

# **Recycled Water Use Guidelines and Best Management Practices**

## **Introduction:**

As a purveyor of recycled water, Eastern Municipal Water District (District) is required to ensure that the District's users are aware of their responsibilities regarding the proper use of recycled water. To ensure that our customers are informed of the proper use of recycled water, the District provides each recycled water user with a copy of "Recycled Water Use Guidelines and Best Management Practices". These guidelines are consistent with those promulgated by the Riverside County Department of Health Services (RCDOHS) and the State of California Department of Health Services (CDOHS) to protect the health of the public and employees of recycled water users. The minimum necessary on-site controls are contained in "Guidelines for Use of Reclaimed Water", issued by the CDOHS; in the County Public Health Code; and in Title 22 of the California Administrative Code.

The implementation of Best Management Practices (BMP's) is essential in minimizing soil erosion, over spray concerns, ponding, and to ensure efficient irrigation practices and to ensure public health and safety. The guidelines for developing BMP's for efficient irrigation are located in Section 8 of this document.

## **State/Local Regulations:**

Recycled water system on-site controls shall meet all of the requirements established by EMWD and the applicable State and local regulatory agencies to protect the public health and safety.

Maximum attainable separation of recycled water lines and domestic water lines should be practiced. Domestic and recycled water transmission and distribution mains should conform to the "Separation and Construction Criteria" found in Section 6 of the "Eastern Municipal Water District Procedural Guide and General Design Requirements for Construction of Recycled Water Facilities".

- The use area facilities must comply with the "Regulations Relating to Cross-Connections", Title 17, Chapter V, Section 7604, California Administrative Code.
- Plans and specifications for all existing and proposed recycled and domestic water systems shall be submitted to the applicable State and local health agencies, as well as the District, for review and approvals before the systems are constructed.

## **Application:**

Developer/Contractor shall:

1. Complete an application to EMWD for recycled water service.
2. Pay all fees and deposits for recycled water service and any required plan checks.

3. Complete EMWD Plan Check procedures.
4. Enter into an agreement with EMWD for the use of recycled water.
5. Obtain all required permits.
6. Designate a recycled water supervisor. Said supervisor shall be available 24 hours per day in case of an emergency.

**Operational Controls:**

The discharge shall be confined to the area designated by the user and approved by the District.

The use of recycled water shall not create odors, slime, unsightly deposits and/or a public nuisance.

The use area shall be developed and maintained so as to prevent the breeding of flies, mosquitoes, and other vectors.

All recycled water valves and outlets shall be appropriately tagged to warn the public and employees that the water is not safe for drinking. Direct contact should be avoided for secondary or disinfected secondary water. All piping, valves and outlets should be color-coded or otherwise marked to differentiate recycled water from domestic or other water.

Impoundments and areas irrigated with recycled water must be kept completely separated from domestic water wells and reservoirs as shown in Table 1.

**Table 1  
Minimum Separation Requirements**

| USE TYPE    | DISTANCE FROM                | WATER QUALITY                                | MINIMUM DISTANCE |
|-------------|------------------------------|--|------------------|
| Irrigation  | Domestic Well                | Tertiary                                     | 50 ft *          |
| Irrigation  | Domestic Well                | Secondary 2.2 or 23                          | 100 ft*          |
| Irrigation  | Domestic Well                | Undisinfected Secondary                      | 150 ft*          |
| Irrigation  | Agricultural Well            | Tertiary, 2.2 or 23                          | None *           |
| Irrigation  | Residence, Park, School, etc | Undisinfected Secondary, Secondary 2.2 or 23 | 100 ft*          |
| Impoundment | Domestic Well                | Tertiary                                     | 100 ft*          |
| Impoundment | Domestic Well                | Secondary 2.2 or 23                          | 100 ft*          |
| Impoundment | Domestic Well                | Undisinfected Secondary                      | 150 ft*          |
| Impoundment | Agricultural Well            | Tertiary, 2.2 or 23                          | None *           |

\*Based on proposed Title 22 limitation

It may be demonstrated that special circumstances justify greater or lesser distances be maintained.

Any exceptions must be approved by District and appropriate regulatory agencies prior to recycled water use.

Where feasible, different piping materials should be used to facilitate water system identification.

All recycled water valves, outlets, sprinkler heads should be of a type that can only be operated by authorized personnel as designated on approved plans.

The minimum necessary operational controls include, but are not limited to:

**1. Posting of On-Site Notices:**

Adequate means of notification shall be provided to inform the public, employees and others that recycled water is being used. Such notification shall include the posting of conspicuous warning signs of sufficient size to be clearly visible. Signs shall be posted at adequate intervals (as deemed appropriate by the District) around the use area. Signs shall be a minimum of 4-inches high by 8-inches wide, or as determined by District, and shall be in compliance with CDOHS regulations. Signs are available and may be purchased from the District. Signs not purchased from District shall be approved by District prior to use. Each sign shall display the universal "DO NOT DRINK" symbol as shown in Figure 1.

At golf courses, notices shall be printed on score cards in a conspicuous size and color stating that recycled water is used. All water hazards containing recycled water shall be posted with signs. All water outlets shall be posted as "**potable**" or "**non-potable**", as applicable and appropriate and including the universal symbol.

**2. Worker/Public Protection:**

Workers, residents, and the public shall be made aware of the potential health hazards involved with contact or ingestion of recycled water, and should be educated regarding proper hygienic procedures to protect themselves and their families.

- A. Workers and others shall be notified that recycled water is in use. Notification shall include the posting of conspicuous warning signs with the universal "Do Not Drink" symbol of sufficient size to be clearly read. (see Figure 1)



Figure 1

- B. Precautionary measures should be taken to minimize contact with recycled water.
  - 1) Workers/public should not be subjected to recycled water sprays.
  - 2) Workers should be provided with protective clothing when there will be more than casual contact with the recycled water.
  - 3) Where tertiary (oxidized, coagulated, clarified, filtered, disinfected) wastewater is used, less stringent precautions may be allowed.
- C. Safe drinking water should be supplied for workers and the public where recycled water is used. Where bottled water is provided, the water should be in contamination-proof containers and protected from recycled water and dust.
- D. Toilet and washing facilities should be provided.
- E. Precautions should be taken to avoid contamination of food taken into recycled water use areas. Food should not be taken into areas still wet with recycled water.
- F. Drinking fountains, picnic tables, barbecues, etc. shall be protected from recycled water.
- G. An adequate first aid kit should be available on location, stocked appropriately to prevent cuts and abrasions from contamination by recycled water.

### **3. General Irrigation Usage:**

Adequate measures shall be taken to provide a minimum of 40 feet between the limits of the recycled water use area and of the adjacent crops if secondary effluent is in use.

Irrigation should be controlled to minimize ponding of recycled water and any potential runoff should be contained and properly disposed.

Irrigation should be done so as to prevent contact by the public with the spray and precautions should be taken to insure that recycled water will not be sprayed on walkways, picnic tables, drinking fountains, passing vehicles, buildings, domestic water facilities, or areas not under control of the user.

Table No.'s 2 and 3 detail the appropriate water quality requirements for various types of crops and other uses.

**4. Landscape Irrigation:**

Irrigation shall be practiced during periods when the ground will have the maximum opportunity to dry before use by the public, unless provisions are made to exclude the public from areas during and after application of recycled water. Wind blown spray from the irrigation area shall not reach areas accessible to the public. Drinking water fountains, picnic tables and food service areas shall be designed for protection from direct or windblown recycled water spray or by being covered during irrigation.

Specific procedural guidelines are detailed in EMWD's handout titled "Procedural Guide and General Design Requirements for Procuring Water Service for On-Site Landscape Irrigation Systems".

Irrigate in the evening or early morning, avoiding the hot and /or windy parts of the day. This will reduce evaporation losses and minimize windblown spray going to areas not intended to receive irrigation water.

**5. Impoundments:**

Adequate measures should be taken to prevent body contact activities, such as wading or swimming, at restricted recreational impoundments containing recycled water.

Adequate measures should be taken to prevent direct public contact with recycled water at landscape and irrigation impoundments.

**6. Construction Water Use:**

Developer/Contractor shall:

- A. Identify water trucks, hoses, drop tanks, etc., as containing recycled water and not suitable for human consumption. Signs shall be painted or otherwise affixed to equipment.
- B. Not use trucks and other equipment for purposes involving human consumption, or potable water applications after being used for recycled water.
- C. Not introduce recycled water into any domestic water piping system and no connection shall be made between equipment containing recycled water and any part of a domestic water system.

**7. Efficient Irrigation:**

The following practices and techniques are common to all types of landscape irrigation systems. When implemented, they result in a highly efficient and uniform irrigation regime. Runoff, ponding and over sprays are reduced to a negligible level.

It must be kept in mind however, that irrigation systems, no matter how well designed, constructed and maintained, can not apply water at 100% uniformity. As a result, there will always be areas within a given irrigation site that receive more than the optimum amount of water. With an efficiently operating system, this situation can be minimized to an insignificant, and often times undetectable amount. The efficiency of a properly designed and constructed irrigation system is dependent on three components: hardware; maintenance; and management.

A. **Hardware:**

All irrigation systems must have the proper equipment/hardware for the application. Usually the most difficult and costly of the three components, proper hardware is essential to a uniform irrigation system.

- 1) Install irrigation system according to design and approved plans.
- 2) Make sure all sprinkler heads are uniform in brand, model and nozzle size. This will insure a uniform irrigation. Where different arcs are needed on the same station, match precipitation rates by changing nozzles.
- 3) Measure spacing between sprinkler heads. Move heads per manufacturer's recommendations if not within required distances.
- 4) Where lower precipitation rates are required, such as on slopes or heavy textured soils, reduced nozzle size and spray angle per manufacturer's recommendations.
- 5) Install booster pumps to increase pressures where needed, with low flow/low pressure cut off switch.
- 6) Install pressure regulators to reduce pressures where needed. These are often used on steep slopes where main lines run downhill.
- 7) Make sure pipes are sized to transmit/distribute water in the quantity demanded by the systems.
- 8) Use **check valves** either in-line or built into the sprinkler head assembly to virtually eliminate low head drainage after the valve has closed. These devices **substantially reduce runoff and ponding** from individual sprinkler heads.
- 9) Use **automatic flow control devices** that shut down a system if a break or other similar high flow/low pressure situation develops during irrigation. These devices **can save significant amounts of water and virtually eliminate runoff and ponding should a break occur.**
- 10) The use of centralized control systems or controllers that measure or can be programmed to use evaporation rates or systems that use controls such as moisture sensors is recommended.

- 11) Use automatic rain shut-off devices to reduce irrigation if significant rainfall occurs. Use Multiple rain shut-off devices to reduce ponding if precipitation rate is higher than infiltration rate of the soil.

**B. *Maintenance:***

Often the most overlooked and easiest component to perform, poor maintenance is usually the cause of many problems associated with non-uniform irrigation. The following practices are performed routinely or as soon as possible to remedy a problem situation. When recycled water is used, these practices are intensified to comply with local regulations.

- 1) Adjust sprinkler heads so that they achieve 80% head to head coverage throughout their intended arc. There should be no obstruction or hindrance that would interfere with the free rotation and smooth operation of any sprinkler, such as tall grass, shrubs, trees, signs, etc. The system should be routinely tested during the daytime when workers are present so adjustments can be made.
- 2) Adjust valves or pressure regulators so that the systems are operating at the pressure required by the sprinkler heads or emitters. Test pressures seasonally or as needed with a pressure gauge and maintain levels required by the sprinklers and/or emitters.
- 3) Routinely test accuracy of time clocks with a stopwatch. This is also a time to check if valves are opening and closing properly. Repair broken or faulty valves and have time clock calibrated/repared if not functioning properly.
- 4) Repair or replace broken risers, sprinklers, valves, etc. as soon as they are discovered. When replacing equipment such as sprinklers and emitters, use correct manufacturer and model number so that system uniformity is maintained.
- 5) Routinely check backflow prevention devices, pumps and other appurtenances for leaks and other conditions that might impact the irrigation system. Repair or replace as needed.
- 6) Routinely clean screens and backwash filters to keep systems operating optimally.
- 7) Routinely check micro-irrigation systems for clogged, broken or faulty emitters. Repair or replace as needed. Clogged emitters cause non-uniform irrigation that result in over and under watering conditions. Plant material suffers (aesthetics and/or yields decrease) and water bills can actually rise.

**Table 2  
BMPs  
Proposed Title 22  
Regulations-  
Minimum Degree of Treatment for  
General Use of Recycled Water  
(As of October, 1999)**

| Use  | Disinfected Tertiary Recycled Water (2.2 median # coliform per 100/ml) | Disinfected Secondary Recycled Water (2.2 median # coliform per 100 ml) | Disinfected Secondary Recycled Water (23 median # coliform per 100 ml) | Undisinfected Secondary Recycled Water |
|--|--|---|--|--|
| Food Crops spray irrigation  | Allowed  | Not allowed <sup>(1)</sup>  | Not allowed <sup>(1)</sup>   | Not allowed <sup>(1)</sup>             |
| Food Crops surface irrigation  | Allowed  | Allowed   | Not allowed <sup>(1)</sup>   | Not allowed <sup>(1)</sup>             |
| Processed Food Crops <sup>(2)</sup>  | Allowed  | Allowed   | Allowed  | Allowed                                |
| Orchards and Vineyards with surface irrigation provided no fruit is harvested that has come into contact with the irrigating water or the ground | Allowed  | Allowed <sup>(3)</sup>  | Allowed <sup>(3)</sup>   | Allowed <sup>(3)</sup>                 |
| Fodder, Fiber, or Seed Crops <sup>(4)</sup>  | Allowed  | Allowed   | Allowed  | Allowed                                |
| Pasture for Milking Animals  | Allowed  | Allowed   | Allowed  | Not allowed                            |
| Landscape Irrigation - Restricted Access (for golf courses, cemeteries, freeway landscapes)  | Allowed  | Allowed   | Allowed  | Not allowed                            |
| Landscape Irrigation - Unrestricted Access (for parks, playgrounds, schoolyards, residential)  | Allowed  | Allowed   | Not allowed  | Not allowed                            |
| Nonrestricted Recreational Impoundments (allows swimming), Decorative Fountains  | Allowed  | Not allowed   | Not allowed  | Not allowed                            |
| Restricted Recreational Impoundment (allows boating and fishing)   | Allowed  | Allowed   | Not allowed  | Not allowed                            |
| Landscape Impoundment without Decorative Fountain  | Allowed  | Allowed   | Allowed  | Not allowed                            |

**The following apply to Tables 2 and 3:**

1. Not acceptable for root crops where edible parts come in contact with recycled water.
2. Processed food crops must undergo extensive commercial, physical, or chemical processes sufficient to destroy pathogenic agents. Processing does not include washing, pickling, fermenting, or milling.
3. Edible portion of plant does not contact the recycled water.
4. Not for human ingestion.
5. No spraying within 30 days of fruit formation.
6. Must have restricted public access and discontinue application of undisinfected recycled water 14 days prior to harvesting.

**Table 3**  
**Specific Treatment Guidelines**  
**for Use of Recycled Water**

| <b>Use</b>   | <b>Disinfected Tertiary Recycled Water<br/>(2.2 median # coliform per 100/ml)</b> | <b>Disinfected Secondary Recycled Water<br/>(2.2 median # coliform per 100 ml)</b> | <b>Disinfected Secondary Recycled Water<br/>(23 median # coliform per 100 ml)</b> | <b>Undisinfected Secondary Recycled Water</b> |
|--|---|--|---|---|
| <b><u>Produce</u></b>  |   |  |   |   |
| General (Lettuce, Carrots, etc.)   | Allowed   | Not allowed  | Not allowed   | Not allowed                                   |
| Tomatoes (unprocessed)   | Allowed   | Allowed <sup>(3)</sup>   | Not allowed   | Not allowed                                   |
| Tomatoes (Processed - No Gleaning) <sup>(2)</sup>  | Allowed   | Allowed  | Allowed   | Not allowed                                   |
| Strawberries   | Allowed   | Not allowed  | Not allowed   | Not allowed                                   |
| Artichokes   | Allowed   | Allowed <sup>(3)</sup>   | Not allowed   | Not allowed                                   |
| Watercress   | Allowed   | Not allowed  | Not allowed   | Not allowed                                   |
| Sugar Beets  | Allowed   | Allowed  | Allowed   | Not allowed                                   |
| Grain - for Human Consumption  | Allowed   | Allowed <sup>(3)</sup>   | Not allowed   | Not allowed                                   |
| <b><u>Trees and Vines:</u></b>   |   |  |   |   |
| Frost Protection   | Allowed   | Allowed <sup>(5)</sup>   | Allowed <sup>(5)</sup>  | Not allowed                                   |
| Pistachio or Walnut  | Allowed   | Not allowed  | Not allowed   | Not allowed                                   |
| Almond   | Allowed   | Not allowed  | Not allowed   | Not allowed                                   |
| Citrus   | Allowed   | Allowed <sup>(3)</sup>   | Allowed <sup>(3)</sup>  | Allowed <sup>(3)</sup>                        |
| Avocado  | Allowed   | Allowed <sup>(3)</sup>   | Allowed <sup>(3)</sup>  | Allowed <sup>(3)</sup>                        |
| Olive  | Allowed   | Allowed  | Allowed <sup>(3)</sup>  | Allowed <sup>(3)</sup>                        |
| <b><u>Other Crops:</u></b>   |   |  |   |   |
| Sod  | Allowed   | Allowed  | Allowed   | Allowed <sup>(6)</sup>                        |
| Ornamental Nursery Stock   | Allowed   | Allowed  | Allowed   | Allowed <sup>(6)</sup>                        |
| Christmas Trees  | Allowed   | Allowed  | Allowed   | Allowed <sup>(6)</sup>                        |
| Firewood - Customer Cut  | Allowed   | Allowed  | Allowed   | Not allowed                                   |
| Firewood - Not Customer Cut  | Allowed   | Allowed  | Allowed   | Allowed                                       |
| <b><u>Other Uses:</u></b>  |   |  |   |   |
| Flushing Toilets, Urinals, Priming Drains  | Allowed   | Not allowed  | Not allowed   | Not allowed                                   |
| Supply for Commercial & Public Laundries for Clothing & Other Linens                             | Allowed   | Not allowed  | Not allowed   | Not allowed                                   |
| Supply for Cooling or Air Conditioning System with Cooling Tower, Evaporative Condenser or Spray | Allowed   | Not allowed  | Not allowed   | Not allowed                                   |

| Use   | Disinfected Tertiary Recycled Water (2.2 median # coliform per 100/ml) | Disinfected Secondary Recycled Water (2.2 median # coliform per 100 ml) | Disinfected Secondary Recycled Water (23 median # coliform per 100 ml) | Undisinfected Secondary Recycled Water |
|---|--|---|--|--|
| Supply for Cooling or Air Conditioning System without Cooling Tower, Evaporative Condenser or Spray | Allowed  | Allowed   | Allowed  | Not allowed                            |
| Industrial Process with Exposure of Workers   | Allowed  | Not allowed   | Not allowed  | Not allowed                            |
| Industrial Process without Exposure of Workers  | Allowed  | Allowed   | Allowed  | Not allowed                            |
| Industrial Boiler Feed  | Allowed  | Allowed   | Allowed  | Not allowed                            |
| Fire Fighting - Non Structural  | Allowed  | Allowed   | Allowed  | Not allowed                            |
| Fire Fighting - Structural  | Allowed  | Not allowed   | Not allowed  | Not allowed                            |
| Consolidation of backfill for Potable Water Trenches  | Allowed  | Not allowed   | Not allowed  | Not allowed                            |
| Consolidation of backfill for Other than Potable Water Trenches                                     | Allowed  | Allowed   | Allowed  | Not allowed                            |
| Dampening Soil for Compaction at Construction Sites, Landfills, etc.                                | Allowed  | Allowed   | Allowed  | Not allowed                            |
| Washing Aggregate and Making Concrete   | Allowed  | Allowed   | Allowed  | Not allowed                            |
| Dampening Roads and Other Surfaces for dust Control   | Allowed  | Allowed   | Allowed  | Not allowed                            |
| Dampening Roads and Street Surfaces in Street Sweeping  | Allowed  | Allowed   | Allowed  | Not allowed                            |
| Flushing Sanitary Sewers  | Allowed  | Allowed   | Allowed  | Allowed                                |
| Washing Yards, Lots and Sidewalks, Road Cleaning  | Allowed  | Allowed   | Allowed  | Not allowed                            |
| Decorative Fountains  | Allowed  | Not allowed   | Not allowed  | Not allowed                            |
| Snow Making - Commercial  | Allowed  | Not allowed   | Not allowed  | Not allowed                            |
| Supply for Fish Hatcheries  | Allowed  | allowed   | Not allowed  | Not allowed                            |