



## WATER REUSE POSITION PAPER

### I. Issue Statement

#### a. Overview

Water – the world’s most precious natural resource. All life is sustained by it. Most of our personal, business and industrial activities depend in some way upon it in plentiful supply.

But the supply of water – both in quantity and quality – has been affected by use patterns and water relocation characteristics of nature. This situation is exasperated by the relocation of populations and industries from areas of historical water surplus (e.g. northeast) to areas of water deficits (e.g. southwest).

U.S. EPA defines water reuse as *reusing treated wastewater for beneficial purposes such as agricultural and landscape irrigation, industrial processes, toilet flushing, and replenishing a ground water basin (referred to as ground water recharge). Water is sometimes recycled and reused onsite; for example, when an industrial facility recycles water used for cooling processes. A common type of recycled water is water that has been reclaimed from municipal wastewater, or sewage. The term water recycling is generally used synonymously with water reclamation and water recycling.*

Because the need for and the use of water is ubiquitous in our way of life, the competition for the supply and quality of water is accelerating the need for water reuse alternatives and the associated technologies that enable those alternatives.

#### b. Legislation, Regulations, Guidelines Affecting the Issue

There are no direct federal regulations or legislation directly addressing water reuse practice in the United States. However, in September 2004, U.S. EPA updated and published its *Guidelines for Water Reuse* which was first published in 1992. The *2004 Guidelines* examines opportunities for substituting reclaimed water for potable water supplies where potable water quality is not required. It presents and summarizes recommended water reuse guidelines, along with supporting information, as guidance for the benefit of the water and wastewater utilities and regulatory agencies, particularly in the U.S.

A large number of states have already developed and implemented regulations and/or guidelines related to water reuse. These states include Arizona, California, Colorado, Florida, Georgia, Hawaii, Massachusetts, Nevada, New Jersey, New Mexico, North Carolina, Ohio, Oregon, Texas, Utah, Washington, and Wyoming have guidelines and/or regulations. Other states, including Louisiana, New York, and Pennsylvania, are developing legislation to require water reuse guidelines and/or regulations.

Guidelines and regulations vary widely between the states but in general provide for standards for reuse water quality and/or specified minimum treatment requirements. Reuse water treatment requirements are most stringent when public exposure is unrestricted and public exposure to the reused water is likely. In those instances when public exposure is not likely, lower levels of treatment are typically acceptable.

Purple colored piping is one universal standard that has been adopted for the identification of water reuse supplies. There continues to be an increasing number of communities considering recycled water as alternative water sources. However, perceptions vary throughout the country, and misperceptions can lead to opposition. By raising awareness and educating the general public, the true benefits of recycled water can be better conveyed, leading to greater public acceptance and practice of water reuse initiatives...

### **c. Macro and Micro Pros/Cons**

The following pros and cons have been compiled and organized into industry and business opportunity categories.

#### **1. Macro (Industry) Pros/Cons**

##### Pros:

- Water reuse in appropriate applications, it is a valuable resource and an alternative to more scarce water supplies.
- Water reuse reduces the demands on potable sources of freshwater.
- Water reuse may reduce the need for large wastewater treatment systems, if significant portions of the waste stream are reused or recycled.
- Provision of nutrient-rich wastewaters can increase agricultural production in water-poor areas.
- Pollution of rivers and ground waters may be reduced.
- In many cases, the quality of the reuse water, as an irrigation water supply, is superior to that of well water.

### Cons:

- Water reuse must be properly managed so as not to negatively impact human, animal or agricultural health.
- A patchwork of various state guidelines and regulations related to performance requirements and impacting the size and growth in the market for water reuse technologies.
- Health problems, such as water-borne diseases and skin irritations, may occur in people coming into direct contact with reused wastewater.
- Gases, such as hydrogen sulfide, produced during the treatment process can result in chronic health problems.
- Reuse of wastewater may be seasonal in nature, resulting in the overloading of treatment and disposal facilities during the rainy season; if the wet season is of long duration and/or high intensity, the seasonal discharge of raw wastewaters may occur.

## **2. Micro (Business Opportunity) Pros/Cons**

### Pros:

- Water reuse may diminish the volume of wastewater discharged, resulting in a beneficial impact on the aquatic environment.
- Capital costs are low to medium for most systems and are recoverable in a very short time; this excludes systems designed for direct reuse of sewage water.
- Operation and maintenance are relatively simple except in direct reuse systems where more extensive technology and quality control are required.
- Water reuse facilitates lawn maintenance and golf course irrigation in resort areas.
- Application of untreated wastewater as irrigation water or as injected recharge water may result in groundwater contamination.

### Cons:

- If implemented on a large scale, revenues to water supply and wastewater utilities may fall as the demand for potable water for non-potable uses and the discharge of wastewaters is reduced.
- In some cases, reuse of wastewater is not economically feasible because of the requirement for an additional distribution system.

## II. Position

- Water reuse is an important part of conserving one of our most precious resources.
- Misconceptions on water reuse in the public and business community requires continued education, awareness and acceptance.
- Mechanisms should be put in place to share and promote best practice for water reuse technology.
- It is recognized that different states may have different reuse requirements; however, WWEMA should continue to advocate for continuity in reuse standards in an effort to reduce confusion by the end-user and the equipment supplier.

## III. Enforcement authority

While several key states like California (Title 22), Florida (High Level Disinfection), Arizona (Class A+) and Hawaii (R-1) have clear water reuse standards, their enforcement efforts are very much focused on conditional acceptance of individual process technologies and equipment and their design implementation within the treatment works. Other states that adhere to the “ten-state standard” also focus on approval of new treatment facilities. The requirements generally involve each new installation to submit a performance test report that proves the process meets the given discharge standard. This report is then reviewed and acceptance, or otherwise, triggers the ability to commence discharge. This covers new installations however there appears to be very little effort expended in on-going monitoring of equipment performance. Thus equipment operation, maintenance and even modifications to equipment are often left largely unchecked. Where discharge reporting is made, there appears to be no common standard used.

## IV. Resource links

*Guidelines for Water Reuse* ([www.epa.gov/ord/NRMRL/pubs/625r04108/625r04108.pdf](http://www.epa.gov/ord/NRMRL/pubs/625r04108/625r04108.pdf))

[www.epa.gov/ord/NRMRL/pubs/625r04108/625r04108.pdf](http://www.epa.gov/ord/NRMRL/pubs/625r04108/625r04108.pdf)

[www.nesc.wvu.edu/ndwc/articles/OT/WI05/reuse.pdf](http://www.nesc.wvu.edu/ndwc/articles/OT/WI05/reuse.pdf)

[www.oasisdesign.net/greywater/law](http://www.oasisdesign.net/greywater/law)

[www.usbr.gov/pmts/water/media/pdfs/report019.pdf](http://www.usbr.gov/pmts/water/media/pdfs/report019.pdf)

[www.mickleyassoc.com/waterreuse.html](http://www.mickleyassoc.com/waterreuse.html)

[www.sandiego.gov/water/waterreusestudy/](http://www.sandiego.gov/water/waterreusestudy/)

[www.water.siemens.com/en/applications/water\\_recycle\\_reuse/municipal\\_ww\\_reuse/Pages/default.aspx](http://www.water.siemens.com/en/applications/water_recycle_reuse/municipal_ww_reuse/Pages/default.aspx)

[en.wikipedia.org/wiki/Reclaimed\\_water](http://en.wikipedia.org/wiki/Reclaimed_water)

[www.amwater.com/files/WaterReuse.012609.pdf](http://www.amwater.com/files/WaterReuse.012609.pdf)

[www.ehow.com/about\\_5537752\\_impact-water-recycling.html](http://www.ehow.com/about_5537752_impact-water-recycling.html)

[www.sunandclimate.com/products/4-water-recycling.html](http://www.sunandclimate.com/products/4-water-recycling.html)

[www.oas.org/dsd/publications/Unit/oea59e/begin.htm#Contents](http://www.oas.org/dsd/publications/Unit/oea59e/begin.htm#Contents)

<http://nett21.gec.jp/GESAP/themes/themes2.html>

[WWW.epa.gov/npdes/pubs/gi\\_munichandbook\\_harvesting.pdf](http://WWW.epa.gov/npdes/pubs/gi_munichandbook_harvesting.pdf)

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