APPENDIX J

LA COUNTY DEPARTMENT OF PUBLIC HEALTH GUIDELINES FOR ALTERNATE WATER SOURCES-INDOOR & OUTDOOR NON-POTABLE USES

Intentionally Left Blank

COUNTY OF LOS ANGELES
Public Health
Environmental Health

POLICY AND OPERATIONS MANUAL

SUBJECT:	APPROVAL AND USE OF CISTERNS FOR RAINFALL / RUN-OFF CAPTURE AND DISTRIBUTION		
POLICY NO.:	515.07	EFFECTIVE DATE:	JANUARY 25, 2010
APPROVED BY:		SUPERCEDES:	NEW

PROGRAM AFFECTED: CROSS CONNECTION AND WATER POLLUTION CONTROL, DRINKING WATER AND LAND USE PROGRAMS

PURPOSE:

To establish standardized procedures for the review and approval of plans and specifications for rainfall / non-potable cistern water capture and distribution systems. Additionally, this policy is intended to provide guidelines for the approved use and operational practices for any proposed system prior to implementation.

These requirements will provide the necessary procedures to acquire approval for the installation of pipeline which will convey untreated rain-fall, non-potable cistern water and / or urban run-off water for **irrigation purposes only**. Moreover, it is intended to establish requirements for the protection of the potable domestic water supply as well as that of public health.

Treatment systems for rain, gray and urban run-off water for re-use in toilet flushing have been proposed but are not covered within these requirements.

BACKGROUND:

Rain barrels and cisterns are methods of storing rainfall and runoff on-site for landscape irrigation purposes. In semi-arid Los Angeles County, captured rainfall / runoff are valuable resources that could reduce the amount of water that must be imported for domestic use. For this reason, there should be no impediment to storing and reusing rainfall and run-off as long as it can be done safely with adequate protection of public health.

Presently within Los Angeles County, there are no regulatory definitions of rainfall, non-potable cistern water or urban run-off that would categorize them as either recycled water or any other regulated water source. These types of non-potable water sources are categorized within the scope of "alternate non-potable water supplies". Therefore rainfall / run-off, non-potable cistern and urban run-off water, for the purposes of these requirements shall be recognized by the Los Angeles County Department of Public Health – Environmental Health (the Department) (pending adoption of proposed regulation) as "alternate non-potable water supply sources". Those regulations pertaining to the protection of the domestic water supply in relation to an "alternate non-potable water supply source" shall apply.

These requirements are intended to focus on projects which integrate below-grade pipelines, pumps and large capacity holding tanks but not necessarily rain barrels that collect rainfall / run-off water from residential rooftops, gravity-fed and / or hand-held

devices. They apply to onsite collection and re-use for the **same site only**. Offsite distribution of collected rainfall / non-potable cistern and urban run-off to other properties shall be evaluated by the California State Department of Public Health (CADPH) in conjunction with the California State Regional Water Quality Control Board (RWQCB).

DEFINITIONS:

Alternate Non-Potable Water Supply is a non-potable source of water which includes gray water, rainfall/run-off non-potable cistern water, urban run-off, on site treated water and recycled/reclaimed water.

Cistern (non-potable) refers to a receptacle or rainwater catchment system for storing water, usually underground, which captures non-potable water run-off for the purposes of reusing the water for irrigation purposes. Non-potable cisterns are distinct from Potable Cisterns that are installed and managed as potable water reservoirs/storage.

Gray water refers to untreated waste water which has not come into contact with toilet waste. Gray water includes used water from bathtubs, showers, bathroom wash basins, clothes washing machines and laundry. It does not include waste water from kitchen sinks, photo lab sinks, dishwashers or laundry water from soiled diapers.

Non-Potable Water refers to water which is not intended for human consumption. Two distinct variations are inclusive in this definition: Non-potable water from a potable source, via a dedicated backflow prevention device vs. untreated non-potable water from collection methods that never originated from a potable source. The term non-potable water is all-inclusive with respect to the various non-potable water supplies mentioned within these requirements.

Onsite Water Supervisor refers to that person appointed at each location proposing to install a non-potable water cistern, as provided for under Title 17, Section 7586, California Code of Regulations who is responsible for the protection of the potable water system from cross connections. This person is responsible for installation, operation, maintenance of the rain-fall / non-potable cistern water and potable water systems, prevention of potential hazards, implementation of these requirements, and coordination with the Department.

Potable Water refers to water which is fit for consumption by humans and other animals. The U.S. Environmental Protection Agency (EPA) identifies contaminants that may adversely affect public health that occur in drinking water with a frequency and at levels that pose a threat to public health. The EPA establishes maximum contaminant levels (MCLs) (both biological and chemical) permissible in drinking water. These MCLs become enforceable standards.

Rain-fall/ Non-potable Cistern Water refers to the harvested rainwater/storm water collected within a cistern from a rain event and/or urban run-off. Cisterns in Los Angeles County may serve as a secondary source of water for applications that do not require potable water, such as landscape irrigation, which can dramatically lower the potable water demand and reducing off-site rain-fall runoff.

Recycled Water / Reclaimed Water refers to tertiary-treated water produced from the three-stage treatment of municipal wastewater. Recycled water is allowable for full-body human contact but not for direct human consumption. Purple pipe is the designated pipeline material specifically allowed to convey tertiary treated recycled water. Other

non-potable water sources as mentioned in these requirements shall **not** use purple pipe. Untreated stored rainfall/run-off should not be confused with tertiary treated wastewater, defined in Title 22 of the California Code of Regulations.

Urban run-off – refers to non-potable water from a dry weather run-off catchment system used for the collection of water run-off which does not necessarily come from a rain event.

POLICY:

The Department shall review construction plans and operational practices for any proposed rainfall / non-potable cistern water capture and distribution system. The Department shall approve those systems which meet the Department Guidelines.

PROCEDURE:

PLAN REVIEW AND SUBMISSION

1. Plans and specifications for the rain-fall/non-potable cistern water capture, distribution, use and operational practices shall be submitted for review and approval to the Department prior to implementation. The applicable Building & Safety Departments having jurisdiction shall also be notified for approval.

2. The Department will review the plans and operational practices to ensure safe re-use practices, correct labeling of pipelines and appropriate separation from potable water supplies and sanitary sewer lines, prior to approval.

3. Prior to commencing new or retrofit construction the contractor or installer shall contact the Department, to arrange for inspection of all on-site rain-fall/non-potable cistern water and potable water work. No excavation or open trench may be backfilled without first securing the Department approval. If any piping, rain-fall/non-potable cistern water or potable water, is installed prior to plan check approval and/or inspection, all or any portion of the system may be required to be exposed and corrected as necessary.

4. The rain-fall/non-potable cistern water system shall be constructed in conformance with potable water system construction standards and in accordance with all other governing codes, rules and regulations.

5. Unused or abandoned potable water lines are to be severed and capped as close to water mains as practical and a four-foot section of abandoned line removed. The cap shall be cemented under the Department's supervision.

REQUIRED SEPARATION OF LINES

In order to minimize construction accidents resulting in pipeline breaks, which may pollute the domestic water supply or accidental cross-connections between rain-fall/non-potable cistern water and potable water systems, maximum attainable separation of non-potable cistern water lines and potable water lines is required.

- Parallel Construction: There shall be at least a four foot (4') separation for all pressure mains, all distances measured from pipeline outside diameter. In restricted areas where 4 foot separations cannot be met, the use of sleeved pipe is required.

- Cross-Over Construction: Perpendicular pipeline installation is set at a one foot (1') separation, with potable water pipes above rain-fall/non-potable cistern water pipes, and one full pipe length centered over crossing.

- Alternative Cross-Over construction (distance not maintained): Either the rain-fall/non-potable cistern water may be sleeved with the same class piping (usually schedule 40 PVC) for one full pipe length (minimum four feet) centered over the cross-over.

Existing On-site piping – To the extent feasible, maximum separation of rain-fall/non-potable cistern water lines and potable water lines shall be practiced upon system addition or modification.

IDENTIFICATION OF LINES

All rainfall/non-potable cistern water main lines, valve boxes and appurtenances shall be identified to clearly distinguish between non-potable cistern water and potable water systems. Specific wording on identification tape shall be required. Evaluation shall be on a case-by-case basis, but with the understanding that the minimum requirement for pipeline identification is per the Uniform Plumbing Code. The following identification tape will be accompanied with respective tags of the same colors and wording for all valve boxes, vaults, control valves, quick couplers, outlets and related appurtenances, if applicable.

a. ***POTABLE WATER*** – All potable water lines are required to be installed in accordance with the Uniform Plumbing Code and all other governing codes, rules and regulations. Buried potable water lines shall be identified by continuous tape with lettering on three inch (3") minimum width green or blue tape with one inch black lettering bearing the continuous wording **"Potable Water".** Identification tape shall be permanently affixed to the pipeline at five foot intervals atop all horizontal piping, laterals and mains. Identification tape shall extend to all valve boxes and/or vaults, exposed piping and hydrants. Identification tape is not necessary for extruded colored PVC with continuous wording **"Potable Water"** printed in contrasting lettering on opposite sides of the pipe.

b. ***RAIN-FALL/NON-POTABLE CISTERN WATER*** – All rain-fall/non-potable cistern water lines (pressure/non-pressure) shall be identified by continuous lettering on three inch (3") minimum width YELLOW tape with one inch black lettering bearing the continuous wording **"Caution – Non-Potable Cistern Water, Subsurface Irrigation Only"** permanently affixed at five foot intervals atop all horizontal piping, laterals and mains. Identification tape shall extend to all valve boxes and/or vaults and exposed piping.

c. ***NON-POTABLE WATER*** – All non-potable irrigation/industrial water lines (pressure/non-pressure) shall be identified by continuous lettering on three inch (3") minimum width yellow tape with one inch black lettering bearing the continuous wording **"Non-Potable Water"** permanently affixed at five foot intervals atop all piping. Identification tape shall extend to all valve boxes and/or vaults, exposed piping, hydrants and quick couplers.

d. Tags, respective of each water supply, shall be identified with the appropriate wording on both sides with the inclusion of a universal symbol.

OPERATIONAL GUIDELINES AND SPECIFICATIONS

1. Irrigation systems utilizing untreated rain-fall/non-potable cistern water shall only be by means of *subsurface irrigation. Misting or spraying into the air is prohibited. Irrigation practices shall be controlled to prevent surface runoff from lands owned or controlled by the user. **(* Above grade spray irrigation would necessitate additional treatment to ensure the removal of pathogens. Please contact the Department for more information).**

2. Any pipeline other than potable water that is installed within a structure shall conform to all building code standards and shall be "barber shop" wrapped with the respective continuous identification tape and without any interconnections with the potable water system.

3. Gray water systems, rain-fall/runoff non-potable cistern systems and recycled water systems are not to be interconnected. Each shall be installed as stand alone systems completely separate from one another. Gray water systems are directly connected to the sewage system. Rain-fall/non-potable cisterns are not to be directly connected to a sewer system. For gray water installation requirements refer to California Plumbing Code 2007, Chapter 16/Appendix G (DWR).

4. Cisterns/storage vessels shall be adequately covered to prevent mosquito breeding. Contact the local Mosquito Abatement District for clarification.

5. Contact with untreated rainfall/non-potable cistern water should be kept to a minimum.

6. Deteriorated or inadequately protected water well casings shall be protected against contamination by untreated rain-fall/non-potable cistern water by correcting these physical deficiencies. Surface infiltration of untreated rainfall/runoff is allowed provided it occurs at least 10 feet from an unprotected foundation structure; when there is a least 10 feet of clearance to the seasonal high ground water table; and when it occurs at least 100 feet from a water supply well.

7. An **On-Site Water Supervisor** shall be appointed as provided for under Title 17, Section 7586, California Code of Regulations. Authorizations for any piping changes or additions to either the potable or recycled wastewater systems shall be subject to review and approval by the water supervisor. The name and position of this individual shall be reported to the water purveyor and to the Department.

8. As-built plans shall be prepared and updated as necessary by the user showing the location of rain-fall/non-potable cistern water and potable water system piping.

9. To prevent secondary exposure to rain-fall/non-potable cistern water, hose bibbs and quick couplers shall not be permitted in order to prevent both the unauthorized use of the non-potable water supply and secondary exposure to untreated non-potable water supply.

10. A potable water source may be connected via an approved backflow prevention device to provide a back up water source to a non-potable water cistern. A non-

potable water backup supply line from a potable source via an approved backflow prevention device **can** be directly connected to the rain-fall/non-potable cistern discharge line to the irrigation system. Gray water systems **cannot** be directly connected to a potable supply with or without a backflow prevention device, (air gaps are excluded) (2007 California Plumbing Code, Section 603.3.5). Air gaps are the only method that may be utilized when potable water is used as a make-up source to a gray water system due to the required sewer connection.

11. A pressure test/cross-connection test shall be performed to confirm the physical separation of the cistern water and potable water systems. Said testing shall be performed in conjunction with the Water Purveyor and this Department and conducted before the introduction of rainfall/non-potable cistern water.

12. The Department shall refer all plans proposing to install a cistern to the following agencies prior to construction:

    - Los Angeles County Cross-Connection & Water Pollution Control Program to: initiate the plan proposal; conditional approval; interim construction inspections and final approval.

    - The City or County Building & Safety Department for construction permits and inspections (Building Codes).

    - The local water purveyor regarding required backflow protection at the potable/city water service connection(s).

    - The Mosquito Abatement District for conditions of approval and to register the cistern tank.

    - The City or County Public Works Department for cistern tank overflow discharge requirements.

AUTHORITY: California Health & Safety Code, Section 116800-116820

California Code of Regulations, Title 17, Division 1, Chapter V, Subchapter 1, Group 4, Article 4, Sections 7583 to 7622

Los Angeles County Code, 11.38.380

CROSS REFERENCE:
California Health & Safety Code 116800-116820
California Code of Regulations, Title 22, Div. 4, Chapter 3
Los Angeles County Code – Title 11 and Title 28
2007 California Plumbing Code, Chapter 6, Appendix G & J.

Guidelines for Alternate Water Sources: Indoor and Outdoor Non-Potable Uses

Los Angeles County Department of Public Health

February 2016

Table of Contents

BASIS FOR DEVELOPING THESE GUIDELINES

In moving toward a safe and sustainable water future for Los Angeles County we must learn to conserve water, replenish groundwater, and safely reuse water so that there is net zero water waste. There are many ways to approach this goal. Thanks to recent changes in State law, many opportunities now exist to reuse water safely. It is clear that if Los Angeles is to be successful in building a sustainable water future, we must learn to reduce the use of potable water (i.e. drinking water) for purposes such as flushing toilets, landscape irrigation, and washing clothes. One method to reduce the use of potable water for these tasks is to promote the safe use of alternate, non-potable water sources, such as rainwater, graywater, and stormwater. These alternate water sources can be used safely for a variety of indoor and outdoor uses, as long as public heath requirements are met. To assist the public with information on how to collect and safely use alternate water sources, the Los Angeles County Department of Public Health (DPH), Environmental Health Division (EH) prepared this document, in collaboration with stakeholders, as a guide for the safe use of alternate water sources in indoor and outdoor settings. These guidelines are intended to provide a user-friendly roadmap for alternate water use; however, it is ultimately the responsibility of the system owner and operator to ensure that non-potable water sources are used appropriately and monitored for safety throughout the life of the project.

This document expands the work begun in 2011, when DPH published its guidance document on outdoor uses of alternate water sources and seeks to build on that work by incorporating the expanded types and uses of alternate water now permitted under State law. These Guidelines are divided into two sections; indoor use and outdoor use of alternate water sources. Under each of these two sections, the four alternate water sources are discussed: rainwater, graywater, stormwater, and recycled water. Each of these alternate water sources is represented in terms of a "tier." Tier 1 represents rainwater; Tier 2, graywater; Tier 3, stormwater; and Tier 4, recycled water. Each tier has specific guidelines and requirements. The guidelines and requirements shall be reviewed annually and updated accordingly based on pertinent studies and research, or until the current federal, State or local regulations are superseded.

In reading this document, you will notice that Tier 1A systems intended for outdoor uses do not require the approval of DPH. However, please take note that all other systems, including Tier 1A systems intended to support indoor uses, do require the review and approval of DPH. Prior to final approval of Tier 1B, 2, 3, and 4 systems, DPH shall conduct project reviews to evaluate possible cross connection hazards between the domestic potable water supply and any alternate non-potable water systems, i.e., rainwater, graywater, stormwater and recycled water. These projects will be reviewed in conjunction with local building & safety departments and/or public works departments as these departments are the administrative authority referenced in the California Plumbing Code for such construction, and as such, EH recognizes their authority in granting joint approval for these types of projects.

If you have any questions regarding the approval process or these requirements, please contact the DPH EH Cross Connection and Water Pollution Control Section for additional information at (626) 430-5290 or visit our website www.publichealth.lacounty.gov/eh/ .

Indoor Water Uses

INDOOR USES

TIER 1: RAINWATER

Rainwater capture systems may be used at single family dwellings, apartments (R1), hotels (R2), commercial, institutional, and municipal facilities. If the system will combine rainwater and graywater, it will be classified as Tier 2: Graywater.

Includes: Rainwater that is collected and used onsite.

Excludes: Stormwater, dry weather runoff, recycled water, and rainwater collected from locations zoned for manufacturing or industrial use.

Tier 1A: Non-Pressurized Rain Barrels/Cisterns

Indoor use of rainwater requires a specially designed gravity feed system in addition to a supplemental supply of potable water. Therefore, the guidelines for Tier 1B, below, need to be followed for indoor uses of rainwater.

Tier 1B: Pressurized Rainwater Catchment Systems

Allowed Uses	Min. Water Quality Standard	Treatment Process	Monitoring & Reporting*
• Toilet and urinal flushing • Laundry washing • Trap primers and cooling tower make-up	• Ch. 17 CPC E. coli < 100 CFU/100 ml, turbidity < 10 NTU *or* • NSF 350 *or* • CCR Title 22 Recycled Water Quality Equivalence at the point of use	• Ch. 17 CPC Table 1702.9.4 Prescreening & 100 µm filtration w/ disinfection • Evaluated on a case-by-case basis per project	• Owner-Occupied Single Family Dwelling: Upon installation and change of ownership • R1 & R2: Annually (Quarterly if used for laundry washing) • Commercial/institutional/industrial: Annually (Quarterly if used for laundry washing) *May suspend monitoring, report as non-operational, during quarters when dry.

Requirements

- ☐ Permits/approvals:
  - o Shall obtain a Building & Safety Building Permit from the local building authority
  - o Shall undergo a Public Health Review and Approval, including a Cross Connection Test, by DPH EH
- ☐ Shall follow all applicable regulations governing dual plumbing systems
- ☐ Shall incorporate failsafe designs and diversion to a protected potable source when treated water is out of specification[1]
- ☐ Shall not be connected to any unprotected conveyance of potable water systems[1]
- ☐ Shall be installed in accordance with manufacturer's instructions and installation requirements of the local building authority and of DPH.

INDOOR USES

TIER 2: GRAYWATER

Graywater systems may be used at single family dwellings, apartments (R1), hotels (R2), commercial, institutional, and municipal facilities.

Includes: "Graywater" that is collected and used onsite. Graywater systems may also use water from swimming pool backwash operations, air conditioner condensate, cooling tower-blow-down, steam system condensate, fluid cooler discharge water, food steamer discharge water, combination oven discharge water, industrial process water, fire pump test water, theme park recreation water operations, and foundation drainage. Systems that combine rainwater and graywater are classified as graywater systems.

Excludes: Stormwater, dry weather runoff (see instead Tier 3: Stormwater), and wastewater from kitchen sinks or toilets (see instead Tier 4: Recycled Water).

Allowed Uses	Min. Water Quality Standard	Treatment Process	Monitoring & Reporting
• Toilet and urinal flushing • Laundry washing • Trap primers and cooling tower make-up	• NSF 350 with disinfection *or* • CCR Title 22 Recycled Water Quality Equivalence at the point of use *or* • Other standard matching or exceeding presently accepted standards	• Packaged Units and/or Design Build Units – evaluated and complying with NSF 350 certification standard as a complete system • Evaluated on a case-by-case basis per project	• Owner-Occupied, Single Family Dwelling: Upon installation and change of ownership • R1 & R2: Annually (Quarterly if used for laundry washing) • Commercial/institutional/industrial: Annually (Quarterly if used for laundry washing)

Requirements

- ☐ Permits/approvals:
  - o Shall obtain Building & Safety Building Permit from the local building authority
  - o Shall undergo Public Health Plan Review and Approval of the piping system, tanks, and pump, in order to reduce risk of cross connection with potable water supplies[2]
  - o Non-NSF certified systems shall complete a 6 month demonstration phase showing water continually meets standard prior to treated graywater being used for any purpose other than subsurface irrigation
- ☐ Non-NSF certified systems shall be certified to meet NSF 350 or other applicable water quality standard by a 3rd party tester approved by DPH EH
- ☐ R1, R2, Commercial, Institutional, and Industrial systems including spray irrigation, outdoor water features, and vehicle washing must have manual developed by the engineer who designed the system identifying operation and maintenance of the system, online water quality
- ☐ Shall be screened or be otherwise equipped to prevent vector intrusion
- ☐ Shall incorporate failsafe designs to comply with failure sensing and signaling equipment standards in NSF 350[3]

- ☐ Shall incorporate diversion to a protected potable source when treated water is out of specification[4]
- ☐ Shall be equipped with an applicable overflow to an approved drainage system: wastewater typically draining to a sewer (e.g.) shall be plumbed to sewer, while wastewater typically draining to a storm drain, (e.g., foundation drainage) shall be plumbed to the storm drain
- ☐ Design and Build systems shall incorporate systems for the online monitoring of turbidity, pH, and Total Suspended Solids (TSS)
- ☐ Design and Build systems must have manual developed by the engineer who designed the system identifying operation and maintenance of the system, online water quality monitoring requirements, the water quality standards, sampling frequency, and procedures for response to different system failures
- ☐ Shall follow the same requirements as listed in Tier 1B
- ☐ Shall be installed in accordance with the manufacturer's instructions and installation requirements of local agencies

INDOOR USES

TIER 3: STORMWATER

Stormwater may be used at commercial, institutional, municipal, and industrial facilities only.

Includes: Stormwater and dry weather runoff collected from non-point sources. Stormwater may contain various contaminants: excess fertilizers, herbicides and insecticides from agricultural lands and residential areas; oil, grease and toxic chemicals from urban runoff and energy production; sediment from improperly managed construction sites, crop and forest lands, and eroding stream banks; salt from irrigation practices and acid drainage from abandoned mines; bacteria and nutrients from livestock, pet wastes and faulty septic systems; atmospheric deposition and hydromodification.

Excludes: Any water that has not entered a municipal stormwater system.

Allowed Uses	Min. Water Quality Standard	Treatment Process	Monitoring & Reporting
• Toilet and urinal flushing • Trap primers and cooling tower make-up	• NSF 350 *or* • CCR Title 22 Recycled Water Quality Equivalence at the point of use *or* • Other standard matching or exceeding presently accepted standards ***and*** Meets all bacterial limits at point of use when distributed offsite ***and*** Meets California Maximum Contamination Levels, and the California Toxics Rule Standards	• Packaged Units and/or Design Build Units – evaluated and complying with NSF 350 certification standard as a complete system • Specific treatment components shall be based on classification of chemical components during the first two years of operation • Evaluated on a case-by-case basis per project	• Stormwater influent shall be tested to characterize chemical components after the first rain event of the rainfall year and at least two additional times during each rainfall year.[5] Summary of stormwater analyses shall be maintained on premises • Annual reporting of final water quality

Requirements

☐ Permits/approvals:
- Shall obtain Building & Safety Building Permit from the local building authority
- Shall undergo Public Health Review and Approval[6]
- Shall undergo review by Sanitation District for contaminates that may affect the wastewater treatment facility

- Non-NSF certified systems shall complete a 6 month demonstration phase showing water continually meets standard prior to being used for any purpose other than sub-surface irrigation

- ☐ Non-NSF certified systems shall be certified to meet NSF 350 or other applicable water quality standard by a 3rd party tester approved by DPH EH
- ☐ R1, R2, Commercial, Institutional, and Industrial systems including spray irrigation, outdoor water features, and vehicle washing must have manual developed by the engineer who designed the system identifying operation and maintenance of the system, online water quality
- ☐ Shall be screened or be otherwise equipped to prevent vector intrusion
- ☐ Shall incorporate failsafe designs to comply with failure sensing and signaling equipment standards in NSF 350[3]
- ☐ Shall incorporate diversion to a protected potable source when treated water is out of specification[4]
- ☐ Shall be equipped with an applicable overflow to an approved drainage system: wastewater typically draining to a sewer (e.g.) shall be plumbed to sewer, while wastewater typically draining to a storm drain, (e.g., foundation drainage) shall be plumbed to the storm drain
- ☐ Design and Build systems shall incorporate systems for the online monitoring of turbidity, pH, and Total Suspended Solids (TSS)
- ☐ Shall be installed in accordance with the manufacturer's installation instructions and installation requirements of local agencies
- ☐ A typical Tier 3 system for offsite collection may also require any of the following:
  - Storm drain diversion
  - Pre-treatment screening/sedimentation device
  - Pump station (where applicable)
  - Underground retention facility and disinfection facility (where applicable)
  - Recirculation system
  - Connection to distribution system
  - A supplemental water supply from a domestic source via an approved dedicated backflow prevention device

INDOOR USES

TIER 4: RECYCLED WATER

Recycled water may be used at commercial, institutional, municipal, industrial facilities, and limited R1 and R2 sites including professionally managed apartment complexes, condominium complexes, and hotels. The use of recycled water indoors at single-family dwellings and non-professionally managed apartments is currently not permitted.

Includes: "Recycled water" provided by a regulated recycled water agency.

Excludes: Blackwater treated through an Onsite Wastewater Treatment System and domestic wastewater *not* treated through a three-stage process.

Allowed Uses	Min. Water Quality Standard	Treatment Process	Monitoring & Reporting
• Toilet and urinal flushing • Laundry washing • Trap primers and cooling tower make-up • Other uses pending DPH review (e.g., industrial processes)	• CCR Title 22 Recycled Water Quality Equivalence at point of use	• CCR Title 22 Recycled Water Quality Equivalence • Additional treatment onsite to bring into compliance with water quality standards	• Permitted R1 & R2: Annually • Commercial/institutional/industrial: Annually

Requirements

- ☐ Permits/approvals:
  - o Shall obtain Building & Safety Building Permit from the local building authority
  - o Shall undergo Public Health Review and Approval
  - o Shall undergo review by the State Water Board
- ☐ Shall incorporate failsafe designs to comply with failure sensing and signaling equipment standards in NSF 350[3]
- ☐ R1, R2, commercial, institutional, and industrial systems shall incorporate systems for the online monitoring of turbidity, pH, and Total Suspended Solids (TSS)
- ☐ Shall incorporate diversion to a protected potable source when treated water is out of specification[4]
- ☐ Shall comply with all regulations and ordinances as applicable to tertiary treated recycled water under permit from the Regional Water Quality Control Board

Outdoor Water Uses

OUTDOOR USES

TIER 1: RAINWATER

Rainwater capture systems may be used at single-family dwellings, apartments (R1), hotels (R2), commercial, institutional, and municipal facilities.

Includes: Rainwater that is collected and used onsite.

Excludes: Stormwater, dry weather runoff, recycled water, and rainwater collected from locations zoned for manufacturing or industrial use.

Tier 1A: Non-Pressurized Rain Barrels/Cisterns

Allowed Uses	Min. Water Quality Standard	Treatment Process	Monitoring & Reporting
• Surface or subsurface landscape irrigation • Vehicle washing	• Not applicable	• None required	• None required

Requirements

- ☐ Permits/approvals:
  - o May need to obtain Building & Safety Building Permit for stability issues
- ☐ Shall have a screened inflow opening, a spigot and/or hose bib, and an overflow pipe or equivalent
- ☐ Shall be clearly labeled to indicate non-potable water use only
- ☐ Shall not be connected to indoor/outdoor municipal potable plumbing, and shall not be pressurized or sprayed
- ☐ Shall be installed in accordance with the rain barrel manufacturer's instructions, and installation requirements of local agencies

Tier 1B: Pressurized Rainwater Catchment Systems

Allowed Uses	Min. Water Quality Standard	Treatment Process	Monitoring & Reporting*
• Drip and subsurface irrigation • Spray irrigation < 360 gallons storage • Vehicle washing	• Not applicable	• Ch. 17 CPC Table 1702.9.4 pre-screening • 100 µm filtration for car washing and drip irrigation	• Not applicable
• Drip and subsurface irrigation • Vehicle washing • Spray irrigation ≥ 360 gallons storage • Non-interactive outdoor water feature	• Ch. 17 CPC E. coli < 100 CFU/100 ml, turbidity < 10 NTU *or* • NSF 350 with disinfection *or* • CCR Title 22 Recycled Water Quality Equivalence at the Point of Use	• Ch. 17 CPC Table 1702.9.4 prescreening and 100 µm filtration with disinfection • Evaluated on a case-by-case basis per project	• Owner-Occupied Single Family Dwelling: Upon installation and change of ownership • R1 (e.g. apartments) & R2 (e.g. hotels): Annually • Commercial/institutional/industrial: Annually *Monitoring and reporting frequencies may be suspended during quarters when cisterns are dry and shall be reported as non-operational. Frequencies shall be reevaluated periodically.

Requirements

- ☐ Permits/approvals:
  - Shall obtain Building & Safety Building Permit from the local building authority
  - Shall undergo Public Health Review and Approval, including a Cross Connection Test, by DPH EH
- ☐ Shall be equipped with an overflow device or rain diverter and be screened or otherwise equipped to prevent vector intrusion
- ☐ Shall be installed in accordance with the manufacturer's instructions, and installation requirements of local agencies

OUTDOOR USES

TIER 2: GRAYWATER

Graywater systems may be used at single-family dwellings, apartments (R1), hotels (R2), commercial, institutional, and municipal facilities.

Includes: "Graywater" refers to wastewater from bathtubs, showers, bathroom washbasins, clothes washing machines, and laundry tubs. Must be collected and used onsite. Also includes water from swimming pool backwash operations, air conditioner condensate, cooling tower-blow-down, steam system condensate, fluid cooler discharge water, food steamer discharge water, combination oven discharge water, industrial process water, fire pump test water, theme park recreation water operations, and foundation drainage. Includes a system that combines rainwater and graywater.

Excludes: Stormwater, dry weather runoff (see instead: Tier 3: Stormwater), and wastewater from kitchen sinks or toilets (see instead: Tier 4: Recycled Water).

Allowed Uses	Min. Water Quality Standard	Treatment Process	Monitoring & Reporting
UNTREATED • Mulch basin or subsurface irrigation	• Not applicable	• Pre-screening	• Not applicable
TREATED • As above • Spray and drip irrigation • Non-interactive outdoor water feature • Vehicle washing	• NSF 350 with disinfection *or* • Title 22 Recycled Water Quality Equivalence	• Packaged Units and/or Design Build Units shall be NSF 350 Certified as a complete system • Evaluated on a case-by-case basis per project	• Owner-Occupied Single-Family Dwelling: Upon installation and change of ownership • R1 (apartments) & R2 (hotels): Annually • Commercial/institutional/industrial: Annually

Requirements

- ☐ Permits/approvals:
  - o Shall obtain Building & Safety Building Permit from the local building authority
  - o Shall undergo Public Health Review and Approval, or equivalent approval by the appropriate local agency of the piping system, tanks, and pump, where applicable, in order to reduce risk of cross connection with potable water supplies
- ☐ Shall be screened or be otherwise equipped to prevent vector intrusion
- ☐ Shall incorporate failsafe designs to comply with failure sensing and signaling equipment standards in NSF 350[7]
- ☐ Shall incorporate diversion to a protected potable source when treated water is out of specification[4]
- ☐ Shall be equipped with an applicable overflow to an approved drainage system: wastewater typically draining to a sewer (e.g.) shall be plumbed to sewer, while wastewater typically draining to a storm drain, (e.g. foundation drainage) shall be plumbed to the storm drain

- ☐ R1, R2, Commercial, Institutional, and Industrial systems including spray irrigation, outdoor water features, and vehicle washing shall include online monitoring for turbidity, pH, and TSS
- ☐ R1, R2, Commercial, Institutional, and Industrial systems including spray irrigation, outdoor water features, and vehicle washing must have manual developed by the engineer who designed the system identifying operation and maintenance of the system, online water quality monitoring requirements, the water quality standards, sampling frequency, and procedures for response to different system failures
- ☐ Shall follow the same requirements as listed in Tier 1B
- ☐ Shall be installed in accordance with the manufacturer's instructions and installation requirements of local agencies

OUTDOOR USES

TIER 3: STORMWATER

Stormwater may be used at commercial, institutional, municipal, and industrial facilities only.

Includes: Stormwater and dry weather runoff collected from non-point sources. Stormwater may contain various contaminants: excess fertilizers, herbicides and insecticides from agricultural lands and residential areas; oil, grease and toxic chemicals from urban runoff and energy production; sediment from improperly managed construction sites, crop and forest lands, and eroding stream banks; salt from irrigation practices and acid drainage from abandoned mines; bacteria and nutrients from livestock, pet wastes and faulty septic systems; atmospheric deposition and hydromodification.

Excludes: Any water that has not entered a municipal stormwater system.

Allowed Uses	Min. Water Quality Standard	Treatment Process	Monitoring & Reporting
• Mulch basin, drip, and subsurface irrigation	• California Maximum Contamination Levels, and the California Toxics Rule Standards	• Package Units and/or Design Build Units evaluated on a case-by-case basis per project	• Stormwater influent shall be tested to characterize chemical components after the first rain event of the rain fall year and at least two additional times during each rain fall year.[5] Summary of stormwater analyses shall be maintained on premises • Annual reporting of final water quality
• As above • Spray irrigation • Non-interactive outdoor water feature • Vehicle washing • Street sweeping • Dust control	• NSF 350, if sprayed *or* • CCR Title 22 Recycled Water Quality Equivalence at the Point of Use *and* Meets all bacterial limits at point of use when distributed offsite *And* Meets California Maximum Contamination Levels, and the California Toxics Rule Standards	• Packaged Units and/or Design Build Units shall be NSF 350 Certified as a complete system • Evaluated on a case-by-case basis per project	

Requirements

☐ Permits/approvals:
- Shall obtain Building & Safety Building Permit from the local building authority
- Shall undergo Public Health Review and Approval
- May require review by Regional Water Quality Control Board for contaminates that may affect the groundwater quality

- Non-NSF certified systems shall complete a 6 month demonstration phase showing water continually meets standard prior to being used for any purpose other than sub-surface irrigation

- ☐ Non-NSF certified systems shall be certified to meet NSF 350 or other applicable water quality standard by a 3rd party tester approved by the department
- ☐ R1, R2, Commercial, Institutional, and Industrial systems including spray irrigation, outdoor water features, and vehicle washing must have manual developed by the engineer who designed the system identifying operation and maintenance of the system, online water quality
- ☐ Shall be screened or be otherwise equipped to prevent vector intrusion
- ☐ Shall incorporate failsafe designs to comply with failure sensing and signaling equipment standards in NSF 350[8]
- ☐ Shall incorporate diversion to a protected potable source when treated water is out of specification[4]
- ☐ Shall be equipped with an applicable overflow device
- ☐ A typical Tier 3 system for offsite collection may also require any of the following:
  - Storm drain diversion
  - Pre-treatment screening/sedimentation device
  - Pump station (where applicable)
  - Underground retention facility and disinfection facility (where applicable)
  - Recirculation system
  - Connection to distribution system
  - A supplemental water supply from a domestic source via an approved dedicated backflow prevention device
- ☐ Shall be installed in accordance with the manufacturer's instructions and installation requirements of local agencies
- ☐ Additional requirements may apply. Check with local regulatory agencies for further information

OUTDOOR USES

TIER 4: RECYCLED WATER

Recycled water can be used by single-family dwellings, R1 (e.g. apartments), R2 (e.g. hotels), commercial, institutional, and industrial facilities.

Includes: "Recycled water" provided by a regulated recycled water agency.

Excludes: Blackwater treated through an onsite wastewater treatment system and domestic wastewater *not* treated through a three-stage process.

Allowed Uses	Min. Water Quality Standard	Treatment Process	Monitoring & Reporting
• Drip, spray, and subsurface irrigation • Non-interactive outdoor water feature • Street sweeping[8] • Dust control[9] • Other uses pending DPH review (e.g., vehicle washing)	• CCR Title 22 Recycled Water *and* • All bacterial limits met at the point of use for spray irrigation	• CCR Title 22 Recycled Water	• Owner-Occupied Single-Family Dwelling: Annually • R1 & R2: Annually • Commercial/institutional/industrial: Annually

Requirements

- ☐ Permits/approvals:
  - Shall obtain Building & Safety Building Permit from the local building authority
  - Shall undergo Public Health Review and Approval by DPH EH
  - Shall undergo review by the State Water Board
  - Shall undergo review by other local agencies as applicable
- ☐ Shall incorporate failsafe designs to comply with failure sensing and signaling equipment standards in NSF 350[8]
- ☐ Shall incorporate diversion to a protected potable source when treated water is out of specification[4]
- ☐ Shall comply with all regulations and ordinances as applicable to tertiary treated recycled water under permit from Regional Water Quality Control Board

DEFINITIONS AND ACRONYMS

Alternate non-potable water supply: A non-potable source of water which includes graywater, rainwater, stormwater, dry weather runoff, onsite treated water (non-potable), and recycled/reclaimed water. Alternate water sources include but are not limited to swimming pool backwash operations, air conditioner condensate, cooling tower blow-down water, steam system condensate, fluid cooler discharge water, food steamer discharge water combination oven discharge water, industrial process water, and fire pump test water, theme park recreation water operations, foundation drainage, and onsite dry weather runoff.

Blackwater: Wastewater containing bodily or other biological wastes, as from toilets, dishwashers, or kitchen drains, and kept separate from graywater in wastewater recycling systems.

Backflow: The undesirable reversal of flow of water or mixtures of water and other liquids, gases or other substances into the distribution pipes of the potable supply of water from any source or sources

CCR: California Code of Regulations.

CFU: Colony Forming Units.

Cistern: A component of a rainwater/stormwater catchment system for storing rainwater/stormwater for the purpose of using the water for non-potable uses.

CPC: California Plumbing Code.

Cross Connection: Any actual or potential connection or structural arrangement between a public or a consumer's potable water system and any other source or system through which it is possible to introduce into any part of the potable system any used water, industrial fluid, gas, or substance other than the intended potable water with which the system is supplied.

DPH EH: Los Angeles County Department of Public Health, Environmental Health Division.

Drip irrigation: An irrigation method allowing water to drip slowly to the roots of plants, either onto the soil surface or directly onto the root zone, through a network of valves, pipes, tubing, and emitters.

Dry weather runoff water: Non-potable water, harvested from a municipal storm water system during dry weather from runoff which flows when potable water is wasted or used inefficiently, and that discharges to waters of the U.S. This does not include water from a combined sewer or from a Publicly Owned Treatment Works (POTW).

Graywater: Untreated wastewater that has not been contaminated by any toilet discharge, has not been affected by infectious, contaminated, or unhealthy bodily wastes, and does not present a threat from contamination by unhealthful processing, manufacturing, or operating wastes.

Graywater includes, but not limited to, wastewater from domestic activities such as bathtubs, showers, bathroom washbasins, clothes washing machines, laundry tubs, but does not include wastewater from toilets, kitchen sinks and dishwashers.

Harvested rainwater: Rainwater that is collected from roofs of buildings and other (e.g. at grade) impervious surfaces, and does not leave the land parcel where it was collected.

Health Officer: The health officer of the county of Los Angeles, or his duly authorized representative.

Hydromodification: Alteration of the natural flow of water through a landscape, and often takes the form of channel modification or channelization. Hydromodification is one of the leading sources of impairment in streams, lakes, estuaries, aquifers, and other water bodies in the United States.

Industrial process water: Wastewater from industrial or commercial processes that has not been contaminated by any toilet discharge, infectious, bodily wastes, or by processing, manufacturing or operating wastes.

MS4: A municipal separate storm sewer system or of conveyances owned by a State, city, or other public entity that discharges to waters of the U.S. and is designed or used for collecting or conveying stormwater. MS4 does not include a combined sewer and is not part of a Publicly Owned Treatment Works (POTW).

Non-interactive outdoor water feature: Fountains, waterfalls, or other features not intended to act as play zones for children.

Non-point source: A source of pollution that issues from widely distributed or pervasive environmental elements, and does not have a distinct point of production or origin, such as a storm drain outlet at the beach, part of the storm drain system. Point sources include POTWs and power plants.

Non-potable cistern catchment system: A system using cisterns to collect harvested rainwater/stormwater from a rain event or from dry weather runoff. Cisterns in Los Angeles County may serve as a secondary source of non-potable water for applications that do not require potable water, such as landscape irrigation and indoor flushing, which can dramatically lower potable water demand and reduce offsite rainfall runoff.

Non-potable water: Water which is not intended for human or animal consumption.

NSF: National Sanitation Foundation.

NTU: Nephelometric Turbidity Units

Onsite treated non-potable water: Non-potable water that has been collected, treated, and intended to be used onsite and is suitable for direct beneficial use. Sources for onsite treated non-potable water include, but are not limited to, graywater, rainwater, stormwater, recycled water, reclaimed water, cooling tower blow-down water, condensate, and foundation drainage.

Potable water: Water which is fit for consumption by humans. The United States Environmental Protection Agency (EPA) identifies biological and chemical contaminants in drinking water that occur at levels that may adversely affect public health. The EPA establishes Maximum Contaminant Levels (MCLs) permissible in drinking water, which become enforceable standards.

Publicly Owned Treatment Works: A system owned and operated by a State, County or local government designed to provide secondary or tertiary treatment to sewage in order to reduce the number of pathogenic bacteria, and the components of the sewage that promote bacterial growth, such as Nitrogen, Biological Oxygen demand, and Total Suspended Solids to allow the waste effluent to be disposed of safely in the environment.

R1 & R2: Multi-unit residential occupancies. R1 – minimal stay (i.e., hotels, motels, bed and breakfast homes); R2 – long-term stay (i.e., dormitories, employee use, apartment houses).

Rain barrel: A container that collects rainwater that falls directly into the container or that is collected by an above ground collection system that prevents the collected water from contacting the ground. Rain barrels are connected to gravity flow systems only, and typically each rain barrel contains 55 gallons of water, more or less, but multiple rain barrels may be connected to increase water collection volume.

Rainwater: Precipitation on any public or private parcel that has not entered an offsite storm drain system or channel, a flood control channel, or any other stream channel.

Recycled water: Treated wastewater from sewage treatment plants to produce high quality non-potable water that is suitable for a range of non-drinking purposes. Recycled water meets California Department of Public Health statewide uniform criteria for disinfected tertiary treated wastewater.

Stormwater: Rainwater that has left a distinct parcel and entered a municipal storm water system or conveyances owned by a State, city, or other public entity that collects rainwater that discharges to waters of the U.S. This water does not include water from a combined sewer or from a Publicly Owned Treatment Works (POTW).

Subsurface irrigation: Irrigation field installed either below finish grade within the top soil, in a trench below the layer of top soil, or below a mulch bed at least two (2) inches deep.

VOCs: Volatile organic compounds.

REFERENCES

Referenced code sections:

- California Code of Regulations Title 22, Chapter 15, Article 4; Chapter 3 and Title 24 (California Plumbing Code), Part 5, Chapters 2, 6, 16 and 17; as adopted by Los Angeles County as Title 28
- California Health & Safety Code, Section 116800
- California Health and Safety Code, Chapter 4, California Safe Drinking Water Act
- Federal Register: December 1992, Part 2. 40 Code of Federal Regulations Part 131 Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants; States' Compliance; Final Rule. A.K.A. California Toxics Rule

Other references:

Chau, Haan-Fawn, "Green Infrastructure for Los Angeles: Addressing Urban Runoff and Water Supply Through Low Impact Development," University of California School of Public Affairs, April 17, 2009.

Bellomo, Angelo J., "Rainwater Harvesting Policy 515.07," Los Angeles County Department of Public Health, January 25, 2010.

"Rainwater Catchment Design and Installation Standards," American Rainwater Catchment Systems Association, 2010.

"Rainwater Harvesting Design Standard 63, ANSI/ASPE/ARCSA, 2013.

"Stormwater Harvesting Design Standard 78, ANSI/ASPE/ARCSA, 2015.

"Green Plumbing & Mechanical Code Supplement," International Association of Plumbing and Mechanical Officials, 2010 rev.

"Rainwater Collection Systems (Cisterns)," Ventura County Resource Management Agency, 2006.

"Capturing Rainwater from Rooftops: An Efficient Water Resource Management Strategy that Increases Supply and Reduces Pollution," NRDC, 2011.

ENDNOTES

[1] A dedicated supply of potable water protected by an approved backflow assembly is allowed to be connected downstream of the cistern pump to supply water to the designed application.
[2] Manufacturer's instructions are written to apply to a general clientele and may require additional conditions for approval, therefore a plan review by Public Health and the local Building & Safety Department is also necessary.
[3] Specifically: NSF 350 sections 5.8.1, 5.8.2. 5.8.3, and 5.8.4, and flow design standards in sections 5.9. NSF 350 standards require a mechanism or process capable of detecting failures of electrical or mechanical components critical to the treatment processes and detecting high water condition. In the event of a detected failure or high water condition, a visual and audible alarm is required that operate even in the event of an electrical, mechanical, or hydraulic malfunction of the system. In addition, commercial systems require telemetric alarms by phone or email to the owner operator. For reuse treatment systems a bypass for discharge of untreated wastewater to the sewer system shall be present and shall be activated automatically in the event of a malfunction. The system shall also possess a means to control the volume of water in the systems and prevent the overflow to any location other than a locally approved water treatment and disposal system.
[4] A dedicated supply of potable water protected by an approved Reduced Pressure Principle Backflow Assembly (RP) is allowed to be connected to the non-pressurized storage tank (treated) and/or surge tank.
[5] A rainfall event is defined as 1/10th of an inch, as measured at the University of Southern California Monitoring Station, information available at Los Angeles County Department of Public Works webpage http://www.ladpw.org/wrd/precip/. The rainfall year is from July 1 through June 30, per the National Weather Service.
[6] The Tier 3 water qualities will be reviewed case by case by Los Angeles County Department of Public Heath, Los Angeles Regional Water Quality Control Board, and other local agencies as applicable. Other water quality standards being developed at the time of the writing of this guidance document shall be considered once the standard has been accepted by the Public Health Agency having Jurisdiction, i.e. IAPMO Z1002 and IAPMO Z1207.
[7] Specifically: NSF 350 sections 5.8.1, 5.8.2. 5.8.3, and 5.8.4.
[8] Both commercial and industrial allowed.

ACKNOWLEDGEMENTS

The Los Angeles County Department of Public Health would like to thank the following organizations that contributed to the development of these guidelines:

City of Los Angeles Bureau of Sanitation/WPD
City of Santa Monica Office of Sustainability & the Environment
Heal the Bay
Natural Resources Defense Council
State Water Board Drinking Water Division
TreePeople

Approved by:
Terri S. Williams, REHS
Acting Director of Environmental Health

Date

Approved by:
Jeffrey D. Gunzenhauser, M.D., M.P.H.
Interim Health Officer

Feb 11, 2016

Date