Prairielands eLine

The Newsletter of the Prairielands Groundwater Conservation District | Fall 2021 | Vol. 7, Iss. 4

Kirk, McPherson, Tischler, and Smith Re-Appointed to Prairielands GCD Board of Directors

In a public meeting on September 20, 2021, Randel Kirk, Marty McPherson, Paul Tischler, and Kent Smith took their oath of office as directors on the Prairielands Groundwater Conservation District Board of Directors after being re-appointed by the county commissioners court in the respective counties the directors represent. The Prairielands GCD Board of Directors lead the District's decision-making process and guides the development of District Rules, budgets and finances, and the authorization of water well permits.

The Prairielands Groundwater Conservation District's Board of Directors consist of eight members, two from each county, who are appointed by the county commissioners' courts to serve unpaid, four-year terms. One director is appointed per county every two years; therefore, each county has one director with a term that expires every two years.

The District is committed to manage and protect the groundwater resources within Ellis, Hill, Johnson and Somervell counties and to work with others to ensure a sustainable, adequate, high quality, and cost-effective supply of water, now and in the future. Find out more about the District and ways to conserve water by visiting www.prairielandsgcd.org.

From L to R: Marty McPherson, Paul Tischler, Kent Smith, and Randel Kirk

In This Issue:

Maximize Irrigation Efficiency by Avoiding Mistakes

Our Customer Service and Management Teams have seen a lot over the years when it comes to high water bills. Lawn irrigation is the overwhelming culprit in most cases, but it's not always intentional. One of my favorite sayings is, "Human happens everywhere!". Of course, my family and the teams at Sardis tend to roll their eyes every time I say it but it's true, we all make honest mistakes (myself more than most). Good intentions sometimes have unintended consequences because there is simply too much to know and way too much to possibly overlook. With this in mind, we have compiled a list of commonly made mistakes along with solutions and tools to help the average homeowner be better equipped with knowledge concerning automatic controllers and watering their lawns. By no means do we "know it all"; however, we have seen a lot!

Eliminate Overwatering by using Rain or Moisture Sensors

These are a great idea. They truly help save water by shortening or deleting a set run time while it's raining. For illustration purposes, let's say that you set your controller to only run Program A at 10:00pm every other day. Billing cycles typically use meter readings from the 15th through the 15th which averages 30 days. So, running automatically every other day results in 15 run times for this billing cycle. Now let's say that it rains a lot in May (rain sensor eliminated 50% of the runs), a little less in June (rain sensor eliminated 25% of the runs), and none in August (rain sensor just sat there lonely and distraught). In this example, your bill due in June would include only seven sprinkler system runs, July's bill would represent 11 runs, and the bill in August would be for the maximum programmed amount of 15 runs. The homeowner changed nothing, but the bill went up! The only thing to do here is to know whether your system has a rain sensor and be aware of how it works!

June
Monthly Rain Amount
Irrigation System Runs
7/15

Rain sensors respond to rainfall amounts and cancel irrigation system runs

July
Monthly Rain Amount
Irrigation System Runs
11/15

Slightly less rain means a few more irrigation cycles were run

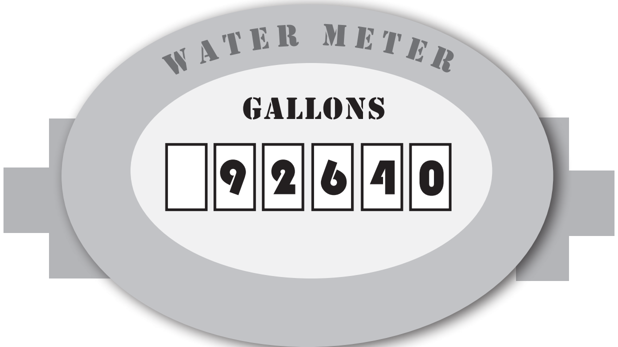
August
Monthly Rain Amount
Irrigation System Runs
15/15

No rainfall means a full irrigation schedule was needed

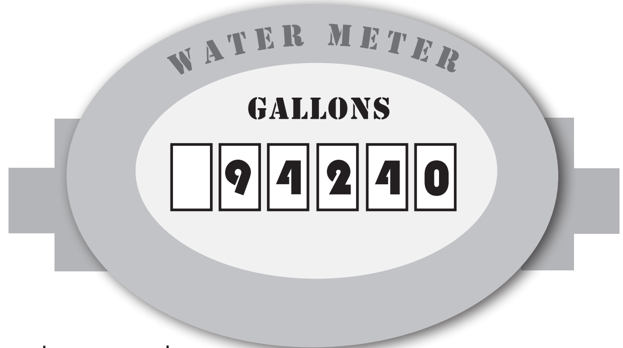
Math Class

Let's keep it simple. We have only one irrigation program running, and it only runs one time each day. It's August and no rain has been seen for 45 days so we set the controller to run the program on Monday, Wednesday, and Saturday (Three times per week). There is an average of four weeks in the billing month, which means the program will run 12 times (Three times per week for four weeks). Now let's say that there are 20 zones on your system and each zone is individually set to run for ten minutes. Twenty zones multiplied by ten minutes each results in 200 minutes of run time per program. How much water is that? This will vary depending on the exact pressure at your home, what nozzles are in the sprinkler heads, how many heads are on a zone, etc. For this example, we will say that each zone uses 15 gallons per minute for each minute that it runs. So, 200 minutes times 15 gallons/minute results in 3,000 gallons being used each time the system runs. The total monthly water used in this situation is 36,000 gallons (12 times per month times 3,000 gallons per run). This stuff adds up quick!

Before Irrigation System Cycle



After Irrigation Cycle



20 zones for 10 minutes each
200 minutes x 8 gallons per minute
1,600 gallons used

What Does this Mean for Your Water Bill?

If you go to our website www.sardiswater.com/water-rates , you will find out exactly what we charge for water and how to calculate your bill. At the bottom of the page is a place where you can enter different amounts of water and our program will calculate the charge for you. The example above calls for 36,000 gallons for irrigation. Add your normal household use to this (system average is 7,000 gallons per month per home) and this homeowner could expect to use a total of 43,000 gallons. Type this into the calculator, click enter, and an estimated bill is calculated at $269.25. Please know that some residential zones can do 8 gallons/minute while others can do 20 gallons/minute. Every irrigation system is unique. If you really want to know what is being used on your system you can read the water meter before and after a complete run. The difference in the readings is the amount of water being used.

Note: This article features excerpts of a larger article written by Paul Tischler, General Manager at Sardis-Lone Elm Water Supply Corporation in Midlothian, TX. The full original article can be found at www.sardiswater.com/faqlawnirrigation. To calculate your water bill based on your specific water provider, use the formulas mentioned above with your provider's rate. The rate can be found by viewing your water bill or by contacting your provider.

Winterizing Water Wells: Southern Style

With prolonged sub-freezing temps, rolling blackouts, and treacherous conditions, Winter Storm Uri in February 2021 taught us all the importance of being prepared for the unknown. Extremely cold weather can impact the operation of private water systems, but thankfully there are some simple preventative steps that can be taken to help well owners prepare for freezing weather.

Insulatate Vital Above Ground Components

Any plumbing that comes from the well to storage tanks should be wrapped with insulating material. Smaller diameter pipe sizes like the one that leads from the manifold to the pressure switch can also be exceptionally vulnerable to freezing. The smaller the diameter of the pipe and the lower to the ground, the more likely it is to freeze. Cast-iron booster pumps are very susceptible to breakage if they hard freeze. Ice expands upon freezing and breaks cast-iron booster pump housings. It is not recommended to cover electrical control components with foam insulation or drape them with insulating blankets.

Conduct a Visual Inspection Prior to a Freeze

Well owners are always encouraged to visually inspect their private water system on a regular basis. Look over your well components for any damage, exposed wires, cracks in PVC or other pipes, or any ill-fitting components. By addressing these before a hard freeze, you will help to reduce the likelihood of severe damage to your system.

Winterize Your Well House

Well pumps that are above ground often have a small pump house built over them to protect the pump from the elements. A well-built pump house, whether built of wood, cement blocks, or metal, should have insulation in the walls, the door, and the ceiling. Make sure all openings and doors are closed properly, keeping the heat in and the wind or snow out. Please be aware that heat lamps and space heaters can potentially cause fires, so please use prudently.

Be Prepared for Surprises

In the instance where pipes burst due to severe freezing weather, it helps to know ahead of time where to locate the main shutoff valve for your water system. One place it can be found is outside at the pump itself, or it might be in a valve box in the ground. Another place you can find your main water shutoff valve when running on a well, is by your pressure tank. Find where your water pipes enter the house and follow those pipes to the pressure tank. You will see the pressure gauge when you have found the pressure tank. The main water shutoff valve will be connected to the pipe that is leaving the pressure tank and going into the house.

Prep Irrigation Systems for Winter

Whether you are on a private water well or not, it is also important to winterize any irrigation systems and outdoor spigots before freezing temperatures hit. Drain your irrigation system and unhook any hoses from outdoor faucets or spigots. Most plants, trees, and turfgrass go dormant in the winter and do not require much watering, if any, so turning off irrigation systems during winter weather is perfectly fine. Taking these steps will prevent damage to your irrigation systems so they will be ready to work properly for you in the spring.

Now Scheduling the Water Education Trailer for Fall 2021 and Spring 2022

The WET, or Water Education Trailer, is a FREE mobile classroom that features exhibits that provide demonstrations about rainwater harvesting, indoor water conservation tips, pollution prevention, how a water well works, and features a working aquifer model! The presentations included in the WET meet TEKS standards and provide STEM-based learning activities.

Since its development in 2015, over 12,000 adults and children have toured the WET at over 120 events. The WET is available for elementary, middle, and high school classes, teacher development, community events, meetings, and workshops. We are happy to tailor the presentations and curriculum to your specific needs.

Please email sinclaire@prairielandsgcd.org to schedule a visit!

Daniels Appointed to Prairielands GCD Board of Directors

PGCD General Manager, Kathy Turner Jones, and Brad Daniels.

On October 13, 2021 Brad Daniels took his oath of office as a director on the Prairielands Groundwater Conservation District Board of Directors. Daniels was appointed by the Hill County Commissioners Court in a public meeting on September 14, 2021 to serve out an unexpired term representing Hill County on the District's Board of Directors through August 31, 2025.

Daniels, a resident of Hill County since 1980, began his career in the water industry working for a contractor installing water lines near Belton Lake and Lake Travis. He currently serves as the General Manager at Aquilla Water Supply District in Hillsboro, where he has worked in various roles for over 32 years. As a member of the Prairielands GCD Board of Directors, Daniels will work alongside seven other appointed members to lead the decision-making process and guide the development of Prairielands GCD's rules and management plan, technical and scientific studies, conservation education, and the authorization of water well permits.

"I am looking forward to becoming more knowledgeable on the groundwater industry and the opportunity to assist and serve within the industry," Daniels said.

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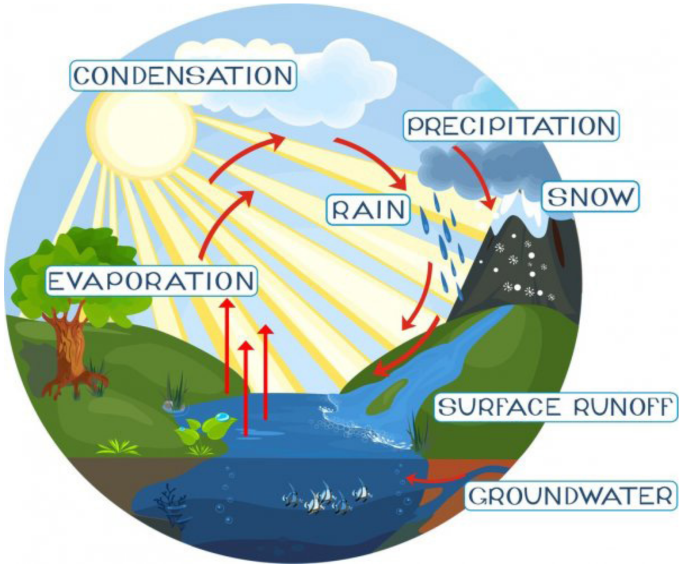
Understanding Surface Water vs Groundwater

Surface water and groundwater are both important sources for water supply needs, but what is the difference between them? In simple terms, surface water is any water formed above ground, such as ponds, lakes, rivers, and streams. Groundwater is water found underground in the cracks and spaces in soil, sand and rock. It is stored in and moves slowly through geologic formations of soil, sand and rocks called aquifers. To understand how these types of water can be used, it's important to look at the many differences between groundwater and surface water. But to set the stage for this discussion, you must first understand the formation of these water sources through the hydrologic cycle.

The Hydrologic Cycle

Water is in constant circulation, powered by the energy from sunlight and gravity in a natural process called the hydrologic cycle. Water evaporates from the ocean and land surfaces, is held temporarily as vapor in the atmosphere, and falls back to Earth's surface as precipitation. Surface water is the residue of precipitation and melted snow, called runoff. Where the average rate of precipitation exceeds the rate at which runoff seeps into the soil, evaporates, or is absorbed by vegetation, bodies of surface water such as streams, rivers, and lakes are formed. Water that infiltrates Earth's surface becomes groundwater, slowly seeping downward into extensive layers of porous soil and rock called aquifers. Under the pull of gravity, groundwater flows slowly and steadily through the aquifer. In low areas it emerges in springs and streams.



Surface Water

The total land area that contributes surface runoff to a river or lake is called a watershed, drainage basin, or catchment area. The volume of water available for municipal supply depends mostly on the amount of rainfall. It also depends on the size of the watershed, the slope of the ground, the type of soil and vegetation, and the type of land use.

The flow rate or discharge of a river varies with time. Higher flow rates typically occur in the spring, and lower flow rates occur in the winter. When the average discharge of a river is not enough for a dependable supply of water, a conservation reservoir may be built. The flow of water is blocked by a dam, allowing an artificial lake to be formed. Conservation reservoirs store water from wet weather periods for use during times of drought and low streamflow. A water intake structure is built within the reservoir, with inlet ports and valves at several depths. Since the quality of water in a reservoir varies seasonally with depth, a multilevel intake allows water of best quality to be withdrawn. Sometimes it is advisable, for economic reasons, to provide a multipurpose reservoir. A multipurpose reservoir is designed to satisfy a combination of community water needs. In addition to drinking water, the reservoir may also provide flood control, hydroelectric power, and recreation.

Groundwater

The value of an aquifer as a source of groundwater is a function of the porosity of the geologic stratum, or layer, of which it is formed. Water is withdrawn from an aquifer by pumping it out of a well. Wells are constructed in several ways, depending on the depth and nature of the aquifer. Wells used for public water supplies, usually more than 30 meters (100 feet) deep and from 10 to 30 cm (4 to 12 inches) in diameter, must penetrate large aquifers that can provide dependable yields of good-quality water. They are drilled using impact or rotary techniques and are usually lined with a metal pipe or casing to prevent contamination. The annular space around the outside of the upper portion of the casing is filled with cement grout, and a special sanitary seal is installed at the top to provide further protection. At the bottom of the casing, a slotted screen is attached to strain silt and sand out of the groundwater. A submersible pump driven by an electric motor can be used to raise the water to the surface. Sometimes a deep well may penetrate a confined artesian aquifer, in which case natural hydrostatic pressure can raise the water to the surface.

How Does Groundwater and Surface Water Interact?

Surface water and groundwater systems are connected in most landscapes. Streams interact with groundwater in three basic ways: streams gain water from inflow of groundwater through the streambed, streams lose water by outflow through the streambed or they do both depending upon the location along the stream. It is the groundwater contribution that keeps streams flowing between precipitation events or after snowmelt. For a stream to gain water, the elevation of the water table in the vicinity of the stream must be higher than the streamwater surface. For a stream to lose water to groundwater, the water table must be below the elevation of the stream-water surface in the vicinity of the stream. If the water table has large variations during the year, a stream segment could receive water from groundwater for a portion of the year and lose water to groundwater at other times. Bodies of surface water such as lakes and wetlands can receive groundwater inflow, recharge groundwater, or do both.

Treatment of Surface Water and Groundwater for Public Water Supply

Water in rivers or lakes is rarely clean enough for human consumption if it is not first treated or purified. Groundwater, too, often needs some level of treatment to render it potable. To protect public health, all public water systems in the State of Texas are required to disinfect drinking water before providing it to customers. The type and extent of treatment required to obtain potable water depends on the quality of the source. The better the quality, the less treatment is needed.

Water is treated in a variety of physical and chemical methods. Treatment of surface water begins with intake screens to prevent fish and debris from entering the plant and damaging pumps and other components. Conventional treatment of water primarily involves clarification and disinfection. Clarification removes most of the turbidity, making the water crystal clear. Disinfection, usually the final step in the treatment of drinking water, destroys pathogenic microbes. The use of chlorine and chlorine compounds called chloramines (chlorine combined with ammonia) for disinfecting public water supplies has been increasing since the beginning of the 21st century. The disinfecting effect of chloramines lasts longer than that of chlorine alone, further protecting water quality throughout the distribution system. A water system that uses chloramine may sometimes employ a free-chlorine conversion, removing ammonia from the treatment process, disinfecting the water only with free chlorine. This common practice is used as preventive maintenance to kill bacteria that, though harmless when consumed by humans, can introduce unwanted taste and odor, and create issues with maintaining a disinfectant residual. In addition to clarification and disinfection, the processes of softening, aeration, carbon adsorption, and fluoridation may be used for certain public water sources. Desalination processes are used in areas where freshwater supplies are not readily available.

About Prairielands GCD

The Prairielands Groundwater Conservation District was created in response to a finding by the Texas Commission on Environmental Quality that groundwater shortages were expected in Ellis, Hill, Johnson, and Somervell counties over the next 25 years. The TCEQ finding required local residents to create a groundwater conservation district, or else TCEQ would mandate one. Enabling legislation for the Prairielands GCD was passed in 2009.

The Mission of the Prairielands Groundwater Conservation District is to develop rules to provide protection to existing wells, prevent waste, promote conservation, provide a framework that will allow availability and accessibility of groundwater for future generations, protect the quality of the groundwater in the recharge zone of the aquifer, insure that the residents of Ellis, Hill, Johnson, and Somervell Counties maintain local control over their groundwater, and operate the District in a fair and equitable manner for all residents of the District.

Upcoming Events and Meetings

Nov 11 — **Veterans Day**
PGCD Office Closed

Nov 15 — **PGCD Board Meeting**
9:00 a.m.
208 Kimberly Dr
Cleburne, TX 76031

Nov 4 — **GMA 8 Meeting**
10:00 a.m.
208 Kimberly Dr
Cleburne, TX 76031

Nov 25-26 — **Thanksgiving Holiday**
PGCD Office Closed

Dec 20 — **PGCD Board Meeting**
9:00 a.m.
208 Kimberly Dr
Cleburne, TX 76031

Dec 23-27 — **Christmas Holiday**
PGCD Office Closed

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