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RIVER RUN



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Winter 2018

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On the Cover: View of Canyon Dam and Hydroelectric Plant

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**MILESTONES
are always
important
opportunities
to stop and
reflect upon past
achievements
and look ahead to
new challenges.**

General Manager/CEO Kevin Patteson (center) participating in the Texas Water Safari with teammates Leigh Crettenden, GBRA IT Manager (left) and Charles Hickman, GBRA Project Engineering Manager (right).



photo by Patty Geisinger

This year's 85th anniversary of the Guadalupe-Blanco River Authority's stewardship and operations from South Central Texas to the Coastal Bend is one such marker in this organization's history, and I believe it is occurring at a decisive time for us and our great state.

The population in Texas since 2000 has increased more than any other state. However, the more notable number is that growth is expected to expand the number of residents in the state from 29.5 million to 51 million by 2070, an increase of 70 percent. We are already seeing our share of that surge in population in counties within GBRA's jurisdiction. That remarkable fact is a clear and incisive guidepost for shaping GBRA's service to the Guadalupe River Basin in the coming years. The good news is that this organization has risen to challenges in the past and has a great base of experience to build on.

GBRA was one of the first river authorities in the U.S. created to manage water resources in an entire river basin. After enabling legislation was passed in 1933, the organization collaborated with the U.S. Army Corps of Engineers to develop the Canyon Reservoir. That major impoundment was designed to mitigate the devastation of flooding which frequents this part of the state, and as a source of water for the broadening numbers of people who made South Central Texas their home since the late 1960s.

The importance of that forward-looking development of more than 50 years ago is still being realized today as flood waters over just the past few months were kept in check at Canyon Lake. And from a water supply standpoint, Canyon Lake water is helping communities and industry throughout the basin meet their growing demands. In addition to that major element of water management that is the Canyon Reservoir, GBRA has also continued to expand its water and wastewater operations by adding smaller but just as critical water and wastewater plants in its 10-county service area. Today, those facilities help serve more than 350,000 citizens each day.

Those achievements required thoughtful problem-solving skills, focused planning and collaborative working relationships to bring to fruition. Tomorrow's challenges are only going to be more complex.

There is still a limited amount of water resources we can use to meet future needs. That means we have to become more innovative in our conservation efforts and technological capabilities. Our commitment to preserving and enhancing the ecosystems we operate in also must take on a new level of proficiency. And while our working relationships are a bit more involved than those famous Texas handshake agreements, we still want our partners to feel that same level of personal commitment in every project we undertake.

Yes, the future is always uncertain and somewhat daunting. But, I am more than confident our group of GBRA managers and professionals has what it takes to design and implement water resource solutions our district's communities will need to continue to prosper into the future. In doing so, GBRA will continue to serve as trusted stewards operating on the leading edge of our industry.



Kevin Patteson
General Manager & CEO



85 YEARS: DEVELOPING, CONSERVING AND PROTECTING WATER RESOURCES IN THE GUADALUPE RIVER BASIN

The Guadalupe River Basin has long provided South Texas with ecosystems featuring unparalleled natural beauty attracting people from all over the state, waterways unleashing extreme destructive power in flooding situations, habitats providing homes to multiple endangered species and an assortment of natural resources sustaining millions of people and multi-billion-dollar economies. In the early 1900s, after Texas experienced both severe drought and devastating floods, the State Legislature created the first river authorities associated with river basins to manage those water resources and plan for future developments in the basins.

In 1933, the Guadalupe River Authority was created as a water conservation and reclamation district. Two years later, the authority was reauthorized by the Texas Legislature as the

Guadalupe-Blanco River Authority to provide stewardship for the water resources in its 10-county district, which begins near the headwaters of the Guadalupe and Blanco Rivers and ends at San Antonio Bay. Counties in the district include Kendall, Comal, Hays, Caldwell, Guadalupe, Gonzales, DeWitt, Victoria, Calhoun and Refugio.

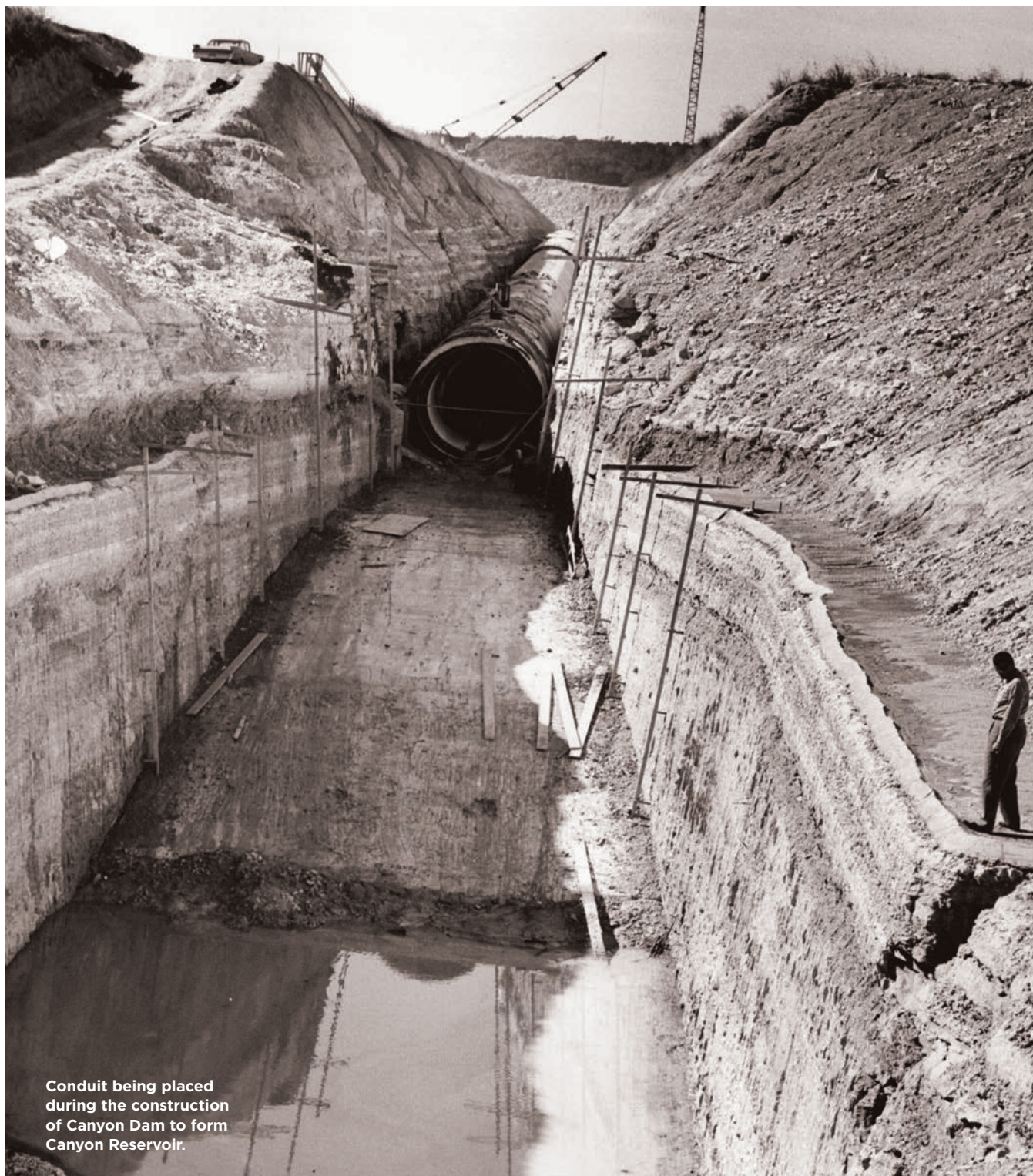
Over the last several decades, river authorities in Texas have been pioneers in developing and implementing water policy and strategies, and the state has been a recognized national leader in developing 50-year regional water plans. GBRA's water planning and resource development, like all water entities in Texas, is accomplished within the overall consideration of regional and statewide water needs. It is this type of local, regional and statewide collaboration GBRA has made a cornerstone of its operations and subsequent success.

1933

Guadalupe River Authority created by Texas Legislature as a water conservation and reclamation district and public corporation.

1935

Texas Legislature reauthorizes the Guadalupe-Blanco River Authority as a political subdivision of the State of Texas to develop, conserve and protect the water resources of the Guadalupe River Basin.



Conduit being placed during the construction of Canyon Dam to form Canyon Reservoir.

1930s-1940s

GBRA submits applications to the Federal Public Works Administration and works to develop a basin-wide program of flood control, navigation, power, irrigation and soil conservation.

1955

Drought of record continues.

THE EARLY YEARS

Following the drought and floods of the 1950s, GBRA supported a statewide Water Resource Development and Conservation Plan and agreed to serve as the local sponsor for the Canyon Reservoir project. The organization spent the early 1960s working with federal entities to plan and develop the Canyon Reservoir as the basin's only flood storage reservoir and a significant water supply source for the region. During that same time period, GBRA began to acquire infrastructure and water rights throughout the basin, including the purchase of the Guadalupe Valley Hydroelectric System and the Calhoun County Canal System, empowering GBRA to begin providing operational services.

Canyon Reservoir was completed in 1964. The U.S. Army Corps of Engineers, which owns the reservoir, and GBRA provide flood control protection and stored water supply management of the lake. GBRA operates the water storage portion to provide municipal, industrial, and agricultural customers with a dependable water supply including during times of drought or low river flow conditions. GBRA is responsible for reservoir water management and water releases within the "conservation pool," which is defined as reservoir levels between 800 ft. mean sea level (msl) and the normal operating elevation of 909 ft. msl. The Corps is responsible for management and release of waters within the "flood control pool" at elevations above 909 ft. msl.

After the completion of Canyon Reservoir, GBRA continued to expand its utility services operations to address the economic and population growth. In 1965, GBRA managed construction of the Lower Guadalupe Saltwater Barrier and Diversion Dam.

The development of the saltwater barrier on the Guadalupe River, just downstream of the confluence of the Guadalupe and San Antonio Rivers, provides protection against saltwater encroachment from the San Antonio Bay during low river flows. That project also initiated the diversion of raw water supplies to industries and municipalities in Calhoun County.

BELOW – Pouring the foundation slab for the Saltwater Barrier and Diversion Dam on the Guadalupe River at the confluence with the San Antonio River in Calhoun County, February 26, 1965.



ABOVE – Completed Saltwater Barrier and Diversion Dam on the Guadalupe River in Calhoun County, June 29, 1965.

1957

GBRA contracts with U.S. Army Corps of Engineers (USACE) for acquisition of the storage rights of Canyon Reservoir and serve as local sponsor for project.

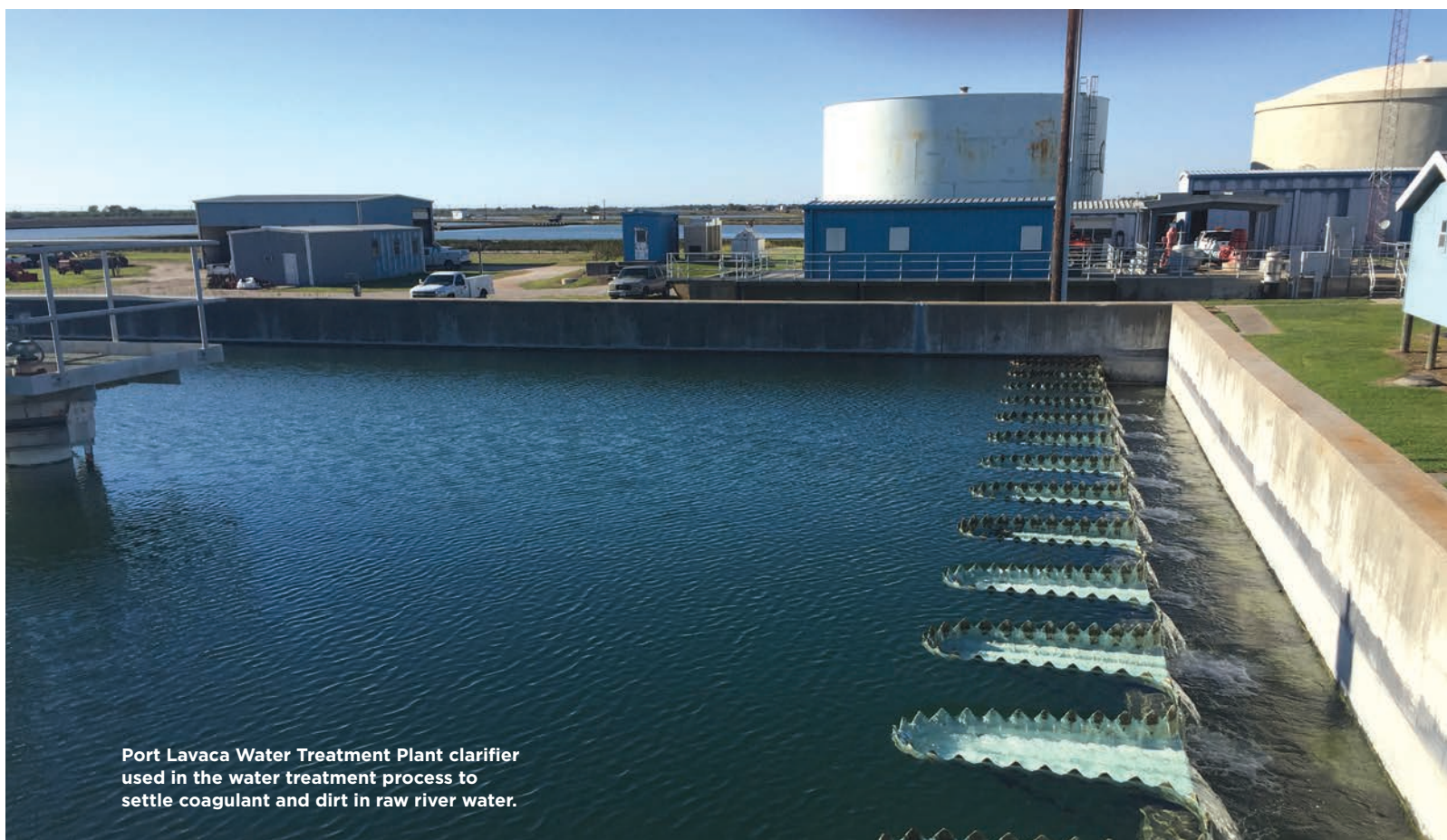
1963

GBRA purchases six hydroelectric dams and acquires the Calhoun Canal System along with substantial water rights in the middle and lower basin.



LEFT - Excavation to place underground piping during the construction of the Port Lavaca Water Treatment Plant, September 22, 1969.

In 1969, GBRA constructed the Port Lavaca Water Treatment Plant. Previously, the city relied on poor quality, brackish groundwater pumped from the Gulf Coast Aquifer. With the construction of the saltwater barrier, and in conjunction with GBRA's senior run-of-river water rights and water stored in Canyon Reservoir, the plant was able to produce high-quality treated drinking water for distribution to customers in Calhoun County. The Port Lavaca plant was GBRA's



Port Lavaca Water Treatment Plant clarifier used in the water treatment process to settle coagulant and dirt in raw river water.

1964

Canyon Reservoir is completed. The cooperative project between the USACE and GBRA provides flood control protection and a stored water supply.

1965

GBRA constructs the Lower Guadalupe Saltwater Barrier and Diversion Dam to prevent intrusion of saltwater into the Guadalupe River.

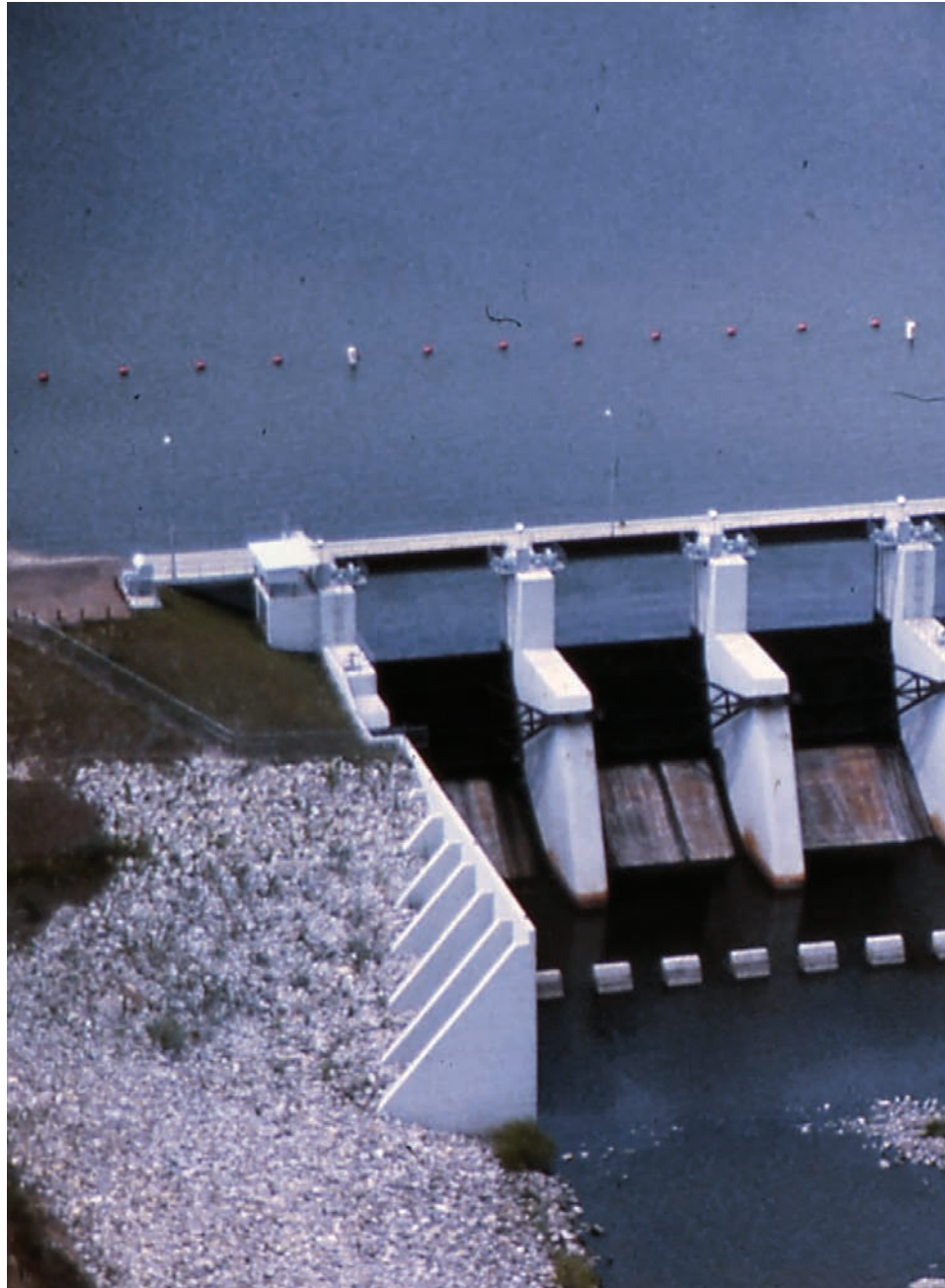
THE MIDDLE YEARS

first water treatment plant.

In the 1970s, GBRA contracted with the City of Victoria to operate its Willow Street Wastewater Treatment Plant and constructed a new, larger Regional Wastewater Reclamation System.

To address the growing need to assist small Texas cities, GBRA created its Rural Utilities Division (RUD) to construct and operate several small wastewater treatment plants and drinking water treatment facilities. Some of those plants included the Canyon Park Estates Reclamation System in Comal County, and the Dunlap Wastewater Reclamation System, Northcliffe Wastewater Treatment Plant and Springs Hill Wastewater Reclamation System in Guadalupe County.

A major addition to the GBRA operation occurred with the startup of the river authority's own water quality laboratory in 1974. The GBRA lab began offering support services for GBRA-operated water and wastewater plants. Additionally, its highly-trained personnel offered chemical and bacteriological testing for cities, water districts, industries, consulting firms and private individuals. The GBRA lab also evolved into providing environmental monitoring and surface water sampling and quality testing throughout the 10-county service area as part of the Texas Commission on Environmental Quality Clean Rivers Program.



1970

GBRA completes the Port Lavaca Water Treatment Plant, allowing for the conversion from wells to surface water.

1972

Construction and initiation of operations of wastewater and reclamation systems.



In the decade of the 1980s, Central Power and Light Company contracted GBRA to construct and operate the Coleta Creek Reservoir 15 miles southwest of Victoria. The reservoir was designed as a cooling lake for a coal-fired electric generating plant and still meets that power plant's needs today. The 1980s also saw GBRA construct a water supply pump station and pipeline in the lower basin's Calhoun County to serve two industries along the Victoria Barge Canal. In the upper basin, the organization built the six megawatt Canyon Hydroelectric Plant in Comal County that supplies power to New Braunfels Utilities.

GBRA's growth accelerated rapidly in the 1990s. During that time period, GBRA constructed and/or assumed operations of seven wastewater treatment plants in the cities of Lockhart and Buda, Crestview subdivision in Calhoun County, the Cordillera Ranch subdivision in Kendall County, and Shadow Creek and Sunfield subdivisions in Hays County.

**Overhead view of
Coleta Creek Spillway.**

1974

GBRA laboratory opens to provide support services for water and wastewater plants, chemical and bacteriological testing for cities, water districts, industries and private individuals.

1977

Construction and operation of Luling Water Treatment Plant.

RECENT DEVELOPMENTS



Construction of a raw water intake wet well at Western Canyon Water Treatment Plant. A hole, 18 feet in diameter, was bored 140 feet into limestone to draw water from Canyon Lake.

During the first years of the new millennium, GBRA assumed operation of water treatment plants for the cities of San Marcos and Lockhart. The organization's water resources development efforts also included the construction of two raw water pipelines and two treated water pipelines totaling approximately 70 miles in length. In 2006, GBRA completed its Western Canyon Water Treatment Plant, which uses water from Canyon Reservoir to provide 10 million gallons per day of treated drinking water to portions of Comal, Kendall and Bexar counties. In the last few years, GBRA has expanded its retail treated water delivery systems and retail wastewater collection and treatment systems in the upper basin for Cordillera, Johnson Ranch and Comal Trace developments as well as the City of Bulverde.

In June 2018, GBRA and Alliance Regional Water Authority partnered to develop a 26.8 million gallon-per-day groundwater project in Caldwell and Gonzales counties. This inventive partnership will save more than \$60 million and will have a smaller environmental footprint as compared to the previous independent projects being pursued. Under the agreement, each entity will produce approximately 15,000 acre feet per year of permitted Carrizo Aquifer groundwater, treat it to drinking water standards and deliver it to customers in Caldwell, Hays, Guadalupe and Comal counties. Additionally, Alliance Water will work with GBRA to construct a single treatment plant and transmission system leading to major cost savings for both organizations throughout the life of the system. The water agencies are utilizing the Texas Water Development Board's low-interest SWIFT Loan Program to finance the \$236 million project that is anticipated to be completed in 2023.

1981

GBRA constructs and manages Coletto Creek Reservoir.

1989

Canyon Hydroelectric Plant begins operation.

1990

Construction and initiation of operations of seven wastewater treatment plants.



One of eight membrane racks at the Western Canyon Water Treatment Plant. Inside each tube are membranes or small straws composed of material containing microscopic pores that filter out particulates and other natural organic matter from water during the treatment process.

1994

Construction and operation of Lockhart Wastewater Reclamation System.

1998

Initiation of operation of San Marcos Water Treatment Plant. Historic Guadalupe River flood (19.2 feet above flood level).



**View of Canyon
Dam flood release
in October 2018.**

LOOKING FORWARD

GBRA has spent the past 85 years planning, developing and implementing water resources strategies to meet the needs of the communities thriving in its service area. Today, GBRA's water and wastewater operations serve more than 350,000 people daily via nine water systems and 13 wastewater systems. Looking toward the future, Texas' population is projected to increase 70 percent by 2070, and much of that expansion is taking place in GBRA's district, which now includes three of the top five fastest-growing counties in the nation.

To meet the demands of those anticipated population gains, GBRA has adopted the One Water approach of managing all water within a specific geography, and will continue to support collaborative development approaches between diverse groups. Now, more than ever, cities, river authorities and other stakeholders must work together on water management strategies to sustain communities and ecosystems alike.

2002

Initiation of operations of Buda Wastewater Treatment Plant. Canyon Lake Gorge created by floodwater.

2006

Construction and operation of Western Canyon Water Treatment Plant.

2010

Expansion of retail water delivery and wastewater collection systems in upper basin.

'One Water' for Numerous Water Issues

**As our cities and communities grow,
so do the amounts of quality water supplies
needed to sustain that development.**

Those increasing population centers also tend to encroach on the ecosystems that are the source of water resources. Over the last few decades, people have begun to appreciate the connections between the environment and our communities. Rivers and streams across our state are the perfect example of that connection between a city and its natural surroundings. Many times, though, the management of those natural and man-made resources can be a bit disjointed. And that is the issue the concept of One Water seeks to make flow a little smoother, and why GBRA is supporting implementation of these strategies.

"GBRA is fully supportive of the One Water way of looking at water resources and the environments through which they flow," said Nathan Pence, GBRA's executive manager of environmental science and community affairs. "We view water as a resource that should be shared. There's no 'your water'

or 'our water' because we're not creating new water, but rather discovering more effective and efficient ways to manage it for the benefit of communities and the environment."

So, what is One Water? One Water is defined by the Water Research Foundation as an integrated planning and implementation approach to managing finite water resources for long-term resilience and reliability, meeting both community and ecosystem needs. It is the emerging term in the United States for what is commonly known as integrated urban water management.

According to a report on One Water by the Cynthia and George Mitchell Foundation, some common traits of a One Water approach include:

- collaboration with a wide variety of stakeholders and engagement with the community

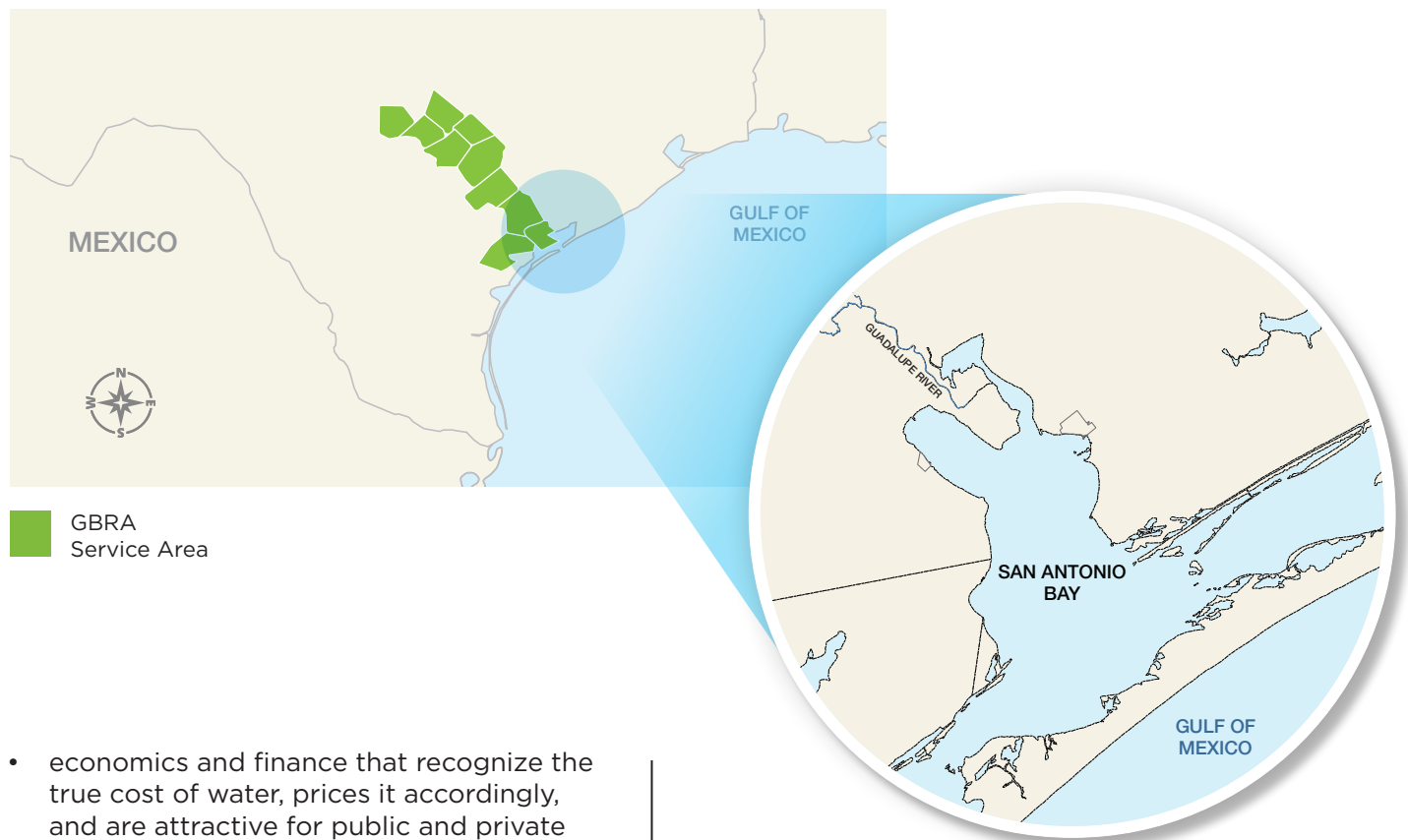
2017

Population increases expand retail operations.

2018

Implementation of Gonzales County Carrizo Groundwater Supply Project to serve areas along the IH-35 growth corridor.

**THE
FUTURE**



- economics and finance that recognize the true cost of water, prices it accordingly, and are attractive for public and private investors
- green infrastructure that works with and mimics nature
- closed-loop systems that enhance nutrient and energy recovery and encourage water sensitive behaviors
- built environment with multifunctional infrastructure that supplements the natural environment
- enabling conditions that foster innovative institutional and management arrangements
- flexible and adaptive to allow for innovation and strengthen resilience to external forces

While that is some interesting terminology to study, how can those concepts play out in GBRA's own sphere of influence? The GBRA/TAP agreement provides some insight as to how a One Water approach can work for multiple entities in a river basin.

In 2016, GBRA and The Aransas Project (TAP) reached an agreement to work together on habitat and inflow issues surrounding San Antonio Bay and the endangered whooping crane. This agreement was forged out of hard-fought litigation over water for San Antonio Bay and the endangered whooping crane flock and sets out a vision of working with one another and other interested parties to find a pathway to shared success.

During 2017, under a grant from the Cynthia and George Mitchell Foundation, GBRA and TAP worked to identify fundamental concepts and tasks for moving forward to implement the promise of the agreement. The four key concepts that form the baseline for work under the GBRA/TAP agreement call for:

- whooping crane habitat expansion,
- realizing the potential of the Guadalupe Delta,

- ensuring sufficient freshwater inflows to maintain a refugium area in San Antonio Bay during drought conditions, and
- working with landowners within the watershed to establish a market for buying and selling ecosystem services that would, among other things, augment base flows in the Guadalupe and San Antonio River systems.

The GBRA/TAP agreement now demonstrates positive outcomes for all parties can be recognized through a collaborative approach to difficult environmental issues. Combining resources and building new partnerships with cities are also essential to improve the quality of the overall environment for people and ecosystems in South Central Texas and the Coastal Bend.

Cities are excellent laboratories for innovative water management strategies to address their specific water needs, infrastructure to deliver drinking water and wastewater systems to manage and recycle the waste. A One Water approach would add a component of working with downstream partners to ensure there are no unintended consequences to a city's water management efforts. While cities might be employing all the best management practices within its city limits, what happens outside of the city limits due to those practices is also important.

"Every river authority is unique in how it develops and delivers services and stewardship," Pence commented. "GBRA firmly believes the One Water collaborative approach of holistically managing the water within a specific geography is the best roadmap to a sustainable future, which will include several million new neighbors in the decades to come."

Two wild whooping cranes seek refuge in the marshes of San Antonio Bay.



An Educational Journey through the Guadalupe River Basin

For more than 25 years, GBRA has led students on a “journey through the Guadalupe River Basin.” What began as a printed fourth-grade social studies lesson distributed to schools in the Guadalupe River Basin soon grew into multi-level educational programs, hands-on lessons, in-class presentations and outdoor classrooms.

“The original Journey through the Guadalupe River Basin student workbook was similar to a comic book for fourth graders,” said Cinde Thomas-Jimenez, GBRA environmental education administrator. “Initially, it focused only on Texas history and geography. Later a science component was added to accommodate what was being tested on the State of Texas Assessments of Academic Readiness (STAAR) test,” she continued. “We also added classroom labs and a detailed teacher’s guide.”

Hoffmann Lane Elementary students walk across the Canyon Lake Gorge where they learn about water and erosion over millions of years.

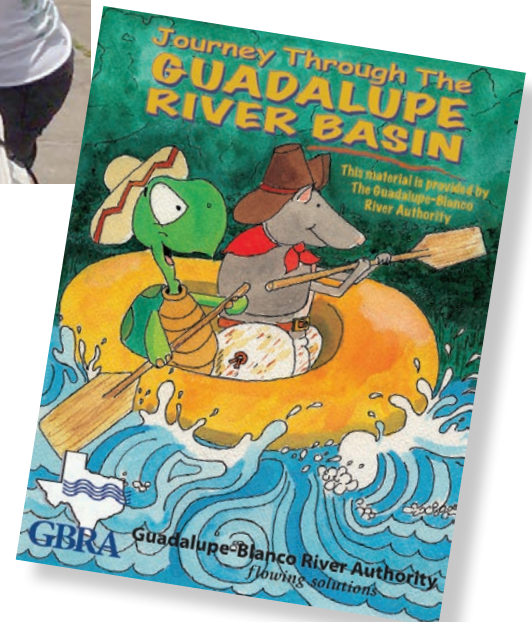




Photo courtesy of Oklahoma State University

LEFT – Example of a stream table used to teach students about river systems.

BELOW – Journey Through the Guadalupe River Basin workbook teaches students about the geographic characteristics of the Guadalupe River, water quality and conservation.



Each school year more than 13,000 students learn about the geographic characteristics of the Guadalupe River, the many uses of the water as well as the importance of water quality and conservation through GBRA's educational outreach. Thomas-Jimenez leads the effort to provide schools in GBRA's 10-county basin with curriculum and programs created to stimulate interest.

Thomas-Jimenez explains the additions are correlations to the Texas Essential Knowledge and Skills (TEKS) which are statewide learning objectives based on subject and grade level. She explains having a TEKS-based curriculum assists students in gaining the skills needed to do well on the State of Texas Assessments of Academic Readiness or STAAR test. The educational materials, distributed to science teachers in the basin, target second, fourth and

middle school students. In an effort to keep materials relevant, GBRA is looking at incorporating more tech-based learning tools.

"We developed a new program called Story Map for the Journey. It's online and interactive for students and teachers," Thomas-Jimenez said. "A story map replaces teachers' use of PowerPoint. Students can access the program at a computer workstation or on other devices and individually connect with the content."

The GBRA Education Department plans to enhance its hands-on learning with the future development of a stream table trailer that enables students to build their own river system to include headwaters, tributaries, hills, valleys and floodplains. Students will gain a comprehensive look at erosion, transportation and deposition of sediment in a river system and how they contribute to the building of deltas at the bay.

Another popular program is the Outdoor Classrooms at the Canyon Lake Gorge. "Across the entire state, students are struggling with anything earth science based. This is one of the reasons why the outdoor classrooms at the Gorge are valuable," Thomas-Jimenez said. "It's key to build relationships with curriculum staff in order to target the needs of the district."

A combination of active and passive learning engages students across all learning styles. Through GBRA's educational programs, students will gain an awareness of and develop an appreciation for water and the natural resources in the basin.



The Canyon Lake Gorge was formed after 34 inches of rain fell in the upper watershed of the Guadalupe River 2002. The historic floodwater sliced open the ground creating this 64-acre gorge and revealing 110-million-year-old cretaceous limestone, fossils and dinosaur footprints.



Safeguarding the Texas Landscape

This conservation easement in Sisterdale preserves a working ranch and contains pristine riparian habitat along the Guadalupe River.

Lizards scurry, butterflies and birds rise out of the underbrush as a 4X4 hums along its path. This is part of a typical day for the Guadalupe-Blanco River Trust (GBRT) staff. They routinely drink in the sights and sounds of the Texas landscape and fill their lungs with crisp, fresh country air as they survey a potential conservation easement or conduct an annual site visit. Staff traverse the land, document features and navigate the terrain with landowners.

“The relationship GBRT shares with landowners is special,” said Carrie Kasnicka, executive director of GBRT. “Building relationships is my favorite part of this job. Our annual site visits typically start with a handshake and end with a hug.”

GBRT assists landowners in preserving their property for future generations. The nonprofit was founded by the Guadalupe-Blanco River Authority in 2001, and now protects 15,000 acres for conservation purposes.

“Conservation easements are legal, voluntary agreements,” Kasnicka explained. “Our goal is to protect land and water resources within the Guadalupe River Basin. Protecting open spaces, working ranches, wildlife habitat and improving water quality is our priority.”

Identifying those areas in the basin is one of GBRT’s goals outlined in its five-year plan expected to be completed in early 2019. Another goal is to develop additional funding sources to aid in the organization’s mission. Recently, GBRT was awarded a \$250,000 trails grant for the Plum Creek Wetlands Preserve in Caldwell County.

According to Texas Land Trends, Texas leads the nation in the conversion of agricultural lands to urban development due to population



growth and increasing property values. Both drivers motivate some landowners to seek out land trusts to protect their agricultural and natural spaces.

“It is an honor to play a role in conservation. We want to protect this fantastic place,” Kasnicka said. “From the karst features of the Hill Country to the wetland habitat of the Coastal Bend, Texas is one of the most diverse and beautiful places in the country.”

Meeting the Test

GBRA's Lab cultivates its capabilities and capacity

In 1974, the Guadalupe-Blanco River Authority opened a laboratory on a small and limited scale to support and ensure its rural wastewater treatment plants meet permit discharge regulations. Forty-four years later, the GBRA laboratory—one of the first for a river authority in Texas—has grown into a full-service environmental testing center serving the entire 10-county Guadalupe River Basin and beyond.

In the mid-1980s, the lab developed a water quality index for the Guadalupe River Basin to establish a historical perspective of the health and safety of the water. This milestone in water quality testing led to the first routine monitoring program on the Guadalupe River and its tributaries. The initial sites monitored included Canyon Reservoir, the Guadalupe River at 2nd Crossing in Comal County, Lake Dunlap, the San Marcos River at Luling, Coletto Creek Reservoir and the Guadalupe River at the saltwater barrier. Additional sites at Lake McQueeney, Comal River at Hinman Island, Guadalupe River above Cuero and San Antonio River above the Guadalupe confluence have since been added.

The next decade brought the GBRA lab's participation in the state's Clean Rivers Program. The program provided funding to river authorities in Texas to expand monitoring programs to collect and analyze more data. This allowed GBRA to establish monitoring locations at sites above Canyon Reservoir, the Blanco River and small tributaries such as Plum, Peach and Geronimo Creeks.

BELOW - Laboratory technicians routinely test for alkalinity in river water.



LEFT - A lab technician tests pH levels in a water sample from one of GBRA's water treatment plants to ensure its safety.



GBRA laboratory staff possess a wide range of educational degrees—from biology and environmental science to chemical engineering and epidemiology—to provide an advanced perspective on ecosystem conditions.

Today, the GBRA lab is a certified drinking water laboratory that has adopted the rigorous National Environmental Laboratory Accreditation Program (NELAP) standards. These certifications allow GBRA and lab customers to attain permit compliance for water quality in a river and its tributaries, drinking water supplies and wastewater effluent discharges.

“The GBRA lab has been recognized by the Texas Commission on Environmental Quality (TCEQ) for its quality work achieved by adhering to strict NELAP Institute laboratory standards,” said Dr. Raymond Casteline, GBRA regional lab director. “In fact, TCEQ uses GBRA’s data when it is evaluating new discharge permit requests to ensure the rivers in the GBRA basin remain at a high water quality level. And GBRA uses the information to let the public know about water quality in the river as it pertains to recreation.”

Over the years, the laboratory has grown its capacity and technological capabilities to handle more testing requests outside of GBRA’s requirements. Governmental agencies, engineering firms, corporations and utilities all rely on the water testing services the GBRA lab provides. On average, the GBRA processes almost 12,000 water quality samples each year to help organizations understand a wide range of parameters important for healthy ecosystems, water and public health.

The GBRA lab is one of the few river authority laboratories to offer water testing services to the public. Citizens may bring in samples from their wells or faucets to learn about the quality of their drinking water.

Perhaps the most unique aspect of the GBRA laboratory is the diversity of skills and educational backgrounds of the staff itself. In addition to the standard biology and environmental science degrees possessed by technicians in most labs, various GBRA lab staff members have earned degrees in zoology, microbiology, epidemiology, chemistry, business management and chemical engineering. That broad academic training helps GBRA provide its partners with not only technologically sound laboratory capabilities, but an advanced perspective on ecosystem conditions as well.

“Building collaborative relationships with all of the organizations we work with is very important to the success of the GBRA lab,” Casteline commented. “We understand that our sampling and lab analysis helps them meet permit requirements and ensure that they are serving their own customers at a high level. And that’s a satisfying feeling to know the GBRA lab contributes to many communities’ quality of life in a meaningful way.”

Quick Facts

Established by the Texas Legislature, the GBRA was first created in 1933 under Section 59, Article 16 of the Constitution of Texas as a water conservation and reclamation district and a public corporation called the Guadalupe River Authority. In 1935, the authority was reauthorized by an act of the Texas Legislature (VCS Art. 8280-106) as the Guadalupe-Blanco River Authority (GBRA).

Key Functions

GBRA's main functions are providing utility services and operations to communities and customers throughout the Guadalupe River Basin for the benefit of the environment and people. Specific utilities include development and sale of regional raw water supplies, public water-supply treatment and distribution, wastewater services collection and treatment, cooling reservoir operation and hydroelectric power generation. Additionally, GBRA offers water and wastewater project planning and development, recreational opportunities, educational curriculum, laboratory services and nonprofit support.

POPULATION OF DISTRICT:
763,688¹

AREA OF DISTRICT:
7,300 square miles

AVERAGE ANNUAL RAINFALL OF DISTRICT:
33.02 inches¹

NUMBER OF EMPLOYEES:
165

Mission

The Guadalupe-Blanco River Authority supports responsible watershed protection and stewardship, provides quality operational service and promotes conservation and educational opportunities in order to enhance quality of life for those we serve.

Offices

Administrative Office
Seguin, TX

**Buda Wastewater
Treatment Plant (WTP)**
Buda, TX

**Calhoun Canal, Port Lavaca WTP,
Calhoun County
Rural Water**
Port Lavaca, TX

Coleto Creek Park and Reservoir
Fannin, TX

**Hydroelectric Divisions,
Rural Utilities, Water Sales
and Laboratory**
Seguin, TX

Lake Wood Recreation Area
Gonzales, TX

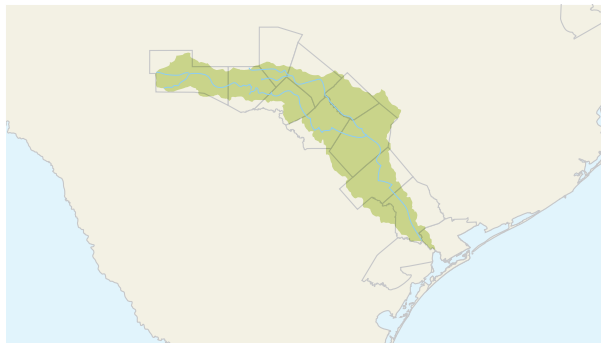
**Lockhart Wastewater Reclamation
System and Lockhart WTP**
Lockhart, TX

Luling WTP
Luling, TX

San Marcos WTP
San Marcos, TX

**Western Canyon Division &
Canyon Lake Office**
Canyon Lake, TX

GBRA Service Area Map



GBRA provides stewardship for the water resources in a 10-county statutory district beginning near the headwaters of the Guadalupe and Blanco Rivers, ends at San Antonio Bay, and includes Kendall, Comal, Hays, Caldwell, Guadalupe, Gonzales, DeWitt, Victoria, Calhoun and Refugio counties.

Rivers

GUADALUPE

Total River Miles: 431.6

Average Discharge: 1.42 million acre feet/year

BLANCO

Total River Miles: 89.8

Average Discharge: 110,100 acre feet/year

SAN MARCOS

Total River Miles: 74.2

Average Discharge: 259,400 acre feet/year

COMAL

Total River Miles: 2.0

Average Discharge: 219,800 acre feet/year

**GBRA Hydroelectric Plant
in Gonzales, TX.**

Dams and Reservoirs

CANYON

Conservation Pool

Capacity: 386,210 acre feet

Surface Area: 8,240 acres

Elevation: 909.0 feet mean sea level

Flood Control Pool

Capacity: 346,400 acre feet

Surface Area: 12,890 acres

Elevation: 943.0 feet mean sea level

COLETO CREEK

Capacity: 35,084 acre feet

Surface Area: 3,100 acres

Elevation: 98.0 feet mean sea level

DUNLAP

Capacity: 5,900 acre feet

Surface Area: 410 acres

MCQUEENEY

Capacity: 5,050 acre feet

Surface Area: 400 acres

LAKE PLACID (TP-4)

Capacity: 2,624 acre feet

Surface Area: 248 acres

MEADOW LAKE

Capacity: 1,550 acre feet

Surface Area: 153 acres

LAKE GONZALES (H-4)

Capacity: 6,500 acre feet

Surface Area: 696 acres

LAKE WOOD (H-5)

Capacity: 4,000 acre feet

Surface Area: 488 acres

LOWER GUADALUPE DIVERSION DAM AND SALTWATER BARRIER

Capacity: 600 acre feet

Surface Area: 100 acres





Clarifiers at the San Marcos Water Treatment Plant are used in the water treatment process to settle coagulant and dirt in raw river water. The clear water then travels through troughs to the filtration and disinfection process before being pumped to the city of San Marcos.

Hydroelectric Generation

CANYON

Average Kwh Produced: 14,318,834

GUADALUPE VALLEY

Average Kwh Produced: 62,225,000
(Dunlap, McQueeney, Placid, Meadow in Guadalupe County and Gonzales, Wood in Gonzales County)

Water Treatment

Calhoun County Rural Water Supply Corporation
Comal Trace Water Distribution System
Cordillera Water Distribution System
Johnson Ranch Water Distribution System
Lockhart Water Treatment Plant
Luling Water Treatment Plant
Port Lavaca Water Treatment Plant
San Marcos Water Treatment Plant
Western Canyon Regional Water Treatment Plant

Wastewater Treatment

Buda Wastewater Treatment Plant
Bulverde Singing Hills Wastewater Treatment Plant
Canyon Park Wastewater Treatment Plant
Cordillera Wastewater Treatment Plant
Crestview Wastewater Treatment Plant
Dunlap Wastewater Treatment Plant
Johnson Ranch Wastewater Treatment Plant
Lockhart Wastewater Treatment Plant
Northcliffe Wastewater Treatment Plant
Park Village Wastewater Treatment Plant
4S Ranch Wastewater Treatment Plant
Shadow Creek Wastewater Treatment Plant
Sunfield Wastewater Treatment Plant

¹ Texas Almanac and Bureau of Census



GUADALUPE-BLANCO RIVER AUTHORITY

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