


ASCE EWRI Currents
American Society of Civil Engineers

Federal Facilities Face a New Stormwater Hurdle

In December of 2007 the 110th Congress passed the Energy Independence and Security Act (EISA) of 2007. The publicity surrounding the enactment of this new law focused on the provisions related to: increasing the fuel economy standards for passenger cars; expanding the requirement to use renewable fuels; improving efficiency standards for light bulbs; requiring energy efficiency improvements in existing federal buildings as well as in new federal construction; and funding for research on solar and geothermal energy. Also contained in the Act was Sec. 438 Storm Water Runoff Requirements for Federal Development Projects. This small section of the Act has the potential to significantly change the way that storm water is managed at federal facilities.

EISA sets forth stringent requirements for storm water management from federal development projects. Specifically, Section 438 of the Act requires that "the sponsor of any development or redevelopment project involving a Federal facility with a footprint that exceeds 5,000 square feet shall use site planning, design, construction, and maintenance strategies for the property to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow."

The intent of the act is for federal facilities to adopt "greener/sustainable" techniques, also known as Low Impact Development (LID) practices. The primary goal of LID practices is to mimic the predevelopment site hydrology by using site design techniques that store, infiltrate, evaporate, and detain runoff. Use of these techniques helps to reduce off-site runoff and ensure adequate groundwater recharge. There are many examples around the country of federal buildings that have incorporated green design and LID stormwater features such as green roofs, permeable surfaces, bioretention, raingardens, constructed wetlands, rainwater capture and reuse, etc. Several of the most recently constructed federal buildings have achieved Leadership in Energy and Environmental Design (LEED) certification under the program developed and managed by the U.S. Green Building Council. (www.usgbc.org).


Green Roof. Chicago Center for Green Technology

However, the most important aspect of Section 438 is the new standard for stormwater management with the use of the statement "to the maximum extent technically feasible." EISA has raised the bar for storm water management at federal facilities. How high the bar has been raised is yet to be determined. Engineers, hydrologists, scientists, planners, and architects have improved our ability to design better stormwater management facilities. New approaches to storm water management including LID techniques have changed in the way that we treat storm water. We now view storm water as a resource to manage and protect and not just an annoyance to quickly move off a site and discharge into the nearest stream, lake or wetland. Will an LID storm water design meet this new standard of "maximum extent technically feasible?" We don't know the answer to this question. Many of us that work in storm water manage-

Highlights

(Continued from Cover Story.)

ment know that we still have quite a distance to go before we could ever stand at the opening of a new facility and be confident that we managed storm water to the maximum extent technically feasible.

A small subcommittee of The Interagency Sustainability Working Group (ISWG) is developing a guidance document on recommendations for complying with Section 438. The ISWG was established in September 2001 in response to Executive Order 13123 – Greening the Government Through Efficient Energy Management. Under EO 13423 – Strengthening Federal Environmental, Energy, and Transportation Management, issued in January 2007, the ISWG was charged with providing interagency assistance for implementing the EO 13423 sustainable building design requirements. The guidance document should be released by the end of February 2009 and it will greatly assist in providing the framework for how designers and engineers working on federal projects should incorporate effective storm water management into their designs.

The Economic Stimulus Package was signed on February 17, 2009 and federal building projects will quickly move toward implementation. There is hope that storm water management will become an important component in the sustainable designs that will last for decades and protect and improve our water resources.

Prepared by:

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FY2010 EWRI VICE PRESIDENTIAL NOMINEES

The EWRI of ASCE Nominations and Elections Committee announces the selection of Daniel L. Thomas, Ph.D., P.E., D.WRE, F.ASCE and William F. Ritter, Ph.D., P.E., F.ASCE as the Official Nominees for the EWRI of ASCE Office of Vice President for FY2010.

Nominations by Petition may be filed, and must be received by the EWRI Director, by midnight Eastern time June 1, 2009. Petitions for such nominations shall contain the signatures of at least 200 individual voting members of EWRI of ASCE and include biographical, occupational and geographical data. You may find the bio forms, et. al., at this link – click here. All petitions packets must be in accord with the EWRI Bylaws as stated in the most current ASCE Official Register.

Voting will take place from June 15 through August 13, 2009.

William F. Ritter, Ph.D., P.E., F.ASCE

Daniel L. Thomas, Ph.D., P.E., D.WRE, F.ASCE

Organizational Membership

EWRI is pleased to announce Bio Clean Environmental Services, Inc. as the Institute's latest Corporate Member through the Organizational Membership Program. Corporate Members will experience great benefits through EWRI-ASCE, including but not limited to: increased visibility via EWRI's newsletters and website, discounted exhibitor pricing at an Institute conference, invitations to all organization events, and an Organizational Membership wall plaque. For more information, or to become an Organizational Member, contact Ann Rountree at arountree@asce.org or (703) 295-6380.

Editor's Corner

Mary Fickert Thomas
Communications
Council Chair

As I write this column, we are not even one month into a new administration, and President Obama has all but signed the $787 billion economic stimulus package into law. A reported $150 billion is targeted for infrastructure projects for roads, sewers, energy and electricity transmission, and not a moment too soon. In its 2009 Report Card for Infrastructure, ASCE estimates that the nation still carries a D average. In fact, "ASCE's current estimate [of repairs and needed upgrades] is $2.2 trillion, up from $1.6 trillion in 2005."

I'm certainly no economist. This bill may do nothing to boost our economy, and it might even make it worse. However, few can argue that jobs will be created (or at the very least saved). Caterpillar Inc., for example, plans to reinstate some of the 22,000 layoffs they recently announced — once the stimulus is signed into law. As professionals in water and environmental fields, one of our most important jobs right now is to spend the infrastructure money (or at least make recommendations on how to spend the money) responsibly. This government package will hopefully jump-start construction projects that will improve national infrastructure (not to mention safety). But let us not forget the potential for 'trickle up" spending, and do our parts to direct it in a responsible, sustainable, and innovative direction.

What are your thoughts? Wouldn't you love to see a story about infrastructure planning in your region? Please contact me with your comments and articles at thomasmf@pbworld.com.

Discussions with Dale

Dale Jacobson,
P.E., DEE, F.ASCE
2008-2009 EWRI President

Last month at the annual EWRI Council Weekend in Houston, the leadership structure of the Institute was addressed with the state of the organization. Many topics were discussed regarding finances, publications, conferences, continuing education, and a bevy of additional endeavors. In these trying economic times, it is quite understandable that a prime topic of conversation revolved around the finances of the Institute. How are the organization's financial reserves? What can EWRI do to run as efficiently as possible? Are there additional resources that could help save money for the Institute and its members?

Although these meetings and conversations featured individuals in leadership roles, it is important to share the general message with 10 year veteran committee chairs and student members alike: EWRI is fine. Thanks to great success in prior years and good planning on the part of the Finance Committee, the organization is in a strong fiscal position with its reserves. However, we are managing our finances very closely as we reach the half way point in the Institute's fiscal year.

At this point in time, while many organizations may be slowing down due to the economy, EWRI is actually building up a head of steam with previously planned and budgeted events. In addition to the annual World Environmental & Water Resources Congress (May 17-21, 2009, Kansas City, Missouri), we are exploring new ventures, such as the World Water Pavilion (coordinated by EWRI) at the 5th World Water Forum and the 33rd IAHR Congress (August 9-14, 2009, Vancouver, British Columbia, Canada – organized and co-sponsored by EWRI). A common sentiment at the Council Weekend was the effort to run the Institute in an economically sound manner, while still providing individuals with quality benefits as members of EWRI.

As members, we should all seek to recognize the benefits of EWRI during a time in which every penny matters. Now, more than ever, the organization can prove beneficial! ASCE and our specific Institute can aid greatly with networking opportunities, help us to expand our knowledge of environmental and water resources technical information, and provide an excellent resource as we seek to improve our careers and our field of work.

Investment in Infrastructure: Focus on Dams

On January 29, 2009, the Association of State Dam Safety Officials (ASDSO) released new numbers on the national cost of rehabilitating the nation's non-federal dams and recommended a federal program to fund rehabilitation of dams, which will encourage state parallel funding programs, provide for cost sharing and stretch the funding pool to maximize the number of dams that will be rehabilitated.

As the new Congress and Administration focus funding on infrastructure improvements and the American Society of Civil Engineers releases its 2009 Infrastructure Report Card, state dam safety officials announce new estimates for upgrades to dams. The total cost of needed dam repairs nationwide is $50 billion, including $16 billion for high-hazard-potential dams. These cost estimates have increased significantly since the Association's 2003 report ($36 billion for all dams and $10.1 billion for high-hazard-potential dams).

Of the $16 billion directed toward high-hazard dams (those whose failure would likely cause loss of human life – this classification does not indicate dam condition), roughly $8.7 billion is needed to repair publicly owned dams with the remaining $7.3 billion needed for privately owned dams.

Further, in order to eliminate the existing backlog of 1819 deficient high-hazard-potential dams over the next ten years, the number repaired will need to be increased by an additional 270 dams per year above the number currently being repaired - at an annual cost of $850 million. ASDSO estimates that, in 2007, about $700 million was spent collectively to rehabilitate about 341 dams (according to state data on dam rehabilitations completed during that year).

The nation's approximately 85,000 regulated dams provide vital benefits, including flood protection, water supply, hydropower, navigation, irrigation and recreation. While the estimated cost of rehabilitating our nation's dams is high, the collective cost of deferring maintenance on these structures is staggering.

The latest data from the National Inventory of Dams (NID), maintained by the US Army Corps of Engineers, shows that the number of deficient dams in the nation is increasing – up by 36% in the last five years.

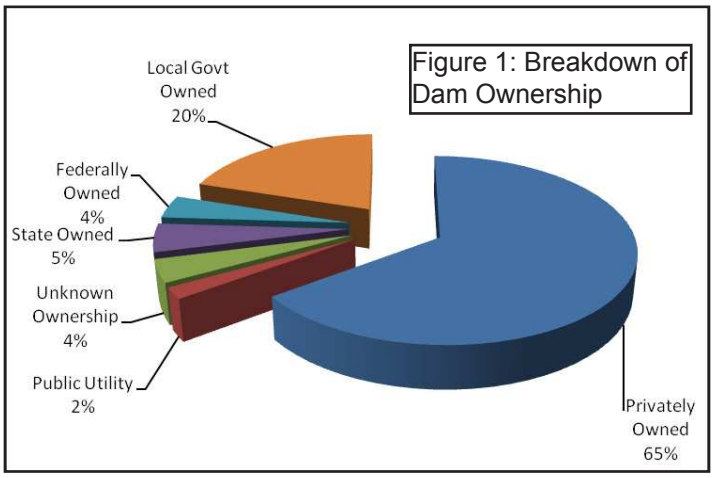
Dam owners -- municipal, state and private – not state or federal regulators — are responsible for dam maintenance and repairs. Many dam owners, both public and private, are facing rehabilitation price-tags averaging in the hundreds of thousands of dollars, which few can afford.

While federal agencies own or regulate only about 4% of the 85,000 dams in the US, they too face formidable challenges as the nation's dams continue to age, downstream development increases and dam design and construction standards evolve. The US Army Corps of Engineers is spending roughly $317 million to fix a dangerously leaking Wolf Creek Dam in Kentucky; the Corps is working with the US Bureau of Reclamation on a ten-year $1.5 billion project to upgrade Folsom Dam in California; Center Hill Dam in Tennessee is undergoing rehabilitation estimated to cost $263 million; and the list goes on.

ASDSO reports that state dam safety officials are preparing for a potential influx of needed funds, as state and federal lawmakers begin to focus on infrastructure. Many states are compiling lists of "shovel-ready" dam rehab projects – those where construction could begin within two to 24 months. ASDSO is aware of 272 projects in 21 states that meet this definition. The funding need for these projects alone reaches almost $382 million, which is the tip of the iceberg for dams in need of rehab.

Current ASDSO President Rob Martinez states, "Rehabilitating dams not only sustains their benefits, but also protects public safety. ASDSO applauds the American Society of Civil Engineers, and Building America's Future, led by Pennsylvania Governor Ed Rendell, in bringing national attention to the aging infrastructure issue. In concert with these efforts, ASDSO asks the Obama Administration and Congress to create a fund for dam rehabilitation—administered through state dam safety programs—that could focus dollars over several years toward the most critical dam rehabilitation needs."

ASDSO endorses legislation that would provide federal funds to be cost-shared at 65 percent federal to 35 percent state/local for non-federal publicly owned dams. The legislation would provide funds to states based on the number of high hazard dams in each of the participating states.



Regulators determine a dam's hazard potential classification based on the downstream consequences should the dam fail or have a serious incident; the classification has absolutely nothing to do with a dam's condition or safety. A high-hazard potential classification does NOT mean the dam is deficient.

Dams that have a high hazard rating are supposed to meet very stringent standards so that they can withstand all credible extreme events such as floods and earthquakes; yet states have determined many high-hazard potential dams as deficient.

"Deficient" is defined as a dam that is not capable of performing safely under all required design pool and loading conditions. Note: Each state may have different definitions and standards.

Since its formation in 1984, the Association of State Dam Safety Officials (ASDSO) has served as one of the premier professional organizations for individuals committed to ensuring the safety of dams in the U.S., including government officials, engineering consultants, contractors, manufacturers and suppliers, researchers, teachers, dam owners and operators and students.

SWANA Applied Research Foundation Releases New Research Reports

The Solid Waste Association of North America's (SWANA) Applied Research Foundation (ARF) recently released five new research reports from FY 2008.

- Curbside Collection of Residential Food Waste
- Benchmarking of Solid Waste Collection Services: FY 2008
- Waste-to-Energy and the Solid Waste Management Hierarchy
- Benchmarking the Performance and Costs of MSW Landfills
- Long Term Environmental Risks of Subtitle D Landfills

The Benchmarking of Solid Waste Collection Services: FY 2008 Report was developed by the Foundation's Collection Research Group. The report represents the second output of a multi-year, sustained effort to address the industry's need for meaningful and comparative benchmarking data of collection services.

The Waste-to-Energy (WTE) Group developed the Waste-to-Energy and the Solid Waste Management Hierarchy Report. This report presents the environmental benefits of waste-to-energy systems as determined an environmental life cycle assessment model developed by the US EPA. Based on the EPA's own research, it recommends that the EPA adopt a new 'systems-based' hierarchy that places waste-to-energy-based systems on the top tier. The report also includes an assessment of waste-to-energy as a renewable energy alternative.

The Disposal Group released two reports for FY 2008. The first report, Benchmarking the Performance and Costs of MSW Landfills, presents summaries and analyses of benchmarking data on the management and operation of MSW landfills which should be of interest to landfill managers and operators.

The second report, Long Term Environmental Risks of Subtitle D Landfills, represents a compilation and analysis of recent and historical research publications on the actual long-term environmental risks associated with Subtitle D landfills and suggests management alternatives that can be used to manage and minimize these risks.

The Curbside Collection of Residential Food Waste is a research memorandum was developed in FY08 by the Foundation's Recycling Research Group. The memorandum provides solid waste recycling managers with up-to-date technical and programmatic information regarding the curbside collection of food waste from residential customers living in single-family households.

"The publication of these timely reports is made possible by the support and involvement of the 34 member organizations of the SWANA Applied Research Foundation. The solid waste managers who represent these organizations are experienced, knowledgeable and visionary leaders who identified the research topics, guided the research and reviewed these reports prior to their publication," said Jeremy O'Brien, P.E., Director of Applied Research.

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The goal of the Applied Research Foundation is to support SWANA's mission of 'advancing the practice' by conducting collectively-funded research on pressing solid waste issues that are identified and selected by the Foundation's subscribers. Solid waste organizations have the opportunity to support and participate in the Foundation's research activities by becoming foundation subscribers and contributing a "penny a ton" for the waste they manage on an annual basis. Subscribers are directly involved in identifying and defining research topics and reviewing interim results and final work products. ARF subscribers also receive research products from all research groups free of charge.

Four of the five reports are currently available for purchase at www.SWANAstore.com. The research memorandum on the Curbside Collection of Residential Food Waste is available free of charge to SWANA members on the SWANA web site (www.swana.org).

For questions about the Applied Research Foundation or any of these reports, contact Jeremy O'Brien, P.E., Director of Applied Research via e-mail at jobrien@SWANA.org.

Water For People to Host Conference in the Dominican Republic and will Recognize Sustainable Water and Sanitation Programs

Water For People (www.waterforpeople.org), an international, nonprofit development organization dedicated to addressing global water, sanitation and hygiene challenges, has announced that it will be holding a conference on the needs for water and sanitation in the Dominican Republic. The conference will be held on April 15th in Santo Domingo and will bring together the non-governmental organizations (NGOs) and local government representatives to identify water and sanitation needs in the Dominican Republic and how Water For People can position itself to help address them. As part of the conference Water For People will recognize 8 NGOs for sustainable programs with cash awards totaling $25,000. The conference is the first step in Water For People's plan to work in the Dominican Republic.

The conference will be held at the Santo Domingo Hilton and will include presentations by key sector role players, regional breakouts and discussions which will lead to a plan for assistance in the future. Financial and technical assistance, additional networking and training are possible outcomes. The conference will cost $25 and scholarships are available to assist attendees. A "meet and greet" reception will be held on Tuesday evening. Participants will include Water For People's Ned Breslin, Acting CEO, Susan Davis, Chief Partnership Officer, Diana Betancourt, Latin American Program Coordinator and Robert Adamski, UN Representative and Water For People's Team lead in the Dominican Republic. Ned Breslin commented, "This is an important first step in Water For People's new program. We look forward to meeting those working to better the water and sanitation access for the residents of the Dominican Republic." Over 50 NGOs as well as INAPA (Instituto Nacional de Aquas Potables y Alcantarillos) have been invited to attend. Additional information about the conference can be found at www.waterforpeople.org.

Water For People is exploring a possible partnership with the Engineers Without Borders Chapter at the Polytechnic Institute of NYU in Brooklyn, who will be assisting with the conference. The new Chapter will be learning program management skills and will play a supportive technical assistance role to Water For People's program in the Dominican Republic. The details of the partnership are being developed. Two Chapter members will attend the conference and assist with gathering data.

The conference is a follow-up to the scoping study completed by Water For People's World Water Corps in 2007. The World Water Corps is Water For People's volunteer arm that strategically utilizes the technical skills of the north American water and wastewater industry to fill identified gaps in Water For People's programming. A World Water Corps team visited the Dominican Republic in 2007 and found there was need for Water For People's involvement and recommended adding the country under Water For People's Strategic Plan. The Board agreed and added the Dominican Republic along with Ecuador, Peru, Nicaragua, Rwanda and Uganda.

A water tank found on Saona Island, off the coast of the Dominican Republic.

About Water For People

Founded in 1991, Water For People is a nonprofit international development organization that supports safe drinking water and sanitation projects in developing countries. Water For People partners with communities, local governments, and other nongovernmental organizations to help people improve their quality of life by supporting the development of locally sustainable drinking water resources, improved sanitation facilities, and hygiene education programs. Water For People supports communities with professional development advice, financial support and volunteer technical services. Typical technologies employed include protected spring-fed community water systems, gravity-fed systems, wells with hand pumps, latrine construction, operator training and hygiene education. Water For People is currently working in Latin America, Africa and Asia. In 2008, Water For People supported the provision of safe and sustainable drinking water resources benefiting 91,722 people in the developing world, sanitation facilities benefiting 92,983, and hygiene education benefiting 153,843 people. More information is available at www.waterforpeople.org.

2008 International Low Impact Development Conference

The Headwaters Project focuses on the redevelopment of a 3-acre plot with the use of raingardens and daylighted creeks.

The Low Impact Development Standing Committee of the Urban Water Resources Research Council of EWRI/ASCE, working in close cooperation with the EWRI and ASCE Conferences staff, planned and managed a very successful International Low Impact Development Conference in Seattle, Washington, November 16-19, 2008. Low impact development (LID) is a sustainable, green infrastructure approach to preventing and controlling the damaging impacts that land development activities can have on our valuable receiving water bodies. This is an area of particular concern in the Pacific Northwest, where local streams and tributaries are the spawning habitat for several endangered species of salmon and trout.

The conference was a co-operative effort between ASCE and the American Society of Landscape Architects (ASLA) as well as a joint effort between the Cities of Seattle and Portland, Oregon. Numerous local organizations sponsored the event including;

- Seattle Public Utilities
- City of Portland Environmental Services
- Washington State Department of Transportation
- Washington State Department of Ecology
- Puget Sound Partnership
- Cedar Grove Composting Inc.
- SvR Design Company
- Tetra Tech
- Herrera Environmental Consultants

Thirty-eight states and 12 countries were represented. The conference, which included well-attended field trips to both Portland and Seattle, featured the following topics.

- Addressing Codes, Ordinances and Regulations
- International Perspectives on LID
- Green Roofs
- Computational Methods for LID
- Green Streets
- LID Incentives for New Construction
- LID & Sustainability: Green Infrastructure
- LID Watershed Retrofits: Case Studies
- LID Applications: Site Considerations
- Bioretention Technology
- Rainwater Harvesting
- LID for CSO Control
- BMP Monitoring
- LID, LEED and Smart Growth
- LID & Sustainability: Stream Restoration
- LID & Sustainability: Soils & Vegetation
- Permeable Pavements

The conference began with a tour of Portland LID projects. 70 hardy souls traveled the 160 miles from Seattle to Portland. They were joined by 10 Portlanders and were given tours of the Headwaters apartment and row-housing project, with green streets, stormwater planters, ecoroofs, porous paving and 500 feet of buried creek was daylighted through the middle of the site. The city removed part of the adjacent street to further daylight the creek in 200 feet of right of way and constructed a rain-garden to handle some of the existing development. Another stop was South Waterfront, a 130 acre industrial conversion to high rise/mixed use development next to the Willamette River and greenway. Dennis Wilde of Gerding Edlen Development took the group up to a 24th floor condo. to give the visitors a bird's eye view of the developments many LID practices. After an unexpected delay at lunch (sorry about that folks) the last stop on the tour was Mt Tabor Middle School raingardens which have been installed to reduce flows into the city combined sewer system. From there it was a 3 hour ride back to Seattle, where we just missed the networking session. Better planning next time...

The conference was highlighted by opening remarks from Mayor Gregory Nickels of Seattle, Mayor-Elect Sam Adams of Portland, and Nancy Richardson Ahern, deputy director of Seattle Public Utilities.

Engaging lunchtime presentations were provided by Tom Liptan, the conference co-chair; Brian D'Arcy of the Scottish Environmental Protection Agency (SEPA), and Dr. Chengqing Yin, Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences, Beijing, China.

The last day of the conference featured three panel discussions. The first one covered the City of Seattle's 110 acre High Point Project. Panelist gave an overview of this major redevelopment project that incorporated various LID practices throughout the site. The second one consisted of a regional overview of LID implementation in the Puget Sound region. The third one was the general discussion about the national and international interests and future development of LID. The conference wrapped-up with a local tour of Seattle Natural Drainage Systems, which included a stop at the High Point Project.

Conference participants expressed great satisfaction with the quality and diversity of the conference. The next two LID conferences have been scheduled for San Francisco in March 2010 and Philadelphia in September/October 2011.

A photograph taken during the Seattle Field Trip to review the High Point Project's natural drainage systems.

Radial Flow Fluidized Filter Finds Niche as a Pretreatment System for Surface Water in Small Communities

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David Bromley, P.E., Enprotec-Clow Water Treatment, Inc., Hebron, KY, dbromley@enprotec-clow.com

An emerging technology called radial flow fluidized filter (R3f) has been developed as a low cost simplistic filtration technology for small communities of less than 10,000 people. Fouling is a major impediment to the sustainability of membrane technology particularly for small potable water treatment system applications. The main culprit for fouling is dissolved organic carbon (DOC). Enhanced coagulation, to remove DOC prior to membrane application, has reduced fouling and organic carbon levels significantly. If chlorine is used, removing DOC also reduces the formation of disinfection byproducts. However, small communities typically do not have highly trained operators or financial resources to use high dosages of coagulants. Alternative filtration technologies are needed to reduce operation and maintenance costs in small communities.

Filtration Technologies

Small communities can choose from several alternative filtration technologies.

1. Screen or fixed barrier filtration systems
2. Disposable final filters
3. Membranes
4. Multimedia filters

Screens or fixed barrier filters provide a coarse filter for the removal of particles larger than 25 microns. Fixed screens are self cleaning filtration systems that require large volumes of backwash water. Particles can lodge in the screen (particle pegging) causing problems during backwash and reduced flux rates.

Membranes and disposable final filters (depth, bag, and cartridge filters) serve as a final filtration barrier for potable water systems by providing sub micron particle removal without the use of coagulants. Membranes and final filters may require pretreatment to be cost effective. Membranes are effectively restored with chemicals involving labor intensive clean-in-place operations and media backwash.

Multimedia filters are typically comprised of coarse anthracite, silica sand, fine garnet sand and gravel as a support medium. The coarse anthracite media removes most of the suspended solids and those particles that pass through are removed by the sand and garnet media below. Expanding the media during backwash easily frees the trapped particles unless media has solidified or mud balls have formed. The use of pretreatment chemistry such as metal coagulants or polymers increases small particle removal (>95%) in the 2 to 3 micron size range.

Research Comparing R3f and Multimedia Filters

The U.S. EPA Office of Research and Development in Cincinnati, Ohio and Enprotec of Hebron, Kentucky, are comparing multimedia and emerging R3f filtration technologies. Both technologies are low cost operationally simplistic alternatives to membrane filtration. Turbidity, particle, and microbial removal studies are being conducted to evaluate filter performance and to determine compliance with the drinking water standards mandated by the Safe Drinking Water Act.

The R3f system is comprised of two liters of non-bonded garnet media (33 micron size) for depth filtration. A typical R3f Tube is 150 mm (6 inches) in diameter and 1.8 m (6 feet) high as shown in Figure 1. The media can be fluidized and backwashed very quickly resulting in backwash volumes significantly lower than other technologies.

The multimedia filter used in this comparison study is comprised of a cylindrical pressure vessel 15 inches in diameter and 50 inches high with the filter media specified in Figure 2.

Results indicate that the R3f system performs significantly better than the conventional multimedia filtration system without the use of chemical coagulants. Turbidity tests on the R3f system resulted in effluent turbidity levels of approximately 0.5 nephelometric turbidity units (NTU) from influent feed water with turbidity levels of 5 NTU and 10 NTU.

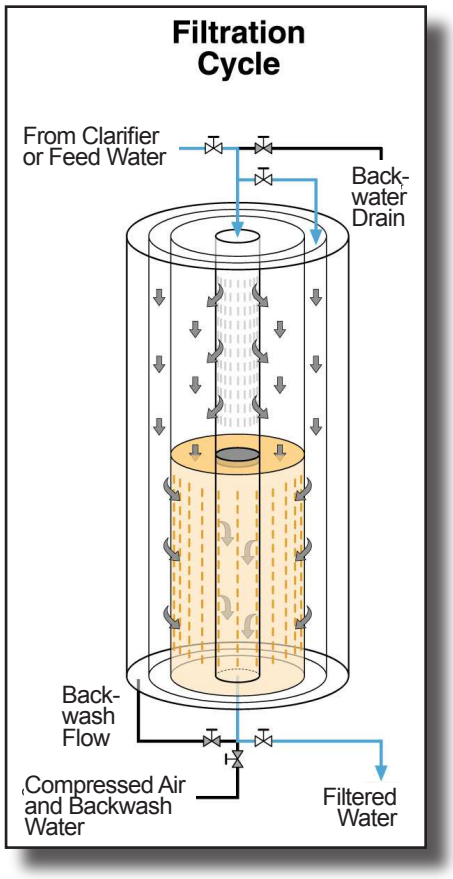


Figure 1. Basic Components of R3f Filtration System (Source: Enprotec, Inc.)

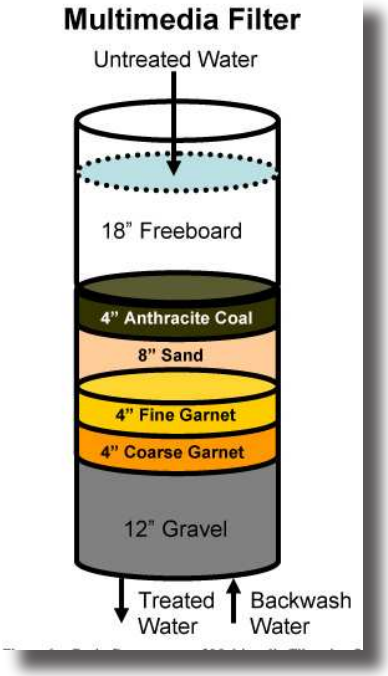


Figure 2. - Basic Components of Multimedia Filtration System

The R3f system was more effective in removing B. Subtilis, E. Coli, Cryptosporidium, and 3.0 micron PSL beads (a non-biological surrogate for Cryptosporidium). Three PSL bead challenges showed an average log removal of 3.30 for the R3f system compared to an average log removal of 0.2 for the multimedia filter when both systems were operated without the use of chemistry. One verification run was performed on the R3f system using Cryptosporidium oocysts resulting in a 3.47 log removal value.

The R3f fits a niche between sub-micron and coarse filtration (1 to 25 micron particle size range), where filtration can be provided without the use of coagulants for particle pretreatment and destabilization. This operationally simplistic filtration technology is suitable for small community potable water systems with flow rates between 5 and 400 gallons per minute. It can also serve as a prefilter to membranes (nanofilters and reverse osmosis systems) or as a prefilter to disposable final filter systems.

This article is one of a regular series of reports on emerging and innovative technologies in the area of environment and water resources produced by EWRI's Emerging and Innovative Technologies Committee (EITC). EITC's mission is to advance the development, knowledge, and application of emerging and innovative technologies for the planning and management of water resources and the protection and enhancement of the environment. If you are interested in contributing an article or becoming a member of this Committee, please contact Walter Grayman at grayman@fuse.net.

The Definition of Sustainability

The Sustainable Water Pollution Engineering Committee, in an effort to diseminate information through the committee, shares a series of articles regarding sustainable design. In this first entry, the definition of sustainability is explored.

Helene Hilger, M.ASCE

Are you putting off learning more about sustainability because it seems so ill-defined? As the push for sustainability gathers momentum, it seems that every product, practice, and company is touted as being "green" or sustainable, so that some pretty careful discernment is required to figure out what the term really means. Admittedly, sustainability concepts are something of a moving target, with new notions coming along as people seek more sophisticated ways to apply and evaluate them, but there are some fundamental tenets that remain constant. In an effort to keep you actively learning more about this new design paradigm, we'd like to offer a definition here that should guide you as you learn and that will work every time you're called upon to explain sustainability to someone else.

In a nutshell, **sustainability is about maintaing the natural systems that support human life**. It is not so much an effort to preserve beautiful vistas or cute koala bears as it is the science of ensuring that our species can persist. There was a fixed amount of natural resources (water, oil reserves, metal and material deposits) available to humans in our earliest days on the planet along with rich biodiversity that kept natural systems in balance. We tend to take these resources and the benefits of their balanced interactions (e.g. soil fertility, pollination, potable water) for granted. We're now realizing that human activity is consuming these resources, or "natural capital," and ecosystem services at rates much higher than the rates at which they can be replenished or restored. Further, this recognition comes at a time when the human population is growing exponentially!

Taken together, these two trends lead to the sobering recognition that our current ways of doing business are unsustainable. Sustainable engineering seeks to reverse this trend. It leads us to envision, plan, design, operate, and decommission in ways that maintain the integrity of the natural systems that support human life. As engineers, we translate science into tangible infrastructure, facilities and technologies that make human life safe and comfortable. Now we are being called upon to help translate that science to the public as we make the sharp shift to more sustainable designs and practices. We hope this definition and your exploration of some of these topics will lead you to include sustainable design criteria in your work: less use of virgin materials, water, non-renewable energy; less production of waste, polluted water, air, or soil; more use of reclaimed materials, facilities that generate more energy than they use, biodegradable materials, and integrated designs.

The committee welcomes your questions about sustainability. We will try to answer them in future issues. Send questions to: Helene Hilger, hhilger@uncc.edu.

World Environmental & Water Resources Congress 2009

Your Congress Invitation

On behalf of the American Society of Civil Engineers' Environmental & Water Resources Institute, I am pleased to invite you to the **2009 World Environmental & Water Resources Congress** in Kansas City, Missouri, May 17-21, 2009.

The Congress Steering Committee has produced an intellectually and professionally stimulating annual Congress program. The agenda includes outstanding technical presentations to further your professional development, and numerous committee meetings and enjoyable social events to bring together old friends and new acquaintances.

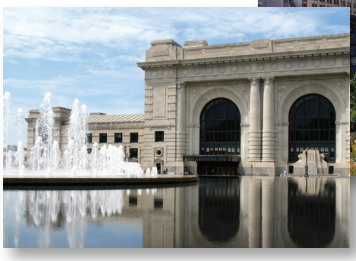
The World Environmental & Water Resources Congress is an important annual opportunity for professionals in the environmental and water fields to convene and focus on topics of the day. This year's technical program focuses on the Great Rivers of the World and the engineering challenges of balancing environmental and development issues while achieving a sustainable future. It is imperative that those working on the front lines – at the environmental/water engineering nexus – share insights from research and practical experience in the field to generate best solutions for the future on issues such as river system management, environmental challenges, watershed management and restoration, dam safety, hydraulic structures, and so much more.

This Congress provides an opportunity to meet and share ideas in the only U.S. city to be named one of five international "Destinations to Watch" in 2009. Kansas City's culinary scene, downtown renaissance, and overall affordability are cited as major reasons for KC's ranking as a top pick. An energetic city forged by a rich history, Kansas City is brimming with activities to keep visitors entertained – swinging jazz, eclectic cuisine, one-of-a-kind museums, a thriving arts scene, and fantastic shopping. Part of the city's charm lies in its beauty, with an impressive network of boulevards, spacious parks, and, of course, exquisite fountains. The city's signature food – mouth-watering BBQ – can be savored at more than 100 establishments. Its unique museums include the world-class Nelson-Atkins Museum of Art, the Negro Leagues Baseball Museum, and the American Jazz Museum. And the city is passionate about the arts with outstanding symphony, ballet, theater, and opera companies.

Please join us in this charming city, which truly depicts the harmony that can be achieved between the environment and water resource development. We know you will professionally benefit not only from the technical program, but also from Kansas City's unique social experience.

Sincerely,

William H. Espey, Jr., Ph.D., P.E., D.WRE, M.ASCE
General Congress Chair



2009 CONGRESS OVERVIEW

Our Congress technical program focuses on *Sustainability of the* GREAT RIVERS OF THE WORLD *and the Complex Balance Between the Environment and Development of Water Resources* concentrated on these 13 topics:

- **11th Water Distribution Systems Analysis Symposium (WDSA09)**
- **7th Symposium on Groundwater Hydrology, Quality, and Management**
- **6th Urban Watershed Management Symposium**
- **Emerging and Innovative Technology**
- **Environmental Engineering**
- **History and Heritage**
- **Hydraulics and Waterways**
- **International Issues**
- **Irrigation and Drainage**
- **Local Issues**
- **Planning and Management**
- **Water, Wastewater, and Stormwater**
- **Watersheds**

CONGRESS STEERING COMMITTEE

General Congress Chair
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Congress Manager
Stacey Ann P. Gardiner, CMP
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World Environmental & Water Resources Congress PROGRAM-AT-A GLANCE 2009

SATURDAY, MAY 16, 2009

8:30 am – 5:30 pm	**TECHNICAL TOURS**
8:30 am – 9:00 pm	Committee Meetings

SUNDAY, MAY 17, 2009

7:00 am – 7:00 pm	**REGISTRATION**
7:00 am – 5:00 pm	Speaker Ready Room
7:30 – 8:00 am	Networking Break for Short Course Participants
7:30 – 9:00 am	Past Chairs' Breakfast
8:00 am – 5:00 pm	Hospitality Lounge – International & Registered Guests
8:00 am – 5:00 pm	**SHORT COURSES** #1: *Curve Number Rainfall-Runoff: Professional Applications* #2: *Principles of Streambank Analysis and Stabilization*
8:00 am – 3:00 pm	**SHORT COURSE** #3: *Treatment of Uncertainty in Water Resources Modeling and Analysis*
8:30 am – 9:00 pm	Committee Meetings
10:00 am – 5:30 pm	**SOCIAL TOURS**
10:30 – 11:00 am	Networking Break for Short Course Participants
12:00 – 1:00 pm	Lunch Break for Short Course Participants
3:00 – 3:30 pm	Networking Break for Short Course Participants
3:00 – 5:00 pm	**SHORT COURSE** #4: *The Arc Hydro Groundwater Data Model*
6:00 – 8:00 pm	Grand Opening of the Exhibit Hall
6:00 – 8:00 pm	Congress Ice Breaker Reception – Section Welcome – in Exhibit Hall

MONDAY, MAY 18, 2009

7:00 am – 7:00 pm	**REGISTRATION**
7:00 am – 6:30 pm	Speaker Ready Room
7:00 am – 6:30 pm	Bookstore Open
7:30 – 8:45 am	Opening Keynote Breakfast & Lifetime Achievement Award Presentation
7:30 – 10:30 am	Spouse/Guest Orientation Breakfast
8:00 am – 5:00 pm	Hospitality Lounge – International & Registered Guests
8:30 – 9:00 am	Networking Break in Exhibit Hall
8:30 – 9:00 am	Daily Moderator Briefing
8:30 am – 4:00 pm	Exhibit Hall Open
9:00 – 10:30 am	**CONCURRENT TECHNICAL SESSIONS I**
9:00 – 11:00 am	AAWRE Engineering Ethics Workshop #1
10:30 – 11:00 am	Networking Break in Exhibit Hall
10:30 am – 12:30 pm	Technical Poster Session I
11:00 am – 12:30 pm	**CONCURRENT TECHNICAL SESSIONS II**
12:30 – 2:00 pm	Lunch on Your Own
2:00 – 3:30 pm	**CONCURRENT TECHNICAL SESSIONS III**
2:00 – 5:30 pm	Technical Poster Session II
3:30 – 4:00 pm	Networking Break in Exhibit Hall
4:00 – 5:30 pm	**CONCURRENT TECHNICAL SESSIONS IV**
6:00 – 6:30 pm	AAWRE Induction Ceremony
6:30 – 8:00 pm	AAWRE Diplomate & Visiting International Fellows Reception
6:00 – 10:00 pm	Committee Meetings

TUESDAY, MAY 19, 2009

7:00 am – 6:30 pm	**REGISTRATION**
7:00 am – 6:30 pm	Speaker Ready Room
7:00 am – 6:30 pm	Bookstore Open
7:30 – 8:45 am	Environmental Council Breakfast, Awards, and Lecture
7:30 – 8:45 am	Hydraulics & Waterways and Groundwater Councils Breakfast, Awards, and Lecture
8:00 am – 5:00 pm	Hospitality Lounge – International & Registered Guests
8:30 am – 4:00 pm	Exhibit Hall Open
8:30 – 9:00 am	Networking Break in Exhibit Hall
8:30 – 9:00 am	Daily Moderator Briefing
8:30 am – 12:30 pm	Technical Poster Session III
9:00 – 10:30 am	**CONCURRENT TECHNICAL SESSIONS V**
10:30 – 11:00 am	Networking Break in Exhibit Hall
11:00 am – 12:30 pm	**CONCURRENT TECHNICAL SESSIONS VI**
12:30 – 1:30 pm	Lunch on Your Own

TUESDAY, MAY 19, 2009 continued

1:30 – 3:00 pm	**CONCURRENT TECHNICAL SESSIONS VII**
1:30 – 5:00 pm	Technical Poster Session IV
3:00 – 3:30 pm	Networking Break in Exhibit Hall
3:30 – 5:00 pm	**CONCURRENT TECHNICAL SESSIONS VIII**
3:30 – 5:00 pm	Student Posters/Papers
5:00 – 6:30 pm	**CONCURRENT TECHNICAL SESSIONS IX**
5:00 – 7:00 pm	AAWRE Engineering Ethics Workshop #2
6:00 – 10:00 pm	Committee Meetings

WEDNESDAY, MAY 20, 2009

6:30 am – 7:00 pm	**REGISTRATION**
7:00 am – 6:00 pm	Speaker Ready Room
7:00 am – 6:00 pm	Bookstore Open
7:30 – 8:45 am	Planning and Management Council Breakfast, Awards, and Lecture
7:30 – 8:45 am	Irrigation and Drainage Council Breakfast, Awards, and Lecture
8:00 am – 5:00 pm	Hospitality Lounge – International & Registered Guests
8:30 am – 4:00 pm	Exhibit Hall Open
8:30 – 9:00 am	Networking Break in Exhibit Hall
8:30 – 9:00 am	Daily Moderator Briefing
8:30 am – 12:30 pm	Technical Poster Session V
9:00 – 10:30 am	**CONCURRENT TECHNICAL SESSIONS X**
9:00 – 10:30 am	The Oklahoma State University – Woolpert Scholars Session on Urban Stormwater Management
9:00 – 10:30 am	Student Posters/Papers
10:30 am – 11:00 pm	Networking Break in Exhibit Hall
11:00 am – 12:30 pm	**CONCURRENT TECHNICAL SESSIONS XI**
11:00 am – 12:30 pm	PB Student Design Competition
11:00 am – 12:30 pm	Student Posters/Papers
12:30 – 1:30 pm	Lunch on Your Own
12:30 – 1:30 pm	Student Luncheon
1:30 – 3:00 pm	**CONCURRENT TECHNICAL SESSIONS XII**
1:30 – 3:00 pm	Student Technical Paper Competition
1:30 – 5:00 pm	Technical Poster Session VI
1:30 – 3:00 pm	Student Posters/Papers
3:00 – 3:30 pm	Networking Break in Exhibit Hall
3:30 – 5:00 pm	**CONCURRENT TECHNICAL SESSIONS XIII**
3:30 – 5:00 pm	Career Opportunities After College Panel Discussion
3:30 – 5:00 pm	Technical Tour
5:00 – 6:30 pm	**CONCURRENT TECHNICAL SESSIONS XIV**
7:00 – 10:00 pm	Offsite Event: BBQ Fest at Faulkner's Ranch

THURSDAY, MAY 21, 2009

7:00 am – 4:00 pm	**REGISTRATION**
7:00 am – 4:00 pm	Speaker Ready Room
7:00 am – 4:00 pm	Bookstore Open
7:30 – 8:45 am	Watershed & Urban Water Resources Research Councils Breakfast, Awards, and Lecture
7:30 – 8:45 am	Water Distribution System Analysis Symposium Breakfast
8:00 am – 5:00 pm	Hospitality Lounge – International & Registered Guests
8:30 am – 3:30 pm	Exhibit Hall Open
8:30 – 9:00 am	Networking Break in Exhibit Hall
8:30 – 9:00 am	Daily Moderator Briefing
8:30 am – 12:30 pm	Technical Poster Session VII
9:00 – 10:30 am	**CONCURRENT TECHNICAL SESSIONS XV**
10:30 – 11:00 am	Networking Break in Exhibit Hall
10:30 am – 12:30 pm	AAWRE Engineering Ethics Workshop #3
11:00 am – 12:30 pm	**CONCURRENT TECHNICAL SESSIONS XVI**
12:30 – 1:30 pm	Lunch on Your Own
1:30 – 3:00 pm	**CONCURRENT TECHNICAL SESSIONS XVII**
1:30 – 5:00 pm	Technical Poster Session VIII
3:00 – 3:30 pm	Networking Break in Exhibit Hall
3:30 – 5:00 pm	**CONCURRENT TECHNICAL SESSIONS XVIII**
6:00 – 10:00 pm	Committee Meetings

Subject to change

World Environmental & Water Resources Congress 2009

REGISTRATION FORM ◆ May 17-21, 2009 ◆ Kansas City Marriott Downtown ◆ Kansas City, Missouri

Please complete the registration form including signature and payment information. Use one registration form per person. Registrations will not be processed without full payment and registrant's full name. PLEASE PRINT OR TYPE ALL INFORMATION.

CONTACT INFORMATION (* Indicates required information)

*First Name _____ MI _____ *Last Name _____

Credentials _____ Badge Nickname _____

Title _____ * Company/Organization/University _____

*Street Address/PO Box _____

*City _____ *State ___ *Postal Code _____ *Country _____

*Work Phone _____ *Home Phone _____ *Cell _____

Fax _____ *Email _____

In Case of Emergency, Congress week contact phone number (IMPORTANT) _____

ASCE/EWRI Member Number _____ If Cooperating Org Member, Name Org _____

❑ Check here if you require vegetarian or other special meal(s).
❑ Check here if you require special assistance during Congress.
A Congress Management representative will contact you to discuss yours needs.

American Society of Civil Engineers

FOR COMPLETE CONGRESS INFORMATION AND TO REGISTER, visit www.asce.org/conferences/ewri2009

FOR CREDIT CARD PAYMENT Register Online: www.asce.org/conferences/ewri2009

Or by Fax: 202-667-9331

FOR CHECK OR PURCHASE ORDER (P.O.) PAYMENT Mail to:
ASCE (EWRI Congress 2009)
PO Box 79668
Baltimore, MD 21279-0668 USA

Registrations cannot be processed by phone.

REGISTER BY APRIL 10, 2009 AND SAVE!

Full Registration

Registration Categories

Includes Sessions, Exhibit Hall, Ice Breaker, Keynote Breakfast, AAWRE Reception, Choice of Tuesday Breakfasts, Choice of Wednesday Breakfasts, Choice of Thursday Breakfasts, Proceedings

	Advance By 4/10/09	Onsite After 4/10/09
EWRI/ASCE Member	❑ $695	❑ $795
Cooperating Organization Member	❑ $695	❑ $795
Speaker	❑ $495	❑ $595
Moderator	❑ $495	❑ $595
Non-Member **	❑ $795	❑ $895
Retired/Senior (70+ years)	❑ $250	❑ $305
Proof of DOB to accompany registration form. Must be 70 years of age or older.		
Full-Time Student Full Package *Includes Student Luncheon*	❑ $250	❑ $305
Full-Time Student Basic Package *Includes Student Luncheon*	❑ $150	❑ $205
Copy of Student ID to accompany registration form. Basic Package does not include Proceedings.		

Daily Registration ❑ Monday ❑ Tuesday ❑ Wednesday ❑ Thursday

Includes for day of registration only: Sessions, Exhibit Hall, Mon: Keynote Breakfast, Tues: Choice of Breakfasts, Wed: Choice of Breakfasts, Thurs: Choice of Breakfasts

EWRI/ASCE Member	❑ $345	❑ $395
Cooperating Organization Member	❑ $345	❑ $395
Speaker	❑ $345	❑ $395
Moderator	❑ $345	❑ $395
Non-Member	❑ $375	❑ $425

Spouse/Guest Registration Guest Name: _____

Includes Ice Breaker, Spouse/Guest Breakfast, AAWRE Reception, Choice of Tuesday Breakfasts, Choice of Wednesday Breakfasts, Choice of Thursday Breakfasts

Spouse/Guest	❑ $125	❑ $150

** Full Non-Member Registration includes FREE 2009 EWRI MEMBERSHIP.
❑ YES, I want to take advantage of my EWRI benefits, active upon the conclusion of the Congress for New Members ONLY.

Technical/Social Tours

	REGISTRANT (SELF)	GUEST #1	GUEST #2
Technical Tours: Saturday, May 16			
Lake Lenexa Dam & Spillway	❑ $ 25	❑ $ 25	❑ $ 25
Brush Creek Corridor	❑ $ 25	❑ $ 25	❑ $ 25
L-385 Levee on the Missouri River	❑ $ 25	❑ $ 25	❑ $ 25
Social Tour: Sunday, May 17			
Explore Kansas City	❑ $ 20	❑ $ 20	❑ $ 20

For tours: Guest Name # 1 _____ Guest Age _____
Guest Name # 2 _____ Guest Age _____

Special Events/Additional Tickets

	Advance/Onsite	QTY	AMOUNT
Sunday, May 17			
Ice Breaker Reception	❑ $ 25	_____	_____
Monday, May 18			
Keynote Breakfast & Lifetime Achievement Awards	❑ $ 25	_____	_____
Spouse/Guest Orientation Breakfast	❑ $ 35	_____	_____
AAWRE Reception	❑ $ 25	_____	_____
Tuesday, May 19			
Environmental Council Breakfast & Awards	❑ $ 25	_____	_____
Hydraulics & Waterways and Groundwater Councils Breakfast & Awards	❑ $ 25	_____	_____
Wednesday, May 20			
Planning and Management Council Breakfast & Awards	❑ $ 25	_____	_____
Irrigation and Drainage Council Breakfast & Awards	❑ $ 25	_____	_____
Offsite Event: BBQ Fest at Faulkner's Ranch	❑ $ 55	_____	_____
Thursday, May 21			
Watershed & Urban Water Resources Research Councils Breakfast & Awards	❑ $ 25	_____	_____
Water Distribution System Analysis Symposium Breakfast	❑ $ 25	_____	_____
Proceedings (Full and Full Student Registrants receive 1 copy.)	❑ $100	_____	_____

Short Courses/Workshops (Does not include Congress Registration)

		Advance	Onsite
Short Courses: Sunday, May 17			
#1: Curve Number Rainfall-Runoff: Professional Applications	Member	❑ $245	❑ $295
	Non-Member	❑ $275	❑ $325
#2: Principles of Streambank Analysis and Stabilization	Member	❑ $245	❑ $295
	Non-Member	❑ $275	❑ $325
#3: Treatment of Uncertainty in Water Resource Modeling and Analysis	Member	❑ $225	❑ $275
	Non-Member	❑ $275	❑ $325
#4: The Arc Hydro Groundwater Data Model	No Fee	❑ Yes, I will attend.	
Workshop: Monday, May 18			
#1: AAWRE Engineering Ethics Workshop	No Fee	❑ Yes, I will attend.	
Workshop: Tuesday, May 19			
#2: AAWRE Engineering Ethics Workshop	No Fee	❑ Yes, I will attend.	
Workshop: Thursday, May 21			
#3: AAWRE Engineering Ethics Workshop	No Fee	❑ Yes, I will attend.	

For registration questions,
please call 202-667-9332 or contact smance@manceandassociates.com.

PAYMENT: Full payment must accompany this registration form. NO REFUNDS granted for cancellations after April 17, 2009.

Full Registration	$ _____
Daily Registration	$ _____
Spouse/Guest Registration	$ _____
Technical/Social Tours	$ _____
Additional Tickets	$ _____
Short Courses/Workshops	$ _____
GRAND TOTAL (pay this amount)	$ _____

❑ **PURCHASE ORDER #** _____ (Provide copy of PO form with your registration form by mail.)

❑ **CHECK** Payable to **ASCE (EWRI Congress 2009).**
Checks must be issued in US dollars, drawn on US banks. To pay by check, mail check and completed form, post-marked by deadlines shown above, to:

ASCE (EWRI Congress 2009)
PO Box 79668
Baltimore, MD 21279-0668 USA

❑ **CREDIT CARD**
❑ AMEX ❑ VISA ❑ MC ❑ DISC ❑ DINERS

Card Number _____
Expiration Date (MM/YY) _____
Cardholder Name _____
Signature _____
TOTAL TO BE CHARGED $_____

The EWRI Green Streets Initiative

Infrastructure and roads are essential lifelines for communities and economies. Traditional road design and construction, however, introduce pollutants into the environment which impact both human health and the quality of receiving water resources. To better address the environmental impacts associated with road design and construction, a small number of communities have initiated innovative efforts in which low impact development and green infrastructure technology are being incorporated into the road right of way in unique forms to produce a concept referred to as "Green Streets."

This concept which has been pioneered in places such as Portland, Oregon and Seattle, Washington, is still in the early years of development. The initial monitoring results suggest that this technology can provide multiple benefits for our urban environments. They indicate that this concept can be effective in reducing peak flows and flow volumes, filter pollutants, replenish ground water, produce attractive streetscapes for neighborhoods, and benefit pedestrian connections throughout our cities (David Elkin, City of Portland, BES).

Recognizing that this technology may help in moving towards a concept of sustainability in our urban areas and cities, EWRI recently launched its streets technology initiative through the activities of the Low Impact Development standing committee of the Urban Water Resources Research Council (UWRRC) by co-sponsoring two (2) technical sessions on green streets technology as part of the 2008 International Conference on Low Impact Technology (LID) held in Seattle, Washington.

Currently the technical guidance with respect to this concept for use in addressing and managing the stormwater management impacts of streets and highways is still somewhat limited. Therefore the LID committee is forming the Green Streets Task Committee. This committee will review the available data on green streets technology and develop the following committee products; 1) A review and summary of the current literature related to the stormwater benefits of this technology (Phase 1); 2) A committee report of the status of green streets technology as a stormwater Best Management Practice (BMP) (Phase 2); 3) The development of national guidelines for the use of green street concepts for stormwater management (Phase 3); and 4) The planning and execution of a mini-symposium or specialty conference on green street technology.

The EWRI Green Streets Task Committee will be chaired by Liv Haselbach of Washington State University who will be assisted by a number of members of the LID SC. Anyone interested in participating in this effort can contact Dr. Haselbach at haselbach@wsu.edu.

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Background image: Division Street Planters, Portland (Courtesy, Tom Liptan, Portland BES)

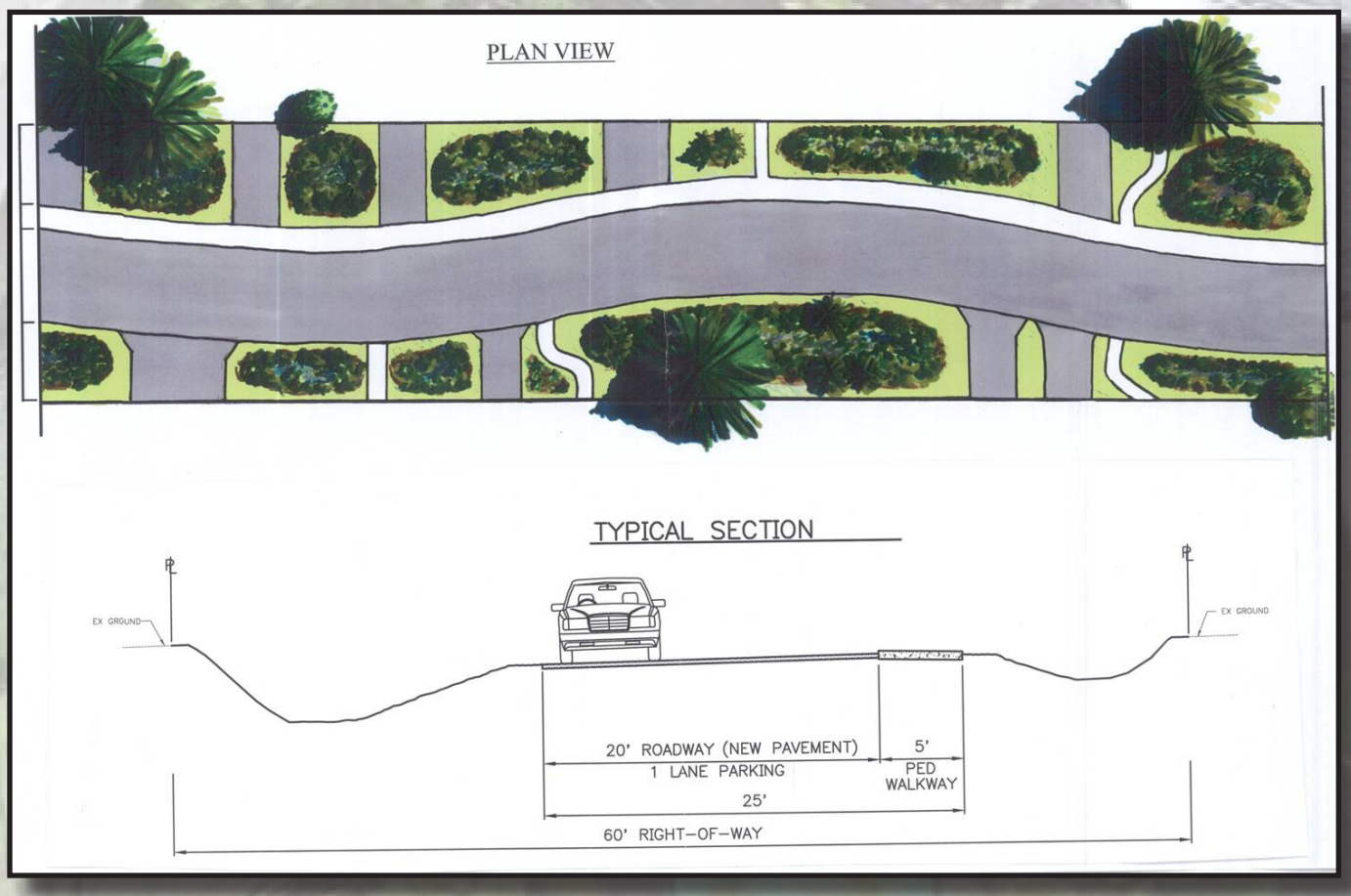

Figure 1. Seattle's Green Streets Concept (Source: Tracy Tackett, Seattle Public Utilities).

Environmental and Water Resources Seminar Planned for October 2009 in Beijing

For the past 26 years, the EWRI International Cooperation Council (and its predecessor committees in ASCE) has organized a biennial seminar at various places around the world. The seminars are aimed at bringing together a relatively small group of international and local engineers and practitioners in the field of water resources management for presentations and discussions on selected water resources and environmental management issues of current interest. Some of the past destinations have included Vietnam (2008), Mexico (2006), Hawaii (2004), Germany (2002), and England (2000).

The next seminar is being planned for Beijing, China on October 22-27, 2009. It is being co-sponsored by Beijing-Normal University and the University of Wisconsin-Green Bay. Co-chairs for the event are Dr. Robert Wenger and Dr. Li Wei of the two sponsoring institutions. The seminar will include formal technical presentations by the international and local participants at Beijing Normal University and both technical and cultural tours in the Beijing area. Tentative plans for technical tours include the Minyun Reservoir, local wetlands, and wastewater and solid waste facilities. Cultural sites to be visited include the Great Wall, the Forbidden City, the "Bird's Nest" stadium, and several other sites. Following the completion of the formal seminar, an optional tour to the EcoSan sustainable urban development project in Ordos, Inner Mongolia is being considered.

Administration Building at Beijing Normal University

Participation is open to the entire water resources and environmental community. Participants make their own international travel arrangements and pay their own travel and hotel costs along with a minimal registration fee to cover incidental meeting expenses. Many participants bring their spouses and a program for spouses during the technical presentations will be organized. Conference proceedings on a CD will be prepared after the seminar.

For additional information on this unique opportunity, please contact Professor Robert Wenger (wengerr@uwgb.edu), Professor Jack Day (dayj@uwgb.com) or Dr. Walter Grayman (grayman@fuse.net).

A New Approach to Sanitary Sewer Self-Cleansing Design

A new task committee for education and promotion of Tractive Force methodology for sanitary self-cleansing design is proposed for initiation in Spring 2009. If you are interested in being a part the committee, contact Dr. LaVere Merritt at merritlb@gmail.com.

It is challenging to get our sanitary sewer design industry in the US to adopt improved design methodologies. Many "Rules of thumb" criteria developed over a hundred years ago are still in common use. Because of uncertainty as to loads and conditions for the 100 yr, or so, practical life of a sanitary sewer, the tendency has been to be very conservative and generally opt for overcapacity, cautious guidelines, etc. Most of these "old" guidelines have worked quite well, but the one area that has suffered is self-cleansing.

The Joint Committee that crafted the 2007 new edition of the ASCE MOP 60/WEF 5 Gravity Sewer manual, realized that considerable effort would be needed to educate and promote some of the newer concepts included. Primary in these newer concepts is Tractive Force self-cleansing methodology. The Committee took a rather bold step to include a methodology that currently is seldom used in the US. Because of the nature of the practice/code situation in the US, it was felt that it might take many tens of years for TF to slowly, if ever, get into use without a fairly bold step. The TF methodology and guidelines are well enough understood that the Committee was confident it was the right step, and the independent manual reviewers agreed. TF is now the recommended approach in the Manual, but getting it into general use calls for an energetic program. The task committee will lead out in this educational and promotional effort.

Deadline for 33rd IAHR Congress Master Classes Extended to April 10, 2009

For students and young researchers interested in environmental and water resources, the Environmental & Water Resources Institute (EWRI) encourages you to consider the Master Classes offered at the 33rd International Association for Hydraulic Engineering & Research (IAHR) Congress (August 9-14, 2009, Vancouver, BC, Canada). Ph.D. students, Masters of Science students, and other young researchers are invited to participate in these classes, which feature lectures by world-renowned researchers on specific topics at the forefront of research, with broad application in hydraulics research and practices, as well as discussions between Masters and participants.

Three classes will be available on Sunday, August 9, 2009, starting at 8:30 am. Each class will be broken up into three lectures, with a networking coffee break included. The titles of the classes are as follows:

- MC-I: Uncertainty Analysis in Hydrometry
- MC-II: Turbulence in Natural and Constructed Waterways
- MC-III: Fish Passages at Stream Crossings

For more information on the Master Classes, please visit http://content.asce.org/conferences/iahr09/student_activities.html. Information on the classes and additional student activities can be found there, as well as the Master Class Application Form. The deadline for application is now April 10, 2009, so register soon to secure your spot in one of the classes!

EWRI President-Elect Presented with Prestigious Engineering Award

On February 28, 2009, EWRI President-Elect Udai P. Singh, D.Engr., BCEEM, M.ASCE, was presented with the Distinguished Alumnus Award (DAA) of the Indian Institute of Technology Kanpur (IITK). The DAA is the highest award given by the Institute to its alumni in recognition of their achievements of exceptional merit. As one of the most prestigious engineering institutes in the world, IIT Kanpur's DAA provides recognition to the best of the best.

After being selected by the DAA Evaluation Committee, an invitation was extended to Dr. Singh to accept the award at IITK's Annual Alumni Convention of the Alumni Association. He traveled to Kanpur with his wife, Manju, and took part in the multitude of events over the course of the weekend. During the award ceremony, IITK and the Alumni Association took the opportunity to recognize him, and present him with the DAA award, which included a silver tray with the award name and his name engraved on it, a framed citation, and a unique IIT Kanpur scarf.

A civil engineering graduate of IITK in 1972, Dr. Singh left India shortly thereafter to pursue his post-graduate studies in Water Resources and Environmental Engineering at the Clemson University and the University of Florida. Since 1974, he has worked for CH2M HILL, where he currently holds the position of Vice President of its Environmental Business Group. Dr. Singh has authored more than 50 technical papers in national and international publications, and written and/or edited eight books in water resources and environmental engineering, including co-author of the book "Hazardous Waste Site Remediation Management" published by Water Environment Federation (WEF). He has been recognized by other awards previously. ASCE presented him with the Outstanding Engineering Manager Award. He received the Grand Award for Engineering Excellence from American Council of Engineering Companies (ACEC), the Hazardous Waste Management Award from WEF, and the Outstanding Achievement Award from EWRI.

From left: Mr. Abhay K. Bhushan, President, IIT Kanpur Alumni Association; Udai P. Singh, the Distinguished Alumnus Award recepient; Prof. M. Anandakrishnan, Chairman of IIT Kanpur Board of Governors; and Prof. Sanjay G. Dhande, Director of IIT Kanpur.

Among his many accomplishments, Dr. Singh served as the conference chair for EWRI's first international conference, "An International Perspective on Environmental & Water Resources," in New Delhi. IIT Kanpur teamed up with EWRI to support this event, which took place in December of 2006. Following the great success of this India 2006 conference, the Institute has held a second conference in Thailand 2009 as a successor to the first of EWRI's international conferences. A 2010 conference in Chennai, India, has been scheduled, as the organization looks to build upon the foundation that Dr. Singh helped to lay. He was also the General Congress Chair of the EWRI's 2008 World Environmental and Water Resources Congress held in Honolulu, Hawaii last May.

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Meetings to Watch For:

2009 World Environmental & Water Resources Congress
May 17-21, 2009, Kansas City, MO
http://content.asce.org/conferences/ewri2009

33rd IAHR Congress
August 10-14, 2009, Vancouver, British Columbia, Canada
http://www.iahr2009.org

2009 AWRA Annual Water Resources Conference
November 8-12, 2009, Seattle, WA
http://www.awra.org/pdf/AWRA2009Seattle.pdf

India 2010: 3rd International Perspective on Current & Future State of Water Resources & the Environment
January 5-7 2010, Chennai, India
http://content.asce.org/conference/india2010

Watershed Management 2010
August 23-27, 2010, Madison, Wisconsin
http://www.asce.org/conferences/watershedmanagement2010/

IAHR-APD 2010
February 21-24, 2010, Aukland, New Zealand
http://www.iahr-apd2010.com/

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