

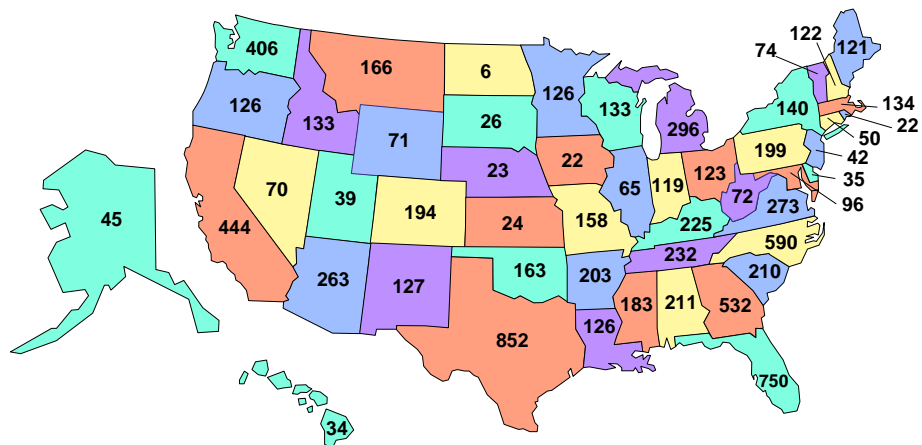
# Clear Solutions

An EPRI Municipal Water and Wastewater Publication—A Market Watch Report

June 2000

## \$6.2 Million Collaborative Project Moves Forward

The U.S. Environmental Protection Agency has awarded \$6.2 million to the EPRI Community Environmental Center (CEC) and Washington University in St. Louis for the National Decentralized Water Resources Capacity Development Project. The CEC and Washington University will jointly manage this project and, working with a Project Steering Committee (PSC) that includes a number of experts, award a number of research grants in the field of decentralized wastewater treatment. The need for advancements in decentralized wastewater treatment can be seen in the map detailing the expected growth for new on-site systems.



Projected new on-site wastewater systems 1990-2015 by state in thousands.

“We are very excited to be a part of this project,” said CEC Director Keith Carns. “Studies show that decentralized wastewater treatment is an issue of growing importance, one which can be resolved by successful wastewater industry and electric industry partnerships.”

### Similarities to Distributed Generation

In many ways, decentralized wastewater treatment is analogous to the electric utility concept of distributed generation. Decentralized wastewater treatment is defined as the treatment of small volumes of wastewater through the use of individual on-site or group cluster systems and the disposal

of the resulting effluent close to the point of generation, usually through a land disposal system. Decentralized wastewater treatment is a cost-effective alternative to centralized facilities, especially in rural areas. It can provide a solution to the lack of adequate wastewater treatment, which hinders economic growth. As such, a number of utilities, especially rural electric cooperatives, are conducting research in this area.

The stated objective of the Capacity Development Project, contained in the EPA grant application, is to:

“Assist in the development of the capacity of electric utilities, water and wastewater utilities, municipalities, engineers, contractors, regulators, and

Also in this issue . . .

NRCEC Projects Show Promise  
page 3

PIER Program Technology Transfer  
page 3

What's New:  
Publications, Training CD  
page 4

BC Hydro's New Centre  
page 4

A publication of the EPRI  
Municipal Water and  
Wastewater Program

EPRI CEC

**Keith Carns, Director**

Washington University  
Campus Box 1150  
Cupples 2, Room 11  
One Brookings Drive  
St. Louis, Missouri 63130  
Phone: (314) 935-8590  
Fax: (314) 935-8599  
e-mail: rehrhard@EPRI.com

South African Centre for  
Essential Community Services  
Johannesburg, South Africa

Newsletter Editorial Board  
**Elizabeth Kawczynski**  
AWWA Research Foundation

**Charles Noss**  
Water Environment  
Research Foundation

**Paul Wolske**  
TU Electric

**Frank Burton**  
Burton Environmental  
Engineering

**Melissa Blanton**  
Executive Editor

Produced by ProWrite Inc.

© 2000 EPRI

other public and private entities to respond to the increasing needs and complexities of decentralized wastewater treatment.”

### **Program Focuses on Two Strategic Areas**

The two projects currently funded are the 1) Risk-Based Decision-Making for On-site Water Treatment and 2) Capacity Development Research Projects.

The Risk-Based Decision-Making Project (\$250,000) culminated in a Research Needs Conference held in St. Louis in May 2000. The Conference used risk assessment/risk management techniques, as explained by Oak Ridge National Laboratories, to prioritize overall research needs in the field on a national level and to give direction to the Project Steering Committee regarding future candidate projects for funding. Three regional forums held in 1999 identified four significant areas of research:

- Process, Function and Performance of Wastewater Soil Absorption Systems
- Fate and Transport of Pathogens
- Fate and Transport of Nutrients
- Economics of Decentralized Wastewater Treatment Systems—Direct and Indirect Costs and Benefits.

Prioritizing the specific research topics will be completed by fall.

The Capacity Development Research

Project (\$6 million) consists of a number of research projects addressing specific barriers to the implementation of decentralized systems. As identified in EPA's Response to Congress on the

Use of Decentralized Wastewater Systems (EPA 832-R-97-001b, April 1997), these barriers include lack of knowledge and public misconception, legislative and regulatory constraints, and lack of management programs.

Some projects have been identified, and proposals are under review. A formal Request for Proposals will be issued this summer for additional projects that address the prioritized research topics identified at the Research Needs Conference.

### **Other Promising Research Efforts**

In addition to the Capacity Development Project, the EPRI MWW is involved in a number of other projects in the field of decentralized wastewater treatment. These include:

- A market study that analyzes on a state-by-state basis the future demand for advanced on-site treatment systems and the need for their professional management. This study, which is currently being printed, is co-funded by EPRI, the Cooperative Research Network of the National Rural Electric Cooperative Association (NRECA), and the Water Environment Research Foundation.
- The development of a business plan targeting the management of decentralized wastewater treatment systems. A generic business plan will be developed for NRECA and for the East Kentucky Power Cooperative that can be used by distribution cooperatives nationwide and by East Kentucky in their service territory. The business plan will draw on the experiences of South Kentucky Rural Electric Cooperative, Blue Grass Energy, Stearns REC (MN), and others that are considering entry into the field of managing decentralized wastewater treatment systems.

## **New Cooperation**

Keith Carns has assumed added responsibility for EPRI's Agriculture and Food Technology Alliance. Because water and wastewater treatment is important to both targets and uses similar technologies, expect to see greater cooperation between the two targets in the future.

## NRCEC Projects Continue To Show Promise

EPRI's Northeast Regional Community Environmental Center (NRCEC) reports encouraging results on several current or recently completed projects. These include:

- **Feasibility on Use of Ozone on White Plains Water.**

This study, undertaken with New York Power Authority, was completed in December 1999. The study concluded that ozone is a feasible option as a disinfectant for the White Plains water supply system. A conceptual design was also provided.

- **UV Demonstration Pilot Study at the Wastewater Treatment Plant of the Town of Poughkeepsie, NY.**

This study, completed with Central Hudson Gas & Electric (CHG&E), was conducted last fall. Three different UV lamp types—Medium pressure, Low pressure/high intensity and pulsed UV—were tested and compared. Preliminary results indicate that UV is a valuable alternative to chlorination for disinfection. A report has been completed and will be published soon.

- **Alternative Disinfection (Ozonation) Pilot Study at Tannersville.**

This study, also with CHG&E, evaluates the feasibility of using ozone in the place of chlorination, dechlorination, and aeration. The



**Start-up training of the ozone pilot skid at Tannersville, NY. Participants include: Pat Bristol, CHG&E; Jim Malley, Principal Investigator from UNH; Birgit Laumen, PCI Wedeco; and NYCDEP plant operators.**

benchscale portion of this study indicated that ozone at cost-effective dosages can be used to achieve the desired level of disinfection required at the Tannersville POTW. The wastewater is discharged into a high-quality receiving stream, which is in the watershed of NYC's water supply system. The pilot study portion of the project is now underway.

- **Pilot Study on Biological Denitrification for Suffolk County Water Authority.** This study, undertaken with Long Island Power Authority, was completed in March. A follow-up study to optimize alternative filtration methods is being investigated.

## MWW Calendar

Plan now to attend this year's upcoming MWW Program meetings. More information on conference registration and arrangements is available from Kim Shilling at the CEC.

➤ **June 21-23**—CEC Conference and MWW Program Meeting. Minneapolis, Minnesota, for the Water & Energy Conference (June 21) and the MWW Program Meeting (June 22-23).

➤ **September 27-29**—CEC Conference and MWW Program Meeting. Dallas, Texas, for the Water & Energy Conference (September 27) and the MWW Program Meeting (September 28-29).

## PIER Program Technology Transfer Continues

The EPRI-CEC is a member of a Southern California Research Consortium evaluating the role of electrotechnologies in providing environmental, economic, and public health benefits for water and wastewater treatment. Approximately \$2.89 million in funding is provided through the California Energy Commission's Public Interest Energy Research (PIER) Program. In-kind services are provided by the consortium collaborators.

The research is intended to help fully develop the potential of existing processes, such as membranes, while investigating cutting-edge processes such as pulsed-ultraviolet radiation and capacitative deionization with carbon aerogel. Other project participants include Edison Technology Solutions, Metropolitan Water District of Southern California, Orange County Water District, and the American Water Works Association Research Foundation.

EPRI MWW is responsible for coordinating the technology transfer activities and has organized two workshops. Publications distributed as part of the public outreach program include tech bulletins on *Pulsed-Ultraviolet Light for Drinking Water Disinfection*; *Membrane Pretreatment of Reclaimed Wastewater for Reverse Osmosis Desalination*; and *Technologies for Improving Water Desalination for Municipal and Industrial Applications*.

# What's New

## Publications

The following publications are available from the EPRI-CEC or through EPRI-CAC:

- *TechCommentary on High-Rate Clarification for Treatment of Wet Weather Flows (TC-113574)*. High-rate clarification (HRC) plants can treat wet weather flows at less cost than conventional biological treatment systems. This *TechCommentary* reviews the technology and describes a Fort Worth, Texas, study where side-by-side testing was conducted of four HRC systems.
- *Technical Brief on The Problems With Water Treatment Plant Residuals (TB-114559)*. This paper describes results of pilot evaluations of freeze/thaw conditioning at installations in California and Texas. The testing demonstrated that freeze/thaw conditioning is probably unsuitable for residuals from water treatment processes relying on ferric salts. However, testing will continue for alum-based residuals. Industrial wastewater treatment also seems promising, particularly with metal hydroxide sludges containing heavy metals.

Contributors' acknowledgments: Karin Lukas, Northern Regional CEC; Tom Yeager, Kennedy/Jenks Consultants; Grad Illic, BC Hydro

Photo credits: p. 3 Karin Lukas, EPRI NRCEC

## About EPRI

EPRI creates science and technology solutions for the global energy and energy services industry. U.S. electric utilities established the Electric Power Research Institute in 1973 as a nonprofit research consortium for the benefit of utility members, their customers, and society. Now known simply as EPRI, the company provides a wide range of innovative products and services to more than 1000 energy-related organizations in 40 countries. EPRI's multi-disciplinary team of scientists and engineers draws on a worldwide network of technical and business expertise to help solve today's toughest energy and environmental problems.

EPRI. Powering Progress

## Training CD



Utility representatives can learn more about water and wastewater treatment and the electrotechnologies involved by using


the EPRI MWW Training CD Version 1.0. The CD will run on Windows-based PCs using an Internet browser. It is designed to be used by the novice, as well as provide photos and explanations helpful to those representatives already serving water and wastewater customers. If you have not yet obtained your copy, contact John Murphy at the CEC.

## BC Hydro's New Centre Conducts Diverse Research Programs

Although launched less than two years ago, the new BC Hydro Water and Wastewater Centre has implemented a comprehensive research program to advance electrotechnologies. Among projects currently underway are:

- Studying the impact of pretreatment processes (ozonation, OAC, and coagulation and flocculation processes) on dissolved air flotation performance in water treatment.
- Reviewing the treatment efficiency and performance of selected MF/UF membranes for applications in British Columbia municipalities.
- Evaluating sequential batch reactor wastewater treatment and residuals management with methanol addition.
- Evaluating a patented process as an alternative non-biological treatment of liquid municipal waste.
- Designing an ozone treatment process for the removal of toxic materials from log yard run-off.

© 2000 Electric Power Research Institute (EPRI), Inc. All rights reserved. Electric Power Research Institute and EPRI are registered service marks of the Electric Power Research Institute, Inc. EPRI. POWERING PROGRESS is a service mark of the Electric Power Research Institute, Inc.

 Printed on recycled paper in the United States of America.

NL-114857-V1

EPRI CEC • Washington University, Campus Box 1150, Cupples II Room 11 • One Brookings Drive • St. Louis, Missouri 63130  
314.935.8590 • fax 314.935.8599 • kecarns@epri.com

EPRI • 3412 Hillview Avenue, Palo Alto, California 94304 • PO Box 10412, Palo Alto, California 94303 USA  
800.313.3774 • fax 650.855.2121 • askepri@epri.com • www.epri.com



## EPRI's Municipal Water and Wastewater Program

### Join Our Collaboration!

With the deregulation of the electric utility industry, investment in research, development, and deployment activities for specific customer segments can be a tough sell. After all, it is extremely difficult to justify most research and development projects with specific customers based purely on a return-on-investment (ROI). Besides, many electric utilities cannot be assured that their customers today will be the same customers in the next few years.

In spite of these uncertainties, research, development, and deployment remains essential to the long-term success of any electric utility. In addition, these activities must be conducted by all electric utilities regardless of their future focus, be it generation, transmission and distribution, energy services, or any combination. For instance, energy management measures offer business opportunities for energy service companies while helping transmission and distribution with asset utilization issues. Your active participation and funding will solidify gains to date and provide a valuable service to your important water and wastewater customers.



#### What We Offer

The EPRI Municipal Water and Wastewater Program offers your company a vehicle you can use to engage this customer base in practical R&D and services. Program membership provides your staff with access to a wide range of publications, technical consultation and expertise, and helpful

services for your customers. By assisting this industry in meeting the many challenges they face today, you can assure the continued growth of your company tomorrow.

So, how do you justify participation in the EPRI MWW Program? We believe there are six specific reasons, many of which are unique to the water and wastewater industry. These include:

- 1 Payback**—Your investment in the R&D of newer electrotechnologies will result in increased revenues in the future. However, participation cannot be justified on this reason alone as typically ROIs will not be less than 3 to 5 years.

**2 Word-of-Mouth**—Members of the water and wastewater community trade a significant amount of information on experiences with new technologies. Thus, successful implementation of a new process at one plant often leads to its installation at several others. This effect, which is quite common in the water and wastewater industry, can be viewed as an “extended ROI.” Conversely, if a new technology is poorly implemented or tested, implementation in other locations may be impossible. The MWW Program provides the quality control needed to prevent such occurrences.

**3 Name Recognition**—As a member of the MWW Program, your utility can become recognized among your municipal customers as a resource and expert in solving many of their problems. This name recognition is invaluable, particularly with a customer base, which nationwide accounts for about 3 percent of U.S. electricity use.

**4 Faster Regulatory Acceptance**—Successful demonstrations of new technologies are essential before regulators allow their use in water and wastewater treatment plants. Thus, demonstrations speed the acceptance and implementation of new technologies by regulators, plant designers, and other water and wastewater professionals.

**5 Economic Development**—Population growth, more stringent regulations, and the public’s aversion to new taxes have made the already difficult job of providing safe drinking water and properly treated wastewater much tougher. In fact, in many regions of the

country, economic growth and the electric load that grows with it are halted when potable water or wastewater treatment capacity is insufficient.

**6 Collaborative Research Efforts**—By joining other, like-minded electric utilities, both the costs and risks associated with furthering the use of electrotechnologies with this important industry can be shared. Further, all members gain access to information generated by all research activities. This greatly speeds the implementation of new technologies and leads to an “extended” ROI, as discussed above.

### **The Merits of the EPRI MWW Program**

For ten years, the EPRI Municipal Water and Wastewater Program has been sponsoring research, development, and deployment activities for state-of-the-art electrotechnologies for the water and wastewater industry. With over 100 active or completed demonstration projects, nearly 30 technical reports, and numerous shorter technical briefs and other articles, the MWW Program now maintains a high degree of respect within the water and wastewater industry. However, this important and valuable work cannot move forward without the continued support of electric utilities across the country.

Staff with the Program would welcome any comments or questions you may have. Please feel free to call us at 314/935-8590 for more information. In addition, we would welcome the opportunity to visit you in person to discuss the merits and value of our Program. Visits can usually be limited to one to two hours and scheduled at your convenience.