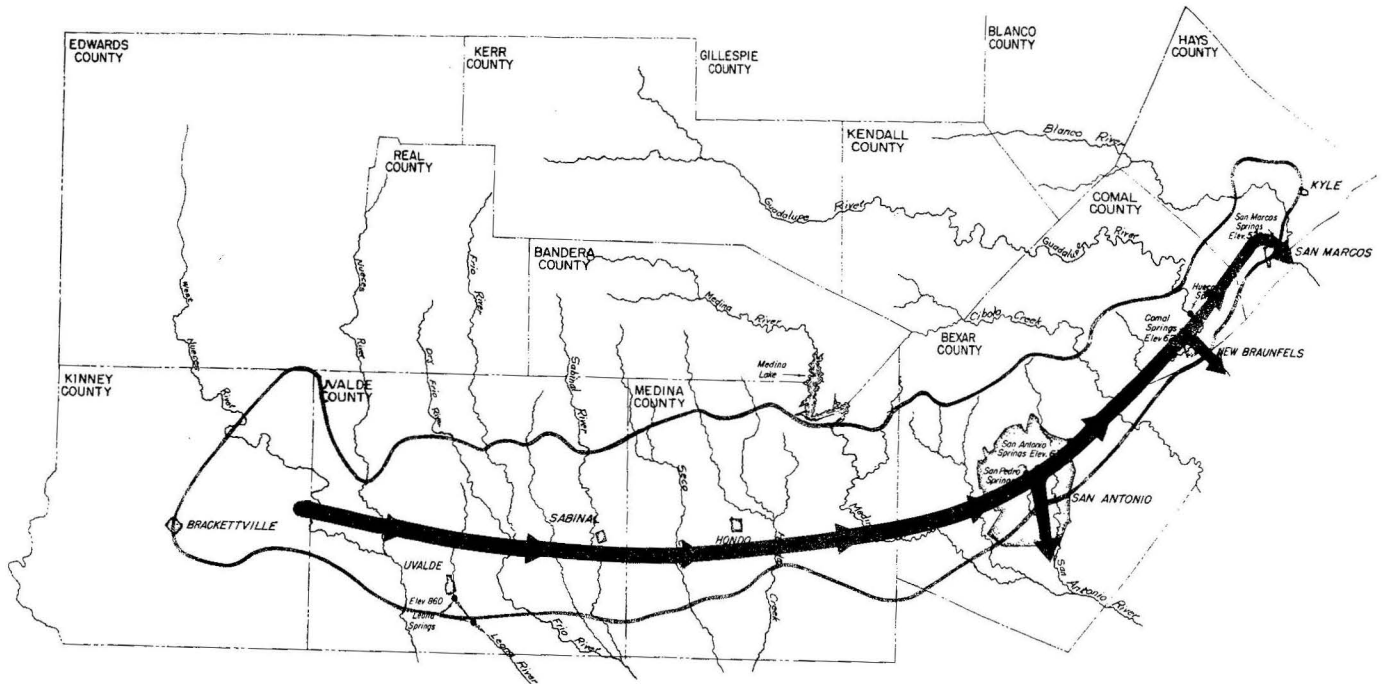


THE EDWARDS UNDERGROUND WATER DISTRICT

1975



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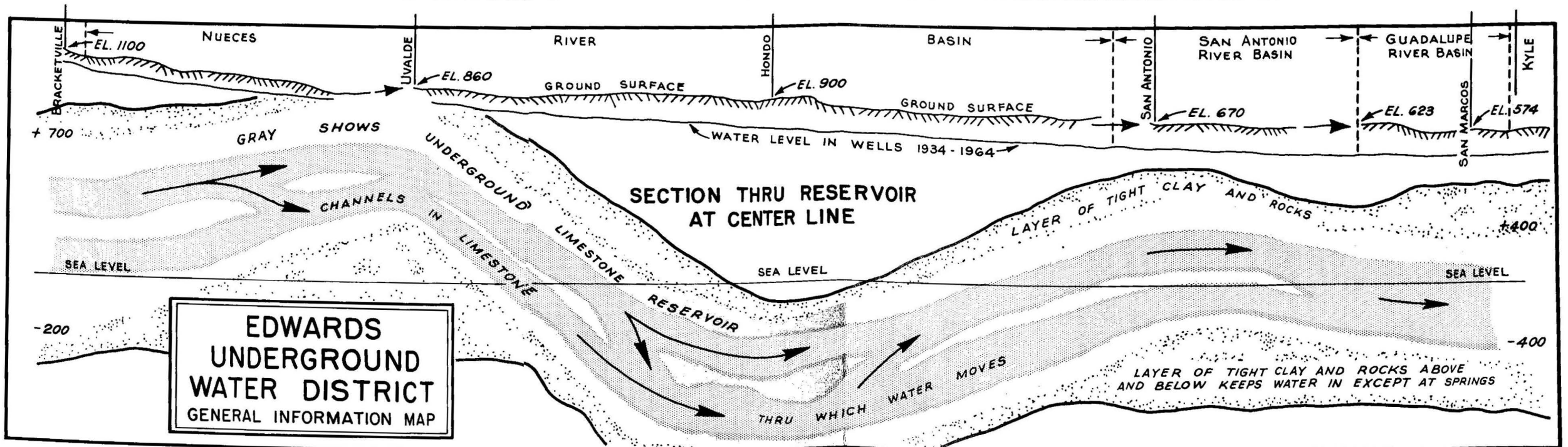
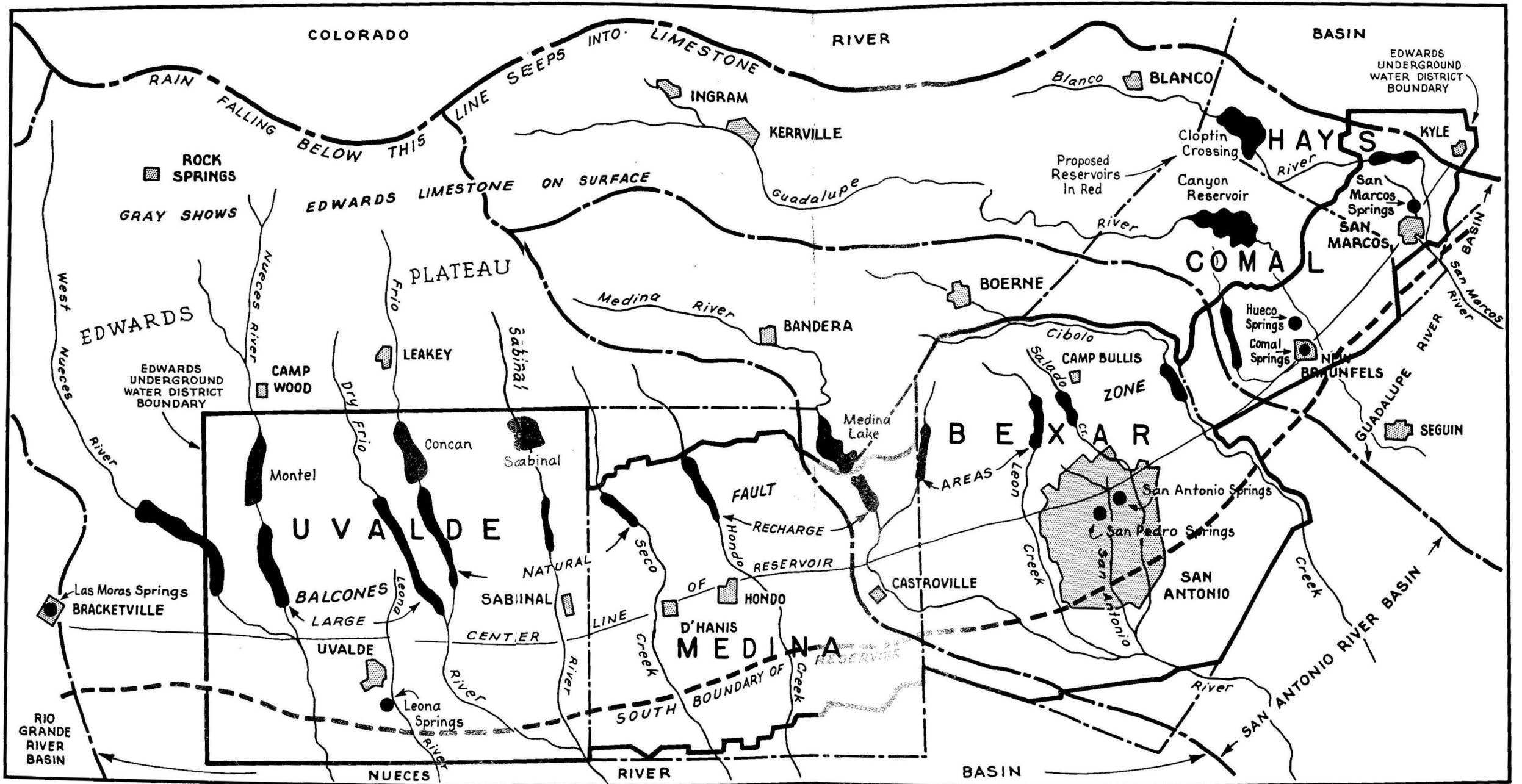
The Edwards Underground Reservoir in the Balcones Fault Zone extends 175 miles across Uvalde, Medina, Bexar, Comal and Hays Counties from the middle of Kinney County to Kyle in Hays County. It is from 5 to 30 miles wide, and about 500 feet thick.

The recharge area is a strip of faulted and porous limestone where water goes into the underground reservoir. Streams that cross the Balcones Fault Zone lose a large part of their water to the underground reservoir, and rain falling directly on this faulted zone adds to the recharge. The streams that contribute most of the water drain that area of the Edwards Plateau below a line generally from Rocksprings to Blanco. See map on page 2.

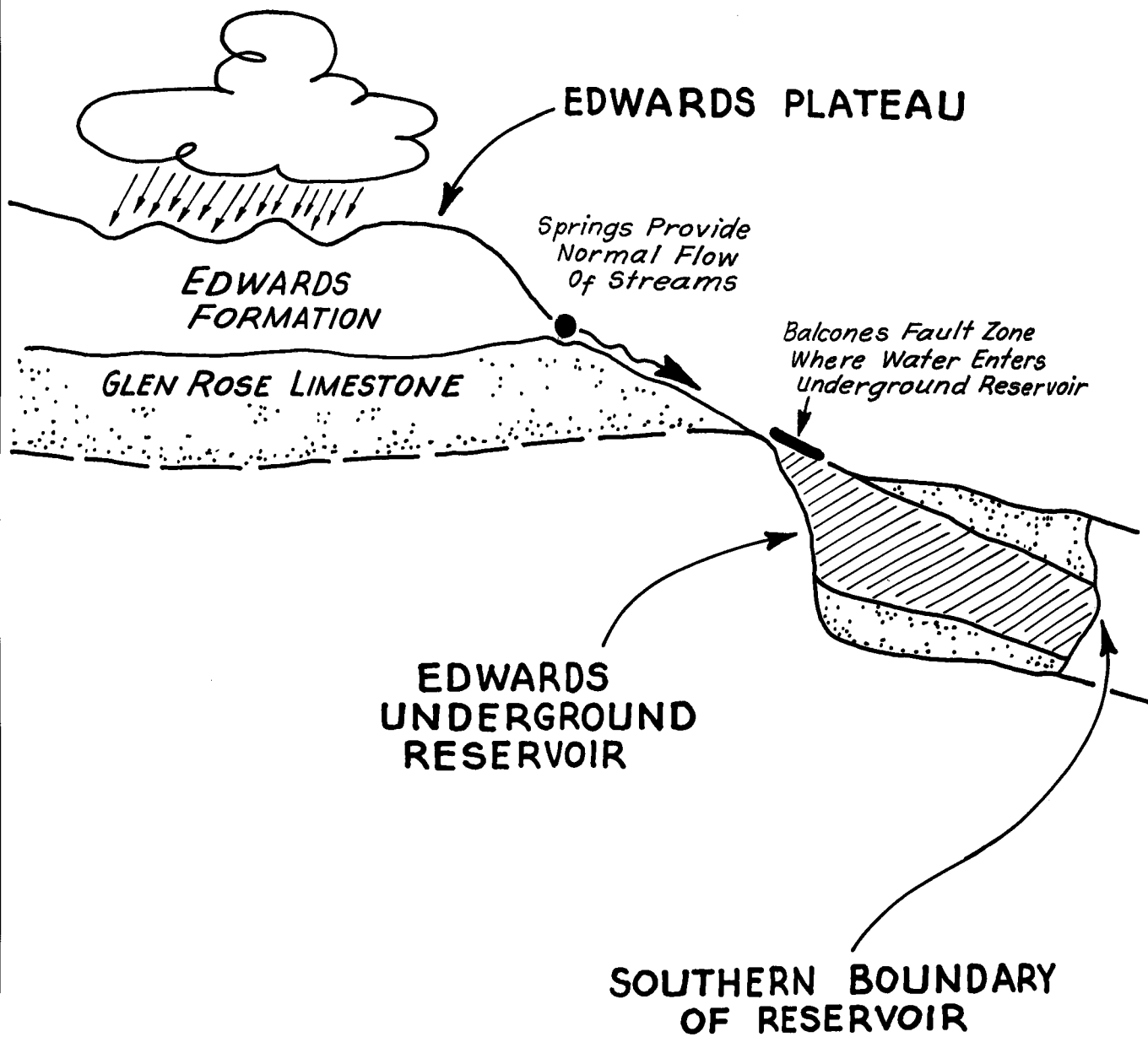
About three-fifths of the water for the reservoir comes from the West Nueces, Nueces, Dry Frio, Frio, Sabinal and Medina Rivers, and the creeks in Uvalde and Medina Counties. The Guadalupe River is the only stream in the area which loses no water to the underground reservoir.

The drought which ended in 1957 was the worst ever known in this area. Water levels in wells reached an all-time low. Medina Lake was dry. All springs except San Marcos Springs stopped flowing. Rainfall was high from 1957 through 1961, and the reservoir recovered the losses brought about by the drought in a period of less than two years.

Water entering the underground reservoir moves slowly southward across the reservoir and then east and northeast toward the large natural discharge outlets at Comal Springs in New Braunfels and San Marcos Springs. Other "leaks" from the reservoir are the Leona River Springs near Uvalde, and San Antonio and San Pedro Springs in San Antonio, and many flowing wells (such as the Salado Creek well at Fort Sam Houston). Because formations through which water cannot move lie above and below the limestone in the underground part of the reservoir, the water is under pressure, rises close to the surface in many wells and flows from others.



WATER MOVEMENT FROM NORTH TO SOUTH ACROSS THE AREA



Annual flow of water into the reservoir from 1934 to 1970 has been as little as 44,000 acre-feet in 1956, and as much as 1,700,000 acre-feet in 1958. There have been four years of record when recharge exceeded 1,000,000 acre-feet. An acre-foot of water is approximately 326,000 gallons. The average annual recharge through 1971 was more than 500,000 acre-feet.

Natural recharge puts most of the water which reaches the Balcones Fault Zone into the ground. Increase of natural recharge will make more water available for use only after water levels have been lowered and spring flow decreases. However, springflow is important and the water is used for recreation and other purposes.

Water is pumped from hundreds of wells from eastern Kinney County to Kyle in Hays County. The reservoir is the only source of water for the cities of Uvalde, Knippa, Sabinal, D'Hanis, Castrovilla, LaCoste, San Antonio, New Braunfels, San Marcos, Kyle and other smaller communities. Irrigation, industrial, domestic, stock and other uses also are dependent on water from the underground reservoir which is the sole water supply for over one million people.

DISCHARGE--ACRE FEET PER YEAR

<u>Date</u>	<u>Springs</u>	<u>Municipal & Industrial</u>	<u>Irriga- tion</u>	<u>Domestic Stock Ranchers, etc.</u>	<u>Total</u>
1962	321,000	166,300	73,000	28,800	589,100
1963	239,600	173,600	75,400	27,800	516,400
1964	213,800	162,400	72,800	26,400	475,400
1965	322,800	161,100	68,000	27,000	578,900
1966	315,300	164,400	68,200	23,300	571,200
1967	216,100	196,800	119,400	25,100	557,400
1968	408,300	166,900	59,300	25,500	660,000
1969	351,200	183,100	95,200	29,200	658,700
1970	397,700	190,000	110,100	29,300	727,100
1971	272,700	218,800	159,400	28,600	679,500

The Edwards Underground Water District has asked the Bureau to re-study the recharge problem with a view to eliminating objection from anyone and in an effort to develop a program which can be financed locally.

The U. S. Geological Survey carries on continuing studies of the amount of water that goes into and out of the reservoir, its movement through the reservoir, and the quality. In 1968 this program was expanded to collect data on the effect of septic tanks on wells in the water table part of the reservoir, and surface geology studies were initiated to accurately define the danger spots in the recharge zone where the greatest danger of pollution of the artesian part of the aquifer occurs.

The San Antonio City Water Board started financing the cost of a research study on the Edwards Reservoir in 1970. A ground water hydrologist, assisted by other Geological Survey personnel, is attempting to determine the capacity of the reservoir and get the answer to many questions of vital concern primarily to San Antonio.

An initial progress report has been released and may be obtained from the District.

INFORMATION AND PUBLICATIONS

A color-sound educational film entitled, "The Edwards Story," is available to any group wishing to view it. The film may be obtained from the Edwards Underground Water District office, or from the Education Service Center, Region 20, 1550 N E Loop 410, San Antonio, Texas. The film shows where and how water enters the underground reservoir, moves through the ground, and is used and discharged from the reservoir from Uvalde County to Kyle in Hays County.

This information booklet is available for distribution to any group wishing to use it, and copies desired may be obtained from the Edwards Underground Water District office upon request.

Bulletins on water recharge and discharge are published annually.

A progress report on water quality and geological studies was published in 1969. A second report was published in 1972.

"THE EDWARDS BULLETIN." a monthly publication giving information on water levels, spring discharge, development in ground water problems nationwide, and current activities of the Edwards Underground Water District is mailed to approximately 325 individuals and agencies.

ARTIFICIAL RECHARGE

Because of the fact that ground water is private property in Texas, and because the law which provides that surface water put into the ground loses its identity, there is no way in which the large recharge dams on the Nueces, Frio and Sabinal Rivers can be financed. It is hoped that the Bureau of Reclamation study of the area will propose an alternate which is acceptable to the people, and which can be financed locally without Federal construction funds.

A policy of cooperating with all Soil Conservation Districts where proposed improvements will add to the natural recharge has been adopted. Each project will be judged on its merits, and financial participation by the Edwards Underground Water District will be based on the value of the increased water made available.

The Edwards Underground Water District has participated in the Seco Creek Watershed Project in Medina, Uvalde and Bandera Counties, and in the Leona River Watershed Project in Uvalde County, and in the Dry Comal-Blieders Creek Project in Comal County by paying \$35,000, \$22,000, and \$16,000, respectively, as part of the cost of field surveys, and has authorized participation in the cost of planning the Upper San Marcos Watershed Project in Hays County in the amount of \$25,000.00.

The District has assisted the San Antonio River Authority in the construction of small dams in the Salado Creek Watershed Project in Bexar County by contributing \$210,000.00 for partial value of increased recharge.

Dam No. 11 of the Seco Creek Watershed Project on Parker Creek in Medina County will be constructed by the District using District funds. The project will be advertised for bids in late 1972. The estimated cost for design and construction is approximately \$180,000.00, and the estimated increase in recharge is 522 acre-feet a year.

The Directors have also voted to construct a recharge dam with District funds on San Geronimo Creek in Medina County at the Bexar County line. An engineering firm has been employed to make a feasibility study and cost estimate.

POLLUTION PREVENTION

Water sampling points have been established on streams, springs, and at selected wells at some forty places extending from Rocksprings in Real County to Hays County, and samples are taken from these points at regular intervals.

Information gathered to date indicates that shallow wells in the water table part of the reservoir are particularly susceptible to bacterial contamination. After prolonged rains in August 1971 on the drainage areas contributing to recharge, there was a significant increase in coliform bacteria found in wells just below the recharge zone and below built-up areas where large numbers of septic tanks had been in use for a long time.

On July 31, 1970, the Texas Water Quality Board issued an Order controlling all waste disposal in the areas contributing water to the Edwards Underground Reservoir in an attempt to prevent pollution from future development.

THE TEXAS WATER PLAN

Issued by the Texas Water Development Board in 1968, the Texas Water Plan stresses the inter-connection of the Nueces, San Antonio and Guadalupe River Basins by the Edwards Underground Reservoir, and points out that "since these basins are essentially in hydraulic connection, there are significant advantages in planning for the development of the water resources of parts or all of these three river basins as a unit."

The water agencies in these three river basins responsible for the planning and development of surface water and the Edwards Underground Water District, are cooperating with the Texas Water Development Board and the Bureau of Reclamation in making a comprehensive study of both surface and ground water. Only ground water in both the Edwards limestone formation and the Carrizo San will be considered in the Nueces Basin. All surface and ground water supplies available will be investigated in the San Antonio and Guadalupe Basins.