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California Regulations Related to Recycled Water

*Excerpts from Titles 22 and 17 California Code of Regulations
State Board, Division of Drinking Water, Recycled Water Regulations
Last updated October 1, 2018*

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TITLE 17 CODE OF REGULATIONS

Division 1. State Department of Health Services

Chapter 5. Sanitation (Environmental)

Group 4. Drinking Water Supplies

Article 1. General.

§7583. Definitions.

In addition to the definitions in Section 4010.1 of the Health and Safety Code, the following terms are defined for the purpose of this Chapter:

- (a) **“Approved Water Supply”** is a water supply whose potability is regulated by a State of local health agency.
- (b) **“Auxiliary Water Supply”** is any water supply other than that received from a public water system.
- (c) **“Air-gap Separation (AG)”** is a physical break between the supply line and a receiving vessel.
- (d) **“AWWA Standard”** is an official standard developed and approved by the American Water Works Association (AWWA).
- (e) **“Cross-Connection”** is an unprotected actual or potential connection between a potable water system used to supply water for drinking purposes and any source or system containing unapproved water or a substance that is not or cannot be approved as safe, wholesome, and potable. By-pass arrangements, jumper connections, removable sections, swivel or changeover devices, or other devices through which backflow could occur, shall be considered to be cross-connections.
- (f) **“Double Check Valve Assembly (DC)”** is an assembly of at least two independently acting check valves including tightly closing shut-off valves on each side of the check valve assembly and test cocks available for testing the watertightness of each check valve.
- (g) **“Health Agency”** means the California Department of Health Services, or the local health officer with respect to a small water system.
- (h) **“Local Health Agency”** means the county or city health authority.
- (i) **“Reclaimed Water”** is a wastewater which as a result of treatment is suitable for uses other than potable use.
- (j) **“Reduced Pressure Principle Backflow Prevention Device (RP)”** is a backflow preventer incorporating not less than two check valves, an automatically operated differential relief valve located between the two check valves, a tightly closing shut-off valve on each side of the check valve assembly, and equipped with necessary test cocks for testing.
- (k) **“User Connection”** is the point of connection of a user's piping to the water supplier's facilities.
- (l) **“Water Supplier”** is the person who owns or operates the public water system.
- (m) **“Water User”** is any person obtaining water from a public water supply.

§7584. Responsibility and scope of program.

The water supplier shall protect the public water supply from contamination by implementation of a cross-connection control program. The program, or any portion thereof, may be implemented directly by the water supplier or by means of a contract with the local health agency, or with

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another agency approved by the health agency. The water supplier's cross-connection control program shall for the purpose of addressing the requirements of Sections 7585 through 7605 include, but not be limited to, the following elements:

- (a) The adoption of operating rules or ordinances to implement the cross-connection program.
- (b) The conducting of surveys to identify water user premises where cross-connections are likely to occur,
- (c) The provisions of backflow protection by the water user at the user's connection or within the user's premises or both,
- (d) The provision of at least one person trained in cross-connection control to carry out the cross-connection program,
- (e) The establishment of a procedure or system for testing backflow preventers, and
- (f) The maintenance of records of locations, tests, and repairs of backflow preventers.

§7585. Evaluation of hazard.

The water supplier shall evaluate the degree of potential health hazard to the public water supply which may be created as a result of conditions existing on a user's premises. The water supplier, however, shall not be responsible for abatement of cross-connections which may exist within a user's premises. As a minimum, the evaluation should consider: the existence of cross-connections, the nature of materials handled on the property, the probability of a backflow occurring, the degree of piping system complexity and the potential for piping system modification. Special consideration shall be given to the premises of the following types of water users:

- (a) Premises where substances harmful to health are handled under pressure in a manner which could permit their entry into the public water system. This includes chemical or biological process waters and water from public water supplies which have deteriorated in sanitary quality.
- (b) Premises having an auxiliary water supply, unless the auxiliary supply is accepted as an additional source by the water supplier and is approved by the health agency.
- (c) Premises that have internal cross-connections that are not abated to the satisfaction of the water supplier or the health agency.
- (d) Premises where cross-connections are likely to occur and entry is restricted so that cross-connection inspections cannot be made with sufficient frequency or at sufficiently short notice to assure that cross-connections do not exist.
- (e) Premises having a repeated history of cross-connections being established or re-established.

§7586. User supervisor.

The health agency and water supplier may, at their discretion, require an industrial water user to designate a user supervisor when the water user's premises has a multipiping system that convey various types of fluids, some of which may be hazardous and where changes in the piping system are frequently made. The user supervisor shall be responsible for the avoidance of cross-connections during the installation, operation and maintenance of the water user's pipelines and equipment.

Article 2. Protection of Water System.

§7601. Approval of backflow preventers.

Backflow preventers required by this Chapter shall have passed laboratory and field evaluation tests performed by a recognized testing organization which has demonstrated their competency to perform such tests to the Department.

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§7602. Construction of backflow preventers.

- (a) Air-gap Separation. An Air-gap separation (AG) shall be at least double the diameter of the supply pipe, measured vertically from the flood rim of the receiving vessel to the supply pipe; however, in no case shall this separation be less than one inch.
- (b) Double Check Valve Assembly. A required double check valve assembly (DC) shall, as a minimum, conform to the AWWA Standard C506-78 (R83) adopted on January 28, 1978 for Double Check Valve Type Backflow Preventive Devices which is herein incorporated by reference.
- (c) Reduced Pressure Principle Backflow Prevention Device. A required reduced pressure principle backflow prevention device (RP) shall, as a minimum, conform to the AWWA Standard C506-78 (R83) adopted on January 28, 1978 for Reduced Pressure Principle Type Backflow Prevention Devices which is herein incorporated by reference.

§7603. Location of backflow preventers.

- (a) Air-gap Separation. An air-gap separation shall be located as close as practical to the user's connection and all piping between the user's connection and the receiving tank shall be entirely visible unless otherwise approved in writing by the water supplier and the health agency.
- (b) Double Check Valve Assembly. A double check valve assembly shall be located as close as practical to the user's connection and shall be installed above grade, if possible, and in a manner where it is readily accessible for testing and maintenance.
- (c) Reduced Pressure Principle Backflow Prevention Device. A reduced pressure principle backflow prevention device shall be located as close as practical to the user's connection and shall be installed a minimum of twelve inches (12") above grade and not more than thirty-six inches (36") above grade measured from the bottom of the device and with a minimum of twelve inches (12") side clearance.

§7604. Type of protection required.

The type of protection that shall be provided to prevent backflow into the public water supply shall be commensurate with the degree of hazard that exists on the consumer's premises. The type of protective device that may be required (listed in an increasing level of protection) includes: Double check Valve Assembly--(DC), Reduced Pressure Principle Backflow Prevention Device--(RP) and an Air gap Separation--(AG). The water user may choose a higher level of protection than required by the water supplier. The minimum types of backflow protection required to protect the public water supply, at the water user's connection to premises with various degrees of hazard, are given in Table 1. Situations not covered in Table 1 shall be evaluated on a case-by-case basis and the appropriate backflow protection shall be determined by the water supplier or health agency.

TABLE 1
TYPE OF BACKFLOW PROTECTION REQUIRED

Degree of Hazard	Minimum Type of Backflow Prevention
(a) Sewage and Hazardous Substances	
(1) Premises where there are waste water pumping and/or treatment plants and there is no interconnection with the potable water system. This does not	AG

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- include a single-family residence that has a sewage lift pump. A RP be provided in lieu of an AG if approved by the health agency and water supplier.
- (2) Premises where hazardous substances are handled in any manner in which the substances may enter the potable water system. This does not include a single-family residence that has a sewage lift pump. A RP may be provided in lieu of an AG if approved by the health agency and water supplier. AG
- (3) Premises where there are irrigation systems into which fertilizers, herbicides, or pesticides are, or can be, injected. RP
- (b) Auxiliary Water Supplies
- (1) Premises where there is an unapproved auxiliary water supply which is interconnected with the public water system. A RP or DC may be provided in lieu of an AG if approved by the health agency and water supplier. AG
- (2) Premises where there is an unapproved auxiliary RP water supply and there are no interconnections with the public water system. A DC may be provided in lieu of a RP if approved by the health agency and water supplier. RP
- (c) Recycled water
- (1) Premises where the public water system is used to supplement the recycled water supply. AG
- (2) Premises where recycled water is used, other than as allowed in paragraph (3), and there is no interconnection with the potable water system. RP
- (3) Residences using recycled water for landscape irrigation as part of an approved dual plumbed use area established pursuant to sections 60313 through 60316 unless the recycled water supplier obtains approval of the local public water supplier, or the Department if the water supplier is also the supplier of the recycled water, to utilize an alternative backflow protection plan that includes an annual inspection and annual shutdown test of the recycled water and potable water systems pursuant to subsection 60316(a). DC
- (d) Fire Protection Systems
- (1) Premises where the fire system is directly supplied from the public water system and there is an unapproved auxiliary water supply on or to the premises (not interconnected). DC
- (2) Premises where the fire system is supplied from the public water system and interconnected with an unapproved auxiliary water supply. A RP may be provided in lieu of an AG if approved by the health agency and water supplier. AG
- (3) Premises where the fire system is supplied from the public water system and where either elevated storage tanks or fire pumps which take suction from private reservoirs or tanks are used. DC
- (4) Premises where the fire system is supplied from the public water system and where recycled water is used in a separate piping system within the same building. DC
- (e) Dockside Watering Points and Marine Facilities
- (1) Pier hydrants for supplying water to vessels for any purpose. RP
- (2) Premises where there are marine facilities. RP

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(f) Premises where entry is restricted so that inspections for cross-connections cannot be made with sufficient frequency or at sufficiently short notice to assure that do not exist. RP

(g) Premises where there is a repeated history of crossconnections being established or re-established. RP

§7605. Testing and maintenance of backflow preventers.

- (a) The water supplier shall assure that adequate maintenance and periodic testing are provided by the water user to ensure their proper operation.
- (b) Backflow preventers shall be tested by persons who have demonstrated their competency in testing of these devices to the water supplier or health agency.
- (c) Backflow preventers shall be tested at least annually or more frequently if determined to be necessary by the health agency or water supplier. When devices are found to be defective, they shall be repaired or replaced in accordance with the provisions of this Chapter.
- (d) Backflow preventers shall be tested immediately after they are installed, relocated or repaired and not placed in service unless they are functioning as required.
- (e) The water supplier shall notify the water user when testing of backflow preventers is needed. The notice shall contain the date when the test must be completed.
- (f) Reports of testing and maintenance shall be maintained by the water supplier for a minimum of three years.

TITLE 22 CODE OF REGULATIONS

Division 4. Environmental Health

Chapter 1. Introduction

Article 1. Definitions.

§60001. Department.

Whenever the term “department” is used in this division, it means the State Department of Health Services, unless otherwise specified.

§60003. Director.

Whenever the term “director” is used in this division, it means the Director, State Department of Health Services, unless otherwise specified.

Chapter 2. Regulations for the Implementation of the California Environmental Quality

Article 1. General Requirements and Categorical Exemptions

§60100. General requirements.

The Department of Health Services incorporates by reference the objectives, criteria, and procedures as delineated in Chapters 1, 2, 2.5, 2.6, 3, 4, 5, and 6, Division 13, Public Resources Code, Sections 21000 et seq., and the Guidelines for the Implementation of the California Environmental Quality Act, Title 14, Division 6, Chapter 3, California Administrative Code, Sections 15000 et seq.

§60101. Specific activities within categorical exempt classes.

The following specific activities are determined by the Department to fall within the classes of categorical exemptions set forth in Sections 15300 et seq. of Title 14 of the California Administrative Code:

- (a) Class 1: Existing Facilities.
 - (1) Any interior or exterior alteration of water treatment units, water supply systems, and pump station buildings where the alteration involves the addition, deletion, or modification of mechanical, electrical, or hydraulic controls.
 - (2) Maintenance, repair, replacement, or reconstruction to any water treatment process units, including structures, filters, pumps, and chlorinators.

- (b) Class 2: Replacement or Reconstruction.
 - (1) Repair or replacement of any water service connections, meters, and valves for backflow prevention, air release, pressure regulating, shut-off and blow-off or flushing.
 - (2) Replacement or reconstruction of any existing water supply distribution lines, storage tanks and reservoirs of substantially the same size.
 - (3) Replacement or reconstruction of any water wells, pump stations and related appurtenances.

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(c) Class 3: New Construction of Small Structures.

- (1) Construction of any water supply and distribution lines of less than sixteen inches in diameter, and related appurtenances.
- (2) Construction of any water storage tanks and reservoirs of less than 100,000 gallon capacity.

(d) Class 4: Minor Alterations to Land.

- (1) Minor alterations to land, water, or vegetation on any officially existing designated wildlife management areas or fish production facilities for the purpose of reducing the environmental potential for nuisances or vector production.
- (2) Any minor alterations to highway crossings for water supply and distribution lines.

Chapter 3. Water Recycling Criteria

Article 1. Definitions.

§60301.050. 24-hour Composite Sample.

"24-hour Composite Sample" means an aggregate sample derived from no fewer than eight discrete samples collected at equal time intervals or collected proportional to the flow rate over the compositing period. The aggregate sample shall reflect the average source water quality covering the composite 24-hour sample period.

§60301.080. Added Tracer.

"Added Tracer" means a non-reactive substance, with measureable characteristics distinctly different from the receiving groundwater, intentionally added to the water applied at a Groundwater Replenishment Reuse Project (GRRP) for the purpose of being a tracer such that the tracer can be readily identified in the groundwater downgradient of the GRRP to determine the underground retention time of the applied water.

§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.

§60301.120. Augmented Reservoir.

"Augmented Reservoir" means a surface water reservoir used as a source of domestic drinking water supply that receives recycled municipal wastewater from a Surface Water Source Augmentation Project (SWSAP).

§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.

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§60301.180. Department.

“Department” means the California Department of Public Health or its successor with authority to regulate public water systems.

§60301.190. Diluent Water.

“Diluent Water” means water, meeting the diluent requirements of this Chapter, used for reducing the recycled municipal wastewater contribution over time.

§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.

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§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 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 (ATCC15597B1) 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
 - (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.

§60301.330. Food crops.

“Food crops” means any crops intended for human consumption.

§60301.370. Groundwater.

“Groundwater” means water below the land surface in a saturated zone.

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§60301.390. Groundwater Replenishment Reuse Project or GRRP.

“Groundwater Replenishment Reuse Project” or “GRRP” means a project involving the planned use of recycled municipal wastewater that is operated for the purpose of replenishing a groundwater basin designated in the Water Quality Control Plan [as defined in Water Code section 13050(j)] for use as a source of municipal and domestic water supply.

§60301.400. Hose bib.

“Hose bib” means a faucet or similar device to which a common garden hose can be readily attached.

§60301.450. Indicator Compound.

“Indicator Compound” means an individual chemical in a municipal wastewater that represents the physical, chemical, and biodegradable characteristics of a specific family of trace organic chemicals; is present in concentrations that provide information relative to the environmental fate and transport of those chemicals; may be used to monitor the efficiency of trace organic compound removal by treatment processes; and provides an indication of treatment process failure.

§60301.455. Intrinsic Tracer.

“Intrinsic Tracer” means a substance or attribute present in the recharge water at levels different from the receiving groundwater such that the substance in the water applied at the GRRP can be distinctly and sufficiently detected in the groundwater downgradient of the GRRP to determine the underground retention time of the water.

§60301.550. Landscape impoundment.

“Landscape impoundment” means an impoundment in which recycled water is stored or used for aesthetic enjoyment or landscape irrigation, or which otherwise serves a similar function and is not intended to include public contact.

§60301.575. Maximum Contaminant Level or MCL.

“Maximum Contaminant Level” or “MCL” means the maximum permissible concentration of a contaminant established pursuant to sections 116275(c)(1) and (d) of the Health and Safety Code or established by the U.S. Environmental Protection Agency.

§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.

§60301.620. Nonrestricted recreational impoundment.

“Nonrestricted recreational impoundment” means an impoundment of recycled water, in which no limitations are imposed on body-contact water recreational activities.

§60301.625. Notification Level or NL.

“Notification Level” or “NL” means the concentration of a contaminant established by the Department pursuant to section 116455 of the Health and Safety Code.

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§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.

§60301.670. Project Sponsor.

“Project Sponsor” means an entity subject to a Regional Water Quality Control Board’s (Regional Board’s) water recycling requirements for a Groundwater Replenishment Reuse Project (GRRP) and is, in whole or part, responsible for applying to the Regional Board for a permit, obtaining a permit, operation of a GRRP, and complying with the terms and conditions of the permit and the requirements of this Chapter.

§60301.680. Public Water System.

“Public Water System” has the same meaning as defined in section 116275(h) of the Health and Safety Code.

§60301.685. Recharge Water.

“Recharge Water” means recycled municipal wastewater, or the combination of recycled municipal wastewater and credited diluent water, which is utilized by a GRRP for groundwater replenishment.

§60301.690. Recycled Municipal Wastewater.

“Recycled Municipal Wastewater” means recycled water that is the effluent from the treatment of wastewater of municipal origin.

§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.

§60301.705. Recycled Municipal Wastewater Contribution or RWC.

“Recycled Municipal Wastewater Contribution” or “RWC” means the fraction equal to the quantity of recycled municipal wastewater applied at the GRRP divided by the sum of the quantity of recycled municipal wastewater and credited diluent water.

§60301.710. Recycling plant.

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

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§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.

§60301.750. Restricted access golf course.

“Restricted access golf course” means a golf course where public access is controlled so that areas irrigated with recycled water cannot be used as if they were part of a park, playground, or school yard and where irrigation is conducted only in areas and during periods when the golf course is not being used by golfers.

§60301.760. Restricted recreational impoundment.

“Restricted recreational impoundment” means an impoundment of recycled water in which recreation is limited to fishing, boating, and other non-body-contact water recreational activities.

§60301.770. Regional Board.

“Regional Board” means the Regional Water Quality Control Board.

§60301.780. Saturated Zone.

“Saturated Zone” means an underground region or regions in which all interstices in, between, and below natural geologic materials are filled with water, with the uppermost surface of the saturated zone being the water table.

§60301.800. Spray irrigation.

“Spray irrigation” means the application of recycled water from sprinklers to crops or vegetation.

§60301.810. Spreading Area.

“Spreading Area” means a natural or constructed impoundment with a depth equal to or less than its widest surface dimension used by a GRRP to replenish a groundwater basin with recharge water infiltrating and percolating through a zone that, in the absence of a GRRP, would be an unsaturated zone.

§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.

§60301.840. Subsurface Application.

“Subsurface Application” means the application of recharge water to a groundwater basin(s) by a means other than surface application.

§60301.850. Surface Application.

“Surface Application” means the application of recharge water to a spreading area.

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§60301.850.5. Surface Water.

As used in this Article and Article 5.3 of this Chapter, "Surface Water" has the same meaning as defined in section 64651.83 of Chapter 17¹.

§60301.851. Surface Water Source Augmentation Project or SWSAP.

"Surface Water Source Augmentation Project" or "SWSAP" means a project involving the planned placement of recycled municipal wastewater into a surface water reservoir that is used as a source of domestic drinking water supply, for the purpose of supplementing the source of domestic drinking water supply.

§60301.852. Surface Water Source Augmentation Project Public Water System or SWSAP PWS.

"Surface Water Source Augmentation Project Public Water System" or "SWSAP PWS" means a public water system that plans to utilize or is utilizing an augmented reservoir as a source of drinking water and is responsible for complying with the requirements of Chapter 17¹ and the applicable requirements of this Chapter.

§60301.853. Surface Water Source Augmentation Project Water Recycling Agency or SWSAP WRA.

"Surface Water Source Augmentation Project Water Recycling Agency" or "SWSAP WRA" means an agency that is subject to a Regional Water Quality Control Board's (Regional Board's) water-recycling requirements applicable to a Surface Water Source Augmentation Project (SWSAP) and is, in whole or part, responsible for applying to the Regional Board for a permit, obtaining a permit, the operation of a SWSAP, and complying with the terms and conditions of the Regional Board permit and the requirements of this Chapter.

§60301.855. Surrogate Parameter.

"Surrogate Parameter" means a measurable physical or chemical property that has been demonstrated to provide a direct correlation with the concentration of an indicator compound, can be used to monitor the efficiency of trace organic compounds removal by a treatment process, and/or provides an indication of a treatment process failure.

§60301.860. Total Nitrogen.

"Total Nitrogen" means the sum of concentrations of ammonia, nitrite, nitrate, and organic nitrogen-containing compounds, expressed as nitrogen.

§60301.870. Total Organic Carbon or TOC.

"Total Organic Carbon" or "TOC" means the concentration of organic carbon present in water.

§60301.900. Undisinfected secondary recycled water.

"Undisinfected secondary recycled water" means oxidized wastewater.

§60301.910. Unsaturated Zone.

"Unsaturated Zone" means the volume between the land surface and the uppermost saturated zone.

¹ Chapter 17, in its entirety, may be found in the DDW's "Drinking Water-Related Regulations" located here: https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/Lawbook.html

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§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.

§60304. Use of recycled water for irrigation.

- (a) Recycled water used for the surface irrigation of the following shall be a disinfected tertiary recycled water, except that for filtration 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) Food crops, including all edible root crops, where the recycled water comes into contact with the edible portion of the crop,
 - (2) Parks and playgrounds,
 - (3) School yards,
 - (4) Residential landscaping,
 - (5) Unrestricted access golf courses, and
 - (6) Any other irrigation use not specified in this section and not prohibited by other sections of the California Code of Regulations.
- (b) Recycled water used for the surface irrigation of food crops where the edible portion is produced above ground and not contacted by the recycled water shall be at least disinfected secondary-2.2 recycled water.
- (c) Recycled water used for the surface irrigation of the following shall be at least disinfected secondary-2.3 recycled water:
- (1) Cemeteries,
 - (2) Freeway landscaping,
 - (3) Restricted access golf courses,
 - (4) Ornamental nursery stock and sod farms where access by the general public is not restricted,
 - (5) Pasture for animals producing milk for human consumption, and
 - (6) Any nonedible vegetation where access is controlled so that the irrigated area cannot be used as if it were part of a park, playground or school yard

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- (d) Recycled wastewater used for the surface irrigation of the following shall be at least undisinfected secondary recycled water:
 - (1) Orchards where the recycled water does not come into contact with the edible portion of the crop,
 - (2) Vineyards where the recycled water does not come into contact with the edible portion of the crop,
 - (3) Non food-bearing trees (Christmas tree farms are included in this category provided no irrigation with recycled water occurs for a period of 14 days prior to harvesting or allowing access by the general public),
 - (4) Fodder and fiber crops and pasture for animals not producing milk for human consumption,
 - (5) Seed crops not eaten by humans,
 - (6) Food crops that must undergo commercial pathogen-destroying processing before being consumed by humans, and
 - (7) Ornamental nursery stock and sod farms provided no irrigation with recycled water occurs for a period of 14 days prior to harvesting, retail sale, or allowing access by the general public.
- (e) No recycled water used for irrigation, or soil that has been irrigated with recycled water, shall come into contact with the edible portion of food crops eaten raw by humans unless the recycled water complies with subsection (a).

§60305. Use of recycled water for impoundments.

- (a) (a) Except as provided in subsection (b), recycled water used as a source of water supply for nonrestricted recreational impoundments shall be disinfected tertiary recycled water that has been subjected to conventional treatment.
- (b) (b) Disinfected tertiary recycled water that has not received conventional treatment may be used for nonrestricted recreational impoundments provided the recycled water is monitored for the presence of pathogenic organisms in accordance with the following:
 - (1) During the first 12 months of operation and use the recycled water shall be sampled and analyzed monthly for *Giardia*, enteric viruses, and *Cryptosporidium*. Following the first 12 months of use, the recycled water shall be sampled and analyzed quarterly for *Giardia*, enteric viruses, and *Cryptosporidium*. The ongoing monitoring may be discontinued after the first two years of operation with the approval of the department. This monitoring shall be in addition to the monitoring set forth in section 60321.
 - (2) The samples shall be taken at a point following disinfection and prior to the point where the recycled water enters the use impoundment. The samples shall be analyzed by an approved laboratory and the results submitted quarterly to the regulatory agency.
- (c) The total coliform bacteria concentrations in recycled water used for nonrestricted recreational impoundments, measured at a point between the disinfection process and the point of entry to the use impoundment, shall comply with the criteria specified in section 60301.230 (b) for disinfected tertiary recycled water.
- (d) Recycled water used as a source of supply for restricted recreational impoundments and for any publicly accessible impoundments at fish hatcheries shall be at least disinfected secondary-2.2 recycled water.

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- (e) Recycled water used as a source of supply for landscape impoundments that do not utilize decorative fountains shall be at least disinfected secondary-23 recycled water.

§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 microorganisms.

§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,
 - (4) Structural fire fighting,
 - (5) Decorative fountains,
 - (6) Commercial laundries,
 - (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-23 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.

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- (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 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 of disinfected tertiary recycled water shall occur within 100 feet of any domestic water supply well.
- (c) No irrigation with, or impoundment 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 with, or impoundment 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 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 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.

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- (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) Except for use in a cemetery that complies with the requirements of section 8118 of the Health and Safety Code, the portions of the recycled water piping system that are in areas subject to access by the general public shall not include any hose bibs. 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

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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) Except as allowed pursuant to section 13553(d) of the Water Code, a recycled water agency shall not deliver recycled water for any internal use to any individually- owned residential units including free-standing structures, multiplexes, or condominiums.²
- (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

² AB 1406, Chapter 537, Statutes of 2007, Water Code 13553, et seq., allows condominiums to be plumbed with recycled water, subject to a number of provisions.

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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.

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- (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 recycled water for reuse from a water reclamation plant without a Department-approved engineering report.
- (b) The report shall be prepared by a qualified engineer licensed 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.

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- (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.

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- (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.

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.

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§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.

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§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.

§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.

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