

## ATTACHMENT B

### CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION

#### WATER RECYCLING CRITERIA FOR NON-IRRIGATION GENERAL WATER REUSE ORDER NO. R4-2009-0049

### CHAPTER 3 WATER RECYCLING CRITERIA ARTICLE 1 DEFINITIONS

#### 60301. Definitions

##### 60301.100. Approved laboratory

"Approved laboratory" means a laboratory that has been certified by the Department to perform microbiological analyses pursuant to section 116390, Health and Safety Code.

##### 60301.160. Coagulated wastewater

"Coagulated wastewater" means oxidized wastewater in which colloidal and finely divided suspended matter have been destabilized and agglomerated upstream from a filter by the addition of suitable floc-forming chemicals.

##### 60301.170. Conventional treatment

"Conventional treatment" means a treatment chain that utilizes a sedimentation unit process between the coagulation and filtration processes and produces an effluent that meets the definition for disinfected tertiary recycled water.

##### 60301.200. Direct beneficial use

"Direct beneficial use" means the use of recycled water that has been transported from the point of treatment or production to the point of use without an intervening discharge to waters of the State.

##### 60301.220. Disinfected secondary-2.2 recycled water

"Disinfected secondary-2.2 recycled water" means recycled water that has been oxidized and disinfected so that the median concentration of total coliform bacteria in the disinfected effluent does not exceed a most probable number (MPN) of 2.2 per 100 milliliters utilizing the bacteriological results of the last seven days for which analyses have been completed, and the number of total coliform bacteria does not exceed an MPN of 23 per 100 milliliters in more than one

sample in any 30 day period.

#### **60301.225. Disinfected secondary-23 recycled water**

"Disinfected secondary-23 recycled water" means recycled water that has been oxidized and disinfected so that the median concentration of total coliform bacteria in the disinfected effluent does not exceed a most probable number (MPN) of 23 per 100 milliliters utilizing the bacteriological results of the last seven days for which analyses have been completed, and the number of total coliform bacteria does not exceed an MPN of 240 per 100 milliliters in more than one sample in any 30 day period.

#### **60301.230. Disinfected tertiary recycled water**

"Disinfected tertiary recycled water" means a filtered and subsequently disinfected wastewater that meets the following criteria:

- (a) The filtered wastewater has been disinfected by either:
  - (1) A chlorine disinfection process following filtration that provides a CT (the product of total chlorine residual and modal contact time measured at the same point) value of not less than 450 milligram-minutes per liter at all times with a modal contact time of at least 90 minutes, based on peak dry weather design flow; or
  - (2) A disinfection process that, when combined with the filtration process, has been demonstrated to inactivate and/or remove 99.999 percent of the plaque forming units of F-specific bacteriophage MS2, or polio virus in the wastewater. A virus that is at least as resistant to disinfection as polio virus may be used for purposes of the demonstration.
- (b) The median concentration of total coliform bacteria measured in the disinfected effluent does not exceed an MPN of 2.2 per 100 milliliters utilizing the bacteriological results of the last seven days for which analyses have been completed and the number of total coliform bacteria does not exceed an MPN of 23 per 100 milliliters in more than one sample in any 30 day period. No sample shall exceed an MPN of 240 total coliform bacteria per 100 milliliters.

#### **60301.240. Drift**

"Drift" means the water that escapes to the atmosphere as water droplets from a cooling system.

### **60301.245. Drift eliminator**

"Drift eliminator" means a feature of a cooling system that reduces to a minimum the generation of drift from the system.

### **60301.250. Dual plumbed system**

"Dual plumbed system" or "dual plumbed" means a system that utilizes separate piping systems for recycled water and potable water within a facility and where the recycled water is used for either of the following purposes:

- (a) To serve plumbing outlets (excluding fire suppression systems) within a building or
- (b) Outdoor landscape irrigation<sup>1</sup> at individual residences.

### **60301.300. F-Specific bacteriophage MS-2**

"F-specific bacteriophage MS-2" means a strain of a specific type of virus that infects coliform bacteria that is traceable to the American Type Culture Collection (ATCC 15597B1) and is grown on lawns of E. coli (ATCC 15597).

### **60301.310. Facility**

"Facility" means any type of building or structure, or a defined area of specific use that receives water for domestic use from a public water system as defined in section 116275 of the Health and Safety Code.

### **60301.320. Filtered wastewater**

"Filtered wastewater" means an oxidized wastewater that meets the criteria in subsection (a) or (b):

- (a) Has been coagulated and passed through natural undisturbed soils or a bed of filter media pursuant to the following:
  - (1) At a rate that does not exceed 5 gallons per minute per square foot of surface area in mono, dual or mixed media gravity, upflow or pressure filtration systems, or does not exceed 2 gallons per minute per square foot of surface area in traveling bridge automatic backwash filters; and

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<sup>1</sup> The Non-Irrigation General Water Reuse Order does not cover landscape irrigation or impoundment, therefore this requirement does not apply to this Order.

- (2) So that the turbidity of the filtered wastewater does not exceed any of the following:
  - (A) An average of 2 NTU within a 24-hour period;
  - (B) 5 NTU more than 5 percent of the time within a 24-hour period; and
  - (C) 10 NTU at any time.
- (b) Has been passed through a microfiltration, ultrafiltration, nanofiltration, or reverse osmosis membrane so that the turbidity of the filtered wastewater does not exceed any of the following:
  - (1) 0.2 NTU more than 5 percent of the time within a 24-hour period; and
  - (2) 0.5 NTU at any time.

**60301.400. Hose bibb**

"Hose bibb" means a faucet or similar device to which a common garden hose can be readily attached.

**60301.600. Modal contact time**

"Modal contact time" means the amount of time elapsed between the time that a tracer, such as salt or dye, is injected into the influent at the entrance to a chamber and the time that the highest concentration of the tracer is observed in the effluent from the chamber.

**60301.630. NTU**

"NTU" (Nephelometric turbidity unit) means a measurement of turbidity as determined by the ratio of the intensity of light scattered by the sample to the intensity of incident light as measured by method 2130 B. in Standard Methods for the Examination of Water and Wastewater, 20th ed.; Eaton, A. D., Clesceri, L. S., and Greenberg, A. E., Eds; American Public Health Association: Washington, DC, 1995; p. 2-8.

**60301.650. Oxidized wastewater**

"Oxidized wastewater" means wastewater in which the organic matter has been stabilized, is nonputrescible, and contains dissolved oxygen.

**60301.660. Peak dry weather design flow**

"Peak Dry Weather Design Flow" means the arithmetic mean of the maximum peak flow rates sustained over some period of time (for example three hours) during the maximum 24-hour dry weather period. Dry weather period is defined as periods of little or no rainfall.

**60301.700. Recycled water agency**

"Recycled water agency" means the public water system, or a publicly or privately owned or operated recycled water system, that delivers or proposes to deliver recycled water to a facility.

**60301.710. Recycling plant**

"Recycling plant" means an arrangement of devices, structures, equipment, processes and controls which produce recycled water.

**60301.740. Regulatory agency**

"Regulatory agency" means the California Regional Water Quality Control Board(s) that have jurisdiction over the recycling plant and use areas.

**Section 60301.830. Standby unit process**

"Standby unit process" means an alternate unit process or an equivalent alternative process which is maintained in operable condition and which is capable of providing comparable treatment of the actual flow through the unit for which it is a substitute.

**60301.900. Undisinfected secondary recycled water**

"Undisinfected secondary recycled water" means oxidized wastewater.

**60301.920. Use area**

"Use area" means an area of recycled water use with defined boundaries. A use area may contain one or more facilities.

## **ARTICLE 2. SOURCES OF RECYCLED WATER.**

### **60302. Source specifications.**

The requirements in this chapter shall only apply to recycled water from sources that contain domestic waste, in whole or in part.

## **ARTICLE 3. USES OF RECYCLED WATER.**

### **60303. Exceptions**

The requirements set forth in this chapter shall not apply to the use of recycled water onsite at a water recycling plant, or wastewater treatment plant, provided access by the public to the area of onsite recycled water use is restricted.

### **60306. Use of recycled water for cooling**

- (a) Recycled water used for industrial or commercial cooling or air conditioning that involves the use of a cooling tower, evaporative condenser, spraying or any mechanism that creates a mist shall be a disinfected tertiary recycled water.
- (b) Use of recycled water for industrial or commercial cooling or air conditioning that does not involve the use of a cooling tower, evaporative condenser, spraying, or any mechanism that creates a mist shall be at least disinfected secondary-23 recycled water.
- (c) Whenever a cooling system, using recycled water in conjunction with an air conditioning facility, utilizes a cooling tower or otherwise creates a mist that could come into contact with employees or members of the public, the cooling system shall comply with the following:
  - (1) A drift eliminator shall be used whenever the cooling system is in operation.
  - (2) A chlorine, or other, biocide shall be used to treat the cooling system recirculating water to minimize the growth of *Legionella* and other micro-organisms.

### **60307. Use of recycled water for other purposes**

- (a) Recycled water used for the following shall be disinfected tertiary recycled water, except that for filtration being provided pursuant to Section

60301.320(a) coagulation need not be used as part of the treatment process provided that the filter effluent turbidity does not exceed 2 NTU, the turbidity of the influent to the filters is continuously measured, the influent turbidity does not exceed 5 NTU for more than 15 minutes and never exceeds 10 NTU, and that there is the capability to automatically activate chemical addition or divert the wastewater should the filter influent turbidity exceed 5 NTU for more than 15 minutes:

- (1) Flushing toilets and urinals,
  - (2) Priming drain traps,
  - (3) Industrial process water that may come into contact with workers, Structural fire fighting,
  - (4) Decorative fountains,
  - (5) Commercial laundries,
  - (6) Consolidation of backfill around potable water pipelines, Artificial snow making for commercial outdoor use, and
  - (7) Consolidation of backfill around potable water pipelines,
  - (8) Artificial snow making for commercial outdoor use, and
  - (9) Commercial car washes, including hand washes if the recycled water is not heated, where the general public is excluded from the washing process.
- (b) Recycled water used for the following uses shall be at least disinfected secondary<sup>23</sup> recycled water:
- (1) Industrial boiler feed,
  - (2) Nonstructural fire fighting,
  - (3) Backfill consolidation around nonpotable piping,
  - (4) Soil compaction,
  - (5) Mixing concrete,

- (6) Dust control on roads and streets,
  - (7) Cleaning roads, sidewalks and outdoor work areas and
  - (8) Industrial process water that will not come into contact with workers.
- (c) Recycled water used for flushing sanitary sewers shall be at least undisinfected secondary recycled water.

## **ARTICLE 4. USE AREA**

### **REQUIREMENTS.**

#### **60310. Use area requirements**

- (a) No irrigation<sup>1</sup> with disinfected tertiary recycled water shall take place within 50 feet of any domestic water supply well unless all of the following conditions have been met:
- (1) A geological investigation demonstrates that an aquitard exists at the well between the uppermost aquifer being drawn from and the ground surface.
  - (2) The well contains an annular seal that extends from the surface into the aquitard.
  - (3) The well is housed to prevent any recycled water spray from coming into contact with the wellhead facilities.
  - (4) The ground surface immediately around the wellhead is contoured to allow surface water to drain away from the well.
  - (5) The owner of the well approves of the elimination of the buffer zone requirement.
- (b) No impoundment<sup>1</sup> of disinfected tertiary recycled water shall occur within 100 feet of any domestic water supply well.
- (c) No irrigation<sup>1</sup> with, or impoundment<sup>1</sup> of, disinfected secondary-2.2 or disinfected secondary-23 recycled water shall take place within 100 feet of any domestic water supply well.



- (d) No irrigation<sup>1</sup> with, or impoundment<sup>1</sup> of, undisinfected secondary recycled water shall take place within 150 feet of any domestic water supply well.
- (e) Any use of recycled water shall comply with the following:
  - (1) Any irrigation<sup>1</sup> runoff shall be confined to the recycled water use area, unless the runoff does not pose a public health threat and is authorized by the regulatory agency.
  - (2) Spray, mist, or runoff shall not enter dwellings, designated outdoor eating areas, or food handling facilities.
  - (3) Drinking water fountains shall be protected against contact with recycled water spray, mist, or runoff.
- (f) No spray irrigation<sup>1</sup> of any recycled water, other than disinfected tertiary recycled water, shall take place within 100 feet of a residence or a place where public exposure could be similar to that of a park, playground, or school yard.
- (g) All use areas where recycled water is used that are accessible to the public shall be posted with signs that are visible to the public, in a size no less than 4 inches high by 8 inches wide, that include the following wording: "RECYCLED WATER - DO NOT DRINK". Each sign shall display an international symbol similar to that shown in figure 60310-A. The Department may accept alternative signage and wording, or an educational program, provided the applicant demonstrates to the Department that the alternative approach will assure an equivalent degree of public notification.
- (h) Except as allowed under section 7604 of title 17, California Code of Regulations, no physical connection shall be made or allowed to exist between any recycled water system and any separate system conveying potable water.
- (i) The portions of the recycled water piping system that are in areas subject to access by the general public shall not include any hose bibbs. Only quick couplers that differ from those used on the potable water system shall be used on the portions of the recycled water piping system in areas subject to public access.



Water Recycling Criteria  
FIGURE 60310-A

## **ARTICLE 5. DUAL PLUMBED RECYCLED WATER SYSTEMS.**

### **60313. General requirements.**

- (a) No person other than a recycled water agency shall deliver recycled water to a dual plumbed facility.
- (b) No recycled water agency shall deliver recycled water for any internal use to any individually-owned residential units including free-standing structures, multiplexes, or condominiums.
- (c) No recycled water agency shall deliver recycled water for internal use except for fire suppression systems, to any facility that produces or processes food products or beverages. For purposes of this Subsection, cafeterias or snack bars in a facility whose primary function does not involve the production or processing of foods or beverages are not considered facilities that produce or process foods or beverages.
- (d) No recycled water agency shall deliver recycled water to a facility using a dual plumbed system unless the report required pursuant to section 13522.5 of the Water Code, and which meets the requirements set forth in section 60314, has been submitted to, and approved by, the regulatory agency.

### **60314. Report submittal**

- (a) For dual-plumbed recycled water systems, the report submitted pursuant to section 13522.5 of the Water Code shall contain the following information in addition to the information required by section 60323:
  - (1) A detailed description of the intended use area identifying the following:
    - (A) The number, location, and type of facilities within the use area proposing to use dual plumbed systems,
    - (B) The average number of persons estimated to be served by each facility on a daily basis,
    - (C) The specific boundaries of the proposed use area including a map showing the location of each facility to be served,
    - (D) The person or persons responsible for operation of the dual plumbed system at each facility, and
    - (E) The specific use to be made of the recycled water at each facility.

- (2) Plans and specifications describing the following:
    - (A) Proposed piping system to be used,
    - (B) Pipe locations of both the recycled and potable systems,
    - (C) Type and location of the outlets and plumbing fixtures that will be accessible to the public, and
    - (D) The methods and devices to be used to prevent backflow of recycled water into the public water system.
  - (3) The methods to be used by the recycled water agency to assure that the installation and operation of the dual plumbed system will not result in cross connections between the recycled water piping system and the potable water piping system. This shall include a description of pressure, dye or other test methods to be used to test the system every four years.
- (b) A master plan report that covers more than one facility or use site may be submitted provided the report includes the information required by this section. Plans and specifications for individual facilities covered by the report may be submitted at any time prior to the delivery of recycled water to the facility.

### **60315. Design requirements**

The public water supply shall not be used as a backup or supplemental source of water for a dual-plumbed recycled water system unless the connection between the two systems is protected by an air gap separation which complies with the requirements of sections 7602 (a) and 7603 (a) of title 17, California Code of Regulations, and the approval of the public water system has been obtained.

### **60316. Operation requirements**

- (a) Prior to the initial operation of the dual-plumbed recycled water system and annually thereafter, the Recycled Water Agency shall ensure that the dual plumbed system within each facility and use area is inspected for possible cross connections with the potable water system. The recycled water system shall also be tested for possible cross connections at least once every four years. The testing shall be conducted in accordance with the method described in the report submitted pursuant to section 60314. The inspections and the testing shall be performed by a cross connection control specialist certified by the California-Nevada section of the American Water Works

Association or an organization with equivalent certification requirements. A written report documenting the result of the inspection or testing for the prior year shall be submitted to the department within 30 days following completion of the inspection or testing.

- (b) The recycled water agency shall notify the department of any incidence of backflow from the dual-plumbed recycled water system into the potable water system within 24 hours of the discovery of the incident.
- (c) Any backflow prevention device installed to protect the public water system serving the dual-plumbed recycled water system shall be inspected and maintained in accordance with section 7605 of Title 17, California Code of Regulations.

## **ARTICLE 5.5. OTHER METHODS OF TREATMENT**

### **60320.5. Other methods of treatment**

Methods of treatment other than those included in this chapter and their reliability features may be accepted if the applicant demonstrates to the satisfaction of the State Department of Health that the methods of treatment and reliability features will assure an equal degree of treatment and reliability.

## **ARTICLE 6. SAMPLING AND ANALYSIS 60321. Sampling and analysis**

- (a) Disinfected secondary-23, disinfected secondary-2.2, and disinfected tertiary recycled water shall be sampled at least once daily for total coliform bacteria. The samples shall be taken from the disinfected effluent and shall be analyzed by an approved laboratory.
- (b) Disinfected tertiary recycled water shall be continuously sampled for turbidity using a continuous turbidity meter and recorder following filtration. Compliance with the daily average operating filter effluent turbidity shall be determined by averaging the levels of recorded turbidity taken at four-hour intervals over a 24-hour period. Compliance with turbidity pursuant to section 60301.320 (a)(2)(B) and (b)(1) shall be determined using the levels of recorded turbidity taken at intervals of no more than 1.2-hours over a 24-hour period. Should the continuous turbidity meter and recorder fail, grab sampling at a minimum frequency of 1.2-hours may be substituted for a period of up to 24-hours. The results of the daily average turbidity determinations shall be reported quarterly to the regulatory agency.

- (c) The producer or supplier of the recycled water shall conduct the sampling required in subsections (a) and (b).

## **ARTICLE 7. ENGINEERING REPORT AND OPERATIONAL REQUIREMENTS**

### **60323. Engineering report**

- (a) No person shall produce or supply reclaimed water for direct reuse from a proposed water reclamation plant unless he files an engineering report.
- (b) The report shall be prepared by a properly qualified engineer registered in California and experienced in the field of wastewater treatment, and shall contain a description of the design of the proposed reclamation system. The report shall clearly indicate the means for compliance with these regulations and any other features specified by the regulatory agency.
- (c) The report shall contain a contingency plan which will assure that no untreated or inadequately treated wastewater will be delivered to the use area.

### **60325. Personnel**

- (a) Each reclamation plant shall be provided with a sufficient number of qualified personnel to operate the facility effectively so as to achieve the required level of treatment at all times.
- (b) Qualified personnel shall be those meeting requirements established pursuant to Chapter 9 (commencing with Section 13625) of the Water Code.

### **60327. Maintenance**

A preventive maintenance program shall be provided at each reclamation plant to ensure that all equipment is kept in a reliable operating condition.

### **60329. Operating records and reports**

- (a) Operating records shall be maintained at the reclamation plant or a central depository within the operating agency. These shall include: all analyses specified in the reclamation criteria; records of operational problems, plant and equipment breakdowns, and diversions to emergency storage or disposal; all corrective or preventive action taken.

- (b) Process or equipment failures triggering an alarm shall be recorded and maintained as a separate record file. The recorded information shall include the time and cause of failure and corrective action taken.
- (c) A monthly summary of operating records as specified under (a) of this section shall be filed monthly with the regulatory agency.
- (d) Any discharge of untreated or partially treated wastewater to the use area, and the cessation of same, shall be reported immediately by telephone to the regulatory agency, the State Department of Health, and the local health officer.

### **60331. Bypass**

There shall be no bypassing of untreated or partially treated wastewater from the reclamation plant or any intermediate unit processes to the point of use.

## **ARTICLE 8. GENERAL REQUIREMENTS OF DESIGN**

### **60333. Flexibility of design**

The design of process piping, equipment arrangement, and unit structures in the reclamation plant must allow for efficiency and convenience in operation and maintenance and provide flexibility of operation to permit the highest possible degree of treatment to be obtained under varying circumstances.

### **60335. Alarms**

- (a) Alarm devices required for various unit processes as specified in other sections of these regulations shall be installed to provide warning of:
  - (1) Loss of power from the normal power supply.
  - (2) Failure of a biological treatment process.
  - (3) Failure of a disinfection process.
  - (4) Failure of a coagulation process.
  - (5) Failure of a filtration process.

- (6) Any other specific process failure for which warning is required by the regulatory agency.
- (b) All required alarm devices shall be independent of the normal power supply of the reclamation plant.
- (c) The person to be warned shall be the plant operator, superintendent, or any other responsible person designated by the management of the reclamation plant and capable of taking prompt corrective action.
- (d) Individual alarm devices may be connected to a master alarm to sound at a location where it can be conveniently observed by the attendant. In case the reclamation plant is not attended full time, the alarm(s) shall be connected to sound at a police station, fire station or other full time service unit with which arrangements have been made to alert the person in charge at times that the reclamation plant is unattended.

### **60337. Power supply**

The power supply shall be provided with one of the following reliability features:

- (a) Alarm and standby power source.
- (b) Alarm and automatically actuated short-term retention or disposal provisions as specified in Section 60341.
- (c) Automatically actuated long-term storage or disposal provisions as specified in Section 60341.

## **ARTICLE 9. RELIABILITY REQUIREMENTS FOR PRIMARY EFFLUENT**

### **60339. Primary treatment**

Reclamation plants producing reclaimed water exclusively for uses for which primary effluent is permitted shall be provided with one of the following reliability features:

- (a) Multiple primary treatment units capable of producing primary effluent with one unit not in operation.
- (b) Long-term storage or disposal provisions as specified in Section 60341.



*Note: Use of primary effluent for recycled water is no longer allowed. [repeal of Section 60309, effective December 2000]*

## **ARTICLE 10. RELIABILITY REQUIREMENTS FOR FULL TREATMENT**

### **60341. Emergency storage or disposal**

- (a) Where short-term retention or disposal provisions are used as a reliability feature, these shall consist of facilities reserved for the purpose of storing or disposing of untreated or partially treated wastewater for at least a 24-hour period. The facilities shall include all the necessary diversion devices, provisions for odor control, conduits, and pumping and pump back equipment. All of the equipment other than the pump back equipment shall be either independent of the normal power supply or provided with a standby power source.
- (b) Where long-term storage or disposal provisions are used as a reliability feature, these shall consist of ponds, reservoirs, percolation areas, downstream sewers leading to other treatment or disposal facilities or any other facilities reserved for the purpose of emergency storage or disposal of untreated or partially treated wastewater. These facilities shall be of sufficient capacity to provide disposal or storage of wastewater for at least 20 days, and shall include all the necessary diversion works, provisions for odor and nuisance control, conduits, and pumping and pump back equipment. All of the equipment other than the pump back equipment shall be either independent of the normal power supply or provided with a standby power source.
- (c) Diversion to a less demanding reuse is an acceptable alternative to emergency disposal of partially treated wastewater provided that the quality of the partially treated wastewater is suitable for the less demanding reuse.
- (d) Subject to prior approval by the regulatory agency, diversion to a discharge point which requires lesser quality of wastewater is an acceptable alternative to emergency disposal of partially treated wastewater.
- (e) Automatically actuated short-term retention or disposal provisions and automatically actuated long-term storage or disposal provisions shall include, in addition to provisions of (a), (b), (c), or (d) of this section, all the necessary sensors, instruments, valves and other devices to enable fully automatic diversion of untreated or partially treated wastewater to approved emergency storage or disposal in the event of failure of a treatment process and a manual reset to prevent automatic restart until the failure is corrected.

### **60343. Primary treatment**

All primary treatment unit processes shall be provided with one of the following reliability features:

- (a) Multiple primary treatment units capable of producing primary effluent with one unit not in operation.
- (b) Standby primary treatment unit process.
- (c) Long-term storage or disposal provisions.

### **60345. Biological treatment**

All biological treatment unit processes shall be provided with one of the following reliability features:

- (a) Alarm and multiple biological treatment units capable of producing oxidized wastewater with one unit not in operation.
- (b) Alarm, short-term retention or disposal provisions, and standby replacement equipment.
- (c) Alarm and long-term storage or disposal provisions.
- (d) Automatically actuated long-term storage or disposal provisions.

### **60347. Secondary sedimentation**

All secondary sedimentation unit processes shall be provided with one of the following reliability features:

- (a) Multiple sedimentation units capable of treating the entire flow with one unit not in operation.
- (b) Standby sedimentation unit process.
- (c) Long-term storage or disposal provisions.

### **60349. Coagulation**

- (a) All coagulation unit processes shall be provided with the following mandatory features for uninterrupted coagulant feed:

- (1) Standby feeders,
  - (2) Adequate chemical stowage and conveyance facilities,
  - (3) Adequate reserve chemical supply, and
  - (4) Automatic dosage control.
- (b) All coagulation unit processes shall be provided with one of the following reliability features:
- (1) Alarm and multiple coagulation units capable of treating the entire flow with one unit not in operation;
  - (2) Alarm, short-term retention or disposal provisions, and standby replacement equipment;
  - (3) Alarm and long-term storage or disposal provisions;
  - (4) Automatically actuated long-term storage or disposal provisions, or
  - (5) Alarm and standby coagulation process.

### **60351. Filtration**

All filtration unit processes shall be provided with one of the following reliability features:

- (a) Alarm and multiple filter units capable of treating the entire flow with one unit not in operation.
- (b) Alarm, short-term retention or disposal provisions and 'standby replacement equipment.
- (c) Alarm and long-term storage or disposal provisions.
- (d) ,Automatically actuated long-term storage or disposal provisions.
- (e) Alarm and standby filtration unit process.

### **Section 60353. Disinfection**

- (a) All disinfection unit processes where chlorine is used as the disinfectant shall be provided with the following features for uninterrupted chlorine feed:

- (1) Standby chlorine supply,
- (2) Manifold systems to connect chlorine cylinders,
- (3) Chlorine scales, and
- (4) Automatic devices for switching to full chlorine cylinders.

Automatic residual control of chlorine dosage, automatic measuring and recording of chlorine residual, and hydraulic performance studies may also be required.

- (b) All disinfection unit processes where chlorine is used as the disinfectant shall be provided with one of the following reliability features:
  - (1) Alarm and standby chlorinator;
  - (2) Alarm, short-term retention or disposal provisions, and standby replacement equipment;
  - (3) Alarm and long-term storage or disposal provisions;
  - (4) Automatically actuated long-term storage or disposal provisions; or
  - (5) Alarm and multiple point chlorination, each with independent power source, separate chlorinator, and separate chlorine supply.

#### **60355. Other alternatives to reliability requirements**

Other alternatives to reliability requirements set forth in Articles 8 to 10 may be accepted if the applicant demonstrates to the satisfaction of the State Department of Health that the proposed alternative will assure an equal degree of reliability.