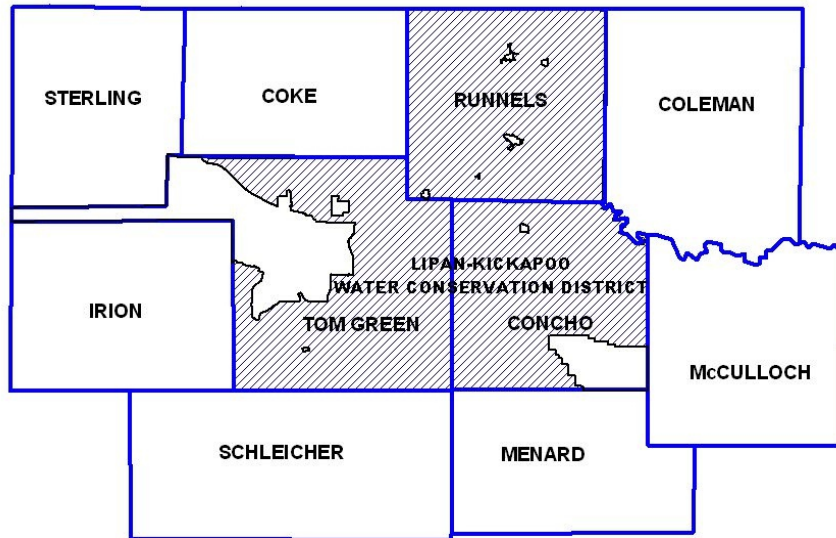


LIPAN-KICKAPOO WATER CONSERVATION DISTRICT



GROUNDWATER MANAGEMENT PLAN

2023-2028

Adopted March 8, 2023

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LIPAN-KICKAPOO WATER CONSERVATION DISTRICT

MANAGEMENT PLAN — 2023-2028

The Lipan-Kickapoo Water Conservation District (the “District”) was created by the 70th Texas Legislature under the authority of Section 59, Article XVI, of the Texas Constitution, and in accordance with Chapter 51 and 52 of the Texas Water Code (“Water Code”) as recorded in Section 4, Chapter 439, Acts of the 70th Legislature, Regular Session, 1987. In 1995, by Acts of the 74th Legislature, Chapter 52 of the Water Code was repealed and replaced with Chapter 36 of the Water Code effective September 1, 1995. In 2009, by Acts of the 81st Legislature, the enabling legislation for the District was renotified in Texas Special District Local Laws Code Ann. ch. 8805 Lipan-Kickapoo Water Conservation District.

The District is a governmental agency and a body politic and corporate. The District was created “to provide for the conservation, preservation, protection, recharge, and prevention of waste and pollution of the district’s groundwater and surface water” consistent with the objectives set forth in Section 59, Article XVI, of the Texas Constitution, and Chapter 36, Water Code. The District is composed of the territory described by Section 4, Chapter 439, Acts of the 70th Legislature, Regular Session, 1987, and as that territory has been modified under Chapter 36, Water Code, or other law.

DISTRICT MISSION

The mission of the Lipan-Kickapoo Water Conservation District is to develop, promote and implement water conservation and management strategies to:

- a) conserve, preserve, and protect the groundwater supplies of the District,
- b) protect and enhance recharge,
- c) prevent waste and pollution, and
- d) to effect the efficient, beneficial and wise use of water for the benefit of the citizens and economy of the District.

The District seeks to protect the groundwater quality and quantity within the District, pursuant to the powers and duties granted under Chapter 36, Subchapter D of the Texas Water Code. Any action taken by the District shall only be after full consideration and respect has been afforded to the individual property rights of all citizens of the District.

TIME PERIOD FOR THIS PLAN

This plan becomes effective upon adoption by the Board of Directors and approval by the Texas Water Development Board executive administrator. The plan remains in effect for five years after TWDB approval, or until such time as a revised or amended plan is approved.

STATEMENT OF GUIDING PRINCIPLES

The District recognizes that its groundwater resources are of utmost importance to the economy and environment, first to the residents of the District and then to the region. Also recognized is the importance of understanding the aquifers and aquifer characteristics for proper management of these resources. In addition, the integrity and ownership of groundwater play an important role in the management of this precious resource. One of the primary goals of the District is to preserve the integrity of the groundwater in the district from all potential contamination sources. This is accomplished as the District sets objectives to provide for the conservation, preservation, protection, recharge, prevention of waste and pollution, and efficient use of water including:

- Acquiring, understanding and beneficially employing scientific data on the District's aquifers and their hydro geologic qualities and identifying the extent and location of water supplies within the District, for the purpose of developing sound management procedures;
- Protecting the private property rights of landowners by ensuring that landowners continue to have an adequate groundwater supply underlying their land;
- Promulgating rules for permitting and regulation of spacing, production, reporting, and transportation of groundwater resources in the District to protect the quantity and quality of the resource;
- Declaring temporary moratoriums on the drilling of wells and limiting the production of wells during times of drought;
- Educating the public and managing for the conservation and beneficial use of the water and to prevent pollution of groundwater resources;
- Cooperating and coordinating with other groundwater conservation districts with which the District shares aquifer resources.

Guidance to achieve these objectives comes from the locally elected board members who understand the local conditions and who try to manage the groundwater resources for the benefit of all the citizens of the district and region.

GENERAL DESCRIPTION OF THE DISTRICT

History

The primary concern of the residents of this area of the State regarding groundwater is the potential contamination of the groundwater from leaking oil and gas wells. For this reason, the residents introduced legislation in the 70th Regular Legislative Session (1987) for creation of the District. In November 1987, the residents confirmed the district and also voted to fund the district operations through local property taxes. It became an active district on November 1, 1988. On January 2, 1989, the district adopted a 10-year Management Plan and in February 1989 adopted Rules and By-Laws which became effective March 6, 1989. In May 2001, in response to a petition submitted to the District to annex territory located outside the District in Runnels, Concho, and Tom Green counties, an election was held and the residents in this territory voted to join the District and to help fund the District through local property taxes.

The District is governed by a seven member locally elected Board of Directors - two members from Concho County and two members from Runnels County are elected in one election, and

two members from Tom Green County and one member-at-large from the District as a whole are elected in another. Elections are held every two years. By having a local board of directors, the District is very responsive to voters' approval or disapproval of the local management of their groundwater and/or the services provided by the District.

Location and Extent

The Lipan-Kickapoo WCD has an areal extent of approximately 2,262,464 acres or 3,535 square miles and is located in the center of the State of Texas. The USGS geographic center of Texas monument is located within the District and is approximately 13 miles southeast of Vancourt, Texas where the District office is located.

The District's economy is based primarily on agriculture with some oil and gas production. The agricultural income is derived primarily from cotton, grain sorghum, wheat, corn, alfalfa as well as sheep, goats, and beef cattle production. Income is also obtained from cattle and sheep feedlots and dairies. Recreational hunting leases also contribute to the income of the area.

The boundaries of the water district generally include: Part of Tom Green, Runnels, and Concho counties not currently within the boundaries of the Hickory Underground Water Conservation District. The cities/towns of Winters, Ballinger, Rowena, Miles, Paint Rock, San Angelo, Christoval, Grape Creek, the Red Creek Municipal Utility District, and the area northwest of San Angelo north of the Middle Concho River and south and west of US Highway 87 north to the Coke County line are excluded from the district (Fig. 1). Most of the towns and cities within these counties were excluded because they get their water supply from surface water that belongs to and is regulated by the state. Therefore, there are no major municipalities within the District boundaries.

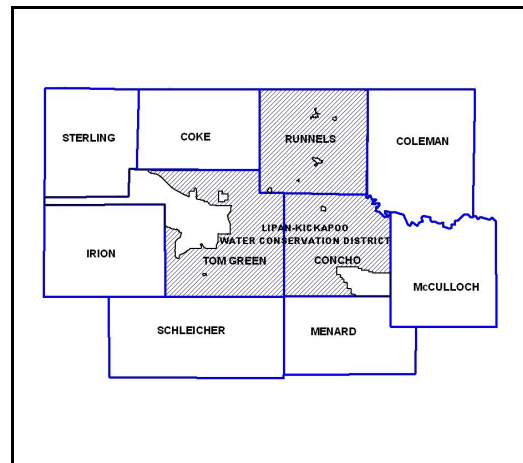


Figure 1. Location of the Lipan-Kickapoo Water Conservation District showing excluded areas.

Tom Green County

The largest single land use in the county is agriculture with a total of 1,114,721 acres of which 230,869 acres is crop or farm land and the balance of 883,852 acres is range land.¹ The crop land is located primarily in the center of the county over the Lipan aquifer while the range land is located on the north, west, and south portions of the county over the Edwards aquifer. Irrigation covers approximately 63,322 acres of the county's crop land.² Pivot irrigation systems have been the primary method of applying irrigation water, but in the last few years a considerable number

¹ U.S. Consolidated Farm Services Agency in San Angelo, TX - 2022 Acreage Report.

² [Nass.usda.gov/Publications/AgCensus/2017/online_Resources/County_Profiles/Texas/cp48095](https://nass.usda.gov/Publications/AgCensus/2017/online_Resources/County_Profiles/Texas/cp48095)

of drip irrigation systems have been installed replacing other methods of irrigation.

Concho County

The largest single land use in the county is agriculture with a total of 560,997 acres of which 109,394 acres is crop or farm land and the balance of 451,602 acres is range land. The crop land is located primarily in the west central portion of the county over the Lipan aquifer while the range land is located on the north, east, and south portions of the county over the Edwards and Hickory aquifers. Irrigation covers approximately 4,265 acres of the county's crop land. The principle method of irrigation is through pivot irrigation systems with some drip irrigation

Runnels County

The largest single land use in the county is agriculture with a total of 672,304 acres of which 255,476 acres is crop or farm land and the balance of 416,828 acres is range land. The crop land is located primarily in the west central and southwestern portion of the county over the Lipan aquifer while the range land is located on the north and east portions of the county. Irrigation covers approximately 5,363 acres of the county's crop land. The principle methods of irrigation are center pivot, drip irrigation and some furrow irrigation

Overall land use in the District is for agricultural purposes of which approximately 595,739 acres are crop or farm land and 1,752,282 acres are range land. The crop land is located primarily in the central portion of the District over the Lipan aquifer while the range land is located along the boundaries of the District over the Edwards-Trinity and Hickory aquifers. Irrigation covers approximately 73,150 acres of the District's crop land. The principle method of irrigation is center pivot irrigation, drip irrigation with some furrow irrigation remaining.

Topography and Drainage

The District lies within the Colorado River Basin with much of the area known as the Concho Valley of Texas. Two major rivers, the Colorado-with its headwaters beginning on the South Plains and the Concho-with its headwaters located in the counties to the north, west, and south of Tom Green county, traverse the District and converge at the O.H. Ivie Reservoir on the Concho-Runnels-Coleman County lines. There are numerous creeks which are tributaries of these two rivers. Drainage is generally in an eastward direction. Springs flowing from the Edwards-Trinity aquifer form the headwaters of the South Concho river, Lipan Creek, and the Kickapoo Creek. Topographically, the District consists of the Lipan Flats in the center of the District southeast of the city of San Angelo to rolling plains in the remainder of the District in Concho, Runnels, and Tom Green Counties.

²nass.usda.gov/Publications/AgCensus/2017/online_Rsources/County_Profiles/Texascp48395

REGIONAL COOPERATION AND COORDINATION

West Texas Regional Groundwater Alliance

The District is a member of the West Texas Regional Groundwater Alliance (WTRGA). This regional alliance consists of eighteen (18) locally created and locally funded districts that encompass a little less than twenty (19.9) million acres or thirty-one thousand ten (31,010) square miles of West Texas (Fig 2). To put this in perspective, this area is larger than many individual states including Rhode Island (1,045 sq mi), Delaware (1,954 sq mi), Puerto Rico (3,425 sq mi), Connecticut (4,845 sq mi), Hawaii (6,423 sq mi), New Jersey (7,417 sq mi), Massachusetts (7,840 sq mi), New Hampshire (8,968 sq mi), Vermont (9,250 sq mi), Maryland (9,774 sq mi), and West Virginia (24, 230 sq mi). This West Texas region is as diverse as the State of Texas. Due to the diversity of this region, each member district provides it’s own unique programs to best serve its constituents.

In May of 1988, four (4) groundwater districts; Coke County UWCD, Glasscock County UWCD, Irion County WCD, and Sterling County UWCD adopted the original Cooperative Agreement. As new districts were created, they too adopted the Cooperative Agreement. In the fall of 1996, the original Cooperative Agreement was redrafted and the West Texas Regional Groundwater Alliance was created. The current member districts and the year they joined the Alliance are:

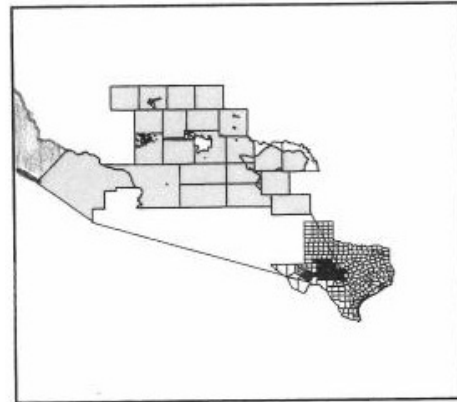


Figure 2. Territory in the West Texas Regional Alliance.

Coke County UWCD	(1988)	Crockett County GCD	(1992)	Glasscock GCD	(1988)
Hickory UWCD # 1	(1997)	Hill Country UWCD	(2005)	Irion County WCD	(1988)
Kimble GCD	(2004)	Lipan-Kickapoo WCD	(1989)	Lone Wolf GCD	(2002)
Menard County UWD	(2000)	Middle Pecos GCD	(2005)	Permian Basin UWCD	(2006)
Plateau UWC & SD	(1991)	Santa Rita UWCD	(1990)	Sterling County UWCD	(1988)
Sutton County UWCD	(1991)	Wes-Tex GCD	(2005)	Reeves County UWCD	(2020)

This Alliance was created for local districts to coordinate and implement common objectives to facilitate the conservation, preservation, and beneficial use of water and related resources in this region of the State, to exchange information among the districts, and to educate the public about regional water issues. Local districts monitor the water-related activities that include but are not limited to farming, ranching, oil & gas production, and municipal water use. The Alliance coordinates management activities of the member districts primarily through exchange of information and policy discussions.

Regional Water Planning

The District has been active in the Region F, Regional Water Planning Group Meetings to provide input in developing and adopting the 2001, 2006, 2011, 2016 and 2021 Regional plans. As the Regional Planning Group moves toward adopting future Regional Plans the District will continue to participate in the planning process.

PURPOSE OF GROUNDWATER MANAGEMENT PLAN

The 75th Texas Legislature in 1997 enacted Senate Bill 1 (“SB 1”) to establish a comprehensive statewide water planning process. In particular, SB 1 contained provisions that required groundwater conservation districts to prepare management plans to identify the water supply resources and water demands that will shape the decisions of each district. SB 1 designed the management plans to include management goals for each district to manage and conserve the groundwater resources within their boundaries. In 2001, the Texas Legislature enacted Senate Bill 2 (“SB 2”) to build on the planning requirements of SB 1 and to further clarify the actions necessary for districts to manage and conserve the groundwater resources of the state of Texas.

The Texas Legislature enacted significant changes to the management of groundwater resources in Texas with the passage of House Bill 1763 (HB 1763) in 2005. HB 1763 created a long-term planning process in which groundwater conservation districts (GCDs) in each Groundwater Management Area (GMA) are required to meet and determine the Desired Future Conditions (DFCs) for the groundwater resources within their boundaries by September 1, 2010. In addition, HB 1763 required GCDs, to share management plans with the other GCDs in the GMA for review by the other GCDs.

The Lipan-Kickapoo Water Conservation District’s management plan satisfies the statutory requirements of Chapter 36 of the Texas Water Code, and the administrative requirements of the Texas Water Development Board (TWDB).

GROUNDWATER RESOURCES ³

Lipan Aquifer - Report 345, “Aquifers of Texas”

http://www.twdb.texas.gov/publications/reports/numbered_reports/doc/R345/Report345.asp

The Lipan aquifer is located in the Lipan Flats of eastern Tom Green, western Concho, and southern Runnels counties. In 1995, the TWDB in Report 345, “Aquifers of Texas”, defined the Lipan Aquifer and its boundaries. The aquifer was located primarily in Tom Green County with parts of the aquifer located in Runnels and Concho Counties.

³ All estimates of groundwater availability, usage, supplies, recharge, storage, and future demands are from data supplied by the Texas Water Development Board, unless otherwise noted. Data sources include Region F-2017 State Water Plan.

Then in 2011, the TWDB in Report 380, “Aquifers of Texas”,
http://www.twdb.texas.gov/publications/reports/numbered_reports/doc/R380_AquifersofTexas.pdf,

expanded the boundaries of the Lipan Aquifer to include all of the alluvium along the rivers and creeks. Water from the aquifer is principally used for irrigation, with limited amounts used for rural domestic and livestock needs. The typical irrigation practice in the area is to pump water held in storage in the aquifer during the growing season with the expectation of recharge of the aquifer during the winter months. This aquifer has been declared not relevant for planning purposes by GMA 7.

Edwards-Trinity (Plateau) Aquifer - Report 380, “Aquifers of Texas”

The Edwards-Trinity (Plateau) aquifer is a major aquifer, but only a minor source of groundwater in the southern part of Concho county and the northern and southern parts of Tom Green county. Since there is very limited amounts of groundwater available from this aquifer within the District, it is used primarily for livestock and domestic needs. It has been declared not relevant for planning purposes within the boundaries of the District by GMA 7.

Hickory Aquifer - Report 380, “Aquifers of Texas”

Underlying the Edwards-Trinity (Plateau) aquifer in the southeastern part of Concho county is a down-dip portion of the Hickory aquifer. Water in the Hickory in Concho county and within the boundaries of the Lipan-Kickapoo WCD is known to be very saline. The water quality varies and the extent of radioactivity within the Hickory aquifer within the District, which is known to exist in other parts of the aquifer, is not yet known. There are 13 acre feet/per year for each of the decades from 2020-2070.

TECHNICAL DISTRICT INFORMATION REQUIRED BY TEXAS ADMINISTRATIVE CODE

ESTIMATE OF MODELED AVAILABLE GROUNDWATER IN DISTRICT BASED ON DESIRED FUTURE CONDITIONS

Estimate of Modeled Available Groundwater in District Based on Desired Future Conditions
Texas Water Code § 36.001 defines modeled available groundwater as “the amount of water that the executive administrator determines may be produced on an average annual basis to achieve a desired future condition established under Section 36.108.”

As required by §36.108, Texas Water Code, district representatives of all of the groundwater districts within the same GMA shall meet at least annually to conduct joint planning. The District is a member of GMA 7 along with 20 other groundwater districts. Following the adoption of DFCs for the aquifers within the GMA, the DFCs were forwarded to the TWDB for development of the MAG calculations. Summaries of the DFC’s and MAGs can be found here:

https://www.twdb.texas.gov/groundwater/management_areas/gma7.asp

On September 22, 2016, GMA 7 determined and declared the Lipan Aquifer, and the portions of the Edwards Trinity Aquifer within the boundaries of the Lipan-Kickapoo Water Conservation District as not relevant for joint planning purposes within GMA 7.

Modeled Available Groundwater in the District.

There are 13 acre feet/per year available for use for each of the decades from 2020 - 2070 in the Hickory Aquifer within the boundaries of the Lipan-Kickapoo Water Conservation District..

Estimated Historical Groundwater Use within the District

Please refer to Appendix A.

Annual Amount of Recharge From Precipitation to the Groundwater Resources within the District

Please refer to Appendix B, page 8.

Annual Volume of Water that Discharges from the Aquifer to Springs and Surface Water Bodies

Please refer to Appendix B, page 8.

Estimate of the Annual Volume of Flow into the District, out of the District, and Between Aquifers in the District

Please refer to Appendix B, page 8.

Projected Surface Water Supply within the District

Please refer to Appendix A, page 6.

Projected Total Demand for Water within the District

Please refer to Appendix A, page 9.

Projected Water Supply Needs

Projected water supply needs in the TWDB estimated historical water use/2022 state water plan data packet (Appendix A) are primarily irrigational. Municipal needs in Concho County, exist for the following water user group. (WUG)s: Millerview-Doole WSC and Concho County. Municipal needs for Runnels County, exist for the following water user groups (WUG): Ballinger, Coleman County SUD, Millersview-Doole WSC, North Runnels WSC, Winters, and Runnels County. Municipal needs in Tom Green County, exist for the following water user groups (WUG): Concho Rural Water, Millersview-Doole WSC, San Angelo, and Tom Green County Please refer to Appendix A, page 11.

Projected Water Management Strategies

Projected water management strategies listed in the TWDB estimated historical water use/2022, state water plan date packet and located within Concho County are: Municipal Conservation, Subordination-San Angelo, Irrigation Conservation-high volume strategy is 539 acre feet by 2070, Subordination-OH Ivie, Millersview-Doole WSC, and Mining Conservation. Runnels County are: Municipal conservation, Subordination-Ballinger, subordination - OH Ivie, Hords Creek, Lake Coleman, San Angelo,, Winters, Winters Lake, Municipal Conservation = Runnels, Miles, Millersview-Doole WSC, North Runnels WSC, and Winters, Concho River Water Project, Mining Conservation, BRA System Operations, and West Texas Water Partnership. Tom Green County: Concho River Water Project, Municipal Conservation: Concho Rural WSC, Dads Supported Living Center, Goodfellow Air Force Base, Millersview Doole WSC, San Angelo and Tom Green County FWSD3, Irrigation Conservation, Mining Conservation, Brush Control, Hickory Well Field Expansion and West Texas Water Partnership. Subordination: San Angelo System Mountain Creek Reservoir, O.H. Ivie Non System Portion. Total high volume strategy is 28,910 by 2070. Please refer to Appendix A.

Methodology to Track District Progress in Achieving Management Goals

In order to achieve management goals, District Activity Reports are presented at every regular meeting of the Board of Directors as a part of the Manager's Report. These reports include district highlights, meetings attended, field/lab activities, office activities, water management activities, and other miscellaneous activities that have taken place in the District since the last meeting. Reflected in these reports are the number of water level monitor wells, the number of wells registered, the number of permits issued, the number of rain gauges in the monitor network, the number of water samples collected and analyzed, the number of wasteful practices and contamination investigations, and other matters of district importance.

MANAGEMENT OF GROUNDWATER SUPPLIES, AND ACTIONS, PROCEDURES, PERFORMANCE AND AVOIDANCE NECESSARY TO EFFECTUATE THE MANAGEMENT PLAN

The District will implement the provisions of this plan and will utilize the provisions of this plan as a guide for determining the direction and/or priority for District activities. All operations of the District will be consistent with the provisions of this plan.

The District adopted its first set of rules in 1989 and amended the rules in 2000, 2006, 2007 and may amend the rules as necessary. Rules adopted or amended by the District shall be pursuant to TWC Chapter 36 and the provisions of this plan to ensure the best management of the groundwater within the District. The development and enforcement of the rules of the District has been, and will continue to be, based on the best scientific and technical evidence available to the District. The rules are available at: <http://lipan-kickapoo.org/rules.html>

These rules are used by the District in the exercise of the powers conferred on the District by law and in the accomplishment of the purposes of the law creating the District. These rules may be used as guides in the exercise of discretion, where discretion is vested. However, under no circumstances and in no particular case will they or any part therein, be construed as a limitation

or restriction upon the District to exercise powers, duties and jurisdiction conferred by law. These rules create no rights or privileges in any person or water well, and shall not be construed to bind the Board in any manner in its promulgation of the District Management Plan, or amendments to these rules.

The District shall treat all citizens with equality. For good cause, the District, in its discretion, and after notice and hearing, if required, may grant an exception to the District rules. In doing so, the Board shall consider the potential for adverse effects on adjacent owners and aquifer conditions. The exercise of said discretion by the Board shall not be construed as limiting the power of the Board.

The District maintains a website <http://www.lipan-kickapoo.org/> that is updated weekly. This site contains information on: District activities, forms, rules, hearing procedures, board meetings and hearings agendas, District programs, Chapter 36-Texas Water Code, Texas Water Well Drillers and Pump Installers Rules, Rules-Quick Reference Chart for the member districts of the West Texas Regional Groundwater Alliance (WTRGA) and other pertinent information.

The District has encouraged and will continue to encourage public cooperation and coordination in the implementation of the management plan for the District, as it is amended. All operations and activities of the District have been and will be performed in a manner that best encourages cooperation with the appropriate state, regional or local water entity. The meetings of the Board of the District are noticed and conducted at all times in accordance with the Texas Open Meetings Law. The District also makes available for public inspection all official documents, reports, records and minutes of the District pursuant with the Texas Public Information Act and will continue to do so in the future.

COORDINATION WITH SURFACE WATER ENTITIES

Only the Tom Green County Water Control and Improvement District #1, a federally owned surface water irrigation district, is located within the boundaries of the LKWCD. However, several reservoirs are located either in the District, partially in the District, or adjacent to it. Therefore, in the spirit of cooperation, this management plan has been forwarded for comment to all surface water entities who hold water rights in these reservoirs.

GOALS, MANAGEMENT OBJECTIVES AND PERFORMANCE STANDARDS

Goal

- 1.0** Providing the Most Efficient Use of Groundwater. (*§36.1071(a)(1)*)
Gather groundwater data both to improve the understanding of the aquifers and their hydro geologic properties and to quantify this resource for prudent planning and efficient use.

Management Objective

1.1 Each year measure, record, and accumulate a historic record of static water levels in approximately 70 wells. These wells are privately owned by landowners within the district. We will measure these wells quarterly.

Performance Standards

1.1a - District will continue to maintain a water level monitoring network. (A number of wells that are measured on a regular basis as well as water quality tests performed on various wells at various times.).

1.1b - Report to Board of Directors the number of wells measured.

Goal

**2.0 Controlling and Preventing Waste of Groundwater. (§36.1071(a)(2))
Minimize potential contamination of the groundwater by monitoring the drilling and completion of wells.**

Management Objective

2.1 Each year, register all new water wells drilled in the District. The District will investigate instances of potential waste of groundwater within 72 hours of receiving complaints

Performance Standards

2.1a - District will maintain files including information on the drilling and completion of all new wells drilled within the District.

2.1b - The Staff will report to the Board of Directors as needed regarding potential waste of groundwater and include the number of investigations and newly registered wells. .

2.1 c - All instances of waste or contamination will be investigated and the proper corrective measures will be taken to fix the issue as quickly as possible.

2.1d - Random water sampling is conducted to verify that aquifer contamination is not occurring.

Goal

3.0 Addressing Conjunctive Surface Water Management Issues. (§36.1071(a)(4))

Management Objective

3.1 Each year, monitor rainfall events on the watersheds within the District that will impact surface water runoff and groundwater recharge.

Performance Standards

3.1a - District will continue to maintain a rainfall monitoring network to monitor rainfall events.

3.1b - Report to Board of Directors the total number rain gauges in the rainfall monitoring network.

Management Objective

3.2 Each year, the district will participate in the regional planning process by attending the *Region F* water planning group meetings to encourage the development of surface water supplies to meet the needs of water user groups in the district. A representative of the district will attend a minimum of 50% of the *Region F* regional water planning group meetings.

Performance Standards

3.2 a The district will, in the annual report, document the participation of district representatives in *Region F* and the number of meetings attended in the preceding calendar year. Documentation will consist of the table listing, all *Region F* meetings scheduled during the preceding 12 months.

Goal

4.0 Addressing Drought Conditions. (§36.1071(a)(6))

Management Objective

4.1 The District will monitor the TWDB Water Data for Texas website for drought and other relevant data:

<https://waterdatafortexas.org/drought/pdsi/monthly?time=2017-11>

Performance Standards

4.1a - District staff will monitor the TWDB Water Data for Texas website and maintain a link to the website on the District website for informational purposes.

4.1b - Report to Board of Directors the number of times the Water Data for Texas website was accessed.

Goal

5.0(a) Addressing Conservation. (§36.1071(a)(7))

Management Objective

5.1(a) The District will continue to be a source for available informational materials and programs to improve public awareness of efficient use, wasteful practices and conservation measures including the water conservation best management practices guide presented by the TWDB:

<https://www.twdb.texas.gov/conservation/BMPs/index.asp>

Performance Standards

5.1(a)1 - Water conservation information will be available at the District office.

5.1(a)2 - Report to the Board of Directors the number of times water conservation information was provided.

Goal

6.0(a) Addressing National Resource Issues. (§36.1071(a)(5))

Management Objective

6.1(a) - The district will monitor any wells that are contaminated and test groundwater quality samples from selected newly drilled wells and existing wells. Attend GMA 7 Meetings regularly.

Performance Standards

6.1(a)1 - Test any new wells that show signs of contamination, generally the driller can tell if the well is contaminated and send in a sample. Most contamination in this area is high Chlorides. We will then contact the Railroad Commission to rectify the problem, the well may need to be plugged.. We will also provide lab results to the board of directors for every well sampled.

6.1(a)2 - By attending the GMA7 meetings, there is the opportunity to participate in discussion, planning and education concerning the interrelationship of groundwater with other natural resource issues.

https://tpwd.texas.gov/huntwild/wild/wildlife_diversity/nongame/listed-species/

Goal

7.0(a) Addressing the Desired Future Conditions of the Aquifers. (§36.1071(a)(8))

Management Objective

7.1(a) - To achieve the desired future condition adopted by GMA 7 for the Hickory Aquifer.

Performance Standards:

7.1(a) - The district has established a monitor well in the Hickory Aquifer and is monitoring the water level and rainfall on a real time basis. A comparison of the annual water level measurement and the cumulative water level trend to the adopted Desired Future Condition will be made annually. The water levels will be included in the district database.

MANAGEMENT GOALS DETERMINED NOT-APPLICABLE

Goal 8.0 Controlling and Preventing Subsidence. (§36.1071(a)(3))

Not appropriate or cost effective. In reference to the study: “*Identification of the Vulnerability of the Major and Minor Aquifers of Texas to subsidence with regard to groundwater pumping,*” The Lipan Aquifer is at low risk of future subsidence. Ref. Page 4-162 - 4-164, figure 4.105 and Table 4.41..

<http://www.twdb.texas.gov/groundwater/models/research/subsidence/subsidence.aso>

Goal 9.0 Addressing Recharge Enhancement. (§36.1071(a)(7))

Not appropriate or cost effective. Research project “Evaluation of Groundwater Availability, Recharge, and Monitoring System Design”⁴ completed for the District by LBG-Guyton Association on January 12, 2005 indicates that water is not available for recharge to the aquifers in the District. This management goal is not applicable to the operations of the District. This is a report done for the district that is available by request.

Goal 10.0 Addressing Rainwater Harvesting. (§36.1071(a)(7))

Not appropriate or cost effective. Due to the limited amount of rainfall in the District, it is not cost effective to do large scale rainwater harvesting. Educational material and programs on rainwater harvesting are provided by the Texas Agrilife Extension Service. This management goal is not applicable to the operations of the District.

Goal 11.0 Addressing Precipitation Enhancement. (§36.1071(a)(7))

Not appropriate or cost effective. Due to poor atmospheric conditions limiting the number of clouds required for cloud seeding and the fact that some areas of the counties including the cities are not part of the District, it would not be cost effective to participate in a weather modification program. This management goal is not applicable to the operations of the District.

Goal 12.0 Addressing Brush Control. (§36.1071(a)(7))

Not appropriate or cost effective. The District recognizes the benefits of brush control through increased spring flows and the enhancement of native turf which limits runoff. However, most brush control projects are carried out and funded through the Natural Resources Conservation Service (NRCS) and educational material and programs on brush control are provided by the Texas Agrilife Extension Service. This management goal is not applicable to the operations of the District.

⁵ Evaluation of Groundwater Availability, Recharge, and Monitoring System Design, LBG-Guyton Associates, Prepared for the Lipan-Kickapoo Water Conservation District, January 12, 2005.

APPENDIX A

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Estimated Historical Groundwater Use And 2022 State Water Plan Datasets:

Lipan-Kickapoo Water Conservation District

Texas Water Development Board
Groundwater Division
Groundwater Technical Assistance Section
stephen.allen@twdb.texas.gov
(512) 463-7317
January 6, 2023

GROUNDWATER MANAGEMENT PLAN DATA:

This package of water data reports (part 1 of a 2-part package of information) is being provided to groundwater conservation districts to help them meet the requirements for approval of their five-year groundwater management plan. Each report in the package addresses a specific numbered requirement in the Texas Water Development Board's groundwater management plan checklist. The checklist can be viewed and downloaded from this web address:

<http://www.twdb.texas.gov/groundwater/docs/GCD/GMPChecklist0113.pdf>

The five reports included in this part are:

1. Estimated Historical Groundwater Use (checklist item 2)
from the TWDB Historical Water Use Survey (WUS)
2. Projected Surface Water Supplies (checklist item 6)
3. Projected Water Demands (checklist item 7)
4. Projected Water Supply Needs (checklist item 8)
5. Projected Water Management Strategies (checklist item 9)
from the 2022 Texas State Water Plan (SWP)

Part 2 of the 2-part package is the groundwater availability model (GAM) report for the District (checklist items 3 through 5). The District should have received, or will receive, this report from the Groundwater Availability Modeling Department. Questions about the GAM can be directed to Grayson Dowlearn, grayson.dowlearn@twdb.texas.gov, (512) 475-1552.

DISCLAIMER:

The data presented in this report represents the most up-to-date WUS and 2022 SWP data available as of 1/6/2023. Although it does not happen frequently, either of these datasets are subject to change pending the availability of more accurate WUS data or an amendment to the 2022 SWP. District personnel must review these datasets and correct any discrepancies in order to ensure approval of their groundwater management plan.

The WUS dataset can be verified at this web address:

<http://www.twdb.texas.gov/waterplanning/waterusesurvey/estimates/>

The 2022 SWP dataset can be verified by contacting Sabrina Anderson (sabrina.anderson@twdb.texas.gov or 512-936-0886).

The values presented in the data tables of this report are county-based. In cases where groundwater conservation districts cover only a portion of one or more counties the data values are modified with an apportioning multiplier to create new values that more accurately represent conditions within district boundaries. The multiplier used in the following formula is a land area ratio: (data value * (land area of district in county / land area of county)). For two of the four SWP tables (Projected Surface Water Supplies and Projected Water Demands) only the county-wide water user group (WUG) data values (county other, manufacturing, steam electric power, irrigation, mining and livestock) are modified using the multiplier. WUG values for municipalities, water supply corporations, and utility districts are not apportioned; instead, their full values are retained when they are located within the district and eliminated when they are located outside (we ask each district to identify these entity locations).

The remaining SWP tables (Projected Water Supply Needs and Projected Water Management Strategies) are not modified because district-specific values are not statutorily required. Each district needs only "consider" the county values in these tables.

In the WUS table every category of water use (including municipal) is apportioned. Staff determined that breaking down the annual municipal values into individual WUGs was too complex.

TWDB recognizes that the apportioning formula used is not ideal but it is the best available process with respect to time and staffing constraints. If a district believes it has data that is more accurate it can add those data to the plan with an explanation of how the data were derived. Apportioning percentages that the TWDB used are listed above each applicable table.

For additional questions regarding this data, please contact Stephen Allen (stephen.allen@twdb.texas.gov or 512-463-7317).

Estimated Historical Water Use

TWDB Historical Water Use Survey (WUS) Data

Groundwater and surface water historical use estimates are currently unavailable for calendar year 2020. TWDB staff anticipates the calculation and posting of these estimates at a later date.

CONCHO COUNTY

88.4% (multiplier)

All values are in acre-feet

Year	Source	Municipal	Manufacturing	Mining	Steam Electric	Irrigation	Livestock	Total
2019	GW	418	0	0	0	5,487	254	6,159
	SW	97	0	0	0	218	254	569
2018	GW	411	0	0	0	5,787	254	6,452
	SW	80	0	0	0	202	254	536
2017	GW	289	0	0	0	4,398	244	4,931
	SW	131	0	0	0	187	244	562
2016	GW	431	0	0	0	3,892	155	4,478
	SW	37	0	0	0	194	155	386
2015	GW	465	0	0	0	3,654	153	4,272
	SW	29	0	0	0	318	153	500
2014	GW	415	0	0	0	3,931	143	4,489
	SW	36	0	0	0	275	143	454
2013	GW	419	0	0	0	4,359	140	4,918
	SW	41	0	0	0	215	140	396
2012	GW	364	0	0	0	4,162	171	4,697
	SW	33	0	0	0	165	171	369
2011	GW	484	0	0	0	2,044	194	2,722
	SW	84	0	0	0	181	194	459
2010	GW	347	0	94	0	5,701	197	6,339
	SW	83	0	16	0	635	197	931
2009	GW	351	0	66	0	1,063	215	1,695
	SW	81	0	11	0	1,238	216	1,546
2008	GW	404	0	39	0	8,543	216	9,202
	SW	32	0	7	0	96	217	352
2007	GW	437	0	0	0	4,523	309	5,269
	SW	60	0	0	0	105	309	474
2006	GW	568	0	0	0	6,747	254	7,569
	SW	58	0	0	0	84	254	396
2005	GW	631	0	0	0	2,604	206	3,441
	SW	86	0	0	0	539	206	831
2004	GW	474	0	0	0	1,606	319	2,399
	SW	87	0	0	0	1,102	80	1,269

RUNNELS COUNTY

99.29% (multiplier)

All values are in acre-feet

Year	Source	Municipal	Manufacturing	Mining	Steam Electric	Irrigation	Livestock	Total
2019	GW	115	0	0	0	3,199	375	3,689
	SW	1,313	3	0	0	418	375	2,109
2018	GW	95	0	0	0	3,449	373	3,917
	SW	1,377	3	0	0	662	373	2,415
2017	GW	104	0	0	0	2,879	363	3,346
	SW	1,161	3	0	0	884	363	2,411
2016	GW	106	0	4	0	2,933	288	3,331
	SW	1,200	4	0	0	601	288	2,093
2015	GW	119	0	0	0	3,813	286	4,218
	SW	1,020	4	0	0	663	286	1,973
2014	GW	107	0	0	0	2,644	275	3,026
	SW	1,058	6	0	0	816	275	2,155
2013	GW	159	0	0	0	3,059	264	3,482
	SW	1,078	10	0	0	390	264	1,742
2012	GW	168	0	0	0	3,378	292	3,838
	SW	1,052	8	0	0	363	292	1,715
2011	GW	184	0	0	0	1,491	472	2,147
	SW	1,342	7	0	0	241	472	2,062
2010	GW	168	0	66	0	2,158	448	2,840
	SW	1,439	7	11	0	874	448	2,779
2009	GW	276	0	60	0	1,970	424	2,730
	SW	1,329	12	10	0	1,065	423	2,839
2008	GW	257	0	54	0	2,528	437	3,276
	SW	1,218	12	9	0	1,168	437	2,844
2007	GW	286	0	0	0	1,354	385	2,025
	SW	1,197	12	0	0	799	384	2,392
2006	GW	239	0	0	0	2,644	404	3,287
	SW	1,307	17	0	0	865	404	2,593
2005	GW	296	0	0	0	1,638	387	2,321
	SW	1,130	27	0	0	810	388	2,355
2004	GW	249	1	0	0	1,466	80	1,796
	SW	1,168	37	0	0	801	721	2,727

TOM GREEN COUNTY

70.35% (multiplier)

All values are in acre-feet

Year	Source	Municipal	Manufacturing	Mining	Steam Electric	Irrigation	Livestock	Total
2019	GW	2,920	354	13	0	37,231	582	41,100
	SW	8,796	80	0	0	2,611	146	11,633
2018	GW	2,725	421	0	0	36,390	576	40,112
	SW	9,276	59	0	0	2,120	144	11,599
2017	GW	3,055	433	7	0	35,219	559	39,273
	SW	8,520	72	0	0	2,205	140	10,937
2016	GW	3,027	419	1	0	27,773	373	31,593
	SW	8,192	75	0	0	1,838	93	10,198
2015	GW	3,190	373	0	0	33,756	370	37,689
	SW	9,124	130	0	0	1,769	92	11,115
2014	GW	2,555	307	0	0	29,712	338	32,912
	SW	9,827	159	0	0	2,186	84	12,256
2013	GW	2,863	281	1	0	23,939	355	27,439
	SW	9,772	169	0	0	2,141	89	12,171
2012	GW	2,779	269	0	0	37,123	771	40,942
	SW	10,595	180	0	0	2,075	193	13,043
2011	GW	3,306	310	0	0	5,534	891	10,041
	SW	12,804	283	0	0	1,970	223	15,280
2010	GW	2,688	253	348	0	26,620	811	30,720
	SW	11,713	206	345	0	4,591	203	17,058
2009	GW	1,839	314	335	0	46,914	788	50,190
	SW	11,517	182	333	0	2,814	197	15,043
2008	GW	1,127	358	323	0	60,368	871	63,047
	SW	11,075	224	320	0	0	218	11,837
2007	GW	1,105	310	0	0	48,392	635	50,442
	SW	10,491	198	0	0	3,752	159	14,600
2006	GW	1,140	284	0	0	23,276	950	25,650
	SW	12,163	177	0	0	11,294	238	23,872
2005	GW	1,133	286	0	0	19,564	867	21,850
	SW	10,577	181	0	0	9,146	217	20,121
2004	GW	972	293	0	0	17,134	101	18,500
	SW	10,401	280	0	0	9,240	905	20,826

Projected Surface Water Supplies

TWDB 2022 State Water Plan Data

CONCHO COUNTY

88.4% (multiplier)

All values are in acre-feet

RWPG	WUG	WUG Basin	Source Name	2020	2030	2040	2050	2060	2070
F	County-Other, Concho	Colorado	Colorado Run-of-River	34	34	34	34	34	34
F	Irrigation, Concho	Colorado	Colorado Run-of-River	182	182	182	182	182	182
F	Livestock, Concho	Colorado	Colorado Livestock Local Supply	197	197	197	197	197	197
F	Millersview-Doole WSC	Colorado	OH Ivie Lake/Reservoir Non-System Portion	84	90	88	86	83	75
Sum of Projected Surface Water Supplies (acre-feet)				497	503	501	499	496	488

RUNNELS COUNTY

99.29% (multiplier)

All values are in acre-feet

RWPG	WUG	WUG Basin	Source Name	2020	2030	2040	2050	2060	2070
F	Ballinger	Colorado	Ballinger/Moonen Lake/Reservoir	0	0	0	0	0	0
F	Ballinger	Colorado	OH Ivie Lake/Reservoir Non-System Portion	1,519	1,547	1,549	1,549	1,543	1,517
F	Coleman County SUD	Colorado	Brownwood Lake/Reservoir	10	10	10	10	10	10
F	Coleman County SUD	Colorado	Coleman Lake/Reservoir	0	0	0	0	0	0
F	Coleman County SUD	Colorado	Hords Creek Lake/Reservoir	0	0	0	0	0	0
F	County-Other, Runnels	Colorado	OH Ivie Lake/Reservoir Non-System Portion	19	20	19	19	19	17
F	Irrigation, Runnels	Colorado	Colorado Run-of-River	196	196	196	196	196	196
F	Livestock, Runnels	Colorado	Colorado Livestock Local Supply	472	472	472	472	472	472
F	Manufacturing, Runnels	Colorado	OH Ivie Lake/Reservoir Non-System Portion	9	9	9	9	9	9
F	Millersview-Doole WSC	Colorado	OH Ivie Lake/Reservoir Non-System Portion	97	102	100	98	95	85
F	North Runnels WSC	Colorado	OH Ivie Lake/Reservoir Non-System Portion	7	8	8	8	8	7
F	North Runnels WSC	Colorado	Winters Lake/Reservoir	0	0	0	0	0	0
F	Winters	Colorado	Winters Lake/Reservoir	0	0	0	0	0	0
Sum of Projected Surface Water Supplies (acre-feet)				2,329	2,364	2,363	2,361	2,352	2,313

Estimated Historical Water Use and 2022 State Water Plan Dataset:

Lipan-Kickapoo Water Conservation District

January 6, 2023

TOM GREEN COUNTY*70.35% (multiplier)*

All values are in acre-feet

RWPG	WUG	WUG Basin	Source Name	2020	2030	2040	2050	2060	2070
F	Concho Rural Water	Colorado	Mountain Creek Lake/Reservoir	0	0	0	0	0	0
F	Irrigation, Tom Green	Colorado	Colorado Run-of-River	1,235	1,235	1,235	1,235	1,235	1,235
F	Livestock, Tom Green	Colorado	Colorado Livestock Local Supply	223	223	223	223	223	223
F	Millersview-Doole WSC	Colorado	OH Ivie Lake/Reservoir Non-System Portion	235	263	269	274	275	254
F	Mining, Tom Green	Colorado	Mountain Creek Lake/Reservoir	0	0	0	0	0	0
F	San Angelo	Colorado	Colorado Run-of-River	214	214	214	214	214	214
F	San Angelo	Colorado	OH Ivie Lake/Reservoir Non-System Portion	5,020	4,850	4,679	4,509	4,338	4,168
F	San Angelo	Colorado	San Angelo Lakes Lake/Reservoir System	0	0	0	0	0	0
Sum of Projected Surface Water Supplies (acre-feet)				6,927	6,785	6,620	6,455	6,285	6,094

Projected Water Demands

TWDB 2022 State Water Plan Data

Please note that the demand numbers presented here include the plumbing code savings found in the Regional and State Water Plans.

CONCHO COUNTY

88.4% (multiplier)

All values are in acre-feet

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
F	County-Other, Concho	Colorado	101	99	96	95	95	95
F	Eden	Colorado	206	210	207	205	204	204
F	Irrigation, Concho	Colorado	4,333	4,333	4,333	4,333	4,333	4,333
F	Livestock, Concho	Colorado	338	338	338	338	338	338
F	Millersview-Doole WSC	Colorado	94	93	90	89	89	89
F	Mining, Concho	Colorado	424	419	373	324	283	247
Sum of Projected Water Demands (acre-feet)			5,496	5,492	5,437	5,384	5,342	5,306

RUNNELS COUNTY

99.29% (multiplier)

All values are in acre-feet

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
F	Ballinger	Colorado	689	687	671	669	667	667
F	Coleman County SUD	Colorado	20	20	20	19	19	19
F	County-Other, Runnels	Colorado	75	73	69	68	67	66
F	Irrigation, Runnels	Colorado	3,083	3,083	3,083	3,083	3,083	3,083
F	Livestock, Runnels	Colorado	700	700	700	700	700	700
F	Manufacturing, Runnels	Colorado	10	11	11	11	11	11
F	Miles	Colorado	113	126	122	121	120	120
F	Millersview-Doole WSC	Colorado	108	105	103	101	101	101
F	Mining, Runnels	Colorado	270	267	238	209	183	160
F	North Runnels WSC	Colorado	169	167	163	162	162	163
F	Winters	Colorado	226	218	206	205	204	204
Sum of Projected Water Demands (acre-feet)			5,463	5,457	5,386	5,348	5,317	5,294

TOM GREEN COUNTY

70.35% (multiplier)

All values are in acre-feet

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
F	Concho Rural Water	Colorado	560	576	588	604	624	646
F	County-Other, Tom Green	Colorado	711	704	730	749	765	778
F	DADS Supported Living Center	Colorado	109	108	108	107	107	107
F	Goodfellow Air Force Base	Colorado	513	568	596	629	666	707
F	Irrigation, Tom Green	Colorado	29,894	29,894	29,894	29,894	29,894	29,894
F	Livestock, Tom Green	Colorado	791	791	791	791	791	791
F	Manufacturing, Tom Green	Colorado	598	677	677	677	677	677

Estimated Historical Water Use and 2022 State Water Plan Dataset:

Lipan-Kickapoo Water Conservation District

January 6, 2023

F	Millersview-Doole WSC	Colorado	263	271	276	283	293	302
F	Mining, Tom Green	Colorado	743	760	787	782	798	813
F	San Angelo	Colorado	17,924	19,657	20,494	21,556	22,847	24,250
F	Tom Green County FWSD 3	Colorado	131	142	147	154	162	172
Sum of Projected Water Demands (acre-feet)			52,237	54,148	55,088	56,226	57,624	59,137

Projected Water Supply Needs

TWDB 2022 State Water Plan Data

Negative values (in red) reflect a projected water supply need, positive values a surplus.

CONCHO COUNTY

All values are in acre-feet

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
F	County-Other, Concho	Colorado	0	0	0	0	0	0
F	Eden	Colorado	25	25	25	25	25	25
F	Irrigation, Concho	Colorado	0	0	0	0	0	0
F	Livestock, Concho	Colorado	0	0	0	0	0	0
F	Millersview-Doole WSC	Colorado	21	27	27	26	22	14
F	Mining, Concho	Colorado	0	0	0	0	0	0
Sum of Projected Water Supply Needs (acre-feet)			0	0	0	0	0	0

RUNNELS COUNTY

All values are in acre-feet

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
F	Ballinger	Colorado	830	860	878	880	876	850
F	Coleman County SUD	Colorado	-10	-10	-10	-9	-9	-9
F	County-Other, Runnels	Colorado	-23	-21	-19	-18	-18	-19
F	Irrigation, Runnels	Colorado	0	0	0	0	0	0
F	Livestock, Runnels	Colorado	0	0	0	0	0	0
F	Manufacturing, Runnels	Colorado	0	0	0	0	0	0
F	Miles	Colorado	-19	-34	-35	-39	-42	-48
F	Millersview-Doole WSC	Colorado	24	31	30	30	26	16
F	Mining, Runnels	Colorado	0	0	0	0	0	0
F	North Runnels WSC	Colorado	-162	-159	-155	-154	-154	-156
F	Winters	Colorado	-226	-218	-206	-205	-204	-204
Sum of Projected Water Supply Needs (acre-feet)			-440	-442	-425	-425	-427	-436

TOM GREEN COUNTY

All values are in acre-feet

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
F	Concho Rural Water	Colorado	8	0	-3	-6	-9	-13
F	County-Other, Tom Green	Colorado	264	252	208	173	140	112
F	DADS Supported Living Center	Colorado	0	0	0	0	0	0
F	Goodfellow Air Force Base	Colorado	-136	-191	-222	-258	-298	-345
F	Irrigation, Tom Green	Colorado	558	509	452	437	386	332
F	Livestock, Tom Green	Colorado	0	0	0	0	0	0
F	Manufacturing, Tom Green	Colorado	-38	-144	-159	-178	-198	-215
F	Millersview-Doole WSC	Colorado	58	80	83	82	75	46

Estimated Historical Water Use and 2022 State Water Plan Dataset.

Lipan-Kickapoo Water Conservation District

January 6, 2023

F	Mining, Tom Green	Colorado	0	0	0	0	0	0
F	San Angelo	Colorado	-4,785	-6,658	-7,632	-8,824	-10,243	-11,775
F	Tom Green County FWSD 3	Colorado	0	0	0	0	0	0
Sum of Projected Water Supply Needs (acre-feet)			-4,959	-6,993	-8,016	-9,266	-10,748	-12,348

Projected Water Management Strategies

TWDB 2022 State Water Plan Data

CONCHO COUNTY

WUG, Basin (RWPG)

All values are in acre-feet

Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
County-Other, Concho, Colorado (F)							
Municipal Conservation - Concho County Other	DEMAND REDUCTION [Concho]	3	3	3	3	3	3
Subordination - San Angelo System	San Angelo Lakes Lake/Reservoir System [Reservoir]	3	3	3	3	3	3
		6	6	6	6	6	6
Eden, Colorado (F)							
Municipal Conservation - Eden	DEMAND REDUCTION [Concho]	4	4	4	4	4	4
		4	4	4	4	4	4
Irrigation, Concho, Colorado (F)							
Irrigation Conservation - Concho County	DEMAND REDUCTION [Concho]	245	490	539	539	539	539
		245	490	539	539	539	539
Millersview-Doole WSC, Colorado (F)							
Municipal Conservation - Millersview-Doole WSC	DEMAND REDUCTION [Concho]	2	2	2	2	2	2
Subordination - OH Ivie Non System Portion	OH Ivie Lake/Reservoir Non-System Portion [Reservoir]	8	0	0	0	1	9
Water Audits And Leak - Millersview-Doole WSC	DEMAND REDUCTION [Concho]	10	10	9	9	9	9
		20	12	11	11	12	20
Mining, Concho, Colorado (F)							
Mining Conservation - Concho County	DEMAND REDUCTION [Concho]	20	20	18	15	13	12
		20	20	18	15	13	12
Sum of Projected Water Management Strategies (acre-feet)		295	532	578	575	574	581

RUNNELS COUNTY

WUG, Basin (RWPG)

All values are in acre-feet

Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
Ballinger, Colorado (F)							
Municipal Conservation - Ballinger	DEMAND REDUCTION [Runnels]	12	12	12	12	12	12
Subordination - Ballinger/Moonen Lake	Ballinger/Moonen Lake/Reservoir [Reservoir]	751	751	750	748	745	740

Subordination - OH Ivie Non System Portion	OH Ivie Lake/Reservoir Non-System Portion [Reservoir]	43	0	0	0	8	51
		806	763	762	760	765	803
Coleman County SUD, Colorado (F)							
Subordination - Hords Creek Lake	Hords Creek Lake/Reservoir [Reservoir]	1	1	1	1	1	1
Subordination - Lake Coleman	Coleman Lake/Reservoir [Reservoir]	9	9	9	8	8	8
		10	10	10	9	9	9
County-Other, Runnels, Colorado (F)							
Municipal Conservation - Runnels County Other	DEMAND REDUCTION [Runnels]	2	2	2	2	2	2
Subordination - Ballinger/Moonen Lake	Ballinger/Moonen Lake/Reservoir [Reservoir]	23	21	19	18	18	19
		25	23	21	20	20	21
Irrigation, Runnels, Colorado (F)							
Irrigation Conservation - Runnels County	DEMAND REDUCTION [Runnels]	155	311	373	373	373	373
		155	311	373	373	373	373
Miles, Colorado (F)							
Concho River Water Project - San Angelo	Indirect Reuse [Tom Green]	27	43	45	49	53	59
Municipal Conservation - Miles	DEMAND REDUCTION [Runnels]	3	3	3	3	3	3
Subordination - San Angelo System	San Angelo Lakes Lake/Reservoir System [Reservoir]	9	9	7	7	6	5
		39	55	55	59	62	67
Millersview-Doole WSC, Colorado (F)							
Municipal Conservation - Millersview-Doole WSC	DEMAND REDUCTION [Runnels]	2	2	2	2	2	2
Subordination - OH Ivie Non System Portion	OH Ivie Lake/Reservoir Non-System Portion [Reservoir]	9	0	0	0	1	10
Water Audits And Leak - Millersview-Doole WSC	DEMAND REDUCTION [Runnels]	11	11	11	11	11	11
		22	13	13	13	14	23
Mining, Runnels, Colorado (F)							
Mining Conservation - Runnels County	DEMAND REDUCTION [Runnels]	11	11	10	9	8	7
		11	11	10	9	8	7
North Runnels WSC, Colorado (F)							
BRA System Operation--Surplus	BRA System Operations Permit Supply [Reservoir]	72	0	0	0	0	0
Municipal Conservation - North Runnels WSC	DEMAND REDUCTION [Runnels]	4	4	4	4	4	4
Subordination - Ballinger/Moonen Lake	Ballinger/Moonen Lake/Reservoir [Reservoir]	11	10	10	10	10	11
Subordination - Winters Lake	Winters Lake/Reservoir [Reservoir]	75	76	77	77	77	78
West Texas Water Partnership (OH Ivie Non System Portion)	OH Ivie Lake/Reservoir Non-System Portion	0	69	64	63	63	63

Irrigation Conservation - Tom Green County	DEMAND REDUCTION [Tom Green]	2,125	4,249	5,099	5,099	5,099	5,099
Weather Modification	Weather Modification [Atmosphere]	2,007	2,007	2,007	2,007	2,007	2,007
		4,132	6,256	7,106	7,106	7,106	7,106
Manufacturing, Tom Green, Colorado (F)							
Concho River Water Project - San Angelo	Indirect Reuse [Tom Green]	1	108	128	149	172	193
Subordination - San Angelo System	San Angelo Lakes Lake/Reservoir System [Reservoir]	37	36	32	29	26	22
		38	144	160	178	198	215
Millersview-Doole WSC, Colorado (F)							
Municipal Conservation - Millersview-Doole WSC	DEMAND REDUCTION [Tom Green]	6	7	7	7	7	7
Subordination - OH Ivie Non System Portion	OH Ivie Lake/Reservoir Non-System Portion [Reservoir]	22	0	0	0	5	29
Water Audits And Leak - Millersview-Doole WSC	DEMAND REDUCTION [Tom Green]	28	29	29	30	31	32
		56	36	36	37	43	68
Mining, Tom Green, Colorado (F)							
Concho River Water Project - San Angelo	Indirect Reuse [Tom Green]	2	3	4	4	4	5
Mining Conservation - Tom Green County	DEMAND REDUCTION [Tom Green]	44	45	47	47	48	49
		46	48	51	51	52	54
San Angelo, Colorado (F)							
Brush Control - San Angelo	San Angelo Lakes Lake/Reservoir System [Reservoir]	90	90	90	90	90	90
Concho River Water Project - San Angelo	Indirect Reuse [Tom Green]	7,723	7,518	7,447	7,365	7,277	7,187
Hickory Well Field Expansion in McCulloch County - San Angelo	Hickory Aquifer [McCulloch]	0	1,040	3,040	3,040	3,040	3,040
Municipal Conservation - San Angelo	DEMAND REDUCTION [Tom Green]	459	532	558	592	629	668
Subordination - OH Ivie Non System Portion	OH Ivie Lake/Reservoir Non-System Portion [Reservoir]	329	0	0	0	0	0
Subordination - San Angelo System	San Angelo Lakes Lake/Reservoir System [Reservoir]	1,547	1,460	1,375	1,288	1,203	1,117
West Texas Water Partnership (Groundwater)	Edwards-Trinity-Plateau, Pecos Valley, and Trinity Aquifers [Pecos]	0	8,191	8,330	8,470	8,609	8,749
		10,148	18,831	20,840	20,845	20,848	20,851
Tom Green County FWSD 3, Colorado (F)							
Municipal Conservation - Tom Green County FWSD 3	DEMAND REDUCTION [Tom Green]	3	4	4	4	5	5
		3	4	4	4	5	5
Sum of Projected Water Management Strategies (acre-feet)		14,784	25,751	28,664	28,733	28,811	28,910

		[Reservoir]						
			162	159	155	154	154	156
Winters, Colorado (F)								
BRA System Operation--Surplus	BRA System Operations Permit Supply [Reservoir]		109	0	0	0	0	0
Municipal Conservation - Winters	DEMAND REDUCTION [Runnels]		17	12	9	9	9	9
Subordination - Winters Lake	Winters Lake/Reservoir [Reservoir]		100	99	98	98	98	97
West Texas Water Partnership (OH Ivie Non System Portion)	OH Ivie Lake/Reservoir Non-System Portion [Reservoir]		0	112	118	119	119	119
			226	223	225	226	226	225
Sum of Projected Water Management Strategies (acre-feet)			1,456	1,568	1,624	1,623	1,631	1,684

TOM GREEN COUNTY

WUG, Basin (RWPG)

All values are in acre-feet

Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070	
Concho Rural Water, Colorado (F)								
Concho River Water Project - San Angelo	Indirect Reuse [Tom Green]	74	83	86	91	95	98	
Municipal Conservation - Concho Rural WSC	DEMAND REDUCTION [Tom Green]	20	21	22	23	24	24	
Subordination - San Angelo System	San Angelo Lakes Lake/Reservoir System [Reservoir]	8	7	6	5	4	4	
		102	111	114	119	123	126	
County-Other, Tom Green, Colorado (F)								
Concho River Water Project - San Angelo	Indirect Reuse [Tom Green]	29	40	43	49	54	58	
Subordination - Mountain Creek Reservoir	Mountain Creek Lake/Reservoir [Reservoir]	70	70	70	70	70	70	
Subordination - San Angelo System	San Angelo Lakes Lake/Reservoir System [Reservoir]	22	18	17	15	13	11	
		121	128	130	134	137	139	
DADS Supported Living Center, Colorado (F)								
Municipal Conservation - Dads Supported Living Center	DEMAND REDUCTION [Tom Green]	1	1	1	1	1	1	
		1	1	1	1	1	1	
Goodfellow Air Force Base, Colorado (F)								
Concho River Water Project - San Angelo	Indirect Reuse [Tom Green]	85	141	173	210	253	301	
Municipal Conservation - Goodfellow Air Force Base	DEMAND REDUCTION [Tom Green]	8	9	9	10	10	11	
Subordination - San Angelo System	San Angelo Lakes Lake/Reservoir System [Reservoir]	44	42	40	38	35	33	
		137	192	222	258	298	345	
Irrigation, Tom Green, Colorado (F)								

Estimated Historical Water Use and 2022 State Water Plan Dataset:

Lipan-Kickapoo Water Conservation District

January 6, 2023

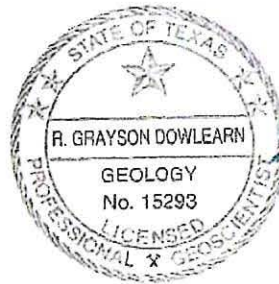
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APPENDIX B

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GAM RUN 22-013: LIPAN-KICKAPOO WATER CONSERVATION DISTRICT MANAGEMENT PLAN

Tim Cawthon, GIF and Grayson Dowlearn, P.G.
Texas Water Development Board
Groundwater Division
Groundwater Modeling Department
512-463-5076
November 8, 2022



Gray Dowlearn
11/8/2022

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GAM RUN 22-013: LIPAN-KICKAPOO WATER CONSERVATION DISTRICT MANAGEMENT PLAN

Tim Cawthon, GIT and Grayson Dowlearn, P.G.
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November 8, 2022

EXECUTIVE SUMMARY:

Texas State Water Code, Section 36.1071, Subsection (h) (Texas Water Code, 2011), states that, in developing its groundwater management plan, a groundwater conservation district shall use groundwater availability modeling information provided by the Executive Administrator of the Texas Water Development Board (TWDB) in conjunction with any available site-specific information provided by the district for review and comment to the Executive Administrator.

The TWDB provides data and information to the Lipan-Kickapoo Water Conservation District in two parts. Part 1 is the Estimated Historical Water Use/State Water Plan dataset report, which will be provided to you separately by the TWDB Groundwater Technical Assistance Department. Please direct questions about the water data report to Mr. Stephen Allen at 512-463-7317 or stephen.allen@twdb.texas.gov. Part 2 is the required groundwater availability modeling information which includes:

1. the annual amount of recharge from precipitation, if any, to the groundwater resources within the district;
2. for each aquifer within the district, the annual volume of water that discharges from the aquifer to springs and any surface-water bodies, including lakes, streams, and rivers; and
3. the annual volume of flow into and out of the district within each aquifer and between aquifers in the district

The groundwater management plan for the Lipan-Kickapoo Water Conservation District should be adopted by the district on or before January 25, 2023 and submitted to the executive administrator of the TWDB on or before February 24, 2023. The current management plan for the Lipan-Kickapoo Water Conservation District expires on April 25, 2023.

Four modeled aquifers are located within Lipan-Kickapoo Water Conservation District: the Hickory, Ellenburger-San Saba, Edwards-Trinity (Plateau), and Lipan aquifers. We used three groundwater availability models to estimate the management plan information for the aquifers within the Lipan-Kickapoo Water Conservation District. We used the groundwater availability models for the minor aquifers of the Llano Uplift Region (Shi and others, 2016), the Edwards-Trinity (Plateau) and Pecos Valley Aquifers (Anaya and Jones, 2009), and the Lipan Aquifer (Beach and others, 2004) to estimate the groundwater management plan information for the Lipan-Kickapoo Water Conservation District.

This report replaces the results of GAM Run 17-005 (Boghici and Shi, 2017). Values may differ from the previous report as a result of routine updates to the spatial grid files used to define county, groundwater conservation district, and aquifer boundaries, which can impact the calculated water budget values. Additionally, the approach used for analyzing model results is reviewed during each update and may have been refined to better delineate groundwater flows. This report also includes a new figure not included in the previous report to help groundwater conservation districts better visualize water budget components. Tables 1 through 4 summarize the groundwater availability model data required by statute and Figures 1, 3, 5, and 7 show the area of the models from which the values in Tables 1 through 4 were extracted. Figures 2, 4, 6, and 8 provide generalized diagrams of the groundwater flow components provided in Tables 1 through 4. If, after review of the figures, the Lipan-Kickapoo Water Conservation District determines that the district boundaries used in the assessment do not reflect current conditions, please notify the TWDB at your earliest convenience.

METHODS:

In accordance with the provisions of the Texas State Water Code, Section 36.1071, Subsection (h), the groundwater availability models mentioned above were used to estimate information for the Lipan-Kickapoo Water Conservation District management plan. Water budgets were extracted for the historical model periods for the Hickory and Ellenburger-San Saba aquifers (1981 through 2010) using ZONEBUDGET USG Version 1.00 (Panday and others, 2013). Water budgets were extracted for the historical model periods for the Edwards-Trinity (Plateau) Aquifer (1981 through 2000) and the Lipan Aquifer (1980 through 1998) using ZONEBUDGET Version 3.01 (Harbaugh, 2009). The average

annual water budget values for recharge, surface-water outflow, inflow to the district, outflow from the district, and the flow between aquifers within the district are summarized in this report.

PARAMETERS AND ASSUMPTIONS:

Hickory and Ellenburger-San Saba aquifers

- We used version 1.01 of the groundwater availability model for the minor aquifers in the Llano Uplift Region to analyze the Hickory and Ellenburger-San Saba aquifers. See Shi and others (2016) for assumptions and limitations of the model.
- The groundwater availability model for the minor aquifers in the Llano Uplift Region contains eight layers (from top to bottom):
 - Layer 1 — Cretaceous age and younger water-bearing units
 - Layer 2 — Permian and Pennsylvanian age confining units
 - Layer 3 — the Marble Falls Aquifer and equivalent
 - Layer 4 — Mississippian age confining units
 - Layer 5 — the Ellenburger-San Saba Aquifer and equivalent
 - Layer 6 — Cambrian age confining units
 - Layer 7 — the Hickory Aquifer and equivalent, and
 - Layer 8 — Precambrian age confining units
- Individual water budgets for the district were determined for the Ellenburger-San Saba Aquifer (Layer 5) and the Hickory Aquifer (Layer 7). The Marble Falls Aquifer does not occur within the Lipan-Kickapoo Water Conservation District and therefore no groundwater budget values are included for it in this report.
- Water budget terms were averaged for the period 1981 through 2010 (stress periods 2 through 31).
- The model was run using MODFLOW-USG (Panday and others, 2013).

Edwards-Trinity (Plateau) Aquifer

- We used version 1.01 of the groundwater availability model for the Edwards-Trinity (Plateau) and Pecos Valley aquifers to analyze the Edwards-Trinity (Plateau) Aquifer. See Anaya and Jones (2009) for assumptions and limitations of the model.
- The groundwater availability model for the Edwards-Trinity (Plateau) and Pecos Valley aquifers contains two layers. Within Lipan-Kickapoo Water Conservation District, these generally represent the Edwards Group and equivalent limestone hydrostratigraphic units of the Edwards-Trinity (Plateau) Aquifer (Layer 1) and the undifferentiated Trinity Group hydrostratigraphic units or equivalent units of the Edwards-Trinity (Plateau) Aquifer (Layer 2).
- An individual water budget for the district was determined for the Edwards-Trinity (Plateau) Aquifer (Layers 1 and 2, combined). The Pecos Valley Aquifer does not occur within the Lipan-Kickapoo Water Conservation District and therefore no groundwater budget values are included for it in this report.
- Water budget terms were averaged for the period 1981 through 2000 (stress periods 2 through 21)
- The model was run with MODFLOW-96 (Harbaugh and McDonald, 1996).

Lipan Aquifer

- We used version 1.01 of the groundwater availability model for the Lipan Aquifer to analyze the Lipan Aquifer. See Beach and others (2004) for assumptions and limitations of the model.
- The groundwater availability model contains one layer with a constant thickness of 400 feet. The layer represents portions of the Quaternary Leona Formation, underlying Permian units, adjacent Permian units, and the Edwards-Trinity (Plateau) Aquifer.
- The General-Head Boundary (GHB) package of MODFLOW was used to model the western boundary condition between the Lipan Aquifer and the Edwards-Trinity (Plateau) Aquifer. This flow is summarized in Table 3 as the estimated average net flow "From the Edwards-Trinity (Plateau) Aquifer to the Lipan Aquifer." Flow from the GHB is combined with the flow from adjacent Permian units in Table 4 as the estimated average net flow "To the Lipan Aquifer from the Edwards-Trinity (Plateau) Aquifer and Permian units."

- Water budget terms were averaged for the period 1980 through 1998 (stress periods 2 through 20). The last stress period representing the year 1999 was not included because of incorrect pumping values.
- The model was run with MODFLOW-96 (Harbaugh and McDonald, 1996).

RESULTS:

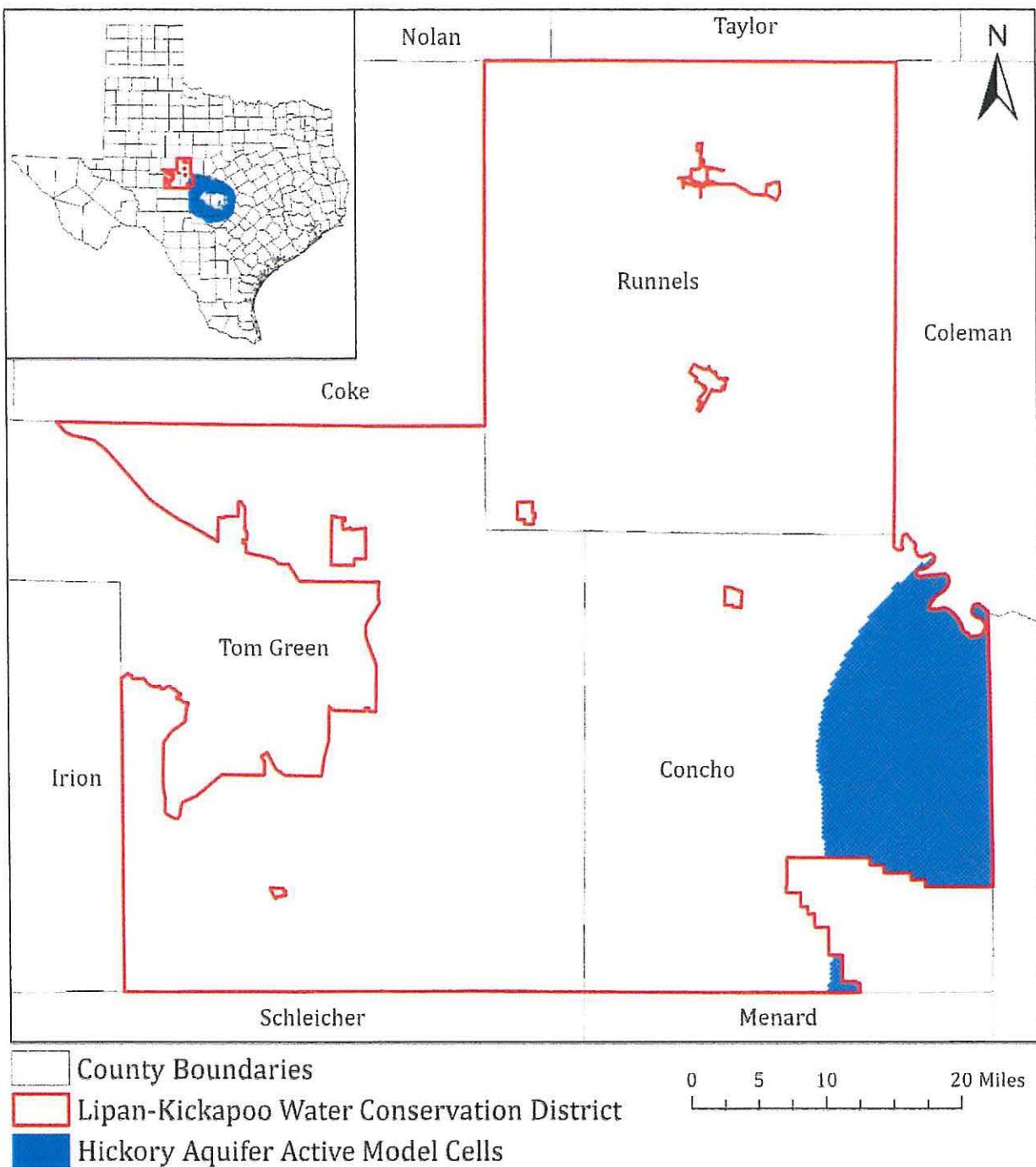
A groundwater budget summarizes the amount of water entering and leaving the aquifer according to the groundwater availability model. Selected groundwater budget components listed below were extracted from the groundwater availability model results for the Hickory, Ellenburger-San Saba, Edwards-Trinity (Plateau), and Lipan aquifers located within the Lipan-Kickapoo Water Conservation District and averaged over the historical calibration period, as shown in Tables 1 through 4.

1. Precipitation recharge—the areally distributed recharge sourced from precipitation falling on the outcrop areas of the aquifers (where the aquifer is exposed at land surface) within the district.
2. Surface-water outflow—the total water discharging from the aquifer (outflow) to surface-water features such as streams, reservoirs, and springs.
3. Flow into and out of district—the lateral flow within the aquifer between the district and adjacent counties.
4. Flow between aquifers—the net vertical flow between the aquifer and adjacent aquifers or confining units. This flow is controlled by the relative water levels in each aquifer and aquifer properties of each aquifer or confining unit that define the amount of leakage that occurs.

The information needed for the district’s management plan is summarized in Tables 1 through 4. It is important to note that sub-regional water budgets are not exact. This is due to the size of the model cells and the approach used to extract data from the model. To avoid double accounting, a model cell that straddles a political boundary, such as a district or county boundary, is assigned to one side of the boundary based on the location of the centroid of the model cell. For example, if a cell contains two counties, the cell is assigned to the county where the centroid of the cell is located.

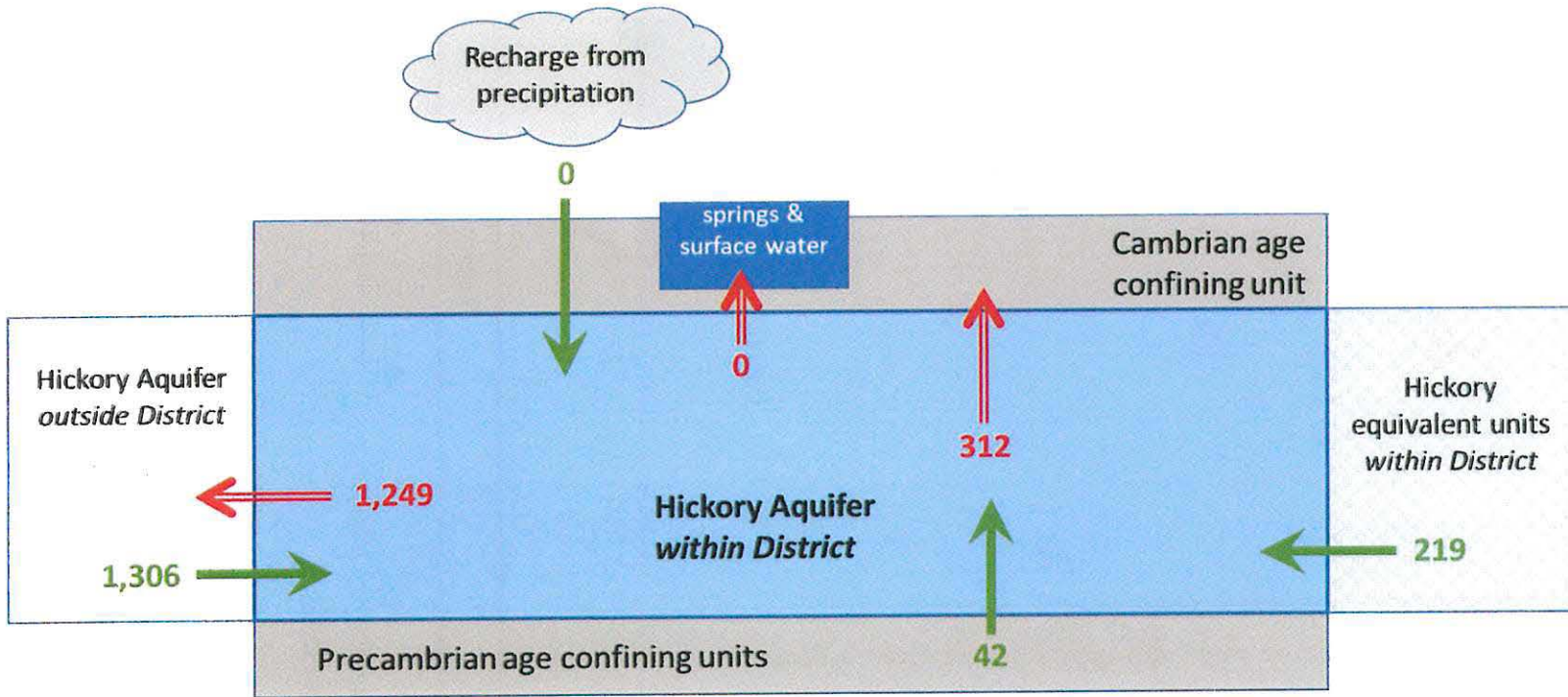
TABLE 1: SUMMARIZED INFORMATION FOR THE HICKORY AQUIFER THAT IS NEEDED FOR THE LIPAN-KICKAPOO WATER CONSERVATION DISTRICT'S GROUNDWATER MANAGEMENT PLAN. ALL VALUES ARE REPORTED IN ACRE-FEET PER YEAR AND ROUNDED TO THE NEAREST 1 ACRE-FOOT.

Management Plan requirement	Aquifer or confining unit	Results
Estimated annual amount of recharge from precipitation to the district	Hickory Aquifer	0
Estimated annual volume of water that discharges from the aquifer to springs and any surface water body including lakes, streams, and rivers	Hickory Aquifer	0
Estimated annual volume of flow into the district within each aquifer in the district	Hickory Aquifer	1,306
Estimated annual volume of flow out of the district within each aquifer in the district	Hickory Aquifer	1,249
Estimated net annual volume of flow between each aquifer in the district	To the Hickory Aquifer from Hickory equivalent units	219
	From the Hickory Aquifer to the Cambrian age confining unit	312
	To the Hickory Aquifer from the Precambrian age confining units	42



gcd boundary date = 06.26.2020, county boundary date = 07.03.2019, lnup grid date = 01.06.2020

FIGURE 1: AREA OF THE GROUNDWATER AVAILABILITY MODEL FOR THE MINOR AQUIFERS IN THE LLANO UPLIFT REGION FROM WHICH THE INFORMATION IN TABLE 1 WAS EXTRACTED (THE HICKORY AQUIFER EXTENT WITHIN THE DISTRICT BOUNDARY).

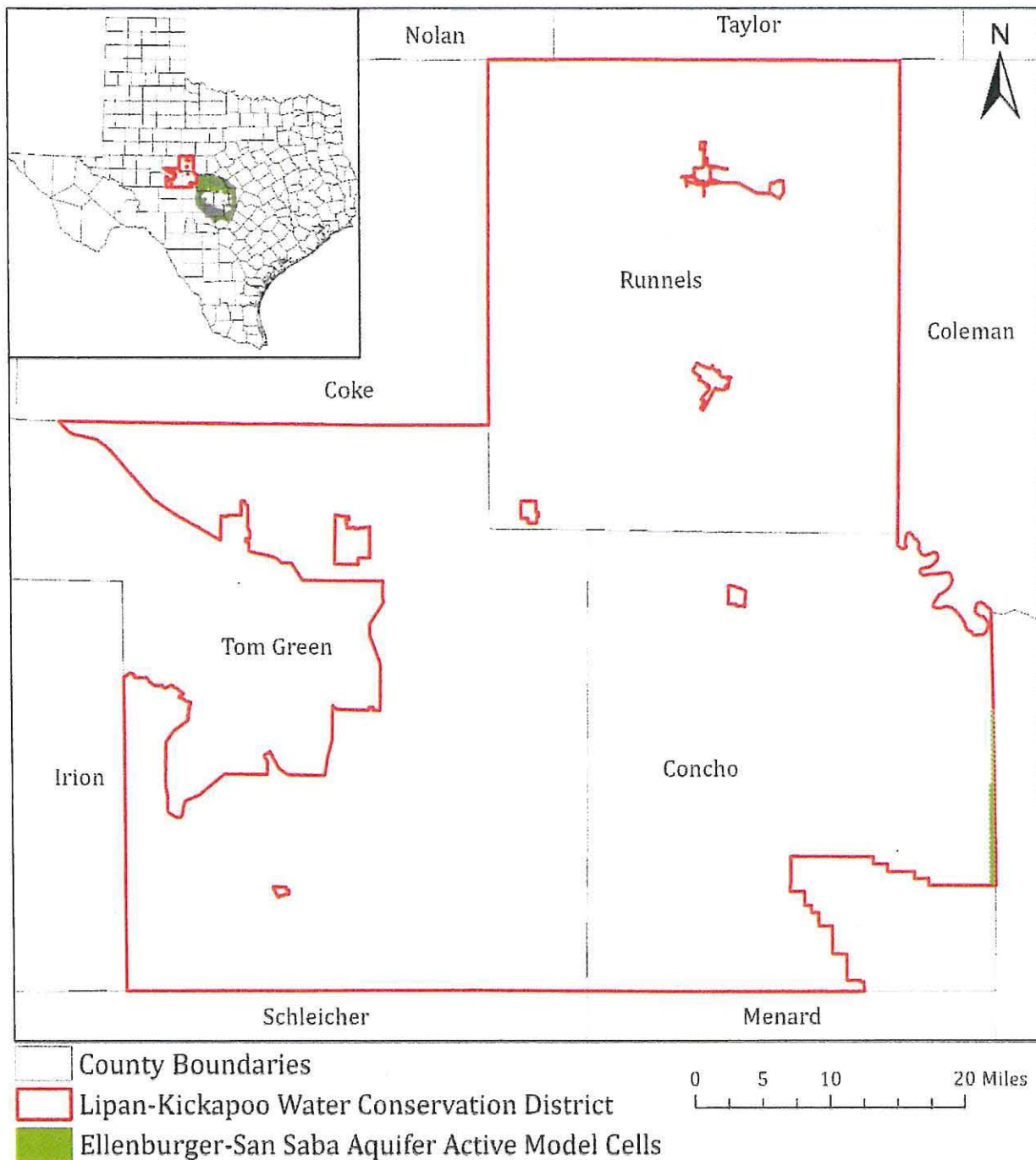


Caveat: This diagram only includes the water budget items provided in Table 1. A complete water budget would include additional inflows and outflows. If the District requires values for additional water budget items, please contact TWDB.

FIGURE 2: GENERALIZED DIAGRAM OF THE SUMMARIZED BUDGET INFORMATION FROM TABLE 1, REPRESENTING DIRECTIONS OF FLOW FOR THE HICKORY AQUIFER WITHIN THE LIPAN-KICKAPOO WATER CONSERVATION DISTRICT. FLOW VALUES EXPRESSED IN ACRE-FEET PER YEAR.

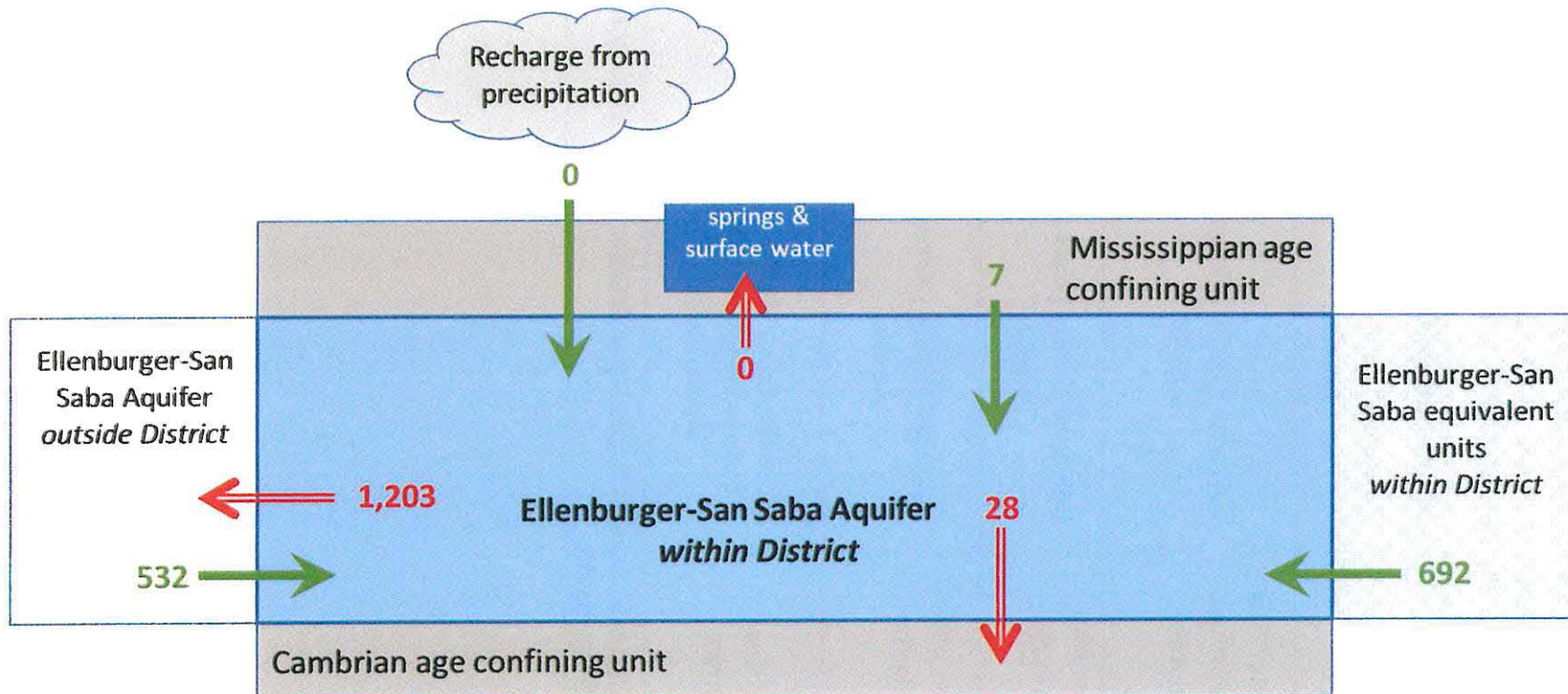
TABLE 2: SUMMARIZED INFORMATION FOR THE ELLENBURGER-SAN SABA AQUIFER THAT IS NEEDED FOR THE LIPAN-KICKAPOO WATER CONSERVATION DISTRICT'S GROUNDWATER MANAGEMENT PLAN. ALL VALUES ARE REPORTED IN ACRE-FEET PER YEAR AND ROUNDED TO THE NEAREST 1 ACRE-FOOT.

Management Plan requirement	Aquifer or confining unit	Results
Estimated annual amount of recharge from precipitation to the district	Ellenburger-San Saba Aquifer	0
Estimated annual volume of water that discharges from the aquifer to springs and any surface water body including lakes, streams, and rivers	Ellenburger-San Saba Aquifer	0
Estimated annual volume of flow into the district within each aquifer in the district	Ellenburger-San Saba Aquifer	532
Estimated annual volume of flow out of the district within each aquifer in the district	Ellenburger-San Saba Aquifer	1,203
Estimated net annual volume of flow between each aquifer in the district	To the Ellenburger-San Saba Aquifer from equivalent units	692
	To the Ellenburger-San Saba Aquifer from the Mississippian age confining unit	7
	From the Ellenburger-San Saba Aquifer to the Cambrian age confining unit	28



gcd boundary date = 06.26.2020, county boundary date = 07.03.2019, lnup grid date = 01.06.2020

FIGURE 3: AREA OF THE GROUNDWATER AVAILABILITY MODEL FOR THE MINOR AQUIFERS IN THE LLANO UPLIFT REGION FROM WHICH THE INFORMATION IN TABLE 2 WAS EXTRACTED (THE ELLENBURGER-SAN SABA AQUIFER EXTENT WITHIN THE DISTRICT BOUNDARY).

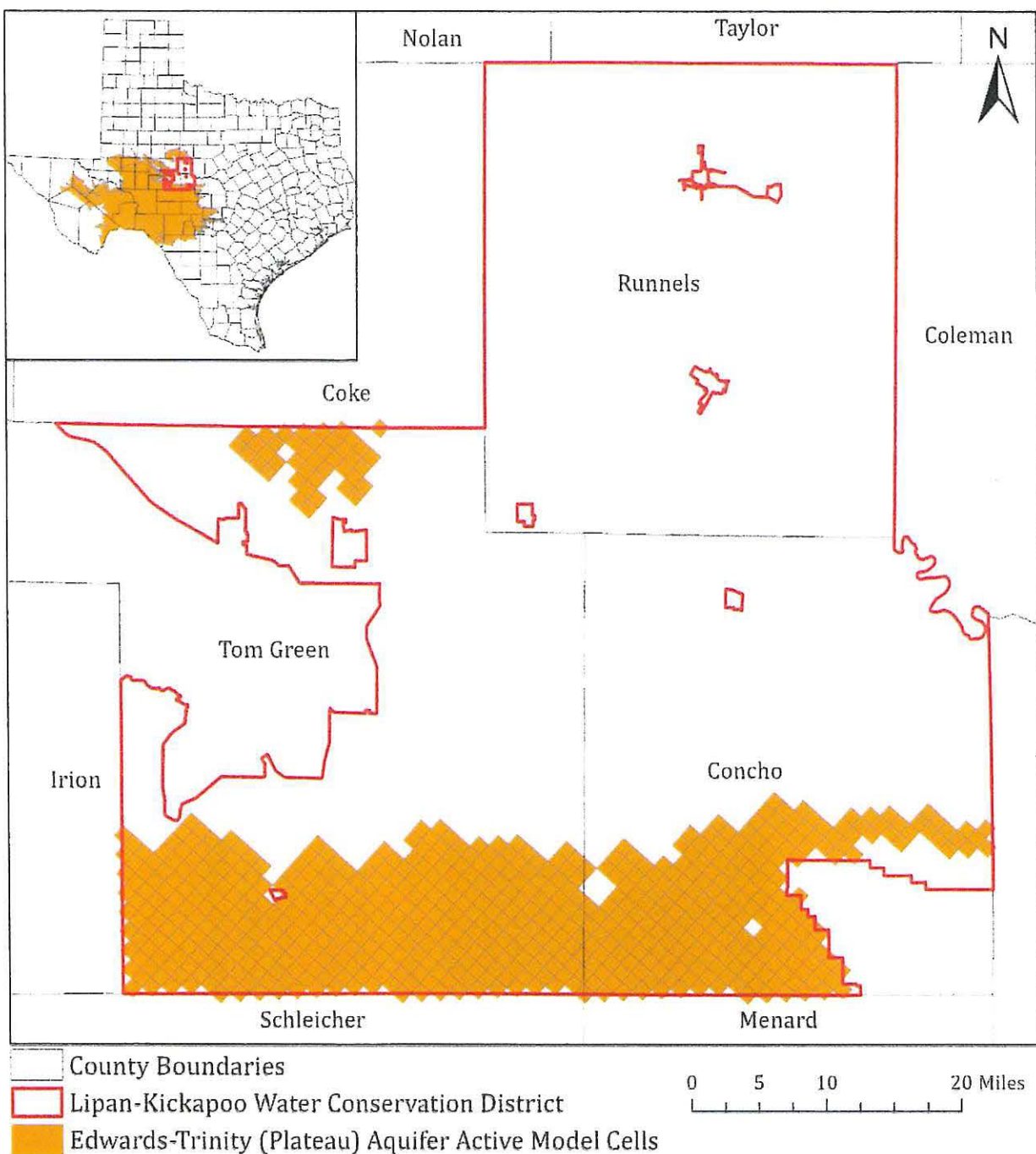


Caveat: This diagram only includes the water budget items provided in Table 2. A complete water budget would include additional inflows and outflows. If the District requires values for additional water budget items, please contact TWDB.

FIGURE 4: GENERALIZED DIAGRAM OF THE SUMMARIZED BUDGET INFORMATION FROM TABLE 2, REPRESENTING DIRECTIONS OF FLOW FOR THE ELLENBURGER-SAN SABA AQUIFER WITHIN THE LIPAN-KICKAPOO WATER CONSERVATION DISTRICT. FLOW VALUES EXPRESSED IN ACRE-FEET PER YEAR.

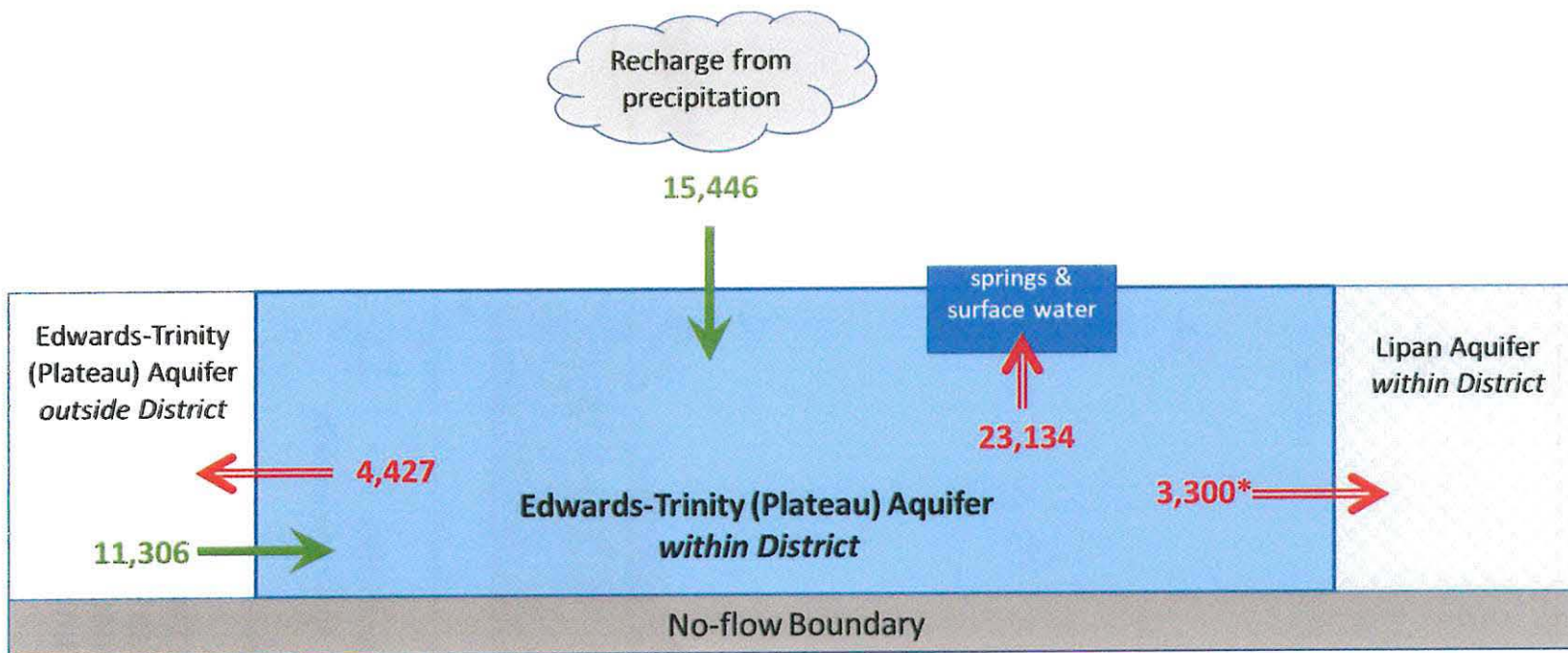
TABLE 3: SUMMARIZED INFORMATION FOR THE EDWARDS-TRINITY (PLATEAU) AQUIFER THAT IS NEEDED FOR THE LIPAN-KICKAPOO WATER CONSERVATION DISTRICT'S GROUNDWATER MANAGEMENT PLAN. ALL VALUES ARE REPORTED IN ACRE-FEET PER YEAR AND ROUNDED TO THE NEAREST 1 ACRE-FOOT.

Management Plan requirement	Aquifer or confining unit	Results
Estimated annual amount of recharge from precipitation to the district	Edwards-Trinity (Plateau) Aquifer	15,446
Estimated annual volume of water that discharges from the aquifer to springs and any surface water body including lakes, streams, and rivers	Edwards-Trinity (Plateau) Aquifer	23,134
Estimated annual volume of flow into the district within each aquifer in the district	Edwards-Trinity (Plateau) Aquifer	11,306
Estimated annual volume of flow out of the district within each aquifer in the district	Edwards-Trinity (Plateau) Aquifer	4,427
Estimated net annual volume of flow between each aquifer in the district	From the Edwards-Trinity (Plateau) Aquifer to the Lipan Aquifer	3,300*
* Flow from the Edwards-Trinity (Plateau) Aquifer to the Lipan Aquifer is provided by the Lipan Aquifer groundwater availability model.		



gcd boundary date = 06.26.2020, county boundary date = 07.03.2019, eddt_p grid date = 01.06.2020

FIGURE 5: AREA OF THE GROUNDWATER AVAILABILITY MODEL FOR THE EDWARDS-TRINITY (PLATEAU) AND PECOS VALLEY AQUIFERS FROM WHICH THE INFORMATION IN TABLE 3 WAS EXTRACTED (THE EDWARDS-TRINITY [PLATEAU] AQUIFER EXTENT WITHIN THE DISTRICT BOUNDARY).



* Flow from the Edwards-Trinity (Plateau) Aquifer to the Lipan Aquifer is provided by the Lipan Aquifer groundwater availability model.

Caveat: This diagram only includes the water budget items provided in Table 3. A complete water budget would include additional inflows and outflows. If the District requires values for additional water budget items, please contact TWDB.

FIGURE 6: GENERALIZED DIAGRAM OF THE SUMMARIZED BUDGET INFORMATION FROM TABLE 3, REPRESENTING DIRECTIONS OF FLOW FOR THE EDWARDS-TRINITY (PLATEAU) AQUIFER WITHIN THE LIPAN-KICKAPOO WATER CONSERVATION DISTRICT. FLOW VALUES EXPRESSED IN ACRE-FEET PER YEAR.

Guidelines for a successful groundwater district management plan pre-review by TWDB staff

Before turning in your plan for a pre-review please make sure that the required items listed below are in the plan. And please consider implementing most or all the optional items listed in the second and third sections which are revisions we have suggested to districts in the past. Important goal definitions to keep in mind are presented in section 4.

Section 1-Required Items

1. The management objective(s) and performance standard(s) of each goal in your plan should be time-based AND quantifiable. An example would be “the district will measure the water levels in ten wells twice per year and report the water levels to the Board of Directors every September.” If a goal is not applicable to the district, please write “this goal is not applicable” and provide an explanation why. Often, a goal is not applicable because it is too costly to implement. If that is the case, simply state that the goal is not applicable because it is cost prohibitive. And remember, a goal that is not applicable has no management objective or performance standard.
2. Always use the most current TWDB estimated historical water use and state water plan data (2022) which are found in the data packet we send you several months before your current plan’s expiration date. Some district plans are being submitted with old data from previous water use surveys and state water plans. In cases where the district has its own historical water use data which it believes to be more accurate than TWDB data, those data can be used instead, or in addition to, the TWDB estimated historical water use data.
3. Data from the TWDB GAM report, MAG report(s), and estimated historical water use/state water plan reports are required to be in the plan. A good practice is to place the reports in appendices and refer readers to them in the text. If you choose to create your own tables of values from the TWDB reports, we know from experience that there will be errors in your tables so make sure you triple check any district-created tables before you submit the plan for a pre-review. Common elements that are missed when creating your own tables include units of measurement (like acre-feet/year), footnotes, and thousand separators for values exceeding 999. And please remember to use the exact same wording in district-created GAM and MAG tables as you see in the original TWDB report tables.
4. To completely meet the requirements for item #11 on the TWDB review checklist, please provide a working web link (preferably a hyperlink) to your district rules in the “Actions, Procedures, and Performance” section of your plan, and double check that a reader can click on it to open the webpage correctly. If your rules are not on your website or you do not have a website, please plan on providing a hard copy of your rules when you submit the final version of your groundwater management plan to the TWDB.

5. Checklist Items #8 and #9, Consider and include the water supply needs and strategies: As stated in Texas Water Code Chapter 36(e)(4) the district is to “**consider** the water supply needs and water management strategies included in the adopted state water plan.” The inclusion of language showing the district considered the water supply needs and water management strategies will make this a more complete plan. You are required to provide a brief statement where you list in the text the primary water supply needs and water management strategies data values that are supplied in the data packet provided from TWDB.
6. Checklist Items #23-26, Controlling and preventing subsidence. Please reference the TWDB subsidence risk report, and state that you have reviewed it for applicability to your district: *Identification of the Vulnerability of the Major and Minor Aquifers of Texas to Subsidence with Regard to Groundwater Pumping – TWDB Contract Number 1648302062*, by LRE Water: <http://www.twdb.texas.gov/groundwater/models/research/subsidence/subsidence.asp>

It is a good idea to reference a chapter and/or map from the report to demonstrate that you have reviewed it for applicability to your district. This report represents the best available science on the matter of subsidence in Texas. Both the Texas Water Code and the Texas Administrative Code require that districts rely on the best available science. And please consider stating that you will be on the lookout for signs of subsidence and that you will respond to any reports of potential subsidence.

Section 2-Optional Recommended (yet important) Items

7. Please provide a contact page with the official address, email address, and phone number of the contact person for ongoing correspondence during the pre-review process. Let us know if a consultant or attorney hired by the district will be responsible for correspondence with TWDB staff.
8. Because we work with 98 groundwater conservation districts, please identify all email correspondence by stating in the subject box something like “Groundwater Management Plan – Texas Country GCD”. This way we can easily search for correspondence with your district when needed. When we are actively working on a review we may trade numerous emails with a district; please use a single email thread so we can easily see the whole history of our communication in one thread. And please include a signature section with your name, title, mailing address, website address, and telephone number.
9. **Important: Please review your plan for errors before sending it to us, for example: dates, spelling, formatting, grammar, sentence completion, and correct statutory references (if used though not required). Up-to-date statutory references are listed in the second and third columns of the management plan review checklist. Our primary role is to doublecheck that your plan is administratively complete not to be the primary writers/editors of your management plan, though we may provide additional input to improve your plan. And, as always, please run spell and grammar check.**

10. Please number the pages of your groundwater management plan so TWDB reviewers have a page number to refer to when preparing your recommendation report.
11. A table of contents is not required but if you have one please ensure that all the page numbers are correct.
12. Consider organizing the plan to match the order of the required items on the TWDB review checklist. This will speed up our review and is helpful with audits that may be conducted by the Texas State Auditor's Office.
13. When presenting each management goal in the plan please consider using the same language you see in the first column of the review checklist for each goal heading. These words are directly from statute.

Section 3-Additional details we commonly provide as suggested(optional) changes to help make the plan the best it can be

14. Use "modeled available groundwater" not "managed available groundwater"
15. For individual aquifers use, for example, "Edwards-Trinity (Plateau) Aquifer" rather than "Edwards-Trinity (Plateau) aquifer" because you are referring to a specific named aquifer.
16. When discussing multiple aquifers use "Dockum and Ogallala aquifers" rather than "Dockum and Ogallala Aquifers"
17. Use lowercase for "modeled available groundwater," "desired future condition", "groundwater conservation district", "regional water planning area", groundwater management area, groundwater management plan, etc.
18. If you decide to use acronyms in the plan, please define them at their first occurrence and then always use the acronym in the rest of the plan. For example, once you have defined "desired future condition (DFC)" always use "DFC" later in the plan.
19. Groundwater management plans are only in effect for five years, not ten years as some districts state.
20. Use the words "effect" and "affect", "principle" and "principal", and "insure" and "ensure" correctly.
21. Use a thousands separator in numbers exceeding 999 in value.
22. Up-to-date statutory references are listed in the second and third columns of the management plan review checklist. If you present references to statutes throughout your plan, please double check to make sure they are correct. The listing of statutory references in the plan is not required.
23. Any web links you use in the plan should be active and correct. Please test them before submitting the plan for pre-review.
24. Checklist #35-38, Addressing drought conditions. Consider adding the TWDB drought page address to this section. It includes information on drought and many drought-related web links:
<https://www.waterdatafortexas.org/drought>

Section 4-Please also refer to the following definitions from the Texas Administrative Code, Chapter 356 and/or the Texas Water Code Chapter 36 that are applicable to the goals in your groundwater management plan:

- Conjunctive use—The combined use of groundwater and surface water sources that optimizes the beneficial characteristics of each source, such as water banking, aquifer storage and recovery, enhanced recharge, and joint management.
- Most efficient use of groundwater—Practices, techniques, and technologies that a district determines will provide the least consumption of groundwater for each type of use balanced with the benefits of using groundwater.
- Natural resources issues—Issues related to environmental and other concerns that may be affected by a district's groundwater management plan and rules, such as impacts on endangered species, soils, oil and gas production, mining, air and water quality degradation, agriculture, and plant and animal life.
- Recharge enhancement—Increased recharge accomplished by the modification of the land surface, streams, or lakes to increase seepage or infiltration rates or by the direct injection of water into the subsurface through wells.
- Surface water management entities—Political subdivisions as defined by Texas Water Code Chapter 15 and identified from Texas Commission on Environmental Quality records that are granted authority under Texas Water Code Chapter 11 to store, take, divert, or supply surface water either directly or by contract for use within the boundaries of a district.
- (8) Waste-- means any one or more of the following:
 - (A) withdrawal of groundwater from a groundwater reservoir at a rate and in an amount that causes or threatens to cause intrusion into the reservoir of water unsuitable for agricultural, gardening, domestic, or stock raising purposes;
 - (B) the flowing or producing of wells from a groundwater reservoir if the water produced is not used for a beneficial purpose;
 - (C) escape of groundwater from a groundwater reservoir to any other reservoir or geologic strata that does not contain groundwater;
 - (D) pollution or harmful alteration of groundwater in a groundwater reservoir by saltwater or by other deleterious matter admitted from another stratum or from the surface of the ground;
 - (E) willfully or negligently causing, suffering, or allowing groundwater to escape into any river, creek, natural watercourse, depression, lake, reservoir, drain, sewer, street, highway, road, or road

ditch, or onto any land other than that of the owner of the well unless such discharge is authorized by permit, rule, or order issued by the commission under Chapter 26;

(F) groundwater pumped for irrigation that escapes as irrigation tailwater onto land other than that of the owner of the well unless permission has been granted by the occupant of the land receiving the discharge; or

(G) for water produced from an artesian well, "waste" also has the meaning assigned by Section 11.205.

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APPENDIX C

DISTRICT RULES

<http://lipan-kickapoo.org/rules.html>

APPENDIX D

LIPAN-KICKAPOO WATER CONSERVATION DISTRICT

8934 Loop 570
Wall, Texas 76957
Ph: 325-651-0919

MANAGEMENT PLAN 2023-2028

WHEREAS, the Lipan-Kickapoo Water Conservation District (Water District) was created by Acts of the 70th Legislature (1987), p. 2010, Ch. 439, S.B. 1525, in accordance with Article 16, Section 59 of the Constitution of Texas and Chapters 51 and 52 of the Texas Water Code, as amended; and

WHEREAS, S.B. 1525 was amended by Acts of the 77th Legislature (2001), H.B. 1909, in accordance with Chapters 36 and 49 of the Texas Water Code, as amended; and

WHEREAS, the Lipan-Kickapoo Water Conservation District (Water District) was recodified to Special District Local Laws Code; Title 6. Water and Wastewater; Subtitle H. Districts Governing Groundwater; Chapter 8805; by Acts 2009, 81st Leg., R.S., Ch. 1139, Sec. 1.05, eff. April 1, 2011; and

WHEREAS, the District is required by Chapter 36.1071 of the Texas Water Code to develop and adopt a Management Plan; and

WHEREAS, the District is required by Chapter 36.1072 of the Texas Water Code to review and readopt the plan with or without revisions at least once every five years and to submit the adopted Management Plan to the Executive Administrator of the Texas Water Development Board for review and approval if the plan is administratively complete; and

WHEREAS, the current Management Plan expires on April 25, 2023 and must be reviewed and replaced with a new Management Plan for 2023-2028, prior to expiration of the current plan; and

WHEREAS, after proper notice and hearing, the District Board of Directors has determined that the Proposed Management Plan addresses the requirements of Chapter 36.1071 and is administratively complete and ready for submission to the Texas Water Development Board for review and approval.

NOW, THEREFORE, be it resolved, that the Board of Directors of the Lipan-Kickapoo Water Conservation District hereby adopts the Management Plan for 2023-2028; and

FURTHER, be it resolved, that this new Management Plan shall become effective immediately upon adoption and final approval of the Texas Water Development Board.

Adopted this 8th day of March, 2023, by the Board of Directors of the Lipan-Kickapoo Water Conservation District.


Presiding Officer

Attest:


Board Secretary

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APPENDIX E

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Standard-Times

PART OF THE USA TODAY NETWORK

PROOF OF PUBLICATION

LIPAN KICKAPOO WATER CONSERVATION D
8934 LOOP 570

WALL, TX 76957

State of Wisconsin, County of Brown

On **January 26, 2023**, personally appeared before me the undersigned, a Notary Public in and for said county and state, legal clerk of the **SAN ANGELO STANDARD-TIMES**, a daily newspaper published in San Angelo, County of TOM GREEN, State of Texas and of general circulation in the following counties: **Tom Green, Coke, Concho, Crockett, Irion, Kimble, Mason, McCulloch, Menard, Reagan, Runnels, Schleicher, Sterling, Sutton**. The attached advertisement, a true copy of which is hereto annexed, was published in said newspaper in its issues there of the issue(s) dated as follows:

01/26/2023

Subscribed and sworn to before me on January 26, 2023

Nicole Jacobs
Legal Clerk

Shelly Hora
Notary Public, State of WI, County of Brown

8-25-23
My commission expires

SHELLY HORA
Notary Public
State of Wisconsin

PUBLIC NOTICE
LIPAN-KICKAPOO
WATER CONSERVATION
DISTRICT
8934 WALL, TEXAS 76957
Ph: (325) 651-0919
Email: lkward@frontier.com
Website: lipan-kickapoo.org

A Public Hearing is scheduled to be held at the Lipan-Kickapoo Water Conservation District Office, 8934 Loop 570, Wall, Texas on Wednesday, March 8, at 7:30 am. The purpose of this hearing is to take public comment on a proposed revised Management Plan (2023-2028) for the District. Full text copies of the Proposed Management Plan may be obtained from the Water District office, the district website, by email request, or by calling the district office. Written comments on the proposed Management Plan are being taken until 4 pm, Monday, February 27, 2023. Comments may be mailed, emailed or submitted in person to the Water District.

Publication Cost: \$196.88
Ad No: 0005571406
Customer No: 1246254
PO #:
of Affidavits 1

This is not an invoice

NOTICE OF HEARING
ON
PROPOSED MANAGEMENT PLAN
FOR THE
LIPAN-KICKAPOO WATER CONSERVATION DISTRICT
Wednesday, March 8, 2023 at 7:30 AM

A Public Hearing is scheduled to be held at the Lipan-Kickapoo Water Conservation District Office, 8934 Loop 570, Wall, Texas. The purpose of this hearing is to take public comments on the proposed Management Plan (2023-2028) for the District.

PUBLIC NOTICE
SPECIAL MEETING OF THE BOARD OF DIRECTORS
LIPAN-KICKAPOO WATER CONSERVATION DISTRICT

The Board of Directors will meet in Special Session on Wednesday, March 8, 2023, immediately following the Public Hearing on the Proposed Management Plan (2023-2028) for the District. The meeting will be held at the Lipan-Kickapoo Water Conservation District Office, 8934 Loop 570, Wall, Texas. Items on this agenda may be taken out of the order indicated.

AGENDA

- (1) Call to Order
- (2) Public Comments. *
- (3) Discussion and possible action to adopt the Proposed Management Plan (2023-2028) with any revisions as necessary.
- (4) Discussion and possibly cancelling elections for At Large Position and the unexpired Concho County Position..
- (5) Next regular meeting tentatively set for May 17, 2023 (3rd Wednesday) at 7:30 AM.
- (6) Adjournment.

** Under the Open Meetings Act, Chapter 551, all meetings of the District are open to the Public, except for executive sessions. The Act does not give the public a right to speak at such meetings. However, the Board at its discretion may allow any person to address the Board on any item and for the length of time as determined by the Board.*

Date: February 21, 2023
Time: 7:29 AM

POSTED March 1, 2023
At 10:34 o'clock A M
Jennifer Hoffpaul Jennifer Hoffpaul
County Clerk, Runnels County, Texas
By _____ Deputy

NOTICE OF HEARING
ON
PROPOSED MANAGEMENT PLAN
FOR THE
LIPAN-KICKAPOO WATER CONSERVATION DISTRICT
Wednesday, March 8, 2023 at 7:30 AM

FILED FOR RECORD
23 MAR - 1 AM 10:53
CHRISTINA UBANDO
COUNTY CLERK
SQUAD 1000 TEXAS

A Public Hearing is scheduled to be held at the Lipan-Kickapoo Water Conservation District Office, 8934 Loop 570, Wall, Texas. The purpose of this hearing is to take public comments on the proposed Management Plan (2023-2028) for the District.

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LIPAN-KICKAPOO WATER CONSERVATION DISTRICT

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Date: February 21, 2023
Time: 7:29 AM

NOTICE OF HEARING
ON
PROPOSED MANAGEMENT PLAN
FOR THE
LIPAN-KICKAPOO WATER CONSERVATION DISTRICT
Wednesday, March 8, 2023 at 7:30 AM

FILED
The 1 Day of March
2023 at 1:00 o'clock PM
Amherst Hall
Concho Clerk, Concho Co. TX
By Janie Saucedo

A Public Hearing is scheduled to be held at the Lipan-Kickapoo Water Conservation District Office, 8934 Loop 570, Wall, Texas. The purpose of this hearing is to take public comments on the proposed Management Plan (2023-2028) for the District.

PUBLIC NOTICE

SPECIAL MEETING OF THE BOARD OF DIRECTORS

LIPAN-KICKAPOO WATER CONSERVATION DISTRICT

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Date: February 21, 2023
Time: 7:29 AM

This is to certify that at 8:42 am and on Wednesday, March 1, 2023 this notice of a meeting, was posted on the bulletin board in the Lipan-Kickapoo Water Conservation District office in Vancouver, Texas.
Executed on 2-1-23, 2023 Leon Braden Leon Braden, General Manager, Lipan-Kickapoo WCD

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APPENDIX F

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Lipan-Kickapoo WCD Management Plan - ADOPTED

From: staff.lkwcd staff.lkwcd (staff.lkwcd@frontier.com)

To: tomgreencountywcid1@gmail.com; andy.vecellio@cosatx.us; s.lincoln@winterstx.org
cwalker@crmwd.org; scottm@ucratx.org; bfrieda@baltx.org

Date: Thursday, March 16, 2023 at 09:16 AM CDT

Lipan-Kickapoo Water Conservation District

8934 Loop 570
Wall, Texas 76957
Ph: 325-651-0919
Email: lkwcd@frontier.com

March 15, 2023

Subject: Lipan-Kickapoo WCD Management Plan - ADOPTED

During a meeting of the Board of Directors of the Lipan-Kickapoo WCD, a new management plan for 2023-2028 was adopted to replace the 2018-2023 management plan that is set to expire in April of this year. Under §36.1072, Texas Water Code, as amended, the District must review and adopt a new plan every five years and submit it to the Texas Water Development Board for review and approval.

Under §36.1071, Texas Water Code, as amended, the Lipan-Kickapoo WCD is required to coordinate with surface water entities located within the district in the preparation of its management plan. In compliance with this chapter of the water code, we have attached a copy of the new adopted management plan for your review and comments. Although the Tom Green County Water Control and Improvement District #1 is the only surface water entity located within the district's boundaries, the district has chosen to submit a copy of the adopted management plan to other surface water entities that have storage either in the district, partially in the district, or adjacent to the district for review and comments. This includes:

- 1) Tom Green County Water Control Water Control and Improvement District #1
- 2) City of San Angelo
- 3) Upper Colorado River Authority
- 4) City of Winters
- 5) Colorado River Municipal Water District
- 6) City of Ballinger
- 7) Region F Regional Water Planning Group.

Please review this management plan and submit any comments or suggestions to the District. If you have any questions or need additional information, please contact me at (325) 651-0919. We appreciate your attention and cooperation in reviewing this management plan.

Sincerely,

Lipan-Kickapoo WCD

From: Mail Delivery Subsystem
Sent: Thursday, March 16, 2023 at 01:10 PM
To: staff.lkwcd@frontier.com

Your message <tomgreencountywcid1@gmail.com> was successfully relayed.
Subject: LKWCD "ADOPTED" Management Plan 2023-2028 for
<tomgreencountywcid1@gmail.com>, Relayed

Lipan-Kickapoo WCD

From: Mail Delivery Subsystem
Sent: Thursday, March 16, 2023 at 1:33 PM
To: staff.lkwcd@frontier.com

Your message <bfrieda@baltx.org> was successfully relayed.
Subject: LKWCD "ADOPTED" Management Plan 2023-2028 for <bfrieda@baltx.org>.
Relayed