

2.16 Water Reuse

A. *Applicability*

This BMP is intended for Municipal Water User Groups (“utility”) that may have potential applications for reusing water within its system. The utility may be a producer of reclaimed water or may work to bring in reclaimed water from outside sources. Reuse can be direct with reclaimed water substituted in end uses to replace potable water or raw water. Another method of reuse is indirect water reuse which involves the intentional planned use of system return flows.

Both direct and/or indirect reuse should be implemented as a supplement to other methods of reducing per capita water use or increasing the efficient use of water.

Upon review, utilities may find that they are already implementing one or more elements of this BMP and may want to adopt additional elements outlined below. Once a utility decides to adopt this BMP, the utility should follow the BMP closely in order to achieve the maximum benefit from this BMP.

B. *Description*

1) Direct Reuse

The direct use of reclaimed water is an effective method of reducing potable water usage. Reclaimed water is defined in Texas Administrative Code (“TAC”) §210.3(24) as “Domestic or municipal wastewater which has been treated to a quality suitable for a beneficial use, pursuant to the provisions of this chapter and other applicable rules and permits.” Direct use of reclaimed water is appropriate for a number of domestic, industrial and irrigation needs where the potential for human contact is limited. Some possible uses for reclaimed water are landscape irrigation, non-contact recreational use, cooling tower make up water, toilet or urinal flushing water, or manufacturing process water. Although differences in water quality between potable and non-potable water may change the quantity needed for a particular task, users of reclaimed water should view it as a valuable water resource and use it as efficiently as possible. Direct use of reclaimed water is regulated by the Texas Commission on Environmental Quality (“TCEQ”) under Chapter 210 of the TAC (2) and Safe Drinking Water Act standards. Included in these rules are provisions that require permission from that agency before providing reclaimed water for beneficial use and design guidelines for reclaimed water systems.

Under this BMP, the utility should identify and rank industrial, commercial, and institutional (“ICI”) customers according to volume of water use and investigate the feasibility of replacing some of potable water uses with reclaimed water. Municipalities should investigate reclaimed water opportunities within their own accounts or with third parties outside their service area. The utility provides a

description of effluent treatment facilities and distribution systems including the amounts and quality of effluent expected to be available for reuse. The utility should implement programs to provide as much reclaimed water to approved non-potable uses as is available and cost-effective to the utility.

2) Indirect Reuse

Indirect reuse can provide substantial water conservation by replacing or delaying the development of additional raw water resources for water supply. Indirect reuse can be for potable or non-potable uses. Indirect potable reuse is defined as follows by the Water Reuse Association¹ “A particular application where the recycled water (generally having received a substantial degree of treatment) is blended into a community’s water supply (via groundwater recharge or surface water augmentation) prior to final treatment and distribution to the customer in the existing water distribution system.”

The use of reclaimed water for augmentation of potable supplies as a BMP involves the intentional planned use of the reclaimed water for this purpose. Use of reclaimed water for augmentation of potable supplies must take into consideration the following:

- TCEQ Surface Water Quality Standards for the receiving water body.
- State laws and regulations directly applicable to authorizing water reuse, including those that consider the impact of reuse on instream uses, freshwater inflows to the bays and estuaries, and existing water rights under circumstances that the regulatory agency deems appropriate.

A water rights permit is required to withdraw reclaimed water that has been discharged to the waters of the state.

C. Implementation

Implementation should consist of at least the following actions:

1) Direct Reuse

- a. Identify Potential Reuse Accounts
- b. Identify and rank ICI accounts according to water use. Proximity to a reclaimed water distribution system, an existing wastewater treatment plant, or possible locations for new wastewater treatment plants should be considered in ranking potential reuse customers. A wastewater interceptor could be designed to divert wastewater flows from a wastewater line for treatment and use in the nearby area. Careful consideration should be given to the water quality needs of the end user. For purposes of this BMP, potential direct reuse accounts are defined as:
 1. Irrigation Accounts: any water user that uses potable water to irrigate large turf, shrubs, trees or other landscaped area. Care should be taken to ensure that such irrigation is in compliance with the human contact

- standards in TAC Chapter 210 and that the plant material can tolerate the water quality of available reclaimed water
2. ICI Accounts: any water users that are defined as ICI in the Conservation Programs for Industrial, Commercial, and Institutional Accounts BMP. Care should be taken to ensure that identified potential uses are in compliance with the human contact standards in TAC Chapter 210.
 3. New Construction: Reclaimed water can be used for toilet and urinal flushing if it meets TCEQ standards. This would only be feasible in new construction of an office building or adult residential facility such as a dormitory. For new subdivisions, dual distribution systems could be installed to use reclaimed water to irrigate common areas, medians, parks and home landscapes. The utility could also adopt an ordinance and regulations requiring all or specific customers to use reclaimed water for irrigation and other suitable purposes if reuse water is available.
- c. Implement a Reclaimed Water Customer Incentives Program. Financial incentives can be offered on a dollar amount per acre-foot of potable water use replaced. Another potential incentive is to offer discount rates or grants to assist a reuse end user in connecting to the reclaimed water system and replumbing facilities from potable to non-potable water use. Purple pipe is required for all reuse water to prevent cross connections. Proper backflow prevention measures must be implemented when a facility has both potable and non-potable water uses or has an irrigation system installed.
- 2) Indirect Reuse
- a. Identify indirect reuse opportunities for augmentation of potable supply.
 - b. Identify the source of reclaimed water that could be used to augment the potable raw water supply.
 - c. Identify the potential water body that would receive the reclaimed water. Careful consideration should be given to the water quality requirements for the augmented water supply to be suitable for potable use. The augmentation of a potable supply should involve multiple barriers to ensure compliance with applicable regulatory standards, including high levels of treatment of the reclaimed water, blending with substantial amount of natural water, retaining the reclaimed water in the receiving water body for significant amounts of time, high degree of treatment of the potable water, and monitoring (sampling and testing) to ensure compliance with applicable regulations.
 - d. Determine potential impacts on instream uses, freshwater inflows to bays and estuaries, and existing water rights with regulatory agency input.

D. Schedule

Utilities pursuing this BMP should begin implementing this BMP within twelve (12) months of adoption of the official resolution to initiate the program.

E. Scope

In order to accomplish this BMP, the utility should perform the following:

- 1) Direct Reuse
To the extent that reclaimed water is available for reuse, replace the use of potable water on golf courses, in large cooling plants, and in other industrial or landscape processes identified by the municipal utility.
- 2) Indirect Reuse
To the extent that reclaimed water is available, that a receiving water body is available, and a water rights permit is obtained from the TCEQ, augment the potable water supply sources with reclaimed water in a manner determined by the utility to be financially and technically feasible.

F. Documentation

To track this BMP, the utility should gather the following documentation based on whether direct and/or indirect reuse is selected:

- 1) Direct Reuse
 - a. Description of wastewater treatment facilities and reclaimed water distribution systems.
 - b. Documentation of its efforts to find reuse opportunities within its customer base, including lists of potential users.
 - c. Number of gallons or acre-feet of water use replaced by reclaimed water or new water demands served by reclaimed water since implementation of this BMP.
- 2) Indirect Reuse
 - a. Description of indirect reuse project(s).
 - b. Number of gallons or acre-feet of previous potable water use replaced by reuse water or new water demands served by reuse since implementation of this BMP.

G. Determination of Water Savings

Water savings are estimated at up to 100 percent of total amount of water replaced by reuse. Changes in operating parameters or water balance calculations which depend upon water quality parameters, such as the impact of TDS in irrigation water, may require different quantities of reuse water to be applied for the same end uses.

H. Cost-Effectiveness Considerations

The costs for direct or indirect reuse include capital costs of facilities, engineering, regulatory costs, and operations costs. There will also be outreach costs to gain public acceptance. The benefits will be the avoided costs for water supply acquisition and additional potable water treatment capacity.

These benefits of direct reuse can be taken into account when setting the reclaimed water rate. If a utility can adopt a regulation requiring reclaimed water use for certain purposes within the proximity of a reclaimed water supply line, more customers will tie on to the reclaimed water system and the utility will be able to charge a rate that recovers its costs.

I. References for Additional Information

- 1) *Water Reuse Association: Fact Sheets and Studies.*
<http://www.watereuse.org/Pages/information.html>
- 2) *Recycled Water Users' Handbook, San Antonio Water System.*
http://www.saws.org/our_water/recycling/handbook/recycle_water_hb.pdf
- 3) *Chapter 210 Rules, Texas Commission on Environmental Quality.*
<http://www.tnrcc.state.tx.us/oprd/rules/pdflib/210a.pdf> through 210e.pdf
- 4) *AWWA M24 Manual: Dual Water Systems.*
<http://www.awwa.org/bookstore/product.cfm?id=30024>
- 5) *Using Reclaimed Water to Augment Potable Water Resources*, Water Environment Federation and American Water Works Association, 1998. (2.16c)