Clearwater Source

Clearwater Underground Water Conservation District

www.cuwcd.org

2017 Annual Newsletter | October 2017 | Volume 13, Issue 1

A Message From The President

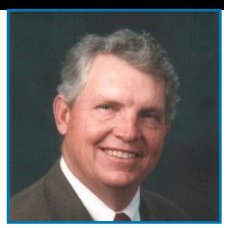
It is fall again and it has been a fairly normal year for rainfall in the Central Texas area with periods of rain and drought. Your district recently passed the budget for 2018 that allocates approximately 60% to groundwater science while being able to lower your tax rate. There is still much to be learned about our groundwater resources so we are partnering with Baylor University, The United States Geological Survey (USGS), and LBG-Guyton, our hydrologist, to further enhance this understanding. We will continue to enhance our District website to provide better information, mapping and our 3D modeling to you, our groundwater users and constituents.

This past year we have invested in an educational trailer to take to our area schools and local events to educate our youth and citizens about groundwater and conservation. Your Bell County Commissioners donated the District a used pickup that was to be put into auction to pull the trailer and to use in our District travels. We would like to publicly thank the Commissions for this donation as they partner with us to manage your groundwater and to keep our costs and taxes low. The trailer will be at our Water Symposium that will be held on November 15th at the Texas A&M University Central Texas campus in Killeen so we encourage you to visit it when you attend. Please contact the District office to make your reservation. There is no cost to attend and lunch will be provided.

It is also, with great pleasure, to announce to you that our District Manager, Dirk Aaron, was recently elected to be the president of the Texas Alliance of Groundwater Districts (TAGD) and will be serving a two year term. This is a great honor to him and our District as we continue to be recognized as one of the leaders in Texas in groundwater management. We hope to see you at the 17th Annual Bell County Water Symposium.

Leland Gersbach, President
Clearwater UWCD

Protecting Our Most Valuable Resource



Concerns about water resources for Central Texas are certainly not new. Over a half century ago, far-sighted leaders took steps to build two major reservoirs in Bell County to secure surface water resources. Initially, the driving force was the need to secure a dependable water supply to sustain Fort Hood. The added benefit was an adequate supply for a rapidly growing population. Those early efforts have served us well.

Concerns for groundwater management were later coming, and more complicated. The surge in population growth in Bexar and Travis counties as early as the 1970's offered the first real glimpse of things to come for our region. At the same time, a philosophical debate about the future of groundwater management began to bubble up. Since groundwater is treated as a property right under Texas law, it came to be viewed as valuable economic resource, and efforts to mine and sell water began to pop up in some thirsty parts of the state. Hydrologists soon realized that groundwater is in reality a shared resource. Aquifers don't recognize boundary lines and one land owner's pumping may affect another's supply. In the case of the Edwards aquifer, groundwater systems and fluvial systems are interrelated, further complicating the issue. So discussions about regulation became more intense and the push-back from property rights advocates became more strident.

Historically, the legislature has taken a hands-off position on the question of groundwater regulation. Rather than adopt sweeping changes to a long-standing body of law, the issue was largely left to local entities. To that end, various local jurisdictions have been authorized by statute to create groundwater districts over time. The enabling legislation for Clearwater Underground Water Conservation District was enacted in the 71st Legislature in 1989 (House Bill 3172 by Shine and Schleuter). This bill authorized the Commissioners Court to call an election to determine whether or not to stand up a district in Bell County. The initiative was confirmed by the voters and Clearwater UWCD was created in 1999.

The District's primary regulatory tool is tied to permitting authority and protection of exempt wells for domestic use. The early years of operation focused on developing policy and establishing the rules and procedures for permitting of wells. From the beginning, the District leadership has been very focused on striking a balance between accommodating need and, at the same time, protecting long-term sustainability. This challenge is further complicated by the diverse geology of the region. Aquifer conditions vary greatly from one part of the county to another. So in recent years, the District has become more focused on science and has invested in a sophisticated tool set to compile hydrologic data and build and support modelling capabilities to underpin permitting decisions. This is a model approach for responsible regulation.

This focus on science has been particularly valuable with the addition of a new challenge related to endangered species. The discovery of *Eurycea Chisholmensis*, a species of salamander unique to spring settings in the northern Edwards aquifer, has raised the issue of federal regulation. The District, working in collaboration with Bell County, Village of Salado and other local entities, has funded additional focused research designed to enhance our understanding of the northern Edwards and its associated spring systems, as well as biological research on species dependent on those systems, in order to satisfy mandates of federal law. To date, the official designation of *Eurycea* as threatened, rather than endangered, is a major victory, resulting in a lower threshold for environmental permitting for projects such as the construction of I-35 and the proposed Salado wastewater system. Species protection aside, the underlying goal of protecting the integrity of a valuable resource is advanced as well.

Maintaining this balanced regulatory approach and an ongoing commitment to science-based resource management will be critical as competition for available resources increases over time.

Tim Brown, Bell County Commissioner, Pct. 2

Board of Directors

Leland Gersbach - Precinct 1
2013-2017 (President)

Wallace Biskup - Precinct 3
2013-2017 (Vice President)

Gary Young - Precinct 2
2014-2017 (Director)

Judy Parker - Precinct 4
2011-2017 (Secretary)

David Cole - At large
2013-2017 (Director)

Mission Statement

To implement an efficient, economical, and environmentally sound groundwater management program to protect and enhance the water resources of the District.

Water Quality Screening

The District's in-house lab offers registered well owners free screening for common constituents and bacteria. Annual screening is recommended.

Lawn and Landscape Water Conservation for Landowners

It hasn't been on the minds of those in Central Texas lately. When the stock tanks are full and the streams are flowing, water conservation doesn't appear as an immediate concern. However, those that call Texas home know that conditions can change in the blink of an eye. Being prepared and taking preventative measures to ensure that our land, livestock, and future generations will have sufficient supply is key to weathering dry conditions.

Up to 25% percent of water usage in urban areas can be attributed to irrigation, but even up to half of that can be lost to inefficiencies in those systems. Just drive through our communities and see that one goal both large and small land owners in Central Texas have in common is producing healthy, lush grass and doing it in an efficient way. Whether it be for production or simply for an aesthetic look, the number one factor in achieving that goal is making sure that the grass you have planted is receiving enough water. There are different varieties or grasses that can help landowners meet their goals.

Not all grass is created equal. St. Augustine thrives the best in shady moist conditions while Bermuda is a sun loving, drought tolerant variety. The solution is to utilize a variety that not only works for the landowner but is functional and water conscious at the same time.

Two varieties come to mind when I think of grass that fits these low water landscape use categories; Buffalo and Bermuda. Buffalo grass is a native grass and the most drought tolerant choice, but it is not well adapted for use as a lawn grass. It does not make a tight sod, but it grows well in low rain fall areas. If grown for grazing or ground cover, mowed to six inches, Buffalo grass will flourish in full sun with minimal water requirements. Land owners that want to utilize a native pasture grass with water conservation or drought conditions in mind will find that this grass is a highly practical choice.

Bermuda grass is almost as drought tolerant as buffalo grass, but it is much easier to manage as a manicured turf grass. Both tolerant to frequent mowing (1 ½ inches or less) and high traffic areas, Bermuda is a top choice among small land owners. During harsh drought conditions Bermuda tends to green up rapidly after irrigation or a fair rain. Just like the Buffalo grass, it also fairs well in full sun. Bermuda is well known for its use and hardiness on golf courses and is the most common warm-season turf grass used in the U.S.

The money you invest in high quality landscape soil and seeding can be paid back in one drought seasons worth of lawn watering, but changing your practices to conserve water for our future generations is a priceless concept. Whatever the grass you select, six inches of soil is imperative to serve as a reservoir for roots and moisture. When it comes to watering, monitor your grass and watch for wilt. Watering only when needed and watering thoroughly, produces a deep-rooted lawn which is more water efficient and drought enduring.

When water is so inexpensive, it's easy to misuse. Municipal water in Belton, Texas costs a home owner $3.70 for 1,000 gallons. That shakes out to less than half a penny per gallon. If you're pumping from an existing, managed well, the input is the utility cost of pumping. Nevertheless, protecting and conserving Texas' vital water resource is an important job that is in all of our hands. Texas A&M AgriLife provides programming in conservation that focuses on reducing household water use and improving irrigation efficiencies in lawns, landscapes, and agricultural production systems. For more information on water wise conservation practices, visit http://water.tamu.edu/water-conservation/ or contact the Bell County Extension Office at (254) 933-5305.

Whitney Grantham, Natural Resources Agent
Texas A&M AgriLife Extension, Bell County

Investing in tomorrow's Leaders
The Texas 4-H Water Ambassadors Program

With the support of Clearwater and many others in the Texas water industry, a new 4-H initiative is helping to grow the next generation of water industry leaders. This summer marked the debut of the Texas 4-H Water Ambassador Program. Sixteen high school youth, including Kolby Dague of Bell County, were selected to participate in the summer 4-H2O Youth Leadership Academy. This 8-day educational tour experience covered 2,200 miles, featured 30 tours and educational presentations, and engaged nearly 80 water industry professionals across Texas.

The summer Academy exposed Ambassadors to a wide range water issues and provided a broad perspective of challenges faced by local communities. Topics covered water law, policy, and management as well as hydrogeology, water treatment, and emerging technologies in irrigation management, reuse, desalination, and aquifer storage and recovery. A highlight of the tour was a stop in Temple, where water ambassadors met with District staff, learned about groundwater management, and toured the mobile aquifer classroom.

As Water Ambassadors, these youth are charged with providing water education and service back in their communities over the next year. They will also further their learning about Texas water through continuing education, participate in water industry events, and meet with local groundwater district and water professionals. Recently, ten Water Ambassadors attended the Texas Groundwater Summit in San Marcos where they had the opportunity to thank Program sponsors and share their 4-H2O Youth Leadership Academy experience.

Kolby is already gaining visibility in his new role as Water Ambassador. In addition to participating in the Groundwater Summit, he has delivered presentations for both Clearwater and Post Oak Savannah Groundwater Conservation District Boards. Whitney Grantham, Bell County extension agent, is very supportive of the Water Ambassadors Program. Whitney assisted during the summer Academy and will continue to help Kolby by facilitating education and service opportunities.

Applications will open in February 2018 for the second cohort of Water Ambassadors.

Special thanks to the District Board, Dirk Aaron, and staff for their continued support of this important program!

David Smith, 4-H2O Program Coordinator
Texas A&M AgriLife Extension
Texas 4-H Youth Development

Whitney Grantham (CEA - NR) and Kolby Dague present to the CUWCD Board of Directors about the 4-H2O program.

Kolby Dague and the 4-H2O Ambassadors near Halfway looking at efficient irrigation research.

Kolby Dague and the 4-H2O Ambassadors tour the Spanish Irrigation Canal system in Menard.

Kolby Dague and the 4-H2O Ambassadors at the Texas A&M AgriLife Research & Extension Center in Dallas learning about youth water education activities.

Natural Resources Extension Agent

Whitney Grantham has been with Texas A&M AgriLife Extension in Bell County as the Natural Resources agent for just over a year now. Within the county, she takes the lead in coordinating adult programing efforts in the areas of water, soil, wildlife, and conservation alongside managing the county 4-H Ag and Natural Resources program. Ag Agent Lyle Zoeller and Whitney work together to provide research based education material for their clientele. In her position, Whitney works with two very important groups of people; the Central Texas Master Naturalists, an organization who consists of trained volunteers that regularly assist them with their education and outreach efforts and a Natural Resources committee which is comprised of several different agency and organization representatives from the area. Their goal in partnership is to provide programming and cover topics that are best suited for the county. Clearwater is one of their major partners, and the extension service greatly appreciates their continued support. If you have any questions for Whitney, she would be happy to speak with you. Her office number is (254) 933-5305.

TWCA: Leader for Water Resources in Texas

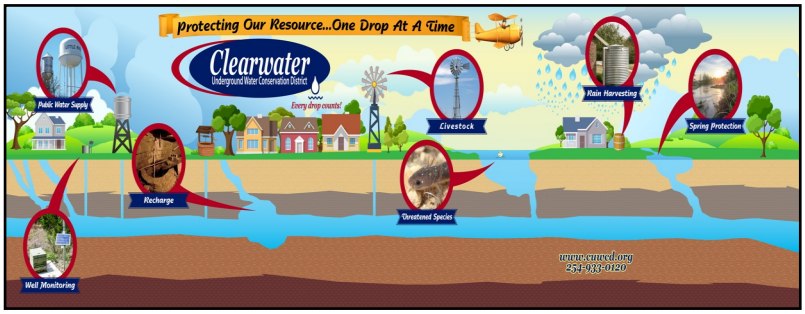
The Texas Water Conservation Association (TWCA) is a nonprofit association of water professionals and organizations in Texas. Members represent river authorities, municipalities, navigation and flood control districts, drainage and irrigation districts, utility districts, and groundwater conservation districts, as well as water users and related interests.

TWCA's mission is to serve as a resource to its members, state agencies, and lawmakers about relevant Texas water issues. The association offers unique opportunities for members to learn about these issues and network with other professionals during TWCA conferences and events. TWCA works with water stakeholders to reach consensus and solve some of the more pressing water policy problems of the day and shares information with the public using website and social media platforms and through the *Confluence*, its quarterly newsletter.

TWCA has five employees: General Manager Dean Robbins, who joined TWCA 20 years ago after a successful career at the Texas Commission on Environmental Quality; Assistant General Manager, Stacey Steinbach, an attorney who has experience in nonprofit management and representing water districts of all types; Office Manager Lisa Henley, who has been with TWCA for nearly 20 years and plans all of TWCA's events; Director of Communications, Adeline Fox, who has experience working with groundwater conservation districts, managing communications platforms, and coordinating membership outreach; and Administrative Assistant, Becky Arledge, who brings more than 15 years of experience to TWCA. Stacey and Adeline look forward to seeing you at the Bell County Water Symposium.

Adeline Fox, Communications Director,
Texas Water Conservation Association
Texas Ground Water Association

Stacey Allison Steinbach, Assistant General Manager,
Texas Water Conservation Association
Texas Ground Water Association



Join the District for the 17th Annual

Bell County Water Symposium

November 15, 2017 8:00 A.M. --- 4:00P.M.
Texas A&M University - Central Texas

This event is free but requires RSVP by November 9th

Key Topics and Speakers

State of the District
Leland Gersbach, President, Clearwater UWCD
Dirk Aaron, General Manager, Clearwater UWCD

GCDs: What They Do, Why They Matter & Reflections on the 1917 Conservation Amendment
Sarah Rountree Schlessinger, Executive Director
Texas Alliance of Groundwater Districts

Overview of the TWCA Organization and the 85th Legislative Session
Stacey Allison Steinbach, Asst. General Manager
Texas Water Conservation Association
Adeline Fox, Communications Director
Texas Water Conservation Association

The State of Water Resources in Texas
Bech Bruun, Chairman, Texas Water Development Board

Understanding the Geology of the Aquifers for ASR
James Beach, P.G., Senior Vice President, LBG-Guyton Associates

Water Planning and Implementation in Texas, Now or Never
Lyle Larson, Chairman, House Natural Resources Committee
Texas House of Representatives, District 122

ASR Feasibility: Can We Make it Work?
Dr. Gretchen Miller, Associate Professor,
Civil Engineering Texas A&M University
Dr. June Wolfe, Associate Research Scientist,
Texas A&M AgriLife Research,
Blackland Research and Extension Center

Scientific Initiatives and Tools Addressing Aquifer Conditions
James Beach, P.G., Senior Vice President, LBG-Guyton Associates
Brant Konetchy, Hydrologist 1, LBG-Guyton Associates

Statewide Earth Observation Network
Dr. Leyon Greene, Hydrologist & Meteorologist, TexMesonet
Texas Water Development Board

Watershed Protection in Central Texas
Lisa Prcin, Research Associate, Texas A&M AgriLife Research,
Blackland Research and Extension Center

Event Sponsors

Clearwater UWCD
Lloyd-Gosselink Attorneys at Law
LBG-Guyton Associates
Bell County Engineers Office
HALFF Associates
Texas AgriLife Extension Service
Texas A&M University - Central Texas

Clearwater Underground Water Conservation District
Every drop counts!
P.O. Box 1989
Belton, TX 76513

The Manager's Comments

Clearwater Underground Water Conservation District has set the 17th Annual Bell County Water Symposium for November 15, 2017 in Killeen at the campus of Texas A&M University - Central Texas. The theme of this year's event is "*Collaboration in Developing Scientific Discernment*".

Last year's symposium focused on the House Research Organization of the Texas Legislature's report in their Interim News Briefs and update on the state studies of surface water loss and exploring the potential for ASR. Because of the importance of ASR as a viable strategy for the future, we will be having speakers address this concept in order to validate why Clearwater is supportive.

I want to point out that the House Research Organization stated, "*ASR involves collecting water during wet periods and storing it underground in an aquifer from which it can be drawn during periods of peak demand.*" Peak periods of demand and an increase in population in Central Texas necessitates the need for an increase in water.

According to the Texas Water Development Board, about 7.2 million acre-feet of water, currently stored in surface water reservoirs, evaporates in an average year. While surface reservoirs continue to feature prominently in the recently adopted 2017 state water plan, many consider ASR to have several advantages over reservoirs that justify its expanded use. In addition to resisting water loss through evaporation, ASR does not involve the acquisition and flooding of land above ground, which can be expensive and result in destruction of wildlife habitat and private property.

The current Chairman of the House Natural Resources Committee, Representative Lyle Larson, will give our Keynote Address this year. He will discuss his sense of urgency for forward planning now and not later to address our future water needs. In 2015, the 84th Legislature enacted HB 655 by Larson, which resulted in several changes to the way ASR is regulated. The bill specified how ASR facilities must account for the water they inject and recover and the role of groundwater conservation districts in such projects. The new law establishes the same regulatory framework for all ASR projects, whether the source of the stored water is groundwater, surface water, or treated wastewater. The new law also prescribes measures designed to protect water quality in the receiving aquifer and modifies the requirement that water meet drinking water standards before being injected.

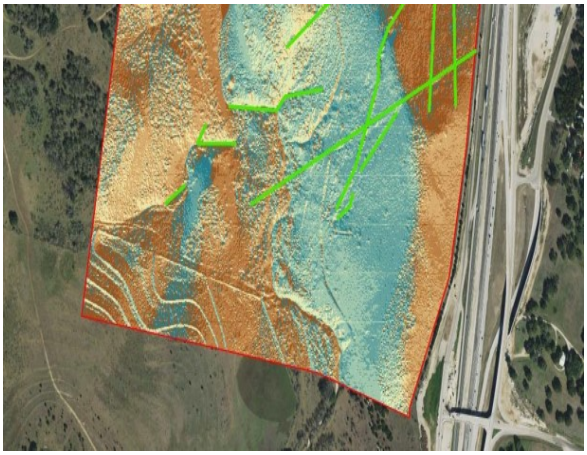
CUWCD embraced this bill and believes that ASR is a critical strategy to help answer the regional question "How can we meet the growing need for water in both Bell and Williamson Counties?" Growth in the entire IH35 corridor is eminent and water is limited.

In addition to scientific discussion, we will have leadership from Statewide organizations committed to supporting all the water related industries in Texas. We also look forward to showcasing our new Mobile Classroom while hosting another successful Water Symposium with our partners.

Dirk Aaron, General Manager

Recharge Pathways and Mechanisms in the Edwards Aquifer

Baylor University and the Bell County Adaptive Management Coalition have worked together to advance the collective knowledge of groundwater in the Northern Segment of the Edwards aquifer since 2011. The research began during the drought of 2011 with the impending listing of the Salado Salamander as possibly an endangered species. The focus was on the spring mechanisms and potential recharge pathways that would be beneficial to both the people of Bell County and the aquatic organisms that use the same aquifer. Phase 1 of the study efforts showed a well-managed aquifer maintaining consistent water levels and minimum spring flow in the Northern Segment of the Edwards aquifer during an epic drought. Although some of the spring openings stopped flowing in 2011 a dye test showed that the downtown springs were a connected system and the efforts to maintain minimum spring flows for the system still allowed for salamander habitat. The good management practices of CUWCD and the productive research including the studies by students and faculty at Baylor University helped convince the Unites States Fish and Wildlife Service to reduce the listing classification to that of a "threatened" versus and "endangered" species.



Linear features identified from slope aspect investigations.

Phase two of the research efforts used lidar to investigate fractures as potential recharge pathways and added insight into the Groundwater and surface-water interactions of the downtown springs and Salado Creek. State-of-the-art tools such as infrared photography and natural tracers found in the dissolved gasses of the aquifer helped quantify spring flow and classify the spring using national protocols. A sensor that monitored (and recorded) water levels and basic water quality (salinity and temperature) in a well immediately upgradient of the spring system has been maintained since 2013 and shows insight into the timing of recharge events. The hydrographs produced by this monitoring device will be used in phase three to learn more about where recharge may occur during certain seasons and events.

Phase three is currently underway and has added a study of detailed precipitation patterns using the 88D radar data currently collected by CUWCD and recently installed recording rain gages to help calibrate the radar data. The research will include the entire basin of Salado Creek and the portion of the aquifer thought to contribute to the recharge of the springs and the local groundwater system.

Stephanie S. Wong, Doctoral Student, Hydrogeology, Baylor University
Joe C. Yelderman Jr. Ph. D., P.G. #2941—Hydrogeology Professor, Baylor University

Mobile Classroom

The Mobile Classroom is part of a dynamic educational program sponsored by the Clearwater Underground Water Conservation District of Bell County. The 24-foot classroom features a fully operational aquifer model, well model, and indoor conservation lab. A large awning can drop down for shade and a colorful wrap covers the outside of the entire trailer with a visual story about water conservation in relation to agricultural, residential, industrial, municipal and recreational use. There are also roll-out features that include an Enviroscape demonstration and drawdown demonstration.

The Mobile Classroom is enjoyed by all ages, but targeted toward third grade through high school. **There is no charge for the Mobile Classroom Program—it is courtesy of the Clearwater Underground Water Conservation District.**

The Mobile Classroom experience will address Texas Essential Knowledge and Skills (TEKS):

- What is solubility of water?
- What is the geology below land surface?
- What is the water cycle?
- Inform on the importance of conservation.
- Inform on collecting data associated with understanding.
- Inform on scientific investigation of groundwater availability.
- Witnessing changes that occur in environmental models.

Inside the Mobile Classroom

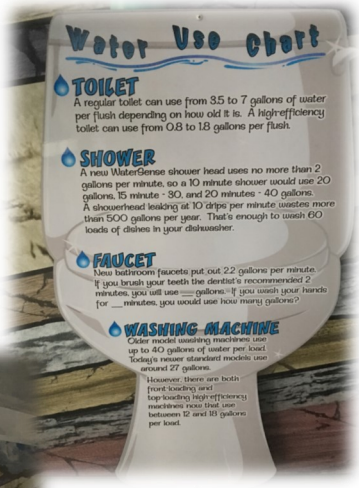
Aquifer Model

- Participants will learn the importance of aquifers in Central Texas.
- How aquifers are formed.
- How aquifers respond to pumping.
- How contamination of aquifers can occur.
- How important proper construction of water wells is.
- How recharge of aquifers occurs.
- How aquifers are part of the water cycle.

Groundwater Well Construction

- Groundwater well construction experience.
- Groundwater well terminology.
- Who constructs groundwater wells?
- Who enforces groundwater well regulations?
- Why should we have groundwater well environmental protection?

Conservation Station



- Understanding how you can conserve for the future.
- Why conserve water.
- What is the importance of water?
- How can you reduce your water use?
- Applying math to our understanding of water.
- Applying chemistry to our understanding of water.

Groundwater Conservation Districts

FAQs

What is a Groundwater Conservation District?

GCDs are political subdivisions of the state created to protect and balance private groundwater interests with the conservation, preservation, protection, recharging, and prevention of waste of groundwater, and the control of subsidence caused by withdrawal.

What does a GCD do?

Establish rules for the spacing and drilling of all water wells
Consider and permit non-exempt water wells
Maintain records of non-exempt wells in a district
Submit management plans to Texas Water Development Board for approval
Collaborate regionally in joint planning for the establishment of DFCs
Collect water level and water quality data on aquifers
Educate stakeholders on water conservation
Work to prevent harm to the aquifer due to pumping or contamination

How do GCDs allocate their budgets?

Education & Outreach | Science & Research | Operations | Conservation | Regional Planning

How many GCDs are there in Texas?

Currently, there are **98** GCDs plus 2 subsidence districts.

What rules must a GCD follow?

GCDs are governed by Chapter 36 of the Texas Water Code. As political subdivisions of the state, they are also subject to Chapter 49 of the Texas Administrative Code. Based on the rules established by the State, each GCD creates policies to accomplish the goals of their District.

Do I have to register my well with my GCD?

Yes, state law requires all wells to be registered with the GCD. This does not mean that all wells require a permit. All domestic wells and livestock wells that produce less than 25,000 gallons per day are exempt from permits. A GCD has the ability to exempt others in their rules.

More GCD FAQs

What is a management plan?

A management plan outlines a GCD's goals and course of action to achieve those goals. The management plan is submitted to TWDB for approval, and rules necessary to implement the management plan are adopted by each district.

What is a Desired Future Condition?

The desired future condition is a metric that is established during the joint planning process by GCDs in a common Groundwater Management Area (GMA). The DFCs provide for consistency in groundwater management in the GMA and a balance between groundwater protection and production.

How are GCDs funded?

GCDs are funded through property taxes, permitting fees and/or usage fees.

Groundwater Terms

Aquifer

An underground geological formation able to store and yield water in useable amounts. Aquifers in Texas can consist of sand, gravel, limestone, granite, and many other rock types that have pores or spaces for water to pass through.

Aquitard

An aquitard, or confining layer, is a zone within the earth that restricts the flow of groundwater.

Total Dissolved Solids (TDS)

TDS refers to the total concentration of dissolved constituents in solution. A TDS level of less than 1000 ppm is often considered freshwater, although many Texans' drinking water has a higher TDS.

Cone of Depression

A cone of depression is a conically shaped area of decreased water level (or pressure) that occurs when water is withdrawn from an aquifer. If wells are too close to each other, these cones may overlap and cause interference resulting in abnormally low water levels in those wells. In areas that withdraw more water than is recharged or flows to that area, a semi-permanent regional cone of depression may occur.

Abandoned Wells & Water Quality

There is a high environmental risk associated with abandoned or deteriorated wells, as they are a direct conduit from the surface to our groundwater resources. Because of this risk, it is highly recommended to have abandoned or deteriorated wells plugged. Some GCDs have have established programs to assist landowners in plugging abandoned wells.

How often should I have my well water tested?

It is recommended that well owners have their water professionally tested annually or when an observed change in water quality occurs.

Who can disinfect my well water?

It is recommend to contact a licensed water well driller or a pump installer to professionally disinfect your well.