



## Help Shape DOWRA! A Message from the President

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The Delaware On-Site Wastewater Recycling Association is over 260 members strong, and still growing. As an association, we rank as one of NOWRA's top 10 affiliate groups. Our membership is diverse, covering the spectrum of on-site professionals including: regulators, designers, engineers, contractors, inspectors, operators, and manufacturers. The tremendous growth and success of our organization is due to the commitment, energy, and enthusiasm of our many member volunteers.

As a nonprofit organization who prides ourselves as the "voice in the onsite industry", we could not be as successful without our member assistance. Our members are the key in shaping the future of the on-site industry, and there is always a need for new volunteers with varying skills and interests. Many members in the onsite community may not have a lot of time or resources to give; however, there are many ways to get involved even without leaving the comfort of your own home!

The first step to getting involved is understanding what DOWRA is. Learn about our organization by visiting our website, [www.dowra.org](http://www.dowra.org). Our website will provide an overview of DOWRA's mission, vision, and goals as an organization. You will also be able to view the DOWRA bylaws, events calendar, board of directors, committees, and educational tools we have to offer.

**Join a Committee.** DOWRA hosts 10 committees that are organized around the needs of our on-site professionals. Some of our committees include: DOWRA/DNREC partnership committee which provides assistance to DNREC and local county governments in the development of regulations, guidance documents, and policies. The education committee utilizes our member's diverse knowledge and experience to provide educational seminars to realtors, schools, exhibits, and to our peers. This committee also assists in the development of informative brochures, and handouts.

**Get to Know Someone.** With so many members, it is easy to meet someone new and voice your opinions and thoughts. DOWRA offers a wide variety of forums where you can have a voice including: quarterly meetings with an open floor; annual conference; and the membership directory and BOD contact information is readily available.

**Attend a Meeting.** All DOWRA quarterly board meetings are open to the public. These meetings provide an overview of DOWRA committee activities; DOWRA's goals and accomplishments; new information including government activities; and provides an opportunity to voice issues within the industry.

Your influence and participation will and does make a difference. Your involvement can range from writing a letter, providing support at a meeting or serving on a committee or BOD. No matter what level of your involvement, your views and opinions will be able to be shared with your peers and can influence the future of the onsite industry.

Sincerely,  
Ken Walsh

## Wood is On-Site Professional of the Year

On May 1, 2008 the Delaware On-Site Wastewater Recycling Association was proud to partner with the Delaware Technical Community College in presenting the second annual on-site professional of the year award. This award is given to an on-site professional who demonstrates a consistent and above average dedication to the betterment of the environment.

The winner of this year's award was Lisa Wood of Terra Firma Consulting. Lisa has long been a stand-out soil scientist in the private sector in which her tenacious work ethic and high professional standards continue to make their mark in the onsite industry. Lisa has been instrumental in working with the Department on regulation amendments and database creation. She also volunteers her time on the On-Site System Advisory Board to ensure current and future licensees meet the necessary requirements for knowledge, experience and education.

Other nominations for the award were: Carol Evans of Apple Designs; Byron Jefferson, P.E. of Byron Jefferson Engineering; William Noyes of KCI, Inc; and Mike Cotten of Environmental Consultants International. DOWRA would also like to recognize Sam Schlegel of Tidewater Utilities and Mark Kondelais of Artesian Wastewater Company who served as the keynote speakers.

Congratulations to all Nominees for enhancing the on-site industry.



Above: Byron Jefferson, Lisa Wood, Carol Evans, and Mike Cotten

Congratulations  
To All  
Nominees!



Above: Ken Walsh and Bill Noyes

## DOWRA Announces 2008 Conference is Fast Approaching



The 12th annual DOWRA Conference & Exhibition is fast approaching and we are very excited that it will be held at the Dover **Downs Hotel and Casino**. Like previous years, the conference again will hold a two tract presentation schedule while at the same time offering attendees the opportunity to network with exhibitors.

A diverse group of presenters have been obtained to provide the most up to date information in the on-site field. Some topics include: business management practices; advanced treatment technologies; aggregate vs. infiltrators; membrane technology; DNREC enforcement activities; home owner education; Class H inspections; Wetlands Delineation; and Service Provider/Operation Maintenance.

Also back by popular demand will be Sarah Christopherson.

**The conference will be held October 14 and 15! More information can be found at [www.dowra.org](http://www.dowra.org). Mail outs will occur in August.**

Professional Continuing Education —Ben Miller, DOWRA Secretary

Why is Professional Continuing Education so important? Time and time again I attend seminars, classes, and training exercises and here licensee holders complaining about the yearly DNREC continuing education requirements. I have heard it from engineers, installers, waste haulers, and so on. As with any industry things change! Some common examples are:

- New scientific data is discovered on how things actually work. Onsite systems are not to just get rid of wastewater. They clean and treat wastewater prior to reaching the groundwater. This is a simple concept but if it is not operating properly it will not work, for example, aerobic (with oxygen) bacteria and organisms are located within the disposal field and soils that break down, treat, and clean the septic tank effluent. If the disposal field stays ponded the drain field and soils will go anaerobic (without oxygen) and the treatment will not occur.
- New technology becomes available. The state currently has an endless list of treatment units, and gadgets that are approved for use in Delaware. These technologies may be used in some instances but may not do as well in other situations. It is good to know what technologies are available, when to use them, and how to use them. Maintenance also becomes an issue. For example, if an advanced treatment unit that is located within a tank and you have been called for a pump out do you know not to pump it dry (manufacturer specified)? Do you also know that the tank contents need to be mixed, depending on the type of system, to be able to pump out the settled solids?

In today's world, homeowners are demanding more. If they are spending money they want to know the details: how much, why, why not something cheaper, will this work, how does it work, and will this solve my problems. If you cannot answer or if they do not feel comfortable with your knowledge they are going to go down the street to the competition.

It is important to continually expand our knowledge and know how within the onsite industry. As an onsite professional you must be able to understand the technologies and processes that are being utilized in order to specify them, operate them, maintain them, and clean them. It is also important to be able to explain these processes and technologies to the owners of these systems.

In response to the 2002 DNREC continuing education requirements, DOWRA has provided continuing education credits for attending the annual DOWRA conference at a reasonable rate per credit. This years DOWRA conference provides **continuing education credits for \$15.00 per credit**. It also provides the opportunity for attaining the required 10 hour of education credits within a two day period instead of having to take several courses or seminars throughout the year. DOWRA provides this to your benefit.

**2008 Calendar Events**

<u>July 17-26</u>	Delaware State Fair Exhibit Grandstand, Delaware State Fair, Harrington, DE
<u>August 21</u>	DOWRA Membership Appreciation Crab Feast Invite Only ** All those who attend board/membership meetings will be invited
<u>September 8</u>	Board/Membership Meeting, 6:30 pm Pizza, 7:00 pm meeting starts Board Room, Exhibit Hall, Delaware State Fairgrounds
<u>September 12</u>	DOWRA Annual Golf Tournament 12:00 pm, at Jonathans Landing Golf Course
<u>October 14-15</u>	<b>12<sup>th</sup> Annual DOWRA Conference, DOVER DOWNS HOTEL &amp; CASINO</b>



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*Don't forget to  
visit us at the FAIR  
under the Grand-  
stand*

## State Leaders Meet to Discuss Future Within NOWRA—Hilary Moore, DOWRA Past President

On April 7, 2008 over 20 state leaders from 14 different state associations gathered together for the first of two state leader's meetings to be held this year. The purpose of these meetings is to discuss and address programs and issues occurring in the industry as well as within NOWRA.

As many of you are aware, the past two years have found the Affiliate Groups wrestling with an identity crisis of how they fit into the NOWRA structure. Numerous conference calls, discussions and meetings have identified key questions. (1) What does NOWRA do for each state association? (2) How do the state associations fit within NOWRA's structure and what is their purpose? (3) What are the goals and mission of NOWRA? (4) Why can't an open line of communication be kept between all groups? (5) NOWRA should be able to provide more information to the states including financial breakdowns?

I am pleased to inform you that hope is on the horizon for getting these issues resolved....there is light at the end of the tunnel. The April meeting proved to be refreshing in that open and honest dialogue occurred not only from the affiliates to the Board and new Management team, but vice versa. The affiliates learned that NOWRA too is in the process of re-defining itself. NOWRA is trying to discover just who they are as an organization and where they fit into the onsite arena. The Board shared the finan-

cial state of the organization and their need to become sustainable, as well as the responsibilities of their new management team.

In turn, each representative provided input on current concerns and needs within their respective association. These needs were turned into a punch list that was distributed to the NOWRA Board in order of importance. Needs included association software, national buying power, national voice, speakers bureau, strategic planning, best practices, website assistance, and leadership orientation. At the end of the meeting the Management team vowed to find new association software in which associations could provide input on its development.

In conclusion, in order to move forward all parties have to work together as a team. A strategic planning session is currently being scheduled for August where state affiliates will be able to work with the NOWRA board to provide key input into the development of a stable association with benefits. Better lines of communication are also being developed in which the board meeting minutes, committee meeting minutes and financial statements will be available to all NOWRA members. These will eventually be posted in a member's only section on [www.nowra.org](http://www.nowra.org). As the Local Affiliate Group Chair, I have also been invited to attend board and committee meetings and provide input

where needed. This will also give us the opportunity to share our monthly meeting minutes with the board.

The road ahead is full of promises if we each take the time to be involved, patient and understanding. As I read once, "Unity is strength... where there is teamwork and collaboration, wonderful things can be achieved."

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## Public Confidence in Onsite Systems Requires Field Testing and Field Standards for Performance—

*By Nicholas Noble, Government Relations Representative, Orenco Systems, Inc.*

In May, Delaware approved Orenco Systems' AdvanTex Treatment System for residential secondary wastewater treatment, joining the 40 other states where AdvanTex systems have been approved. Like a number of other states, Delaware based its approval on NSF Standard 40, which sets out requirements for evaluation of advanced treatment systems.

In 1970, when Standard 40 was developed, manufacturers, regulators and other industry stakeholders were chiefly concerned with preventing wastewater from surfacing onto the ground. They decided that a test-center protocol (bench test) was adequate for evaluating the onsite treatment systems that were available at the time. However, the needs of yesteryear are not the needs of today.

Today, jurisdictions must protect surface and ground water resources, limit nutrient inputs to sensitive ecosystems, and contemplate the effects of pharmaceuticals and pathogens, while dealing with demands from elected officials and wastewater system manufacturers. Today's regulator needs to be armed with data that can, with some level of confidence, indicate how a system will perform in the field, over a long period of time.

A bench test can be a useful tool for comparing performance of treatment technologies in a controlled setting and should be required of all treatment systems new to the market place. However, it has many limitations in assessing long-term performance under variable conditions. The most recent attempt to address the evolving needs of the industry is NSF Standard 245 for nutrient reduction. Many of the same limitations of Standard 40 are also inherent to Standard 245. Here are a few of the most significant ones:

Bench tests often use a nontypical – and weaker – waste stream. For example, NSF/ANSI Standard 40 allows influent that is one-third the concentration of typical residential wastewater (Crites and Tchobanoglous, Small and Decentralized Wastewater Management Systems, Table 4-14, page 181).

Bench tests also use “stress tests” that don't realistically simulate real stresses. For example, “wash-day stress” samples are not collected until 24-48 hours after the stress period, so the hydraulic loading is no higher than normal! These kinds of stress tests cannot be relied on to provide useful information about how a system will perform under real stress conditions.

Bench tests are also performed under unrealistic temperature conditions. Under the guidelines for NSF Standard 245, for example, sampling is discontinued if the ambient temperature drops below 10 degrees C or 50 degrees F. This does not adequately provide jurisdictions in cold climates with the data they need to approve or not approve systems. Moreover, test centers are located in different geographic regions of the country with different climates. Since temperature affects a system's ability to nitrify, performance results can be skewed, depending on the location.

Bench test durations are too short. For example, NSF/ANSI Standard 40 and 245 are only six-month tests. Performance issues may not, and likely will not, become apparent in the first six months of operation.

In summary, bench tests evaluate systems under conditions that are not similar to what the system would experience in the real world. They are not capable of reliably gauging how a product will perform in multiple installations with highly variable, real-world conditions. To achieve statistical reliability, it is far more informative to evaluate performance based on testing a larger number of actual residential installations.

As evidence, studies show that many advanced treatment systems that have passed test center testing are failing in the field (Roeder and Brookman, “Performance of Aerobic Treatment Units,” *Journal of Environmental Health*, 2006; Heufelder et al, “Performance of Innovative Alternative Onsite Septic Systems for the Removal of Nitrogen,” *Barnstable County Report*, 2007). Some of these systems rely on finicky treatment technologies better suited to a treatment plant with round-the-clock operators than to a residential household. Others have poor equipment – moving parts that wear out or fragile parts that break. Still others fail because of inadequate maintenance, lack of real-time monitoring, or lack of incentive for



**Public Confidence, Continued**

for homeowners to maintain service contracts.

Because test center testing doesn't evaluate these factors, states constantly approve advanced treatment systems that are bound to fail in use. These failures frustrate homeowners, endanger public health, and give the onsite treatment industry a black eye.

If the public loses confidence in onsite wastewater treatment, governments will start making unwise and expensive decisions, such as imposing construction moratoria and mandating centralized sewer systems that can be inefficient for the application. So the answer is simple: 1) require field testing in addition to test center testing, and 2) enforce field performance.

Decision-makers and stakeholders should formulate a field-testing protocol, which jurisdictions could adapt to their own requirements, taking local soils and climate into consideration. This would allow memoranda of understanding between jurisdictions that have similar soils, climates, and regulatory requirements, eliminating redundant testing. Qualified local laboratories would carry out sample analyses, reducing overall program costs. These costs would be borne by the manufacturer whose product is being tested.

To enforce field performance, local jurisdictions should adopt the following requirements:

At a minimum, require sampling of turbidity, pH, and dissolved oxygen during scheduled service visits, as performance indicators. If one of these samples is outside a mandated threshold, further sampling should be required. If the problem persists, laboratory analysis, at the manufacturer's expense, should be required, as well as repair or alteration to the system to ensure compliance.

Require mandatory random field audits to maintain approval status. At the manufacturer's expense, jurisdictions should audit some percentage of installed systems annually. Jurisdictions should also require a certain percentage of systems to be in compliance with the effluent quality standard under which they were approved. If manufacturers are out of compliance, their approval status should be suspended until further evaluations, at manufacturer's expense, can be conducted.

Require online record-keeping so that records of service visits, sampling results, and the status of O&M contracts are available for regulators to view at any time.

A robust field test standard would allow governments and homeowners to feel confident about relying on advanced onsite treatment. Orenco and other manufacturers will benefit greatly from this, and we look forward to cooperating with other stakeholders on such an initiative. We hope that DOWRA and other state wastewater organizations will recognize the value of field testing and take a leadership role in developing this new approach.

***As a footnote the DNREC does not rely on NSF certification only, but on a compilation of data submitted by the manufacturer.***

**NOWRA's Septic Locator**

Be sure to visit Nowra's Septic Locator at [www.septiclocator.com](http://www.septiclocator.com) is a online search directory created by NOWRA to help on-site system users locate septic products, services and industry professional in their local areas. This site is a great advertising tool to all of DOWRA/NOWRA members and it is free to you and the public. The site is also a great source of information. Each member's information will be updated annually by DOWRA based on your membership renewal application.

## Where is the “N” in Wastewater—Brian C. Carbaugh, P.E., Director of Engineering Design, Artesian Wastewater Management, Inc.

Nitrogen is typically considered to be THE pollutant of concern in on-site wastewater systems. Soil removes most other contaminants in significant quantities, but as we will see much of the nitrogen can escape to the environment.

Nitrogen is both a groundwater pollutant, capable of causing contamination of drinking water; and a surface water pollutant, capable of degrading our waterways by promoting the growth of algae that can choke off the oxygen to fish.

So where does it come from, and what can we do about it.

Nitrogen in domestic wastewater comes from both organic materials (organic nitrogen) and ammonia. Together these two (2) forms of nitrogen are referred to as TKN or Total Kjeldahl nitrogen (the claim to fame of J. Kjeldahl, who invented a test for these combined forms of nitrogen in 1883).

Typically domestic wastewater has been considered to have approximately 40 mg/l (milligrams per liter, which is equal to 1 part per million) of TKN. For those of you jumping ahead, there is typically no nitrate or nitrite nitrogen in raw domestic wastewater.

Recently, due to water conservation, nitrogen concentrations in raw wastewater have been increasing. TKN concentrations of 60 mg/l are not uncommon in wastewater from newer homes. You see, water conservation only conserves water, while the same amount of waste is being produced, increasing the concentration of the waste constituents.

In a typical home, producing approximately 150 gallons per day (gpd) of wastewater at 60 mg/l TKN, approximately 27 lbs of N will be produced in a year. (If I did my math right, that is approximately the same amount of nitrogen in 2-15,000 sf. bags of Scott's Super Turf Builder fertilizer).

A septic tank does little to remove nitrogen, but some nitrogen reduction may occur in the disposal system as the organic and ammonia nitrogen are converted to nitrite and nitrate nitrogen by bacteria under aerobic conditions. In a properly functioning septic system, most all nitrogen will be converted to the nitrate form, since the bacteria that perform nitrate conversion (Nitrobacter) are more active than the bacteria that produce nitrite (Nitrosomonas). Unfortunately, nitrate is very mobile and will flow easily in the groundwater.

Nitrate is a problem in groundwater. At concentrations of greater than 10 mg/l it can cause “Blue Baby Syndrome” where nitrates inhibit the ability of a baby's blood to carry oxygen, causing harm to the child and making them turn blue.

Nitrate is also a concern for our waterways because, once groundwater travels to a surface water outlet, nitrate can cause increased growth of algae. Algae alone is not as much of a problem, but when it dies, it decays causing low oxygen concentrations and possibly fish kills. Of course it is far better to have a properly functioning on-site disposal system removing as much nitrogen as possible, rather than a failing system dumping nitrogen directly into a waterway.

So what can be done to significantly reduce nitrogen? Small individual system treatment plants have the ability to remove some nitrogen. Most of these treatment plants can remove 30-40% of nitrogen, and under careful operation can approach 50% or greater removal.

Better removal efficiencies are typically observed in larger treatment systems with greater operational control. In Delaware, nitrogen reducing treatment plants have been producing effluents with less than 10 mg/l of total nitrogen for well more than a decade. DNREC adopted guidelines in 2005 requiring all on-site systems with a design flow of greater than 20,000 gpd to meet the 10 mg/l total nitrogen discharge.

Spray irrigation wastewater treatment systems also have the ability to significantly reduce nitrogen which, rather than being removed in the treatment plant, are removed by the crops being grown as it is used as a fertilizer. Spray irrigation systems are required to show that nitrogen is reduced to less than 10 mg/l after passing through the crop root zone.

More technologically advanced treatment systems and better managed spray irrigation systems are now coming into play that will help us to reduce nitrogen to meet even more stringent requirements. The pollution control strategy (PCS) for the Inland Bays will require large treatment systems, either on-site infiltration systems or spray irrigation, to reduce nitrogen to less than 5 mg/l before it reaches the groundwater. These systems will provide reduction of more than 90 percent of the nitrogen produced in the watershed as a protection to both our groundwater and surface water.

Nitrogen is certainly a concern. As wastewater professionals we did not make it (or at least any more than anyone else did), but it has to be our goal to make sure that nitrogen is properly managed to protect the environment. Given the concerns relating to nitrogen pollution, it is sure that our industry will be asked to do ever more to reduce this contaminant, and we will most likely rise to the occasion.

### Call to Duty—Jack Hayes, DNREC Environmental Science

Here it is almost the middle of summer - hot, humid and sticky. The best part about it is that it means I am half way through my 120 day rotation at the Dover Port Mortuary. Some of you know I have been deployed but others may not. If you have gone through the DNREC building lately you've probably seen me there in my Air Force uniform and not shorts and a T-shirt. Then maybe some of you haven't since my uniform blends so well with the surroundings (that camouflaged thing). Anyway I was asked to write an article about being deployed and still trying to maintain the soils portion of the Large Systems Branch.

I will tell you I am not doing it alone. I am able to keep up with the paper work myself so far and that is in large part because of the slow housing industry now which is a big reason why I decided to volunteer for this rotation in the first place. The field work in Sussex County has been overseen by Scott Kline while Michele Adkins has assisted in Kent and New Castle Counties. I know Hilary Moore and Marlene Baust have done a lot of work on our new Environmental Navigator database (without a lot of input from me lately) which is going operational this month. Ron Graeber has helped with questions about our program and some administrative duties for me as well.

I guess what I am trying to convey with this article is that, yes, I am deployed and trying to keep up with both positions but if were not for the assistance of many others from DNREC and the Air Force I would be floundering in both positions. I feel good about being able to serve our great country in returning our fallen heroes to their loved ones and thanking them for giving their all but also that our service to you, the on-site industry, hasn't been diminished by my absence with the help of so many from my DNREC family. I am looking forward to September when my orders end and I can return to my normal routine and fully serve for you, my on-site industry family.

### Weathering the Storm, When Times are Tough - Small Business Finances - Small Business Finances

The secret to weathering a particularly nasty economy is to diversify your customer base, free up cash flow and cut costs where you can. Here are a few ideas for recession-proofing your business:

**Cut costs.** Have a look at your business and figure out where you could save, When times are tough, it's best to focus on core markets and spend money in those areas, not in areas that haven't been more profitable.

**Maintain prices.** You may be tempted to slash prices to free up cash flow. That's a mistake !! You'll have work but you'll also cut your profit margins and likely dilute your pool of jobs. Plus, if customers decide to use you again they will expect similar discounts.

**Reserve discounts.** "Don't go into a discounting war! Since you don't want to dilute value and you especially don't want to start competing on price with discounters, tread lightly when it comes to offering discounts. Be sure to reserve them only for current, repeat customers. "You're trying to breed loyalty" without diminishing your value and quality of workmanship.

**Focus on service.** It is one of the best ways to add value without costing money.

**Talk to your business attorney or accountant** about the pros and cons of your current business structure and whether it's still right for you. Don't forget that 2008 will be a political transition year, and tax rates may be changing in the near future.

**We are on the Web**  
[www.dowra.org](http://www.dowra.org)

**The 2008 NOWRA Installer Academy**  
**December 8-10, 2008**  
**Riviera Hotel, Las Vegas, Nevada**

#### Request for Training Presentations

Share your expertise and experience with others in our industry at The Installer Academy, a NOWRA premier education and training program.

Attendance and interest in this event continues to grow, and this year will prove even better! This conference focuses on specialized installer training programs. We are asking onsite professionals to share valuable knowledge and experience in design, installation, inspection and O & M of systems, as well as some of the practical skills you need to do your job and run a successful business. This is your chance to participate as one of the trainers in a growing event! Deadline for proposals is June 26, 2008.

For full details, please visit <http://www.nowra.org/abstracts.html>