"Dedicated to Conservation of our Natural Resources"

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## **Flow Meter Maintenance Tips**

By Curtis Scheele, NRCS Irrigation Water Management Specialist

It's been 2-3 years since the rush of flow meter installations in the Republican River Basins portion of the Tri-Basin NRD. More flow meters are still being installed across the rest of the NRD. As with any mechanical device, a good preventive maintenance program can greatly extend the life and reliability of your flow meter. Always follow the manufacturer's recommendations for maintenance, including lubricating, periodic service, and frequent checks to make sure the meter is operating properly. Following are some general maintenance tips.

1. Prior to the irrigation season, look for physical damage that could cause the meter to leak or reduce its accuracy. Damage

could be caused by cattle rubbing or leaning on the meter. Rabbits and rodents have been known to chew on propellers so it is wise to ensure an end plug is installed in the off-season. Damage may also occur just from leaving the meter installed during the winter months. One cause of meter damage is freezing water left in the pipe section over the winter. Also, without a lid or cover, the dial can be damaged by prolonged exposure to sun and rain.

2. During the irrigation season, when the meter is in operation, look for erratic movements of the needle or the flow rate indicator. Sudden jerks might indicate register gears are not meshing properly. Wobbling of the meter could mean bearing wear or an unbalanced propeller.

3. Look for moisture under the lens. A fogging of the inside of the lens indi-

cates a moisture leak. Another indicator of leaks is if the flow rate indicator or needle works but the totalizer does not. Early moisture leak detection and repair can prevent expensive repair bills.

On electronic flow meters, the batteries should be checked. Some meters will display in advance that the batteries are going low and need to be replaced.

Another check on flow meters while irrigating would be to see what the flow rate indicator is recording versus the historic flow rate. If you have a pivot set up for 800 gpm and the flow meter is reading 500 gpm then there is a problem. It could be in the well, pivot, etc. but it could also be a malfunctioning flow meter. We can help you troubleshoot those problems with our portable, electronic flowmeter. Call the NRD or Holdrege NRCS office to schedule an ultra-sonic flowmeter check.

After the irrigation season, remove your meter from the pipeline and check it to see if it needs maintenance or repair. Once removed, you can check the propeller and other inside parts for wear and corrosion caused by pumped sand or other debris.

When in the shop, spin the propeller to check for freedom of movement. Listen for noises such as popping, grinding, etc. The propeller should spin smoothly and quietly. You should be able to detect sand in the bearings. Check shaft play to determine bearing wear. When spinning the propeller, also check the flow rate indicator and totalizer for solid response. Also check for moisture in the meter.

Some propeller meters need to have the bearings regreased about every third year or so depending upon the amount of usage.

Depending on the meter type, usually a small screw needs to be removed on the bearing assembly housing. Grease can be applied into this hole with a needle fitting at the end of a grease gun. The needle fitting can be purchased at an auto parts store. Some meters don't need more than one ounce of grease so be careful not to over grease as the front seal can be pushed out. A white lithium grease is recommended. Some propeller meters have sealed

Some propeller meters have sealed bearings. If the propeller is not free spinning, or there is a wobble in the rotor blades, replacement parts will be required.

Periodic calibration or checking the flow rate is also recommended to make sure the meters are recording accurately. For a detailed calibration and inspection, you should contact your dealer and/or the flow meters manufacturer.

A very important step in this process is reinstalling the meter into the pipeline. You need to make sure you record the beginning meter reading for the irrigation season. This could change from last year's ending reading when doing the off-season inspection, maintenance, repair work, or just plain storing the meter in the offseason. Without the correct beginning reading, you will not be able to determine total water pumped for the year. This is especially important in areas where annual flow meter readings are required to be submitted to an NRD or other agency.

These are some general maintenance tips and checks that will help extend the life and reliability of your flow meter. Accurate measurements will provide you with the best information for your irrigation water management program. Follow your flow meter's operating manual for a good preventive maintenance program, or contact your dealer or your flow meter's manufacturer for more information.



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## Manager's Message By: John Thorburn

#### Abandoned Wells: An Ever-Present Danger

A well is a pipe that extends down to the water table. Wells pose little danger

while they are in use, because that pipe is sealed and protected from the elements. If the pump is removed, however, a well can become a source of contamination of the groundwater aquifer.



Abandoned wells pose other dangers. Depending on the diameter of the well column, animals and even small children can become trapped in them, if they are left uncovered. Most modern irrigation wells have an inside diameter of 12 inches or less, but even so. an adult could easily fall in one and break a leg. Proper well closing, or

"decommissioning" is a good, safe practice for landowners to follow, but it is also required by state law. Nebraska's well decommissioning law

dates back to 1897. It was enacted as a result of a particularly harrowing experience that a Custer County pioneer had with an abandoned well.

In the 1800s, before internal combustion engines became a readily available source of power for well drilling rigs, there were two common methods of well construction: driving a perforated pipe with a pointed tip into the ground or digging a well by hand. Driven wells were easier and safer to construct, but sometimes the volume of water needed, the presence of rock formations or great depth to water required that wells be dug by hand.

Many homesteads in Custer County relied on hand-dug wells as their water source. Because of the danger of cave-ins, hand-dug wells couldn't be dug very far down into the aquifer, so they were prone to dry up during droughts. A severe drought in the early 1890s led to the abandonment of many farms as both crops and wells dried out.

On August 14, 1895, a pioneer named F.W. Carlin steered his wagon off on the wrong track as he was crossing the prairie north of Broken Bow. The trail dead-ended at an abandoned sod house. He tried to turn his team of horses around and head back down the road, but one of them balked. He got off the wagon to see what was spooking his horse.

Here in his own words, as reported at the time by the *Custer County Beacon*, is what happened next: "without a moment's notice, I became aware of the fact that I had stepped into an old well and was going down like a shot out of a gun. I placed my feet close together, stretched my arms straight over my head and said "O God have mercy on me!" According to a later measurement of the well, he fell 143 feet.

Amazingly, the only injuries he sustained when he landed in water and mud at the bottom of the well were a broken rib and a badly sprained ankle. In spite of this amazing stroke of luck, he still faced the staggering problem of getting out of this very deep hole by himself.

He struggled for hours before he was able to break away part of a board in the cribbing that lined the well hole. He shoved that board into the sidewall and used it as a seat. There he spent his first, cold, wet night underground.

For the next two days he slowly, patiently inched his way up, digging footholds and handholds using his trusty pocketknife. Emerging from his would-be grave, he gave thanks to God for saving him from death by hypothermia or starvation, but his troubles weren't over. His horses and wagon were long gone, so he had to crawl on his hands and knees a mile and a half to the nearest house, which took all night.

It is critically important for the protection of our drinking water supplies to have licensed well drillers properly close old, unused wells. Natural Resources Districts have costshare funds available to help pay the cost of decommissioning old wells. We are even willing to help close old handdug wells, and a few of them are still out there. So next time you're out wandering around an abandoned farmstead, watch your step!

## **Arbor Day Tree Giveaways**

Part of the mission of natural resources districts is to promote tree-planting as a good conservation practice, with benefits for people and wildlife. Tri-Basin NRD plants trees for rural landowners when they need windbreaks and shelterbelts. We also promote "urban forestry" through our support for Arbor Day celebrations across the district. This year, we hope to give away 500 FREE trees to residents of Gosper, Phelps and Kearney counties. Tri-Basin NRD is working with local tree boards and other community organizations to give away trees on Arbor Day, April 25. Trees will be given away at the Holdrege Senior Center from 9:30 a.m. to 10:30 a.m. Trees will also be handed out in Elwood, Bertrand and Minden. For details on giveaways in those communities, watch your local newspaper or contact the Tri-Basin NRD office at 1-877-995-6688 or 308-995-6688.

## Little Joins Tri-Basin NRD Staff

Nolan Little has been hired as Tri-Basin NRD's Water Resources Technician. His primary responsibilities in the district will be water quality sampling, water level measurements and the chemigation program.



Nolan grew up in Kearney and graduated from the University of Nebraska-Kearney in 2005, where he studied geography and history. He and his wife, Laura, moved to Missoula, Montana, where Laura is currently finishing her master's degree in chemistry at the University of Montana. Right now, Nolan is living in Kearney, but once Laura graduates they plan to move to a community in the area. The couple is expecting their first child in early July.

In his free time, Nolan enjoys running, backcountry hiking, travelling, geocaching and photography. He notes that he has been to all the lower 48 states, every Canadian province that borders the U.S., and Mexico, but has never flown in a plane to get there. Still, central Nebraska is where Nolan prefers to call home.

"Of all the places I have been, central Nebraska is where I like to be, even after a short time in Montana. As the saying goes, 'Anyone can love the mountains, but it takes a soul to love the prairie," says Nolan.

## **Chemigation Permits Due June 1**

Chemigation renewal forms have been sent to producers and are due, along with payment, in the Tri-Basin NRD office by June 1, 2008. Anyone needing to apply for a new chemigation permit for the 2008 season should contact the Tri-Basin NRD office at 308-995-6688 or 1-877-995-6688. All newly permitted chemigation systems must be inspected before use.

Staff will be doing routine inspections on chemigation systems from June until August. Routine inspections are required every three years. If your system is due for an inspection, you will receive a postcard this summer. Routine inspections must be completed for the permits to be renewed for the following year.

### Lower Platte North NRD Reaches Settlement with Producer over Violation of Ground Water Regulations

Lower Platte North NRD (LPNNRD) has reached a settlement with a Colfax County producer over violations of the district's ground water regulations.

The producer, located in LPNNRD's Richland-Schuyler Phase 2 Ground Water Management Area, was originally issued a cease and desist order for his refusal to submit required annual fertilizer application reports and for failing to attend required Nitrogen Management Certification training.

Under the terms of the Consent Decree reached with the NRD and the Colfax County Attorney, the producer will pay a fine of \$2,079.

Like Tri-Basin NRD, the entire LPNNRD, based in Wahoo, is in a Phase 1 Ground Water Management Area due to water quality concerns. All producers in the NRD who either apply fertilizer or make the decision on when fertilizer is applied are required to have a current Nitrogen Management Certification Training card. The training provides information regarding the extent of nitrogen contamination of groundwater in the NRD, offers tips for reduced nitrogen application based on the University of Nebraska's recommendations, gives updates regarding the district's Rules and Regulations, and discusses potential impacts of new statutory laws passed by the Unicameral.

There are two Phase 2 areas in the LPNNRD, one in the Bellwood area and one in the Richland-Schuyler area, to deal with elevated amounts of nitrogen in the groundwater. One of the Phase 2 requirements is that producers submit annual fertilizer application reports for each production agriculture tract in the Phase 2 area by December 31<sup>st</sup> each year. When reports are not received by the deadline the district may issue a cease and desist order, and a maximum fine of \$5,000 per tract may be levied in addition to court costs. Fines paid are sent to the Nebraska Education Fund and distributed to all public schools across the state.

#### 2007 irrigation water use data is now available on our website: www.tribasinnrd.org.



Producers in the Phase II and III areas for Nitrogen Management are reminded to take samples from their irrigation wells this summer for next year's reports. Sample bottles are available at the Tri-Basin NRD office. Soil samples are also required before applying fertilizer. For more information on the Phase II and Phase III areas, call the Tri-Basin NRD office at 308-995-6688 or 1-877-995-6688.

# **ONLINE** Resources

http://dnrdata.dnr.ne.gov/wellssql/?&	Dept. of Natural Resources Well Data
http://water.usgs.gov/ogw	Ground water information
http://www.cnppid.com/Elevation_Flows2.htm	Reservoir elevation/Platte River Flow
http://tribasinnrd.org/domesticwatertest.html	Domestic Nitrate Testing
http://www.arborday.org	Tree recommendations, identification
http://www.websoilsurvey.nrcs.usda.gov/app/	Determining soil type
http://water.usgs.gov/cgi-bin/daily_flow?ne	Current water resource conditions for Nebraska



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Holdrege, NE 68949 1308 Second Street

#### RETURN SERVICE REQUESTED

#### **JUSSI SIHT NI**

\*Flow meter maintenance tips

\*Little joins TBNRD staff \*Importance of abandoning wells

Brad Lundeen Wilcox NF David Olsen Ray Winz

#### **TRI-BASIN NRD BOARD OF DIRECTORS**

Esther Smith	Office Clerk
Nicole Salisbury	Office Assistant
Ruth Nielsen	Minden Office Secretary
Lori Hagan	Elwood Office Secretary
Patty Abrahamson	Holdrege Office Secretary
A mailing list is maintained and requise sent to the above address. addressed to the General Manager.	uests to be placed on the list should Comments and suggestions may be

TRI-BASIN TOPICS Is a publication of the Tri-Basin Natural Resources District,

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Richard Holloway.....Assistant Manager

Charles Brooks..... Land Resources Coordinator

Carie Lynch ...... Administrative Secretary Nolan Little ......Water Resources Technician

Tammy Fahrenbruch ......Office Manager

#### (All meetings are at NRD office in Phelps County Ag Center unless otherwise noted.)

#### April

April 8 ..... NRD Board Meeting at 7:30 p.m.\* April 9 ..... Rainwater Basin Conservation Day April 23 & 24 .... Water Jamboree at Harlan Reservoir April 25 ..... Arbor Day

#### May

May 13..... NRD Board Meeting 7:30 p.m.\* May 26..... Memorial Day (office closed)

#### June

June 10..... NRD Board Meeting at 7:30 p.m.\*

\* Times are tentative

## WATER CONSERVATION TIP

Aerate your lawn at least once a year so water can reach the roots rather than run off the surface.



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Permit No. 220 Holdrege, NE 68949 **DIA9** 9965209.2.V Jimrə9 Jilor9-noN