-required confirmation sample is taken for any contaminant, then the results of the initial and confirmation sample shall be averaged. The resulting average shall be used to determine the system's compliance in accordance with paragraph (15) of this section. The Department has the discretion to delete results of obvious sampling errors.

(13) The Department may require more frequent monitoring than specified in paragraphs (8), (9), (10) and (11) of this section or may require confirmation samples for positive and negative results at its discretion.

(14) Systems may apply to the Department to conduct more frequent monitoring than the minimum monitoring frequencies specified in this section.

(15) Compliance with Section B(2) above (as appropriate) shall be determined based on the analytical result(s) obtained at each sampling point.

(a) For systems which are conducting monitoring at a frequency greater than annual, compliance with the maximum contaminant levels for antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium, or thallium is determined by a running annual average at any sampling point. If the average at any sampling point is greater than the MCL, then the system is out of compliance. If any one sample would cause the annual average to be exceeded, then the system is out of compliance immediately. Any sample below the method detection limit shall be calculated at zero for the purpose of determining the annual average. If a system fails to collect the required number of samples, compliance (average concentration) will be based

on the total number of samples collected.

(b) For systems which are monitoring annually, or less frequently, the system is out of compliance with the maximum contaminant levels for arsenic, asbestos, antimony, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury nickel, selenium or thallium if the level of a contaminant at any sampling point is greater than the MCL. If a confirmation sample is required by the Department, the determination of compliance will be based on the average of the two samples. If a system fails to collect the required number of samples, compliance (average concentration) will be based on the total number of samples collected.

(c) Compliance with the maximum contaminant levels for nitrate and nitrite is determined based on one sample if the levels of these contaminants is below the MCLs. If the levels of nitrate and/or nitrite exceed the MCLs in the initial sample, a confirmation sample is required in accordance with paragraph (12)(b) of this section, and compliance shall be determined based on the average of the initial and confirmation samples

(d) Arsenic sampling results will be reported to the nearest 0.001 mg/L.

(16) Each public water system shall monitor at the time designated by the Department during each compliance period

(17) Inorganic Analysis

(a) Analysis for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, nitrate, nitrite, selenium, and thallium shall be conducted using EPA-approved methods listed in 40 CFR 141.

(b) Sample collection for antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, nitrate, nitrite, selenium, and thallium under this section shall be conducted using EPA-approved methods listed in 40 CFR 141.

(c) Analysis under this section shall only be conducted by laboratories that have been certified by the Department.

D. Maximum Contaminant Levels for Organic Chemicals.

(1) The following are the maximum contaminant levels for organic chemicals. The MCLs specified in R.61-58.5(D)(2) below, apply to all public water systems. The maximum contaminant level for total trihalomethanes is pursuant to Section P below.

(2) The maximum contaminant levels for organic chemicals are as follows:

Contaminant			Level, mg/L
(a)	Reserved		
(b)	(i)	Alachlor	0.002
	(ii)	Atrazine	0.003
	(iii)	Carbofuran	0.04
	(iv)	Chlordane	0.002
	(v)	Dibromochloropropane	0.0002
	(vi)	2,4-D	0.07
	(vii)	Ethylene dibromide (EDB)	0.00005

(viii)	Heptachlor	0.0004
(ix)	Heptachlor epoxide	0.0002
(x)	Lindane	0.0002
(xi)	Methoxychlor	0.04
(xii)	Polychlorinated biphenyls(PCBs)	0.0005
(xiii)	Pentachlorophenol	0.001
(xiv)	Toxaphene	0.003
(xv)	2,4,5-TP	0.05
(xvi)	Benzo[a]pyrene	0.0002
(xvii)	Dalapon	0.2
(xviii)	Di(2-ethylhexyl)adipate	0.4
(xvix)	Di(2-ethylhexyl)phthalate	0.006
(xx)	Dinoseb	0.007
(xxi)	Diquat	0.02
(xxii)	Endothall	0.1
(xxiii)	Endrin	0.002
(xxiv)	Glyphosate	0.7
(xxv)	Hexachlorobenzene	0.001
(xxvi)	Hexachlorocyclopentadiene	0.05
(xxvii)	Oxamyl (vydate)	0.2
(xxviii)	Picloram	0.5
(xxvix)	Simazine	0.004
(xxx)	2,3,7,8-TCDD (Dioxin)	3×10^{-8}

E. Organic Chemicals Other Than Total Trihalomethanes, Sampling and Analytical Requirements.

(1) The monitoring requirements for organic contaminants specified in R.61-58.5(D)(2)(a) shall apply to all community water systems. The monitoring requirements for organic contaminants specified in 61-58.5(D)(2)(b) shall apply to community water systems and non-transient non-community water systems.

(2) Reserved.

(3) Reserved.

(4) Reserved.

(5) Reserved.

(6) Reserved.

(7) Analytical methods used to comply with Section D(2)(b) above, shall be made using EPA-approved methods listed in 40 CFR 141. Analysis of the contaminants listed in Section D(2)(b) above, for the purposes of determining compliance with the maximum contaminant level shall be conducted as follows:

(a) Groundwater systems shall take a minimum of one sample at every entry point to the distribution system which is representative of each well after treatment (hereafter called a sampling point). Each sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

(b) Surface water systems shall take a minimum of one sample at points in the distribution system that are representative of each source or at each entry point to the distribution system after treatment (hereafter called a sampling point). Each sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant. [Note: For purposes of this paragraph, surface water systems include systems with a combination of surface and ground sources.]

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

(d) Monitoring frequency:

(i) Each community and non-transient non-community water system shall take four consecutive quarterly samples for each contaminant listed in Section D(2)(b) above, during each compliance period beginning with the initial compliance period.

(ii) Systems serving more than 3,300 persons which do not detect a contaminant in the initial compliance period, may reduce the sampling frequency to a minimum of two quarterly samples in one year during each repeat compliance period.

(iii) Systems serving 3,300 persons or less which do not detect a contaminant in the initial compliance period may reduce the sampling frequency to a minimum of one sample during each repeat compliance period.

(e) Each community and non-transient water system may apply to the Department for a waiver from the requirement of paragraph (7)(d) of this section. A system must reapply for a waiver for each compliance period.

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

(i) Previous analytical results.

(ii) The proximity of the system to a potential point or non-point source of contamination. Point sources include spills and leaks of chemicals at or near a water treatment facility or at manufacturing, distribution, or storage facilities, or from hazardous and municipal waste landfills and other waste handling or treatment facilities. Non-point sources include the use of pesticides to control insect and weed pests on agricultural areas, forest lands, home and gardens, and other land application uses.

(iii) The environmental persistence and transport of the pesticide or PCBs.

(iv) How well the water source is protected against contamination due to such factors as depth of the well and the type of soil and the integrity of the well casing.

(v) Elevated nitrate levels at the water supply source.

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

(g) If an organic contaminant listed in Section D(2)(b) above, is detected (as defined by paragraph (7)(r) of this section) in any sample, then:

(i) Each system must monitor quarterly at each sampling point which resulted in a detection.

(ii) The Department may decrease the quarterly monitoring requirement specified in paragraph (7)(g)(i) of this section provided it has determined that the system is reliably and consistently below the maximum contaminant level. In no case shall the Department make this determination unless a groundwater system takes a minimum of two quarterly samples and a surface water system takes a minimum of four quarterly samples.

(iii) After the Department determines the system is reliably and consistently below the maximum contaminant level the Department may allow the system to monitor annually. Systems which monitor annually must monitor during the quarter that previously yielded the highest analytical result.

(iv) Systems which have 3 consecutive annual samples with no detection of a contaminant may apply to the Department for a waiver as specified in paragraph (7)(f) of this section.

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

(h) Systems which violate the requirements of Section D(2)(b) above, as determined by paragraph (7)(k) of this section must monitor quarterly. After a minimum of four quarterly samples show the system is in compliance and the Department determines the system is reliably and consistently below the MCL, as specified in paragraph (7)(k) of this section, the system shall monitor at the frequency specified in paragraph (7)(g)(iii) of this section.

(i) The Department may require a confirmation sample for positive or negative results. If a confirmation sample is required by the Department, the result must be averaged with the first sampling result and the average used for the compliance determination as specified by paragraph (7)(k) of this section. The Department has the

discretion to delete results of obvious sampling errors from this calculation.

(j) The Department may reduce the total number of samples a system must analyze by allowing the use of compositing. Composite samples from a maximum of five sampling points are allowed, provided that the detection limit of the method used for analysis is less than one-fifth of the MCL. Compositing of samples must be done in the laboratory and analyzed within 14 days of sample collection.

(i) If the concentration in the composite sample detects one or more contaminants listed in Section D(2)(b) above, then a follow-up sample must be taken 14 days at each sampling point included in the composite, and be analyzed for that contaminant.

(ii) If duplicates of the original sample taken from each sampling point used in the composite are available, the system may use these duplicates instead of resampling. The duplicate must be analyzed and the results reported to the Department within 14 days of collection.

(iii) If the population served by the system is more than 3,300 persons, then compositing may only be permitted by the Department at sampling points within a single system. In systems serving 3,300 persons or less, the Department may permit compositing among different systems provided the 5-sample limit is maintained.

(k) Compliance with Section D(2)(b) above, shall be determined based on the analytical results obtained at each sampling point. If one sampling point is in violation of an MCL, the system is in violation of the MCL.

(i) For systems monitoring more than once per year, compliance with the MCL is determined by a running annual average at each sampling point.

(ii) Systems monitoring annually or less frequently whose sample result exceeds the regulatory detection level as defined by paragraph (7)(r) of this section must begin quarterly sampling. The system will not be considered in violation of the MCL until it has completed one year of quarterly sampling.

(iii) If any sample result will cause the running annual average to exceed the MCL at any sampling point, the system is out of compliance with the MCL immediately.

(iv) If a system fails to collect the required number of samples, compliance will be based on the total number of samples collected.

(v) If a sample result is less than the detection limit, zero will be used to calculate the annual average.

(l) [Reserved]

(m) Analysis for PCBs shall be conducted using EPA-approved methods listed in 40 CFR 141.

(i) [Reserved]

(ii) [Reserved]

(iii) Compliance with the PCB MCL shall be determined based upon the quantitative results of analyses using EPA-approved methods listed in 40 CFR 141.

(n) If monitoring data collected after January 1, 1990, are generally consistent with the requirements of this section, then the Department may allow systems to use that data to satisfy the monitoring requirement for the initial compliance period beginning January 1, 1993.

(o) The Department may increase the required monitoring frequency, where necessary, to detect variations within the system (e.g., fluctuations in concentration due to seasonal use, changes in water source).

(p) The Department has the authority to determine compliance or initiate enforcement action based upon analytical results and other information compiled by the Department.

(q) Each public water system shall monitor at the time designated by the Department within each compliance period.

(r) Detection as used in this paragraph shall be defined as greater than or equal to the following concentrations for each contaminant.

Contaminant	Detection Limit
Alachlor	0.0002 mg/L
Atrazine	0.0001 mg/L
Benzo[a]pyrene	0.00002 mg/L
Carbofuran	0.0009 mg/L
Chlordane	0.0002 mg/L
Dalapon	0.001 mg/L
Dibromochloropropane (DBCP)	0.00002 mg/L
Di (2-ethylhexly) adipate	0.0006 mg/L
Di (2-ethylhexly) phthalate	0.0006 mg/L
Dinoseb	0.0002 mg/L
Diquat	0.0004 mg/L
2,4-D	0.0001 mg/L
Endothall	0.009 mg/L
Endrin	0.00001 mg/L
Ethylene dibromide (EDB)	0.00001 mg/L
Glyphosate	0.006 mg/L
Heptachlor	0.00004 mg/L
Heptachlor epoxide	0.00002 mg/L
Hexachlorobenzene	0.0001 mg/L
Hexachlorocyclopentadiene	0.0001 mg/L
Lindane	0.00002 mg/L
Methoxychlor	0.0001 mg/L
Oxamyl	0.002 mg/L
Picloram	0.0001 mg/L
Polychlorinated biphenyls (PCBs) (as decachlorobiphenyl)	0.0001 mg/L
Pentachlorophenol	0.00004 mg/L

Simazine	0.00007 mg/L
Toxaphene	0.001 mg/L
2,3,7,8-TCDD (Dioxin)	0.000000005 mg/L
2,4,5-TP (Silvex)	0.0002 mg/L

(s) All new systems or systems that used a new source of water that begin operation after January 22, 2004 must demonstrate compliance with the MCL within a period of time specified by the Department. The system must also comply with the initial sampling frequencies specified by the Department to ensure a system can demonstrate compliance with the MCL. Routine and increased monitoring frequencies shall be conducted in accordance with the requirements in this section.

F. Maximum Contaminant Levels (MCLs) for Microbiological Contaminants.

These maximum contaminant levels shall apply to all public water systems.

(1) Until March 31, 2016, the total coliform MCL is based on the presence or absence of total coliforms in a sample, rather than coliform density.

(a) For a system which collects at least forty (40) samples per month, if no more than five (5.0) percent of the samples collected during a month are total coliform-positive, the system is in compliance with the MCL for total coliforms.

(b) For a system which collects fewer than forty (40) samples per month, if no more than one (1) sample collected during a month is total coliform -positive, the system is in compliance with the MCL for total coliforms.

(2) Until March 31, 2016, any fecal coliform-positive repeat sample or E. coli-positive repeat sample, or any total coliform-positive repeat sample following a fecal coliform-positive or E. coli-positive routine sample constitutes a violation of the MCL for total coliforms. For purposes of the public notification requirements in R.61 58.6.E, this is a violation that may pose an acute risk to health.

(3) Beginning April 1, 2016, a system is in compliance with the MCL for E. coli for samples taken under provisions of R.61-58.17 unless any of the conditions identified in R.61-58.5.F(3)(a) through (d) occur. For purposes of the public notification requirements in R.61-58.6.E, violation of the MCL may pose an acute risk to health.

(a) The system has an E. coli-positive repeat sample following a total coliform-positive routine sample.

(b) The system has a total coliform-positive repeat sample following an E. coli-positive routine sample.

(c) The system fails to take all required repeat samples following an E. coli-positive routine sample.

(d) The system fails to test for E. coli when any repeat sample tests positive for total coliform.

(4) Until March 31, 2016, a public water system must determine compliance with the MCL for total coliforms in R.61-58.5.F(1) and (2) for each month in which it is required to monitor for total coliforms. Beginning April 1, 2016, a public water system must determine compliance with the MCL for E. coli in R.61-58.5.F(3) for each month in which it is required to monitor for total coliforms.

(5) The United States Environmental Protection Agency Administrator, pursuant to section 1412 of the federal Safe Drinking Water Act, has identified the following as the best technology, treatment techniques, or other means available for achieving compliance with the maximum contaminant level for total coliforms in R.61-58.5.F (1)and (2) and for achieving compliance with the maximum contaminant level for E. coli in R.61-58.5.F(3):

(a) Protection of wells from fecal contamination by appropriate placement and construction;

(b) Maintenance of a disinfection residual throughout the distribution system;

(c) Proper maintenance of the distribution system including appropriate pipe placement and repair procedures, main flushing programs, proper operation and maintenance of storage tanks and reservoirs, cross connection control, and continual maintenance of positive water pressure in all parts of the distribution system;

(d) Filtration and/or disinfection of surface water, as described in R.61-58.10, or disinfection of ground water, as described in R.61-58.16, using strong oxidants such as chlorine, chlorine dioxide, or ozone; and

(e) For systems using ground water, compliance with the requirements of an EPA-approved Department Wellhead Protection Program developed and implemented under section 1428 of the federal Safe Drinking Water Act.

(6) The United States Environmental Protection Agency Administrator, pursuant to section 1412 of the federal Safe Drinking Water Act, identifies the technology, treatment techniques, or other means available identified in R.61-58.5.F(5) as affordable technology, treatment techniques, or other means available to systems serving 10,000 or fewer people for achieving compliance with the maximum contaminant level for total coliforms in R.61-58.5.F(1) and (2) and for achieving compliance with the maximum contaminant level for E. coli in R.61-58.5.F(3).

G. Microbiological Contaminant Sampling and Analytical Requirements.

These sampling and analytical requirements shall apply to community and non-community water systems. Analytical methods used to comply with Section F above, shall be made using EPA-approved methods listed in 40 CFR 141.

(1) Routine Monitoring.

(a) Community and non-community water systems shall collect total coliform samples at sites which are representative of water throughout the distribution system according to a written sample siting plan. These plans are subject to Department review and revision.

(b) The monitoring frequency for total coliforms for community water systems is based on the population served by the system, as follows:

Population Served			Minimum # of Samples Per Month
25	to	1,000[1]	1
1,001	to	2,500	2
2,501	to	3,300	3
3,301	to	4,100	4
4,101	to	4,900	5
4,901	to	5,800	6
5,801	to	6,700	7
6,701	to	7,600	8
7,601	to	8,500	9
8,501	to	12,900	10
12,901	to	17,200	15
17,201	to	21,500	20
21,501	to	25,000	25
25,001	to	33,000	30
33,001	to	41,000	40
41,001	to	50,000	50
50,001	to	59,000	60
59,001	to	70,000	70
70,001	to	83,000	80
83,001	to	96,000	90
96,001	to	130,000	100
130,001	to	220,000	120
220,001	to	320,000	150
320,001	to	450,000	180
450,001	to	600,000	210
600,001	to	780,000	240
780,001	to	970,000	270
970,001	to	1,230,000	300
1,230,001	to	1,520,000	330
1,520,001	to	1,850,000	360
1,850,001	to	2,270,000	390
2,270,001	to	3,020,000	420
3,020,001	to	3,960,000	450
3,960,001	or more		480

[1]Includes public water systems which have at least fifteen (15) service connections, but serve fewer than twenty-five (25) persons.

If a community water system serving twenty-five (25) to one-thousand (1,000) persons has no history of total coliform contamination in its current configuration and a sanitary survey conducted in the past five years shows that the system is supplied solely by a protected groundwater source and is free of sanitary defects, the Department may reduce the monitoring frequency specified above, except that in no case may the Department reduce the monitoring frequency to less than one sample per quarter. The Department must approve the reduced monitoring frequency in writing.

(i) [Reserved]

(ii) Community water systems shall make at a minimum one fecal or total coliform density measurement each day from the raw water source, and one coliform density or presence/absence measurement from the finished water, if treating surface water. This requirement may be waived by the Department on a

case-by-case basis if a public water supply can demonstrate that such monitoring is unnecessary.

(c) The monitoring frequency for total coliforms for non-community water systems is as follows:

(i) A non-community water system using only ground water (except ground water under the direct influence of surface water) and serving one-thousand (1,000) persons or fewer shall monitor each calendar quarter that the system provides water to the public, except that the Department may reduce this monitoring frequency, in writing, if a sanitary survey shows that the system is free of sanitary defects. Beginning June 29, 1994, the Department cannot reduce the monitoring frequency for a non-community water system using only ground water (except ground water under the direct influence of surface water) and serving one-thousand (1,000) persons or fewer to less than once per year.

(ii) A non-community water system using only ground water (except ground water under the direct influence of surface water) and serving more than one-thousand (1,000) persons during any month shall monitor at the same frequency as a like-sized community water system, as specified in paragraph (1)(b) of this section, except that the Department may reduce this monitoring frequency, in writing, for any month the system serves one-thousand (1,000) persons or fewer. The Department cannot reduce the monitoring frequency to less than once per year. For systems using ground water under the direct influence of surface water, paragraph (1)(c)(iv) of this section applies.

(iii) A non-community water system using surface water, in total or in part, shall monitor at the same frequency as a like-sized community water system, as specified in paragraph (1)(b) of this section, regardless of the number of persons it serves.

(iv) A non-community water system using ground water under the direct influence of surface water shall monitor at the same frequency as a like-sized community water system, as specified in paragraph (1)(b) of this section. The system shall begin monitoring at this frequency beginning six (6) months after the Department determines that the ground water is under the direct influence of surface water.

(d) The community or non-community water system shall collect samples at regular time intervals throughout the month, except that a system which uses ground water (except ground water under the direct influence of surface water), and serves 4,900 persons or fewer, may collect all required samples on a single day if they are taken from different sites.

(e) A community or non-community water systems that uses surface water or ground water under the direct influence of surface water and does not practice filtration in compliance with R.61-58.10 shall collect at least one sample near the first service connection each day the turbidity level of the source water, measured as specified in R.61-58.10.F(2)(b), exceeds 1 NTU. This sample shall be analyzed for the presence of total coliforms. When one or more turbidity measurements in any day exceed 1 NTU, the system shall collect this coliform sample within 24 hours of the first exceedance, unless the Department determines that the system, for logistical reasons outside the system's control, cannot have the sample analyzed within thirty (30) hours of collection. Sample

results from this coliform monitoring shall be included in determining compliance with the MCL for total coliforms in Section F above.

(f) Special purpose samples, such as those taken to determine whether disinfection practices are sufficient following pipe placement, replacement, or repair, shall not be used to determine compliance with the MCL for total coliforms in Section F above. Repeat samples taken pursuant to paragraph (2) of this section are not considered special purpose samples, and shall be used to determine compliance with the MCL for total coliforms in Section F above.

(2) Repeat Monitoring.

(a) If a routine sample is total coliform-positive, the community or non-community water system shall collect a set of repeat samples within twenty-four (24) hours of being notified of the positive result. A system which collects more than one routine sample per month shall collect no fewer than three repeat samples for each total coliform-positive sample found. A system which collects one routine sample per month or fewer shall collect no fewer than four repeat samples for each total coliform-positive sample found. The Department may extend the twenty-four (24) hour limit on a case-by-case basis if the system has a logistical problem in collecting the repeat samples within twenty-four (24) hours that is beyond its control. In the case of an extension, the Department shall specify how much time the system has to collect the repeat samples.

(b) The system shall collect at least one repeat sample from the sampling tap where the original total coliform-positive sample was taken, and at least one repeat sample at a tap within five service connections upstream and at least one repeat sample at a tap within five (5) service connections downstream of the original sampling site. If a total coliform-positive sample is at the end of the distribution system, or one away from the end of the distribution system, the Department may waive the requirement to collect at least one repeat sample upstream or downstream of the original sampling site.

(c) The system shall collect all repeat samples on the same day, except that the Department may allow a system with a single service connection to collect the required set of repeat samples over a four-day period or to collect a larger volume repeat sample(s) in one or more sample containers of any size, as long as the total volume collected is at least 400 ml (300 ml for systems which collect more than one routine sample per month).

(d) If one or more repeat samples in the set is total coliform-positive, the water system shall collect an additional set of repeat samples in the manner specified in paragraphs (2)(a) through (c) of this section. The additional samples shall be collected within twenty-four (24) hours of being notified of the positive result, unless the Department extends the limit as provided in paragraph (2)(a) of this section. The system shall repeat this process until either total coliforms are not detected in one complete set of repeat samples or the system determines that the MCL for total coliforms in Section F above, has been exceeded and notifies the Department.

(e) If a system collecting fewer than five routine samples per month has one or more total coliform-positive samples and the Department does not invalidate the sample(s) under paragraph (3) of this section, it shall collect at least five routine samples during the next month the system provides water to the public, except that the Department may waive this requirement if the conditions of paragraph (2)(e)(i) or (ii) of this section are met. The Department cannot waive the requirement for a system to collect repeat samples in paragraphs (2)(a) through (d) of this section.

(i) The Department may waive the requirement to collect five routine samples the next month the system provides water to the public if the Department, or an agent approved by the Department, performs a site visit before the end of the next month the system provides water to the public. Although a sanitary survey need not be performed, the site visit shall be sufficiently detailed to allow the Department to determine whether additional monitoring and/or any corrective action is needed. The Department cannot approve an employee of the system to perform this site visit, even if the employee is an agent approved by the Department to perform sanitary surveys.

(ii) The Department may waive the requirement to collect five routine samples the next month the system provides water to the public if the Department has determined why the sample was total coliform-positive and establishes that the system has corrected the problem or will correct the problem before the end of the next month the system serves water to the public. In this case, the Department shall document this decision to waive the following month's additional monitoring requirement in writing, have it approved and signed by the supervisor of the Department official who recommends such a decision, and make this document available to the EPA and public. The written documentation shall describe the specific cause of the total coliform-positive sample and what action the system has taken and/or will take to correct this problem. The Department cannot waive the requirement to collect five routine samples the next month the system provides water to the public solely on the grounds that all repeat samples are total coliform-negative. Under this paragraph, a system shall still take at least one routine sample before the end of the next month it serves water to the public and use it to determine compliance with the MCL for total coliforms in R.61-58.5.F, unless the Department has determined that the system has corrected the contamination problem before the system took the set of repeat samples required in paragraphs (2)(a) through (d) of this section, and all repeat samples were total coliform-negative.

(f) After a system collects a routine sample and before it learns the results of the analysis of that sample, if it collects another routine sample(s) from within five adjacent service connections of the initial sample, and the initial sample, after analysis, is found to contain total coliforms, then the system may count the subsequent sample(s) as a repeat sample instead of as a routine sample.

(g) Results of all routine and repeat samples not invalidated by the Department shall be included in determining compliance with the MCL for total coliforms in Section F above.

(3) Invalidation of total coliform samples.

A total coliform-positive sample invalidated under this paragraph does not count towards meeting the minimum monitoring requirements of this section.

(a) The Department may invalidate a total coliform-positive sample only if the conditions of paragraph (3)(a)(i), (ii) or (iii) of this section are met.

(i) The laboratory establishes that improper sample analysis caused the total coliform-positive result.

(ii) The Department, on the basis of the results of repeat samples collected as required by paragraphs (2)(a) through (d) of this section, determines that the total coliform-positive sample resulted from a domestic or other non-distribution system plumbing problem. The Department cannot invalidate a sample on the basis of repeat sample results unless all repeat sample(s) collected at the same tap as the original total coliform- positive sample are also total coliform-positive, and all repeat samples collected within five service connections of the original tap are total coliform-negative (e.g., the Department cannot invalidate a total coliform-positive sample on the basis of repeat samples if all the repeat samples are total coliform- negative, or if the public water system has only one service connection).

(iii) The Department has substantial grounds to believe that a total coliform-positive result is due to a circumstance or condition which does not reflect water quality in the distribution system. In this case, the system shall still collect all repeat samples required under paragraphs (2)(a) through (d) of this section, and use them to determine compliance with the MCL for total coliforms in Section F above. To invalidate a total coliform-positive sample under this paragraph, the decision with the rationale for the decision shall be documented in writing, and approved and signed by the supervisor of the Department official who recommended the decision. The Department shall make this document available to the EPA and the public. The written documentation shall state the specific cause of the total coliform-positive sample, and what action the system has taken, or will take, to correct this problem. The Department may not invalidate a total coliform-positive sample solely on the grounds that all repeat samples are total coliform-negative.

(b) A laboratory shall invalidate a total coliform sample (unless total coliforms are detected) if the sample produces a turbid culture in the absence of gas production using an analytical method where gas formation is examined (e.g., the Multiple-Tube Fermentation Technique), produces a turbid culture in the absence of an acid reaction in the Presence-Absence (P-A) Coliform Test, or exhibits confluent growth or produces colonies too numerous to count with an analytical method using a membrane filter (e.g., Membrane Filter Technique). If a laboratory invalidates a sample because of such interference, the Department shall be notified, and the system shall collect another sample from the same location as the original sample within twenty-four (24) hours of being notified of the interference problem, and shall have it analyzed for the presence of total coliforms. The system shall continue to re-sample within twenty-four (24) hours and have the samples analyzed until it obtains a valid result. The Department may waive the twenty-four (24) hour time limit on a case-by-case basis.

(4) Sanitary Surveys.

(a) (i) Public water systems which do not collect five (5) or more routine samples per month shall undergo an initial sanitary survey by June 29, 1994, for community water systems and June 29, 1999, for non-community water systems. hereafter, systems shall undergo another sanitary survey every five (5) years, except that non-community water systems using only protected and disinfected ground water, as defined by the Department, shall undergo subsequent sanitary surveys at least every ten (10) years after the initial sanitary survey. The Department shall review the results of each sanitary survey to determine whether the existing monitoring frequency is adequate and what additional measures, if any, the system needs to undertake to improve drinking water quality.

(ii) In conducting a sanitary survey of a system using ground water in a State having an EPA-approved wellhead protection program under the Federal Safe Drinking Water Act, information on sources of contamination within the delineated wellhead protection area that was collected in the course of developing and implementing the program should be considered instead of collecting new information, if the information was collected since the last time the system was subject to a sanitary survey.

(b) Sanitary surveys shall be performed by the Department or an agent approved by the Department. The system is responsible for ensuring the survey takes place.

(c) Sanitary surveys conducted by the Department under the provisions of 40 CFR 142.16(o)(2) may be used to meet the sanitary survey requirements of R.61-58.5.G(4).

(5) Fecal coliforms/Escherichia coli (E. coli) testing.

(a) If any routine or repeat sample is total coliform positive, the system shall analyze that total coliform-positive culture medium to determine if fecal coliforms are present, except that the system may test for E. coli in lieu of fecal coliforms. If fecal coliforms or E. coli are present, the system shall notify the Department by the end of the day when the system is notified of the test result, unless the system is notified of the result after the Department is closed, in which case the system shall notify the Department before the end of the next business day.

(b) The Department has the discretion to allow a public water system, on a case-by-case basis, to forego fecal coliform or E. coli testing on a total coliform-positive sample if that system assumes that the total coliform-positive sample is fecal coliform-positive or E. coli-positive. Accordingly, the system shall notify the Department as specified in paragraph (5)(a) of this section and the provisions of Section F(2) above, apply.

(6) Analytical methodology.

(a) The standard sample volume required for total coliform analysis, regardless of analytical method used, is 100 ml.

(b) Water systems need only determine the presence or absence of total coliforms; a determination of total coliform density is not required.

(c) Analytical methods used to comply with R.61-58.5.G shall be in accordance with EPA-approved methods listed in 40 CFR 141 (11-8-06 edition).

(d) Water systems must conduct fecal coliform analysis in accordance with the procedure outlined in 40 CFR 141.21(f)(5) (11-8-06 edition).

(e) Water systems must conduct Escherichia coli analysis in accordance with the analytical methods outlined in 40 CFR 141.21(f)(6) (11-8-06 edition).

(7) Response to violation.

(a) A water system which has exceeded the MCL for total coliforms in Section F above, shall report the violation to the Department no later than the end of the next business day after it learns of the violation, and shall notify the public in accordance with

R.61-58.6.E.

(b) A water system which has failed to comply with a coliform monitoring requirement, including the sanitary survey requirement, shall report the monitoring violation to the Department within ten days after the system discovers the violation, and shall notify the public in accordance with R.61-58.6.E.

(8) The provisions of R.61-58.5.G(1) and (4) are applicable until March 31, 2016. The provisions of R.61-58.5.G(2), (3), (5), (6), and (7) are applicable until all required repeat monitoring under R.61-58.5.G(2) and fecal coliform or E. coli testing under R.61-58.5.G(5) that was initiated by a total coliform-positive sample taken before April 1, 2016 is completed, as well as analytical method, reporting, recordkeeping, public notification, and consumer confidence report requirements associated with that monitoring and testing. Beginning April 1, 2016, the provisions of R.61-58.17 are applicable, with systems required to begin regular monitoring at the same frequency as the system-specific frequency required on March 31, 2016.

H. Maximum Contaminant Levels for Radionuclides.

(1) The maximum contaminant level for radionuclides are applicable to all public water systems. Compliance with the maximum contaminant levels for radionuclides is calculated pursuant to Section I below.

(2) MCL for combined radium-226 and -228. The maximum contaminant level for combined radium-226 and radium-228 is 5 pCi/L. The combined radium-226 and radium-228 value is determined by the addition of the results of the analysis for radium-226 and the analysis for radium-228.

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

(4) MCL for beta particle and photon radioactivity.

(a) The average annual concentration of beta particle and photon radioactivity from man-made radionuclides in drinking water must not produce an annual dose equivalent to the total body or any internal organ greater than 4 millirem/year (mrem/year).

(b) Except for the radionuclides listed in Table A, the concentration of man-made radionuclides causing 4 mrem total body or organ dose equivalents must be calculated on the basis of two (2) liters per day drinking water intake using the 168 hour data list in "Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air and in Water for Occupational Exposure," NBS (National Bureau of Standards) Handbook 69 as amended August 1963, U.S. Department of Commerce. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies of this document are available from the National Technical Information Service, NTIS ADA 280 282, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161. The toll-free number is 800-553-6847. Copies may be inspected at EPA's Drinking Water Docket, 401 M Street, SW, Washington, DC 20460; or at the Office of the Federal Register, 800 North Capitol Street, NW, Suite 700, Washington, DC. If two or more radionuclides are present, the sum of their annual dose equivalent to the total body or to any organ shall not exceed 4 mrem/year.

TABLE A: AVERAGE ANNUAL CONCENTRATIONS ASSUMED TO PRODUCE A TOTAL BODY OR ORGAN DOSE OF 4 MREM/YR

Radionuclide	Critical organ	pCi per liter
1. Tritium	Total body	20,000
2. Strontium-90	Bone Marrow	8

(5) MCL for uranium. The maximum contaminant level for uranium is 30 μg/L.

(6) Compliance dates. Compliance dates for combined radium-226 and -228, gross alpha particle activity, gross beta particle and photon radioactivity, and uranium: Community water systems must comply with the MCLs listed in paragraphs (2), (3), (4), and (5) of this section beginning December 8, 2003 and compliance shall be determined in accordance with the requirements of Sections I and K below. Compliance with reporting requirements for the radionuclides under Appendix D to R.61-58.12 and Appendices A , B and C to R.61-58.6 is required on December 8, 2003.

(7) Best available technologies (BATs) for radionuclides. The Administrator, pursuant to section 1412 of the Federal Safe Drinking Water Act, hereby identifies as indicated in the following table the best technology available for achieving compliance with the maximum contaminant levels for combined radium-226 and -228, uranium, gross alpha particle activity, and beta particle and photon radioactivity.

TABLE B: BAT FOR COMBINED RADIUM-226 AND RADIUM-228, URANIUM, GROSS ALPHA PARTICLE ACTIVITY, AND BETA PARTICLE AND PHOTON RADIOACTIVITY

CONTAMINANT	BAT
1. Combined radium-226 and radium-228	Ion exchange, reverse osmosis, lime softening.
2. Uranium	Ion exchange, reverse osmosis, lime softening, coagulation/filtration.
3. Gross alpha particle activity (excluding Radon and Uranium)	Reverse osmosis.
4. Beta particle and photon radioactivity	Ion exchange, reverse osmosis.

(8) Small systems compliance technologies list for radionuclides.

TABLE C: LIST OF SMALL SYSTEMS COMPLIANCE TECHNOLOGIES FOR RADIONUCLIDES AND LIMITATIONS TO USE

Unit technologies	Limitations (see foot-notes)	Operator skill level required. [1]	Raw water quality range and considerations.[1]
1. Ion exchange (IE)	(a)	Intermediate	All ground waters.
2. Point of use (POU 2) IE	(b)	Basic	All ground waters.
3. Reverse osmosis (RO)	(c)	Advanced	Surface waters usually require pre-filtration.
4. POU[2] RO	(b)	Basic	Surface waters usually require pre-filtration.
5. Lime softening	(d)	Advanced	All waters.
6. Green sand filtration	(e)	Basic.	
7. Co-precipitation with Barium sulfate	(f)	Intermediate to Advanced	Ground waters with suitable water quality.
8. Electrodialysis/ electrodialysis reversal	.....	Basic to Intermediate	All ground waters.
9. Pre-formed hydrous Manganese oxide filtration	(g)	Intermediate	All ground waters.
10. Activated alumina	(a), (h)	Advanced	All ground waters; competing anion con-centrations may affect regeneration frequency.
11. Enhanced coagulation/ filtration	(i)	Advanced	Can treat a wide range of water qualities.

[1] National Research Council (NRC). Safe Water from Every Tap: Improving Water Service to Small Communities. National Academy Press. Washington, D.C. 1997.

[2] A POU, or "point-of-use" technology is a treatment device installed at a single tap used for the purpose of reducing contaminants in drinking water at that one tap. POU devices are typically installed at the kitchen tap. See the April 21, 2000 NODA for more details.

Limitations Footnotes: Technologies for Radionuclides:

[a] The regeneration solution contains high concentrations of the contaminant ions. Disposal options should be carefully considered before choosing this technology.

[b] When POU devices are used for compliance, programs for long-term operation, maintenance, and monitoring must be provided by water utility to ensure proper performance.

[c] Reject water disposal options should be carefully considered before choosing this technology. See other RO limitations described in the SWTR Compliance Technologies Table.

[d] The combination of variable source water quality and the complexity of the water chemistry involved may make this technology too complex for small surface water systems.

[e] Removal efficiencies can vary depending on water quality.

[f] This technology may be very limited in application to small systems. Since the process requires static mixing, detention basins, and filtration, it is most applicable to systems with sufficiently high sulfate

levels that already have a suitable filtration treatment train in place.

[g] This technology is most applicable to small systems that already have filtration in place.

[h] Handling of chemicals required during regeneration and pH adjustment may be too difficult for small systems without an adequately trained operator.

[i] Assumes modification to a coagulation/filtration process already in place.

TABLE D: COMPLIANCE TECHNOLOGIES BY SYSTEM SIZE CATEGORY FOR RADIONUCLIDES

Contaminant	Compliance technologies [1] for system size categories (population served)		
	25B500	501B3,300	3,300B10,000
1. Combined radium-226 and radium-228	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9
2. Gross alpha particle activity	3, 4	3, 4	3, 4
3. Beta particle activity and photon activity	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4
4. Uranium	1, 2, 4, 10, 11	1, 2, 3, 4, 5, 10, 11	1, 2, 3, 4, 5, 10, 11

Note: [1] Numbers correspond to those technologies found listed in the Table C above.

I. Monitoring Frequency and Compliance Requirements for Radionuclides in Community Water Systems.

(1) This section shall apply only to community water systems which serve at least fifteen (15) service connections used by year-round residents or systems which regularly serve at least twenty-five (25) year -round residents. Suppliers of water for applicable community water systems shall analyze for radionuclides to determine compliance with Section H above.

(2) The monitoring and compliance requirements for gross alpha particle activity, radium-226, radium-228, and uranium.

(a) Community water systems (CWSs) must conduct initial monitoring to determine compliance with Section H(2), (3) and (5) above by December 31, 2007. For the purposes of monitoring for gross alpha particle activity, radium-226, radium-228, uranium, and beta particle and photon radioactivity in drinking water, "detection limit" is defined as in Section K(3) below.

(i) Applicability and sampling location for existing community water systems or sources. All existing CWSs using ground water, surface water or systems using both ground and surface water (for the purpose of this section hereafter referred to as systems) must sample at every entry point to the distribution system that is representative of all sources being used (hereafter called a sampling point) under normal operating conditions. The system must take each sample at the same sampling point unless conditions make another sampling point more representative of each source or the Department has designated a distribution system location, in accordance with paragraph (2)(b)(ii)(C) of this section.

(ii) Applicability and sampling location for new community water systems or sources. All new CWSs or CWSs that use a new source of water must begin to conduct initial monitoring for the new source within the first quarter after initiating use of the source. CWSs must conduct more frequent monitoring when ordered by the Department in the event of possible contamination or when changes in the distribution system or treatment processes occur which may increase the concentration of radioactivity in finished water.

(b) Initial monitoring: Systems must conduct initial monitoring for gross alpha particle activity, radium-226, radium-228, and uranium as follows:

(i) Systems without acceptable historical data, as defined below, must collect four consecutive quarterly samples at all sampling points before December 31, 2007.

(ii) Grandfathering of data: The Department may allow historical monitoring data collected at a sampling point to satisfy the initial monitoring requirements for that sampling point, for the following situations:

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

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

(C) To satisfy initial monitoring requirements, a community water system with appropriate historical data for a representative point in the distribution system may use the monitoring data from the last compliance monitoring period that began between June 2000 and December 8, 2003, provided that the Department finds that the historical data satisfactorily demonstrate that each entry point to the distribution system is expected to be in compliance based upon the historical data and reasonable assumptions about the variability of contaminant levels between entry points. The Department must make a written finding indicating how the data conforms to these requirements.

(iii) For gross alpha particle activity, uranium, radium-226, and radium-228 monitoring, the Department may waive the final two quarters of initial monitoring for a sampling point if the results of the samples from the previous two (2) quarters are below the detection limit.

(iv) If the average of the initial monitoring results for a sampling point is above the MCL, the system must collect and analyze quarterly samples at that sampling point until the system has results from four (4) consecutive quarters that are at or below the MCL, unless the system enters into another schedule as part of a formal compliance agreement with the Department.

(c) Reduced monitoring: The Department may allow community water systems to reduce the future frequency of monitoring from once every three (3) years to once every six (6) or nine (9) years at each sampling point, based on the following criteria.

(i) If the average of the initial monitoring results for each contaminant (i.e., gross alpha particle activity, uranium, radium-226, or radium-228) is below the detection limit specified in Table B, in Section K(3)(a) below, the system must collect and analyze for that contaminant using at least one (1) sample at that sampling point every nine (9)years.

(ii) For gross alpha particle activity and uranium, if the average of the initial monitoring results for each contaminant is at or above the detection limit but at or below one-half (1/2) the MCL, the system must collect and analyze for that contaminant using at least one (1) sample at that sampling point every six (6) years. For combined radium-226 and radium-228, the analytical results must be combined. If the average of the combined initial monitoring results for radium-226 and radium-228 is at or above the detection limit but at or below one-half (1/2) the MCL, the system must collect and analyze for that contaminant using at least one (1) sample at that sampling point every six (6) years.

(iii) For gross alpha particle activity and uranium, if the average of the initial monitoring results for each contaminant is above one-half (1/2) the MCL but at or below the MCL, the system must collect and analyze at least one (1) sample at that sampling point every three (3) years. For combined radium-226 and radium-228, the analytical results must be combined. If the average of the combined initial monitoring results for radium-226 and radium-228 is above one-half (1/2) the MCL but at or below the MCL, the system must collect and analyze at least one (1) sample at that sampling point every three (3) years.

(iv) Systems must use the samples collected during the reduced monitoring period to determine the monitoring frequency for subsequent monitoring periods (e.g., if a system's sampling point is on a nine (9) year monitoring period, and the sample result is above one-half (1/2) MCL, then the next monitoring period for that sampling point is three (3) years).

(v) If a system has a monitoring result that exceeds the MCL while on reduced monitoring, the system must collect and analyze quarterly samples at that sampling point until the system has results from four (4) consecutive quarters that are below the MCL, unless the system enters into another schedule as part of a formal compliance agreement with the Department.

(d) Compositing: To fulfill quarterly monitoring requirements for gross alpha particle activity, radium-226, radium-228, or uranium, a system may composite up to four (4) consecutive quarterly samples from a single entry point if analysis is done within a year of the first sample. The Department will treat analytical results from the composited as the average analytical result to determine compliance with the MCLs and the future monitoring frequency. If the analytical result from the composited sample is greater than one-half (1/2) MCL, the Department may direct the system to take additional quarterly samples before allowing the system to sample under a reduced monitoring schedule.

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

the required uranium measurement provided that the measured gross alpha particle activity does not exceed 15 pCi/l.

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

(3) Monitoring and compliance requirements for beta particle and photon radioactivity.

To determine compliance with the maximum contaminant levels in paragraph (4) of this section for beta particle and photon radioactivity, a system must monitor at a frequency as follows:

(a) Community water systems (both surface and ground water) designated by the Department as vulnerable must sample for beta particle and photon radioactivity. Systems must collect quarterly samples for beta emitters and annual samples for tritium and strontium-90 at each entry point to the distribution system (hereafter called a sampling point), beginning within one quarter after being notified by the Department. Systems already designated by the Department must continue to sample until the Department reviews and either reaffirms or removes the designation.

(i) If the gross beta particle activity minus the naturally occurring potassium-40 beta particle activity at a sampling point has a running annual average (computed quarterly) less than or equal to 50 pCi/L (screening level), the Department may reduce the frequency of monitoring at that sampling point to once every three (3) years. Systems must collect all samples required in paragraph (2)(a) of this section during the reduced monitoring period.

(ii) For systems in the vicinity of a nuclear facility, the Department may allow the CWS to utilize environmental surveillance data collected by the nuclear facility in lieu of monitoring at the system's entry point(s), where the Department determines if such data is applicable to a particular water system. In the event that there is a release from a nuclear facility, systems which are using surveillance data must begin monitoring at the community water system's entry point(s) in accordance with paragraph (2)(a) of this section.

(b) Community water systems (both surface and ground water) designated by the Department as utilizing waters contaminated by effluents from nuclear facilities must sample for beta particle and photon radioactivity. Systems must collect quarterly samples for beta emitters and iodine-131 and annual samples for tritium and strontium-90 at each entry point to the distribution system (hereafter called a sampling point), beginning within one quarter after being notified by the Department. Systems already designated by the Department as systems using waters contaminated by effluents from nuclear facilities must continue to sample until the Department reviews and either reaffirms or removes the designation.

(i) Quarterly monitoring for gross beta particle activity shall be based on the analysis of monthly samples or the analysis of a composite of three monthly samples. The former is recommended.

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

(iii) Annual monitoring for strontium-90 and tritium shall be conducted by means of the analysis of a composite of four consecutive quarterly samples or analysis of four quarterly samples. The latter procedure is recommended.

(iv) If the gross beta particle activity beta minus the naturally occurring potassium-40 beta particle activity at a sampling point has a running annual average (computed quarterly) less than or equal to 15 pCi/L (screening level), the Department may reduce the frequency of monitoring at that sampling point to every three (3) years. Systems must collect all samples required in paragraph (2)(a) of this section during the reduced monitoring period.

(v) For systems in the vicinity of a nuclear facility, the Department may allow the CWS to utilize environmental surveillance data collected by the nuclear facility in lieu of monitoring at the system's entry point(s), where the Department determines if such data is applicable to a particular water system. In the event that there is a release from a nuclear facility, systems which are using surveillance data must begin monitoring at the community water system's entry point(s) in accordance with paragraph (2)(a) of this section.

(c) Community water systems designated by the Department to monitor for beta particle and photon radioactivity can not apply to the Department for a waiver from the monitoring frequencies specified in paragraph (2)(a) or (2)(b) of this section.

(d) Community water systems may analyze for naturally occurring potassium-40 beta particle activity from the same or equivalent sample used for the gross beta particle activity analysis. Systems are allowed to subtract the potassium-40 beta particle activity value from the total gross beta particle activity value to determine if the screening level is exceeded. The potassium-40 beta particle activity must be calculated by multiplying elemental potassium concentrations (in mg/L) by a factor of 0.82.

(e) If the gross beta particle activity minus the naturally occurring potassium-40 beta particle activity exceeds the appropriate screening level, an analysis of the sample must be performed to identify the major radioactive constituents present in the sample and the appropriate doses must be calculated and summed to determine compliance with Section H(4)(a) above , using the formula in Section H(4)(b) above. Doses must also be calculated and combined for measured levels of tritium and strontium to determine compliance.

(f) Systems must monitor monthly at the sampling point(s) which exceed the maximum contaminant level in R.61-58.5.H(4)(a), beginning the month after the exceedance occurs. Systems must continue monthly monitoring until the system has established, by a rolling average of three (3) monthly samples, that the MCL is being met. Systems who establish that the MCL is being met must return to quarterly monitoring until they meet the requirements set forth in paragraphs (3)(a)(i) or (3)(b)(iv) of this section.

(4) General monitoring and compliance requirements for radionuclides.

(a) The Department may require more frequent monitoring than specified R.61-58.5.I(1) or (2), or may require confirmation samples at its discretion. The results of the initial and confirmation samples will be averaged for use in compliance determinations.

(b) Each public water systems shall monitor at the time designated by the Department during each compliance period.

(c) Compliance: Compliance with Section H(2) through (5) above, will be determined based on the analytical result(s) obtained at each sampling point. If one (1) sampling point is in violation of an MCL, the system is in violation of the MCL.

(i) For systems monitoring more than once per year, compliance with the MCL is determined by a running annual average at each sampling point. If the average of any sampling point is greater than the MCL, then the system is out of compliance with the MCL.

(ii) For systems monitoring more than once per year, if any sample result will cause the running average to exceed the MCL at any sample point, the system is out of compliance with the MCL immediately.

(iii) Systems must include all samples taken and analyzed under the provisions of this section in determining compliance, even if that number is greater than the minimum required.

(iv) If a system does not collect all required samples when compliance is based on a running annual average of quarterly samples, compliance will be based on the running average of the samples collected.

(v) If a sample result is less than the detection limit, zero will be used to calculate the annual average, unless a gross alpha particle activity is being used in lieu of radium-226 and/or uranium. If the gross alpha particle activity result is less than detection, one-half (1/2) the detection limit will be used to calculate the annual average.

(d) The Department has the discretion to delete results of obvious sampling or analytic errors.

(e) If the MCL for radioactivity set forth in Section H(2) through (5) above, is exceeded, the operator of a community water system must give notice to the Department pursuant to R.61-58.6.

J. Maximum Contaminant Level Goals for Radionuclides.

MCLGs for radionuclides are as indicated in the following table:

Contaminant	MCLG
1. Combined radium-226 and radium-228	Zero.
2. Gross alpha particle activity (excluding radon and uranium)	Zero.
3. Beta particle and photon radioactivity	Zero.
4. Uranium	Zero.

K. Analytical Methods for Radionuclides.

(1) Analysis for the following contaminants shall be conducted to determine compliance with Section H above, (radioactivity) in accordance with the methods adopted by the Department.

(2) For the purpose of monitoring radioactivity concentrations in drinking water, the required sensitivity of the radio-analysis is defined in terms of detection limit. The detection limit shall be that concentration which can be counted with a precision of plus or minus one hundred percent at the ninety-five percent confidence level (1.96 sigma where sigma is the standard deviation of the net counting rate of the sample). To determine compliance with Sections H and J above, the detection limits shall not exceed those set form by the Administrator.

(3) To judge compliance with the maximum contaminant levels listed in Sections H and J above, averages of data shall be used and shall be round to the same number of significant figures as the maximum contaminant level for the substance in question.

(a) To determine compliance with Section H(2), (3), and (5), above the detection limit shall not exceed the concentrations in Table B to this paragraph.

TABLE B DETECTION LIMITS FOR GROSS ALPHA PARTICLE ACTIVITY, RADIUM 226, RATIUM 228, AND URANIUM

Contaminant	Detection limit
Gross alpha particle activity	3 pCi/L.
Radium 226	1 pCi/L.
Radium 228	1 pCi/L.
Uranium	I microgram/L

(b) To determine compliance with Section H(4) above, the detection limits shall not exceed the concentrations listed in Table C to this paragraph.

TABLE C: DETECTION LIMITS FOR MAN-MADE BETA PARTICLES AND PHOTON EMITTERS

Contaminant	Detection limit
Tritium	1,000 pCi/l
Strontium-89	10 pCi/l
Strontium - 90	2 pCi/l
Iodine-131	1 pCi/l
Cesium-134	10 pCi/l
Gross Beta	4 pCi/l
Other radionuclides	1/10 of the applicable limit

(4) To judge compliance with the maximum contaminant levels listed in Section H above, 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.

L. [Reserved]

M. [Reserved]

N. Maximum Contaminant Levels for Volatile Synthetic Organic Chemicals (VOCs).

(1) The maximum contaminant levels for volatile synthetic organic chemicals (VOCs) apply to all public water systems.

(2) The maximum contaminant levels for volatile synthetic organic chemicals (VOCs) are as follows:

	Contaminant	MCL (mg/L)
(a)	Vinyl chloride	0.002
(b)	Benzene	0.005
(c)	Carbon tetrachloride	0.005
(d)	1,2-Dichloroethane	0.005
(e)	Trichloroethylene	0.005
(f)	para-Dichlorobenzene	0.075
(g)	1,1,-Dichloroethylene	0.007
(h)	1,1,1-Trichloroethane	0.2
(i)	cis-1,2-Dichloroethylene	0.07
(j)	1,2-Dichloropropane	0.005
(k)	Ethylbenzene	0.7
(l)	Monochlorobenzene	0.1
(m)	o-Dichlorobenzene	0.6
(n)	Styrene	0.1
(o)	Tetrachloroethylene	0.005
(p)	Toluene	1
(q)	trans-1,2-Dichloroethylene	0.1
(r)	Xylenes (total)	10
(s)	Dichloromethane	0.005
(t)	1,2,4-Trichlorobenzene	0.07
(u)	1,1,2-Trichloroethane	0.005

O. VOC Monitoring, Sampling and Analytical Requirements.

(1) This section shall apply to community and non-transient non-community water systems.

(2) Beginning with the initial compliance period analysis of the contaminants listed in Section N(2) above, for the purpose of determining compliance with the maximum contaminant level shall be conducted as follows:

(a) Groundwater systems shall take a minimum of one (1) sample at every entry point to the distribution system which is representative of each well after treatment (hereafter called a sampling point). Each sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

(b) Surface water systems (or combined surface/ground) shall take a minimum of one (1) sample at points in the distribution system that are representative of each source or at each entry point to the distribution system after treatment (hereafter called a sampling point). Each sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source, treatment plant, or within the distribution system.

(c) If the system draws water from more than one (1) source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water representative of all sources is being used).

(d) Each community and non-transient non-community water system shall take four consecutive quarterly samples for each contaminant listed in Section N(2)(b) through (u) above, during each compliance period beginning in the initial compliance period.

(e) If the initial monitoring for contaminants listed in Section N(2)(a) through (h) and the monitoring for the contaminants listed in Section N(2)(i) through (u) as allowed in paragraph (2)(r) of this section, has been completed by December 31, 1992, and the system did not detect any contaminant listed in Section N(2) above, then each ground and surface water system shall take one (1) sample annually beginning with the initial compliance period.

(f) After a minimum of three (3) years of annual sampling, the Department may allow groundwater systems with no previous detection of any contaminant listed in Section N(2) above, to take one (1) sample during each compliance period.

(g) Each community and non-transient non-community ground water system which does not detect a contaminant listed in Section N(2) above, may apply to the Department for a waiver from the requirement of paragraphs (4)(e) and (4)(f) of this section after completing the initial monitoring. (For the purposes of this section, detection is defined as 0.0005 mg/L.) A waiver shall be effective for no more than six (6) years (two compliance periods). The Department may also issue waivers to small systems for the initial round of monitoring for 1,2,4-trichlorobenzene.

(h) The Department may grant a waiver after evaluating the following factor(s):

(i) Knowledge of previous use (including transport, storage, or disposal) of the contaminant within the watershed or zone of influence of the system. If a

determination by the Department reveals no previous use of the contaminant within the watershed or zone of influence, a waiver may be granted.

(ii) If previous use of the contaminant is unknown or it has been used previously, then the following factors shall be used to determine whether a waiver is granted.

(A) Previous analytical results.

(B) The proximity of the system to a potential point or non-point source of contamination. Point sources include spills and leaks of chemicals at or near a water treatment facility or at manufacturing, distribution, or storage facilities, or from hazardous and municipal waste landfills and other waste handling or treatment facilities.

(C) The environmental persistence and transport of the contaminants.

(D) The number of persons served by the public water system and the proximity of a smaller system to a larger system.

(E) How well the water source is protected against contamination such as whether it is a surface or groundwater system. Groundwater systems must consider factors such as depth of the well, the type of soil, and wellhead protection. Surface water systems must consider watershed protection.

(i) As a condition of the waiver a groundwater system must take one (1) sample at each sampling point during the time the waiver is effective (i.e., one sample during two compliance periods or six years) and update its vulnerability assessment considering the factors listed in paragraph (2)(h) of this section. Based on this vulnerability assessment the Department must reconfirm that the system is non-vulnerable. If the Department does not make this reconfirmation within three (3) years of the initial determination, then the waiver is invalidated and the system is required to sample annually as specified in paragraph (e) of this section.

(j) Each community and non-transient non-community surface water system which does not detect a contaminant listed in Section N(2) above may apply to the Department for a waiver from the requirements of paragraph (4)(e) of this section after completing the initial monitoring. Composite samples from a maximum of five sampling points are allowed, provided that the detection limit of the method used for analysis is less than one-fifth of the MCL. Systems meeting this criteria must be determined by the Department to be non-vulnerable based upon a vulnerability assessment during each compliance period. Each system receiving a waiver shall sample at the frequency specified by the Department (if any).

(k) If a contaminant listed in Section N (2)(b) through (u) above, is detected at a level exceeding 0.0005 mg/L in any sample, then:

(l) Systems which violate the requirements of Section N(2) above, as determined by paragraph (2)(o) of this section must monitor quarterly. After a minimum of four (4) consecutive quarterly samples which shows the system is in compliance as specified in paragraph (2)(o) of this section, the system and the Department determines that the

system is reliably and consistently below the maximum contaminant level, the system may monitor at the frequency and time specified in paragraph (4)(k)(iii) of this section.

(m) The Department may require a confirmation sample for positive or negative results. If a confirmation sample is required by the Department, the result must be averaged with the first sampling result and the average is used for the compliance determination as specified by paragraph (2)(o) of this section. The Department has the discretion to delete results of obvious sampling errors from this calculation.

(n) The Department may reduce the total number of samples a system must analyze by allowing the use of compositing. Composite samples from a maximum of five sampling points are allowed, provided that the detection limit of the method used for analysis is less than one-fifth of the MCL. Compositing of samples must be done in the laboratory and analyzed within fourteen (14) days of sample collection.

(i) If the concentration in the composite sample is 0.0005 mg/L for any contaminant listed in Section N(2) above, then a follow-up sample must be taken within fourteen (14) days at each sampling point included in the composite, and be analyzed for that contaminant.

(ii) If duplicates of the original sample taken from each sampling point used in the composite are available, the system may use these instead of resampling. The duplicate must be analyzed and the results reported to the Department within fourteen (14) days of collection.

(iii) If the population served by the system is greater than 3,300 persons, then compositing may only be permitted by the State at sampling points within a single system. In systems serving 3,300 persons, the Department may permit compositing among different systems provided the 5-sample limit is maintained.

(iv) Compositing samples prior to GC analysis.

(A) Add 5 ml or equal larger amounts of each sample (up to 5 samples are allowed) to a 25 ml glass syringe. Special precautions must be made to maintain zero headspace in the syringe.

(B) The samples must be cooled at 4°C during this step to minimize volatilization losses.

(C) Mix well and draw out a 5-ml aliquot for analysis.

(D) Follow sample introduction, purging, and desorption steps described in the method.

(E) If less than five samples are used for compositing, a proportionately small syringe may be used.

(v) Compositing samples prior to GC/MS analysis.

(A) Inject 5-ml or equal larger amounts of each aqueous sample (up to 5 samples are allowed) into a 25-ml purging device using the sample introduction technique described in the method.

(B) The total volume of the sample in the purging device must be 25 ml.

(C) Purge and desorb as described in the method.

(o) Compliance with Section N(2) above, shall be determined based on the analytical results obtained at each sampling point. If one sampling point is in violation of an MCL, the system is in violation of the MCL.

(i) For systems monitoring more than once per year, compliance with the MCL is determined by a running annual average at each sampling point.

(ii) Systems monitoring annually or less frequently whose sample result exceeds the MCL must begin quarterly sampling. The system will not be considered in violation of the MCL until it has completed one year of quarterly sampling.

(iii) If any sample result will cause the running annual average to exceed the MCL at any sampling point, the system is out of compliance with the MCL immediately.

(iv) If a system fails to collect the required number of samples, compliance will be based on the total number of samples collected.

(v) If a sample result is less than the detection limit, zero will be used to calculate the annual average.

(p) Analysis for the contaminants listed in Section N(2) above, shall be conducted using EPA-approved methods listed in 40 CFR 141.

(q) Analysis under this section shall only be conducted by laboratories that are certified by the Department.

(r) The Department may allow the use of monitoring data collected after January 1, 1988, for purposes of initial monitoring compliance. If the data are generally consistent with the other requirements in this section, the Department may use those data (i.e., a single sample rather than four quarterly samples) to satisfy the initial monitoring requirement of paragraph (2)(d) of this section. Systems which use grandfathered samples and did not detect any contaminant listed in Section N(2)(b) through (u) above shall begin monitoring annually in accordance with paragraph (2)(e) of this section beginning with the initial compliance period.

(s) The Department may increase required monitoring where necessary to detect variations within the system.

(t) Each public water system shall monitor at the time designated by the Department within each compliance period.

(u) All new systems or systems that use a new source of water that begin operation after January 22, 2004 must demonstrate compliance with the MCL within a period of time specified by the Department. The system must also comply with the initial sampling frequencies specified by the Department to ensure a system can demonstrate compliance with the MCL. Routine and increased monitoring frequencies shall be conducted in

accordance with the requirements in this section.

(3) If a community or a non-transient non-community water system fails to comply with an applicable VOC MCL, that system shall give notice to the customers served by the system in accordance with the requirements of R.61-58.6.E.

P. Maximum Contaminant Levels for Disinfection Byproducts.

(1) Bromate and Chlorite

The maximum contaminant levels (MCLs) for bromate and chlorite are as follows:

Disinfection Byproduct	MCL (mg/L)
Bromate	0.010
Chlorite	1.0

(a) Compliance Dates. Community water systems and non-transient non-community water systems that use a surface water source or a ground water source under the influence of surface water serving 10,000 or more persons must comply with this section beginning January 1, 2002. Community water systems and non-community non-transient water systems that use a surface water source or a ground water source under the influence of surface water serving fewer than 10,000 persons and community water systems and non-community non-transient water systems using only ground water not under the direct influence of surface water must comply with this section beginning January 1, 2004.

(b) Best technology, treatment techniques, or other means available for achieving compliance with the maximum contaminant levels for bromate and chlorite identified in this section are specified in 40 CFR 141.64 (a)(2) (1-04-06 edition).

(2) TTHM and HAA5.

(a) Stage 1 DBP Rule Running Annual Average (RAA) compliance.

The maximum contaminant levels (MCLs) for TTHM and HAA5 are as follows:

Disinfection Byproduct	MCL (mg/L)
Total Trihalomethanes (TTHM)	0.080
Haloacetic Acids (five) (HAA5)	0.060

(i) Compliance dates. Subpart H systems serving 10,000 or more persons must comply with this paragraph (2)(a) beginning January 1, 2002. Subpart H systems serving fewer than 10,000 persons and systems using only ground water not under the direct influence of surface water must comply with this paragraph (2)(a) beginning January 1, 2004. All systems must comply with these MCLs until the date specified for Stage 2 DBP Rule compliance in R.61-58.15.B(2).

(ii) Best technology, treatment techniques, or other means available for achieving compliance with the maximum contaminant levels for TTHM and HAA5 identified in this section are specified in 40 CFR 141.64 (b)(1)(ii) (1-04-06 edition).

(b) Stage 2 DBP Rule Locational Running Annual Average (LRAA) compliance.

The maximum contaminant levels (MCLs) for TTHM and HAA5 are as follows:

Disinfection Byproduct	MCL (mg/L)
Total Trihalomethanes (TTHM)	0.080
Haloacetic Acids (five) (HAA5)	0.060

(i) Compliance dates. The MCLs for TTHM and HAA5 must be complied with as a locational running annual average at each monitoring location beginning the date specified in R.61-58.15.B(2).

(ii) Best technology, treatment techniques, or other means available for achieving compliance with the maximum contaminant levels for TTHM and HAA5 identified in this section are specified in 40 CFR 141.64 (b)(2)(ii), and 40 CFR 141.64 (b)(2)(iii) (1-04-06 edition).

Q. Maximum Residual Disinfectant Levels (MRDLs) for Disinfectants.

(1) Maximum residual disinfectant levels (MRDLs) are as follows:

Disinfectant Residual	MRDL (mg/L)
Chlorine	4.0 (as Cl_2)
Chloramines	4.0 (as Cl_2)
Chlorine dioxide	0.8 (as ClO_2)

(2) Compliance dates.

(a) Community water systems and non-transient non-community water systems that use a surface water source or a ground water source under the influence of surface water serving 10,000 or more persons must comply with this section beginning January 1, 2002. Community water systems and non-community non-transient water systems that use a surface water source or a ground water source under the influence of surface water serving fewer than 10,000 persons and community water systems and non-community non-transient water systems using only ground water not under the direct influence of surface water must comply with this section beginning January 1, 2004.

(b) Transient non-community water systems that use a surface water source or a ground water source under the influence of surface water serving 10,000 or more persons and using chlorine dioxide as a disinfectant or oxidant must comply with the chlorine dioxide MRDL beginning January 1, 2002. Transient non-community water systems that use a surface water source or a ground water source under the influence of surface water systems serving fewer than 10,000 persons and using chlorine dioxide as a disinfectant or oxidant and transient non-community water systems using only ground water not under the direct influence of surface water and using chlorine dioxide as a disinfectant or oxidant must comply with the chlorine dioxide MRDL beginning January 1, 2004.

R. Secondary Maximum Contaminant Levels.

(1) The secondary maximum contaminant levels are applicable to all public water systems.

(2) The secondary maximum contaminant levels are as follows:

Contaminant	Level
Aluminum	0.05 to 0.2 mg/L
Chloride	250 mg/L
Color	15 color units
Copper	1 mg/L
Corrosivity	Noncorrosive
Fluoride	2.0 mg/L
Foaming agents	0.5 mg/L
Iron	0.3 mg/L
Manganese	0.05 mg/L
Odor	3 threshold odor number
pH	6.5 to 8.5 s.u.
Silver	0.1 mg/L
Sulfate	250 mg/L
Total Dissolved Solids (TDS)	500 mg/L
Zinc	5 mg/L

(3) The Department may establish higher or lower levels which may be appropriate depending upon local conditions provided the supplier of water is able to demonstrate that use of the water will not adversely affect the public health and welfare. In evaluating the affect to the public health and welfare, the supplier of water may evaluate the unavailability of alternate water sources; the economic evaluation of necessary treatment or other compelling factors that may prevent compliance.

(4) Community water systems that exceed the secondary MCL for fluoride, as determined by the last single sample taken in accordance with the requirements of these regulations, shall send the notice described in paragraph (5) of this section, to: (1) all existing billing units, (2) all new billing units at the time service begins, and (3) the Department.

(5) The public notice that shall be used by systems which exceed the secondary MCL for fluoride shall contain the specific language outlined in R.61-58.6.E(8), and no additional language except as necessary to complete the notice.

S. Secondary Maximum Contaminant Levels Sampling and Analytical Requirements.

(1) This section shall apply only to community and non-community water systems which serve at least fifteen service connections or regularly serve an average of at least twenty-five individuals daily at least sixty (60) days out of the year.

(2) At the discretion of the Department any community or non-community water system may be required to monitor, in whole or in part, for secondary maximum contaminant levels listed in Section R(2) or for any other secondary standard designated by the Department.

(3) For the initial analyses required by paragraph (2) of this section, data for surface waters acquired within one (1) year prior to the effective date and data for groundwaters acquired within three (3) years prior to the effective date of this regulation may be substituted at the discretion of the Department. Analyses conducted to determine compliance with Section R above shall be made using EPA-approved methods listed in 40 CFR 141.

T. Special Monitoring for Inorganic and Organic Contaminants.

(1) All community and non-transient non-community water supply systems shall conduct special monitoring for the following contaminants. Systems serving 10,000 or fewer persons are not required to monitor for the contaminants in the section after December 31, 1998.

Chloroform	1,3-Dichloropropane
Bromodichloromethane	Chloromethane
Chlorodibromomethane	Bromomethane
Bromoform	1,2,3-Trichloropropane
Chlorobenzene	1,1,1,2-Tetrachloroethane
m-Dichlorobenzene	Chloroethane
2,2-Dichloropropane	1,1-Dichloropropene
o-Chlorotoluene	1,1-Dichloroethane
Bromobenzene	1,1,2,2-Tetrachloroethane
1,3-Dichloropropene	p-Chlorotoluene

(2) Monitoring for the organic compounds listed in paragraph (1) of this section, shall begin no later than the date specified below:

Population Served	Initial Monitoring Date
>10,000	No later than January 1, 1988
3,300 - 10,000	No later than January 1, 1989
<3,300	No later than January 1, 1991

(3) Surface water systems shall sample at points in the distribution system representative of each water source or at entry points to the distribution system after any application of treatment. The minimum number of samples is one year of quarterly samples per water source.

(4) Ground water systems shall sample at points of entry to the distribution system representative of each well after any application of treatment. The minimum number of samples is one (1) sample per entry point to the distribution system.

(5) The Department may require confirmation samples for positive or negative results.

(6) (Reserved)

(7) Analysis under this section shall be conducted using EPA-approved methods listed in 40 CFR 141.

(8) Analysis under this section shall only be performed by laboratories which are certified by the Department.

(9) Public water systems may use monitoring data collected any time after January 1, 1983, to meet the requirements of paragraph (1) of this section, provided that the monitoring program was consistent with the requirements of this section. In addition, the results of EPA's Ground Water Supply Survey may be used in a similar manner for systems supplied by a single well.

(10) At the Department's discretion, community water systems and non-transient non-community water systems may be required to conduct special monitoring for the following contaminants:

1,2,4-Trimethylbenzene	p-Isopropyltoluene
1,2,4-Trichlorobenzene	Isopropylbenzene
1,2,3-Trichlorobenzene	Tert-butylbenzene
n-Propylbenzene	Sec-butylbenzene
n-Butylbenzene	Fluorotrichloromethane
Naphthalene	Dichlorodifluoromethane
Hexachlorobutadiene	Bromochloromethane
1,3,5-Trimethylbenzene	

(11) All community and non-transient non-community water systems shall repeat the monitoring required by this Section no less frequently than every five (5) years from the dates specified in paragraph (2) of this section.

(12) The Department or public water systems may composite up to five samples when monitoring for the organic contaminants in paragraphs (1) and (10) of this section.

(13) Monitoring of the contaminants listed in paragraphs (13)(k) and (l) of this section, shall be conducted as follows:

(a) Each community and non-transient, non-community water system shall take four consecutive quarterly samples at each sampling point for each contaminant listed in paragraph (13)(k) of this section and report the results to the Department. Monitoring must be completed by December 31, 1995.

(b) Each community and non-transient non-community water system shall take one sample at each sampling point for each contaminant listed in paragraph (13)(l) of this section and report the results to the Department. Monitoring must be completed by December 31, 1995.

(c) Each community and non-transient non-community water system may apply to the Department for a waiver from the requirements of paragraph (13)(a) and (b) of this section.

(d) The Department may grant a waiver for the requirement of paragraph (13)(a) of this section based on the criteria specified in Section E(7)(f) above. The Department may grant a waiver from the requirement of paragraph (13)(b) of this section if previous analytical results indicate contamination would not occur, provided this data was collected after January 1, 1990.

(e) Groundwater systems shall take a minimum of one (1) sample at every entry point to the distribution system which is representative of each well after treatment (hereafter called a sampling point). Each sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

(f) Surface water systems shall take a minimum of one (1) sample at points in the distribution system that are representative of each source or at each entry point to the distribution system after treatment (hereafter called a sampling point). Each sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant. [Note: For purposes of this paragraph, surface water systems include systems with a combination of surface and ground sources.]

(g) If the system draws water from more than one (1) source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water representative of all sources is being used).

(h) The Department may require a confirmation sample for positive or negative results.

(i) The Department may reduce the total number of samples a system must analyze by allowing the use of compositing. Composite samples from a maximum of five (5) sampling points are allowed. Compositing of samples must be done in the laboratory and the composite sample must be analyzed within fourteen (14) days of collection. If the population served by the system is greater than3,300 persons, then compositing may only be permitted by the Department at sampling points within a single system. In systems serving 3,300 persons or less, the Department may permit compositing among different systems provided the 5-sample limit is maintained.

(j) Instead of performing the monitoring required by this section, a community water system or non-transient non-community water system serving fewer than 150 service connections may send a letter to the Department stating that the system is available for sampling. This letter must be sent to the Department by January 1, 1994. The system shall not send such samples to the Department, unless requested to do so by the Department.

(k) List of Unregulated Organic Contaminants:

Organic Contaminants	EPA Analytical Method
Aldicarb	531.1
Aldicarb sulfone	531.1
Aldicarb sulfoxide	531.1
Aldrin	505, 508, 525.1
Butachlor	507, 525.1
Carbaryl	531.1
Dicamba	515.1
Dieldrin	505, 508, 525.1
3-Hydroxycarbofuran	531.1
Methomyl	531.1
Metolachlor	507, 525.1
Metribuzin	507, 525.1
Propachlor	508, 525.1

(l) List of Unregulated Inorganic Contaminants:

Inorganic Contaminant	EPA Analytical Method
Sulfate	Colorimetric

(14) The owner or operator of a community or non-transient non-community water system that is required to monitor in accordance with this section shall send a copy of the results of such monitoring within thirty (30) days of receipt, and a copy of any public notice under paragraph (15) of this section, to the Department.

(15) The owner or operator shall notify the persons served by the system of the availability of the results of sampling conducted in accordance with this section by including a notice in the first set of water bills issued by the system after the receipt of the results or written notice within three (3) months. The notice shall identify a person and supply the telephone number to contact for information on the monitoring results. For surface water systems, public notification is required only after the first quarter's monitoring and must include a statement that additional monitoring will be conducted for three (3) more quarters with the results available upon request.

U. Special Monitoring for Sodium.

(1) Suppliers of water for community public water systems shall collect and analyze one (1) sample per plant at the entry point of the distribution system for the determination of sodium concentration levels; samples must be collected and analyzed annually for systems utilizing surface water sources in whole or in part, and at least every three (3) years for systems utilizing solely ground water sources. 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 may, with the Department's approval, be considered one (1) treatment plant for determining the minimum number of samples. The supplier of water may be required by the Department to collect and analyze water samples for sodium more frequently in locations where the sodium content is variable.

(2) The supplier of water shall report to the Department the results of the analyses for sodium within the first ten (10) days of the month following the month in which the sample results were received or within the first ten (10) days following the end of the required monitoring period as stipulated by the Department, whichever of these is first. If more than annual sampling is required the supplier shall report the average sodium concentration within ten (10) days of the month following the month in which the analytical results of the last sample used for the annual average was received.

(3) The supplier of water shall notify the appropriate local public health officials of the sodium levels in the water by written notice by direct mail within three (3) months after receiving the results of analyses. Within ten (10) days after notifying the local public health officials, the supplier of water shall forward a copy of such written notice to the Department. The supplier of water is not required to notify local public health officials where the Department provides such notices.

(4) Analysis for sodium shall be conducted using EPA-approved methods listed in 40 CFR 141.

V. Special Monitoring for Corrosivity Characteristics.

(1)-(3)[Reserved]

(4) The supplier of water for applicable community water systems shall identify and report to the Department whether the following construction materials are present in their distribution system:

(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) Vinyl lined asbestos cement pipe.

(f) Coal tar lined pipes and tanks.

(g) Asbestos cement pipe.

W. Special Monitoring and Notification Requirements.

The Department shall perform such monitoring as is necessary to insure the quality and integrity of results of tests, measurements, or analyses reported by the supplier of water. Should such monitoring by the Department indicate a violation of the maximum contaminant levels, or the presence of any contaminant at levels considered to be a real or potential threat to the public's health, the Department at its discretion may notify the public or require the supplier of water to notify the public pursuant to R.61-58.6.E, or other method deemed appropriate by the Department and initiate the necessary action to eliminate the violation or contaminant.

X. Monitoring of Consecutive Public Water Systems.

When a public water system supplies water to one or more other public water systems, the Department may modify the monitoring requirements imposed by this regulation to the extent that the interconnection of the systems justifies treating them as a single system for monitoring purposes. Any modified monitoring shall be conducted pursuant to a schedule specified by the Department and concurred in by the Administrator.

Y. Criteria and Procedures for Public Water Systems using Point-of-Entry Devices.

(1) Public water systems may use point-of-entry devices to comply with maximum contaminant levels only if they meet the requirements of this section.

(2) It is the responsibility of the public water system to operate and maintain the point-of-entry treatment system.

(3) The public water system must develop and obtain Department approval for a monitoring plan before point-of-entry devices are installed for compliance. Under the plan approved by the Department, point-of-entry devices must provide health protection equivalent to central water treatment. "Equivalent" means that the water would meet all State primary drinking water regulations and would be of acceptable quality similar to water distributed by a well-operated central treatment plant. In addition to the VOCs, monitoring must include physical measurements and observations such as total flow treated and mechanical condition of the treatment equipment.

(4) The public water system must properly apply effective technology under a plan approved by the Department and must maintain the microbiological safety of the water.

(a) The public water system must provide adequate certification of performance, field testing, and, if not included in the certification process, a rigorous engineering design review of the point-of-entry devices.

(b) The design and application of the point-of-entry devices must consider the tendency for an increase in heterotrophic bacteria concentrations in water treated with activated carbon. It may be necessary to use frequent backwashing, post-contactor disinfection, and Heterotrophic Plate Count monitoring to ensure that the microbiological safety of the water is not compromised.

(5) The public water system must protect all consumers. Every building connected to the

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

Z. Use of Other Non-Centralized Treatment Devices.

Public water systems shall not use bottled water or point-of-use devices to achieve compliance with an established maximum contaminant level. Bottled water or point-of-use devices may be used on a temporary basis to avoid an unreasonable risk to health.

AA. Treatment Techniques.

(1) This section establishes criteria and requirements for treatment techniques in lieu of maximum contaminant levels for specified contaminants. This section applies to all public water systems.

(2) Treatment techniques for acrylamide and epichlorohydrin. Each public water system must certify annually in writing to the Department (using third party or manufacturer's certification) that when acrylamide and epichlorohydrin are used in drinking water systems, the combination (or product) of dose and monomer level does not exceed the levels specified as follows:

Acrylamide	=	0.05% dosed at 1 ppm (or equivalent)
Epichlorohydrin	=	0.01% dosed at 20 ppm (or equivalent)

Certifications can rely on manufacturers or third parties, as approved by the Department.

BB. Approved Laboratories.

For the purpose of determining compliance with R.61-58.5.B through R.61-58.5.V, R.61-58.5.CC, R.61-58.10.F, R.61-58.11.D, and R.61-58.16.E, samples may be considered only if they have been analyzed by a laboratory approved by the Department, except that measurements for turbidity may be performed by a properly certified water treatment plant operator.

CC. Alternative Analytical Techniques.

With express written permission of the Department, concurred in by the Administrator, 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 this regulation.

R.61-58.6 REPORTS, RECORD RETENTION AND PUBLIC NOTIFICATION OF DRINKING WATER VIOLATIONS

A. Applicability.

This regulation specifies the information public water supplies are required to report to the Department; the information they are required to retain; and the conditions and procedure for making public notification of a violation. This regulation shall apply to each public water system, unless the public water system meets all of the following conditions:

(1) Consists only of distribution and storage facilities (and does not have any collection and treatment facilities);

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

(3) Does not sell water to any person; and

(4) Is not a carrier which conveys passengers in interstate commerce.

B. Reporting Requirements.

(1) Except where a shorter reporting period is specified in this regulation, the supplier of water shall report to the Department the results of any test, measurement or analysis required to be made by the primary drinking water regulation within ten calendar days following the end of the month in which the result is received or within ten calendar days following the end of the monitoring period specified by the Department, whichever of these is shortest. Such report shall be in form established by the Department.

(2) If the result of an analysis made pursuant to the requirements of R.61-58.5, Maximum Contaminant Levels in Drinking Water, indicates that the level of any contaminant listed in said regulation exceeds the maximum contaminant level, the supplier of water shall report these findings to the Department within seven days of receiving the results.

(3) Except where a different reporting period is specified in these regulations, the supplier of water shall report to the Department within 48 hours the failure to comply with any national primary drinking water regulations (including failure to comply with monitoring requirements) as set forth in these regulations.

(4) The supplier of water is not required to report analytical results to the Department in cases where a State Laboratory performs the analysis and reports the results to the Department.

(5) The public water system, within ten (10) days of completing the public notification requirements under Section E below for the initial public notice and any repeat notices, must submit to the Department a certification that it has fully complied with the public notification regulations. The public water system must include with this certification a representative copy of each type of notice distributed, published, posted, and made available to the persons served by the system and to the media.

(6) The public water system shall submit to the Department, when requested, within the time stated in the request, copies of any records required to be maintained under R.61-58.6.D or copies of any documents then in existence which the Department or the EPA Administrator is entitled to inspect pursuant to the authority of section 1445 of the Safe Drinking Water Act or the equivalent provisions of State law.

C. Reports To Be Submitted.

All reports listed below are to be on a form or in a format (written or electronic) approved by the Department.

(1) By the tenth calendar day of each month, the supplier of water for each surface water treatment plant shall complete and submit to the Department, as a minimum, the following reports for the previous month:

(a) Surface Water Supply Monthly Operation Report

(b) Bacteriological Summary Analysis Report

(c) Turbidity Summary Analysis Report

(2) By the tenth calendar day of each month, the supplier of water, who operates a groundwater treatment plant that provides water to a community water system serving at least fifteen service connections or twenty-five individuals on a continuous basis, shall complete and submit to the Department, as a minimum, the following reports for the previous month:

(a) Ground Water Supply Monthly Operation Report

(b) Bacteriological Summary Analysis Report (if eight or more bacteriological samples are collected each month)

(3) By the tenth calendar day of each month, the supplier of water, who uses wells as a sole source of supply for a community water system serving at least fifteen service connections or twenty-five individuals on a continuous basis, and does not treat the water, shall complete and submit to the Department, as a minimum, the following reports for the previous month:

(a) Bacteriological Summary Analysis Report (if eight or more bacteriological samples are collected each month)

(b) Bacteriological Analysis Report (if seven or less bacteriological samples are collected each month)

(c) The total amount of water pumped from the wells each month and the total volume of water delivered to the customers each month, if the information is available

(4) By the tenth calendar day of each month, the supplier of water, who obtains water from another public water supply and provides it to a community water system serving at least fifteen service connections or twenty-five individuals on a continuous basis, shall complete and submit to the Department, as a minimum, the following reports for the previous month:

(a) Bacteriological Summary Analysis Report (if eight or more bacteriological samples are collected each month)

(b) Bacteriological Analysis Report (if seven or less bacteriological samples are collected each month)

(c) The total amount of water purchased each month and the total amount of water delivered to the customers each month, where required by the Department

(5) By the tenth calendar day of each month, the supplier of water, who operates a groundwater treatment plant using treatment processes other than the addition of chlorine or corrosion inhibitor or the adjustment of pH, and which provides water to a non-community water system serving at least fifteen service connections or an average of at least twenty-five individuals daily at least sixty days out of the year, shall complete and submit to the Department, as a minimum, the following reports for the previous month:

(a) Ground Water Supply Monthly Operation Report

(b) Bacteriological Summary Analysis Report (if eight or more bacteriological samples are collected each month)

(c) Bacteriological Analysis Report (if seven or less bacteriological samples are collected each month)

(6) Based on complaints received, the results of chemical, or bacteriological testing or the findings of sanitary surveys, the Department may require the supplier of water for any community or non-community water system not described in subsections (1) through (5) above to submit any necessary reports or monitoring data at a frequency established by the Department.

(7) If a water level measuring device has been installed in a well serving a public water supply, the supplier of water shall measure and record the static and pumping water levels on a quarterly basis. The results shall be forwarded to the Department by the tenth calendar day of the following month.

(8) The supplier of water for a community water system that serves more than one hundred service connections shall monitor the operating pressure in the distribution system annually and shall record the date and location where each pressure test was made and the pressure in pounds per square inch. A copy of the results shall be made available to the Department upon request. Records of these results shall be maintained for a period not less than three years.

(9) In the event the Department finds it necessary to require a supplier of water to monitor for chemical parameters on a schedule more stringent than required for routine monitoring, the supplier of water shall submit the monitoring data by the tenth calendar day of the month following the month in which the data was received.

D. Record Keeping.

(1) Any supplier of water subject to the provisions of this regulation and R.61-58.5, Maximum Contaminant Levels in Drinking Water, shall retain on the premises at a convenient location near the premises all appropriate records, and make them available for inspection by the Department and the public upon request.

(2) These records shall include the following:

(a) Records of microbiological analyses and turbidity analyses made pursuant to the State Primary Drinking Water Regulation: R.61-58 shall be kept for not less than five (5) years. Records of chemical analyses made pursuant to the State Primary Drinking Water Regulation: R.61-58 shall be kept for not less than ten years. Actual laboratory reports may be kept, or data may be transferred to tabular summaries, provided that the following information is included:

(i) The date, place, and time of sampling, and the name of the person who

collected the sample.

(ii) 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.

(iii) Date of analysis.

(iv) Laboratory and person responsible for performing analysis.

(v) The analytical technique or method used.

(vi) The results of the analysis.

(b) Records of action taken by the supplier of water to correct violation of regulations, shall be kept for a period not less than three years after the last action with respect to the particular violation involved.

(c) Copies of any written reports, summaries, or communications relating to sanitary surveys or operational inspections of the public water supply conducted by the supplier of water, by a private consultant, or by any local, state, or federal agency, shall be kept for a period not less than ten years after completion of the sanitary survey involved.

(d) Records concerning a variance or exemption granted to the public water supply shall be kept for a period ending not less than five years following the expiration of such variance or exemption.

(e) Copies of public notices issued pursuant to Section E below and certifications made to the Department pursuant to the provisions of this regulation must be kept for three (3) years after issuance.

(f) Copies of monitoring plans developed pursuant to the State Primary Drinking Water Regulation: R.61-58 shall be kept for the same period of time as the records of analyses taken under the plan are required to be kept under paragraph (a) of this section, except as specified elsewhere in this regulation.

E. Public Notification of Drinking Water Violations.

(1) General public notification requirements:

(a) ***Who must give public notice?*** Each owner or operator of a public water system (community water systems, non-transient non-community water systems, and transient non community water systems) must give notice for all violations of State Primary Drinking Water Regulations (SPDWR) and for other situations, as listed in Table 1. The term "SPDWR violations" is used in this regulation to include violations of the maximum contaminant level (MCL), maximum residual disinfection level (MRDL), treatment technique (TT), monitoring requirements, and testing procedures in this regulation. Appendix A to this regulation identifies the tier assignment for each specific violation or situation requiring a public notice.

TABLE 1: VIOLATION CATEGORIES AND OTHER SITUATIONS REQUIRING A PUBLIC NOTICE

(1) SPDWR violations:
- (i) Failure to comply with an applicable maximum contaminant level(MCL) or maximum residual disinfectant level (MRDL).
- (ii) Failure to comply with a prescribed treatment technique (TT).
- (iii) Failure to perform water quality monitoring, as required by the drinking water regulations.
- (iv) Failure to comply with testing procedures as prescribed by a drinking water regulation.

(2) Variance and exemptions under R.61-58.9:
- (i) Operation under a variance or an exemption.
- (ii) Failure to comply with the requirements of any schedule that has been set under a variance or exemption.

(3) Special public notices:
- (i) Occurrence of a waterborne disease outbreak or other waterborne emergency.
- (ii) Exceedance of the nitrate MCL by non-community water systems (NCWS), where granted permission by the Department under R.61-58.5.B(3).
- (iii) Exceedance of the secondary maximum contaminant level (SMCL) for fluoride.
- (iv) Availability of unregulated contaminant monitoring data.
- (v) Other violations and situations determined by the Department to require a public notice under this regulation, not already listed in Appendix A to this regulation.

(b) ***What type of public notice is required for each violation or situation?*** Public notice requirements are divided into three (3) tiers, to take into account the seriousness of the violation or situation and of any potential adverse health effects that may be involved. The public notice requirements for each violation or situation listed in Table 1 of this section are determined by the tier to which it is assigned. Table 2 of this section provides the definition of each tier. Appendix A to this regulation identifies the tier assignment for each specific violation or situation.

TABLE 2: DEFINITION OF PUBLIC NOTICE TIERS

(1) Tier 1 public notice -- required for SPDWR violations and situations with significant potential to have serious adverse effects on human health as a result of short-term exposure.

(2) Tier 2 public notice -- required for all other SPDWR violations and situations with potential to have serious adverse effects on human health.

(3) Tier 3 public notice -- required for all other SPDWR violations and situations not included in Tier 1 and Tier 2.

(c) ***Who must be notified?***

(i) Each public water system must provide public notice to persons served by the water system, in accordance with this regulation. Public water systems that sell or otherwise provide drinking water to other public water systems (i.e., to consecutive systems) are required to give public notice to the owner or operator of the consecutive system; the consecutive system is responsible for providing public notice to the persons it serves.

(ii) If a public water system has a violation in a portion of the distribution system that is physically or hydraulically isolated from other parts of the distribution system, the Department may allow the system to limit distribution of the public notice to only persons served by that portion of the system which is out of compliance. Permission by the Department for limiting distribution of the notice must be granted in writing.

(iii) A copy of the notice must also be sent to the Department, in accordance with the requirements of R.61-58.6.B(5).

(2) Tier 1 Public Notice: Form, Manner, and Frequency of Notice

(a) ***Which violations or situations require a Tier 1 public notice?*** Table 1 of this section lists the violation categories and other situations requiring a Tier 1 public notice. Appendix A to this regulation identifies the tier assignment for each specific violation or situation.

TABLE 1: VIOLATION CATEGORIES AND OTHER SITUATIONS REQUIRING A TIER 1 PUBLIC NOTICE

(1) Violation of the MCL for total coliforms when fecal coliform or E. coli are present in the water distribution system (as specified in R.61-58.5.F(2)), or when the water system fails to test for fecal coliforms or E. coli when any repeat sample tests positive for coliform (as specified in R.61-58.5.G(5)), violation of the MCL for E. coli (as specified in R.61-58.5.F);
(2) Violation of the MCL for nitrate, nitrite, or total nitrate and nitrite, as defined in R.61-58.5.B, or when the water system fails to take a confirmation sample within 24 hours of the system's receipt of the first sample showing an exceedance of the nitrate or nitrite MCL, as specified in R.61-58.5.C(12)(b);
(3) Exceedance of the nitrate MCL by non-community water systems, where permitted to exceed the MCL by the Department under R.61-58.5.B(3), as required under paragraph (9) of this section;
(4) Violation of the MRDL for chlorine dioxide, as defined in R.61-58.5.Q(1), when one or more samples taken in the distribution system the day following an exceedance of the MRDL at the entrance of the distribution system exceed the MRDL, or when the water system does not take the required samples in the distribution system, as specified in R.61-58.13.D(3)(b)(i);
(5) Violation of the turbidity MCL under R.61-58.10(C), (E), (H), or (I), where the Department determines after consultation that a Tier 1 notice is

required or where consultation does not take place within 24 hours after the system learns of the violation;

(6) Violation of the Surface Water Treatment Rule (SWTR), Interim Enhanced Surface Water Treatment Rule (IESWTR) or Long Term 1 Enhanced Surface Water Treatment Rule (LT1EWSTR) treatment technique requirement resulting from a single exceedance of the maximum allowable turbidity limit (as identified in Appendix A to this regulation), where the Department determines after consultation that a Tier 1 notice is required or where consultation does not take place within twenty-four (24) hours after the system learns of the violation;

(7) Occurrence of a waterborne disease outbreak, as defined in R.61-58(B)(179), or other waterborne emergency (such as a failure or significant interruption in key water treatment processes, a natural disaster that disrupts the water supply or distribution system, or a chemical spill or unexpected loading of possible pathogens into the source water that significantly increases the potential for drinking water contamination);

(8) Detection of E. coli, enterococci, or coliphage in source water samples as specified in R.61-58.16.E(1) or R.61-58.16.E(2).

(9) Other violations or situations with significant potential to have serious adverse effects on human health as a result of short-term exposure, as determined by the Department either in its regulations or on a case-by-case basis.

(b) ***When is the Tier 1 public notice to be provided? What additional steps are required?*** Public water systems must:

(i) Provide a public notice as soon as practical but no later than twenty-four (24) hours after the system learns of the violation;

(ii) Initiate consultation with the Department as soon as practical, but no later than twenty-four (24) hours after the public water system learns of the violation or situation, to determine additional public notice requirements; and

(iii) Comply with any additional public notification requirements (including any repeat notices or direction on the duration of the posted notices) that are established as a result of the consultation with the Department. Such requirements may include the timing, form, manner, frequency, and content of repeat notices (if any) and other actions designed to reach all persons served.

(c) ***What is the form and manner of the public notice?*** Public water systems must provide the notice within twenty-four (24) hours in a form and manner reasonably calculated to reach all persons served. The form and manner used by the public water system are to fit the specific situation, but must be designed to reach residential, transient, and non-transient users of the water system. In order to reach all persons served, water systems are to use, at a minimum, one or more of the following forms of delivery:

(i) Appropriate broadcast media (such as radio and television);

(ii) Posting of the notice in conspicuous locations throughout the area served by the water system;

(iii) Hand delivery of the notice to persons served by the water system; or

(iv) Another delivery method approved in writing by the Department.

(3) Tier 2 Public Notice: Form, Manner, and Frequency of Notice.

(a) ***Which violations or situations require a Tier 2 public notice?*** Table 1 of this section lists the violation categories and other situations requiring a Tier 2 public notice. Appendix A to this regulation identifies the tier assignment for each specific violation or situation.

TABLE 1: VIOLATION CATEGORIES AND OTHER SITUATIONS REQUIRING A TIER 2 PUBLIC NOTICE

(1) All violations of the MCL, MRDL, and treatment technique requirements, except where a Tier 1 notice is required under paragraph (2)(a) of this section or where the Department determines that a Tier 1 notice is required;
(2) Violations of the monitoring and testing procedure requirements, where the Department determines that a Tier 2 rather than a Tier 3 public notice is required, taking into account potential health impacts and persistence of the violation; and
(3) Failure to comply with the terms and conditions of any variance or exemption in place.
(4) Failure to take corrective action or failure to maintain at least 4-log treatment of viruses (using inactivation, removal, or a Department approved combination of 4-log virus inactivation and removal) before or at the first customer under R.61-58.16.F(1).

(b) ***When is the Tier 2 public notice to be provided?***

(i) Public water systems must provide the public notice as soon as practical, but no later than thirty (30) days after the system learns of the violation. If the public notice is posted, the notice must remain in place for as long as the violation or situation persists, but in no case for less than seven (7) days, even if the violation or situation is resolved. The Department may, in appropriate circumstances, allow additional time for the initial notice of up to three (3) months from the date the system learns of the violation. It is not appropriate for the Department to grant an extension to the thirty (30) day deadline for any unresolved violation or to allow across-the-board extensions by rule or policy for other violations or situations requiring a Tier 2 public notice. Extensions granted by the Department must be in writing.

(ii) The public water system must repeat the notice every three (3) months as long as the violation or situation persists, unless the Department determines that

appropriate circumstances warrant a different repeat notice frequency. In no circumstance may the repeat notice be given less frequently than once per year. It is not appropriate for the Department to allow less frequent repeat notice for an MCL or treatment technique violation under the Total Coliform Rule or the Revised Total Coliform Rule (R.61-58.17) or a treatment technique violation under the Surface Water Treatment Rule or Interim Enhanced Surface Water Treatment Rule. It is also not appropriate for the Department to allow through its rules or policies across the board reductions in the repeat notice frequency for other ongoing violations requiring a Tier 2 repeat notice. Department determinations allowing repeat notices to be given less frequently than once every three (3) months must be in writing.

(iii) For the turbidity violations specified in this paragraph, public water systems must consult with the Department as soon as practical but no later than twenty-four (24) hours after the public water system learns of the violation, to determine whether a Tier 1 public notice under paragraph (2)(a) of this section is required to protect public health. When consultation does not take place within the twenty-four (24) hour period, the water system must distribute a Tier 1 notice of the violation within the next twenty-four (24) hours (i.e., no later than forty-eight (48) hours after the system learns of the violation), following the requirements under paragraphs (b) and (c) of this section. Consultation with the Department is required for:

(A) Violation of the turbidity MCL under R.61-58.10(C), (E), (H), or (I); or

(B) Violation of the SWTR, IESWTR or LT1ESWTR treatment technique requirement resulting from a single exceedance of the maximum allowable turbidity limit.

(c) ***What is the form and manner of the Tier 2 public notice?*** Public water systems must provide the initial public notice and any repeat notices in a form and manner that is reasonably calculated to reach persons served in the required time period. The form and manner of the public notice may vary based on the specific situation and type of water system, but it must at a minimum meet the following requirements:

(i) Unless directed otherwise by the Department in writing, community water systems must provide notice by:

(A) Mail or other direct delivery to each customer receiving a bill and to other service connections to which water is delivered by the public water system; and

(B) Any other method reasonably calculated to reach other persons regularly served by the system, if they would not normally be reached by the notice required in R.61-58.6.E(3)(c)(i)(A). Such persons may include those who do not pay water bills or do not have service connection addresses (e.g., house renters, apartment dwellers, university students, nursing home patients, prison inmates, etc.). Other methods may include: Publication in a local newspaper; delivery of multiple copies for distribution by customers that provide their drinking water to others (e.g., apartment building owners or large private employers);

posting in public places served by the system or on the Internet; or delivery to community organizations.

(ii) Unless directed otherwise by the Department in writing, non-community water systems must provide notice by:

(A) Posting the notice in conspicuous locations throughout the distribution system frequented by persons served by the system, or by mail or direct delivery to each customer and service connection (where known); and

(B) Any other method reasonably calculated to reach other persons served by the system if they would not normally be reached by the notice required in R.61-58.6.E(3)(c)(ii)(A). Such persons may include those served who may not see a posted notice because the posted notice is not in a location they routinely pass by. Other methods may include: Publication in a local newspaper or newsletter distributed to customers; use of E-mail to notify employees or students; or, delivery of multiple copies in central locations (e.g., community centers).

(4) Tier 3 Public Notice: Form, Manner, and Frequency of Notice.

(a) ***Which violations or situations require a Tier 3 public notice?*** Table 1 of this section lists the violation categories and other situations requiring a Tier 3 public notice. Appendix A to this regulation identifies the tier assignment for each specific violation or situation.

TABLE 1: VIOLATION CATEGORIES AND OTHER SITUATIONS REQUIRING A TIER 3 PUBLIC NOTICE

(1) Monitoring violations under R.61-58.5, except where a Tier 1 notice is required under paragraph (2)(a) of this section or where the Department determines that a Tier 2 notice is required;
(2) Failure to comply with a testing procedure established in R.61-58.5, except where a Tier 1 notice is required under paragraph (2)(a) of this section or where the Department determines that a Tier 2 notice is required;
(3) Operation under a variance or an exemption granted under R.61-58.9;
(4) Availability of unregulated contaminant monitoring results, as required under R.61-58.6.E(7);
(5) Exceedance of the fluoride secondary maximum contaminant level (SMCL), as required under R.61-58.6.E(8); and
(6) Reporting and Recordkeeping violations under R.61-58.17.

(b) ***When is the Tier 3 public notice to be provided?***

(i) Public water systems must provide the public notice not later than one (1) year after the public water system learns of the violation or situation or begins

operating under a variance or exemption. Following the initial notice, the public water system must repeat the notice annually for as long as the violation, variance, exemption, or other situation persists. If the public notice is posted, the notice must remain in place for as long as the violation, variance, exemption, or other situation persists, but in no case less than seven (7) days (even if the violation or situation is resolved).

(ii) Instead of individual Tier 3 public notices, a public water system may use an annual report detailing all violations and situations that occurred during the previous twelve months, as long as the timing requirements of paragraph (b)(i) of this section are met.

(c) ***What is the form and manner of the Tier 3 public notice?*** Public water systems must provide the initial notice and any repeat notices in a form and manner that is reasonably calculated to reach persons served in the required time period. The form and manner of the public notice may vary based on the specific situation and type of water system, but it must at a minimum meet the following requirements:

(i) Unless directed otherwise by the Department in writing, community water systems must provide notice by:

(A) Mail or other direct delivery to each customer receiving a bill and to other service connections to which water is delivered by the public water system; and

(B) Any other method reasonably calculated to reach other persons regularly served by the system, if they would not normally be reached by the notice required in paragraph (c)(i)(A) of this section. Such persons may include those who do not pay water bills or do not have service connection addresses (e.g., house renters, apartment dwellers, university students, nursing home patients, prison inmates, etc.). Other methods may include: Publication in a local newspaper; delivery of multiple copies for distribution by customers that provide their drinking water to others (e.g., apartment building owners or large private employers); posting in public places or on the Internet; or delivery to community organizations.

(ii) Unless directed otherwise by the Department in writing, non-community water systems must provide notice by:

(A) Posting the notice in conspicuous locations throughout the distribution system frequented by persons served by the system, or by mail or direct delivery to each customer and service connection (where known); and

(B) Any other method reasonably calculated to reach other persons served by the system, if they would not normally be reached by the notice required in paragraph (c)(ii)(A) of this section. Such persons may include those who may not see a posted notice because the notice is not in a location they routinely pass by. Other methods may include: Publication in a local newspaper or newsletter distributed to customers; use of E-

mail to notify employees or students; or, delivery of multiple copies in central locations (e.g., community centers).

(d) ***In what situations may the Consumer Confidence Report be used to meet the Tier 3 public notice requirements?*** For community water systems, the Consumer Confidence Report (CCR) required under R.61-58.12 of this regulation may be used as a vehicle for the initial Tier 3 public notice and all required repeat notices, as long as:

(i) The CCR is provided to persons served no later than twelve (12) months after the system learns of the violation or situation as required under paragraph (4)(b) of this section;

(ii) The Tier 3 notice contained in the CCR follows the content requirements under paragraph (5) of this section; and

(iii) The CCR is distributed following the delivery requirements under paragraph (4)(c) of this section.

(5) Content of the Public Notice.

(a) ***What elements must be included in the public notice for violations of State Primary Drinking Water Regulations (SPDWR) or other situations requiring a public notice?*** When a public water system violates a SPDWR or has a situation requiring public notification, each public notice must include the following elements:

(i) A description of the violation or situation, including the contaminant(s) of concern, and (as applicable) the contaminant level(s);

(ii) When the violation or situation occurred;

(iii) Any potential adverse health effects from the violation or situation, including the standard language under paragraphs (d)(i) or (d)(ii) of this section, whichever is applicable;

(iv) The population at risk, including subpopulations particularly vulnerable if exposed to the contaminant in their drinking water;

(v) Whether alternative water supplies should be used;

(vi) What actions consumers should take, including when they should seek medical help, if known;

(vii) What the system is doing to correct the violation or situation;

(viii)When the water system expects to return to compliance or resolve the situation;

(ix) The name, business address, and phone number of the water system owner, operator, or designee of the public water system as a source of additional information concerning the notice; and

(x) A statement to encourage the notice recipient to distribute the public notice to other persons served, using the standard language under paragraph (d)(iii) of this section, where applicable.

(b) ***What elements must be included in the public notice for public water systems operating under a variance or exemption?***

(i) If a public water system has been granted a variance or an exemption, the public notice must contain:

(A) An explanation of the reasons for the variance or exemption;

(B) The date on which the variance or exemption was issued;

(C) A brief status report on the steps the system is taking to install treatment, find alternative sources of water, or otherwise comply with the terms and schedules of the variance or exemption; and

(D) A notice of any opportunity for public input in the review of the variance or exemption.

(ii) If a public water system violates the conditions of a variance or exemption, the public notice must contain the ten elements listed in paragraph (a) of this section.

(c) ***How is the public notice to be presented?***

(i) Each public notice required by this section:

(A) Must be displayed in a conspicuous way when printed or posted;

(B) Must not contain overly technical language or very small print;

(C) Must not be formatted in a way that defeats the purpose of the notice;

(D) Must not contain language which nullifies the purpose of the notice.

(ii) Each public notice required by this section must comply with multilingual requirements, as follows:

(A) For public water systems serving a large proportion of non-English speaking consumers, as determined by the Department, the public notice must contain information in the appropriate language(s) regarding the importance of the notice or contain a telephone number or address where persons served may contact the water system to obtain a translated copy of the notice or to request assistance in the appropriate language.

(B) In cases where the Department has not determined what constitutes a large proportion of non-English speaking consumers, the public water system must include in the public notice the same

information as in paragraph (c)(ii)(A) of this section, where appropriate to reach a large proportion of non-English speaking persons served by the water system.

(d) ***What standard language must public water systems include in their public notice?*** Public water systems are required to include the following standard language in their public notice:

(i) Standard health effects language for MCL or MRDL violations, treatment technique violations, and violations of the condition of a variance or exemption. Public water systems must include in each public notice the health effects language specified in Appendix B to this regulation corresponding to each MCL, MRDL, and treatment technique violation listed in Appendix A to this regulation, and for each violation of a condition of a variance or exemption.

(ii) Standard language for monitoring and testing procedure violations. Public water systems must include the following language in their notice, including the language necessary to fill in the blanks, for all monitoring and testing procedure violations listed in Appendix A to this regulation:

"We are required to monitor your drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether or not your drinking water meets health standards. During [compliance period], we "did not monitor or test" or "did not complete all monitoring or testing" for [contaminant(s)], and therefore cannot be sure of the quality of your drinking water during that time."

(iii) Standard language to encourage the distribution of the public notice to all persons served. Public water systems must include in their notice the following language (where applicable): Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

(6) Notice to New Billing Units or New Customers.

(a) ***What is the requirement for community water systems?*** Community water systems must give a copy of the most recent public notice for any continuing violation, the existence of a variance or exemption, or other ongoing situations requiring a public notice to all new billing units or new customers prior to or at the time service begins.

(b) What is the requirement for non-community water systems? Non-community water systems must continuously post the public notice in conspicuous locations in order to inform new consumers of any continuing violation, variance or exemption, or other situation requiring a public notice for as long as the violation, variance, exemption, or other situation persists.

(7) Special Notice of the Availability of Unregulated Contaminant Monitoring Results.

(a) ***When is the special notice to be given?*** The owner or operator of a community water system or non-transient, non-community water system required to monitor under

R.61-58.5.T must notify persons served by the system of the availability of the results of such sampling no later than 12 months after the monitoring results are known.

(b) ***What is the form and manner of the special notice?*** The form and manner of the public notice must follow the requirements for a Tier 3 public notice prescribed in paragraphs (4)(c), (d)(i), and (d)(iii) of this section. The notice must also identify a person and provide the telephone number to contact for information on the monitoring results.

(8) Special Notice for Exceedance of the SMCL for Fluoride.

(a) ***When is the special notice to be given?*** Community water systems that exceed the fluoride secondary maximum contaminant level (SMCL) of 2 mg/L as specified in R.61-58.5.R (determined by the last single sample taken in accordance with R.61-58.5.C, but do not exceed the maximum contaminant level (MCL) of 4 mg/L for fluoride (as specified in R.61-58.5.B), must provide the public notice in paragraph (c) of this section to persons served. Public notice must be provided as soon as practical but no later than twelve (12) months from the day the water system learns of the exceedance. A copy of the notice must also be sent to all new billing units and new customers at the time service begins and to the State public health officer. The public water system must repeat the notice at least annually for as long as the SMCL is exceeded. If the public notice is posted, the notice must remain in place for as long as the SMCL is exceeded, but in no case less than seven (7) days (even if the exceedance is eliminated). On a case-by-case basis, the Department may require an initial notice sooner than twelve (12) months and repeat notices more frequently than annually.

(b) ***What is the form and manner of the special notice?*** The form and manner of the public notice (including repeat notices) must follow the requirements for a Tier 3 public notice in paragraphs (4)(c) and (d)(i) and (d)(iii) of this section.

(c) ***What mandatory language must be contained in the special notice?*** The notice must contain the following language, including the language necessary to fill in the blanks:

"This is an alert about your drinking water and a cosmetic dental problem that might affect children under nine years of age. At low levels, fluoride can help prevent cavities, but children drinking water containing more than 2 milligrams per liter (mg/L) of fluoride may develop cosmetic discoloration of their permanent teeth (dental fluorosis). The drinking water provided by your community water system [name] has a fluoride concentration of [insert value] mg/L.

Dental fluorosis, in its moderate or severe forms, may result in a brown staining and/or pitting of the permanent teeth. This problem occurs only in developing teeth, before they erupt from the gums. Children under nine should be provided with alternative sources of drinking water or water that has been treated to remove the fluoride to avoid the possibility of staining and pitting of their permanent teeth. You may also want to contact your dentist about proper use by young children of fluoride-containing products. Older children and adults may safely drink the water.

Drinking water containing more than 4 mg/L of fluoride (the U.S. Environmental Protection Agency's drinking water standard) can increase your risk of developing bone disease. Your drinking water does not contain more than 4 mg/L of fluoride, but we're

required to notify you when we discover that the fluoride levels in your drinking water exceed 2 mg/L because of this cosmetic dental problem.

For more information, please call [name of water system contact] of [name of community water system] at [phone number]. Some home water treatment units are also available to remove fluoride from drinking water. To learn more about available home water treatment units, you may call NSF International at 1-877-8-NSF-HELP."

(9) Special notice for Nitrate Exceedances Above MCL by Non-Community Water Systems (NCWS), Where Granted Permission by the Department under R.61-58.5.B(3).

(a) ***When is the special notice to be given?*** The owner or operator of a non-community water system granted permission by the Department under R.61-58.5.B(3) to exceed the nitrate MCL must provide notice to persons served according to the requirements for a Tier 1 notice under paragraphs (2)(a) and (b) of this section.

(b) ***What is the form and manner of the special notice?*** Non-community water systems granted permission by the Department to exceed the nitrate MCL under R.61-58.5.B(3) must provide continuous posting of the fact that nitrate levels exceed 10 mg/L and the potential health effects of exposure, according to the requirements for Tier 1 notice delivery under paragraph (2)(c) of this section and the content requirements under paragraph (5) of this section.

(10) Notice by Department on Behalf of the Public Water System.

(a) ***May the Department give the notice on behalf of the public water system?*** The Department may give the notice required by this regulation on behalf of the owner and operator of the public water system if the Department complies with the requirements of this regulation.

(b) ***What is the responsibility of the public water system when notice is given by the primacy agency?*** The owner or operator of the public water system remains responsible for ensuring that the requirements of this regulation are met.

(11) Special notice for repeated failure to conduct monitoring of the source water for Cryptosporidium and for failure to determine bin classification or mean Cryptosporidium level

(a) Special notice for repeated failure to monitor.

The owner or operator of a community or non-community water system that is required to monitor source water under R.61-58.10.K(2) must notify persons served by the water system that monitoring has not been completed as specified no later than 30 days after the system has failed to collect any 3 months of monitoring as specified in R.61-58.10.K(2)(c). The notice must be repeated as specified in R.61-58.6.E(3)(b).

(b) Special notice for failure to determine bin classification or mean Cryptosporidium level.

The owner or operator of a community or non-community water system that is required to determine a bin classification under R.61-58.10.K(11), or to determine mean Cryptosporidium level under R.61-58.10.K(13), must notify persons served by the water system that the determination has not been made as required, no later than 30 days after the system has failed to report the determination as specified in R.61-58.10.K(11)(e) or

R.61-58.10.K(13)(a), respectively. The notice must be repeated as specified in R.61-58.6.E(3)(b). The notice is not required if the system is complying with a Department-approved schedule to address the violation.

(c) Form and manner of the special notice.

The form and manner of the public notice must follow the requirements for a Tier 2 public notice prescribed in R.61-58.6.E(3)(c). The public notice must be presented as required in R.61-58.6.E(5)(c).

(d) Mandatory language that must be contained in the special notice.

The notice must contain the following language, including the language necessary to fill in the blanks.

(i) The special notice for repeated failure to conduct monitoring must contain the following language: "We are required to monitor the source of your drinking water for Cryptosporidium. Results of the monitoring are to be used to determine whether water treatment at the (treatment plant name) is sufficient to adequately remove Cryptosporidium from your drinking water. We are required to complete this monitoring and make this determination by (required bin determination date). We (did not monitor or test) or (did not complete all monitoring or testing) on schedule and, therefore, we may not be able to determine by the required date what treatment modifications, if any, must be made to ensure adequate Cryptosporidium removal. Missing this deadline may, in turn, jeopardize our ability to have the required treatment modifications, if any, completed by the deadline required, (date). For more information, please call (name of water system contact) of (name of water system) at (phone number)".

(ii) The special notice for failure to determine bin classification or mean Cryptosporidium level must contain the following language: "We are required to monitor the source of your drinking water for Cryptosporidium in order to determine by (date) whether water treatment at the (treatment plant name) is sufficient to adequately remove Cryptosporidium from your drinking water. We have not made this determination by the required date. Our failure to do this may jeopardize our ability to have the required treatment modifications, if any, completed by the required deadline of (date). For more information, please call (name of water system contact) of (name of water system) at (phone number)".

(3) Each special notice must also include a description of what the system is doing to correct the violation and when the system expects to return to compliance or resolve the situation.

R.61-58.7 OPERATION AND MAINTENANCE

A. Applicability.

This regulation applies to all public water systems, no matter when constructed, and establishes minimum requirements for the operation and maintenance of the system in order to ensure the delivery of safe, potable water to the public. Existing systems may be required to upgrade to comply with regulations 61-58.2, 58.3, or 58.4:

(1) when no construction permit exists, or;

(2) when required by the Department as the result of a sanitary survey.

B. General Requirements for Operation and Maintenance of Public Water Systems.

(1) All water systems must be operated and maintained in accordance with their construction and operating permit(s) and any approved modifications.

(2) Each system shall have and maintain up-to-date written Standard Operating Procedures for the operation and maintenance of its system. These procedures shall include but not be limited to:

(a) detailed instructions for the operation of all major components of the water system, including wells and/or intakes, pumps, chemical feed equipment, etc.

(b) detailed instructions on starting and stopping any treatment plant;

(c) preventive maintenance schedules on equipment;

(d) reporting and public notification requirements;

(e) water quality monitoring, including frequency of monitoring and sampling and analytical procedures for any monitoring conducted by the water system;

(f) sample siting plans;

(g) disinfection requirements for the new construction of, or the repair of, wells, tanks and water lines;

(h) valve and fire hydrant maintenance;

(i) distribution system flushing program;

(j) leak detection and repair program;

(k) cross connection control program; and,

(l) safety procedures.

(3) All chemical feed systems that are in operation shall be monitored as often as necessary to ensure proper operation. Documentation must be maintained.

(4) The water from each treatment process shall be sampled and analyzed as often as necessary to ensure that the treatment process is functioning properly, but in no case less than once a day.

The operator shall maintain a written record of all analyses conducted. These records shall be kept for a minimum of three (3) years. Except where otherwise noted, any analyses conducted for compliance with the monitoring requirements of R.61-58.5, R.61-58.10, R.61-58.11 and R.61-58.13, shall be performed by a laboratory certified by the Department and the records of these analyses kept on file in accordance with the retention schedules outlined in the regulations. All other monitoring conducted for the purpose of process control shall be performed using equipment and methodology acceptable to the Department.

(5) If a combined phosphate or poly-phosphate chemical is used, total phosphate residual monitoring may be conducted once every two weeks in lieu of the daily monitoring as required in R.61-58.7(B)(4).

(6) The operator shall measure the amounts of chemicals used each day and calculate the dosages. The operator shall maintain a written record of all measurements and dosage calculations. These records shall be kept for a minimum of 3 years.

(7) The system shall have immediate access to parts for routine repairs and shall repair any malfunctioning equipment as soon as possible.

(8) Chemical spills shall be cleaned up promptly and disposed of properly. Any chemical spills which are not contained and reach the environment shall be reported to the Department immediately.

(9) Where chlorine gas is used, the following shall apply:

(a) Chlorine gas feed and storage rooms shall be maintained in a reasonably air tight condition. The louvers on the air inlet and on the discharge side of the ventilating fan shall be maintained to ensure proper closure when the fan is not in use. Weather striping on the door shall be maintained in good condition and no opening shall be allowed to exist between the rooms and other parts of the treatment plant. If a floor drain is provided, a water seal or removable plug must be maintained to prevent escaped gases from exiting through the building sewer.

(b) The doors to the chlorine gas feed and storage rooms shall be kept closed except while being occupied by authorized personnel.

(c) The chlorine gas feed and storage rooms shall be well lighted.

(d) Ammonia shall not be stored in the same room with chlorine gas cylinders or feed equipment.

(e) The ventilating fans for the chlorine gas feed and storage rooms shall work properly at all times, and be manually controlled only. If the fans should ever malfunction, they shall be repaired or replaced promptly.

(f) The vents from the feeders and storage shall be maintained free of any debris.

(g) All cylinders (full and empty) shall be restrained.

(h) The chlorinator room shall be heated to maintain proper temperature for operation.

(i) There shall be no equipment housed in the chlorine feed room except chlorinators, chlorine cylinders, weighing scales, heater, ventilation fan, light(s), chlorine

gas leak detector(s), and chlorinator appurtenances.

(j) Scales for weighing cylinders shall be calibrated yearly and properly maintained.

(k) The chlorine feed system shall be operated to ensure continuous feed of chlorine when the plant is operating.

(l) A chlorine leak detection and alarm system shall be in service at all times.

(m) The public water system shall have an emergency action plan for addressing chlorine leaks.

(10) Where ammonia gas is used, the following shall apply:

(a) Ammonia gas feed and storage rooms shall be maintained in a reasonably air tight condition. The louvers on the air inlet and on the discharge side of the ventilating fan shall be maintained to ensure proper closure when the fan is not in use. Weather striping on the door shall be maintained in good condition and no opening shall be allowed to exist between the rooms and other parts of the treatment plant.

(b) The doors to the ammonia gas feed and storage rooms shall be kept closed except while occupied by authorized personnel.

(c) The ammonia gas feed and storage rooms shall be well lighted.

(d) The ventilating fans for the ammonia gas feed and storage rooms shall work properly at all times, and be manually controlled only. If the fans should ever malfunction, they shall be repaired or replaced promptly.

(e) Chlorine shall not be stored in the same room with ammonia gas cylinders or feed equipment.

(f) The vents from the feeders and storage shall be maintained free of any debris.

(g) All cylinders (full and empty) shall be restrained.

(h) The ammoniator room shall be heated to maintain proper temperature for operation.

(i) There shall be no equipment housed in the ammonia feed room except ammoniators, ammonia cylinders, weighing scales, heater, ventilation fan, light(s), ammonia gas leak detector(s), and ammoniator appurtenances.

(j) Scales for weighing cylinders shall be calibrated yearly and properly maintained. Where bulk storage tanks are installed a pressure gauge shall be maintained.

(k) The ammonia feed system shall be maintained and operated to ensure continuous feed of ammonia when the plant is operating.

(l) An ammonia leak detection and alarm system shall be in service at all times.

(m) The public water system shall have an emergency action plan for addressing ammonia leaks.

(11) Where fluoride is added to the water the following shall apply:

(a) The fluoride content of the water shall be maintained between eight-tenths (.80) and one and two-tenths (1.20) milligrams per liter.

(b) Finished water shall be analyzed daily for fluoride content in accordance with methodology specified in Section C(17) of R.61-58.5.

(c) Should a public water system cease fluoridating for any reason the Department shall be notified immediately.

(d) A public water system which fluoridates must notify their service population and all local dental and public health practices prior to ceasing fluoridation.

(12) Adequate safety equipment for handling of chemicals used in treatment shall be provided.

(13) Chemical dosages shall not exceed the maximum dosage specified by the Department.

(14) All emergency power equipment shall be operated at least once per month under load and records of this operation kept on file with the water system.

(15) All chemicals and products added to a public water supply as part of the treatment process shall be certified as meeting the specifications of the American National Standard Institute/National Sanitation Foundation Standard 60, Drinking Water Treatment Chemicals - Health Effects. The certifying party shall be accredited by the American National Standards Institute.

(16) All materials and products installed in a public water system after December 31, 1995, which comes into contact with drinking water during the treatment, storage, transmission or distribution of the water, shall be certified as meeting the specifications of the American National Standard Institute/National Sanitation Foundation Standard 61, Drinking Water System Components - Health Effects. The certifying party shall be accredited by the American National Standards Institute.

(17) All storage and de-watering facilities for water treatment plant residuals shall be maintained in good operating condition. Equipment shall be cleaned and lubricated according to manufacturer's recommendations and the operation and maintenance manual for the plant. Records shall be kept of maintenance performed. There shall be no bypassing of any treatment process to the environment. The facilities shall be monitored in accordance with any operating permit(s) issued by the Department.

(18) Security shall be provided and maintained for all intake, treatment, storage and pumping facilities so as to prevent the entrance of unauthorized persons.

(19) Sampling taps shall be maintained so that representative water samples can be obtained from:

(a) each raw water source;

(b) appropriate locations throughout the treatment process so that the operator can maintain proper control of the treatment process;

(c) effluent from each filter and the combined filter effluent prior to any post chemical addition;

(d) the entry point(s) to the distribution system

(20) All required flow meters shall be maintained and operated in accordance with design criteria.

(21) Secondary containment systems shall be maintained for all liquid chemical storage tanks and solution tanks, capable of receiving and containing accidental spills or overflows. Incompatible chemicals shall not be stored in the same secondary containment area.

C. Surface Water Treatment Plants.

(1) All surface water treatment plants shall have an operator of the appropriate grade present at the plant and responsible for its operation, when the plant is producing water for public consumption.

(2) All enclosed filters shall be opened and inspected per manufacturer's recommendation or as required to ensure proper operation.

(3) All water, chemical and waste lines shall be labeled and color coded to identify line contents and direction of flow (if applicable).

(4) The treatment facility shall be operated such that the Department approved filtration rate is not exceeded at any time, and the pretreatment retention times are not reduced below those times approved by the Department. The treatment facility shall be operated such that hydraulic surges through the filters are minimized during flow rate changes and when filters are removed from service for backwashing.

(5) The use of chemicals for the control of aquatic weeds, algae and water borne organisms in rivers, lakes and reservoirs which are used as a source of water by a public water supply, shall be approved by the Department prior to their use.

(6) Intake screens shall be cleaned as often as is necessary for the proper functioning of the intake station.

(7) All plants shall have an on-site laboratory with the necessary equipment and methodology acceptable to the Department for process control monitoring. If the on-site laboratory is to conduct any analyses for compliance with the monitoring requirements of R.61-58.5, R.61-58.10 , R.61-58.11 and R.61-58.13, it must be certified by the Department.

(8) The following analyses shall be conducted as often as necessary, but no less than once a day, to ensure the treatment plant is functioning properly.

(a) Raw water shall be analyzed for pH, alkalinity, temperature, turbidity and total or fecal coliform bacteria.

(b) The coagulated water shall be analyzed for pH and alkalinity. If a pre-disinfectant and/or oxidant is added, the coagulated water shall be analyzed for the disinfectant and/or oxidant.

(c) The settled water shall be analyzed for turbidity and for disinfectant residual if a pre-disinfectant is used. If the pretreatment unit is used as a disinfectant sequence, the disinfectant concentration, pH and water temperature shall be measured in accordance with the requirements of R.61-58.10 for calculating CT values.

(d) The filtered water shall be analyzed for turbidity. If a pre-filter disinfectant is used, the filtered water disinfectant residual shall be measured.

(e) The finished water (water entering distribution system) shall be analyzed for pH, alkalinity, temperature, disinfectant residual, calcium hardness and turbidity.

(f) The system shall analyze for any additional parameter that the Department may require for a specific plant for special concerns.

(9) The effluent weirs of the sedimentation basins shall be maintained so there is a uniform flow of water over the entire length of the weir.

(10) Flocculation and sedimentation basins and clarifiers shall be cleaned as often as necessary to keep the settled material and algae growths to a minimum.

(11) The reliable capacity of a surface water treatment plant shall be based on the lowest capacity in the treatment train. This shall include, but not be limited to, the capacity of the source, capacity of the raw water pump station with the largest pump out of service, capacity of the rapid mix chamber(s), flocculator(s), sedimentation basin(s), clarifier(s) and filters(s) and the capacity of the high service pump station with the largest pump out of service. If the reliable capacity of a plant is exceeded on a consistent basis during the peak water use months, the Department may elect not to issue any construction permits for new water line construction until the reliable capacity of the plant is increased.

(12) When the average daily demand during any month exceeds eighty (80) percent of the public water system's reliable capacity, as specified in R.61-58.7.C(11), the system shall submit a preliminary engineering report to the Department within one hundred eighty (180) days addressing in detail any upgrade necessary to keep up with any growth in demand on the system. When the average daily demand during any month exceeds ninety (90) percent of the public water system's reliable capacity as specified in R.61-58.7.C(11), the system shall submit to the Department plans and specifications along with an application for a permit to construct the upgrade within one hundred eighty (180) days, unless a longer time period is specified by the Department .

D. Groundwater Sources and Treatment Plants.

(1) All well heads and associated piping shall be inspected at a minimum of once a week. Stand-by wells shall be inspected and exercised at least quarterly. Documentation of these inspections must be maintained.

(2) All groundwater treatment plants shall be monitored by an operator of the appropriate grade, at a frequency to ensure proper operation, but in no case less than once a day. Such monitoring may be accomplished through site visits and/or remote monitoring equipment approved by the Department.

(3) All pressure filters and enclosed aeration devices shall be opened and inspected per manufacturer's recommendation or as required to ensure proper operation.

(4) Valves provided for the isolation of each well shall be maintained to ensure proper operation.

(5) The check valve and blow-off on the well head piping shall be maintained.

(6) Adequate freeze protection for the well head piping shall be maintained.

(7) A flow meter shall be maintained for each well serving a community water system and each well which is equipped with chemical treatment. The meter shall be periodically calibrated to ensure accuracy in accordance with the manufacturer's recommendations. Calibration records shall be kept on file for a minimum of three (3) years.

(8) Drainage systems shall be maintained so that surface water flows away from the well head.

(9) All wells shall be maintained so the sanitary seal, the casing, the screened vent and the concrete pad are in good repair and can prevent the entrance of contamination into the well.

(10) If a well is no longer used, does not meet the requirements of a stand-by or emergency well, and is not converted to another active use (e.g. irrigation), it shall be properly abandoned in accordance with R.61-58.2.B(15).

(11) Public water systems using ground water as its drinking water source shall maintain compliance with R.61-58.2B(1).

(12) The capacity of a public water system which uses groundwater as its only drinking water source, shall be based on all operable wells pumping 16 hours a day or all operable wells minus the largest well pumping 24 hours a day, which ever is less. If the system has an additional source (surface water plant or metered connection from another public water system), the additional capacity from that source shall be used in determining the total capacity of the system. If the capacity of the system is exceeded on a consistent basis during the peak water use months, the system shall submit a preliminary engineering report to the Department within ninety (90) days addressing in detail any upgrade necessary to keep up with any growth in demand on the system. Construction plans and specifications for a new well may be submitted in lieu of the preliminary engineering report. In addition, the Department may elect not to issue any construction permits for new water line construction until the capacity of the system is increased.

(13) The public water system shall conduct monitoring as specified in R.61-58.2(B)(14)(c) when required by the Department to determine if the ground water source is under the direct influence of surface water.

(14) Stand-by wells must be exercised and sampled for total coliform on at least a quarterly basis. In addition, stand-by wells must be sampled annually for nitrate and nitrite. This monitoring is conducted by the water system and records must be maintained for Department inspection. Whenever a stand-by well is put in service, the system must notify the Department as soon as possible, but in no case later than the end of the next business day.

(15) Emergency wells must be exercised on an annual basis to ensure that they are operable. Whenever an emergency well is placed into service, the system must notify the Department as soon as possible, but in no case later than the end of the next business day. In addition, the system must immediately issue a Boil Water Advisory for all portions of the system being served by the emergency well.

E. Distribution Systems and Storage Tanks.

(1) Operator Certification

(a) All distribution treatment plants (e.g. booster chlorination stations) shall be monitored by an operator of appropriate grade, at a frequency to ensure proper operation,

but in no case less than once a day. Such monitoring may be accomplished through site visits and/or remote monitoring equipment approved by the Department

(b) All community and non-transient non-community water systems must designate an operator(s) of appropriate grade as the operator responsible for the operation and maintenance of their distribution system.

(c) All community and non-transient non-community water systems must be operated such that all personnel making decisions which could affect water quality, water quantity, or distribution system integrity be certified distribution system operators. Certified water treatment plant operators that make such decisions as a part of their routine treatment plant operation duties (e.g. starting and stopping distribution pumps) are not required to have dual certification.

(2) All elevated, hydropneumatic and ground storage tanks shall be inspected at a minimum of once a week for the purpose of checking on the security of the tank(s) and insuring that proper air/water ratios are being maintained in hydropneumatic storage tanks. Vent screens, hatches and other openings on atmospheric tanks must be inspected annually to ensure sanitary protection.

(3) The drainage system on any storage tank lot shall be maintained to channel water away from the tank foundations.

(4) Valves provided for the isolation of each tank shall be maintained to ensure proper operation.

(5) Screens shall be maintained on all storage tank vents.

(6) Screens or flap valves shall be maintained on all storage tank overflows.

(7) The minimum pressure in the distribution system under normal operating conditions shall be twenty-five (25) pounds per square inch at a customer's service connection. A minimum pressure of twenty (20) pounds per square inch shall be maintained at all service connections during unusually heavy flows (i.e., fire or flushing).

(8) Each public water system shall maintain a map of the distribution system which shows the location of water lines and their sizes as well as the location of all valves, hydrants and blow-offs. The location of all water sources and all pumping, treatment and storage facilities shall also be included on this map.

(9) Valves and hydrants shall be exercised and maintained in accordance with the system's valve and hydrant maintenance program to ensure operability. Any valves or hydrants that malfunction shall be repaired promptly. Records shall be kept on this maintenance program.

(10) A flow test shall be conducted on all fire hydrants at a minimum of once every three years. The flow from the hydrant shall be measured and recorded along with the static and residual pressure and time of day the test was conducted. The system shall keep a record of the latest test of each hydrant on file.

(11) All community water systems shall initiate and carry out a program aimed at detecting leaks in the distribution system. At a minimum, a leak detection program shall include a comparison of water produced to water sold or used for other purposes. Any leaks found through this program or any leaks discovered through other means shall be repaired promptly. Records shall be kept of the leaks detected and the repairs made.

(12) When a break occurs in a system's distribution line, the repairs to that line must be made promptly and in accordance with good sanitary practices. Precautions shall be taken throughout the repair process to make sure that customers affected by the break will be assured of safe water after the line is placed back into service.

(13) All public water systems shall develop and maintain a flushing program in order to prevent customer complaints caused by stagnant, discolored, and sediment laden water and maintain adequate disinfectant residuals throughout the distribution system. Detailed instructions of this program shall be included in the system's manual of standard operating procedures. Records of all flushing activities shall be maintained by the system.

(14) The Department shall be notified in writing at least ten (10) days prior to the repainting of the interior or exterior of any storage tank. All interior paint coatings shall be certified as meeting ANSI/NSF Standard 61.

(15) A storage tank that is drained for any reason must be properly disinfected and satisfactory bacteriological samples must be obtained prior to placing it back into service.

(16) The Department shall be notified in writing at least thirty (30) days prior to the entry of an underwater diver into a finished water storage tank for the purpose of inspecting or cleaning of the tank.

F. Cross Connection Control.

(1) General

(a) All public water systems shall initiate and maintain a viable cross connection control program. Such a program shall consist of:

(i) Locating and eliminating unprotected cross connections.

(ii) Maintaining records pertaining to the location of existing backflow prevention assemblies, type and size of each assembly and test results.

(b) No person shall install, permit to be installed or maintain any cross connection between a public water system and any other non-public water system, sewer or a line from any container of liquids or other substances, unless an approved backflow prevention device or assembly is installed between the public water system and the source of contamination.

(2) Low Hazard Cross Connections

A connection between an approved public water system and another water source not hazardous to health but not meeting the standards of the approved public water system and not cross-connected within its system with a potentially dangerous substance shall be considered a low hazard category cross connection. At a minimum, an approved Double Check Valve Assembly or Pressure Vacuum Breaker must be installed on a low hazard cross connection except as provided for in section 3 below.

(3) Residential Lawn Irrigation Systems

(a) Low hazard residential lawn irrigation systems - Each public water system which has low hazard residential irrigation systems directly or indirectly connected to their

public water system must have a written low hazard residential lawn irrigation system cross connection control policy. This policy must be documented in writing and must be approved by the governing body of the public water system. The policy must specify the minimum acceptable device for low hazard residential lawn sprinkler systems. The minimum acceptable device for low hazard residential lawn sprinkler systems is a residential dual check. If a water system specifies another backflow prevention assembly as the minimum acceptable protection for these cross connections, the policy must be approved by the governing body of the public water system with due opportunity being provided for public comment and participation. The written policy must:

(i) Identify the type of backflow prevention device or assembly that is required to be installed on low hazard residential lawn irrigation system connections.

(ii) Establish a schedule for the required testing of double check valve assemblies, or other testable assembly, if testable assemblies are designated by the policy as minimum acceptable protection for low hazard residential lawn irrigation systems. The minimum testing frequency must be specified in the policy and appropriate records must be maintained to verify compliance with the established testing requirements.

(iii) establish a schedule for the required change out of residential dual checks if these are the devices designated by the policy as minimum acceptable protection for low hazard residential lawn irrigation systems. The minimum change out frequency must be specified in the policy and appropriate records must be maintained to verify compliance with the established change out requirements.

(b) High hazard residential lawn irrigation systems - Any residential lawn irrigation system that includes chemical addition, or is also connected to another water source which is not an approved public water system, shall be considered a high hazard cross connection and must meet the requirements of paragraph (4) below.

(4) High Hazard Cross Connections

(a) A connection between an approved public water system and a service or other water system which has or may have any material in the water dangerous to health, or connected to any material dangerous to health, that is or may be handled under pressure, or subject to negative pressure, shall be considered a high hazard category cross connection. Protection shall be by air gap separation or an approved reduced pressure principle backflow prevention assembly.

(b) Reduced pressure principal backflow prevention assemblies shall not be installed in any location subject to possible flooding. This includes pits or vaults which are not provided with a gravity drain to the ground's surface that is capable of exceeding the discharge rate of the relief valve.

(5) Fire Sprinkler Systems

Fire line sprinkler systems, except those in the high hazard category shall be protected by an approved double check valve assembly. High hazard category fire sprinkler systems shall include, but not be limited to: antifreeze systems, foam systems, systems charged from or tied into ponds, lakes, streams, or any water source other than the approved public water supply. High hazard category fire sprinkler systems shall comply with the requirements of Paragraph (4) above.

(6) Approved Devices and Assemblies

The Department shall prepare and publish a list of backflow prevention assemblies approved by the Department for use in South Carolina, and this list shall be updated at least once annually.

(7) Testing Requirements

When double check valve assemblies, pressure vacuum breakers, and/or reduced pressure principal backflow prevention assemblies are installed to protect a public water system against the possibility of backflow from a customer's water service, routine testing of the assemblies shall be performed by a certified tester.

(a) Each assembly shall be tested by a certified tester after installation and before use by the customer. Except as specified in paragraph 3(a)(ii) above, each assembly shall be tested at least once annually by a certified tester.

(b) The public water system is to receive a written report of the inspection and testing results for all assemblies tested within its distribution system. The report shall be submitted by the certified tester making the inspection and test.

(c) All backflow prevention assemblies shall be tested immediately after repairs of any kind are made to the assembly.

(8) Backflow Prevention Tester Certification

There are four (4) types of certified testers of backflow prevention assemblies: General Tester, Limited Tester, Inspector Tester and Manufacturer's Agent. The definition of each type of certified tester is specified in R.61-58(A).

(a) Each certified tester's license shall expire three (3) years from the date of issue. In order to renew this certification for three (3) more years, the tester shall come before a designated person approved by the Department and shall successfully complete a written examination with a passing score of 70%, and perform the prescribed test on an approved reduced pressure principal backflow prevention assembly, double check valve assembly, and a pressure vacuum breaker using the tester's own differential pressure gauge. The gauge must be accurate within 2% of full scale or plus or minus 0.3 pounds per square inch differential (PSID). Any gauge found to be inaccurate or malfunctioning will be required to be calibrated or repaired as needed to bring it into compliance before certification will be renewed.

(b) Any applicant for certification who fails to properly perform the above prescribed tests will have his certification revoked immediately and will have to successfully complete the state sponsored backflow prevention training and certification course in order to become re-certified as a tester of backflow prevention assemblies in South Carolina.

(c) A certified tester may have his tester's certification revoked due to incompetence or falsification of test results, as determined by the Department.

(d) The Department shall reserve the right to charge or allow for the charge of a nominal fee for the administration of the recertification of testers. This fee shall not

exceed fifty dollars ($50.00).

(9) Installation of Pressure Vacuum Breakers

Where used, pressure vacuum breakers shall be installed at a minimum of twelve (12) inches above the highest downstream piping and shall not be subject to backpressure.

G. Operation and Maintenance Requirements for Drinking Water Vending Machines and Dispensing Stations.

(1) All drinking water vending machines and dispensing stations shall be monitored by an operator who holds a valid Bottle Water Class Operator's Certificate issued by the Department of Labor, Licensing and Regulation, at a frequency to ensure proper operation. Dispensing stations shall be inspected by the operator no less than once a week.

(2) Records shall be kept of each visit by the operator and any other maintenance personnel under the direct supervision of the operator. The records shall show the date and time of the visit, any tests performed, any maintenance performed, and the signature of the operator or maintenance personnel. These reports must be kept by the owner of the vending machine or dispensing station for minimum of two (2) years. These records shall be made available to the Department upon request.

(3) A twenty-four (24) hour telephone number shall be clearly posted on the front of each machine or dispensing station for use in emergencies or for consumer complaints. A record of any consumer complaints shall be kept on file with the owner of the machine for a minimum of three years, and shall be made available to the Department upon request.

(4) Each machine will be considered a transient non-community water system and shall comply with the monitoring requirements of R.61.58.5.

(5) Vending machines shall be operated and maintained in accordance with the manufacturer's recommendations.

H. Operating and Monitoring Requirements for Bottled Water Plants.

(1) All bottled water treatment plants shall be monitored on a daily basis by an operator of the appropriate grade to insure proper operation. This monitoring must be by site visitation. No remote monitoring shall be allowed.

(2) All sources used by bottled water plants in the State shall be approved by Department prior to their use. These sources shall be monitored on an annual basis for all contaminants specified in R.61-58.5, R.61-58.10, and R.61-58.11. The results of this monitoring shall be submitted to the Department by the January 10th following the year for which the monitoring is conducted. If the source is from the distribution system of existing public water system in the State, this monitoring is not required. However, the operator of such a bottled water plant shall hold a valid Bottle Water Class Operator's Certificate issued by the Department of Labor, Licensing and Regulation.

(3) No surface water sources or groundwater sources under the direct influence of surface water shall be used for bottled water unless the requirements of R.61-58.10 are met.

I. Operation and Maintenance of Aquifer Storage and Recovery (ASR) Wells.

(1) All ASR wells must be operated and maintained in accordance with their construction and operating permits(s) and any approved modifications.

(2) The Department may require routine testing of specific water quality parameters. Results of such testing must be submitted to the Department upon request or at a frequency established by the Department.

(3) Records must be kept of total flow volume into and out of an ASR well. Such records must be submitted to the Department upon request or at a frequency established by the Department.

(4) For the purposes of determining compliance with R.61-58.7.C(12) and R.61-58.7.D(12), the Department may consider up to ninety (90) percent of the water stored in an ASR well(s) as an additional source of water in lieu of requiring the expansion of existing sources or treatment facilities or the development of new sources or treatment facilities on a case-by-case basis.