

It's the 21st Century – It's Time to Move Beyond Ourselves and Embrace the Direct Potable Reuse of Water

Abstract: It's the 21st Century. We continually amaze ourselves at how advanced our civilization has become. Technological innovations continue to remove barriers to advancing our future that only decades ago seemed insurmountable. Medical technology has dramatically advanced human life expectancy. Telecommunication technology has radically advanced our social connectedness.

Computational technology has opened our discoveries from the micro world of nano-structures to the vastness of cosmological space and time. Yet despite these incredible advances, that until recently were mere science fiction novelties, we struggle to advance the basic necessity of life itself: reusing water. Why does technology not seem to have the “strength” to remove the barriers to direct potable reuse so that water, our most precious of natural resources, can be preserved for our future generations? What are these barriers and how, if ever, will they be overcome?

The reuse of water through both indirect and direct potable reuse pathways is about understanding how water can be made “fit for the purpose.” No one doubts that current technological approaches to the treatment of wastewater can achieve the quality required for direct potable reuse. Nor is there any doubt that it has been proven for years. The doubt rests in our perception of the reliability of the performance of our technology to be, in absolute, fail-proof. How do we elevate our trust in our well-known “engineered” solutions to a level equal to that of the value we hold in environmental buffers (aquifers, surface waters, reservoirs, etc.)?

In part, barriers to the direct potable reuse of used water lie in our own understanding of the breadth of the challenge. The public perceives the fundamental drivers for the reuse of water to be, in order of priority, quantity, quality, environmental concerns, and other issues. The implication is that reuse happens only when our backs are against the wall of diminishing quantity. Even then, many fear that the quality will never be “good enough.” Some of the controversy rests in the fact that we lack an “up-to-date information base.” This is evidenced by the fact that those pushing for reuse of used water by making it “fit for a purpose” are generally water professionals and municipal and state authorities, while those opposing it are, ironically, environmental advocacy groups and community organizations, the very ones who would be assumed at the forefront of complete reuse of water. Clearly, there is a disconnect in our understanding. This disconnect lies somewhere between our perception that public health cannot be compromised at any cost, and yet remaining convinced that we cannot live without water, no matter what the cost.

This presentation will provide thoughts on the reuse of water for direct potable purposes, while asking the provocative questions of balancing treatment and regulatory oversight with the specific useful purpose for every drop of available water.

Presenter: Art Umble, PhD, PE, BCEE

Title: Americas Wastewater Practice Leader

Organization: MWH

1801 California St.

Denver, CO 80202

Art.Umble@us.mwhglobal.com

Professional Background: Dr. Umble's experience covers many aspects of engineering practice. He began developing his engineering career in private development and municipal civil engineering in areas throughout the southwestern United States, specializing in hydraulics and water resources. After completing a Ph.D. in biological waste treatment at the University of Notre Dame, he added to his experience nearly a decade municipal water and wastewater utilities management and operations for the City of Elkhart, IN, a city of 50,000. In this capacity he was responsible for strategic master planning, day-to-day treatment plant operations, regulatory compliance, facility planning, preliminary and final design of civil/sanitary systems, asset management and maintenance of the drinking water and wastewater treatment systems. During this time, Dr. Umble has also served as Adjunct Professor of Civil Engineering at the University of Notre Dame.

In his current role as the Americas Wastewater Practice Leader, Dr. Umble provides technical analysis and review support to design teams for new and rehabilitated wastewater treatment plants, with a focus on nutrient removal facilities, process optimization for treatment capacity, wet weather treatment, solids processing and disposal facilities, disinfection systems, and emerging contaminant removal technology. His role focuses on providing technical support to the wastewater facilities design staff, development of design guidelines, staff technical training, and a wide range of business development opportunities with existing and potential clients for business units across the country. He is also responsible for cultivating the firm's role and participation in professional associations both nationally and at the State level through a wide range of participatory activities.

Dr. Umble has been a leader in community initiatives involving the promotion of environmental stewardship, such as watershed planning and pollution prevention. He serves in numerous state and national forums and stakeholder work groups related to environmental rules, regulations and environmental legislation, and emerging treatment technologies. His focus has been in technical support for the environmental policy areas of water quality standards, treatment technology, water reuse, biosolids and residuals management, stormwater management, watershed planning, affordability for water environment program implementation, developing frameworks for stakeholder coalitions in environmental policy, and implementation of environmental management systems. He is active on numerous committees with the Water Environment Federation, and serves as a technical advisor/reviewer for Water Environment Research Foundation and the Water Reuse Foundation collaborative research projects.