



# Water Ways

Volume XIX — Fall 2022



## *Forty Years of Meter Reading*

*by Greg Bates,  
IRWA Board President*

Things have changed drastically in the water industry over the last few decades. Looking back over my 40 year career I couldn't help but be amazed at how things have changed.

In 1981, I started working as a contracted meter reader. I was given two routes out of five. There were four of us meter readers covering roughly 2,400 meters monthly with an average of about a mile between meters in a three county, mostly rural area. I also worked for Jersey County Rural Water on an hourly basis assisting the current water operator with daily tasks and new construction of meters and mains. I read water meters on contract for one year and picked up another route in that time period. JCRW decided to make the meter reading a full-time in house job with a pickup truck and eliminate the contracted meter reading. I was hired as the full-time meter reader as well as working with the water operator in my spare time. I did this for two years while attending night classes at a local community college to obtain my Class C Water Operators license.

The first day of meter reading, the objective was obviously to learn the route. I was handed a four-way meter wrench, a leather bound two punch meter book with the customer's ledgers, a pencil, large empty coffee can, an empty mason jar and a round solid wood dowel. Of course the meter wrench was to loosen the meter nut lid and the flat part of the wrench was to pry up the meter lid. The leather bound meter book had all the previous readings by month as well as name, address and a somewhat accurate meter location (things change over the years). The large coffee can was used to bail the ground water out of the meter pit so you could read the numbers to write them down (this could be challenging after a two-inch rain). The mason jar was used as a magnifying glass if you were lucky enough to have clear ground water that was not too deep, so you didn't have to bail it out. Last but not least and probably the MOST important was the wooden dowel rod that you used to discourage the homeowner's dogs

that came after you while trying to read the meter (some dogs were not intimidated by the stick and quite obviously that would not be recommended in today's world).

The contract meter reading was based on being paid on a cost per meter. I was paid twenty-five cents per meter to read it and twenty cents per mile. It was important financially to read the meters as fast as I could because when I would finish the route I could do hourly wage work with the water operator and make more money. The biggest problem with contract meter reading was keeping your own vehicle on the road and finding one as fuel efficient as possible while at the same time being suitable for the job on the backroads of a rural area in all types of weather conditions. I started with a car but the door hinges didn't last and the country roads were very hard on it. I tried a postal jeep which was perfect for getting in and out but they had bad transmissions back then and I could not keep it on the road faithfully. I eventually finished with a three quarter ton pickup that held up pretty well until the company made the job full time and provided me with a company truck.

Last year I read meters with our meter reader and I was amazed at the range we had with the truck drive-by unit with radio read meters. We parked up on a steep hill and read two hundred and fifty meters in ten minutes.

It is truly mind boggling how things have advanced over the years and I am looking forward to what the future might bring! 💧





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## MISSION STATEMENT

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

### On the Cover:

**This photo was taken by Jeff McCready, IRWA  
Wastewater Technician, of a silo in Huntley, Illinois.**

Water Ways is the official publication of the Illinois Rural Water Association, P.O. Box 49, Taylorville, Illinois 62568, and is published quarterly for distribution to members as well as other industry associations and friends. Our website is [www.ilrwa.org](http://www.ilrwa.org). Articles and photographs are encouraged. Advertising and submissions should be mailed to the above address or e-mail us at [ilrwadb@ilrwa.org](mailto:ilrwadb@ilrwa.org).



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# Water System Infrastructure Replacement???

by Don Craig,  
IRWA Deputy Executive Director

In the year 1972, as part of the Clean Water Act, the U.S. Congress passed legislation to provide a very large investment into the various water system infrastructures throughout the United States. Unfortunately, even though they have served those community systems well since that large scale endeavor fifty years ago, most of those water utilities are now in dire need of upgrades, rehabilitation, and/or flat out replacement.

The evolution of distribution system features and treatment plants, has not transcended into meeting today's changing demands upon them. In many cases, concerning rural water systems, the manpower and money to properly maintain and 'keep up', has not always been available when it comes to good operations and meeting regulatory requirements. In other instances, larger rural community water utilities, have basically outgrown the system they have; as well as the treatment process and capacity to put the quantity and quality of water that's needed into that distribution system.

Factors such as budgets, schedule, regulations, projected future growth and life cycle affect a water provider's decision to extend and/or replace existing water systems assets. This is in addition to meeting demand, reliability, and drinking water regulations.

Although water facilities upgrading or rehabilitation may be more cost effective; sometime complete replacement of the entire system may be deemed necessary. And to be honest, in many instances, it may be the best resolution for the utility, the community it serves, and just as important... the environment.

When you consider and study the overall advancement of technology and design, complete replacement could mean better efficiencies throughout the entire life cycle of a water infrastructure project. This includes from its original design

and construction, on down to operations and maintenance. A key advantage of replacing aging infrastructure is the enhanced efficiency and reliability that it provides.

But, of course, prioritizing when it comes to financing and budgeting is an important action that community leaders need to consider when it comes system rehabilitation and/or replacement.

While the cost of system replacement may directly affect planned spending in other areas for the community...continuing "band-aid" actions on the water system now, may only lead to even more seemingly unsurmountable challenges in the future. 💧

*\*Information acquired from Water World Magazine*



## Why All the Paperwork?

by Steve Vance,  
IRWA Training & Technical  
Assistance Specialist

In an electronic age, it seems we're all still encumbered by paperwork. Whether is handwritten or entering information electronically, we all feel the burden of paperwork occasionally. From IRS tax documents to medical information to service contracts to loan agreements, much of the paperwork is a necessary burden and must accurately reflect the information that is requested. Often inaccurate information leads to additional paperwork and frustrating corrective actions.

This theory also holds true in the potable water industry. Throughout my career at the Illinois Environmental Protection Agency (Agency) and now, Illinois Rural Water Association (Association), I've listened to complaints from community water supply officials regarding the ridiculous amount of paperwork that is required. While at the Agency, I myself was amazed at the number of filing cabinets overflowing with reports, forms and

correspondence. As we transitioned to the electronic era, the amount of paperwork did not decrease, as it only changed to an electronic form of reporting. Until recently at the Agency,

the electronic submittals were often printed and copies were included in the filing cabinets.

While much of the paperwork seems to be a futile exercise, my career at the Agency often taught me the importance of the information provided in the paperwork. The majority of the information submittals to the Agency were prompted by regulatory requirements. Generally, regulations also require that a community water supply maintain records related to system operation for a period of ten years. This would include sample analysis reports, documentation of corrective actions, public notifications, permits and monthly operating reports.

Creating and maintaining accurate information related to the operation of a public water supply is essential for many reasons. Timely submittal and maintenance of accurate records can be a primary defense against allegations and/or enforcement actions. Our legal system is based on the premise that we are innocent until proven guilty. However, in the court of public opinion, it is often the opposite. Diligence in completing and submitting paperwork and maintaining accurate records provides the basis creating a defense against frivolous allegations.



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## Why All the Paperwork?

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Monitoring results from samples sent to a certified laboratory provide a specific means of determining compliance with maximum contaminant levels (MCLs). Additional daily monitoring is also important in process control and provides a basis for immediate and proactive corrective actions. Additionally, accurate and abundant monitoring and record-keeping provides the optics of diligent efforts to protect public health and instills a confidence from the public that the community water supply is operated optimally.

During my tenure at the Agency, I was always amazed when reviewing inadequate/inaccurate monthly operating reports that would include consistent daily chlorine residuals at the minimum required regulatory levels. For example, occasionally, I would find a community water supply that would record daily total chlorine residuals of exactly 1.0 milligrams per liter on each day over a three-year period. While this may appear to indicate a system that is well-operated, science and experience indicates that this is not logistically possible. Factors related to deteriorating chlorine strength, variable chlorine demand, and changes in raw water quality make it virtually impossible to

produce the consistency included in those reports.

In conclusion, my recommendation is to maintain and document as much information as possible when operating a potable water supply, conduct additional monitoring above what is required, and keep accurate results based on the monitoring conducted. This type of monitoring and record-keeping will be a huge asset in preparing an argument in enforcement actions and provides a strong basis in telling your own story rather than reacting defensively to allegations of neglect or wrong-doing.

Finally, remember that as officials of a community water supply, your primary obligation is the protection of public health in your community. 💧



## 41st Annual Technical Conference February 21 - 23, 2023

Watch all your mailboxes, our website and social media pages for announcements on registration for our Annual Technical Conference at the Keller Convention Center in Effingham. Exhibitor registration opens in late November and Attendee registration will open in December.



## Show Me the Money!! Loans and Grants!!

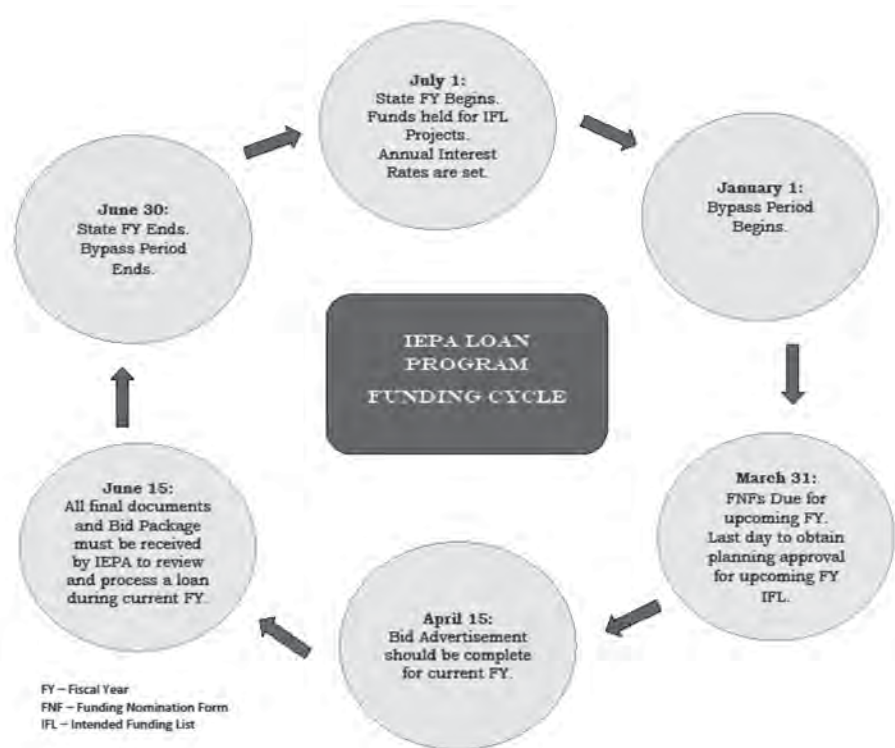
by Clark Cameron,  
IRWA State Circuit Rider

Here we go again, time for another article for the magazine. For me, it is absolutely the hardest part of my job. And I apologize if reading my articles are as hard as they are to write. But the subject that I am going to write about today is hugely important to the well-being and survival of many small communities. MONEY! More importantly, where to go looking for money on both the State and the Federal levels.

The State of Illinois has a huge loan and grant program that covers just about any possible need a community may have for projects both big and small. I will do my best to try and walk you through where to go on the EPA website for your easiest possible access to the multitude of loans and grants available. Let's start by going to the opening page of the EPA website. You should now be on a page that has Welcome to the Illinois Environmental Protection Agency at the top. Below is 4 boxes- Air, Land, Water and Energy. To the right of the boxes is a list of quick links. Go down that list to lucky number 7 and click on Grants & Loans.

Now let's take a moment to explore our new world that we have just entered. Loans and Grants for everything from Tanks and storage to Brownfields. For the purposes of this article we are going to focus on the sixth item down of Wastewater/Stormwater and Drinking Water Loans. This now takes you to the magic page that allows you to view and apply for any and all Loans in the State Revolving Fund (SRF). The SRF provides low interest loans for water and wastewater/stormwater projects thru 2 main programs- The Pollution Control Loan Program (WPCLP) for

wastewater/stormwater and The Public Water Supply Loan Program (PWSLP). The following chart shows the funding cycle of the IEPA loan programs.



At the very bottom of the page is the section with all of the contact information for the fine people that work in the Infrastructure Financial Assistance Section (IFAS). The number is 217-782-2027. This number will connect you to a very helpful lady or gentleman who will then direct your call in a direction to best serve your needs. Gary Bingenhiemer is the Section Manager and there are several Project Managers to assist you.

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## Smoke Testing often Underutilized

by Scott Tozier,  
IRWA Wastewater Technician

The one common thing I've seen in almost all sewer plants as I travel across Southern Illinois and all over the US is high influent flows into sewer plants. Pretty much all plants struggle with high flows when the wet season comes around. Hopefully your treatment facility has enough design capacity to handle these seasonal variations in flow but most do not.

We here at IRWA do a lot of video service jobs whether it's push videos or Crawler videos with the Van but our smoke testers rarely get used, in fact the one unit I have has only been utilized once this summer season. The unit is free to use and I come out for a day and train you on how to use it. From the few times I've used or been a part of smoke testing the results are more than impressive to say the least. I've seen many cleanout caps or broke pieces of service line as well as storm sewer lines and roof gutters tied into the Sanitary sewer. The one thing you won't find is sump pumps which is a whole other story all together.

One Village we did this year is a good example of what can be found. The Village of Royalton in Southern Illinois called me last winter, the Village has a population of 1198 with 511 sewer connections. The contract operator Mr. Glenn Gulley was concerned with the Villages sustained high flows and the Village Mayor, Christy Powers agreed that something had to be done. I met with Glenn and Mr. William Reinbold Water and Sewer Superintendent for Royalton, in February of this year and we did an assessment of their flows as well as wet well draw downs and looked over their system to try to decide where to go to try to help with the flows into the wastewater treatment facility.

The flows were sustained at well over 10 times their dry weather flow which is alarming to say the least. I've seen flows that will peak at 10 times but to have sustained flows of that high is unusual. We decided to ride it out as the system was

regularly surcharging, luckily the lagoons had recently been dredged and washout of solids wasn't happening but overflow of the lagoons was a concern. We decided to wait for the peak dry weather and smoke test to try to locate areas of concern.

Fast forward to the end of July when I arrived onsite with the smoke testing equipment ready to do a quick training and we started on the West side of the Village which was the older side of town. The East side had extensive relining done as well as some new construction so the crew decided to concentrate on the West side this year. With a crew of the 4 of us we covered several blocks on our first day and found several major problems on the first street we surveyed. One area was 2 roof lines that drained to a cleanout next to a foundation and then down the road was an abandoned service line that had been dug through and left broken directly in the bottom of a ditch line. Both of these could contribute to major flow increases. I like to categorize a system leaks into major and minors, leaks that could affect flow a lot or ones that probably don't change flow much. With doing the categorizing you can use your manpower to tackle the major leaks first then go back later and fix the minor leaks.

The second day was a bit of a washout as we experienced some decent rainfall which on a side note, don't

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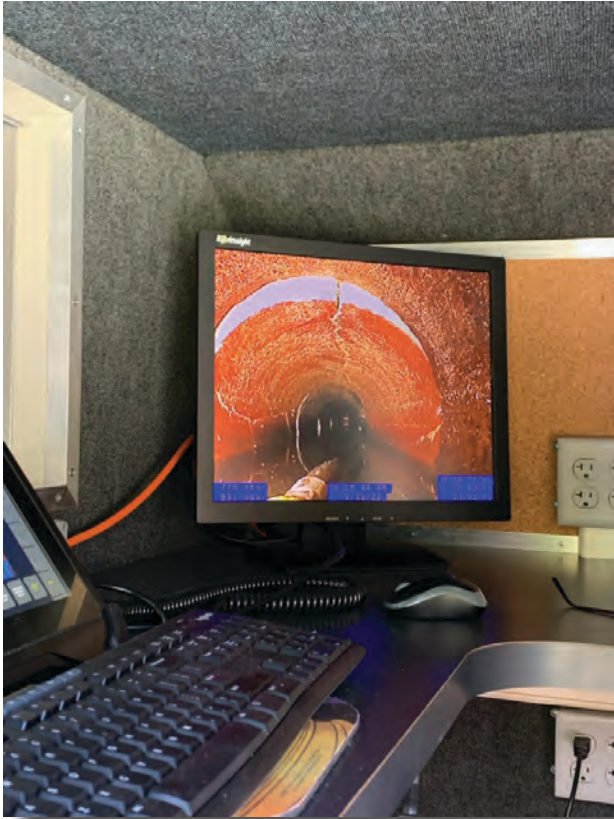
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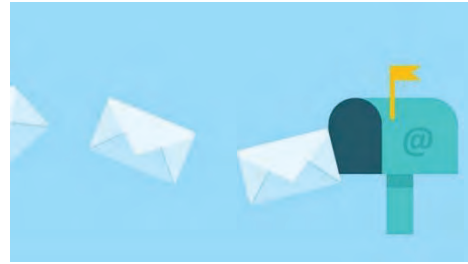
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smoke test in the rain. The section we smoke tested after some rain fall missed a major contributor to the flow. Due to the rain, we missed a storm sewer drain manhole that was tied into the Sanitary Sewer main line. The Village had been separated as far as Storm sewer and sanitary years ago but either there is now a break connecting the two together now or they were missed years ago and never fixed. We planned to use the EnviroSight crawler video camera that IRWA has to look at this problem area as well as others. Luckily the Village crew came back to that area after I left and resurveyed the section or they would never have found it. The village crew finished the West side and uncovered many more issues but decided to leave it at that for this year. Glenn wanted to make sure that the Village only smoke tested what they felt they could fix within this year.

I returned in mid-September with the EnviroSight Crawler sewer video camera to inspect the areas that we knew had some major issues, especially the sections that appeared to have a cross connection to the storm sewer. Fortunately, we had good weather the week I went back with the crawler. We started with one of the sections that had a connection to the storm sewer and on the first forward pass we were expecting to see a tee or some direct



### IRWA Support Letters Are Needed

IRWA employees are dedicated in helping the water and wastewater systems throughout the state in making onsite visits and providing technical assistance in helping to ensure your systems have safe and quality water.

Please take a moment to thank any or all of the IRWA employees who have helped your system by writing an appreciation letter on your letter-head and mail to:

Illinois Rural Water Association

P.O. Box 49

Taylorville, IL 62568

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## Show Me the Money!! Loans and Grants!!

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On the Federal level there is the USDA Water & Wastewater Disposal Loan & Grant Program for Rural Development. The loans and grants page is available from the opening page of the USDA website. The USDA program has a few more requirements

than the IEPA loans and grants program so be prepared to spend some time jumping thru all of the necessary hoops to qualify. In the end it will all be worth it. 💧

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- **Certification Overview from IRWA**—Training > Certification
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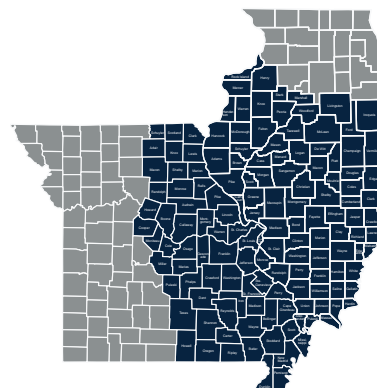
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### Why Have a Rate Study Conducted?

With the amount of grant dollars available for water and wastewater projects continuing to dwindle, coupled with the aging water and/or wastewater infrastructure, it is increasingly more important that decision makers for systems throughout the state become more educated about system finances. This **FREE** rate study takes an in-depth look into the expenses and revenue that a system has. Once all of the data has been gathered and entered into a spreadsheet a detailed report is generated to explain the findings and recommendations. This easy to read report and any rate changes recommended will assist Boards and Councils in mapping out the financial future of their respective systems.

If your system is interested in having a rate study conducted, please contact Clark Cameron at (217) 287-2115(Office) or (217) 820-3814 (Cell).

### What Information Will the Rate Study Provide?

- ⇒ Breakdown of expenses
- ⇒ The cost to produce the water (if applicable)
- ⇒ Amount of nonrevenue water
- ⇒ Amount of lost revenue from water loss
- ⇒ Annual gain or shortfall in revenue
- ⇒ Different rate scenarios



### What Information Will I Need to Supply For a Rate Study?

- ⇒ Financial statements for the most current fiscal year (audit report preferred)
- ⇒ Amount of water produced and/or purchased during the most current fiscal year
- ⇒ Amount of water sold during the most current fiscal year
- ⇒ Current rate structure
- ⇒ Number of customers in each rate class
- ⇒ Amount of debt (if any)



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**What is Ameren's current electricity price?**

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Ameren has also asked the ICC for approval of an additional 83 million dollar increase for next year!

## Consider ...

The high cost of operating utilities has gotten to the point where the utility has to look at all options available. Keeping the operational costs to a minimum ensures that your rates are the lowest possible and still ensure safe drinking water and wastewater utilities.

## What do we assess?

The Energy Conservation Circuit Rider will assess your electric bills, system assets and operational procedures. They will break it down into a usable format with options to explore which will lower costs and a projection of the time to payback.

## Why ...

Most Operators spend their time in operational issues to ensure safe drinking water and maintaining compliance. They often do not have the time to dedicate to energy savings or expertise in doing assessments. We can take the time and figure it out for you.

## Key Offerings

Find where your system can save money on energy. Not only can your system be more efficient, it can outline which changes can generate repayment the quickest.

## What is requested of the system?

You Provide a Tour of the Facilities for Circuit Rider  
You Provide Copies of Energy Bills for one year

## What Do You Receive?

Recommendations on how to conserve and save on your energy bills with items listed on the projected cost of improvements and how quickly those investments recoup the return.



## How Do I Get A **Free** Energy Assessment?

**Contact Dave Speagle**  
217-820-1560 – cell phone      217-287-2115 – IRWA office  
[speagle@ilrwa.org](mailto:speagle@ilrwa.org)



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# RURAL WATER FLEET PROGRAM

The National Rural Water Association has created partnerships with motor groups to offer discounts to utilities around the country. Member utilities should contact their State Rural Water Association to access the Rural Water Fleet Program.

Visit <https://nrwa.org/members/products-services-portfolio/fleet-program/> for up-to-date information.



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connection to the storm sewer but were not able to see anything apparent besides some cracking at 12 o'clock on the clay piping. We went as far as we could go until we met a lateral that had the piping extending to far into the main that the crawler would not get past. On the return of the camera to the van I noticed the cracking that was seen on the forward pass much worse and a section of the bell joint was actually missing. One great feature of the EnviroSight camera is that it has a rear camera on it and many times you can see things on the way back to the original manhole that you didn't see on forward pass. As we came to the cracking of the pipe Glenn and I had the idea to use the Villages Fire truck to dump a load of water into one of the roadside drainage interceptors to see if the cracking was indeed the issue. Once we dumped the water it was apparent quickly that that was the issue. The pipe was quickly surcharged within a minute of the water going into the storm sewer. It appeared that where the storm sewer crossed over the clay pipe it had caused the pipe to fail due to excess stress on the sanitary sewer pipe and the crack allowed a huge amount of storm water into the sanitary sewer system. The rest of that day we continued to video more of the suspect areas and didn't find anything as big as earlier but we did find a large

amount of break in taps that looked to be leaking but without groundwater table being high it was hard to tell. The only thing left for the village to do is decide on what contractor to use to fix the largest contributor to the Infiltration. The only cost to the Village was the maintenance fee of the camera for the two days, the smoke testing equipment was free to use as well as training to the Village employees by IRWA. In all the smoke testing revealed that 6 storm water catch basins were leaking to the Sanitary sewer as was at least probably 10 what I would call significant leaks into the sewer. It will be interesting to see once the Village fixes the issues to see the reduction in flows to the treatment plant. The Village saved a substantial amount of money by doing the smoke testing themselves as well as having IRWA do the Video of the Sewer. The biggest draw back of smoke testing is it does require some man power, generally 3 people, but the savings to the systems can be huge just in electrical savings as well as the potential for the EPA getting involved if left too long. If you would like to inquire about smoke testing or video services, please call the IRWA office and they can get you in touch with the appropriate Wastewater technician in your area. 💧





# RURAL WATER Loan Fund

## About The Program

The NRWA Rural Water Loan Fund (RWLF) is a funding program specifically designed to meet the unique needs of small water and wastewater utilities.

The RWLF provides low-cost loans for short-term repair costs, small capital projects, or pre-development costs associated with larger projects. The RWLF was established through a grant from the USDA/RUS, and repaid funds used to replenish the fund and make new loans.

Apply today by contacting your State Rural Water Association or NRWA!



## Reasons to Apply

- Reasonable interest rates
- No administrative or processing fees
- Straightforward application process and quick turnaround
- Systems must be public entities serving up to 10,000 persons, or in rural areas with no population limits
- Loan amounts may not exceed \$200,000 or 75% of the total project cost, whichever is less
- Emergency loans are 90-day no interest, with immediate turn around on applications

## Eligible Projects

- Pre-development (planning) costs for infrastructure projects
- Replacement equipment, system upgrades, maintenance and small capital projects
- Energy efficiency projects to lower costs and improve sustainability
- Disaster recovery or other emergency loans available

Applications, information and forms can be downloaded from the NRWA website at [nrwa.org](http://nrwa.org) or by scanning the QR Code above. For help, please call 1.800.332.8715 or email [nrwarwlf@nrwa.org](mailto:nrwarwlf@nrwa.org).



National Rural Water Association is an equal opportunity provider and employer. This material is based upon work supported by the Rural Utilities Service, United States Department of Agriculture.

## *The Sleeping Giant*

*by Richmond Adams,  
IRWA Sourcedwater  
Protection Specialist*

When we think of earthquakes in America, we tend to first think of the famed San Andreas fault line that runs around 800 miles up through California - a fault line so famous it even made it to the silver screen. But history shows us that there's a seismic threat much closer to home.

Over the course of three months, from December, 1811 to February, 1812, a series of earthquakes hit the New Madrid seismic zone (NMSZ) that lies just south of Illinois. These three earthquakes were among the strongest to hit North America since European settlement. The main quakes were followed by hundreds of aftershocks, many of them major earthquakes themselves. During the earthquakes the ground rose, fell, and cracked; trees snapped and were uprooted; and large landslides were abundant on the steep ground from the site that would eventually become Memphis, Tennessee to southern Illinois. Eyewitness accounts noted that the shaking rang church bells as far away as Boston, Massachusetts and brought down chimneys in Cincinnati, Ohio. The damage was so bad that it became the catalyst for the country's first ever disaster relief act.

The United States Geological Survey has projected that for an earthquake of magnitude 7.5 to 8.0 to strike the NMSZ, the probability for occurrence is approximately 7-10% over the next 50 years. For a quake of 6.0 to 7.0 the probability rises to 28-46% over the next 50 years. So, given that it's a question of when rather than if, how will this affect us and how do we prepare?

Water and wastewater utilities are particularly vulnerable to earthquakes because of the extensive network of above and below ground pipelines, pump stations, tanks, administrative and laboratory buildings, reservoirs, chemical storage and treatment facilities. For a drinking water system, an earthquake can cause hundreds, even thousands of breaks in water pipelines, ruptures in storage and process tanks and the collapse of buildings. This can cause a loss of water system pressure, contamination and drinking water service disruptions for your customers.

A wastewater system can also expect infrastructure damage from an earthquake, including breaks in the collection system. Sewers and wastewater treatment plants tend to be built on ground which is subject to liquefaction. Damage can lead to sewage backups in homes and potential releases of untreated sewage into the environment.

So, how can water systems prepare? The EPA recommends taking these steps towards action. Firstly, take inventory of the critical assets in your system and plot them on hazard maps. Then, characterize the critical assets, the types of failures that could occur and consequences of damage to your utility. Finally, summarize the results of your assessment and prioritize mitigation methods before disaster strikes.

For further and more in-depth reading on the issue, including more detailed instructions on characterizing assets, mitigation options and ways to fund them, I highly recommend checking out the EPA's Earthquake Resilience Guide for Water and Wastewater Utilities in addition to other resources provided by the EPA, FEMA, and the USGS. If you need help locating these resources, feel free to reach out to me at [adams@ilrwa.org](mailto:adams@ilrwa.org) and I'll be happy to assist.

Earthquake volume in the NMSZ is around 300% above normal this summer. Don't wait until it's too late! 💧







Video inspection technology for wastewater and storm sewer systems can help you identify and prioritize maintenance issues, while improving service and reducing emergency maintenance costs.

Small jobs (typically two city blocks, or less than 800 feet) has a "Maintenance Fee" charge of \$500.00 for our members. Non-member utilities pay \$750. There are no additional expenses charged for this type of small project. Larger projects requiring more time and inspection coverage, will be based on the Maintenance Fee (reduced for IRWA members), cost per foot (30% IRWA discount) and expenses.

Due to staffing varied work demands and logistics, IRWA will not undertake inspection jobs exceeding 5,000 feet maximum per project. For more information, or to schedule an inspection of your system, email Deputy Director Don Craig at: [craig@ilrwa.org](mailto:craig@ilrwa.org) or call him at 217-561-1061.



Our mapping technician will work with your system personnel to develop digital and hardcopy system maps of your water system infrastructure. This is also true for wastewater systems and/or storm sewer features, if needed.

IRWA personnel will first do complete GPS of system features. Attributes on these features can be added when gathering the data, and also added by facility personnel any time after the project is completed.

Incorporating this kind of data allows you to monitor, edit, and evaluate your system at a whole new level, including from computers, cellular based tablets or cell phone. IRWA will input the data from the field, and through the GIS processing stage, add background layers such as aerial photography and road view maps with detailed views of your system. At the end of the project, all data and the maps will be owned by you for use in the future.

Through a project proposal, the cost for services is determined by a charge per each system feature located and mapped; and overall project expenses. These amounts will be discussed with system personnel, and documented before the start of the project. IRWA members receive an automatic 30% discount, and possibly a larger reduction with bigger projects.

For more information, please contact Deputy Director Don Craig via e-mail: [craig@ilrwa.org](mailto:craig@ilrwa.org), or via phone: 217-561-1061 or visit our website: [https://www.ilrwa.org/Equipment/Asset\\_Mapping.html](https://www.ilrwa.org/Equipment/Asset_Mapping.html).

# 10 Bizarre Things You Should Know About Your Skin

by Anna Grig

Do you know what is the largest organ of the human body? Yes, it is the skin, and it weighs approximately 15% of our total body weight. Learning more about your skin's particularities is highly important for a healthy body, so let's dive right in!

The skin is an organ because it consists of several tissues and cells of different and specific functions. It is an organ of protection, first and foremost, and it changes depending on age, internal health, and external factors. Due to its specificity across different areas of the same body, the skin is a sensitive, ever-changing organ. Since the skin around the eyes is made of a thinner layer of the epidermis, it needs different care than the skin on your legs, for example.

## The structure of the skin

There are three main types of layers of the skin: epidermis, dermis, and subcutaneous layer. The epidermis, the outer layer, contains cells that produce the pigment (color/nuance of the skin), and they protect the immune system.

The dermis, the middle layer, contains connective tissue, capillaries, nerve tissue, and hair follicles. It also contains the sweat glands, and the body oil glands (sebum). The subcutaneous layer is the innermost layer of the skin and contains the large blood vessels, nerves, fat and connective tissues. It regulates body temperature and protects the internal organs and muscles from damaging impacts. It also produces the hormone called leptin which stabilizes the metabolism. Now that we understand how important the skin is for our survival, let's see what are the negative factors that affect the health of the skin, and therefore, our general health.

## Internal negative factors

The internal factors that can influence the health and aspect of your skin are genetics, hormones, and disease such as diabetes. Genes determine our skin type and aging process, so we cannot do much about it, except reduce the factors that would worsen our genes' predisposition. Genes can influence our cell regeneration and biological aging; they can also determine how our sebum and sweat glands function.

Change of hormones can cause acne, especially during teenage years, or during menstruation in women. Female estrogen decreases after menopause, so the natural moisturizing function of the skin also decreases.

Some grave internal diseases can manifest at the skin level such as diabetes, cancer, and most commonly liver issues - intoxication, or bile malfunctioning. Liver issues manifest either as skin rashes or yellowish pigmentation of the skin. Hence, in many cultures, there is an old mentality that glowing, smooth skin indicates an internal healthy body. What you eat is what you are, and shown on the skin, so healthy, and vitamin-rich diets are a must for healthier skin. Other internal factors that can affect the skin are severe medical treatments such as chemotherapy. There are also viruses that affect the skin by eruption such as varicella and variola viruses.

## External negative factors

External negative factors are the most known by people, because we hear about them in TV commercials, and they are highly visible at the skin level. The most common negative external factors for the skin are:

- Sunburn/UV radiation
- Excessive spray or artificial tan
- Drastic change in temperature
- Chemical products
- Excessive washing
- Smoking

## Common skin conditions

Depressed because of acne, or depigmentation? You should know that acne and depigmentation are one of the most common skin conditions. Acne affects more than 50 million Americans annually, according to American Academy of Dermatology Association statistics. Atopic dermatitis will affect 1 in 10 people during their lifetime. 50 million men and 30 million women are affected by hair loss, according to Medline Plus, National Library of Medicine. Rosacea or redness of facial skin affects up to 16 million Americans, mostly over the age of 30. Vitiligo, another very common disease, manifesting as depigmentation or white patches on the skin surface, affects over 70 million people globally. All these skin conditions are often related to external negative factors and improper nutritional care.

The skin is a sensitive and complex organ that requires intensive care. It's a wonderful part of our body and it is hiding even more miracles.

## 10 Bizarre Things You Should Know About Your Skin

1. It renews itself every 28 days;
2. Approximately 50% of the dust in your home is dead skin;
3. Body hair growth rate is 2 to 6 years;
4. The thickest skin is on the sole of your feet;
5. The thinnest skin is on the eyelids;
6. We lose around 20 - 100 hairs daily;
7. Scars don't have hair and sweat glands;
8. Sweat doesn't smell, but the bacteria in it does.
9. The skin has its own 1000 species of bacteria;
10. Babies develop their skin tone in 6 months.

The human body deserves care and respect, including the skin. This means that we need to be careful about what we eat and what we expose ourselves to, from a stressful environment to weather conditions. Don't forget that health care is a *modus vivendi*. 💧



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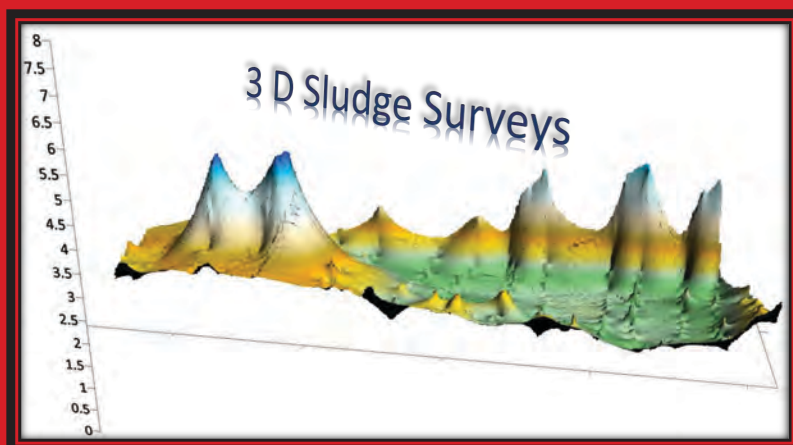
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