

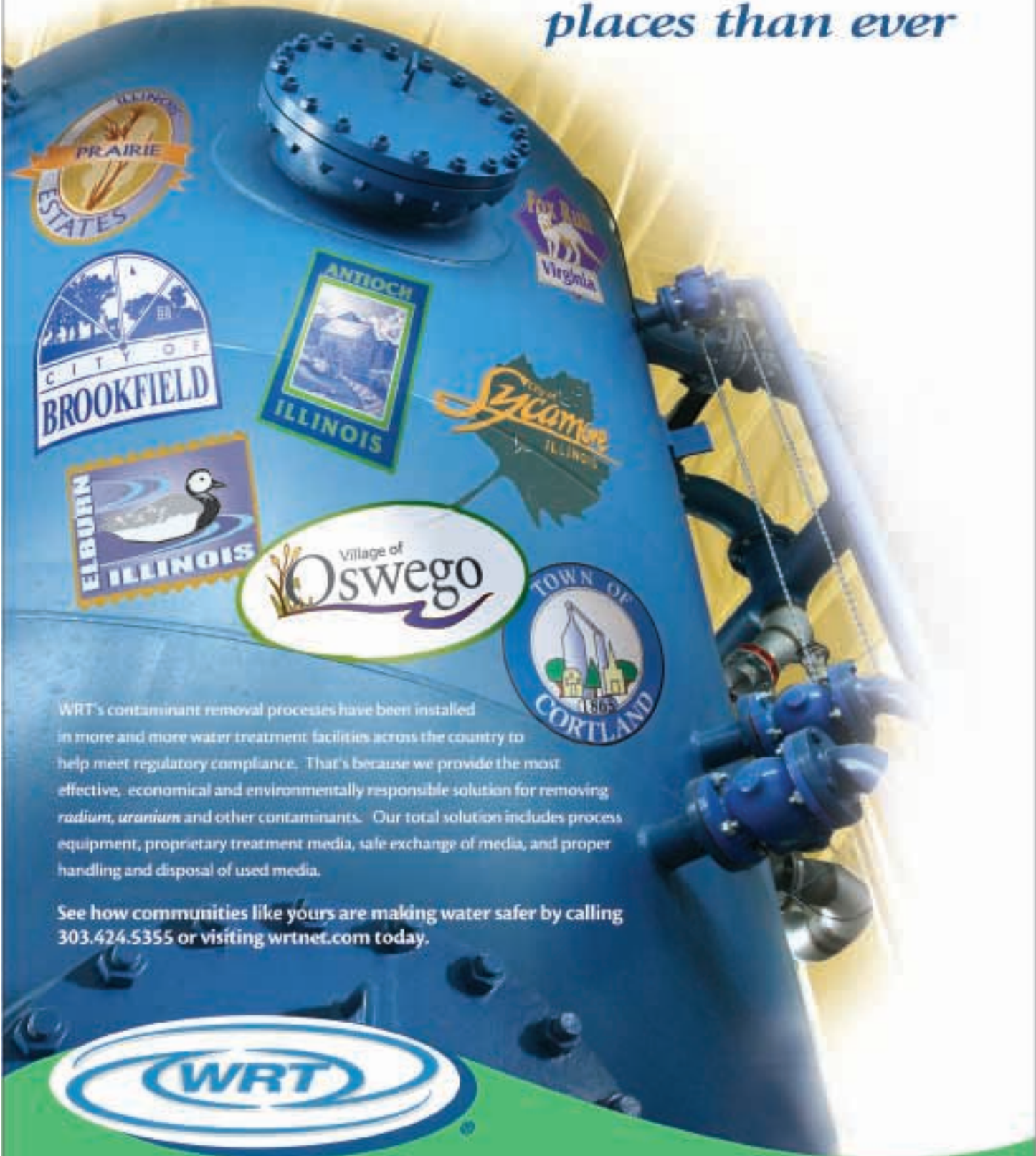


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IRWA's Mission Statement

"Protecting and preserving the water and wastewater resources of Rural Illinois through education, representation and on-site technical assistance".

ON THE COVER...

Pictured is farmer Gary Walker of Gilson, Illinois in a combine picking corn adjacent to Illinois Route 97 between Gilson and Maquon, Illinois. Picture taken by Gary Chase, IRWA Wastewater Technician.

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Become Part of the Solution

by Frank Dunmire, Executive Director

Recently I attended the annual in-service conference hosted by NRWA in Reno, Nevada. This three day conference is designed to update all of the rural water affiliates to new and changing requirements of our national programs/contracts. These required conferences for staff people have been going on for years but what set this one apart from others is that the administration staff and field staff conferences were held separately. All of IRWA's Circuit Riders, Wastewater Technicians, and Source Water Specialists attended their in-service conference in June while Executive Directors, Financial Officers, and Membership Services staff attended their in-service training in late August.

Why the change?

As a recipient of Federal grants and contracts, NRWA (as well as all of the state affiliates) is scrutinized beyond the comprehension of the average person. Along with annual audits, reviewing how business and training sessions are conducted is done as well. During last year's review it was questioned what assurances were there that - say a Circuit Rider didn't wander into an Executive Director's meeting. Well, short of the age-old honor system, there really weren't any so NRWA decided that they would remove all doubt and hold the conferences on different dates.

So with that brief history of in-service training let's get on with this month's article.

During the Executive Director's first day of training you can always bank on the DC lobbyists being first on the agenda. This year was no different. But, what gave this year's presentation a whole new flavor was their encouraging words regarding funding for the next fiscal year. After suffering a serious loss of funding for FY07 USEPA programs, they were reporting that things are looking very good for the reinstatement of those programs for



FY08. They did caution that, although the House and Senate have both marked-up the appropriations bill for USEPA funding, their numbers are different. A joint conference between the two houses will probably not take place until sometime next month. If that is the case, then the government will be operating under a continuing resolution once again. For those of you who have been keeping a score card, a continuing resolution is what the Federal government is operating under for the entire 2007 fiscal year, ending September 30, 2007. An agreed budget was never passed last year!

In an effort to ensure that funds for Circuit Riders and Wastewater Technicians is stable and uninterrupted contract extensions are already being negotiated. If the extensions are put into place, then there should be no chance of a funding loss. NRWA's DC staff is working diligently to make sure that this is the case.

Like most any other professional conference, it seems the most beneficial part of in-service was the constant interaction with your peers from across the nation. This year it seemed that the hot topic of conversation centered on training. However, the training being discussed was not that of the operator. Instead, it was the discussion of board training (or the lack thereof) that took center stage.

continued on page 23

An advertisement for Ressler & Associates, Inc. The background is a grayscale image of a chain link partially submerged in water, with ripples and reflections. The text is white and centered. At the bottom right is the company logo and contact information.

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Activated Sludge Wasting

by Dick Rohr, Wastewater Technician

One of the main controls in the activated sludge process is sludge wasting. Many questions arise from operators who are new to activated sludge operation or have not been around that type of treatment for a while as to the sludge wasting operation. How much do I waste? Did I waste enough? How often should I waste? After I waste, why does my effluent appear to have straggler floc in it? It is the hope that this article provides a guide to how to approach wasting sludge and a system that can be used to suit your purpose.

Proper wasting techniques help balance the biomass with the load on an activated sludge plant. When done properly, wasting will help the plant produce an effluent relatively free of suspended solids (TSS) and Biochemical Oxygen Demand (BOD). Wasting affects:

- Growth rate of the biomass
- Oxygen Consumption
- The occurrence of foam
- Nutrients needed
- Clarity of the effluent

Control of solids in the activated sludge process is the "name of the game". Balance of the solids in the plant and the loading coming into the plant is the control objective of the operator. For example, if you have 500 lbs. of BOD (or food) coming into your plant daily, and you are discharging 75 lbs. of BOD

into the effluent; then you have 425 lbs that are in the system every day. To maintain some part of equilibrium, part of that 425 lbs. must be wasted daily. To find out how much is an arbitrary amount as all plants are different. To put it simply, you waste just enough to maintain a quality effluent. Somewhere along the line you will have to set up a schedule for wasting- daily, hourly, bi-weekly, weekly, etc.. Of course, you may wait until the "next big rain", but this is frowned upon by all those of sound mind!! A general rule of thumb is; "keep the waste rate as constant and even as possible."

Does Your Sludge Settle?

If your solids are not settling, they're probably going over the effluent weirs, and you are violating your discharge permit. If the sludge does not readily



settle to about 300 ml on a 1000 settleometer within the first 15-30 minutes,

continued on page 7



The IRWA Office will be closed the following days:

Monday, November 12
Veteran's Day

Thursday, November 22
Thanksgiving

Friday, November 23
Day after Thanksgiving

Monday, December 24
Christmas Eve

Tuesday, December 25
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you might have problems. Factors affecting settleability:

- Young sludge (sludge hesitant to settle); High D.O.
- Low D.O. (sludge floating or in stage of denitrification)
- Toxicity (industrial discharge or shock load)
- Improper wasting amounts
- Filamentous organisms

Since this article is directed towards sludge wasting, we will assume that the sludge settles and compacts as it should. We will address sludge settling at a future article.

Controlling Sludge Levels

There are several methods used to assist the operator in adjusting wasting rates. The most common methods are:

- Constant MLSS (MLVSS)
- F/M Ratio
- Sludge Age (MCRT)

Whatever method works for you is the right method. Your guideline is the plant effluent. When your plant effluent is at its best in clarity and quality, then find the parameters associated with effluent and try to stick by them. I stress "try" because there are always outside influences that may interfere with your best laid plans.

Constant MLSS

Lets assume you've been operating your plant with a sparkling clear effluent for about a week or two; or you've been tracking your plant effluent and MLSS for a while. You notice that when you have a MLSS of @ 2200 mg/L or

MLVSS of 1430 mg/L your plant effluent is almost perfect, low in TSS and BOD. Now, your objective should be to waste enough solids to maintain your MLSS hi that range, say 2000-2500 mg/L MLSS.

Remember, that when seasonal cooler temperatures occur, MLSS may be increased to assist the natural bacterial action in colder climes. The downside to using the Constant MLSS system is that

the system is susceptible to high organic or sudden shock loading. If it works for you, however, use it!

Common MLSS Ranges in Process Variations

- High Rate — 500 -1500 mg/L
- Conventional —1500-3000 mg/L
- Extended (Oxidation Ditch) — 3000-6000 mg/L

Constant F/M Control

If you maintain the amount and quality of food coming into the plant, you have total control of the diet and out come of the quality of the plant effluent. Since this is for the most part not feasible, you can maintain the biomass to the amount of food coming into the plant. In the F/M Control method we monitor the amount of food (BOD) coming in each day, and we monitor the amount of solids in the aeration tank. The formula reads:

$$F/M = \frac{\text{lbs of food (BOD) to aeration}}{\text{lbs of MLSS under aeration}}$$

$$F = BOD, \text{ mg/L}$$

$$M = MLSS \text{ or } MLVSS, \text{ mg/L}$$

The problem with this method is the length of time for the BOD test (5 days). Your ratio is always five days behind, but if you use a moving ratio you will detect trends and make wasting adjustments accordingly. If you use this method, make sure that all flow measurements are as accurate as possible and use 24 composite sampling for BOD measurement. F/M is like being on a diet. If you consume as many calories as you expend, then you can no weight. Your activated sludge plant is no different. You cannot control the food, but you have control of the biomass. When you reach that proper F/M ratio where your effluent is very low in TSS and BOD, then you try to maintain the ration in that range.

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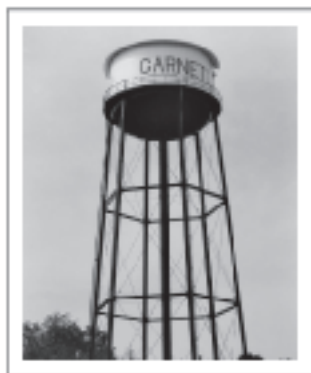
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OCTOBER 3, 2007

Illinois Rural Water Association Wins National Recognition.

National Rural Water Association is pleased to announce that Illinois Rural Water Association made a great showing at NRWA's Annual Tribute to Excellence Awards Ceremony held in Philadelphia, Pennsylvania on September 26.

Walking away with two outstanding awards including Excellence in Member Services and a Merit Award for Excellence in Public Relations, IRWA Executive Director, Frank Dunmire, went on stage to accept the awards on behalf of the hardworking staff of the association.

Illinois Rural Water was recognized for their outstanding work in many areas as they constantly work for their utility membership in providing clean, safe, affordable water for the residents of their state.

The NRWA Awards in Excellence program was established to recognize the outstanding efforts of the Member State Affiliates, their staff, and special members of the rural water industry.

The National Rural Water Association is a non-profit federation of State Rural Water Associations. Its mission: to provide state associations with support services to meet the needs of their membership. NRWA is America's largest utility association with over 26,292 members. Historically, NRWA's state associations have trained over 55,000 water and wastewater system personnel each year for two decades. They also provide over 100,000 on-site technical assistance visits a year.

Smithfield Gets New Treatment Plant and Water Tower

by Gale Moore, Circuit Rider



The Village of Smithfield located in Bureau County has a population of 277 and 112 connections. Mayor Glen Manuel and Operator Richard Lafary were kind enough to give me a tour of their new facility. First we took a look at the 50,000-gallon water tower, aerator, and the ground storage reservoir. An added feature to the water tower is the sprayed on insulation. Next we went in the treatment plant. It contains 2 Tonka iron removal filters, 2 high service pumps, chemical feed pumps for fluoride and chlorine, and a chemical testing area. The filters are rated at 43 gallons per minute each, and are backwashed once per week at 190 gallons per minute using 1500 gallons per filter. Each high service



pump is rated at 85 gallons per minute. Average daily pumping is 20,000 gallons. The raw iron is 3.3 mg/l and after going through the filters the iron has been running at 0.0 mg/l. The chlorine residuals are 1.7 mg/l total and .24 mg/l free and fluoride at .9 to 1.0 mg/l. 💧

additional photos on page 12



Smithfield Gets New Treatment Plant and Water Tower

continued from page 11



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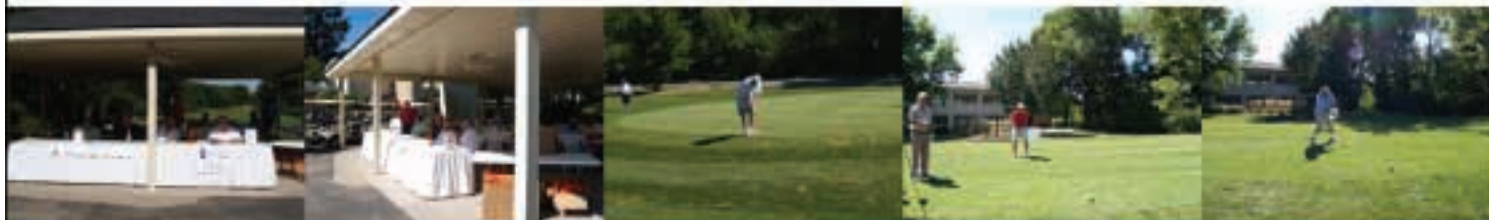
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High Speed Internet Connection

by Toh Poh Leng

Internet has almost become a lifeline for the new generation. Many businesses now depend entirely on the Internet. People residing in different parts of world are able to talk to each other via the medium of Internet. Video conferencing is a live example of it. Many marriages are also made with the help of the Internet. The list of benefits that Internet provides is limitless.

But, what would you do when you have a slow speed internet connection that takes a lot of time? That internet connection would simply be useless to you.

The speed at which you are connected to the Internet plays a very important role in enjoying the advantages offered by it. For example, suppose one of your relatives who is residing overseas, has sent you a holiday clip. Now, if your Internet speed is slow then first of all it would take a long time to load the mail website. Then you would enter your user name and password. It would again take extra time to verify it. Also, downloading the clip would be very slow, even if its size is very small. Overall, you can say that having a low speed Internet connection (dial-up connection) is not a good thing.

There are many choices available for a high speed Internet connection. DSL, Cable and Satellite are some of them. You can select the best one from them. Here are some of the common benefits


that all these high speed Internet connections provide.

- Viewing of streamlining clips or videos is very easy and fast in these connections. Dial-up connections may not even allow their access.
- You can upload web pages and download any kind of information or software with more than twice the speed of dial-up connection.
- Downloading of images and huge e-mail files can be done almost promptly.
- High speed Internet connection has proven to be a boon for all businessmen. They can now access the world wide web within a few seconds. Their businesses have been highly benefited through efficient and quick video conferencing which would have been impossible in a slow dial-up connection.
- For those people who work from home, a high speed Internet connection can assist them in increasing their overall work efficiency and output.
- On a long term basis, the high speed Internet connection can prove to be highly economical.

DSL: The best choice for high speed internet connection Now-a-days, DSL has become the leading choice for a high speed Internet connection. DSL works on existing telephone lines. With a DSL connection you can browse the web and talk on the phone at the same time. Generally, a DSL connection requires a DSL router, a dedicated phone line and a network card or a modem for each system. The installation of DSL at your location is the responsibility of the service provider. Last but not the least, this high speed Internet connection is offered at very affordable prices.

About The Author

Toh Poh Leng owns and operates <http://www.dsl-upgrade-help.com> Dsl Upgrade. 📌



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Getting Our Message Out to The Public

by Wayne Nelson, Training Specialist/Field Staff Coordinator

The 2007 Farm Progress Show was held near Decatur, Illinois on August 28-30, 2007. Illinois Rural Water Association staff showed off our Mobile Training Unit (MTU) at the event as a member of the Partners in Conservation team. Our purpose there was two-fold. First, we wanted to get the word out to the general public of what IRWA and public water supply personnel do to make their lives better. The weather

assisted us in this venture. With temperatures in the high 90's show visitors were in dire need of cool clear water and IRWA met that need. We had the only free ice water on the grounds. Of course, our water was not that high-priced stuff in plastic bottles but originated at the local public water supply. We received many thank-yous and even a few blessings from the folks that complimented us on how good the water was. I think we may have even changed the opinions of some of the school kids that had to agree that this "city" water was pretty good. In three days we went through over a quarter ton of ice cubes!

Our second goal was to try to inform our young people about what water treatment personnel do and about a possible career in the treatment field. It is a fact that there is a shortage of certified operators in the nation and that this shortage is expected to get much worse in future years. During tours of the MTU we showed them a model of a water treatment plant, how water service taps

are made, how fire hydrants work, and how contamination can occur by using our groundwater flow model. We also showed attendees how water meters work and why water must flow through them to make them turn.

We did meet several public water supply decision-makers and operators at the show, mostly from rural water districts and cooperatives, and did get a chance to "talk shop". The question we were asked the most from other show attendees was "How can we get rural water to our house?" Our answer was that they have to work for it but that there is help out there. I truly believe that rural water now is the equivalent to our parents and grandparents getting electric power in the 1930's. Our profession is offering quality on tap. 💧



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Public Works Professionals — Our Unsung Heroes

by Jeff Tumiati, District #5 Board Member

My hat is off to all the men and women who have one of the most satisfying and aggravating jobs known to mankind. You dedicate yourself to serving your customers, putting their needs ahead of your own, working long hours with limited resources and being taken for granted. If you haven't figured it out yet, I'm referring to the field of public works and more specifically water and wastewater professionals.

Your customers and council members don't see you out working all hours of the day and night. But they do know you're there; or do they? You are available 24/7. Anytime someone goes to the faucet for a drink they expect (and rightly so) that your product is available. Who gives waste a second thought? One flush and it's gone; or is it? How many people think about the miles of distribution &

collection mains, water plants, booster stations and lift stations necessary to keep it all flowing? It seems you should keep one hand on the phone and the other on the door. It's not if you get called out again; it is when. You know it will come and once again, you will be out taking care of the business of making sure safe drinking water and sanitary service are available.

One of the biggest problems for small systems is adequate funding. Governing bodies have a duty to keep rates affordable, while at the same time retaining a well trained and quality staff, which is not an easy task.

An equally troubling issue is that the water/wastewater professionals are showing their age. When was the last time you talked to an operator in his or her 20's?

That alone scares me.

Your profession is one that no one can live without. You provide Quality On Tap 24 hours a day - 365 days a year.

I saw this poem printed somewhere years ago and thought it would be a shame not to share it again. It seems very



fitting. Keep doing what you do best; providing life to others. 💧

THE DREAMER

*Last night as I lay sleeping
I died or so it seems,
Then I went to Heaven
But it was only in my dreams.*

*But, it seems St. Peter met me
There at the Pearly Gate,
He said: "I must see your record
So stand right there and wait."*

*He returned and said "your record
is clouded up with flaws,
But, on earth I see you labored
for a worthy cause."*

*"You fought snow and ice in winter
Pumped lots of water in summer heat,
Then, frowned on by the public
When you stopped for a bite to eat."*

*"I see where you drank whiskey
And used tobacco too,
Fact is you've done everything
That a good man shouldn't do."*

*"We can't have men like you up here
Your life is full of sin,"
Then he read the last of my record
Grasped my hand and said, "Come In"*

*He took me up to the Big Boss
Said: "Take him and treat him well,
He worked for the Water Works, Sir
He's had his share of HELL."*

(Author Unknown)



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It has been said over and over by many groups and agencies that there will undoubtedly be a shortage of operators in this country. Some are saying that it could potentially reach a critical level within the next eight years. In some areas of the country, including Illinois, the shortage of competent operators is already beginning to appear. Everyone in attendance at this year's training did agree that the shortage is real and will only worsen over time unless some sort of action is taken to reverse the trend. Unfortunately, there was no clear cut answer as to what the best course of action would be.

Upon further reflection, I should qualify that last sentence. I guess it would have been more accurate to say that there was no easily attainable solution to the

problem. In a nut shell, the solution is obvious. Board training! During our discussions, it was revealed that, if it were not a requirement, village board and city council members rarely attended formal training that addressed their specific roles as a protector of the public's best interest. Too often, decisions are made from the heart and not from a good sound business mind.

Let's face it; whether it's a village, a city, or a rural water district/co-op, it is still a business that, in the end, must sustain itself. Think about it; successful businesses have not become so by

employing managers and administrators that do not continue to broaden their horizons through continuing education and training seminars. Whether offered by IRWA or some other entity and you are a Board member, please, try to take advantage of the next training opportunity that presents itself. Who knows....you might become part of the solution. ♠



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Common Ratios for A.S. Facilities

- High Rate — .5 -2.5
- Conventional — .1 - .5
- Extended Air — .05 - ..1

Sludge Age (MCRT)

MCRT (Mean Cell Residence Time) provides direct control over the amount of organisms in the plant. That is, the amount of time for the average bacterium to pass through the system before being wasted or discharged in the effluent. If you waste 10% of the aeration on a daily basis, you allow approximately 10 days for the bacteria to stabilize the waste material. You need to know the pounds of solids under aeration, pounds of wasted sludge, and pounds of effluent solids.

$$\text{MCRT} = \frac{\text{lbs of solids under aeration}}{\text{lbs of solids wasted} + \text{lbs of solids in effluent}}$$

Lbs to Waste?

$$\text{MLSS (lbs)} - \frac{\text{Effluent Solids (lbs)}}{\text{Desired MCRT}}$$

Lbs to Gallons?

$$\frac{(\text{Waste, lbs/dav} \times 1,000,000)}{(\text{Waste Sludge SS, mg/L}) \times 8.34}$$

For example, if we decided that to achieve a certain MCRT, our projected wasting amount had to be 150 lbs/day, and we knew our wasted sludge (or return sludge) concentration was 8000 mg/L; then:

$$\begin{aligned} \text{Waste, gpd} &= \frac{(150 \text{ lbs/dav} \times 1,000,000)}{(8000 \text{ mg/L})(8.34)} \\ &= \frac{150,000,000}{66720} \\ &= 2,248 \text{ gpd} \end{aligned}$$

Therefore, you would waste @ 2,248 gpd to try to maintain that certain MCRT that you decided was best for your plant. (Provided you have the room to waste!!)

Whatever method you use, Constant Mass, F/M or MCRT, feel comfortable with the system you choose. If one doesn't suit you, try another. The end game is to find the parameter that gives you the best effluent. When you do, you'll have a cleaner effluent and more efficient operation.

...OH!! !...By the way.... DON'T FORGET TO SHUT OFF THE WASTING!! 

Illinois Rural Water Association's 2007-2008 Tentative Training Schedule

PLACE	DATE	TOPIC	WATER/WW
MILAN	11/8/07	MOTOR HEALTH & CONTROL	WW
CARTERVILLE	11/15/07	EMERGENCY PLANNING / NIMS IS-100 & IS-700 COURSES	WATER
MONTICELLO	11/15/07	SAFETY & CONFINED SPACES	WW
ROCK FALLS	12/7/07	FLUKE METERS & ELECTRICAL TROUBLESHOOTING	WW
FLORA	1/16/08	WASTEWATER OPERATION A - Z	WW
EL PASO	1/23/08	ACTIVATED SLUDGE- CLASS I/II REVIEW	WW
COLCHESTER	2/7/08	ROCK & FILTER CLEANING	WW
EFFINGHAM	2/19/08 - 2/21/08	IRWA'S 26TH ANNUAL TECHNICAL CONFERENCE	WATER & WASTEWATER
OREGON	3/6/08	VARIABLE FREQUENCY DRIVES	WW
CARTERVILLE	3/12/08	WASTEWATER SECURITY	WW
EFFINGHAM	3/19/08	COLLECTION SYSTEM O. & M.	WW
PITTSFIELD	3/20/08	ACTIVATED SLUDGE - CLASS I/II REVIEW	WW
MORRIS	4/3/08	DUPLEX PUMP CONTROL	WW
MONTICELLO	5/14/08	LAGOON O. & M. / CLASS III/IV REVIEW	WW
CARTERVILLE	5/21/08	SAFETY	WW
ROCK FALLS	6/5/08	RURAL DEVELOPMENT GRANTS	WW
EFFINGHAM	7/16/08	WASTEWATER SECURITY	WW
EL PASO	7/16/08	LAGOON O & M. - CLASS III/IV REVIEW	WW

***THIS IS A TENTATIVE SCHEDULE. OUR WEBSITE (WWW.ILRWA.ORG) WILL REFLECT THE LATEST CHANGES, AS WELL AS CURRENT TRAINING TO REGISTER FOR. PLEASE CALL THE OFFICE AT 217-287-2115 WITH ANY QUESTIONS.

THE WATER BOARD BIBLE SERIES

The Water Board Bible

For a quick overview of the do's and don'ts city administrators and clerks look to this handbook. If operators, managers and superintendents wish to develop a better working relationship with their boards/councils, they use the Water Board Bible. You can use it to see how your system is doing today and where you could improve.

Getting Results from your Experts

Construction projects are the theme of this handbook. That's because construction projects bring together most of the experts you work with - consulting engineers, attorneys, bond council, financial advisors, contractors, etc. They are in charge of building your project to spec, on time and within budget. It is your job to make sure your experts do theirs.

The Operator's Handbook: Facts, Figures & More

This handbook presents a fast look-up information, graphs, tables, charts, equations and formulas. The goal? To save time for these very busy people. Their unsung work supports our entire nation's lifestyles, livelihoods and livability.



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Personnel Management

This Handbook has three purposes. 1) To help supervisors, boards/city council and employees review the basics. 2) To provide practical tips and examples concerning personnel problems and issues. 3) To look beyond the rush of daily affairs to the future and your relationship with your customers. It is by partnering with customers that small systems will be able to make decisions today about serving your children and grandchildren tomorrow.

Financial Accounting Guide for Small Water Utilities

The Financial Accounting Guide for Small Water Utilities strives to take the mystery out of accounting. It moves from basics through key concepts such as the general ledger, monthly financial results, the balance sheet, etc. This includes sample formats and examples, as well as case histories telling "how we do it here".

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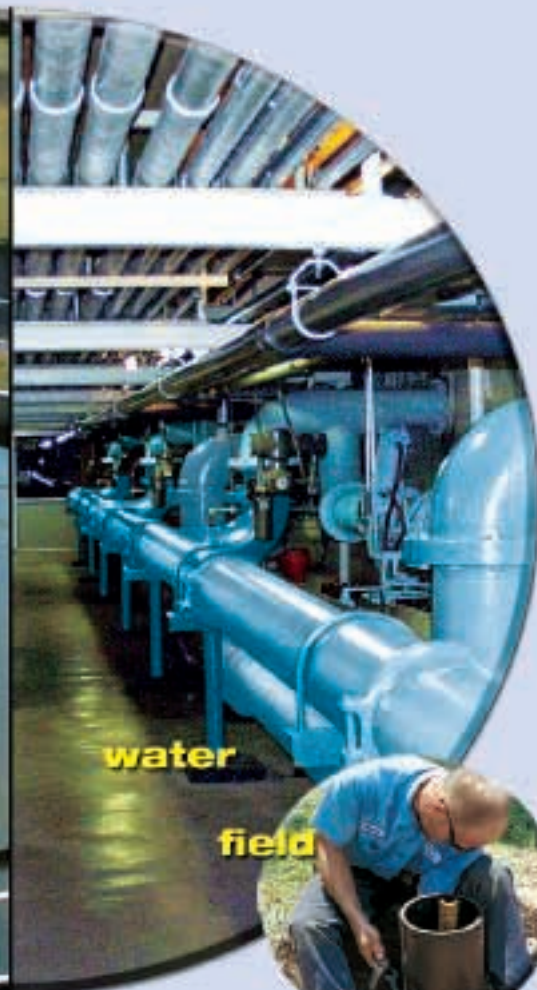
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