TEXAS
WATER
DEVELOPMENT
BOARD

Report 95

GROUND-WATER RESOURCES OF KIMBLE COUNTY, TEXAS

MAY 1969

TEXAS WATER DEVELOPMENT BOARD

REPORT 95

GROUND-WATER RESOURCES OF KIMBLE COUNTY, TEXAS

By

W. H. Alexander, Jr., and J. H. Patman
United States Geological Survey

Prepared by the U.S. Geological Survey
in cooperation with the
Texas Water Development Board

May 1969

Published and distributed
by the
Texas Water Development Board
Post Office Box 12386
Austin, Texas 78711

TABLE OF CONTENTS

TABLE OF CONTENTS (Cont'd.)

TABLES

TABLE OF CONTENTS (Cont'd.)

FIGURES

GROUND-WATER RESOURCES OF KIMBLE COUNTY, TEXAS

ABSTRACT

The aquifer formed by the Edwards and associated limestones, which underlies all of the upland areas in Kimble County, is the most extensive source of fresh ground water in the county. In addition to the flow of springs, this aquifer supplies water for rural domestic and livestock use in much of the county—an estimated 420 acre-feet in 1964. The theoretical quantity available for future development from this aquifer in Kimble County is about 33,000 acre-feet per year. If more than this amount were pumped annually, the water levels in the rural domestic and livestock wells would decline and the flow of the springs would decrease and ultimately cease.

The alluvial deposits along the major streams, although relatively small in area and in capacity to store water, supply more than half of the fresh water pumped from wells in Kimble County—about 1,200 acre-feet of the total 1,900 acre-feet in 1964. This aquifer supplies annually about 1,000 acre-feet (0.9 million gallons per day) to the city of Junction and most of the 210 acre-feet (0.19 million gallons per day) pumped for irrigation.

The total quantity of water available for future development from all of the alluvial deposits is closely related to the minimum base flow of the Llano River at the gaging station near Junction. Based on the hydrograph record for a 45-year period (1916-50, 1955, 1957-65), the minimum base flow was 10 mgd (million gallons per day) or 31 acre-feet per day during the summer period (April through September) of 1955, which is several times the present use.

A number of relatively shallow wells in the valleys of the Llano River and its tributaries and in the valleys of the East Fork and West Fork James River supply water for rural domestic, livestock, and limited irrigation uses. These wells are supplied from sands and sandstones in the Hensell Member of the Pearsall Formation. Most of the water from this aquifer is fresh in the eastern part of the county and slightly saline in the western part.

The other aquifers in the county yield a total of about 30 acre-feet of fresh water per year.

GROUND-WATER RESOURCES OF KIMBLE COUNTY, TEXAS

INTRODUCTION

Location and Extent of the Area

Kimble County is in the southwestern part of central Texas. Junction, the county seat, is 130 miles west of Austin and 110 miles northwest of San Antonio. The county is bordered on the north by Menard County, on the east by Mason and Gillespie Counties, on the south by Kerr and Edwards Counties, and on the west by Sutton County (Figure 1). The area of the county is 1,274 square miles.

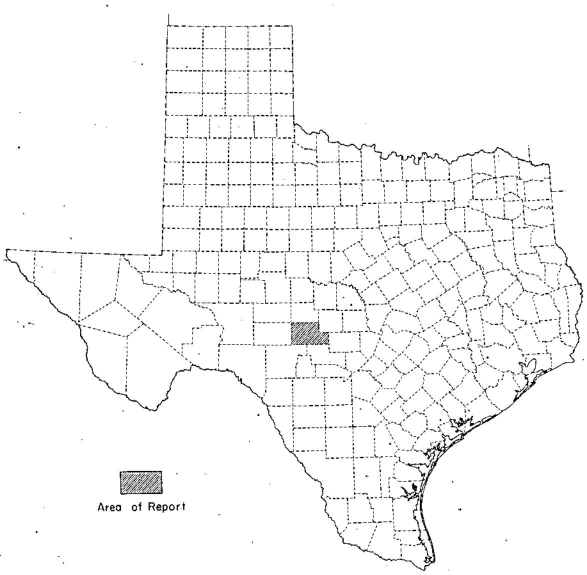

Figure 1.—Location of Kimble County

Purpose and Scope of the Investigation

The investigation of the ground-water resources of Kimble County was a cooperative project of the Texas Water Development Board and the U.S. Geological Survey. Fieldwork was begun in July 1965 and continued until September 1966. The purpose of the investigation was to determine the occurrence, availability, dependability, quality, and quantity of the ground-water resources of the county.

The general scope of the investigation included the collection, compilation, and analysis of all available data related to ground water in the county, and the preparation of a report that presents information and data that can be used in obtaining optimum benefits from the available ground-water supplies.

Methods of Investigation

The following items were included in the investigation of the ground-water resources of Kimble County:

1. An inventory was made of 67 springs and 585 water wells, including all public supply, irrigation, and industrial wells (Table 3). The locations of the springs and wells are shown on Figure 12.

2. The electric logs of 70 oil and gas tests and drillers' logs of water wells (Table 4) were used for correlation and evaluation of the water-bearing properties of the aquifers. The locations of the oil and gas tests are shown on Figure 12.

3. Analyses of water samples collected from 77 wells and 3 springs were used to determine the chemical quality of the water (Table 5). Also used were field measurements of specific conductance of samples from 446 wells and 40 springs and field determinations of the iron content of samples from 109 wells and 6 springs.

4. Altitudes of the land surface at 110 water wells and 11 springs were determined from topographic maps; altitudes at 228 water wells and 24 springs were measured by altimeter (Table 3). From these altitudes and measurements of depths to water in wells, maps were made of the altitudes of the water table and piezometric surface (Figures 8 and 9).

5. Estimates were made of the quantity of ground water used in the county.

6. Records of streamflow were analyzed and compared with climatological records.

7. Maps, geologic sections, and graphs were prepared to correlate and illustrate geologic and hydrologic data.

8. The hydrologic data were analyzed to determine the quantity and quality of ground water available for development.

9. Problems related to the development and protection of the ground-water supplies in the county were studied.

Previous Investigations

Kimble County was included in the reconnaissance investigation of the ground-water resources of the Colorado River basin, Texas, by Mount and others (1967); the water supply for the city of Junction was described in the report on public water supplies in central and north-central Texas by Sundstrom and others (1949). Ground-water conditions in adjacent Menard County were described by Baker and others (1965), and the ground-water geology of adjacent Edwards County was described by Long (1962 and 1963). The geology in quadrangles RK-56-38 and RK-56-46 (Figure 12) was mapped by Barnes (1954 and 1956).

Related Investigations

Related surface water resources investigations are mentioned in this report because the quantity of surface water used for irrigation in the county in 1964 was more than twice that of ground water (Gillett and Janca, 1965, p. 19); and because the spring flow from one aquifer sustains the low flow of the principal streams, which in turn contributes most of the recharge to another aquifer (see section: "Availability of Ground Water").

Stream-gaging stations are maintained at two localities (Figure 12) in Kimble County, North Llano River near Junction (8-1485) and Llano River near Junciton (8-1500). Measurements of streamflow in Texas are published annually. (For the records at these stations from October 1965 to September 1966, see U.S. Geol. Survey, 1967, p. 356, 357, 469, and 470.)

During the interval January 17-24, 1962, the flow of the Llano River and its principal tributaries was measured at 53 localities between Junction and Llano, and samples were collected at 31 of the localities. Holland and Mendieta (1965) discussed the measurements and the chemical analyses of the samples. They stated that the flow of the Llano and its tributaries was being sustained by spring flow, because there had been no runoff-producing rains for 66 days prior to and during the investigation; and that the chemical quality of the Llano River between Junction and Llano at the time of the investigation probably was at or near its maximum concentration of dissolved solids, but was suitable for public supply and irrigation uses.

Economic Development

The economy of Kimble County is based on agriculture. The greater part of the county's income is obtained from ranching. An important source of income has resulted from the development of the recreational facilities of the county—principally from hunting and fishing. Cedar posts, cedar products, and pecans are other sources of income. The production of natural gas in the county in 1966 was 75,218 mcf (million cubic feet) and the total oil production to January 1, 1967, was 32,823 barrels (Railroad Commission of Texas, 1967).

In 1960 (U.S. Census data) the population of Kimble County was 3,943; the population of Junction was 2,441; London, 250; Roosevelt, 125; Telegraph, 25; Segovia, 20; Cleo, 15; and Noxville, 10. Ground water supplies all of the water for public supply and rural domestic uses, most of the water for livestock use, and about one-third of the water used for irrigation. Ground water contributes directly to the economy of the county as water supply and indirectly as a scenic feature—the famous springs and spring-fed streams contribute much to the recreational features of the county.

Topography and Drainage

The three principal topographic features of Kimble County are: (1) the valley of the Llano River, which ranges in width from about 2 miles near Junction to about 8 miles in the northeastern corner of the county, (2) the valleys of the East Fork and West Fork James River, which range in width from less than a mile each to a combined width of about 5 miles near the boundary with Mason County, and (3) the Edwards Plateau, which makes up the remainder of the county.

The Edwards Plateau is underlain by almost flat layers of limestone and dolomite that have been dissected by stream erosion to some extent in almost all of its area. Kimble County is along the eastern border of the plateau and, consequently, erosion has removed much of the original plateau surface leaving only concordant flat-topped ridges at the higher altitudes. The altitudes of these ridge tops range from about 2,200 feet in the southeastern corner of Kimble County to 2,460 feet in the northwestern corner—the rate of decrease being about 4.6 feet per mile. The lowest altitude in the county is about 1,450 feet, where the Llano River enters Mason County. The altitude is about 1,850 feet where the South Llano River crosses the Edwards County boundary; and about 1,950 feet where the North Llano River enters the county from Sutton County.

Kimble County is drained by the Llano River, except for a few square miles in the northwestern and in the southeastern corners of the county. The principal streams in the report area are: the North Llano and

South Llano Rivers that join at Junction to become the Llano River; the East Fork and West Fork James River that join near the Mason County boundary to become the James River; and Johnson Creek, a tributary of the Llano River.

Climate

Most of Kimble County is in the dry subhumid moisture region (Thornthwaite, 1952, fig. 30). The average annual precipitation is 23.81 inches (Figure 2). The approximate dates of the first and last frosts are November 3 and April 3, respectively. The growing season is about 213 days.

The average monthly gross lake surface evaporation rate in Kimble County during the period 1940-65 ranged from 2.6 inches during January to 11.1 inches during August; the average annual rate during the same period was 73 inches (Kane, 1967).

Well-Numbering System

The numbering system used for the wells and springs in this report is based on latitude and longitude, and is the system used throughout the State by the Texas Water Development Board. Under this system, each 1-degree quadrangle in the State is given a number consisting of two digits from 01 to 89; the report area

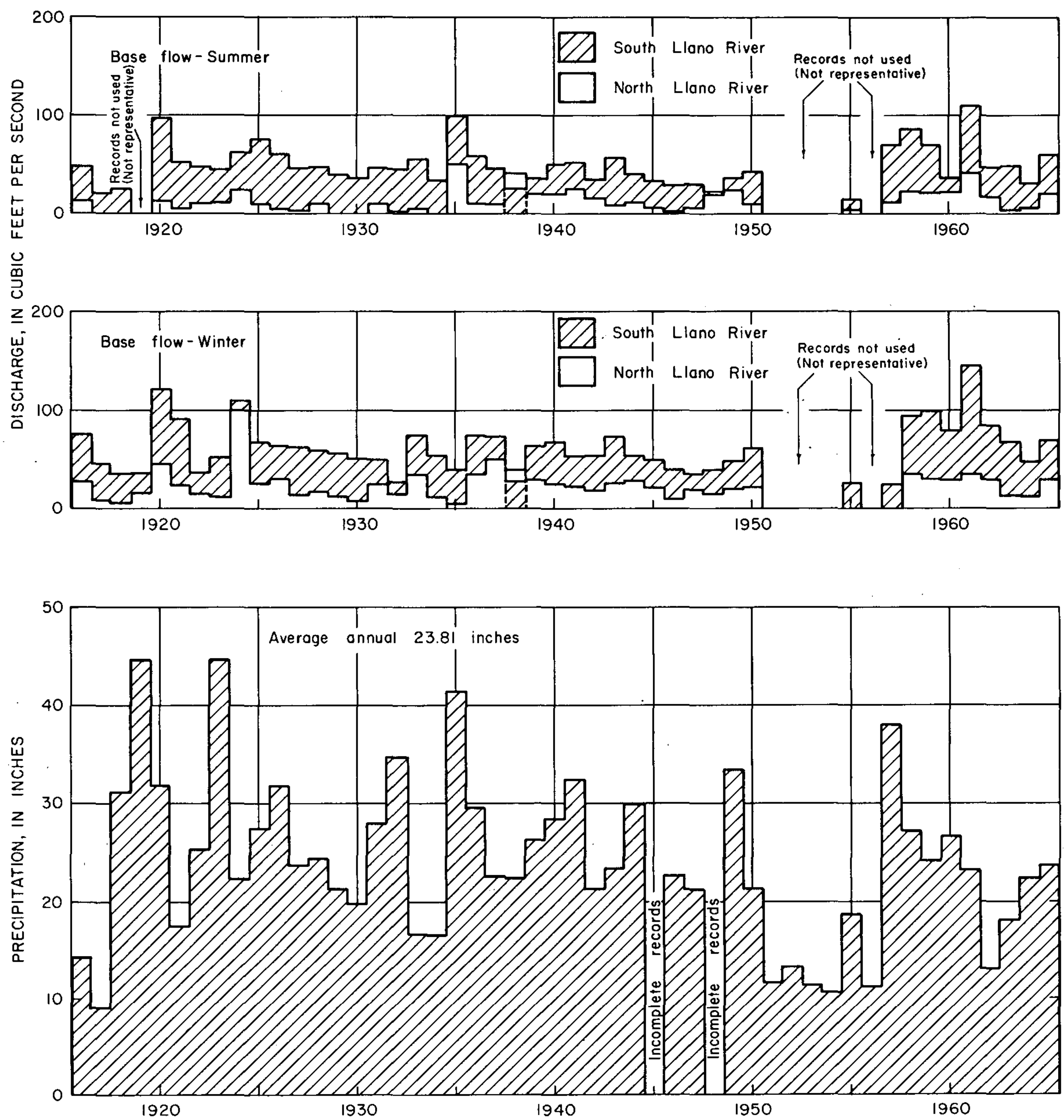

Figure 2.—Annual Precipitation at Junction, 1916-65, and Base Flow of North and South Llano Rivers, 1916-65

includes parts of quadrangles 55 and 56. These are the first two digits appearing in the well number. Each 1-degree quadrangle is divided into 7½-minute quadrangles which are also given 2-digit numbers from 01 to 64. These are the third and fourth digits of the well number. Each 7½-minute quadrangle is subdivided into 2½-minute quadrangles and given a single digit number from 1 to 9. This is the fifth digit of the well number. Finally, each well within a 2½-minute quadrangle is given a 2-digit number in the order in which it is inventoried, starting with 01. These are the last two digits of the well number. Only the last three digits of the well number are shown at the location of a well on Figure 12; the second two digits are shown in the northwest corner of each 7½-minute quadrangle; and the first two digits are shown by the large block numbers 55 and 56. In addition to the 7-digit well number, a 2-letter prefix is used to identify the county. The prefixes for Kimble County and adjacent counties are as follows:

COUNTY	PREFIX
Edwards	JJ
Gillespie	KK
Kerr	RJ
Kimble	RK
Mason	SZ
Menard	TH
Schleicher	WY
Sutton	XS

For example, well RK-56-34-301 (which supplies part of the water for the city of Junction) is in Kimble County (RK), in 1-degree quadrangle 56, in 7½-minute quadrangle 34, in 2½-minute quadrangle 3, and was the first well (01) inventoried in that 2½-minute quadrangle (Figure 12).

Acknowledgments

The authors are indebted to the landowners in Kimble County for supplying information about their water wells and for permitting access to their properties; to the well drillers for logs and other information on water wells; and to the officials of the county, the city of Junction, and the state and federal agencies for their assistance in collecting data for the report—especially the officials of the Upper Llano Soil Conservation Districts, Sam H. Coleman of the Soil Conservation Service, County Judge W. W. Leamons and Mayor A. E. Fife. Lloyd Stewart and Don Bizzell, of the Texas Highway Department, generously provided many highway elevations from which altimeter measurements were made of the altitude of several hundred wells and springs. Most of the data shown on the maps and geologic sections in this report were obtained from the electrical logs of oil and gas tests. Mr. L. G. Stearns, U.S. Geological Survey, Austin, evaluated records of streamflow in the county.

HYDROLOGIC AND GEOLOGIC UNITS AND THEIR WATER-BEARING PROPERTIES

General Stratigraphy and Structure

The hydrologic and geologic units discussed in this report range in age from Cambrian to Holocene. The thickness, lithology, and water-bearing properties of the units are summarized in Table 1. The areal geology and the locations of wells and springs are shown on Figure 12. The general structure of the report area is shown on the subsurface maps (Figures 3, 4, 5, and 6), and the thicknesses of the units are shown on the two geologic sections (figures 13 and 14). Most of the data for these figures were obtained from the electrical logs of oil and gas tests.

Kimble County is on the southwestern side of the Llano uplift, and the Paleozoic rocks in the county dip away from the uplift, or to the southwest (Figures 4 and 5). The Llano uplift, the major geologic structure of the region, is composed of Precambrian metamorphic and igneous rocks that crop out in almost all of Llano County, most of the eastern part of Mason County, and small parts of adjacent counties (Figure 3). The major faults in the Paleozoic rocks in Kimble County (Figures 4 and 5) trend in the direction of the dip of the rocks. The rocks of Cretaceous age lie unconformably on the Paleozoic rocks and dip gently toward the southeast in Kimble County.

Hydrologic and Geologic Units

According to their water-bearing properties, rock units are classified as either aquifers or aquicludes. An aquifer is a geologic formation, group of formations, or part of a formation that is water bearing. An aquiclude is an impermeable or relatively impermeable rock that may contain water but is incapable of transmitting an appreciable quantity. The phrase "transmitting an appreciable quantity" must be emphasized because many aquicludes allow relatively small quantities of leakage from their adjacent aquifers. This is the most suitable explanation of the occurrence of fresh water to depths of many hundreds of feet below sea level. All of the rock units described in this report are classified as aquifers, with the exceptions of (1) the Cretaceous rocks younger than the Edwards and associated limestones, (2) the Glen Rose Limestone (except locally), and (3) almost all of the Paleozoic rocks younger than the Ellenburger Group. The physical characteristics and water-bearing properties of the hydrologic and geologic units are summarized in Table 1.

Table 1.--Physical Characteristics and Water-Bearing Properties of Hydrologic and Geologic Units in Kimble County

ERA	SYSTEM	UNIT	APPROXIMATE MAXIMUM THICKNESS (FEET)	DESCRIPTION OF ROCKS	WATER-BEARING PROPERTIES
Cenozoic	Quaternary	Alluvial deposits	50	Sand, silt, and gravel.	Yields small to large quantities of fresh water to wells in valleys; of local importance as an aquifer.
Mesozoic	Cretaceous	Cretaceous rocks younger than the Edwards and associated limestones.	50	Shale or marl and limestone.	Not known to yield water to wells in Kimble County.
		Edwards and associated limestones.	480	Limestone, dolomite, and dolomitic limestones.	Yields small to large quantities of fresh water to springs and wells in Kimble County. Principal aquifer.
		Trinity Group: Glen Rose Limestone	425	Alternating layers of limestone and marl with some gypsum and anhydrite.	Yields a small quantity of slightly saline water to one livestock well in Kimble County.
		Trinity Group: Hensell Member of the Pearsall Formation	180	Sand, sandstone, siltstone, and clay.	Yields small to moderate quantities of fresh to slightly saline water to wells.
Paleozoic	Permian Pennsylvanian	Paleozoic rocks younger than the Ellenburger Group	3,000	Shale, limestone, and some sandstone.	Sandstone yields small quantities of slightly saline water to two wells in the outcrop area.
	Ordovician	Ellenburger Group	800	Limestone and dolomite.	Yields small quantities of fresh water to a few wells in the outcrop area.
	Cambrian	Cambrian rocks younger than the Hickory Sandstone Member	1,100	Sandstone and limestone, with some dolo-dolomite and siltstone.	Yields small to moderate quantities of fresh water to a few wells in the lower part of the Llano Valley.
		Hickory Sandstone Member of the Riley Formation.	500		No water wells have been drilled to the Hickory Sandstone Member in Kimble County. On the basis of wells in adjoining counties, the Hickory may be capable of furnishing small to moderate quantities of fresh to slightly saline water.

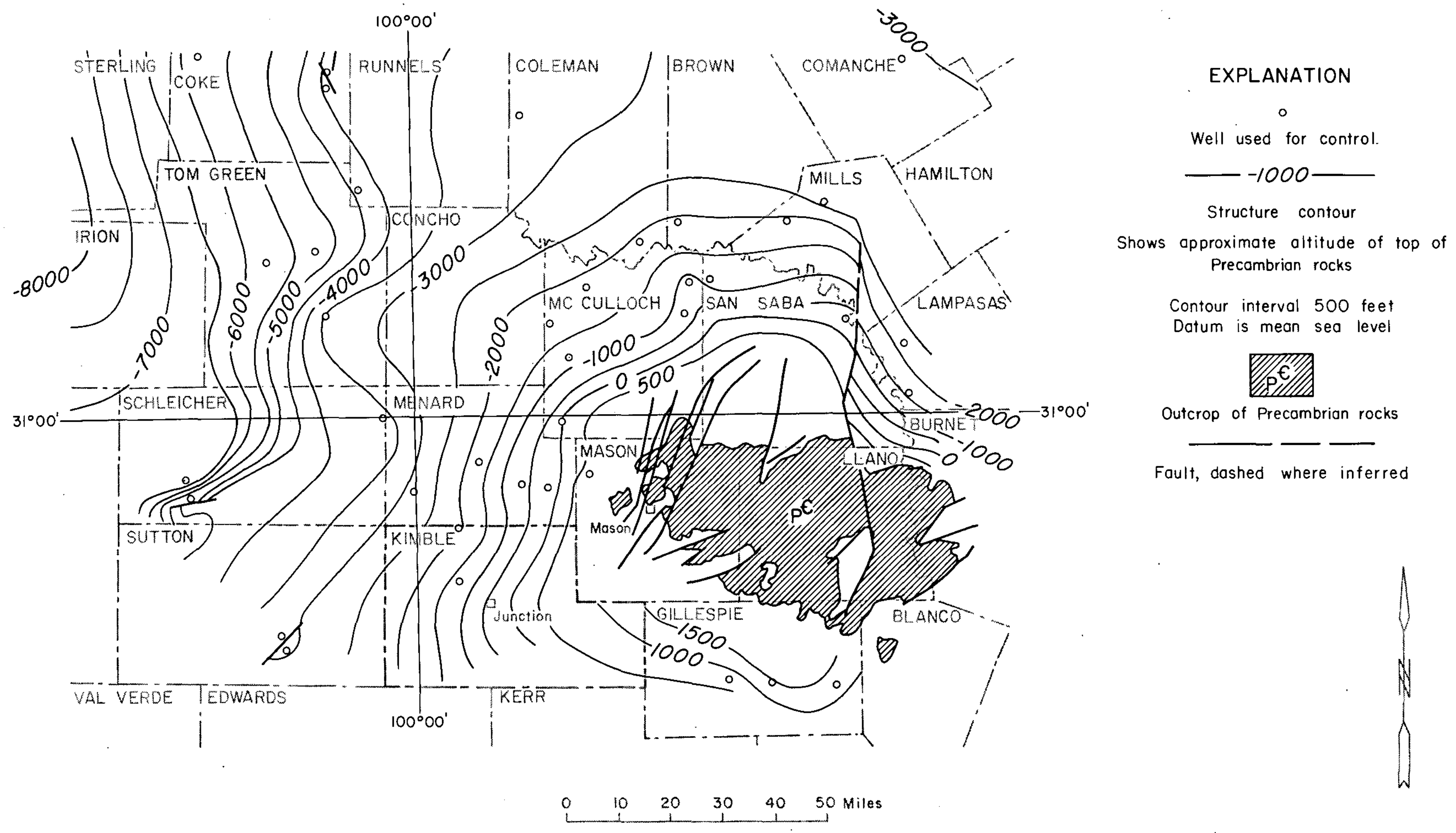

Figure 3

Approximate Altitude of the Top of the Precambrian Rocks in Parts of Central and Western Texas

From Flawn (1956, pl. 1)

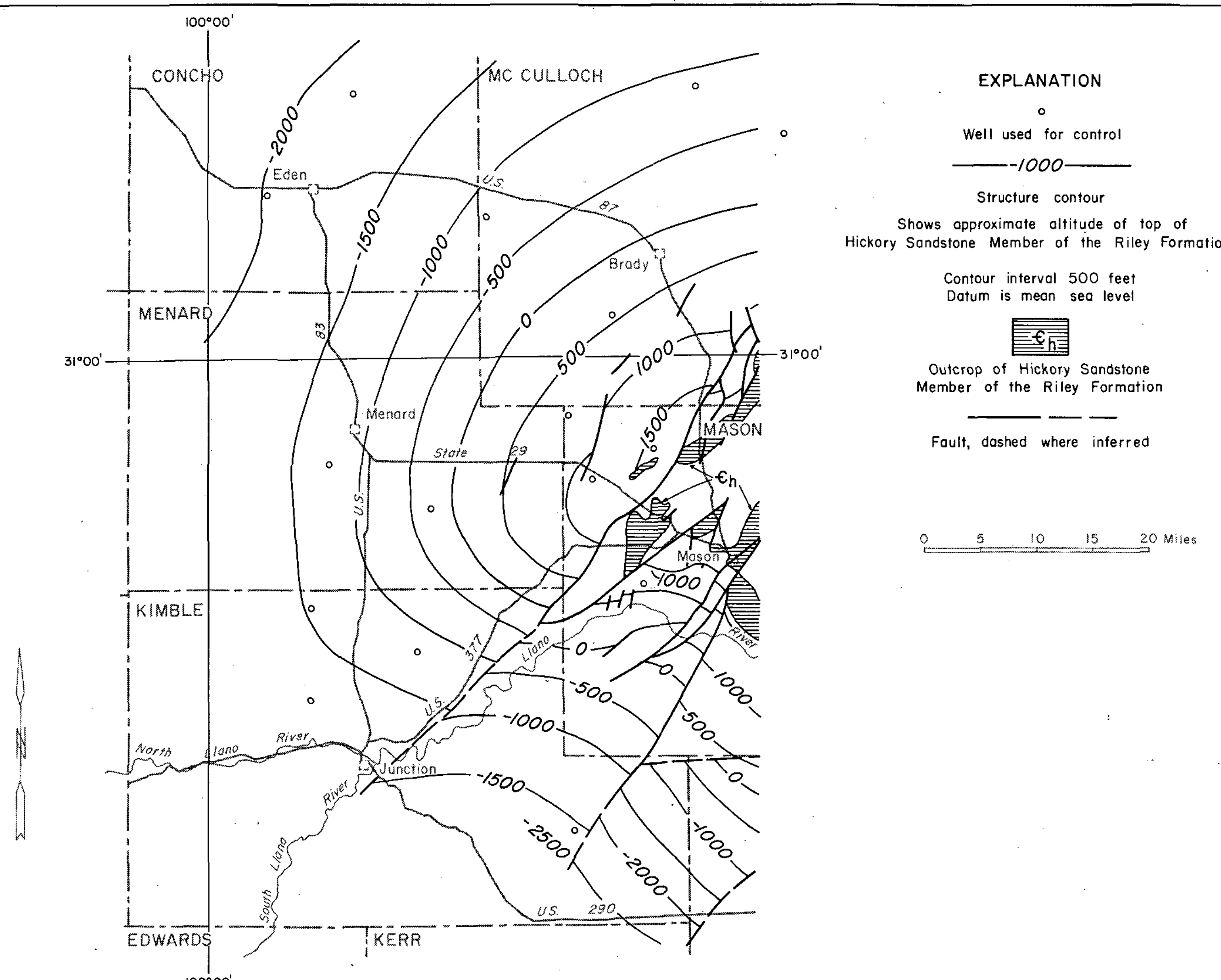

Figure 4

Approximate Altitude of the Top of the Hickory Sandstone Member of the Riley Formation in Kimble and Adjacent Counties

From Mount and others (1967, pl. 12)

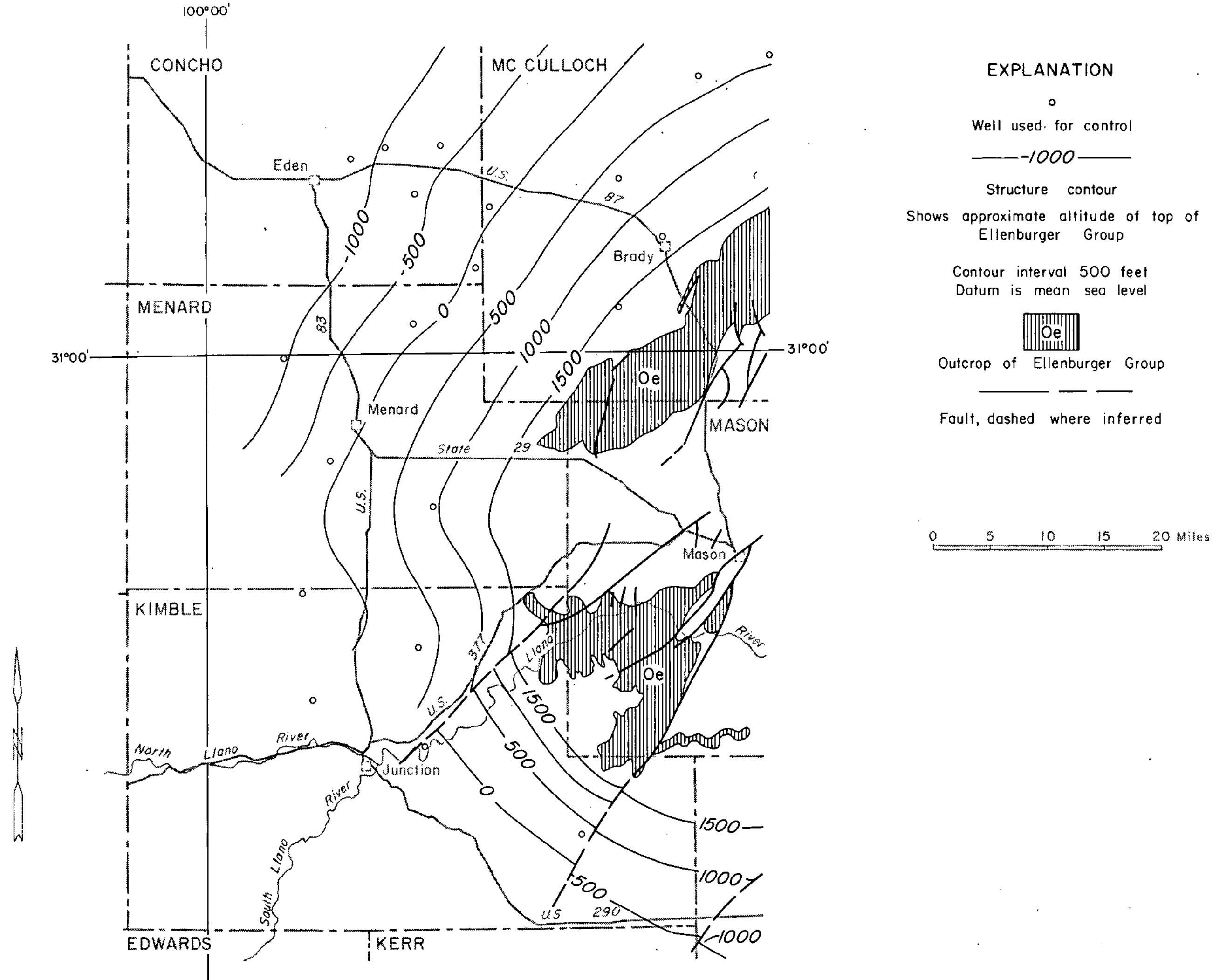

Figure 5

Approximate Altitude of the Top of the Ellenburger Group in Kimble and Adjacent Counties

From Mount and others (1967, pl. 12) and Darton and others (1937)

In the descriptions of the water-bearing properties of the units, the yields of wells are described according to the following rating:

DESCRIPTION	YIELD (GALLONS PER MINUTE)
Small	Less than 50
Moderate	50 to 500
Large	More than 500

The chemical quality of the water is described according to the following dissolved-solids content (Winslow and Kister, 1956, p. 5):

DESCRIPTION	DISSOLVED-SOLIDS CONTENT (MILLIGRAMS PER LITER)
Fresh	Less than 1,000
Slightly saline	1,000 to 3,000
Moderately saline	3,000 to 10,000
Very saline	10,000 to 35,000
Brine	More than 35,000

Hickory Sandstone Member of the Riley Formation

The Hickory Sandstone Member, of Cambrian age, was deposited on an irregular surface composed of Precambrian metamorphic and igneous rocks—the "basement rocks," a term of common usage. The Hickory crops out in irregularly shaped areas encircling the basement rocks that comprise the core of the Llano uplift. These areas are generally from 1 to 3 miles wide; the parts of the outcrop areas that function as recharge areas to this aquifer in Kimble County extend from the southeastern to the west-central parts of Mason County (Figure 4).

The Hickory Sandstone Member consists almost entirely of coarse to very fine-grained sandstone, and in Kimble County it is about 500 feet thick (Barnes and others, 1959, p. 26-27, and pls. 2 and 3). In Kimble County, the Hickory dips generally to the southwest at rates of from 100 to 150 feet per mile (Figure 4). Although no water wells have been drilled to the Hickory in Kimble County, data from wells in Concho and McCulloch Counties (described in following sections of this report) indicate that small to moderate quantities of fresh to slightly saline water may be available in Kimble County.

Cambrian Rocks Younger than the Hickory Sandstone Member

The Cambrian rocks younger than the Hickory Sandstone Member of the Riley Formation crop out in irregularly shaped areas that are adjacent to and encircle the outcrops of the Hickory. These rocks do not crop out in Kimble County, but in the southwestern part of Mason County they comprise a belt from 1 to 5 miles in width. In Kimble County, the Cambrian rocks younger than the Hickory consist of coarse to very fine-grained sandstone and limestone, with some dolomite and siltstone. The total thickness of the unit ranges from 650 to almost 1,100 feet (Barnes and others, 1959, p. 27-34, and pls. 2 and 3). These rocks consist of 80 to 170 feet of limestone and dolomite in the uppermost part of the unit; the remainder of the upper part consists of approximately 300 feet of sandstone; and the lower part consists of limestone and some siltstone with about 100 feet of sandstone in the middle. The 300 feet of sandstone mentioned above is apparently separated from the outcrop area by a barrier reef that trends northward in the area east of Kimble County; and only 30 feet of the 100-foot sandstone in the lower part of the unit crops out in the west-central part of Mason County (Barnes and others, 1959, p. 33, and pls. 2 and 3).

Because the Cambrian rocks younger than the Hickory thicken in the up-dip direction (Figures 13 and 14), the dip of the top of the 300-foot sand zone (an estimated 190 feet per mile to the southwest) is greater than the dip of the top of the Hickory Sandstone Member (100 to 150 feet per mile).

The present development of this aquifer in Kimble County is restricted to a few wells in the lower part of the Llano Valley that tap only a small part of the uppermost sandstones in this unit. The lower part of the Llano Valley of this report is downstream from Farm Road 385.

Ellenburger Group

The Ellenburger Group, of Ordovician age, crops out in three relatively small and irregularly shaped areas in Kimble County; two are in the lower part of the Llano Valley, and the third is in the valleys of the East Fork and West Fork James River (Figure 12). Each of these areas is an extension of the outcrop in the southwestern part of Mason County (Figure 5). The Ellenburger consists of limestone and dolomite; the thickness of the unit in the report area ranges from 450 to about 800 feet (Barnes and others, 1959, p. 34-37, and pls. 2 and 3). Much of the upper part of the Ellenburger Group in Kimble County was removed by erosion that left an irregular surface upon which the overlying rocks were deposited. The irregularity of this ancient erosion surface is the principal reason for the present variations of thickness of the unit. The dip of the top of the Ellenburger in the report area ranges from 100 to 200 feet per mile, mostly toward the southwest (Figure 5).

Water in the Ellenburger is contained in and transmitted through fracture and solution channels that vary considerably in size and distribution. Porous zones are of minor importance in the area of present development, but may be important in other parts of the county. The water occurs under water-table conditions in the outcrop areas and under artesian conditions downdip from the outcrops.

Paleozoic Rocks Younger than the Ellenburger Group

The Paleozoic rocks younger than the Ellenburger Group are mostly of Pennsylvanian age and consist of shale, limestone, and some sandstone. The thickness of this unit in Kimble County ranges from more than 200 feet in the outcrop area (Plummer, 1943, p. 47-59) to about 3,000 feet in the western part of the county. The dip of the base of the unit is the same as the dip of the top of the Ellenburger. The top of the unit, which is the base of the Cretaceous rocks (Figure 6), is an erosion surface that does not indicate the dip of the rocks.

These rocks crop out in relatively small and irregularly shaped areas in the lower part of the Llano Valley (Figure 12). In the outcrop area, this unit consists of about 200 feet of limestone that is overlain by shale and thin beds of sandstone. The limestone is not known to yield water to wells in the report area, and the sandstone yields small quantities of slightly saline water to two wells in the outcrop area.

Trinity Group

In Kimble County, rocks of Cretaceous age were deposited on the irregularly eroded surface of Paleozoic rocks. Figure 6 shows the irregularities of this surface. The basal unit of the Cretaceous in Kimble County is equivalent to the Hensell Shale Member of the Pearsall Formation at the type locality. Because it is predominantly sand in Kimble County, it is referred to as the Hensell Member in this report. The Hensell and the overlying Glen Rose Limestone constitute the Trinity Group (Table 1) which crops out in the valleys of the Llano River and its tributaries and in the valleys of the East Fork and West Fork James River (Figure 12).

The Hensell Member of the Pearsall Formation consists of sand, sandstone, siltstone, and clay. The thickness of the Hensell ranges from a few feet in the western and northwestern parts of the county to about 180 feet in the southern part. The dip of the base of the Hensell, which is at right angles to the contours on Figure 6 in the direction of decreasing altitude, is difficult to describe accurately. In the eastern part of the report area, it ranges from 30 to 50 feet per mile toward the southwest or west; in the western part, it ranges from 25 to 50 feet per mile toward the southeast or east. The dip of the top of the Hensell is about 2 feet per mile to the southeast. The beds of sand and sandstone in the Hensell constitute the water-bearing parts of this unit.

The Glen Rose Limestone consists of alternating beds of limestone and marl, with some gypsum and anhydrite. The thickness of the Glen Rose ranges from a few feet in the northwestern part of the county to about 425 feet in the southeastern part. The Glen Rose yields small quantities of slightly saline water to only one stock well in Kimble County. Wells that are drilled through the Glen Rose and completed in the Hensell are or should be cased to prevent the entrance of water from the Glen Rose.

Edwards and Associated Limestones

The Edwards and associated limestones crop out in most of Kimble County (Figure 12). The unit is composed of limestone, dolomite, and dolomitic limestone; and its thickness ranges from 380 to 480 feet. The rocks dip gently toward the southeast at about 2 feet per mile. The Edwards and associated limestones form the principal aquifer yielding small quantities of fresh water to wells and small to large quantities of fresh water to springs in Kimble County. The water is under water-table conditions and the larger springs emerge from the dolomites and dolomitic limestones in the lower part of the unit.

Cretaceous Rocks Younger than the Edwards and Associated Limestones

Outcrops of the Cretaceous rocks younger than the Edwards and associated limestones form caps on the highest parts of the divide areas in Kimble County (Figure 12). These rocks consist of about 20 feet of shale or marl containing thin lenses of limestone that are overlain by a few feet to 30 feet of limestone. The Cretaceous rocks younger than the Edwards and associated limestones are not known to yield water to wells in Kimble County.

Alluvial Deposits

The alluvial deposits, of Holocene and Pleistocene ages, consist of sand, silt, and gravel. They form the flood plains and stream terraces along the major streams and yield small to large quantities of fresh water to wells in Kimble County. The alluvial deposits are about 50 feet thick where large yields are being obtained, and in these areas the aquifer is of local importance.

GROUND-WATER HYDROLOGY

The general principles of ground-water hydrology as they apply to the study area are discussed in the following sections of the report. For additional technical information on these and other hydrologic principles, the reader is referred to: Meinzer (1923a, 1923b), Meinzer and others (1942), Todd (1959), Tolman (1937), and Wisler and Brater (1959); and, for nontechnical discussions, to: Leopold and Langbein (1960), and Baldwin and McGuinness (1963).

The hydrologic cycle (Figure 7) is the complete cycle of phenomena through which water passes, commencing as atmospheric water vapor, passing into liquid or solid form as precipitation, thence moving along or into the ground, and finally returning to the form of atmospheric water vapor by means of evaporation and transpiration. Leopold and Langbein (1960, p. 3) have defined the hydrologic cycle as the exchange of water between earth and atmosphere.

Source and Occurrence of Ground Water

The source of ground water in Kimble County is precipitation on the land surface of the county and adjoining areas. Much of the precipitation runs off or is consumed by evapotranspiration; a part migrates downward until it reaches the zone of saturation. The upper surface of the zone of saturation is the water table, below which water is contained in the channels and porous zones in the dolomites and limestones and in the pore spaces between the rock particles of the sands and sandstones.

Water-bearing rock units, or aquifers, are of two types—water table, or unconfined aquifers; and artesian, or confined aquifers. Water-table conditions occur where the upper surface of the zone of saturation is under atmospheric pressure only, and the water is free to rise or fall in response to changes in the volume of water in storage. In and near Kimble County, water-table conditions occur in the outcrop area of the aquifers and in the alluvial deposits along the major streams. A well penetrating an aquifer under water-table conditions becomes filled with water only to the level of the water table.

Confined, or artesian conditions, occur downdip from the outcrop, where an aquifer is overlain by less permeable sediments that confine the water under a pressure greater than atmospheric pressure. A well penetrating an aquifer under artesian pressure becomes filled with water to a level that is proportionate to the hydrostatic pressure. If the pressure head is high enough, water in the well may rise to an altitude greater than that of the land surface, causing the well to flow. There are a few flowing wells in Kimble County. These wells are supplied from the beds of sand and sandstone in the Hensell Member of the Pearsall Formation. The discharge rates are less than 1 gpm, thus the term "seepage" would be a more accurate description than "flow."

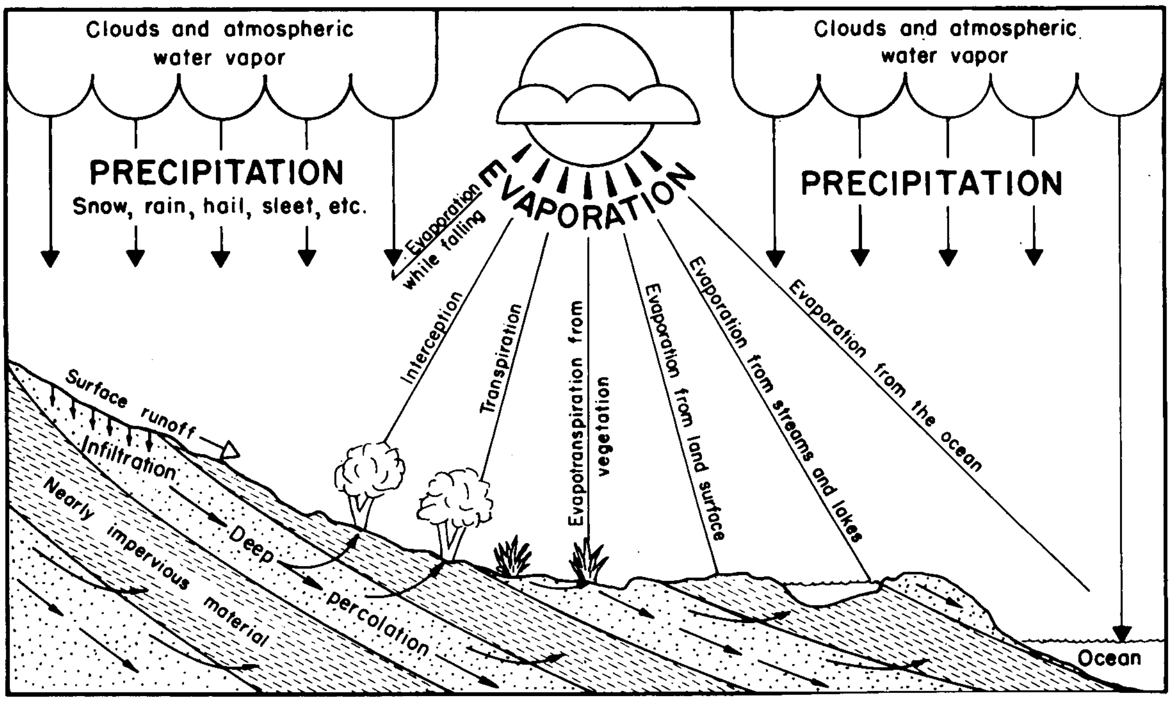

Figure 7.—Hydrologic Cycle

The level or surface to which water will rise in artesian wells is called the piezometric surface. Although the terms "water table" and "piezometric surface" are synonymous in the outcrop areas, the term "piezometric surface" is more suitable for an artesian aquifer.

Recharge, Movement, and Discharge of Ground Water

Recharge is the addition of water to an aquifer, either by natural or artificial processes. Natural recharge results from the infiltration of precipitation either directly or from streamflow. Usually, the process of artificial recharge includes only the addition to the aquifer of relatively small quantities of water resulting from the infiltration of irrigation water, industrial waste water, and sewage. Recharge by improperly treated waste water and sewage is frequently a source of contamination of fresh ground water, especially at shallow depths.

Ground water moves slowly through the aquifers under the force of gravity from areas of recharge to areas of discharge. The initial direction of movement is downward from the surface of the outcrop to the zone of saturation; then the water moves in a more horizontal direction down the hydraulic gradient.

The water from recharge accumulates in the interconnected fractures, solutional cavities, and porous zones in the Edwards and associated limestones. The configuration of the water table in this aquifer in Kimble County during 1966 is shown by Figure 8, a map showing the approximate altitude of springs and the water levels in wells. Because the direction of movement of water is at right angles to the contour lines in the direction of decreasing altitude, the ground water moves from the ground-water divides (beneath the land-surface divides) toward the principal streams.

Figure 9 is a map showing the approximate altitude of water levels in wells tapping the Hensell Member of the Pearsall Formation in 1966. The water is under artesian conditions in most of the area and the piezometric slope is in the same direction as the dip of the sands in the base of the units, which is also the base of the Cretaceous rocks (Figure 6).

Ground water is discharged artificially by wells; and naturally by springs and seeps where the water table intersects the land surface, and by evapotranspiration where the water table is near the land surface. Most of the spring flow in Kimble County emerges from the lower half of the outcrop of the Edwards and associated limestones (Figures 8 and 12).

Aquifer Tests

Aquifer tests provide data that are useful in the efficient development of the ground-water resources of an area. Therefore, during an investigation, tests generally are made of a representative number of the larger-capacity wells supplied from each aquifer, if such wells are available and if it is determined that the resulting data would be of value to the investigation. In Kimble County, few wells were suitable or available for testing. Most of the wells in the Hensell Member of the Pearsall Formation either yielded too little water for an adequate test or the water levels could not be measured. Although the yields of wells in the alluvial deposits were large, the proximity of the wells to the river, which functions as a line source of recharge, significantly affected the relation between yield and drawdown. Tests in the Edwards and associated limestones are of little value in estimating the potential of the aquifer. The complex hydraulic properties of the Edwards and the wide range in the yields of wells demonstrate that hydraulic data obtained from one locality cannot safely be applied to other localities.

Of the deeper aquifers, test data are available from nearby areas only for the Hickory Sandstone Member of the Riley Formation. Pumping tests made in wells near Brady, in McCulloch County, about 40 miles from the lower part of the Llano Valley in Kimble County, showed that the Hickory has a coefficient of transmissibility of about 20,000 gpd (gallons per day) per foot and a coefficient of storage of about 0.0001 (Mason, 1961, p. 22). Because the Hickory underlies the two areas at about the same altitude, and because the two areas are about equidistant from the Hickory outcrop, the values obtained from the Brady test probably can be applied to the Hickory in the lower part of the Llano Valley. These values are useful in estimating the drawdown that can be expected at different distances from a well (Figure 10). The drawdown caused by pumping at rates other than 1,000 gpm (gallons per minute) can be determined by multiplying the drawdown indicated on the graph by the proper multiple or fraction of 1,000.

Use of Ground Water

Approximately 1,900 acre-feet, or 1.7 mgd (million gallons per day), of ground water was pumped from wells for all purposes in Kimble County during 1964, and a partial inventory of the total amount of ground water used in the county in 1966 indicated that it was about the same as in 1964. The city of Junction used 1,000 acre-feet, or 0.9 mgd, in 1964 and 965 acre-feet (0.86 mgd) in 1966. About 210 acre-feet (0.19

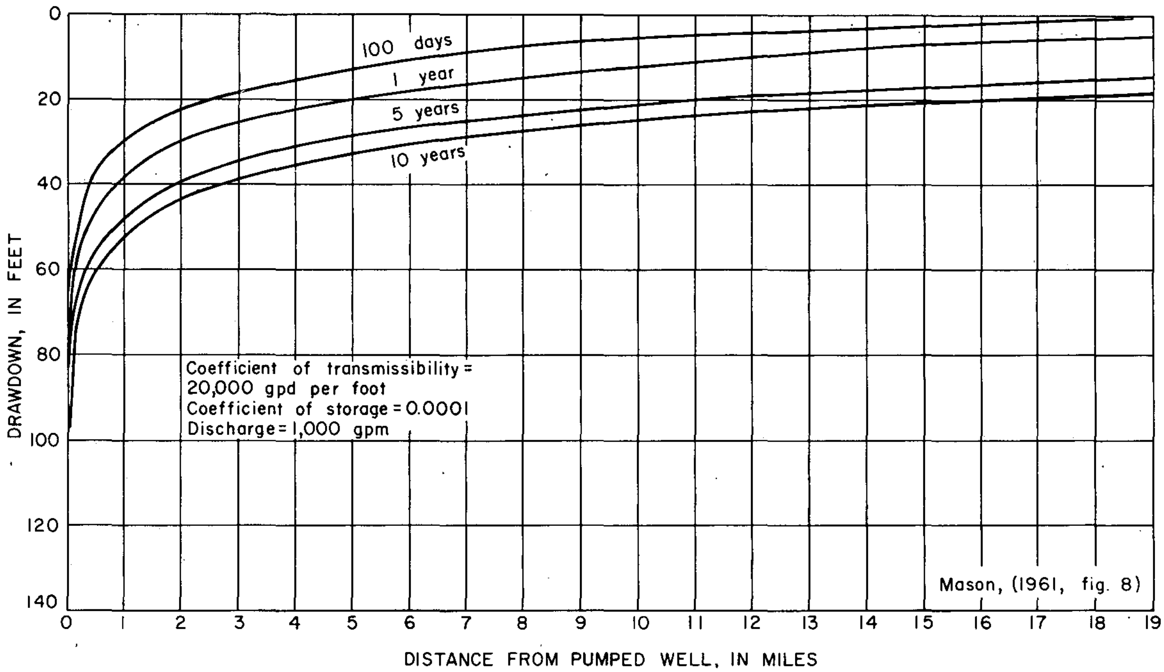

Figure 10.—Theoretical Drawdown Caused by Pumping From an Infinite Aquifer

mgd) was used for irrigation in the county in 1964 (Gillett and Janca, 1965, p. 19), and about 665 acre-feet (0.6 mgd) was pumped for rural domestic and livestock uses. The estimate of the quantity pumped for rural domestic and livestock uses was based on 1964 Census of Agriculture data and estimates of the 1964 rural population.

The 1964 pumpage by aquifers was as follows: Alluvial deposits, about 1,200 acre-feet; Edwards and associated limestones, 420 acre-feet; Hensell, 230 acre-feet; and other aquifers, 30 acre-feet. All of the water used by the city of Junction and most of the ground water used for irrigation was obtained from the alluvial deposits.

Construction of Wells

Most of the wells in Kimble County were drilled by the hydraulic rotary method, several were drilled with cable tools, and wells RK-56-20-504 and RK-56-20-901 were drilled by the rotary method using compressed air to remove the cuttings. Most of the wells tapping the alluvial deposits were dug—wells for domestic and livestock supplies were dug by hand, but the large-capacity wells were dug by motor-driven excavating equipment.

Wells tapping the Edwards and associated limestones and the Ellenburger Group range from 5 to 8 inches in diameter. Casings extend only short distances below the land surface. However, the general effectiveness of this method of preventing inflows of surface water is indicated by the chemical analysis of the water samples (Table 5)—the nitrate content of only two samples exceeded 45 mg/l (milligrams per liter). The wells tapping the sands and sandstones in the Hensell also range from 5 to 8 inches in diameter, and in most wells the casings extend to the total depth of the wells. In these wells the casings are perforated opposite the sands and sandstones. The dug wells range from 24 to 120 inches in diameter, and are lined with masonry, cement, or steel plates. The lower parts of the steel plates are perforated.

All of the deeper wells and most of the shallower ones that supply domestic and livestock needs are equipped with windmills and cylinder pumps. However, a few of the shallower wells are equipped with water-jet, submergible, or centrifugal pumps powered by electrical motors. The large-capacity wells are equipped with turbine pumps.

QUALITY OF GROUND WATER

The chemical constituents of the ground water in Kimble County originate principally from the soil and rocks through which the water has moved and thus reflect the differences in the mineral content of the geologic formations that have been in contact with the water. The chemical content of the water generally increases with depth. However, the small quantities of some constituents, especially sodium and chloride, indicate the extent of the flushing of connate water.

The temperature of ground water near the land surface is generally about the same as the mean air temperature of the region, approximately 19°C (66°F) at Junction, but increases with depth. However, there are exceptions to this general statement in Kimble County. The temperature of the water from the heavily pumped wells supplied from the alluvial deposits may be several degrees higher than 19°C (66°F) during the summer, and the water from some wells and springs supplied from the Edwards and associated limestones may be several degrees lower. Apparently, these variations are related to the temperatures of the water when it was recharged, the rates of movement, and the distances traveled through the aquifers. The temperatures of the water samples are given in Table 3.

The laboratory analyses of water from 77 selected wells and 3 springs in the report area are given in Table 5. The field measurements of specific conductance of samples from 446 wells and 40 springs and field determinations of the iron content of samples from 109 wells and 6 springs were used to supplement the data in Table 5.

The source and significance of dissolved-mineral constituents and properties of water are summarized in Table 2 (from Doll and others, 1963, p. 39-43). The dissolved-mineral constituents, in milligrams per liter (mg/l) or milliequivalents per liter (me/l), are listed in the same sequence as in Table 5, the tabulation of the chemical analyses of water from selected wells in the report area. General discussions of the quality of ground water are included in "A Primer on Water Quality," by Swenson and Baldwin (1965), and in the "Study and Interpretation of the Chemical Characteristics of Natural Water," by Hem (1959).

Relationship of Quality of Water to Use

The major factors that determine the suitability of a water supply are the limitations imposed by the contemplated use of the water. Among the various criteria established for water quality are: bacterial content; physical characteristics, such as temperature, odor, color, and turbidity; and chemical constituents. Usually, the bacterial content and the undesirable physical properties can be alleviated economically, but the removal of undesirable chemical constituents can be difficult and expensive.

The dissolved-solids content is an indication of the chemical quality of the water. A general classification of water based on dissolved-solids content, in mg/l, was given on page 11. There is a general relationship of the specific conductance measurements to the dissolved-solids contents of water samples from wells supplied from the same aquifer in the same general area. After this relationship has been established, relatively accurate estimates of dissolved-solids contents of other samples can be made from field measurements of specific conductance. The samples analyzed in the laboratory (Table 5) were collected from wells that constitute representative samplings of the water in each aquifer in the county. Graphs were made of the relationship of specific conductance to dissolved-solids contents of samples from the following aquifers: the Edwards and associated limestones, the Hensell Member of the Pearsall Formation, and the alluvial deposits. The maximum measurements and dissolved-solids contents were as follows:

AQUIFER	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)	DISSOLVED SOLIDS (mg/l)	CLASSIFICATION
Edwards and associated limestones	980	550	Fresh water
Hensell	6,500	3,000	Slightly saline water
Alluvial deposits	950	525	Fresh water

Samples from the Hensell with specific conductance less than 1,700 micromhos at 25°C were fresh water (less than 1,000 mg/l dissolved solids).

The U.S. Public Health Service (1962) has established and periodically revises standards of drinking water to be used on common carriers engaged in interstate commerce. The standards are designed to protect the traveling public and may be used to evaluate domestic and public water supplies. According to the standards, chemical constituents should not be present in a public water supply in excess of the listed concentrations shown in the following table, except where other more suitable supplies are not available. The following is a partial list of the standards adopted by the U.S. Public Health Service (1962, p. 7-8, 41). These constituents are included in the analyses given in Table 5.

Table 2.—Source and Significance of Dissolved-Mineral Constituents and Properties of Water

(From Doll and Others, 1963, p. 39-43)

CONSTITUENT OR PROPERTY	SOURCE OR CAUSE	SIGNIFICANCE
Silica (SiO_2)	Dissolved from practically all rocks and soils, commonly less than 30 mg/l. High concentrations, as much as 100 mg/l, generally occur in highly alkaline waters.	Forms hard scale in pipes and boilers. Carried over in steam of high pressure boilers to form deposits on blades of turbines. Inhibits deterioration of zeolite-type water softeners.
Iron (Fe)	Dissolved from practically all rocks and soils. May also be derived from iron pipes, pumps, and other equipment.	On exposure to air, iron in ground water oxidizes to reddish-brown precipitate. More than about 0.3 mg/l stain laundry and utensils reddish-brown. Objectionable for food processing, textile processing, beverages, ice manufacture, brewing, and other processes. U.S. Public Health Service (1962) drinking-water standards state that iron should not exceed 0.3 mg/l. Larger quant ties cause unpleasant taste and favor growth of iron bacteria.
Calcium (Ca) and Magnesium (Mg)	Dissolved from practically all soils and rocks, but especially from limestone, dolomite, and gypsum. Calcium and magnesium are found in large quantities in some brines. Magnesium is present in large quantities in sea water.	Cause most of the hardness and scale-forming properties of water; soap consuming (see hardness). Waters low in calcium and magnesium desired in electroplating, tanning, dyeing, and in textile manufacturing.
Sodium (Na) and Potassium (K)	Dissolved from practically all rocks and soils. Found also in oil-field brines, sea water, industrial brines, and sewage.	Large amounts, in combination with chloride, give a salty taste. Moderate quantities have little effect on the usefulness of water for most purposes. Sodium salts may cause foaming in steam boilers and a high sodium content may limit the use of water for irrigation.
Bicarbonate (HCO_3) and Carbonate (CO_3)	Action of carbon dioxide in water on carbonate rocks such as limestone and dolomite.	Bicarbonate and carbonate produce alkalinity. Bicarbonates of calcium and magnesium decompose in steam boilers and hot water facilities to form scale and release corrosive carbon dioxide gas. In combination with calcium and magnesium, cause carbonate hardness.
Sulfate (SO_4)	Dissolved from rocks and soils containing gypsum, iron sulfides, and other sulfur compounds. Commonly present in some industrial wastes.	Sulfate in water containing calcium forms hard scale in steam boilers. In large amounts, sulfate in combination with other ions gives bitter taste to water. U.S. Public Health Service (1962) drinking water standards recommend that the sulfate content should not exceed 250 mg/l.
Chloride (Cl)	Dissolved from rocks and soils. Present in sewage and found in large amounts in oil-field brines, sea water, and industrial brines.	In large amounts in combination with sodium, gives salty taste to drinking water. In large quantities, increases the corrosiveness of water. U.S. Public Health Service (1962) drinking-water standards recommend that the chloride content should not exceed 250 mg/l.
Fluoride (F)	Dissolved in small to minute quantities from most rocks and soils. Added to many waters by fluoridation of municipal supplies.	Fluoride in drinking water reduces the incidence of tooth decay when the water is consumed during the period of enamel calcification. However, it may cause mottling of the teeth, depending on the concentration of fluoride, the age of the child, amount of drinking water consumed, and susceptibility of the individual (Maier, 1950, p. 1120-1132).
Nitrate (NO_3)	Decaying organic matter, sewage, fertilizers, and nitrates in soil.	Concentration much greater than the local average may suggest pollution. U.S. Public Health Service (1962) drinking water standards suggest a limit of 45 mg/l. Waters of high nitrate content have been reported to be the cause of methemoglobinemia (an often fatal disease in infants) and therefore should not be used in infant feeding (Maxcy, 1950, p. 271). Nitrate has been shown to be helpful in reducing inter-crystalline cracking of boiler steel. It encourages growth of algae and other organisms which produce undesirable tastes and odors.

Table 2.—Source and Significance of Dissolved-Mineral Constituents and Properties of Water—Continued

CONSTITUENT OR PROPERTY	SOURCE OR CAUSE	SIGNIFICANCE
Boron (B)	A minor constituent of rocks and of natural waters.	An excessive boron content will make water unsuitable for irrigation. Wilcox (1955, p. 11) indicated that a boron concentration of as much as 1.0 mg/l is permissible for irrigating sensitive crops; as much as 2.0 mg/l for semitolerant crops; and as much as 3.0 mg/l for tolerant crops. Crops sensitive to boron include most deciduous fruit and nut trees and navy beans; semitolerant crops include most small grains, potatoes and some other vegetables, and cotton; and tolerant crops include alfalfa, most root vegetables, and the date palm.
Dissolved solids	Chiefly mineral constituents dissolved from rocks and soils.	U.S. Public Health Service (1962) drinking-water standards recommend that waters containing more than 500 mg/l dissolved solids not be used if other less mineralized supplies are available. For many purposes the dissolved-solids content is a major limitation on the use of water. A general classification of water based on dissolved-solids content, in mg/l, is as follows (Winslow and Kister, 1956, p. 5): Waters containing less than 1,000 mg/l of dissolved solids are considered fresh; 1,000 to 3,000 mg/l, slightly saline; 3,000 to 10,000 mg/l, moderately saline; 10,000 to 35,000 mg/l, very saline; and more than 35,000 mg/l, brine.
Harndess as $CaCO_3$	In most waters nearly all the hardness is due to calcium and magnesium. All of the metallic cations other than the alkali metals also cause hardness.	Consumes soap before a lather will form. Deposits soap curd on bathtubs. Hard water forms scale in boilers, water heaters, and pipes. Hardness equivalent to the bicarbonate and carbonate is called carbonate hardness. Any hardness in excess of this is called non-carbonate hardness. Waters of hardness up to 60 mg/l are considered soft; 61 to 120 mg/l, moderately hard; 121 to 180 mg/l, hard; and more thann 180 mg/l, very hard.
Sodium-adsorption ratio (SAR)	Sodium in water.	A ratio for soil extracts and irrigation waters used to express the relative activity of sodium ions in exchange reactions with soil (U.S. Salinity Laboratory Staff, 1954, p. 72, 156). Defined by the following equation: $SAR = \dfrac{Na^+}{\sqrt{\dfrac{Ca^{++} + Mg^{++}}{2}}}$, where Na^+, Ca^{++}, and Mg^{++} represent the concentrations in milliequivalents per liter (me/l) of the respective ions.
Residual sodium carbonate (RSC)	Sodium and carbonate or bicarbonate in water.	As calcium and magnesium precipitate as carbonates in the soil, the relative proportion of sodium in the water is increased (Eaton, 1950, p. 123-133). Defined by the following equation: $RSC = (CO_3^{--} + HCO_3^-) - (Ca^{++} + Mg^{++})$, where CO_3^{--}, HCO_3^-, Ca^{++}, and Mg^{++} represent the concentrations in milliequivalents per liter (me/l) of the respective ions.
Specific conductance (micromhos at 25°C)	Mineral content of the water.	Indicates degree of mineralization. Specific conductance is a measure of the capacity of the water to conduct an electric current. Varies with concentration and degree of ionization of the constituents.
Hydrogen ion concentration (pH)	Acids, acid-generating salts, and free carbon dioxide lower the pH. Carbonates, bicarbonates, hydroxides, and phosphates, silicates, and borates raise the pH.	A pH of 7.0 indicates neutrality of a solution. Values higher than 7.0 denote increasing alkalinity; values lower than 7.0 indicate increasing acidity. pH is a measure of the activity of the hydrogen ions. Corrosiveness of water generally increases with decreasing pH. However, excessively alkaline waters may also attack metals.

SUBSTANCE	CONCENTRATION (mg/l)
Chloride (Cl)	250
Fluoride (F)	* 0.7
Iron (Fe)	0.3
Nitrate (NO_3)	45
Sulfate (SO_4)	250
Dissolved solids	500

* The optimum fluoride level for a given community depends on climatic conditions because the amount of water consumed (and consequently the amount of fluoride ingested) is influenced primarily by air temperature. The optimum value of 0.7 mg/l in Kimble County is based on the annual average of maximum daily air temperature of 79.6°F at Junction. The presence of fluoride in average concentrations greater than twice this value, or 1.4 mg/l, would constitute grounds for rejection of the supply. The recommended lower limit is 0.6 mg/l, and the upper limit is 0.8 mg/l.

Of the 75 samples analyzed for fluoride, 18 were greater than 0.7 mg/l and 11 exceeded 1.4 mg/l. Water containing optimum fluoride content reduces tooth decay, especially when the water is used by children during the period of enamel calcification. In excessive concentration, fluoride may cause mottling of the teeth, depending on the age of the child, the amount of water consumed, and the susceptibility of the individual (Maier, 1950, p. 1120-1132).

Water having a chloride content of more than 250 mg/l may have a salty taste. The chloride content of 77 samples ranged from less than 10 to 1,090 mg/l, with 8 samples exceeding 250 mg/l.

Water containing iron in excess of 0.3 mg/l may cause reddish-brown stains on laundry, utensils, and plumbing fixtures. Large amounts if iron give water an objectionable taste. Of the 38 samples analyzed for iron by the laboratory, 20 contained more than 0.3 mg/l. Of the field determinations of the iron content of samples collected from an additional 109 wells and 6 springs, 71 samples contained more than 0.3 mg/l of iron.

The drinking-water standards of the U.S. Public Health Service (1962, p. 7) suggest a limit of 45 mg/l of nitrate. Waters of high nitrate content have been reported to be the cause of methemoglobinemia (an often fatal disease in infants), and therefore, should not be used in infant feeding (Macy, 1950, p. 271). Of the 76 samples analyzed for nitrate, 5 contained more than 45 mg/l. It is possible that these wells were polluted by sewage or by other organic material from surface water entering the wells.

Water containing sulfate in excess of 250 mg/l may produce a laxative effect. The sulfate content in 80 samples ranged from less than 5 to 956 mg/l, however, only 5 samples contained more than 250 mg/l.

Calcium and magnesium are the principal constituents in water that cause hardness. Hard water forms scale in boilers, water heaters, and pipes, and increases the consumption of soap. The commonly accepted classification of water hardness, expressed in mg/l calcium carbonate, is as follows: 60 mg/l or less, soft; 61 to 120 mg/l, moderately hard; 121 to 180 mg/l, hard; and more than 180 mg/l, very hard. All of the 79 water samples in Table 5 exceeded 180 mg/l in hardness.

The quality-of-water requirements for industrial uses range widely, as almost every industrial requirement has different standards. In general, water used for industry may be placed in three categories—process water, cooling water, and boiler water. Process water is the term used for the water incorporated into or in contact with the manufactured products. The quality requirements for this use may include physical and biological factors in addition to chemical factors. Water for cooling and boiler uses should be noncorrosive and relatively free of scale-forming constituents. In boiler water the presence of silica is undesirable because it forms a hard scale or encrustation, the scale-froming tendency increasing with the pressure in the boiler (Moore, 1940, p. 263). Suggested water-quality tolerances for a number of industries have been summarized by Hem (1959, p. 250-254) and Moore (1940).

Several factors other than the chemical quality are involved in determining the suitability of water for irrigation. The type of soil, adequacy of drainage, crops grown, climatic conditions, and quantity of water used all have important bearing on the continued productivity of irrigated land. The tabulation of the chemical analyses of water samples from wells and springs in Kimble County (Table 5) includes basic data commonly used in the determination of the suitability of water for irrigation. However, the other factors should be considered because they may modify the effects of the chemical content of the water.

A classification for judging the quality of a water for irrigation was proposed in 1954 by the U.S. Salinity Laboratory Staff (1954, p. 69-82). This classification, which is now commonly used, is based on the salinity hazard as measured by the electrical conductivity of the water and the sodium hazard as measured by the SAR (sodium-adsorption ratio). Sodium can be a significant factor in evaluating the quality of irrigation water because water with a high SAR will cause the soil structure to break down by deflocculating the colloidal soil particles. Consequently, the soil can become plastic, thereby causing poor aeration and low water availability. This possibility is especially true of fine-textured soils. Wilcox (1955, p. 15) stated that the system of classification of irrigation waters proposed by the Laboratory Staff " . . . is not directly applicable to supplemental waters used in areas of relatively high rainfall." Wilcox (1955, p. 16) indicated that generally water may be used safely for supplemental irrigation if its conductivity is less tahhan 2,250 micromhos at 25°C and its SAR is less than 14. Most of the water from the aquifers in Kimble County which have a potential for irrigation (the Edwards and associated limestones and the alluvial deposits) is suitable for irrigation on the basis of the above standards.

Another factor in assessing the quality of water for irrigation is the RSC (residual sodium carbonate) in the water. Excessive RSC will cause the water to be alkaline, and the organic material in the soil will tend to dissolve. The soil may become a grayish black, and the land areas affected are referred to as "black alkali." Wilcox (1955, p. 11) states that laboratory and field studies have resulted in the conclusion that water containing more than 2.5 me/l (milliequivalents per liter) RSC is not suitable for irrigation. Water containing from 1.25 to 2.5 me/l is marginal, and water containing less than 1.25 me/l RSC probably is safe. However, the successful use of marginal water for irrigation might be made possible by proper irrigation practices and use of soil amendments. Furthermore, the degree of leaching will modify the permissible limit to some extent (Wilcox, Blair, and Bower, 1954, p. 265).

Boron is essential to proper plant nutrition, but an excessive boron content will make water unsuitable for irrigation. Wilcox (1955, p. 11) indicated that a boron concentration of as much as 1.0 mg/l is permissible for irrigating sensitive crops. The small boron content of 15 water samples, which ranged from 0.04 to 0.29 mg/l, indicates that boron is not a problem in Kimble County.

Chemical Quality of Ground Water in the Hydrologic and Geologic Units

Hickory Sandstone Member of the Riley Formation

No water wells have been drilled to the Hickory Sandstone Member in Kimble County. However, a summary of the chemical quality of the water from the Hickory Sandstone in McCulloch and Concho Counties may indicate the quality of the water to be expected in this aquifer in the valley of the Llano River in Kimble County.

Wells K-1, K-2, K-3, and L-1 in McCulloch County (the public supply wells at Brady) encountered the top of the Hickory at approximately sea level, which is the approximate altitude of the top of the Hickory in the lower part of the Llano Valley in Kimble County (Figure 4). Also, the Brady area and the lower part of the Llano Valley in Kimble County are about equidistant from the Hickory outcrops. The water from the Brady wells is very hard but meets all the suggested standards of the U.S. Public Health Service, with the exception of well L-1 which contains a slight excess of fluoride (Mason, 1961, tables 3 and 6). Mason (1961, p. 38) stated that water from the Hickory in the southern part of McCulloch County was suitable for irrigation.

The public supply for the city of Eden, in Concho County, is obtained from the Hickory Sandstone. The altitude of the top of the Hickory at Eden is about 1,800 feet below sea level, which is about 200 feet higher than the top of the Hickory at Junction (Figure 4). Also, Eden and Junction are about equidistant from the outcrop areas. The water from the city of Eden well (DZ-42-50-103) is soft; however, it is slightly saline (1,100 mg/l of dissolved solids) and it contains 400 mg/l of chloride and 2.0 mg/l of fluoride (Mount and others, 1967, table 4).

Cambrian Rocks Younger than the Hickory Sandstone Member

The Kimble County well inventory includes data on one irrigation and one livestock well supplied mostly from Cambrian rocks younger than the Hickory Sandstone Member of the Riley Formation, and 4 domestic and livestock wells supplied from both the Ellenburger Group and the Cambrian rocks younger than the Hickory Sandstone Member.

Mason (1961, p. 26) stated that in most of the southern part of McCulloch County the general similarity in the quality of the water from the Hickory, the overlying Cambrian rocks, and the Ellenburger indicates a hydraulic connection between the rocks. The same situation probably exists in Kimble County, as indicated by the similarity of specific conductance measurements of water samples from wells shown in the following table.

WELL	AQUIFER	SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C)	REMARKS
RK-56-20-504	C [1]	1,020	Laboratory measurement.
56-20-901	C	1,030	Do.
56-28-301	E [2] + C	949	Do.
56-20-601	E + C	850	Field measurement.
56-20-605	E + C	950	Do.
56-29-102	E + C	1,000	Do.
56-20-602	E	775	Do.

[1] Cambrian rocks younger than Hickory Sandstone Member.
[2] Ellenburger Group.

Laboratory analyses of samples RK-56-20-504, , RK-56-20-901, and RK-56-28-301 are given in Table 5. These samples are very hard fresh water that is suitable for most uses.

The chemical quality of the water from Cambrian rocks younger than the Hickory in nearby areas is similar to that found in Kimble County. Baker and others (1965, p. 18) stated that wells TH-56-04-602 and TH-56-04-603, in the more southern northeastern corner of Menard County, probably are supplied from sandstones in the Cambrian rocks younger than the Hickory. The water is very hard and is suitable for domestic, livestock, and irrigation uses. These wells are comparable in depth, source of supply, and quality of water to the Kimble County wells RK-56-20-504 and RK-56-20-901. Wells K-22, L-31, M-8, and M-9, in the southern part of McCulloch County (Mason, 1961, p. 83), are supplied from the Cambrian rocks younger than the Hickory; and are comparable in depth and quality of water to the wells in Menard and Kimble Counties, mentioned above.

Ellenburger Group

The only available information on the chemical quality of the well water in the Ellenburger Group in Kimble County is the field measurement of the specific conductance of the sample from one well (354 feet deep) given in the table above. The water from this well is fresh and probably suitable for most uses.

Most of the public supply for the city of Fredericksburg, in Gillespie County, is obtained from wells supplied from the Ellenburger. Water from wells KK-57-50-101 (260 feet deep, 5 samples) and well KK-57-50-102 (240 feet deep, 6 samples) is fresh, very hard, and suitable for most uses (Mount, 1963, table 3, p. 41). The specific conductance of one sample from well KK-57-50-101 was 901 micromhos at 25°C.

In the southern part of McCulloch County, water from wells K-20, K-21, and M-10 in the Ellenburger was fresh, very hard, and met the suggested standards of the U.S. Public Health Service. The depths of these wells are 625, 150, and 363 feet, respectively; the specific conductance was 899, 828, and 1,120 micromhos at 25°C, respectively; and the SAR values were 0.6, 0.1, and 0.2, respectively. In the northern part of the county, water from 7 wells in the Ellenburger was fresh to slightly saline and was moderately hard or hard. It met the suggested standards of the U.S. Public Health Service, with the exception of the chloride content, which ranged from 280 to 400 mg/l. The SAR values ranged from 8.3 to 21. The depths of the wells ranged from 1,380 to 2,450 feet, and the measurements of specific conductance ranged from 1,480 to 1,960 micromhos at 25°C (Mason, 1961, table 2). These samples show the general increase of the mineral content of water with depth.

Paleozoic Rocks Younger than the Ellenburger Group

Only two wells supplied from the Paleozoic rocks younger than the Ellenburger Group were found during the investigation. The specific conductance of the sample from well RK-56-28-202 was 4,510 micromhos at 25°C, and the SAR was 20. The water is very hard, slightly saline, and it contained 956 mg/l sulfate, 730 mg/l chloride, and 2.8 mg/l iron. The owner reported that the water kills irrigated crops, but is suitable for livestock use. The field measurement of the specific conductance of the sample from well RK-56-20-805 was 5,800 micromhos at 25°C. The owner of this well reported that the water was suitable only for livestock use.

In the central and western parts of Kimble County, the Paleozoic rocks younger than the Ellenburger Group contain brine.

Trinity Group

The fresh water from the Hensell Member of the Pearsall Formation is suitable for most uses, but some of the slightly saline water was reported unsuitable for domestic, livestock, or irrigation uses. All of the samples from the 27 wells supplied from the Hensell and reported in Table 5 contained very hard water; in 14 samples, the fluoride content ranged from 0.9 to 4.0 mg/l; in 7 samples, the chloride content ranged from 325 to 1,090 mg/l; in 4 samples, the sulfate content ranged from 260 to 432 mg/l; and in 16 samples, the iron content ranged from 0.37 to 7.6 mg/l. Field determinations of the iron content of water from an additional 69 wells ranged from 0.1 to 5.0 mg/l, and 47 exceeded 0.3 mg/l.

Figure 11 is a map outlining the areas in which the Hensell contains slightly saline water and the areas in which almost all of the water is fresh. With the exception of the area of fresh water that extends up the North Llano River valley, the delineation on this map is about the same as the delineation of the area of greater well yield as shown on Figure 6.

Edwards and Associated Limestones

The chemical analyses of samples from 32 wells and 3 springs in the Edwards and associated limestones in Kimble County show that the water is fresh, very hard, and is suitable for public supply, irrigation, and most industrial uses. The fluoride content in samples from 5 wells (Table 5) exceeded by 0.1 or 0.2 mg/l the upper limit recommended by the U.S. Public Health Service. The specific conductance of the 32 samples measured in the laboratory ranged from 478 to 921 micromhos at 25°C (dissolved solids, 261 to 516 mg/l). Field measurements of 301 samples ranged from 400 to 980 micromhos at 25°C (estimated dissolved solids, 215 to 550 mg/l).

Alluvial Deposits

The chemical quality of the water in the alluvial deposits is very similar to the water in the Edwards and associated limestones. Both aquifers contain water that is fresh, very hard, and suitable for public supply, irrigation, and most industrial uses. The specific conductance of samples from 13 wells (Table 5) tapping the alluvial deposits ranged from 406 to 795 micromhos at 25°C (dissolved solids, 225 to 452 mg/l). Field measurements of 24 samples ranged from 425 to 950 micromhos at 25°C (estimated dissolved solids, 240 to 525 mg/l).

Protection of Ground Water

There are at least three potential sources of contamination of fresh water-bearing formations in areas where tests for oil or gas have been drilled: (1) the movement of brines from the underlying salt water-bearing formations through improperly cased wells or improperly plugged tests, (2) the infiltration of brine from disposal pits, and (3) the disposal of brine in stream courses and its subsequent infiltration to the fresh water-bearing formations.

In recent years, the Texas Water Development Board has made recommendations to the oil operators of the depths to which water-bearing formations should be protected in the drilling and production activities of the petroleum industry; the Oil and Gas Division of the Railroad Commission of Texas requires the protection of the fresh water-bearing formations. All of the electrical logs of oil and gas tests in Kimble County that were studied indicate that well casings extended in the wells to depths sufficient to protect the fresh water-bearing formations of Cretaceous age.

The Texas Water Commission and Texas Water Pollution Control Board (1963) published a statistical analysis of data on oil-field brine production and disposal in Texas for the year 1961 from an inventory conducted by the Texas Railroad Commission. According to this inventory, no brine was produced from the oil-bearing strata in Kimble County in 1961.

The greater part of the recharge to the alluvial deposits in the heavily pumped areas is from the flow of the adjacent streams. Consequently, any contamination of the rivers upstream from these areas could not only impair the quality of surface water for recreation and irrigation but also impair the quality of the ground water in the alluvial deposits for its present uses of public supply and irrigation.

AVAILABILITY OF GROUND WATER

The availability of water for future development from the aquifers in Kimble County is dependent on several hydrologic and economic factors. Among the hydrologic factors, the more important are the ability of the aquifers to transmit water, the amount of water in storage, the rate of recharge to the aquifers, and the quality of the water. Economic factors include the cost of wells—an important factor because of the greater depth to the tops of the aquifers of Cambrian age and the Ellenburger Group in most of the county. The hydrologic and economic aspects of the development of the aquifers in the report area are summarized and evaluated in this concluding section of the report, with the exception of the Paleozoic rocks younger than the Ellenburger Group, which are not known to yield fresh water to wells in the county.

Supplies of ground water that are adequate for present needs are found in almost all of Kimble County. With the exceptions of a few large-capacity wells tapping the alluvial deposits, no wells capable of supplying large quantities for irrigation have been developed. Surface water and ground water are so closely related in the county that plans for the development of one source would not be complete without considering their effect on the other—for example, contamination or pollution of the surface water probably would change the quality of the ground water pumped from the alluvial deposits.

The wells and springs supplied from the Edwards and associated limestones furnish adequate supplies of ground water for present needs in most of Kimble County; in most of the remainder of the county (the river valleys), adequate supplies for present needs are obtained from the Hensell Member of the Pearsall Formation and the alluvial deposits. Where the Hensell and the alluvial deposits are absent or have insufficient quantities of water available, other supplies of fresh to slightly saline water probably are available from deeper wells, however, at greater costs.

There are four known sources of fresh ground water in the valley of the Llano River in Kimble County: alluvial deposits, Hensell Member, Ellenburger Group (in the lower part of the valley), and Cambrian rocks younger than the Hickory Sandstone Member (also in the lower part of the valley). The Hickory is presently an unknown but probable source of fresh water, especially in the lower part of the valley. In the areas where the saturated alluvial deposits are absent or relatively thin, the Cambrian rocks younger than the Hickory probably have the largest potential for future development at the lowest production cost.

With the exception of one spring (RK-56-37-301) supplied from the Ellenburger Group, the only known source of fresh ground water in the valleys of the East Fork and West Fork James River is the Hensell Member. No wells drilled deeper than the base of the Trinity Group were found in these areas during the well inventory; apparently, the Hensell yields sufficient water for present needs.

Hickory Sandstone Member of the Riley Formation

No water wells have been drilled to the Hickory Sandstone in Kimble County; consequently, any appraisal of the availability must be based on nearby areas where conditions are probably similar to the report area. From oil test data, the altitude of the top of the Hickory in the Llano Valley in Kimble County ranges from sea level near the Mason County line to about 2,000 feet below sea level at Junction (Figure 4), and the depths to the top of the aquifer range from about 1,700 to 3,800 feet, respectively. The estimate that small to moderate quantities of fresh to slightly saline water may be available from the Hickory in the eastern part of the county was based on data previously discussed in this report.

The data on the city wells at Brady and Eden might be indicative of the expected yields from wells of comparable depths in Kimble County although test drilling is needed. The depths of the city of Brady wells range from 2,082 to 2,127 feet, and the yields range from 585 to 750 gpm. The temperature of the water is 29°C (85°F). The city of Eden well DZ-42-50-103 is 4,150 feet deep, the yield was 200 gpm in 1954, and the temperature of the water was 54°C (130°F).

Cambrian Rocks Younger than the Hickory Sandstone Member

Only two wells in Kimble County are supplied from sands in the Cambrian rocks younger than the Hickory, and 4 wells are supplied from these sands and the Ellenburger Group.

The yields from the sandstone near the top of the Cambrian rocks have been tested in two wells. Well RK-56-20-504, an irrigation well, yields 290 gpm obtained almost entirely from sandstone between the depths of 715 and 730 feet. Well RK-56-20-901, an irrigation test well, yielded 200 gpm obtained almost entirely from sandstone between the depths of 870 and 880 feet (see drillers' logs, Table 4). At Junction, the top of these sands was estimated on the basis of oil tests to be 2,800 feet below the land surface. The yields of 290 and 200 gpm from these two wells indicate that greater yields are to be expected from wells tapping greater thicknesses of the sandstone, but more data are needed for an accurate estimate of the potential development of this aquifer in the county. The extent of the fresh water in the aquifer in the county is not known.

Ellenburger Group

The depth to the top of the Ellenburger Group will be an important factor in the development of this aquifer in most of Kimble County. The Ellenburger crops out in relatively small areas in the valley of the Llano River and in the valleys of the East Fork and West Fork James River. The altitude of each of these outcrop areas is about 1,700 feet. In the valley of the Llano River in the Junction area, the altitude of the top of the Ellenburger ranges from about 500 feet above sea level to about 500 feet below sea level (Figure 5). The estimated depths to the top range from about 1,200 to 2,200 feet, however, it is doubtful if fresh water extends to these depths. The actual extent of the fresh water in the Ellenburger in Kimble County is not known.

The development to date in the outcrop areas has resulted in only small yields of fresh water to wells. One livestock well and 4 springs supplied from the Ellenburger were found in the county during the investigation. Spring RK-56-37-301, near the confluence of the East Fork and West Fork James River, flowed 424 gpm on June 21, 1961. The remaining three springs and the well are in the valley of the Llano River. The yields of the springs were 5, 15, and 65 gpm; the reported yield of the well was 3 gpm. Four domestic and livestock wells, supplied from both the Ellenburger and the sandstones below the top of the Cambrian rocks, were found in the same area. These wells range in depth from 540 to 925 feet, and the reported yields ranged from 3 to 16 gpm. Yields from the Ellenburger were measured during the drilling of wells RK-56-20-504 and RK-56-20-901; the yield in the former well was 15 gpm, and in the latter it was 5 gpm. The small yields from the Ellenburger, and the drilling of 4 domestic and livestock wells through the Ellenburger to the sandstones beneath, indicate that the potential of fresh-water production from the Ellenburger in the area tested is small—the potential for the remainder of the county is still unknown. The yields of wells in nearby areas indicate that larger yields may be possible in Kimble County. In McCulloch County (Mason, 1961, table 3), the Ellenburger supplies a number of domestic and livestock wells; flows ranging from 4½ to 60 gpm were reported from wells 1,480 to 2,450 feet deep. In Gillespie County (Mount, 1963, p. 20, tables 2, 6, and 10), the Ellenburger supplies most of the water used by the city of Fredericksburg and several irrigation wells. City wells KK-56-50-101 and KK-57-50-102 each yield more than 500 gpm from the Ellenburger.

Trinity Group

As a general rule, wells are drilled to the Hensell Member of the Pearsall Formation in areas where the Edwards and associated limestones either do not yield sufficient water, or are not present. These areas include most of the valleys of the Llano River and its tributaries and the valleys of the East and West Forks James River; consequently, a number of wells and irrigation test wells have been drilled to the Hensell and the potential for future development is better known than that for the Paleozoic rocks. The Hensell east of the line shown on Figure 6 yields from 10 to 55 gpm of generally fresh water to wells; west of this line, the reported yields are less than 10 gpm ranging mostly from 2 to 5 gpm of generally slightly saline water.

The areas in Kimble County where the Hensell has the greater potential for future development are in the eastern parts of the county. In other words, the areas closer to the Llano uplift contain the larger quantities of sand and the larger volumes of better quality water—but yields much larger than those presently being obtained may not be possible.

Edwards and Associated Limestones

Long (1958, p. 21), in discussing the relation between the ground water in the Edwards and associated limestones to the stream flow in Real County, wrote that the base flow of the streams is sustained by ground-water discharge (spring flow) which, in turn, is sustained by ground-water recharge; changes in base flow are related to changes in ground-water storage. The base flow during the winter months represents the average rate of ground-water discharge because evapotranspiration is small and withdrawals from the streams are negligible. The average winter base flow for many years would be about the same as the average rate of recharge to the ground-water basin because the effects of any changes in storage would be comparatively small. The quantity of water in storage in this aquifer in Kimble County is large, but the exact amount is not known.

Yearly hydrograph records of flow for the Llano River near Junction, obtained for 45 of the past 50 years, indicate that base flow for the winter months (October through March) ranged from a minimum of 16 mgd, or 49 acre-feet per day in 1957 to 136 mgd, or 417 acre-feet per day in 1924, with a winter average of 55 mgd, or 169 acre-feet per day. The drainage area above the gaging station is 1,874 square miles, of which 1,850 square miles is directly underlain by the Edwards and associated limestones—588 square miles in Kimble County and 1,262 square miles in adjacent counties. The average recharge rate to the Edwards and associated limestones in this ground-water basin is 33 acre-feet per square mile, or 0.62 inch of water per year.

Figure 8 is a map of the approximate altitude of springs and water levels in wells in the Edwards and associated limestones in the report area; similar maps have been made for Edwards County (Long, 1963, pl. 5), Real County (Long, 1958, fig. 7), Menard County (Baker and others, 1965, fig. 5), and for the region (Mount and others, 1967, pl. 11). These maps show that the major ground-water divides coincide with the divides of the Llano River basin, which is almost entirely in the counties adjacent to Kimble County. Consequently, part of the ground water in the Edwards and associated limestones in the adjacent parts of bordering counties moves down the hydraulic gradient into Kimble County where it ultimately becomes part of the spring flow. With the exception of the small amount pumped from wells, the remainder emerges as spring flow in the bordering counties and then enters Kimble County as base flow of streams.

The quantity of ground water available from the Edwards and associated limestones in Kimble County, without reducing the quantity in storage, would be at the approximate rate of recharge to the aquifer. The aquifer comprises about 1,000 square miles in the county. Therefore, if the average recharge rate of 33 acre-feet per square mile determined for the Llano River basin above Junction is applicable to this 1,000 square miles, at least 33,000 acre-feet per year is available. However, it would require many wells distributed throughout the county to produce this water, therefore, the figure may not be significant. Furthermore, large-scale production of this water would proportionately decrease the base flow of the streams.

Alluvial Deposits

The alluvial deposits supply about two-thirds of the ground water presently used in Kimble County. Although additional quantities of water could be developed from this aquifer, the amount would be difficult to determine because it would depend on the base flow of the rivers which, according to the records, is highly variable. Yearly hydrograph records of flow for the Llano River near Junction for the 45-year period (1916-50, 1955, 1957-65) show that during the summer months (April through September) the base flow ranged from a minimum of 10 mgd, or 31 acre-feet per day to a maximum of 130 mgd, or 399 acre-feet per day. The base flow during the winter months (October through March) is larger than during the summer months when evaporation and water demands are high. Therefore, when estimating the availability of base flow for an entire year, these factors should be taken into consideration. During 1964, pumpage from the alluvial deposits was about 1,200 acre-feet 1.1 mgd, which is substantially less than the minimum base flow of 10 mgd. Consequently, pumping from the alluvial deposits could be increased several times, but any additional withdrawals from the Edwards and associated limestones will reduce the quantity of recharge that would be available to the alluvial deposits.

REFERENCES CITED

American Geological Institute, 1960, Glossary of geology and related sciences, with supplement: Washington, Am. Geol. Inst., 395 p.

Baker, R. C., Dale, O. C., and Baum, G. H., 1965, Ground-water conditions in Menard County, Texas: Texas Water Comm. Bull. 6519, 92 p.

Baldwin, H. L., and McGuinness, C. L., 1963, A primer on ground water: Washington, U.S. Govt. Printing Office, 26 p.

Barnes, V. E., 1952, Geology of the Spring Creek Quadrangle, Gillespie County, Texas: Univ. Texas, Bur. Econ. Geology, Geologic quadrangle map no. 6.

______1954, Geology of Wendel Quadrangle, Gillespie, Kerr, and Kimble Counties, Texas: Univ. Texas, Bur. Econ. Geology, Geologic quadrangle map no. 15.

______1956, Geology of Fall Prong Quadrangle, Kimble, Gillespie, and Mason Counties, Texas: Univ. Texas, Bur. Econ. Geology, Geologic quadrangle map no. 19.

Barnes, V. E., Cloud, P. E., Dixon, L. P., Folk, R. L., Jonas, E. C., Palmer, A. R., and Tynan, E. J., 1959, Stratigraphy of the pre-Simpson Paleozoic subsurface rocks of Texas and southeast New Mexico: Univ. Texas Pub. 5924, Bur. Econ. Geology, 836 p.

Darton, N. H., and others, 1937, Geologic map of Texas: U.S. Geol. Survey map.

Doll, W. L., Meyer, G., and Archer, R. J., 1963, Water resources of West Virginia: West Virginia Dept. Nat. Resources, Div. Water Resources, 134 p.

Eaton, F. M., 1950, Significance of carbonates in irrigation waters: Soil Sci., v. 59, p. 123-133.

Ferris, J. G., and others, 1962, Theory of aquifer tests: U.S. Geol. Survey Water-Supply Paper 1536-E, p. 69-174.

Flawn, P. T., 1956, Basement rocks of Texas and southeast New Mexico: Univ. Texas Pub. 5605, Bur. Econ. Geology, 261 p.

Gillett, P. T., and Janca, I. G., 1965, Inventory of Texas irrigation, 1958 and 1964: Texas Water Comm. Bull. 6515, 317 p.

Hem, J. D., 1959, Study and interpretation of the chemical characteristics of natural water: U.S. Geol. Survey Water-Supply Paper 1473, 269 p.

Holland, P. H., and Mendieta, H. B., 1965, Base-flow studies, Llano River, Texas, quantity and quality: Texas Water Comm. Bull. 6505, 20 p.

Kane, J. W., 1967, Monthly reservoir evaporation rates for Texas, 1940 through 1965: Texas Water Devel. Board Rept. 64, 111 p.

Langbein, W. B., and Iseri, K. T., 1960, General introduction and hydrologic definitions: U.S. Geol. Survey Water-Supply Paper 1541-A, 29 p.

Leopold, L. B., and Langbein, W. B., 1960, A primer on water: Washington, U.S. Govt. Printing Office, 50 p.

Long, A. T., 1958, Ground-water geology of Real County, Texas: Texas Board Water Eng. Bull. 5803, 46 p.

Long, A. T., 1963, Ground-water geology of Edwards County, Texas: U.S. Geol. Survey Water-Supply Paper 1619-J, 29 p.

Maier, F. J., 1950, Fluoridation of public water supplies: Am. Water Works Assoc. Jour., v. 42, pt. 1, p. 1120-1132.

Mason, C. C., 1961, Ground-water geology of the Hickory Sandstone Member of the Riley Formation, McCulloch County, Texas: Texas Board Water Eng. Bull. 6017, 84 p.

Maxcy, D. F., 1950, Report on the relation of nitrate concentrations in well waters to the occurrence of methemoglobinemia: Natl. Research Council, Bull. Sanitary Eng. and Environment, App. D., p. 265-271.

Meinzer, O. E., 1923a, Occurrence of ground water in the United States, with a discussion of principles: U.S. Geol. Survey Water-Supply Paper 489, 231 p.

______1923b, Outline of ground-water hydrology, with definitions: U.S. Geol. Survey Water-Supply Paper 494, 71 p.

Meinzer, O. E., and others, 1942, Physics of the earth, v. 9, Hydrology: New York, McGraw-Hill Book Co., Inc., 712 p.

Moore, E. W., 1940, Progress report of the committee on quality tolerances of water for industrial uses: New England Water Works Assoc. Jour., v. 54, p. 261-272.

Mount, J. R., 1963, Investigation of ground-water resources near Fredericksburg, Texas: Texas Water Comm. Memo. Rept. 63-03, 119 p.

Mount, J. R., Rayner, F. A., Shamburger, V. M., Jr., Peckham, R. C., and Osborne, F. L., Jr., 1967, Reconnaissance investigation of the ground-water resources of the Colorado River basin, Texas: Texas Water Devel. Board Rept. 51, 107 p.

Piper, A. M., 1953, The nationwide situation, *in* Subsurface facilities of water management and patterns of supply-type area studies, v. 4 *of* The Physical and Economic Foundation of Natural Resources: U.S. Cong., House Comm. on Interior and Insular Affairs, p. 1-20.

Plummer, F. B., 1943, The Carboniferous rocks of the Llano region of central Texas: Univ. Texas Pub. 4329, Bur. Econ. Geology, 170 p.

Railroad Commission of Texas, 1967, Annual report of the oil and gas division, 1966: Railroad Comm. Texas, 583 p.

Sellards, E. H., 1928, Well records of Kimble County: Univ. Texas, Bur. Econ. Geology Mimeo. Circular 3, 20 p.

Stiles, E., Roper, F. C., and McCammon, J. H., 1955, Val Verde basin cross sections, *in* Geological contributions: San Angelo Geological Society, San Angelo, Texas.

Sundstrom, R. W., Broadhurst, W. L., and Dwyer, B. C., 1949, Public water supplies in central and north-central Texas: U.S. Geol. Survey Water-Supply Paper 1069, 128 p.

Swenson, H. A., and Baldwin, H. L., 1965, A primer on water quality: Washington, U.S. Govt. Printing Office, 27 p.

Texas Water Commission and Texas Water Pollution Control Board, 1963, A statistical analysis of data on oil-field brine production and disposal in Texas for the year 1961, from an inventory conducted by the Texas Railroad Commission: Railroad Comm. of Texas Dist. 7C, vol. 1.

Thornthwaite, C. W., 1952, Evapotranspiration in the hydrologic cycle, *in* The physical basis of water supply and its principal uses, v. 2 *of* The Physical and Economic Foundation of Natural Resources: U.S. Cong., House Comm. on Interior and Insular Affairs, p. 25-35.

Todd, D. K., 1959, Ground-water hydrology: New York, John Wiley and Sons, Inc., 336 p.

Tolman, C. F., 1937, Ground water: New York, McGraw-Hill Book Co., Inc., 593 p.

U.S. Geological Survey, 1967, Water resources data for Texas [for water year 1965-66], pt. 1, Surface water records: U.S. Geol. Survey duplicated rept., 495 p.

U.S. Public Health Service, 1962, Public Health Service drinking water standards: U.S. Public Health Service Pub. 956, 61 p.

U.S. Salinity Laboratory Staff, 1954, Diagnosis and improvement of saline and alkali soils: U.S. Dept. of Agr. Handb. 60, 160 p.

Wilcox, L. V., 1955, Classification and use of irrigation waters: U.S. Dept. Agr. Circ. 969, 19 p.

Wilcox, L. V., Blair, G. Y., and Bower, C. A., 1954, Effect of bicarbonate on suitability of water for irrigation: Soil Sci., v. 77, no. 4, p. 259-266.

Winslow, A. G., Doyel, W. W., and Wood, L. A., 1957, Salt water and its relation to fresh ground water in Harris County, Texas: U.S. Geol. Survey Water-Supply Paper 1360-F, p. 275-407.

Winslow, A. G., and Kister, L. R., Jr., 1956, Saline water resources of Texas: U.S. Geol. Survey Water-Supply Paper 1365, 105 p.

Wisler, C. O., and Brater, E. F., 1959, Hydrology: New York, John Wiley and Sons, Inc., 408 p.

Table 3.--Records of Wells and Springs in Kimble County and Adjacent Areas

All Wells are Drilled Unless Otherwise Noted in Remarks Column.
Water Level : Reported water levels given in feet; measured water levels given in feet and tenths.
Method of Lift and Type of Power: A, airlift; C, cylinder; Cf, centrifugal; E, electric; G, gasoline, butane, or diesel engine; J, jet; N, none; T, turbine; W, windmill. Number indicates horsepower.
Use of water : D, domestic; Ind, industrial; Irr, irrigation; N, none; P, public supply; S, livestock.
Water-bearing unit : Ke, Edwards and associated limestones; Kt, Trinity Group; Qa, Quarternary-alluvium; Py, Paleozoic ricks, younger than Ellenburger Group; E, Ellenburger Group; C, Cambrian rocks, younger than Hickory Sandstone Member.

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND-SURFACE DATUM (FT)	WATER LEVEL: DATE OF MEASUREMENT	METHOD OF LIFT	USE OF WATER	REMARKS
						Kimble County						
RK-55-24-207	Edith Murr well 1	Lauderdale & Straughan, et al.	1962	3,873	--	--	2,399	--	--	--	--	Oil test.1/
* 401	Milton Morales	--	--	--	--	Ke	--	--	--	C,W	D,S	Temp. 72°F.
402	J. D. Cowsert well 1-A	Tucker Drilling Co.	1963	4,148	--	--	2,429	--	--	--	--	Oil test.1/
403	Eliseu Morales well 1	do	1964	4,158	--	--	2,368	--	--	--	--	Do.
404	-- Trimble well 1	Sun Oil Co., et al.	1964	3,799	--	--	2,422	--	--	--	--	Do.
405	O. T. Murr	-- Atkinson	1936	350	--	Ke	2,452	290	Mar. 1966	C,W	S	The West Mill well.
* 501	G. H. Lopez	--	--	270	--	Ke	2,335	--	--	C,W	D,S	Temp. 70°F.
502	O. T. Murr well 1	Texas Pacific Coal & Oil Co.	1945	4,473	--	--	2,466	--	--	--	--	Oil test.1/
503	do	-- Atkinson	1930	350	--	Ke	2,394	290	Mar. 1966	C,W,E, 1¼	D,S	Reported water level varies approximately 60 ft in area. Headquarters well. Temp. 67°F.
504	G. H. Lopez	--	1935	300	--	Ke	2,388	210	Aug. 1966	C,W	S	South well.
601	A. D. Rust	O. E. Morgan	1960	318	--	Ke	2,283	263.1 252.4	Sept. 23, 1965 Mar. 30, 1966	C,W	S	West Samson well.
602	Fortran Johnson	--	1937	310	6	Ke	2,280	277.6	Mar. 30, 1966	C,W	D,S	Cased to 40 ft.

See footnotes at end of table.

WELL	OWNER	DRILLER	DATE COM-PLET-ED	DEPTH OF WELL (FT)	DIAM-ETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND-SURFACE DATUM (FT)	WATER LEVEL: DATE OF MEASUREMENT	METHOD OF LIFT	USE OF WATER	REMARKS
RK-55-24-603	Aldie Murr	--	1929	300	--	Ke	2,282	240	Mar. 1966	C,W	D,S	Reported strong supply. Headquarters well. Temp. 66°F.
604	do	Chester Murr	1939	260	--	Ke	2,327	204.9	Mar. 30, 1966	C,W	S	Reported strong supply. West Pasture well.
* 605	Mrs. John Fish	--	Old	190	--	Ke	2,290	172.7 174.7	Mar. 31, 1966 May 13, 1966	C,W	D,S	Headquarters well. Temp. 67°F.
606	do	--	Old	190	--	Ke	2,282	186.3	Mar. 31, 1966	C,W	S	Toby well.
607	O. T. Murr	--	Old	240	--	Ke	2,305	200	Mar. 1966	C,W	S	
701	O. T. Murr well 1	Sunray Oil Co.	1964	4,177	--	--	2,427	--	--	--	--	Oil test.1/
702	Clay Holland	John Pullen	1877	96	--	Ke	2,245	85.1	Mar. 31, 1966	C,W,T, E,3/4	D,S	Reported discharge 12½ gpm. Headquarters well. Temp. 68°F.
703	Mrs. Tom Driskell	--	1951	180	--	Ke	2,327	170	Mar. 1966	C,W	S	The West well. Temp. 63°F.
704	Mrs. Vernon Hamilton	--	--	180	--	Ke	2,322	165	Mar. 1966	C,W	S	Little Rock House well. Temp. 67°F.
705	Ray Holland	--	1914	178	--	Ke	2,335	170	Mar. 1966	C,W	S	Reported weak supply. Holland Ranch well.
706	Mrs. J. M. Treadwell	-- Johnson	--	173	--	Ke	2,340	164.5	Mar. 31, 1966	C,W	S	Treadwell well.
801	John Hasse	--	1939	270	--	Ke	2,372	209.2	Mar. 30, 1966	C,W	D,S	Temp. 68°F.
802	J. C. Graham	--	Old	180	--	Ke	2,332	159.7	Mar. 31, 1966	C,W	D,S	Reported discharge 10 gpm. Headquarters well.
803	O. T. Murr	--	1944	350	--	Ke	2,453	290	Mar. 1966	C,W	S	
804	Delivan Chadwick	--	Old	180?	--	Ke	2,281	169.8	Apr. 5, 1966	C,W	S	Temp. 62°F.
901	David Akers	--	1928	219	--	Ke	2,280	184.9	Mar. 29, 1966	C,W	S	Patilla well. Reported discharge 4 gpm.
902	Mrs. John Fish	Hayden Sales	1948	320	--	Ke	2,366	264.4	Mar. 31, 1966	C,W	S	South Mill well. Temp. 68°F.
903	J. C. Graham	--	Old	240	--	Ke	2,319	180	Mar. 1966	C,W	S	The East Mill well. Temp. 66°F.

See footnotes at end of table.

Table 3.--Records of Wells and Springs in Kimble County and Adjacent Areas--Continued

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL BELOW LAND-SURFACE DATUM (FT)	WATER LEVEL DATE OF MEASUREMENT	METHOD OF LIFT	USE OF WATER	REMARKS
RK-55-24-904	H. C. Dutton	-- Maddox	Old	180	--	Ke	2,310	--	--	C,W	D,S	Headquarters well.
905	do	Hubert Johnson	1946	275	--	Ke	2,330	227.8	Apr. 5, 1966	C,W	S	Reported weak supply. North Mill well.
906	Nat Murr	--	Old	245	4	Ke	2,245	195	Apr. 1966	C,W,E	D,S	Cased to bottom. Perforated from 225 ft to bottom. Headquarters well.
32-101	David Akers	Sammie Bruce	1960	140	--	Ke	2,211	132.5	Mar. 29, 1966	C,W	S	Reported weak supply. 320 well.
102	Hal Holland	Buster Atkinson	1948	150	--	Ke	2,200	143	Mar. 1966	A,E,1	D,S	Headquarters well.
103	do	--	--	Spring	--	Ke	2,140	+	--	Flows	S	Reported flow ½ gpm, Mar. 1966.
104	Mrs. Tom Driskell	--	--	Spring	--	Ke	2,170	+	--	Flows	S	Reported flow 5 gpm, Mar. 1966.
105	Mrs. Betty Schmidt	--	--	Spring	--	Ke	2,165	+	--	Flows	S	Do.
* 201	D. W. Chadwick	Judd Mays	Old	110	--	Ke	2,185	99.3	June 2, 1961	C,W	D,S	Headquarters well.
202	J. S. Farmer well 1	Aztec Oil Co.	1952	4,099	--	--	2,231	--	--	--	--	Oil test.1/
203	David Akers	--	Old	199	--	Ke	2,211	120.5	Mar. 29, 1966	C,W	S	Reported strong supply.
204	D. W. Chadwick	--	1949	234	--	Ke	2,260	197.7	Mar. 24, 1966	C,W	S	Reported strong supply. Temp. 63°F.
301	N. K. Farmer	Sammie Bruce	1960	180	--	Ke	2,223	169.9	Apr. 5, 1966	C,W	S	Reported strong supply. McCain well.
302	do	-- Williamson	1944	168	--	Ke	2,175	117.2	do	T,E,3	D,S	Reported discharge 5 gpm. Reported strong supply. Headquarters well.
303	do	Sammie Bruce	1959	132	--	Ke	2,142	86.6	do	C,W	S	Reported strong supply.
304	H. C. Dutton	-- Welch	--	347	--	Ke	2,339	300	Apr. 1966	C,W	S	Reported strong supply. South well.
305	O. T. Murr	--	Old	180	--	Ke	2,164	108.8	Apr. 5, 1966	C,W	S	Reported discharge approximately 5 gpm. Murr Headquarters well.

See footnotes at end of table.

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
								BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
RK-55-32-401	David Akers	--	1948	195	--	Ke	2,167	123.4	Mar. 29, 1966	C,W	S	Temp. 64°F.
402	do	--	--	Spring	--	Ke	2,075	+	--	Flows	S	Reported flow 35 gpm, Mar. 1966.
403	Hal Holland	--	--	Spring	--	Ke	2,170	+	--	Flows	S	Reported flow 5 gpm, Mar. 1966. Turkey Hollow Spring.
404	Jack Haschke	--	Old	169	5	Ke	2,123	109.1	Apr. 6, 1966	C,W,E, 3/4	D,S	Reported strong supply. Headquarters well. Temp. 65°F.
405	Jack Haschke	--	1938	135	--	Ke	2,172	119.0	Apr. 6, 1966	C,W	S	Reported strong supply. South Pasture well. Temp. 66°F.
406	do	--	1940	135	--	Ke	2,182	131.2	do	C,W	S	Reported strong supply. The East well. Temp. 68°F.
501	A. Murr well 1	R. P. Fisher	1963	3,798	--	--	2,136	--	--	--	--	Oil test.1/
* 502	Asa Murr	Trimble Well Co.	1965	250	5	Ke	2,190	135	Mar. 1966	T,E, ½	D,S	Cased to bottom. Perforated from 240 ft to bottom. Headquarters well.
503	do	--	1935	184	--	Ke	2,158	144	Mar. 1966	C,W	S	Reported discharge 8 gpm. Section 11 well. Temp. 67°F.
504	David Akers	Sammie Bruce	1958	185	--	Ke	2,146	75.0	Mar. 29, 1966	C,W	S	Temp. 66°F.
505	do	--	--	Spring	--	Ke	2,085	+	--	Flows	D,S	Reported flowed 60 gpm, Mar. 1966.
506	Jack Haschke	--	--	Spring	--	Ke	2,030	+	--	Flows	S	Reported flowed 2 gpm, Apr. 1966.
601	Mrs. Joe Boyer	--	1951	250	--	Ke	2,161	164.0	Mar. 24, 1966	C,W	S	West Middle Pasture well.
602	do	--	--	Spring	--	Ke	2,050	+	--	Flows	S	Estimated flow 200 gpm, Mar. 1966. Temp. 68°F.
603	N. K. Farmer	Sammie Bruce	1964	--	--	Ke	2,150	103.8	Apr. 5, 1966	C,W	S	Reported strong supply. The Middle well.
604	Mrs. A. J. Grosenbacher	--	Old	171	--	Ke	2,113	--	--	C,W	S	Reported discharge ½ gpm. The Simon Place. Temp. 70°F.

See footnotes at end of table.

Table 3.--Records of Wells and Springs in Kimble County and Adjacent Areas--Continued

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
								BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
RK-55-32-701	Fred Schweining	--	Old	120	--	Ke	2,165	70	Apr. 1966	C,W	S	Reported discharge 3 gpm. North Mill well.
702	do	Sammie Bruce	1965	97	--	Ke	2,110	70	Apr. 1966	C,W	S	Reported strong supply.
801	Mrs. Allie Grosenbacher	--	Old	190	--	Ke	2,150	140	Sept. 1965	C,W	D,S	Headquarters well.
802	do	--	1940	130	--	Ke	2,133	96.7	Sept. 24, 1965	C,W	S	Reported discharge 3 gpm. Pipeline well. Temp. 70°F.
803	Otto Schweining	--	1941	191	--	Ke	2,132	113.8	Apr. 6, 1966	C,W	S	Temp. 68°F.
804	do	--	1941	189	--	Ke	2,080	--	--	C,W	D,S	Reported discharge ¼ gpm. Pumping level 129.1 ft, Oct. 13, 1965.
805	Mrs. August Bruns	O. E. Morgan	1952	150	--	Ke	2,121	110	Oct. 1965	C,W	S	Reported strong supply of good water.
* 806	Jim Bruns	do	1956	206	--	Ke	2,171	159.2 159.2	Oct. 27, 1965 Apr. 6, 1966	C,W	D,S	
807	-- Grosenbacher well 1	Ben J. Taylor	1958	3,640	--	--	2,213	--	--	--	--	Oil test.1/
808	Mrs. A. J. Grosenbacher	Lonnie Itz	1965	100	--	Kt	1,980	--	--	N	N	Unused well.
901	Mrs. August Bruns	--	--	60	6	Qa	1,940	32.0	Sept. 9, 1965	Cf,E	D,S	Reported well has never gone dry. Temp. 72°F.
902	S. F. Lackey	-- Atkinson	1952	100	--	Ke	2,095	80	Oct. 1965	C,W	S	Reported small supply. Temp. 72°F.
903	Gene Simon	--	1945	110	--	Ke	2,069	57.1	Oct. 27, 1965	N	N	Reported small supply. Not used.
904	Mrs. C. W. Fox	Sammie Bruce	1953	150	6	Kt	1,960	50	Mar. 1966	C,W	S	Reported water bad tasting and used for livestock only. Reported weak supply.
* 905	Mrs. August Bruns	--	1943	80	6	Kt	1,984	62.4 61.2	Apr. 6, 1966 May 13, 1966	C,W	S	Reported small supply. Fox Pasture well. Temp. 67°F.

See footnotes at end of table.

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND-SURFACE DATUM (FT)	WATER LEVEL: DATE OF MEASUREMENT	METHOD OF LIFT	USE OF WATER	REMARKS
RK-55-40-102	Wilburn Gardner	O. E. Morgan	1940	200	--	Ke	2,110	140	Oct. 1965	C,W	S	Reported strong supply.
103	do	Buster Atkinson	1940	160	--	Ke	2,130	140	Oct. 1965	C,W	S	Reported discharge 3 gpm.
104	do	do	1930	250	--	Ke	2,200	170.0	Oct. 27, 1965	C,W	S	
105	John R. Bailey well 1-B	F. Arthur Stout	1962	2,017	--	--	2,081	--	--	--	--	Oil test.1/
106	Sophie Thiers well 1	Atlantic Refining Co.	1951	3,818	--	--	1,971	--	--	--	--	Do.
107	do	Harry Bass Drilling Co.	1951	2,960	--	--	1,932	--	--	--	--	Do.
108	-- Faulkner well 1	S. A. Lamb, et al.	1953	2,937	--	--	1,964	--	--	--	--	Do.
109	John R. Bailey well 1	Atlantic Refining Co.	1953	3,196	--	--	2,040	--	--	--	--	Do.
110	Mrs. W. Faulkner well 1	Westexas Oil & Royalty Corp., et al.	1950	3,157	--	--	1,955	--	--	--	--	Oil test.1/
111	do	Paramount Oil, Inc.	1958	2,943	--	--	1,924	--	--	--	--	Do.
201	Ben Allison	--	1929	30	6	Qa	1,890	20.0	Sept. 9, 1965	J,E, 1	D,S	Dug well. Reported discharge 10 gpm.
* 202	Mrs. Joe Gardner	Robert Allsup	1964	208	5	Kt	1,920	12.1	Sept. 10, 1965	N	N	Cased from 108 ft to bottom. Unused well.
203	do	Sammie Bruce	1958	300	6	Kt	2,010	--	--	N	N	Formerly used for livestock; unused now.
204	August Simon	--	Old	48	6	Qa	1,935	36.7	Sept. 21, 1965	C,W	D,S	Reported to go dry when river goes dry. Temp. 71°F.
205	Lee Joy	--	1940	90	4	Kt	1,925	0.0	Sept. 29, 1965	N	N	Reported poor quality of water. Unused well; seeps at surface.

See footnotes at end of table.

Table 3.--Records of Wells and Springs in Kimble County and Adjacent Areas--Continued

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
								BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
RK-55-40-206	J. R. Rucker	J. R. Rucker	1966	23	8	Qa	1,920	20	Aug. 1966	J,E, 1	D,S	Cement and asbestos casing. Perforated 1-in. holes from 20 to 23 ft.
* 301	S. F. Lackey	Carl Cahill	1952	30	24	Qa	1,880	17.6	Aug. 10, 1965	T,E, 7½	Irr	Dug well. Reported discharge 210 gpm and adequate for irrigating 30 acres of alfalfa and bermuda.
302	G. C. Ragsdale	O. E. Morgan	1962	235	--	Ke	2,150	145	Sept. 1965	C,W	S	Reported water at 155 ft; blue shale from 155 ft to bottom. Well adequate for livestock use.
303	Jack Gardner	--	1947	150	--	Ke(?)	2,080	80	Sept. 1965	N	N	Unused well.
304	Mrs. Joe Gardner	--	Old	250	--	Ke(?)	2,140	--	--	N	N	Unused well. Formerly used for livestock.
305	Roy A. Ahrens	Carl Cahill	1961	34	36	Qa	1,890	31.6	Sept. 29, 1965	J,E	D,S	Dug well. Reported discharge 25 gpm. Temp. 69°F.
306	do	--	Old	28	48	Qa	1,890	31.1	do	C,W	S	Dug well. Reported water of poor quality after heavy rains. Temp. 69°F.
307	E. H. Harrison	-- Dunk	Old	--	6	Qa	1,870	12.3	Sept. 24, 1965	C,W	D,S	Reported good supply of water except in severe drought. Dug well.
308	Gene Simon	Carl Cahill	1952	20	36	Qa	1,870	--	--	N	N	Dug well. Unused.
401	Mrs. Meta Rieck	--	1946	125	--	Ke	2,104	95	Sept. 1965	C,W	S	Reported very strong supply. Liberty well.
402	Mrs. Edna Eubank	-- Roberson	Old	216	--	Ke	2,205	165	Sept. 1965	C,W	D,S	Reported adequate supply of water for domestic and livestock use. Temp. 70°F.
* 501	Mrs. Joe Gardner	Buster Atkinson	1945	165	--	Ke	2,102	140	Sept. 1965	C,W	S	Temp. 72°F.
502	M. P. Rieck well 1	Skelly Oil Co.	1954	4,611	--	--	2,234	--	--	--	--	Oil test.1/
503	J. P. Rieck, et al.	--	--	Spring	--	Ke	1,990	+	--	Flows	D	Estimated flow 700 gpm, Oct. 5, 1965. Maynard Spring. Temp. 69°F.

See footnotes at end of table.

Table 3.--Records of Wells and Springs in Kimble County and Adjacent Areas--Continued

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND-SURFACE DATUM (FT)	WATER LEVEL: DATE OF MEASUREMENT	METHOD OF LIFT	USE OF WATER	REMARKS
RK-55-40-504	J. P. Rieck, et, al.	--	--	Spring	--	Ke	1,995	+	--	Flows	N	Estimated flow 5 gpm, Sept. 28, 1965.
505	Mrs. W. J. Cotterell III	--	--	242	--	Ke	2,196	234.5	Sept. 29, 1965	C,W	S	Reported weak supply. Loma Alta well.
506	Tom Love	--	--	Spring	--	Ke	1,990	+	--	Flows	D,S	Estimated flow 15 gpm, Oct. 27, 1965. Reported never goes dry. Temp. 69°F.
601	Mrs. Joe Gardner	John Braley	1938	185	--	Ke	2,110	199.5	Sept. 10, 1965	C,W	S	Reported discharge 1½ gpm. Reported water of good quality. Temp. 76°F.
602	Jack Gardner	--	1939	160	--	Ke	2,090	115	Sept. 1965	C,W	D,S	Reported discharge inadequate, but water of good quality.
603	do	--	1940	185	--	Ke	2,090	115	Sept. 1965	C,W	D,S	Reported inadequate water supply.
604	do	Buster Atkinson	1930	255	--	Ke	2,155	225	Sept. 1965	N	N	Unused well.
* 605	do	Billy Bruce	1957	295	--	Ke	2,209	248.0	Sept. 10, 1965	C,W	S	Temp. 73°F.
606	Mrs. R. H. Herring	James Cotter	1905	280	--	Ke	2,214	186.9	Aug. 7, 1966	C,W	S	Cotter well.
701	Mrs. Meta Rieck	--	Old	200	--	Ke	2,100	100	Sept. 1965	C,W	S	Reported discharge about 10 gpm. Wilson Place well.
* 702	do	--	Old	200	--	Ke	2,132	125.0	Sept. 29, 1965	C,W	S	Reported not very strong well. Cloudt well.
703	do	O. E. Morgan	1960	300	--	Ke	2,275	--	--	C,W	S	Reported discharge approximately 10 gpm.
704	J. P. Rieck, et al.	--	1960	200	--	Ke	2,170	160	Dec. 1965	A,E	D	Reported discharge more than 10 gpm. M&M Camp well.
705	-- Paterson well 1	Delvatex Petroleum Corp.	--	3,980	--	--	2,140	--	--	--	--	Oil test.1/ 2/
801	Meta R. Rieck well 1	H. F. Wilcox	1935	4,857	--	--	2,209	--	--	--	--	Do.

See footnotes at end of table.

Table 3.--Records of Wells and Springs in Kimble County and Adjacent Areas--Continued

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL BELOW LAND-SURFACE DATUM (FT)	WATER LEVEL DATE OF MEASUREMENT	METHOD OF LIFT	USE OF WATER	REMARKS
RK-55-40-802	Mrs. Meta Rieck	Sammie Bruce	1964	330	--	Ke	2,282	273.3	Sept. 29, 1965	C,W	S	Reported discharge more than 10 gpm. Middle Pasture well.
803	Mrs. W. S. Cotterell	--	Old	250	--	Ke	2,203	235.5	do	C,W	S	Reported discharge 3 gpm. Mota Negro well.
804	J. P. Rieck, et al.	--	Old	360	--	Ke	2,288	279.8	do	C,W	S	Reported discharge more than 10 gpm.
901	M. B. Patterson well 1	Seneca Development Company	1952	3,884	--	--	2,265	--	--	--	--	Oil test.1/
902	Mrs. E. Patterson	--	Old	220	--	Ke	2,160	--	--	C,E, 1	D,S	Reported weak supply. Headquarters well. Temp. 69°F.
903	V. J. Loeffler	O. E. Morgan	1957	260	--	Ke	2,171	178.0	Aug. 7, 1966	C,W,E, 3/4	D,S	West well.
904	Mrs. R. H. Herring	--	1909	310	4	Ke	2,182	186.1	do	C,E, 3/4	D,S	Reported weak supply.
48-102	J. P. Rieck, et al	--	1947	265	--	Ke	2,245	230.0	Dec. 16, 1965	C,W	S	Reported discharge more than 10 gpm. Cloudt well 2.
103	do	O. E. Morgan	1955	155	--	Ke	2,158	145	Dec. 1965	T,E, 1	S	Reported discharge 145 gpm.
301	-- Hill well 1	O. N. Beer, Inc., et al.	1961	4,403	--	--	2,301	--	--	--	--	Oil test.1/
302	Earl Hill	-- Leyendecker	1940	310	--	Ke	2,313	290	Dec. 1965	C,W	S	Reported strong supply. The North well.
303	Lewellyn Rose	--	1941	330	--	Ke	2,290	300	July 1966	T,E, 1	D,S	Reported strong supply. Headquarters well.
304	Mrs. E. Patterson	--	1948	220	--	Ke	2,192	192.6	Aug. 7, 1966	C,W	S	South well.
305	do	O. E. Morgan	1958	230	--	Ke	2,203	193.9	do	C,W	S	West well.
501	Earl Hill	--	Old	330	--	Ke	2,300	299.4	Dec. 16, 1965	C,W, E	D,S	Reported strong supply. Headquarters well.

See footnotes at end of table.

Table 3.--Records of Wells and Springs in Kimble County and Adjacent Areas--Continued

WELL	OWNER	DRILLER	DATE COM-PLET-ED	DEPTH OF WELL (FT)	DIAM-ETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
								BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
RK-55-48-502	Mrs. Aubrey Hill	-- Sellers	1939	330	--	Ke	2,310	307.7	July 20, 1966	C,W	S	Reported strong supply. Temp. 70°F.
503	Billy C. Sykes	--	1945	310	--	Ke	2,302	303.8	June 1, 1961	C,W	S	North Pasture well.
* 601	do	--	1900	350	--	Ke	2,295	305.8 306.0	June 1, 1961 Aug. 28, 1966	C,W	D,S	Temp. 70°F.
602	Mary B. Patterson well 1	J. S. Michael	1949	4,194	--	--	2,275	--	--	--	--	Oil test.1/
603	Billy C. Sykes	Hicks & Puckitt	1964	350	--	Ke	2,302	290	Oct. 1965	T,E, 1½	D,S	
604	Llewellyn Rose	J. S. Michael	1949	350	--	Ke	2,280	277.3	July 20, 1966	C,W	S	Reported strong supply. Temp. 70°F.
56-17-401	A. D. Rust	Paul Urban	1950	180	--	Ke	--	156.6	Sept. 23, 1965	C,W	S	Temp. 69°F.
402	do	--	1925	160	--	Ke	2,177	141.2	do	C,W	S	West Toby well. Temp. 69°F.
* 501	do	--	Old	140	--	Ke	2,156	94.7 96.0 97.3	July 27, 1961 Sept.23, 1965 May 13, 1966	C,W	S	Temp. 68°F.
502	J. Y. Rust well 1	G. W. Strake	1948	3,455	--	--	2,239	--	--	--	--	Oil test.1/
503	A. D. Rust	O. E. Morgan	1957	114	6	Ke	--	94	Sept. 1965	T,E, 1½	D	Reported discharge 35 gpm. Headquarters house well. Temp. 70°F.
504	A. D. Rust Ranch well 1	Thomas Drilling Corp.	1959	2,507	10	--	--	--	--	--	--	Oil test.1/
601	C. R. Nasworthy well 1	Katz Oil Co.	1957	2,613	--	--	2,238	--	--	--	--	Do.
602	Roy Spiller	-- Atkinson	1941	245	--	Ke	2,176	194.1	Aug. 24, 1966	C,W	S	Four Section well.
603	Mrs. M. S. Crawford	--	Old	250	--	Ke	--	220	May 1966	T,E	D,S	Reported discharge 5 gpm. Old Headquarters well.
701	A. D. Rust	--	--	220	--	Ke	--	180	Sept. 1965	C,W	S	Reported strong supply. North Fish Pasture well.

See footnotes at end of table.

Table 3.--Records of Wells and Springs in Kimble County and Adjacent Areas--Continued

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND-SURFACE DATUM (FT)	WATER LEVEL: DATE OF MEASUREMENT	METHOD OF LIFT	USE OF WATER	REMARKS
RK-56-17-702	A. D. Rust well 1	Tucker Drilling Co., Inc.	1964	3,535	8	--	--	--	--	--	--	Oil test.
801	A. D. Rust	--	--	Spring	--	Ke	1,981	+	--	Flows	--	Estimated flow 125 gpm, Sept.23, 1965. Reported not to be affected by rainfall.
802	do	O. E. Morgan	1960	120	--	Ke	2,129	89.4	Sept. 23, 1965	C,W	S	North Home Pasture well.
803	do	do	1958	188	--	Ke	--	170.3	do	C,W	S	South Home Pasture well.
901	do	--	1927	160	--	Ke	--	126.4	do	C,W	S	Graham Pasture well.
902	-- Rust well F-1	Guffey Drilling Co., et al.	1956	3,030	--	--	2,221	--	--	--	--	Oil test. 1/
903	Guss Bannowsky	Buster Atkinson	1936	158	--	Ke	2,140	119.5	Aug. 1, 1966	C,W, T,E	D,S	Reported strong supply. Headquarters well. Temp. 71°F.
904	do	do	1944	185	--	Ke	2,152	145.2	Aug. 24, 1966	C,W	S	The East well.
18-111	Mary Spiller Crawford well 1	Birdwell & Son Drilling Co.	1958	2,444	--	--	2,241	--	--	--	--	Oil test. 1/
* 401	E. G. Sieker	-- Atkinson	1938	287	--	Ke	--	--	--	C,W	S	
402	-- Spiller well 1	Phillips Petroleum Co.	1945	4,264	--	--	2,222	--	--	--	--	Oil test. 2/
403	-- Sieker well 1	J. Ralph Stewart	1948	2,481	--	--	2,185	--	--	--	--	Oil test. 1/
404	Mary Spiller Crawford	--	Old	--	--	Ke	2,210	195.5	Aug. 20, 1966	C,W	D,S	Temp. 70°F.
405	Hugh M. Spiller	--	Old	165	--	Ke	--	135	May 1966	T,E, 2	S	Reported discharge 25 gpm. West Pasture well.
* 501	Mrs. W. J. Wilkinson	--	Old	170	--	Ke	--	140	May 1966	C,W	D,S	Reported strong supply. Headquarters well. Temp. 68°F.
502	do	--	Old	220	--	Ke	--	140	May 1966	C,W	S	Reported weak supply.

See footnotes at end of table.

WELL	OWNER	DRILLER	DATE COM-PLET-ED	DEPTH OF WELL (FT)	DIAM-ETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND-SURFACE DATUM (FT)	WATER LEVEL: DATE OF MEASUREMENT	METHOD OF LIFT	USE OF WATER	REMARKS
RK-56-18-503	Mrs. W. J. Wilkinson	--	Old	322	--	Ke	2,240	228.2	Aug. 17, 1966	C,W	S	Pump station well. Temp. 70°F.
601	do	Cecil Collier	1940	342	--	Ke	2,275	273.8 282.4	Aug. 25, 1961 Aug. 17, 1966	C,W	S	Thirteen well. Temp. 70°F.
602	do	--	Old	--	--	Ke	2,192	216.4	July 16, 1966	C,W	S	Reported strong supply. North well.
603	do	-- Atkinson	1920	200	--	Ke	2,188	140	May 1966	C,W	S	Reported supplies water for livestock in 4 pastures. Reported discharge 10 gpm. East well.
604	J. D. Noguess	--	Old	130	--	Ke	2,086	106.3	July 15, 1966	C,W	D,S	Headquarters well. Temp. 69°F.
701	R. R. Spiller well 1	G. W. Strake	1949	2,355	--	--	2,086	--	--	--	--	Oil test. 1/
702	Alamo Freight Lines, Inc.	--	--	220	--	Ke	2,108	100.0	Apr. 16, 1966	C,W	S	Reported strong supply. Temp. 66°F.
703	Roy Spiller	-- Maddox	1927	160	--	Ke	--	140	May 1966	C,W	D,S	Reported discharge 2 gpm. Headquarters well.
801	Mrs. W. J. Wilkinson	--	Old	170	--	Ke	2,180	140	May 1966	C,W	S	Supplies water for livestock in 3 pastures. White well.
802	do	Albert Dietz	1943	210	--	Ke	2,073	100.2	July 16, 1966	C,W	S	Reported good supply. South well.
803	do	-- Dietz	--	200	--	Ke	2,141	148.1	do	C,W	S	Reported good well.
901	Walter Pfluger	--	--	Spring	--	Ke	1,929	+	--	Flows	--	Reported flowed 25 gpm, Mar. 23, 1966. Temp. 65°F.
902	do	Buster Atkinson	1937	220	--	Ke	2,207	205.0	Mar. 23, 1966	C,W	S	Temp. 63°F.
903	Mrs. W. J. Wilkinson	--	--	Spring	--	Ke	2,005	+	--	Flows	S	Reported flow 10 gpm, May 16, 1966. Gentry Springs.
19-401	G. R. Kothman well 1	R. A. Irwin	1952	3,964	--	--	2,188	--	--	--	--	Oil test. 1/
* 402	Awbrey Kothmann	--	Old	120	--	Ke	2,060	94.9	Mar. 23, 1966	C,W,T, E,3/4	D,S	Reported strong supply. House well. Temp. 68°F.

See footnotes at end of table.

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
								BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
RK-56-19-403	Awbrey Kothmann	--	Old	190	--	Ke	--	170	Mar. 1966	C,W	S	Reported strong supply. West well.
404	do	--	Old	--	--	Ke	2,159	183.8	Mar. 23, 1966	C,W	S	South well. Temp. 67°F.
405	Walter Pfluger	--	1936	220	--	Ke	--	--	--	C,W	D,S	Reported strong supply. Appleton well.
406	J. C. Noguess	--	1945	130	--	Ke	2,066	110.4	July 13, 1966	C,W	S	Reported discharge 10 gpm on test. The Deer well. Temp. 72°F.
501	Mrs. Arnold Grosenbacher	--	--	Spring	--	Ke	1,930	+	--	Flows	D,S	Reported flow 25 gpm, Mar. 21, 1966. Reported weakens when dry. Temp. 66°F.
502	do	--	--	130	--	Ke	--	100	Mar. 1966	C,W	S	The South well. Temp. 67°F.
503	J. D. Noguess	--	--	Spring	--	Ke	1,923	+	--	Flows	S	Reported flow 600 gpm from all springs in area, July 13, 1966. Iona Spring. Temp. 67°F.
601	M. B. Durst	--	Old	65	36	Kt	1,824	44.3	May 15, 1966	C,E, 3/4	D	Dug well. Reported never goes dry.
602	John J. Underwood	--	1954	187	5	Kt	--	142.1	Sept. 22,1965	C,W	S	Reported discharge 3 gpm.
603	do	Dudley Magill	1963	145	5	Kt	--	105	Sept. 1965	C,W	D,S	Reported water good and clear. Discharge 3 gpm.
604	Awbrey Kothmann	--	1952	325	6	Kt	2,009	257.5	Aug. 18, 1966	C,W	S	Reported strong supply. Temp. 73°F.
605	do	--	--	--	6	Kt	--	92.0	Aug. 17, 1966	C,W	S	Reported strong supply. Discharge 3 gpm.
701	H. H. Kothmann	--	Old	240	6	Ke	--	220	Dec. 1965	C,W	S	Reported weak supply.
702	do	--	Old	190	6	Ke	--	112.7	May 16, 1966	C,W	S	Reported discharge 4 gpm. West Cox Pasture well.
703	Walter Pfluger	--	1955	190	--	Ke	2,186	182.4	Mar. 23, 1966	C,W	S	South Appleton well.
801	H. H. Kothmann	--	Old	160	--	Ke	--	140	Dec. 1965	C,W	S	Reported strong supply. North Pasture well.

See footnotes at end of table.

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
								BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
RK-56-19-802	H. H. Kothmann	W. E. Page	1960	447	5,4	Ke	--	367.7	Dec. 14, 1965	C,W	D,S	Cased from 270 ft to bottom. Perforated from 250-270 ft, and 417 ft to bottom. Headquarters well.
803	do	--	1949	220	--	Ke	2,040	81.0	May 16, 1966	C,W	S	Reported discharge 4 gpm. Temp. 69°F.
804	do	Paul Urban	1953	360	6	Kt	--	335	Dec. 1965	C,W	S	Reported discharge 4 gpm. Perforated from 340 ft to bottom. East Stengel well.
805	do	O. E. Morgan	1950	20	6	Ke	1,989	8.0	Dec. 14, 1965	C,W	S	Reported a good well. Red Barn well. Temp. 65°F.
806	do	--	1948	160	--	Ke	--	140	Dec. 1965	C,W	S	Reported weak supply. Bruce II Pasture well.
807	do	Milton Vater	1950	240	--	Ke	2,075	126.0	Dec. 14, 1965	C,W	S	Reported strong supply. Temp. 65°F.
901	do	Cal Robinson	1950	127	6	Ke	--	110	Dec. 1965	C,W	S	Cased to bottom. Perforated from 107 to bottom. Reported strong well. East Cracked Springs well.
902	O. C. Fisher	--	1915	150	6	Kt	1,772	126.2	Mar. 25, 1966	C,W	S	The North well.
903	do	Sammie Bruce	1960	220	6	Kt	1,842	188.3	do	C,W	S	Reported discharge 3 gpm. The Canyon well.
20-320	Cone & Slator	--	--	90	--	Kt	1,728	34.9	Oct. 14, 1965	C,W	S	The D'Spain well.
401	Jack McMillan	O. E. Morgan	1962	--	6	Kt	--	15	Sept. 1965	N	N	Unused well at present. Owner plans to irrigate later.
* 402	John J. Underwood	Milton Vater	1965	167½	5	Kt	--	145.7 145.2	Sept.22, 1965 May 15, 1966	C,W	S	Reported discharge 10 gpm. Temp. 67°F.
403	Mrs. Ellis Brown	--	1950	135	6	Kt	--	125.3	Dec. 12, 1965	C,W	S	Reported small supply.
404	do	--	1920	140	6	Kt	--	131.5	do	C,W	S	Reported discharge 4 gpm.
405	do	--	1915	80	6	Kt	--	68.6	Dec. 12, 1965	J,E, 1	D,S	Reported discharge 10 gpm.

See footnotes at end of table.

Table 3.--Records of Wells and Springs in Kimble County and Adjacent Areas--Continued

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND-SURFACE DATUM (FT)	WATER LEVEL: DATE OF MEASUREMENT	METHOD OF LIFT	USE OF WATER	REMARKS
RK-56-20-406	Awbrey Kothmann	--	Old	140	6	Kt	1,790	90.6	Mar. 21, 1965	T,E, 3/4	D,S	Headquarters well.
407	do	--	Old	80	6	Kt	1,779	33.4	May 15, 1966	C,W	S	Reported discharge 3 gpm.
408	do	--	--	120	6	Kt	--	81.7	Mar. 21, 1966	C,W	S	Reported strong supply.
409	Palmer Smith	--	Old	--	--	Kt	--	40.1	Aug. 15, 1966	J,E, ¼	D,S	Reported discharge 7 gpm.
410	Jack McMillan	Milton Vater	1963	80	6	Kt	1,740	47.1	Aug. 17, 1966	J,E	D,S	
* 501	Jack Dayton	--	--	35	7	Kt	1,698	18.4 19.8	June 2, 1961 Aug. 17, 1966	N	N	Unused at present.
502	Edmond Dayton	--	1961	48½	6	Kt	--	18.5 20.2	June 2, 1961 Aug. 17, 1966	N	N	Do.
503	R. F. Cannon well 1	H. A. McLean, et al.	1929	1,648	--	--	--	--	--	--	--	Oil test. 1/
* 504	C. W. Kirschner	Hicks & Puckitt	1964	730	9	C	1,779	120	Sept. 1966	T,E, 25	Irr	Reported discharge 300 gpm. Irrigates about 15 acres. Cased to 75 ft. Temp. 74°F. 2/
* 505	Preston & Martin	O. E. Morgan	1963	91	6	Kt	--	18	July 1965	T,E, 1½	D,Irr	Irrigates about 3 acres. Reported discharge 60 gpm.
506	C. W. Kirschner	Hicks & Puckitt	1964	700	9	C	--	--	--	N	N	Reported large cave at 360 ft. Unused well.
507	George Pearl	--	Old	55	6	Kt	1,694	40.4	Aug. 15, 1966	C,W	D,S	Temp. 70°F.
508	do	--	1950	250	6	Kt	--	46.5	do	C,W	D,S	Reported discharge 3½ gpm.
509	Mrs. Johnie Martin	--	1940	100	6	Kt	--	40	Aug. 1966	T,E, ½	D,S	Headquarters well.
510	E. E. Keith	--	Old	45	36	Kt	1,754	41.4	Aug. 15, 1966	C,W	D,S	Dug well. Reported discharge 2 gpm.
511	do	--	Old	60	5	Kt	--	31.0	do	C,W	S	Reported discharge 3½ gpm.

See footnotes at end of table.

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND-SURFACE DATUM (FT)	WATER LEVEL: DATE OF MEASUREMENT	METHOD OF LIFT	USE OF WATER	REMARKS
RK-56-20-512	Mrs. Hester Hardesty	--	Old	45	6	Kt	1,697	28.5	Aug. 15, 1966	J,E, 3/4	D	Reported discharge 8 gpm.
* 513	London Community	Magill Well Service	1966	90	4	Kt	--	35	Aug. 1966	T,E	P	Reported discharge 25 gpm. Cased from 30 ft to bottom.
514	Ferrell McKinney	--	Old	--	6	Kt	--	--	--	J,E, ½	D	Reported discharge 8 to 10 gpm.
515	Max Hahn	--	Old	40	6	Kt	--	20	Aug. 1966	J,E, ½	D	Reported discharge 10 gpm.
516	Mrs. Johnie Martin	--	Old	100	--	Kt	1,716	55.6	Aug. 15, 1966	C,W	S	Headquarters well. Temp. 71°F.
517	Max Hahn	--	Old	38	--	Kt	--	28	Aug. 1966	J,E, ½	D	House well.
518	Raymond Pearl	--	Old	60	--	Kt	1,699	26.6	Aug. 17, 1966	C,W	D	
519	J. L. Glossenbrener	Magill Well Service	1963	36	6	Kt	--	18	Aug. 1966	J,E, ½	D	Reported discharge 10 gpm.
520	Jack Dayton	do	1963	110	6	Kt	--	40	Aug. 1966	T,E, 1	D	Reported discharge 30 gpm.
521	Mrs. Allie Nelson	Ferrell McKinney	1960	36	5	Kt	--	26	Aug. 1966	J,E, ½	D	Reported water has bitter taste.
601	Cone & Slator	H. C. Harris	1942	906	--	E,C	1,729	81.5	Oct. 14, 1965	C,W	S	Eagle well. Temp. 75°F.
602	do	George Ford	1933	354	6	E	--	103.4	do	C,W	S	East well. Temp. 72°F.
603	do	--	--	Spring	--	E	1,626	+	--	Flows	--	Estimated flow 65 gpm, Oct. 11, 1965. Maberry Spring. Temp. 72°F.
604	do	-- Hahn	--	100	--	Kt	--	33.8	Oct. 14, 1965	C,W	S	Reported strong supply. Hahn Place well. Temp. 72°F.
605	do	-- Kinsey	1933	540	--	E,C	1,727	77.5	do	C,W	D,S	Reported water level has lowered 6 ft in 30 years. Temp. 74°F.

See footnotes at end of table.

Table 3.--Records of Wells and Springs in Kimble County and Adjacent Areas--Continued

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND-SURFACE DATUM (FT)	WATER LEVEL: DATE OF MEASUREMENT	METHOD OF LIFT	USE OF WATER	REMARKS
RK-56-20-606	L. C. Hardesty	--	Old	650	--	Kt,E	1,755	90.4	Aug. 15, 1966	C,W	D,S	Reported weak supply until well RK-58-20-601 was drilled; then became stronger. Temp. 69°F.
607	Roy D. Martin	--	--	200	6	Kt	1,725	52.4	Aug. 15, 1966	C,W	S	Reported discharge 2 gpm. Well at old Lavalle Place.
701	C. D. McCollum	--	1907	66	6	Kt	--	44.6	Sept.30, 1965	C,W	D,S	Reported discharge 5 gpm; not good for drinking purposes.
702	do	E. McCullough	1954	193	8	Kt	1,803	55.7	do	N	N	Reported on 36-hour test, 55 gpm. Well no. 2. Unused at present.
703	M. R. Watters, Jr.	--	Old	110	6	Kt	1,929	104.7	Dec. 11, 1965	C,E, 1/3	S	Reported weak supply. Snyder Place well.
704	Murray Jarvis	Murray Jarvis	1948	55	6	Kt	--	41.9	Dec. 13, 1965	C,W	D,S	Reported discharge 9 gpm. Horn Headquarters well.
705	do	--	1905	90	6	Kt	--	73.0	do	C,W	D,S	Reported discharge 9 gpm. Horn Hog well.
706	Alfred Stewart	--	1948	71	6	Kt	1,801	47.1	Dec. 11, 1965	C,W	D,S	Reported water at 40 and 60 ft.
801	J. B. Stewart	--	1914	45	6	Kt	--	25	Dec. 1965	C,W, E,¼	D,S	Reported strong supply.
802	J. F. Johnson	--	Old	60	--	Kt	1,690	38.1	Mar. 21, 1966	C,W	D,S	Headquarters well. Temp. 70°F.
803	do	--	--	100	--	Kt	1,646	97.9	do	C,W	S	Temp. 74°F.
804	do	--	--	60	--	Kt	--	49.1	do	C,W	S	Temp. 70°F.
805	do	--	--	100	--	Py	1,656	29.3	do	C,W	S	Reported water suitable for livestock only. Temp. 68°F.
806	do	--	--	60	--	Kt	1,712	52.2	Mar. 21, 1966	C,W	S	Well at the mountain. Temp. 70°F.
807	L. A. Ivy Estate	--	1958	70	6	Kt	1,688	25.4	Aug. 15, 1966	C,W, J,E,½	S	Reported discharge 10 gpm. Good quality of water. Temp. 70°F.
808	London Community Cemetery	Magill Well Service	1966	90	6	Kt	--	30	Aug. 1966	J,E, ½	Irr	Reported discharge 10 gpm. Used to irrigate flowers and lawns.

See footnotes at end of table.

Table 3.--Records of Wells and Springs in Kimble County and Adjacent Areas--Continued

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
								BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
*RK-56-20-901	Raymond Pfluger	Hicks & Puckitt Water Service Inc.	1964	880	--	C	1,680	120	Sept. 1966	C,W	S	2/
21-701	Bill Day	--	--	Spring	--	E	--	+	--	Flows	N	Reported flowed about 15 gpm on July 29, 1966; good drinking water. Old Chimney Spring.
25-201	Mrs. G. W. Landers	--	Old	150	--	Ke	--	--	--	C,W, T,E, 3/4	D,S	Reported discharge 6 to 8 gpm. Headquarters well. Temp. 68°F.
202	do	--	1964	160	--	Ke	2,137	93.6	Aug. 1, 1966	C,W	S	Reported discharge 3 gpm. Walnut Pasture well.
203	Charles J. Murr	Hubert Johnson	1945	276	--	Ke	--	260	Aug. 1966	C,W, E,1	D,S	Reported discharge 8 to 10 gpm. Headquarters well.
301	E. H. Harrison and E. O. Bode well 1	Dixie Oil Co.	1927	3,026	--	--	1,910	--	--	--	--	Oil test.
302	Dan O. Morales well 1	J. C. Renfro, et al.	1940	2,001	--	--	1,900	--	--	--	--	Oil test. 2/
303	Jack Moore	--	--	Spring	--	Ke	1,965	+	--	Flows	D,S	Reported flow 1 gpm, Aug. 1, 1966.
304	Jake Andrews	--	Old	33	48	--	--	--	--	C,W, J,E	D,S	Dug well.
305	Chester Bannowsky	Buster Atkinson	1948	90	--	Ke	2,089	68.1	Aug. 1, 1966	C,W	S	South Pasture well.
401	Ruth Simon Bode	Hunt Oil Co.	1953	3,219	--	--	2,177	--	--	--	--	Oil test. 1/
501	-- Mudge well 2	Utex Exploration Co.	1960	2,212	--	--	2,061	--	--	--	--	Do.
502	Mrs. Ethel Mudge well 1	do	1960	2,551	--	--	2,081	--	--	--	--	Do.
503	Mrs. Louise Kennedy well 1	do	1961	2,449	--	--	2,124	--	--	--	--	Do.
504	Fred Mudge well 3	-- Casex	1962	2,900	--	--	2,111	--	--	--	--	Do.

See footnotes at end of table.

Table 3.--Records of Wells and Springs in Kimble County and Adjacent Areas--Continued

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND-SURFACE DATUM (FT)	WATER LEVEL: DATE OF MEASUREMENT	METHOD OF LIFT	USE OF WATER	REMARKS
*RK-56-25-505	-- Mudge well 4	-- Casex	1966	285	--	Kt	2,155	210	Feb. 1966	N	N	Unused well. Water samples taken at 246 and 285 ft furing drilling of oil test.
506	Fred Mudge	--	--	133	6	Ke	--	130	Mar. 1966	-,E	D,S	Reported discharge 18 gpm. High Lonesome well. Temp. 70°F.
507	do	--	--	Spring	--	Ke	1,971	+	--	Flows	S	Estimated flow 2 gpm, Aug. 10, 1966. North Creek Spring. Temp. 68°F.
508	Charles J. Murr	O. E. Morgan	1960	140	--	Ke	--	110	Aug. 1966	C,W	S	Reported bailer test of 15 gpm. East Pasture well.
* 601	Felix Murr	--	Old	180	--	Ke	--	150	May 1966	C,W,E	D,S	Reported discharge 2 gpm. Headquarters well. Temp. 69°F.
602	do	--	1942	80	--	Ke	2,077	56.8	Aug. 1, 1966	C,W	S	Reported discharge 5 gpm. Temp. 71°F.
701	Gully Cowsert well 1	Skelly Oil Co.	1961	3,003	--	--	2,048	--	--	--	--	Oil test. 1/
702	K. Cowsert	Sammie Bruce	1960	400	--	Kt	--	--	--	N	N	Reported insufficient supply of water for domestic or livestock use.
703	do	--	--	Spring	--	Ke	--	+	--	Flows	D,S	Reported flow 7 gpm, Aug. 2, 1966. Headquarters supplied by 1.4 miles of 2-in. pipe line from spring. Bois D'Arc Spring.
801	-- Mudge well 1	Utex Exploration Co.	1960	2,870	--	--	2,115	--	--	--	--	Oil test. 1/
802	K. Cowsert	Sammie Bruce	1964	40	6, 5	Qa	--	26	Aug. 1966	T,E, 1	D	Reported discharge 18 gpm. Temp. 68°F.
* 803	Mrs. Louise Kennedy	--	--	80	5	Kt	1,837	47.5	Aug. 3, 1966	C,W	S	Reported not suitable for drinking purposes. Sulphur well.
804	John Y. Francis	--	1952	65	6	Qa	--	30.5	Aug. 9, 1966	C,W	S	Reported tested 30 gpm.

See footnotes at end of table.

Table 3.--Records of Wells and Springs in Kimble County and Adjacent Areas--Continued

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
								BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
RK-56-25-805	John Y. Francis	--	1952	280	6	Kt	2,065	277.7	Aug. 9, 1966	C,W	S	
806	do	--	1946	240	6	Ke	2,116	118.9	do	C,W	S	
807	do	--	--	--	6	Kt	--	177.7	Aug. 10, 1966	C,W,E	S	Temp. 73°F.
* 901	do	Buster Atkinson	1951	49	--	Qa	--	--	--	T,E, 7½	Irr	Estimated discharge 250 gpm. Temp. 66°F.
902	do	do	1951	50	--	Qa	--	--	--	T,G	Irr	Do.
903	Mrs. A. N. Woods	--	1917	45	48	Qa	--	38.4	Sept. 7, 1965	C,W	D,S	Dug well. Reported good water. Temp. 69°F.
904	Mrs. J. M. Livingston	--	1955	250	6	Kt	1,867	114.7	Aug. 22, 1966	C,E	D,S	Headquarters well.
* 905	Mrs. A. L. Mudge	O. E. Morgan	1955	330	6	Kt	1,830	--	--	N	N	Destroyed.
906	do	Sammie Bruce	1965	110	--	Kt	1,821	84.6	Aug. 10, 1966	C,W	D,S	Reported discharge 3 gpm. Headquarters well.
907	Fred Mudge	--	1940	170	4	Kt	1,866	134.0	do	C,W	S	Reported water has sulphur taste.
908	do	--	1954	210	6	Kt	--	90	Sept. 1966	C,W,E	S	Reported discharge 3 gpm; good livestock water. Weber well.
* 26-101	Earny Goule	--	1925	160	5	Kt	1,904	139.2	May 4, 1966	C,W	D	Reported discharge 3 gpm. Reported corrodes pipes. Temp. 70°F.
102	Daniel O. Morales	-- Murdock	1925	177	6	Kt	1,900	103.0	Sept. 8, 1965	C,W	D,S	Cased to 170 ft; perforated from 150 to 170 ft.
* 103	John C. Francis	--	1960	30	11	Qa	--	--	--	J,E	D,S	Cased to bottom; perforated from 20-30 ft. Temp. 72°F.
104	Daniel O. Morales	Doc Maddox	--	112	6	Kt	1,897	95.2	Sept. 8, 1965	N	N	Unused well. Cased to bottom; perforated from 100-112 ft. Weak supply.
105	A. A. Bannowsky	A. A. Bannowsky	1952	15	36	Qa	--	12.0	Sept. 1965	Cf,E, 1½	D	Dug well.

See footnotes at end of table.

Table 3.--Records of Wells and Springs in Kimble County and Adjacent Areas--Continued

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
								BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
*RK-56-26-106	A. A. Bannowsky	-- Adkins	1944	150	--	Ke	--	88.0	Sept. 8, 1965	C,W	S	Reported discharge 3 gpm. Temp. 70°F.
107	L. B. Nicholson	--	1959	180	4	Kt	--	160	Sept. 1965	T,E, ½	D,S	Reported weak supply; pumps dry in 5 minutes. Temp. 70°F.
108	do	--	--	147	--	Ke	2,042	73.4	Aug. 7, 1966	C,W	S	Reported discharge 3 gpm.
109	do	--	--	255	6	Kt	1,958	143.8 144.0	Sept. 8, 1965 Aug. 7, 1966	N	N	Unused well.
110	do	--	--	145	--	Kt	1,880	77.4	Aug. 7, 1966	C,W	S	Reported water of poor quality.
111	H. H. Lawler well 4	Anzac Oil Corp.	1952	2,040	--	--	2,097	--	--	--	--	Oil test. 1/
112	Alamo Freight Lines, Inc.	--	1948	230	--	Ke	--	200	Apr. 1966	C,W	S	Reported discharge 4 gpm. Willie Mill well.
113	do	--	--	Spring	--	Ke	--	+	--	Flows	D,S	Reported flow 5 gpm, Apr. 16, 1966. Piped to house at Cleo. Section Spring.
201	H. H. Lawler well 1	Anzac Oil Corp.	1952	2,173	--	--	2,190	--	--	--	--	Oil test. 1/
202	Irma Lawler Woodward	Humble Oil & Refining Co.	1955	3,030	--	--	2,105	--	--	--	--	Do.
203	Walter Pfluger	B. Atkinson	1936	200	--	Ke	2,122	141.4	Mar. 23, 1966	C,W	S	Reported strong supply. Highline well. Temp. 65°F.
* 204	Alamo Freight Lines, Inc.	--	Old	225	--	Ke	2,205	206.4	Apr. 16, 1966	C,W	D,S	Reported discharge 5 gpm. Headquarters well. Temp. 67°F.
205	do	--	Old	180	--	Ke	2,118	116.9	May 4, 1966	C,W	S	Reported weak supply. Bannowsky well.
206	do	--	Old	250	--	Ke	2,246	236.8	Apr. 16, 1966	C,W	S	Reported discharge 4 gpm. North well. Temp. 67°F.
301	W. L. Pfluger, et al, well 1	Anzac Oil Corp.	1952	2,138	--	--	2,107	--	--	--	--	Oil test. 1/

See footnotes at end of table.

Table 3.--Records of Wells and Springs in Kimble County and Adjacent Areas--Continued

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND-SURFACE DATUM (FT)	WATER LEVEL: DATE OF MEASUREMENT	METHOD OF LIFT	USE OF WATER	REMARKS
RK-56-26-302	H. H. Lawler well 2	Anzac Oil Corp.	1952	2,050	--	--	2,072	--	--	--	--	Oil test. 1/
303	Walter Pfluger	--	Old	200	--	Ke	--	50	Mar. 1966	C,W	S	Reported discharge 3 gpm. Temp. 67°F.
304	do	--	--	Spring	--	Ke	--	+	--	Flows	S	Reported flow 10 gpm, Mar. 23, 1966. Gorman Springs.
305	Alamo Freight Lines, Inc.	--	--	Spring	--	Ke	1,934	+	--	Flows	S	Reported flow 25 gpm, Apr. 16, 1966. 490 Spring. Temp. 67°F.
401	Lottie Bolt well 1	Humble Oil & Refining Co.	1948	4,170	--	--	2,015	--	--	--	--	Oil test. 1/
402	Weaver Baker well 1	-- Auld, et al.	1940	2,626	--	--	1,856	--	--	--	--	Oil test.
403	Delivan Chadwick	--	Old	--	--	Kt	--	--	--	C,W	D,S	Reported weak supply.
404	M. B. Murr well 1	Low Drilling Co., Inc.	1961	1,659	--	--	1,830	--	--	--	--	Oil test. 1/
405	Delivan Chadwick	O. E. Morgan	1962	200	6	Kt	1,800	0.00	July 30, 1966	N	N	Unused well. Seeps at surface. Reported suitable for livestock. Cedar Mill well. Temp. 71°F.
501	Lottie Bolt well 3	Anzac Petroleum Corp.	1951	1,947	--	--	2,030	--	--	--	--	Oil test. 1/
502	H. H. Lawler well 2	do	1952	2,069	--	--	2,095	--	--	--	--	Do.
503	Alamo Freight Lines, Inc.	--	1951	225	--	Ke	2,077	101.6	Apr. 16, 1966	C,W	S	Reported discharge 4 gpm.
504	do	--	--	Spring	--	Ke	--	+	--	Flows	S	Reported flow 5 gpm, Apr. 14, 1966. West Elm Spring.
505	do	Sammie Bruce	1963	200	--	Ke	2,101	119.4	Apr. 16, 1966	C,W	S	Reported discharge 3/4 gpm. New Bannowsky well. Temp. 64°F.
601	Houston Smith	--	--	Spring	--	Ke	--	+	--	Flows	S	Reported flow 3 gpm, Mar. 17, 1966.

See footnotes at end of table.

Table 3.--Records of Wells and Springs in Kimble County and Adjacent Areas--Continued

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND-SURFACE DATUM (FT)	WATER LEVEL: DATE OF MEASUREMENT	METHOD OF LIFT	USE OF WATER	REMARKS
RK-56-26-602	Houston Smith	--	--	Spring	--	Ke	--	+	--	Flows	D,S	Reported flow 1 gpm, Mar. 17, 1966.
603	Alamo Freight Lines, Inc.	--	--	225	--	Ke	2,081	124.8	Apr. 16, 1966	C,W	S	Reported discharge 4 gpm. South well.
604	Silver Lake Ranches Co.	--	Old	140	--	Ke	2,078	128.0	May 16, 1966	C,W	D,S	Reported discharge 1½ gpm. Menard Road Place well.
605	Mrs. Beatrice Whittle Hobbs	--	1953	180	5	Kt	1,841	133.7	July 30, 1966	C,W	S	Estimated discharge 3 gpm. Upper Ranch well.
701	J. M. Anderson	Plateau Oil Co.	1938	1,860	--	--	1,782	--	--	--	--	Oil test. 2/
702	Leonard McGowan	--	Old	40	30	Qa	--	27.0	Mar. 29, 1966	C,W	D,S	Dug well. Reported discharge 3 gpm. Well at Old Chambers Place.
703	J. R. Neff	O. E. Morgan	1956	90	--	Kt	1,759	42.0	Apr. 7, 1966	C,W	D	Estimated discharge 3 gpm. The Neff well. Temp. 64°F.
704	Fred Mudge	--	1949	35	6	Qa	--	25	Aug. 1966	J,E	D,S	Estimated discharge 10 gpm. Fred Mudge Headquarters well.
705	do	--	1953	180	5	Kt	1,776	33.7	Aug. 10, 1966	C,W,E	S	Reported discharge 3 gpm. Temp. 74°F.
801	W. E. Bolt well 1	Anzac Oil Corp.	1951	1,913	--	--	1,830	--	--	--	--	Oil test.1/
802	-- Reid well 1	do	1951	1,772	--	--	1,714	--	--	--	--	Do.
803	Lottie Bolt	O. E. Morgan	1948	250	--	Kt	1,797	67.9	Aug. 11, 1966	C,W	S	Supplies water for livestock in 3 pastures. East Lower Pasture well.
804	do	--	Old	256	--	Kt	1,794	161.5	Aug. 8, 1966	C,W	D	Water not used for drinking purposes. Headquarters well.
* 805	do	J. N. Maddox	1926	185	--	Kt	1,792	135.7	do	C,W	D,S	Reported discharge ½ gpm. W. E. Bolt Headquarters well.
806	Mrs. Myra Caldwell	--	--	216	--	Kt	--	83.6	do	C,W	S	Big Pasture well.

See footnotes at end of table.

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND-SURFACE DATUM (FT)	WATER LEVEL: DATE OF MEASUREMENT	METHOD OF LIFT	USE OF WATER	REMARKS
RK-56-26-807	Mrs. Myra Caldwell	--	--	--	--	Kt	--	38.8	Aug. 8, 1966	C,W	D,S	Estimated discharge 3 gpm. Headquarters well.
808	W. E. Bolt	Hubert Johnson	--	260	6	Kt	1,807	56.5	Aug. 10, 1966	C,W	S	Reported sulfur water corrodes the pipes. Temp. 72°F.
* 901	Kimble County	O. E. Morgan	1959	158	5	Kt	--	38	Sept. 1965	T,E, 1	D,S	Reported discharge 10 gpm. Well operated by Junction Warehouse Co. Temp. 70°F.
902	Junction Warehouse Co.	--	1950	185	6	Kt	1,759	163.1	Sept. 2, 1965	N	N	Reported water unsuitable for livestock use.
* 903	Roy Baker	--	1935	230	6	Kt	1,763	--	--	C,W	S	Reported discharge 20 to 30 gpm, and suitable for livestock use only. Sulfur and salty taste in water. Temp. 65°F.
904	Mrs. I. S. Foley	Ed Wahl	Old	250	6	Kt	1,822	209.0	May 16, 1966	C,W	D,S	Reported discharge 3 gpm. Water has mineral taste and rusts metal. Headquarters well.
905	Ben Dechert	Hubert Johnson	1947	200?	6	Kt	1,710	90.4	Aug. 9, 1966	C,W,E	S	Reported discharge 3 gpm. Good water for all livestock.
906	do	C. A. Hill	1958	35	36	Qa	--	28.4	do	T,E, 1	D	Dug well. Reported discharge 8 gpm.
907	Mrs. Beatrice Whittle Hobbs	--	Old	40	24	Kt	--	37.8	July 30, 1966	C,W	D,S	Dug well. Estimated discharge 3 gpm. Headquarters well. Temp. 71°F.
* 27-201	H. H. Kothmann	Cal Robinson	1925	200	5	Kt	1,822	174.8	Sept.11, 1965	C,W	S	Red Creek well. Temp. 71°F.
202	G. R. Kothmann	--	1940	240	5	Kt	1,822	212.5	Sept. 3, 1965	C,W	D,S	Reported discharge 4 gpm. Water reported of good quality.
203	do	Burl Fisher & Jack Goodman	1908	120	--	Ke	--	105	Nov. 1965	C,W	S	Reported discharge 0.25 gpm in summer, and 1.0 gpm in winter.
204	do	Cal Robinson	1925	70	--	Ke	--	16	Nov. 1965	C,W	S	Reported average discharge 0.5 gpm.

See footnotes at end of table.

Table 3.--Records of Wells and Springs in Kimble County and Adjacent Areas--Continued

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
								BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
*RK-56-27-205	Bill Jordan, et al.	Christian Vater	1920	240	--	Ke	2,133	197.2	Dec. 14, 1965	C,W	D,S	Reported discharge 4 gpm. White House well. Temp. 69°F.
206	H. H. Kothmann	W. E. Page	1960	340	4	Kt	--	262	Dec. 1965	C,W	S	Reported discharge 3 gpm. Lower Hodge well.
207	O. B. Fisher	--	1940	250	6	Kt	--	161.2	Dec. 15, 1965	C,W	S	Reported discharge 3 gpm. Reported strong supply.
208	do	Cal Robinson	1930	250	6	Kt	--	231.0	Dec. 15, 1965	C,W	S	Reported discharge 6 gpm.
301	do	-- Atkinson	1930	200	6	Kt	--	179.7	do	C,W	S	Reported discharge 3 gpm.
302	do	-- Snow	1940	400	--	Kt	1,982	369.0	do	C,W	S	Do.
303	Mrs. Grace Jordan	--	1940	100	5	Kt	1,676	44.9	do	C,W	N	Unused well. Reported discharge 3 gpm.
304	do	--	1940	100	5	Kt	--	92.9	do	C,W	S	Reported discharge 3 gpm.
305	Murray Jarvis	--	1910	101	6	Kt	1,683	59.4	do	C,W	D,S	Reported discharge 3½ gpm. Headquarters well.
306	do	Cal Robinson	1950	100	6	Kt	--	38.6	do	C,W	D,S	Reported discharge 3 gpm. The Winkle well.
307	O. C. Fisher	Hicks & Puckitt	1964	390	8	Kt	1,719	80.2	Mar. 18, 1966	N	N	Unused well.
308	do	--	Old	100	6	Kt	--	88	Mar. 1966	C,W	S	Reported discharge 3 gpm. The Falls Mill well.
309	do	--	1945	200	6	Kt	--	125	Mar. 1966	T,E	D	Reported discharge 50 gpm. Headquarters well.
310	do	--	1945	100	6	Kt	--	81.4	Mar. 25, 1966	C,W	S	Reported discharge 3 gpm. North Headquarters well.
311	do	--	1947	100	6	Kt	--	74.7	do	C,W	S	Reported discharge 3 gpm. East Headquarters well. Temp. 68°F.
312	do	--	1901	90	6	Kt	1,718	77.5	Mar. 23, 1966	C,W	D,S	Reported discharge 3 gpm. Old Ranch well.

See footnotes at end of table.

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
								BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
*RK-56-27-401	Silver Lake Ranches Co.	--	--	200	--	Kt	--	30	Aug. 1965	C,W, E,½	D,S	Reported discharge 10 gpm for short periods. Corrodes pipes and fixtures. Temp. 70°F.
402	do	--	--	200	--	Kt	--	30	Aug. 1965	C,W	S	Estimated discharge 3 gpm. Temp. 73°F.
403	do	--	--	200	--	Kt	--	30	Aug. 1965	C,W	S	Estimated discharge 3 gpm.
404	C. C. Scott	--	1938	150	6	Kt	--	75	Sept. 1965	C,W	D,S	Temp. 70°F.
501	O. B. Fisher	Cal Robinson	--	170	6	Kt	--	90.5	Sept. 1, 1965	C,W	S	Estimated discharge 3 gpm. Temp. 70°F.
502	do	--	Old	80	6	Kt	1,679	71.6	Dec. 10,1965	C,W	S	Reported discharge 3 gpm.
601	do	--	1962	175	6	Kt	--	--	--	T,E, 1½	D	Reported discharge 15 gpm.
602	do	--	1950	140	6	Kt	1,737	127.3 127.0	June 2, 1961 Aug. 31, 1965	N	N	Unused well.
603	do	--	Old	--	4	Kt	--	116.7	Sept. 1, 1965	N	N	Unused well at abandoned school house.
604	do	--	Old	115	6	Kt	--	--	--	C,W	S	Estimated discharge 3 gpm. Temp. 71°F.
605	Harry Spaeth	--	1959	200	6	Kt	--	145.4	Sept. 2, 1965	C,W	S	Estimated discharge 3 gpm. Temp. 72°F.
606	Murray Jarvis	Cal Robinson	1945	183	6	Kt	1,752	--	--	C,W	S	Pumping level 151.6 ft, Dec. 17, 1965. Reported discharge 4 gpm. The North well.
607	Lilly Overstreet	--	1936	190	6	Kt	1,772	160	May 1966	T,E, 1/3	D,S	Reported discharge 7 gpm. Headquarters well. Temp. 69°F.
* 701	Elmer D. Parrott	O. E. Morgan	1963	140	5	Kt	1,720	93.9	Sept. 2, 1965	T,E, 1	S	Plastic casing. Reported discharge 8 gpm. Temp. 71°F.
702	Silver Lake Ranches Co.	--	--	180	--	Kt	--	30	Aug. 1965	C,W	S	Estimated discharge 3 gpm. Temp. 73°F.

See footnotes at end of table.

Table 3.--Records of Wells and Springs in Kimble County and Adjacent Areas--Continued

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
								BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
RK-56-27-703	C. C. Scott	--	1938	210	--	Kt	--	180	Sept. 1965	C,W	D,S	Estimated discharge 3 gpm. Water reported usable, but not desirable.
704	M. E. Blackburn	Robert Allsup	1965	101	6	Kt	1,676	--	--	T,E	D	Softener used for domestic use. Gravel-packed.2/
801	P. T. Hodges well 1	Mudge Oil Co. of Texas	1931	2,902	--	--	1,660	--	--	--	--	Oil test.2/
802	J. C. Bumguardner	Sammie Bruce	1964	140	6	Kt	--	81.9	July 30, 1965	N	N	Owner plans to use well for irrigation.
* 803	do	do	1963	195	5	Kt	1,742	127.0	do	J,E, 1	D,S	Plastic casing. Reported discharge 4 gpm. Water hard and not used for drinking purposes. Temp. 73°F.
* 804	Ralph Ingram	--	--	--	--	Qa	--	--	--	T,E, 20	Irr	Temp. 79°F.
805	O. B. Fisher	--	Old	85	6	Kt	--	45.5	Dec. 10, 1965	C,W	S	Reported discharge 3 gpm. Reported strong supply.
806	L. R. Hodges	O. E. Morgan	1956	200	5	Kt	1,652	51.6	Apr. 26, 1966	C,W	D,S	Reported discharge 2 gpm. Headquarters well. Temp. 69°F.
* 807	Texas-New Mexico Pipeline Co.	--	1937	130	6	Kt	1,668	59	Aug. 1937	C,G	Ind	Supplies water for pipeline compressor station.
901	A. E. Bradshaw	Sammie Bruce	1965	105	4	Kt	--	55	May 1966	T,E, 3/4	S	Reported discharge 25 gpm.
902	do	do	1964	48	8	Qa	--	15	May 1966	T,E, 3	D,S	Headquarters well. Temp. 66°F.
* 903	do	do	1963	50	8	Qa	--	33.7	May 3, 1966	T,E, 5	Irr	Reported discharge 125 gpm. Reported 20 acres under irrigation. Temp. 69°F.
904	S. W. Dunnam	--	--	69	4	Kt	--	50	July 1966	T,E	D,S	Reported discharge 7 gpm. Headquarters well.

See footnotes at end of table.

Table 3.--Records of Wells and Springs in Kimble County and Adjacent Areas--Continued

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
								BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
RK-56-27-905	S. W. Dunnam	--	--	172	4	Kt	1,881	165	July 1966	C,W	S	Estimated discharge 3 gpm. East Reese well.
906	Murray Jarvis	O. E. Morgan	1960	80	6	Kt	1,640	54.8	Dec. 17, 1965	C,W	S	Reported discharge 3½ gpm. The South well.
* 28-101	Jack Black, Sr.	Bill Black	1900	104	6	Kt	--	70	Sept. 1965	C,W	D,S	Reported discharge 3 gpm. Temp. 74°F.
102	C. D. McCollum & M. R. Watters, Jr.	E. McCullough	1954	138	11	Kt	1,791	37.0	Sept.30, 1965	N	N	Unused well.
103	Ernest Copeland	-- Harris	1940	76	6	Kt	--	58	Dec. 1965	C,W	D,S	
104	M. R. Watters, Jr.	O. E. Morgan	1955	135	6	Kt	1,840	105.2	Dec. 11, 1965	C,W	D,S	Reported discharge 10 gpm. The Headquarters well.
105	do	--	1914	65	6	Kt	1,768	40.2	do	C,W	S	Reported strong supply. The Summers Place well.
106	Sam Morgan	--	1940	60	--	Kt	--	41.5	do	C,W	D,S	Reported discharge 3 gpm.
* 107	do	Sam Morgan	1952	80	--	Kt	1,740	41.0 41.3	Dec. 11, 1965 May 15, 1966	T,E, 1	D,S	Reported discharge 16 gpm. Pump set at 73 ft. Temp. 77°F.
201	Mrs. R. E. Moore	--	Old	60	--	Kt	--	40	Dec. 1965	C,E	D,S	Estimated discharge 3 gpm.
* 202	Luther Walton	Cal Robinson	1935	324	6	Py	1,668	60	Dec. 1965	C,E	S	Reported strong supply. Good for livestock, but not for drinking or irrigation of gardens.
203	Mrs. Mary Cummins	Edd Cummins	Old	50	5	Kt	--	40	Dec. 1965	C,W	S	Reported discharge 8 gpm.
204	Hadley Wardlaw	--	1916	100	--	Kt	1,722	17.6	Dec. 12, 1965	C,W	S	Jenkins Place well.
205	do	Cal Robinson	1935	350	6	Kt	1,712	87.0	do	C,W	S	Reported pumps dry at 3 gpm. Headquarters Deep well.
206	do	--	1947	39	5	Kt	1,719	21.4	Dec. 12, 1965	T,E, 1	D,S	Reported tested at 20 gpm.
207	do	--	1925	220	5	Kt	1,741	87.2	do	C,W	D,S	Reported discharge 4 gpm. Well at the Big Barn.

See footnotes at end of table.

Table 3.--Records of Wells and Springs in Kimble County and Adjacent Areas--Continued

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND-SURFACE DATUM (FT)	WATER LEVEL: DATE OF MEASUREMENT	METHOD OF LIFT	USE OF WATER	REMARKS
RK-56-28-208	Hadley Wardlaw	--	1935	60	6	Kt	1,682	24.2	Dec. 12, 1965	C,W	S	Reported discharge 3 gpm. Kendrick well.
209	Carl Whitworth	--	Old	47	6	Kt	1,746	30.4	Aug. 19, 1966	C,W	S	Reported discharge 3 gpm. Lemuel Jones well. Temp. 72°F.
* 301	Cecil L. Smith	Milton Vater	1964	925	6	E,C	1,785	138.3 140.6	Oct. 15, 1965 July 29, 1966	T,E, 1½	D,S	Reported discharge 16 gpm. Temp. 72°F.
302	do	--	--	Spring	--	E	--	+	--	Flows	D,S	Reported flow 15 gpm, Oct. 15, 1965. Temp. 71°F.
* 401	Joe W. Luchini	--	--	--	--	Qa	--	--	--	T,E, 60	Irr	Reported irrigates alfalfa field. Temp. 83°F.
402	Bill Gephart	-- McReynolds	1900	101	6	Kt	--	45	Dec. 1965	C,W	D,S	Reported discharge 3 gpm. Temp. 70°F.
403	do	Sammie Bruce	1965	140	--	Kt	1,691	46.6	Dec. 10, 1965	N	N	Test well.
404	J. L. Gephart	do	1965	140	6	Kt	--	115	Dec. 1965	T,E, 1½	D,S	Reported tested at 25 gpm.
405	do	Cal Robinson	1940	140	6	Kt	1,743	109.1	Dec. 10, 1965	C,W	D,S	Reported discharge 3 gpm.
501	Delton Stewart	--	1955	40	6	Kt	1,741	28.9 28.6	July 27, 1961 Aug. 19, 1966	C,W	S	
502	Mrs. Raymond Rucker	Trimble Well Service	1966	106	8	Kt	1,709	--	--	T,E	D	Reported discharge 9 gpm. Water at 90-95 ft when drilled.
601	C. C. Smith	--	--	130	6	Kt	--	--	--	C,W	S	Reported discharge 3 gpm.
602	do	Dave Kinsey	--	100	6	Kt	1,773	31.8	Dec. 13, 1965	C,W	D,S	Reported discharge 3 gpm.
603	do	--	--	195	6	Kt	1,789	87.3	do	C,W	D,S	Do.
604	Mrs. Minton Cook	--	1941	125	6	Kt	1,925	71.4	do	C,W, T,E,1	D,S	Reported discharge 6 gpm. Headquarters well.
605	do	--	1900	135	--	Kt	1,917	114.2	do	C,W	D,S	Reported discharge 3½ gpm.
606	do	--	1920	135	--	Kt	--	81.2	do	C,W	S	Do.

See footnotes at end of table.

Table 3.--Records of Wells and Springs in Kimble County and Adjacent Areas--Continued

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND-SURFACE DATUM (FT)	WATER LEVEL: DATE OF MEASUREMENT	METHOD OF LIFT	USE OF WATER	REMARKS
RK-56-28-607	Carl Whitworth	--	Old	90	6	Kt	1,803	84.4	Aug. 19, 1966	C,W	S	Reported discharge 2 gpm.
608	do	--	Old	100	6	Kt	--	90	May 1966	C,W	S	Reported discharge 1½ gpm. Jack Jones well.
701	W. E. Bolt	--	Old	40	--	Kt	--	27.4	July 19, 1966	C,W	S	Sycamore Ranch Headquarters well. Temp. 71°F.
702	do	--	--	130	--	Kt	1,833	105.5	July 19, 1966	C,W	S	Estimated discharge 3 gpm. The Middle well.
901	Mrs. W. W. House	--	--	Spring	--	Ke	--	+	--	Flows	D,S	Estimated flow 2 gpm, Dec. 9, 1965. Known as spring in 800 Pasture.
902	Jimmie Zesch	--	Old	210	--	Ke	2,226	177.1	Aug. 19, 1966	C,W	D,S	Reported discharge 2 gpm. Temp. 70°F.
29-101	C. C. Smith	Dave Kinsey	Old	115	6	Kt	1,795	--	--	C,W	S	Pumping level 46.6 ft, Dec. 13, 1965. Reported discharge 3 gpm.
102	J. M. Day	Douglas Clarey	1950	805	--	E,C	1,798	168.3	Aug. 18, 1966	C,W	S	Reported discharge 6 to 8 gpm. Temp. 72°F.
103	do	--	1915	65	6	Kt	1,812	52.0	do	C,W	D,S	Reported discharge 1 gpm. Headquarters well.
33-101	Mrs. Lydia Little	Robert Allsup & Son	1964	185	6	Ke	--	80	Sept. 1965	C,W	S	Reported weak supply. Pumping level 179.6 ft, Sept. 3, 1965.
102	do	--	--	Spring	--	Ke	--	+	--	Flows	S	Estimated flow 1½ gpm, Sept. 3, 1965. Reported rainfall affects flow. Road Hollow Spring.
103	do	--	--	Spring	--	Ke	--	+	--	Flows	S	Estimated flow 5 gpm, Sept. 3, 1965. Reported unaffected by rainfall. Cougar Hollow Spring.
104	E. H. Harrison	J. W. Hancock	1963	2,865	--	--	1,841	--	--	--	--	Oil test.1/
105	Mrs. J. F. Burt	--	1956	313	6	Kt	1,911	101.5	Aug. 3, 1966	C,E	D,S	Measured discharge 3/4 gpm. Bois D'Arc ranch well. Temp. 70°F.

See footnotes at end of table.

Table 3.--Records of Wells and Springs in Kimble County and Adjacent Areas--Continued

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND-SURFACE DATUM (FT)	WATER LEVEL: DATE OF MEASUREMENT	METHOD OF LIFT	USE OF WATER	REMARKS
RK-56-33-201	Mrs. Lydia Little	--	--	Spring	--	Ke	--	--	--	Flows	S	Estimated flow ½ gpm, Sept. 3, 1965. Reported flow unaffected by rainfall.
202	Della Dunbar well 1	Utex Exploration Co.	1960	2,863	--	--	1,852	--	--	--	--	Oil test.1/
203	Carrie L. Turner well 1	do	1961	2,533	--	--	1,816	--	--	--	--	Do.
204	W. L. Taylor well 1	-- Casex	1963	2,525	--	--	1,812	--	--	--	--	Do.
205	Coke Stevenson, Jr. well 1	do	1963	2,779	--	--	2,032	--	--	--	--	Do.
206	Carrie L. Turner well 2	do	--	2,805	--	--	2,035	--	--	--	--	Do.
207	R. D. Kothmann	--	Old	40	24	Qa	--	39.1	July 12, 1966	C,W	S	Dug well. Temp. 70°F.
208	do	Mack Scarborough	1942	137	--	Ke	--	32	July 1966	C,W	S	Estimated discharge 3 gpm.
209	Edward Dunbar	--	1930	34	--	Qa	--	32	July 1966	C,E	D,S	Dug well. Reported weakens when river goes dry. Headquarters well.
210	do	--	--	Spring	--	Ke	--	+	--	Flows	S	Reported flow ½ gpm, July 13, 1965. Wood Hollow Spring.
211	Ramsey Randolph	--	--	Spring	--	Ke	1,911	+	--	Flows	S	Reported flow 20 gpm, July 15, 1965. Rock Hollow Spring. Temp. 68°F.
212	do	Cal Robinson	1943	240	--	Ke	--	170	July 1966	C,W	D,S	Reported discharge less than ½ gpm.
301	Bobbie Hunger	Buster Atkinson	1947	300	--	Ke	--	130	Aug. 1966	C,W	S	Reported discharge 3 gpm. North Pasture well.
401	Seaton Prentice	--	--	Spring	--	Ke	1,921	+	--	Flows	S	Measured flow 15 gpm, Aug. 3, 1966. The Garden Spring.

See footnotes at end of table.

Table 3.--Records of Wells and Springs in Kimble County and Adjacent Areas--Continued

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND-SURFACE DATUM (FT)	WATER LEVEL: DATE OF MEASUREMENT	METHOD OF LIFT	USE OF WATER	REMARKS
RK-56-33-402	Seaton Prentice	--	--	Spring	--	Ke	1,940	+	--	Flows	D,S	Reported flow 30 gpm, Aug. 3, 1966. Bois D'Arc Headquarters Spring.
403	do	--	1949	250	--	Ke	2,181	212.2	Aug. 3, 1966	C,W	S	Reported strong supply. The East well. Temp. 68°F.
404	do	-- Doyle	1933	200	--	Ke	2,057	113.4	do	C,W	S	Reported strong supply. Water Hole well. Temp. 69°F.
501	Edward Dunbar	Virgil Andrews	1943	310	--	Ke	--	303.6	July 13, 1966	C,W	S	Reported discharge ½ gpm. Allison Mountain well.
502	do	--	Old	280	--	Ke	--	211.5	do	C,W	S	Reported discharge 3 gpm. East well.
503	do	Phillips Petroleum Co.	1945	180	--	Ke	--	--	--	N	N	Unused well. Reported discharge 20 gpm.
504	Ramsey Randolph	Johnny Sellers	1943	100	--	Ke	2,077	80.0	July 15, 1966	C,W	S	Reported discharge 3 gpm.
505	Mrs. Weaver Baker	--	Old	230	--	Ke	--	170	Aug. 1966	C,W	S	Reported discharge 3 gpm. The West well.
601	do	--	1952	--	--	Ke	--	44.9	July 15, 1966	C,W	S	Reported discharge 5 gpm.
* 602	do	--	1928	--	--	Ke	2,075	102.4	do	C,W	S	Reported discharge 1 gpm. East well. Temp. 69°F.
603	Bobbie Hunger	--	Old	230	--	Ke	--	160	Aug. 1966	C,W	S	Reported weak supply. Old Smelser Place well.
604	Boyce Hunger	Hubert Johnson	1952	130	--	Ke	2,085	102.7	Aug. 3, 1966	C,W	D,S	Reported strong supply.
605	Mrs. Weaver Baker	--	Old	160	--	Ke	--	112.7	do	C,W	S	Reported discharge 3 gpm. Front Pasture well.
606	Ed Hunger	--	--	Spring	--	Ke	--	+	--	Flows	D,S	Reported 3,500 ft of pipeline from spring to house.
701	C. W. Weisenburg	Hubert Johnson	1950	200	--	Ke	--	200.8	Aug. 26, 1966	C,W	S	Reported discharge 5 gpm. North Pasture well.

See footnotes at end of table.

Table 3.--Records of Wells and Springs in Kimble County and Adjacent Areas--Continued

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND-SURFACE DATUM (FT)	WATER LEVEL: DATE OF MEASUREMENT	METHOD OF LIFT	USE OF WATER	REMARKS
RK-56-33-702	C. W. Weisenburg	Hubert Johnson	1950	200	--	Ke	--	174.5	Aug. 26, 1966	C,W	S	Reported discharge 5 gpm. South Pasture well.
* 801	Fred Coleman	--	--	Spring	--	Ke	1,894	+	--	Flows	D,S	Reported flow 750 gpm, Mar. 22, 1966. Flow decreases each spring season if rain is not plentiful.
802	do	--	--	Spring	--	Ke	--	+	--	Flows	S	Reported flow 100 gpm, Mar. 22, 1966.
803	do	O. E. Morgan	1962	220	--	Ke	--	191.2	Mar. 22, 1966	C,W	S	Middle Pasture well.
804	C. W. Weisenburg	--	Old	--	--	Ke	2,079	170.0	do	C,W	D,S	Reported discharge 5 gpm. Headquarters well. Temp. 69°F.
901	Fred Coleman	O. E. Morgan	1961	220	--	Ke	--	--	--	C,W	S	Reported discharge 5 gpm. North Pasture well.
902	Julius Hunger	--	--	Spring	--	Ke	1,896	+	--	Flows	D,S, Irr	Estimated flow 140 gpm, Aug. 4, 1966. Bailey Creek Headquarters Springs.
34-101	W. E. Bolt	--	1940	220	--	Ke	--	--	--	C,W	S	Pumping level 219.5 ft, Aug. 10, 1966. Estimated discharge 3 gpm. High Lonesome well.
102	Fred Mudge	O. E. Morgan	1958	200	--	Ke	--	179.3	Aug. 10, 1966	C,W	S	Reported discharge ½ gpm. Nixon well.
201	W. E. Bolt well 2	Anzac Oil Corp.	1952	1,795	--	--	1,782	--	--	--	--	Oil test.1/
202	-- Bolt well 4	do	1953	2,372	--	--	2,033	--	--	--	--	Do.
203	Bobbie Hunger	O. E. Morgan	1957	46	6	Qa	--	40	Aug. 1966	J,E, 3/4	D	Reported discharge 5 gpm.
204	W. E. Bolt	Jack Guffey	1960	525	6	Kt	--	330.9	Aug. 10, 1966	C,W	S	Reported strong supply.
205	do	O. E. Morgan	1956	200	--	Ke	--	--	--	C,W	S	Do.
* 301	City of Junction well 1	--	1934	32	120	Qa	--	--	--	T,E, 40,40	P	Dug well. Two turbine pumps, 750 gpm in well.

See footnotes at end of table.

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND-SURFACE DATUM (FT)	WATER LEVEL: DATE OF MEASUREMENT	METHOD OF LIFT	USE OF WATER	REMARKS
RK-56-34-302	City of Junction well 1-A	--	1940	40	120	Qa	--	--	--	--	P	Infiltration well-connected to well 1 by 12 in. concrete tile pipeline.
* 303	City of Junction well 2	--	1950	18	144-168	Qa	--	--	--	Cf,E, 35	P	Dug well. Reported discharge 500 gpm.
* 304	H. H. Lawler	Luke Hagood	1955	35	48	Qa	--	21	Aug. 1965	Cf,E, 15	Irr	Dug well. Reported discharge 1,250 gpm. Temp. 69°F.
* 305	A & M University	--	1950	25	36	Qa	--	21.0	Aug. 12, 1965	T,E, 3,3	P	Dug well. Two turbine pumps in well. Temp. 69°F.
* 306	Alamo Freight Lines, Inc.	--	1945	50	--	Kt	--	--	--	T,E	D,S	Reported water corrodes pipes and fixtures. Temp. 65°F.
* 307	City of Junction well 3	--	1963	21	120	Qa	--	--	--	T,E, 35,35	P	Dug well. Reported discharge 500 gpm each. Two submersible pumps.
401	Roy Blackburn	--	Old	40	--	Kt	1,800	29.9	Aug. 4, 1966	C,E	S	Reported suitable for livestock use only.
501	-- Wright well 1	Barron Kidd	1954	1,514	--	--	1,729	--	--	--	--	Oil test.1/
* 502	R. D. Kothmann	-- Borland	1952	32	16	Qa	--	29	July 1966	T,G, 75	Irr	Dug well. Reported discharge 600 to 800 gpm. Irrigates 100 acres.
503	do	--	Old	32	25	Qa	--	25.4	July 12, 1966	Cf,E, 1	D,S	Dug well. Reported discharge 6 gpm. Old Eckert well. Temp. 69°F.
601	Lewis Jetton	Lewis Jetton	1940	18	12	Qa	--	8	Aug. 1965	Cf,G, 100	S,Irr	Dug well. Reported discharge 100 gpm.
602	do	do	1940	18	12	Qa	--	12	Aug. 1965	Cf,G, 100	S,Irr	Do.
* 603	do	do	1940	18	12	Qa	--	12	Aug. 1965	Cf,G, 100	S,Irr	Dug well. Reported discharge 100 gpm. Temp. 69°F.
604	do	do	1940	18	12	Qa	--	8	Aug. 1965	Cf,G, 100	S,Irr	Dug well. Reported discharge 100 gpm.

See footnotes at end of table.

Table 3.--Records of Wells and Springs in Kimble County and Adjacent Areas--Continued

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
								BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
RK-56-34-701	J. W. Johnson well 1	Barron Kidd	1954	1,130	--	--	1,805	--	--	--	--	Oil test. 1/
702	Burt Ranch well 1	Mobil Oil Co.	1964	1,300	--	--	1,764	--	--	--	--	Oil test.
703	Burt Ranch well 2	do	1964	1,325	--	--	1,858	--	--	--	--	Do.
704	Burt Ranch well 3	do	1964	1,212	--	--	1,824	--	--	--	--	Do.
705	W. C. Oliver	--	--	Spring	--	Ke	1,895	+	--	Flows	D,S	Estimated flow 25 gpm, Aug. 2, 1966. Big Turner Pasture spring. Temp. 68°F.
706	Henry Bossman	--	Old	35	36	Qa	--	25.3	Aug. 4, 1966	J,E, ½	D	Estimated discharge 8 to 10 gpm. Dug well. Temp. 81°F.
801	J. W. Johnson well 5	Barron Kidd	1956	3,670	--	--	1,823	--	--	--	--	Oil test. 1/
802	J. W. Johnson well 3	do	1954	1,149	--	--	1,854	--	--	--	--	Do.
803	J. W. Johnson well 4	do	1954	1,238	--	--	1,956	--	--	--	--	Do.
804	Burt Ranch well 4	Mobil Oil Co.	1964	1,201	--	--	1,887	--	--	--	--	Oil test.
805	Burt Ranch well 5	do	1965	1,405	--	--	2,063	--	--	--	--	Do.
806	Mrs. J. F. Burt	--	--	Spring	--	Ke	1,903	+	--	Flows	D	Estimated flow 25 gpm, Aug. 2, 1966. Chalk House Spring. Temp. 68°F.
901	C. T. Holekamp	--	Old	--	--	Ke	2,026	199.7	Aug. 16, 1966	C,W	S	Reported discharge 1 gpm. Cedar Break well. Temp. 71°F.
902	do	--	--	Spring	--	Ke	--	+	--	Flows	S	

See footnotes at end of table.

Table 3.--Records of Wells and Springs in Kimble County and Adjacent Areas--Continued

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND-SURFACE DATUM (FT)	WATER LEVEL: DATE OF MEASUREMENT	METHOD OF LIFT	USE OF WATER	REMARKS
RK-56-35-101	Maurice Nethery	--	1944	150	--	Ke	--	140	Dec. 1965	C,W	S	Reported discharge 1 gpm.
102	do	Barney Smith	1910	120	6	Kt	1,664	46.8	Dec. 8, 1965	C,W	D,S	Reported discharge 3 gpm. Temp. 72°F.
* 103	Mrs. Sama Baker	-- Lyondecker	1946	135	--	Ke	2,002	120.8	Apr. 15, 1966	C,W	S	Reported discharge 3 gpm. Temp. 65°F.
201	Maurice Nethery	--	1910	135	6	Kt	--	--	--	C,W	S	Reported discharge 3 gpm.
202	Robert Neal	--	Old	100	--	Kt	1,711	91.4	July 14, 1966	C,W	S	Reported discharge 1 gpm. Old Headquarters well.
203	do	--	Old	125	--	Kt	1,737	118.9	do	C,W	D,S	Reported discharge 3 gpm. Patterson Place well. Temp. 69°F.
301	do	Neal Sellers	1946	168	6	Kt	1,719	108.6	do	C,E	D,S	Reported discharge 2 gpm. Headquarters well. Temp. 69°F.
302	S. W. Dunnam	--	1959	269	4	Ke	2,064	157.8	July 19, 1966	C,W	D,S	Estimated discharge 3 gpm. Cedar Hill well. Temp. 69°F.
303	do	--	1956	308	4	Kt	1,902	273.3	do	C,E	D,S	Estimated discharge 4 gpm. Southeast Pasture well.
304	do	--	--	Spring	--	Ke	1,882	+	--	Flows	D,S	Estimated discharge 3 gpm, July 19, 1966. Reported to have smell of sulfur during drought. Walnut Spring.
401	Maurice Nethery	--	Old	150	--	Ke	--	80	Dec. 1965	C,W	D,S	Reported discharge 3 gpm.
402	Alamo Freight Lines, Inc.	Cal Robinson	1939	160	--	Ke	--	--	--	C,W,E	D,S	Do.
403	J. F. Johnson	--	Old	160	--	Ke	2,051	141.2	Aug. 14, 1966	C,W	S	Estimated discharge 3 gpm. Dillingham well.
404	do	--	--	Spring	--	Ke	--	+	--	Flows	S	Estimated flow 200 gpm, Aug. 14, 1966. Cedar Creek Spring. Temp. 68°F.
501	A. F. Hatch	W. H. Weymeyer	1961	82	--	Kt	--	63.7	May 25, 1961	N	N	Destroyed.

See footnotes at end of table.

Table 3.--Records of Wells and Springs in Kimble County and Adjacent Areas--Continued

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND-SURFACE DATUM (FT)	WATER LEVEL: DATE OF MEASUREMENT	METHOD OF LIFT	USE OF WATER	REMARKS
RK-56-35-502	A. F. Hatch	W. H. Weymeyer	1961	245	5	Kt	--	141.7	May 25, 1961	N	N	Unused well.
503	John L. Phillips well 1	Enfield Services	1960	1,016	--	--	--	--	--	--	--	Oil test.1/
504	Mrs. A. F. Hatch	W. H. Weymeyer	1963	260	5	Kt	--	--	--	T,E	D,S	Reported discharge 14 gpm.
505	C. C. Phillips	--	1950	180	6	Kt	1,735	107.1	Dec. 6, 1965	C,W	D	Estimated discharge 3 gpm.
506	Hollis Phillips	John Sellers	1942	180	6	Kt	1,696	77.4	Dec. 7, 1965	C,W	D,S	Reported discharge 3 gpm.
507	Douglas Jackson	--	--	Spring	--	Ke	1,897	+	--	Flows	D,S	Reported flow 30 gpm, Dec. 8, 1965. Flow became weaker in drought. Temp. 67°F.
701	J. F. Johnson	--	Old	350	--	Ke	2,061	168.3	Mar. 18, 1966	C,E, 1½	D,S	Estimated discharge 9 gpm. Reported a good well. Headquarters well. Temp. 66°F.
702	do	--	Old	200	--	Ke	--	139.4	Aug. 14, 1966	C,W	S	Estimated discharge 3 gpm.
703	C. T. Holekamp II	--	Old	--	--	Ke	2,131	279.7	Aug. 16, 1966	C,W	S	Reported discharge 3 gpm. High Lonesome well.
704	Doris Johnson well 1	Delva-Tex Petroleum Corp.	--	2,778	--	--	2,100	--	--	--	--	Oil test.
801	Mrs. L. J. Cotter	--	--	--	--	Ke	2,016	104.8	Aug. 31, 1966	C,W	S	Estimated discharge 3 gpm. High Lonesome well. Temp. 68°F.
802	F. C. Hodges	--	--	Spring	--	Ke	--	+	--	Flows	S	Reported discharge 50 gpm, Dec. 6, 1965.
901	Mrs. L. J. Cotter	W. E. Page	1956	300	6	Kt	--	200	Dec. 1965	T,E	D,S	Reported supplies water for 3 houses, and livestock.
902	do	--	--	300	--	Kt	--	--	--	C,E	D,S	Reported adequate supply of water.
903	F. C. Hodges	--	1939	17	6	Qa	--	14	Dec. 1965	Cf,E, 2	D,S	Reported discharge 50 gpm.
904	W. H. Dunk	Mack Scarborough	1944	213	6	Kt	1,770	145.4	Dec. 7, 1965	T,E, 3/4	D,S	Reported discharge 10 gpm.

See footnotes at end of table.

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL		METHOD OF LIFT	USE OF WATER	REMARKS
								BELOW LAND-SURFACE DATUM (FT)	DATE OF MEASUREMENT			
RK-56-35-905	W. H. Dunk	Hubert Johnson	1945	190	--	Ke	--	122.5	Dec. 7, 1965	C,W	S	Reported tested at least 15 gpm.
906	Mrs. L. J. Cotter	W. E. Page	1956	363	6	Kt	1,984	324.7	Aug. 31, 1966	C,W	S	Reported strong supply. Temp. 70°F.
36-101	Hilmer Schulze	--	Old	12	48	Ke	1,902	3.8	July 19, 1966	J,E	D,S	Dug well. Reported discharge 15 gpm capacity with pump. Reported went dry during drought. Headquarters well.
102	Arthur Schulze	--	Old	200	4	Kt	--	--	--	C,W,E	D,S	Measured discharge 3 gpm. Headquarters well. Temp. 68°F.
103	do	Hubert Johnson	1952	186	5	Kt	1,880	147.4	July 19, 1966	C,W	S	Reported discharge 1½ gpm. East Pasture well. Temp. 70°F.
104	S. W. Dunnam	--	1941	300	4	Ke	2,044	139.9	do	C,W	S	Estimated discharge 3 gpm. East Grobe well. Temp. 69°F.
201	Mrs. W. W. House	--	--	200	--	Ke	--	216.6	Dec. 9, 1965	C,W	S	Reported strong supply. West well.
202	Gordon McMillan	--	1938	180	--	Ke	--	120	July 1966	C,W,E 3/4	D,S	Measured discharge 3½ gpm. Temp. 70°F.
* 301	Mrs. W. W. House	--	--	200	--	Ke	2,229	176.9 170.2	July 27, 1961 Dec. 9, 1965	C,W	S	Estimated discharge 3 gpm. Northwest Pasture well. Temp. 71°F.
302	do	--	1948	180	--	Ke	--	160	Dec. 1965	C,E	D,S	
303	Lewis Ferguson	--	Old	250	--	Ke	--	149.9	Dec. 9, 1965	C,W	S	Reported discharge 3 gpm. The Gamble well.
304	do	C. R. Robinson	1941	102	--	Ke	--	88.5	do	C,W,E	D,S	Reported discharge 3 gpm. Ferguson House well.
305	Mrs. Wes Smith	--	Old	250	--	Ke	2,180	110.6	Aug. 19, 1966	C,W	S	Reported discharge 3 gpm. Home Pasture well.
401	R. D. Kothmann	--	Old	200	--	Ke	--	188.3	Apr. 13, 1966	C,W	S	Estimated discharge 3 gpm. Temp. 68°F.
402	Jim Herron, Jr.	--	Old	145	--	Ke	--	83.2	July 19, 1966	C,W,E	D,S	Estimated discharge 3 gpm. Headquarters well.

See footnotes at end of table.

Table 3.--Records of Wells and Springs in Kimble County and Adjacent Areas--Continued

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND-SURFACE DATUM (FT)	WATER LEVEL: DATE OF MEASUREMENT	METHOD OF LIFT	USE OF WATER	REMARKS
RK-56-36-403	Dooley, & Hoester, et al.	--	Old	230	--	Ke	2,167	228.4	July 19, 1966	C,E	D,S	Measured discharge 3 gpm. Headquarters well. Temp. 69°F.
501	Mrs. Jim Hull	--	1946	200	--	Ke	--	129.8	Dec. 8, 1965	C,W	S	Reported discharge 3 gpm. West Hull well.
502	Ben Cobb	Sammie Bruce	1952	200	--	Ke	--	185.9	do	C,W	S	Reported tested 14 gpm.
503	Ted Kiser & Lewis Ferguson	C. R. Robinson	1940	202	--	Ke	--	140	Dec. 1965	C,W	S	Reported discharge 3 gpm. The 320 well.
* 504	R. D. Kothmann	P. Urban	1951	300	--	Ke	2,161	184.7	Apr. 13, 1966	C,W	S	Estimated discharge 3 gpm. North Bishop well. Temp. 68°F.
601	Ben Cobb	--	Old	155	--	Ke	--	60	Dec. 1965	T,E	D,S	Reported discharge 4½ gpm. House well.
602	do	Johnny Sellers	1944	180	--	Ke	2,061	136.0	Dec. 8, 1965	C,W	S	Reported discharge 3 gpm.
603	Mrs. Jim Hull	--	Old	165	--	Ke	--	58.2	do	T,E	D,S	Reported discharge 12 gpm. Hull House well.
604	Ted Kiser & Lewis Ferguson	--	Old	252	--	Ke	2,269	193.8	Dec. 9, 1965	C,W	D,S	Reported discharge 3 gpm. Kiser well.
605	do	C. R. Robinson	Old	180	--	Ke	--	140	Dec. 1965	C,W	S	
701	M. O. Teel	--	Old	110	--	Ke	2,039	106.3	Apr. 13, 1966	C,E	D,S	Reported strong supply. Headquarters well. Temp. 68°F.
702	R. D. Kothmann	--	1946	200	--	Ke	2,152	167.4	Apr. 13, 1966	C,W	S	Reported small supply. South Bishop well. Temp. 68°F.
* 703	do	--	Old	157	--	Ke	2,042	123.5	do	C,W	D,S	Estimated discharge 3 gpm. Headquarters well. Temp. 68°F.
704	do	--	Old	230	--	Ke	--	--	--	C,W	S	Reported small supply. Valley well.
801	W. W. Whitworth	--	Old	150	--	Ke	2,114	144.7	Apr. 14, 1966	C,W	S	Reported discharge 3 gpm. Copple well. Temp. 68°F.
802	do	--	1928	255	--	Ke	2,170	222.4	do	C,W	S	Temp. 68°F.

See footnotes at end of table.

Table 3.--Records of Wells and Springs in Kimble County and Adjacent Areas--Continued

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND-SURFACE DATUM (FT)	WATER LEVEL: DATE OF MEASUREMENT	METHOD OF LIFT	USE OF WATER	REMARKS
RK-56-36-803	-- Beasley well 1	Delvatex Petroleum Corp.	--	2,670	--	--	2,100	--	--	--	--	Oil test. 1/ 2/
901	W. W. Whitworth	--	--	Spring	--	Ke	--	+	--	Flows	D,S	Estimated flow 5 gpm, Apr. 13, 1966. Temp. 67°F.
902	do	Cal Robinson	1935	120	--	Ke	--	80	Apr. 1966	C,W	S	Reported discharge 3 gpm. Knox Place well.
* 903	Tommie Murr	--	Old	160	--	Ke	2,064	81.4	May 6, 1966	C,W	D,S	Reported discharge 6 gpm. Headquarters well. Temp. 68°F.
904	W. W. Whitworth	--	Old	--	--	Ke	--	73.8	Apr. 14, 1966	C,W	S	South Pasture well. Temp. 67°F.
905	do	--	1927	190	--	Ke	2,135	170.1	do	C,W	S	Reported discharge 3 gpm. Cobb well. Temp. 68°F.
37-101	Don Hart	Jim Bell	1920	235	6	Kt	1,952	193.9	Aug. 19, 1966	C,W	S	The Buster Place well. Temp. 72°F.
102	N. H. Whitworth	Johnny Sellers	1956	235	5	Kt	--	215	May 1966	C,W	S	Reported discharge 3 gpm. Old Farris Place well.
201	Carl Whitworth	Sellers & Bell	1923	135	6	Kt	1,905	118.3	Aug. 19, 1966	C,W	S	Burned House well. Temp. 69°F.
202	do	Arthur Sellers	1925	235	6	Kt	--	220	May 1966	T,E	D,S	Estimated discharge 10 gpm. Tom's Place well.
301	Mrs. J. W. Haymore	--	--	Spring	--	E	1,746	+	--	Flows	N	Measured flow 424 gpm, June 21, 1961. Cedar Spring. Temp. 66°F.
* 401	W. W. Whitworth, et al.	Mack Scarborough	1940	250	6	Kt	1,924	244.6	Apr. 14, 1966	C,W	N	Reported discharge 1 gpm. The Estate well.
402	Carl Whitworth	do	1945	70	6	Kt	--	60	May 1966	C,W	S	Reported tested at 5 gpm. Tom's South Pasture well.
* 601	David Schmidt	do	1930	180	6	Kt	1,920	146.4	May 12, 1966	C,W	D,S	Reported discharge 5 gpm. Headquarters well.
602	do	do	1928	202	6	Kt	--	--	--	C,W	S	Reported discharge 3 gpm.
701	J. A. Milam	--	Old	--	--	Ke	--	82.0	May 31, 1961	C,W	--	

See footnotes at end of table.

Table 3.--Records of Wells and Springs in Kimble County and Adjacent Areas--Continued

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND-SURFACE DATUM (FT)	WATER LEVEL: DATE OF MEASUREMENT	METHOD OF LIFT	USE OF WATER	REMARKS
RK-56-37-702	Dillard Stapp well 1	Forest Development Corp.	1936	4,090	--	--	1,975	--	--	--	--	Oil test.2/
801	Odessa Berry	--	Old	180	--	Ke	2,162	160.9	July 25, 1966	C,W,E 1	D,S	Reported discharge 14 gpm. Headquarters well. Temp. 67°F.
* -901	V. D. Parker	Harper Pump Service Co.	1964	325	6	Kt	1,970	292.5	July 25, 1966	C,W	D,S	Reported discharge 3 gpm. Temp. 70°F.
38-201	David Schmidt	Mack Scarborough	1937	157	6	Kt	--	--	--	C,W	S	Reported discharge 2½ gpm. East Pasture well.
* 401	Sam Howig	--	Old	125	6	Kt	1,889	110.1 107.9	May 31, 1961 May 12, 1966	C,W	D,S	
402	E. M. Schmidt	Aubrey Harper	1963	191	6	Kt	1,802	132.0	July 26, 1966	C,W, T,E, ½	D,S	Reported tested 20 gpm. The North well. Temp. 69°F.
403	do	Sam Howig	1905	55	6	Kt	--	49	July 1966	C,W	S	Estimated discharge 3 gpm. Middle well. Temp. 70°F.
501	do	Mack Scarborough	1930	165	--	Ke	2,122	160.3	July 26, 1966	C,W	S	Reported discharge 2 gpm. West well-at house. Temp. 70°F.
502	do	--	--	Spring	--	Ke	--	+	--	Flows	S	Estimated flow 1½ gpm, July 26, 1966. Reported flows 9 to 12 gpm in winter. Spring on The East Place well.
701	E. R. Brown	Mack Scarborough	1940	400	5	Ke	--	130	Dec. 1965	C,W	D,S	Reported water at 130 ft; Approximately 300 ft of blue shale reported.
* 702	do	--	1904	130	--	Ke	2,036	92.1	Dec. 4, 1965	C,W	D,S	Reported inadequate supply of water for domestic and livestock uses.
703	do	Mack Scarborough	1950	90	--	Ke	--	72.3	do	C,W	S	Reported strong supply of water.
801	Mrs. Sarah Cosper	Arthur Sellers	1928	350	10	Kt	--	320	Dec. 1965	C,W	D,S	Reported tested at 25 gpm. Sand from 330 to 350 ft.
802	H. B. Schmidt	--	Old	250	--	Ke	2,062	109.0	Dec. 4, 1965	C,W	D,S	Reported strong supply.

See footnotes at end of table.

Table 3.--Records of Wells and Springs in Kimble County and Adjacent Areas--Continued

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND-SURFACE DATUM (FT)	WATER LEVEL: DATE OF MEASUREMENT	METHOD OF LIFT	USE OF WATER	REMARKS
RK-56-41-101	Llewellyn Rose	--	1953	240	--	Ke	2,170	188.3	July 20, 1966	C,W	S	Reported strong supply. East well.
102	do	--	Old	318	--	Ke	--	--	--	C,W	S	Reported discharge 3 gpm. Temp. 70°F.
201	Marvin Simpson	Sammie Bruce	1950	--	--	Ke	--	78.5	Aug. 26, 1966	C,W	S	Reported strong supply. South Pasture well.
301	Coke R. Stevenson	--	--	Spring	--	Kt	--	+	--	Flows	D,S	Reported flow 15 gpm, Mar. 25, 1966. Jackson Canyon Spring.
302	do	--	--	Spring	--	Ke	--	+	--	Flows	S	Estimated flow more than 300 gpm, Mar. 25, 1966. Spring Creek. Temp. 67°F.
401	H. Ray Jacoby	O. E. Morgan	1954	277	--	Ke	--	220	July 1966	C,E, 1½	S	Reported discharge 8 gpm. Temp. 69°F.
402	Coke R. Stevenson	--	1902	104	--	Ke	2,052	102.0	Mar. 24, 1966	C,W	D,S	Reported discharge 3 gpm. Old Terry Place well.
403	Nelson B No. 1	Cities Service Oil Co.	1956	3,865	--	--	2,134	--	--	--	--	Oil test.1/
501	Coke R. Stevenson	--	1902	210	--	Ke	--	177.5	July 20, 1966	C,W	S	Reported discharge 3 gpm. South well.
502	Coke R. Stevenson well 4	Tucker Drilling	1962	3,665	--	--	2,145	--	--	--	--	Oil test.1/
503	Coke R. Stevenson well 2	do	1962	3,798	--	--	2,246	--	--	--	--	Do.
504	Coke R. Stevenson well 3	do	1962	9,828	--	--	2,156	--	--	--	--	Do.
505	Coke R. Stevenson	--	--	Spring	--	Ke	--	+	--	Flows	D,S	Reported flow 5,000 gpm, Mar. 24, 1966. Christmas Canyon Spring. Temp. 66°F.
506	do	--	--	Spring	--	Ke	1,865	+	--	Flows	S	Reported flow 100 gpm, Mar. 24, 1966. House Canyon Spring. Temp. 67°F.

See footnotes at end of table.

Table 3.--Records of Wells and Springs in Kimble County and Adjacent Areas--Continued

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND-SURFACE DATUM (FT)	WATER LEVEL: DATE OF MEASUREMENT	METHOD OF LIFT	USE OF WATER	REMARKS
RK-56-41-507	Coke R. Stevenson	--	--	Spring	--	Ke	--	+	--	Flows	N	Reported flow 2,000 gpm, Mar. 24, 1966.
601	Stevenson well 1	Cecil Haden	1959	2,650	--	--	1,915	--	--	--	--	Oil test.1/
602	Coke R. Stevenson	--	--	Spring	--	Ke	--	+	--	Flows	N	Reported flow 25 gpm, Mar. 24, 1966. Temp. 65°F.
603	do	--	--	Spring	--	Ke	--	+	--	Flows	S	Reported flow 25 gpm, Mar. 24, 1966. Temp. 60°F.
701	Coke R. Stevenson well 1	Tucker Drilling Co.	1962	4,811	--	--	2,151	--	--	--	--	Oil test.1/
42-101	Coke R. Stevenson	O. E. Morgan	1958	110	--	Ke	--	70.3	Mar. 25, 1966	C,W	S	Reported discharge 3 gpm. Indian Mound well. Temp. 64°F.
102	Mrs. J. F. Burt	--	Old	95	--	Ke	2,087	94.6	Aug. 2, 1966	C,W	S	Reported weak supply.
201	Terry Jetton	--	1936	260	--	Ke	--	--	--	C,W	D,S	Reported discharge 1¼ gpm. Headquarters well. Temp. 70°F.
202	Mrs. J. F. Burt	--	Old	100	--	Ke	2,055	86.2	Aug. 2, 1966	C,W	D,S	
301	C. T. Holekamp	--	--	387	--	Ke	2,108	203.4	Mar. 17, 1966	C,W	D,S	Measured discharge 4 gpm. Headquarters well. Temp. 68°F.
401	Terry Jetton	--	--	--	--	Ke	--	--	--	C,W	S	
402	Coke R. Stevenson	O. E. Morgan	1956	300	--	Ke	2,198	242.4	Mar. 25, 1966	C,W	S	Reported discharge 3 gpm. Red Rock well. Temp. 65°F.
403	do	--	1900	212	--	Ke	2,135	181.3	July 20, 1966	C,W	S	Reported a good well. East well.
501	Walter Pfluger	--	1956	260	--	Ke	2,177	222.9	Aug. 6, 1966	C,W	D,S	Headquarters well.
601	Carl Pfluger	--	Old	240	--	Ke	2,143	201.9	do	C,W,E 1/3	D,S	Reported discharge 5 gpm. Headquarters well.
602	do	Sammie Bruce	1943	340	--	Ke	2,292	318.2	do	C,W	S	Reported strong supply. North Sink Hole Pasture well. Temp. 68°F.

See footnotes at end of table.

Table 3.--Records of Wells and Springs in Kimble County and Adjacent Areas--Continued

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND-SURFACE DATUM (FT)	WATER LEVEL: DATE OF MEASUREMENT	METHOD OF LIFT	USE OF WATER	REMARKS
RK-56-42-603	Carl Pfluger	--	1915	400	--	Ke	--	--	--	C,W	S	South Sink Hole Pasture well.
604	W. R. Allen	--	1937	350	--	Ke	--	300	Mar. 1966	C,W	S	Reported discharge 3 gpm. Big Tree well.
43-101	H. C. Stapp	--	1899	220	--	Ke	--	208	June 1961	C,W	D,S	
102	C. T. Holekamp, II	--	Old	--	--	Ke	--	232.4	Aug. 16, 1966	C,W	S	Reported discharge 3 gpm. East well.
201	Mrs. H. C. Stapp	--	1947	240	--	Ke	2,156	190.9 188.1	June 1, 1961 Aug. 30, 1966	C,W	S	
301	F. C. Hodges	--	1939	160	--	Ke	2,044	106.9	Aug. 31, 1966	C,W	S	Reported discharge ½ gpm.
302	Chet Porter	Johnny Sellers	1940	167	--	Ke	--	38	Apr. 1966	C,E, 1½	D,S	Reported discharge 12 gpm.
303	do	--	Old	15	40	Ke	1,847	1.4	Apr. 25, 1966	Cf,E, 3	D,S	Dug well. Temp. 64°F.
304	Mrs. Jack Roach, Sr.	--	--	Spring	--	Ke	--	+	--	Flows	--	Flow unknown, but large, Apr.26, 1966. Ten Bubbling Springs.
305	do	--	--	Spring	--	Ke	--	+	--	Flows	--	Estimated discharge 25 gpm, Apr. 26, 1966.
306	Mrs. W. R. Nicholson	--	1948	327	--	Ke	1,870	74.4	Aug. 5, 1966	C,E, 1½	D	Estimated discharge 10 gpm.
307	do	--	Old	140	--	Ke	2,049	112.2	do	C,W	D,S	Reported discharge 3 gpm. Temp. 71°F.
401	Mrs. Luke Hagood	--	Old	495	--	Ke	--	425	Mar. 1966	C,W	S	Reported discharge 1½ gpm. The Dobie well.
402	Luke Hagood	O. E. Morgan	1955	280	--	Ke	2,188	232.6	Mar. 17, 1966	C,W	S	Temp. 68°F.
403	do	--	1930	350	--	Ke	--	300	Mar. 1966	C,W	S	Reported discharge 5 gpm. Horseshoe well.
404	W. E. Dixon	Cal Robinson	1928	291	--	Ke	2,183	244.4	Aug. 5, 1966	C,W	S	Reported has been pumped at 12 gpm. West Pasture well.

See footnotes at end of table.

Table 3.--Records of Wells and Springs in Kimble County and Adjacent Areas--Continued

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND-SURFACE DATUM (FT)	WATER LEVEL: DATE OF MEASUREMENT	METHOD OF LIFT	USE OF WATER	REMARKS
RK-56-43-405	Carl Pfluger	--	1948	400	--	Ke	--	329.9	Aug. 6, 1966	C,W	S	East Gardner Mill. well.
* 501	W. B. Dixon	--	1900	191	--	Ke	2,066	156.0	Aug. 5, 1966	C,E, 1	D,S	Reported strong supply; has pumped 20 gpm. Headquarters well. Temp. 69°F.
601	Mrs. Jack Roach, Sr.	--	Old	111	--	Ke	--	71	Apr. 1966	T,E	D	Reported discharge 10 gpm. Headquarters well. Temp. 66°F.
602	Rio Bonito Ranch, Inc.	--	--	Spring	--	Ke	1,861	+	--	Flows	D,S	Estimated flow 3,800 gpm, Apr. 21, 1966. Supplies water to lake. East Spring.
603	do	--	--	Spring	--	Ke	--	+	--	Flows	--	Estimated flow 1,000 gpm, Apr. 21, 1966. Supplies water to lake. West Spring.
604	do	--	--	Spring	--	Ke	--	+	--	Flows	S	Water Hole Spring.
605	do	Sammie Bruce	1954	355	--	Ke	--	--	--	C,W	S	Estimated discharge 3 gpm. Temp. 61°F.
606	do	--	1939	486	--	Kt	--	--	--	C,W	S	Estimated discharge 3 gpm.
607	do	--	1948	255	--	Ke	--	--	--	C,W	S	Little West Well. Temp. 63°F.
44-101	Dunk Bros.	J. E. Page	1931	200	--	Ke	2,025	136.2	Dec. 7, 1965	T,E	D,S	Reported discharge 15 gpm; strong well. Temp. 62°F.
102	R. D. Kothmann, et al.	Paul Urban	1950	177	--	Ke	2,007	92.7	Apr. 13, 1966	C,W	S	Reported small supply. Porter well. Temp. 68°F.
103	Earnest Jones	--	--	Spring	--	Ke	1,877	+	--	Flows	D	Estimated flow 600 gpm, Apr. 25, 1966. Headquarters Spring. Temp. 67°F.
104	do	--	--	Spring	--	Ke	--	+	--	Flows	S	Reported flow 75 gpm, Apr. 25, 1966.
105	Robert Davis	Johnny Sellers	1949	303	--	Ke	2,117	237.1	Apr. 26, 1966	C,E	D,S	Headquarters well. Temp. 66°F.
201	W. H. McNutt	--	Old	378	--	Ke	--	275	Apr. 1966	C,W	S	North well.

See footnotes at end of table.

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND-SURFACE DATUM (FT)	WATER LEVEL: DATE OF MEASUREMENT	METHOD OF LIFT	USE OF WATER	REMARKS
RK-56-44-202	Robert Davis	O. E. Morgan	1961	165	--	Ke	2,126	134.6	Apr. 27, 1966	C,W	S	Reported small supply. Temp. 67°F.
301	Tommie Murr	--	Old	155	--	Ke	--	151.6	Apr. 15, 1966	C,W	S	Reported discharge 10 gpm.
302	Tommie Murr, et al.	--	Old	165	--	Ke	--	80	Apr. 1966	C,W	D,S	Reported discharge 7 gpm. Tracy well.
401	Rio Bonito Ranch, Inc.	--	--	150	--	Ke	--	--	--	C,W	S	Well 3/4 mile northeast of Headquarters.
* 402	do	--	Old	300	--	Ke	2,121	269.0 267.1	Apr. 21, 1966 May 9, 1966	C,W	S	Estimated discharge 3 gpm. Shearing Pen well. Temp. 69°F.
403	do	--	--	--	--	Ke	2,118	203.5	May 10, 1966	C,W	S	Bald Mountain well.
* 501	W. H. McNutt	Mack Scarborough	1942	468	6	Ke	2,104	159.4 157.5	May 25, 1961 Apr. 20, 1966	C,W	D,S	Foreman's Headquarters well. Temp. 68°F.
* 502	do	--	1941	168	8	Ke	2,061	150.0	Apr. 20, 1966	T,E, 5	D,S	Reported discharge 100 gpm. Headquarters well. Temp. 69°F.
* 503	Lafay Stapp	Wesley C. Young Drilling Co.	1966	758	7	Ke,Kt	2,058	--	--	T,G, 300	Ind	Reported discharge 170 gpm. Supplies water for highway construction. Temp. 73°F.2/
504	do	--	Old	135	--	Ke	--	130	Apr. 1966	T,E, 1	D,S	Reported discharge 20 gpm. Headquarters well. Temp. 68°F.
505	W. H. McNutt	--	Old	330	--	Ke	--	--	--	C,W	S	Reported discharge ½ gpm. South well.
506	Rio Bonito Ranch, Inc.	--	Old	235	--	Ke	--	--	--	C,W	S	Estimated discharge 3 gpm. Bob's Place well. Temp. 65°F.
601	Elmer Real	Mack Scarborough	1916	350	--	Ke	2,184	205.9 206.1	Mar. 28, 1966 May 9, 1966	C,W	S	Reported good supply. West well. Temp. 66°F.
602	Lafay Stapp	do	1941	175	--	Ke	--	155	Apr. 1966	C,W	S	Reported strong supply.
603	do	--	Old	165	--	Ke	--	160.1	Apr. 20, 1966	C,W	S	Middle Pasture well. Temp. 66°F.
604	do	O. E. Morgan	--	130	--	Ke	2,104	115.9	do	C,W	S	Reported discharge 5 gpm.

See footnotes at end of table.

Table 3.--Records of Wells and Springs in Kimble County and Adjacent Areas--Continued

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND-SURFACE DATUM (FT)	WATER LEVEL: DATE OF MEASUREMENT	METHOD OF LIFT	USE OF WATER	REMARKS
RK-56-44-605	W. E. Collins	Mack Scarborough	1954	130	--	Ke	--	--	--	C,W	S	Reported discharge 7 gpm. Pumping level 108.3 ft, Apr. 21, 1966. West well. Temp. 68°F.
* 606	Red Laird & Milton Williams	--	Old	310	--	Ke	2,262	267.6	Apr. 21, 1966	C,W	S	Reported discharge 6 gpm. Holland well. Temp. 68°F.
45-101	Gilbert Anderegg	--	Old	212	--	Ke	--	160	Apr. 1966	C,W, T,E,1½	D,S	Reported water level affected by rainfall. Headquarters well. Temp. 69°F.
201	R. E. Bode	--	Old	260	--	Ke	--	--	--	C,W, T,E	D,S	Reported discharge 14 gpm. Headquarters well. Temp. 68°F.
202	Odessa Berry	Mack Scarborough	1940	165	--	Ke	--	130	July 1966	C,W	S	Reported supplies water for livestock in 3 pastures. Back Trap well. Temp. 68°F.
301	Jess F. Parker	--	--	Spring	--	Ke	1,918	+	--	Flows	D,S	Reported flow decreases during drought. Estimated flow 8 gpm, July 25, 1966. Temp. 68°F.
302	Carlos Parker	--	--	Spring	--	Ke	1,902	+	--	Flows	S	Estimated flow 290 gpm, July 25, 1966 at ford on county road 0.6 mile north of springs. Temp. 68°F.
303	Walter Parker	--	--	Spring	--	Ke	--	+	--	Flows	D,S	Estimated flow 3 gpm, July 25, 1966. Reported strong supply. Temp. 68°F.
401	Elmer Real	Mack Scarborough	1916	240	--	Ke	2,208	226.8	Mar. 28, 1966	C,W	S	Reported discharge 2½ gpm.
402	W. E. Collins	--	Old	250	--	Ke	--	235	Apr. 1966	C,W,E, 2	D,S	Headquarters well. Temp. 66°F.
501	Gilbert Anderegg	Mack Scarborough	1941	260	--	Ke	--	240	Apr. 1966	C,W	S	Reported discharge 4 gpm.
502	Victor Marschall	J. M. Scarborough	1938	264	--	Ke	--	204	Apr. 1966	C,W,E, 3/4	D,S	Reported discharge 4 gpm. Headquarters well. Temp. 67°F.
503	William Edwards	--	1937	300	12	Ke	--	215	Apr. 1966	C,W	S	Reported discharge less than ½ gpm. Headquarters livestock well.
504	W. E. Fletcher	Mack Scarborough	1950	315	--	Ke	--	200	Apr. 1966	T,E	D,S	Reported discharge 5 gpm. Headquarters well. Temp. 67°F.

See footnotes at end of table.

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND-SURFACE DATUM (FT)	WATER LEVEL: DATE OF MEASUREMENT	METHOD OF LIFT	USE OF WATER	REMARKS
RK-56-45-505	W. E. Fletcher	Mack Scarborough	1945	265	--	Ke	--	148.7	Apr. 19, 1966	C,W,E	D,S	Reported discharge 4 gpm. Cabin Pasture well.
* 506	Clark Bierschwale	Arthur Sellers	1916	264	--	Ke	2,205	206.3	Apr. 19, 1966	T,E, ½	D,S	Reported discharge 6½ gpm. Headquarters well. Temp. 65°F.
601	Chester Itz	Mack Scarborough	Old	460	6	Ke	2,069	--	--	C,W	D,S	Headquarters well. Temp. 70°F.
602	R. E. Peril	do	1948	220	--	Ke	2,050	172.2	Apr. 19, 1966	C,W	D,S	Reported strong supply. Temp. 69°F.
603	J. R. Peril	J. M. Scarborough	1942	190	--	Ke	2,159	172.1	Apr. 18, 1966	C,W	S	Reported strong supply. Scarborough well. Temp. 67°F.
46-101	Dennis Parker	Mack Scarborough	1920	96	--	Ke	2,084	78.6	Dec. 7, 1965	C,W	D,S	Reported small supply. Home Place well.
102	Mrs. Loyd Carter	do	1932	180	--	Ke	--	177	Dec. 1965	C,W	S	Reported discharge 2 gpm.
103	do	do	1927	100	--	Ke	2,075	83.4	Dec. 7, 1965	C,W	D,S	Reported discharge 10 gpm.
201	Earl Copple	--	--	225	--	Ke	2,199	197.5	Dec. 4, 1965	C,W	S	Reported tested by driller 18 gpm.
202	Rodger Parker	--	1899	140	--	Ke	2,091	97.8	do	C,W	S	Reported discharge 5 gpm.
203	Fred Whitewood	Mack Scarborough	1940	141	--	Ke	--	103	Dec. 1965	T,E	D,S	
401	R. E. Peril	--	Old	300	--	Ke	2,169	172.4 171.9	May 25, 1961 Apr. 18, 1966	C,W	S	Reported discharge 1½ gpm. North well. Temp. 67°F.
402	A. L. Gibson	O. W. Killam	1951	2,808	--	--	2,245	--	--	--	--	Oil test.2/
403	J. A. Lennon	--	Old	191	--	Ke	--	185	Dec. 1965	T,E, 3/4	D,S	Reported discharge 10 gpm. Headquarters well.
404	Dennis Parker	Mack Scarborough	1915	180	--	Ke	2,182	177.5	Dec. 7, 1965	C,W	D,S	Reported discharge 5 gpm. Headquarters well.
405	R. E. Peril	--	Old	190	--	Ke	--	170	Apr. 1966	C,E, 1	D,S	Reported strong supply. Headquarters well.
406	do	Mack Scarborough	1954	308	--	Ke	2,171	182.0	Apr. 19, 1966	C,W	S	Reported strong supply.

See footnotes at end of table.

Table 3.--Records of Wells and Springs in Kimble County and Adjacent Areas--Continued

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND-SURFACE DATUM (FT)	WATER LEVEL: DATE OF MEASUREMENT	METHOD OF LIFT	USE OF WATER	REMARKS
RK-56-46-407	J. R. Peril	--	1925	204	--	Ke	--	184	Apr. 1966	C,E, 1	D,S	Headquarters well. Temp. 68°F.
408	do	J. H. Scarborough	1953	190	--	Ke	2,147	165.4	Apr. 18, 1966	C,W	S	North Pasture well. Temp. 67°F.
* 501	Vester B. Parker	Aubrey Harper	1950	205	--	Ke	--	160	May 1966	T,E, 1½	Irr	Reported discharge 30 gpm; irrigates about 12 acres. Headquarters well. Temp. 62°F.
502	Raymond Spaeth	--	--	160	6	Ke	--	--	--	C,W	S	Temp. 62°F.
503	Joe Heineman	--	--	246	--	Ke	2,116	119.4	Dec. 3, 1965	C,W	D	Reported well pumps dry in 8 hours at 3 gpm. Reported nearly fails in drought.
505	Riley Ranch	Mack Scarborough	1903	177	--	Ke	--	--	--	C,W, T,E	D,S	Reported strong supply.
506	J. A. Lennon	--	--	225	--	Ke	--	200	Dec. 1965	C,W	S	Reported strong supply. School House well.
						Edwards County						
JJ-55-56-301	J. H. Guthrie well 1	Humble Oil & Refining Co.	1953	4,140	--	--	2,002	--	--	--	--	Oil test. Stiles and others (1955), and well D-5 in Long (1963, pl. 3).
						Gillespie County						
KK-56-48-401	Richard Kott well 1	L. U. Rountree	--	3,189	--	--	2,067	--	--	--	--	Oil test. Barnes (1952), Barnes and others (1959, pl. 3).
						Mason County						
SZ-56-05-402	-- Bradshaw well 1	Carpenter Exploration Co.	--	1,095	--	--	1,790	--	--	--	--	Oil test. Baker and others (1965 fig. 3), and Barnes and others (1959 pl. 2).
						Menard County						
TH-56-11-501	Bennie Bradford well 1	American Republic Co.	1947	2,745	--	--	2,043	--	--	--	--	Oil test. Baker and others (1965 fig. 3), and Barnes and others (1959 pl. 2).

See footnotes at end of table.

WELL	OWNER	DRILLER	DATE COMPLETED	DEPTH OF WELL (FT)	DIAMETER OF WELL (IN.)	WATER-BEARING UNIT	ALTITUDE OF LAND SURFACE (FT)	WATER LEVEL: BELOW LAND-SURFACE DATUM (FT)	WATER LEVEL: DATE OF MEASUREMENT	METHOD OF LIFT	USE OF WATER	REMARKS
						Schleicher County						
WY-55-22-306	D. C. O. Wilson well 1	Scherck & Chizum	1954	7,154	--	--	2,339	--	--	--	--	Oil test. Barnes and others (1959 pls. 2 and 3).
23-308	Mary Ball well 1	Magnolia Petroleum Co.	1954	4,841	--	--	2,251	--	--	--	--	Oil test. Barnes and others (1959 pl. 3).

* For chemical analyses of water from wells and springs see Table 5.
1/ For electric logs, and radioactivity logs see files of Water Development Board, or U.S. Geological Survey, Austin, Texas.
2/ For drillers. logs of wells, see Table 4.

Table 4.—Drillers' Logs of Wells in Kimble County

	THICKNESS (FEET)	DEPTH (FEET)
Well RK-55-40-705, partial log		
Owner: --Patterson well 1. Driller: Delvatex Petroleum Corp.		
Line	280	280
Slate, black	170	450
Lime	30	480
Slate, blue	20	500
Lime	25	525
Rock, red	85	610
Total depth		3,980
Well RK-55-40-801, partial log		
Owner: Meta R. Rieck well 1. Driller: H. F. Wilcox		
Lime	298	298
Shale, limy	7	305
Shale, blue	20	325
Shale, gray	190	515
Shale, blue	35	550
Shale, brown	40	590
Total depth		4,857
Well RK-56-18-402, partial log		
Owner: --Spiller well 1. Driller: Phillips Petroleum Co.		
Lime, white chalky fossiliferous, and marly yellow	100	100
Lime, yellow earthy, and anhydrite	80	180
Lime, granular colitic, with abundant fusuline fossils	80	260
Lime with some coarse sand	70	330
Lime, dense yellow with some sand	10	340
Lime with some sand, and red and green shale	50	390
Total Depth		4,264
Well RK-56-20-503, partial log		
Owner: R. F. Cannon well 1. Driller: --McLean, et al.		
Clay, sandy	18	18
Sandrock	47	65
Rock, chalk	7	72
Clay, gray	8	80
Clay, red and gray	10	90
Sandrock, sharp	20	110
Rock, flint, blue	20	130
Total Depth		1,648
Well RK-56-20-504		
Owner: C. W. Kirschner. Driller: Hicks & Puckitt.		
Caliche	32	32
Sand, white	7	39
Lime, yellow	22	61
Red beds	9	70
Lime, white	93	163
Shale, gray	7	170
Dolomite, hard, white	22	192
Lime, yellow and gray	128	320
Lime, hard, yellow	43	363
Lime and shale, yellow	337	700
Sand and lime	30	730
Well RK-56-20-901		
Owner: Raymond Pfluger. Driller: Hicks & Puckitt Water Service, Inc.		
No record	176	176
Lime, yellow and white	127	303
Lime, blue	37	340
Lime, yellow and white	210	550
Shale, blue	40	590
Sand with lime streaks	280	870
Sand, coarse	10	880
Well RK-56-25-302, partial log		
Owner: Dan O. Morales well 1. Driller: J. C. Renfro, et al.		
Surface	10	10
Gravel	16	26
Sand, water	4	30
Rock, red	37	67
Shale, white	8	75
Rock, red	55	130
Shale, brown	16	146
Sand, water	9	155
Shale, blue	160	315
Total Depth		2,001

	THICKNESS (FEET)	DEPTH (FEET)
Well RK-56-26-701, partial log		
Owner: J. M. Anderson well 1. Driller: Plateau Oil Co.		
Caliche	35	35
Shale	40	75
Red beds	35	110
Caliche	25	135
Lime	17	152
Shale, blue	4	156
Lime	42	198
Shale, blue	3	201
Lime	13	214
Shale, blue	6	220
Lime, broken	4	224
Lime	5	229
Sand, water	8	237
Shale, blue	4	241
Lime	131	372
Total Depth		1,860
Well RK-56-27-704		
Owner: M. E. Blackburn. Driller: Robert Allsup.		
Topsoil, reddish-brown	3	3
Caliche and gravel	12	15
Sand and gravel	30	45
Clay, light-blue	10	55
Red beds and sand, water	15	70
Clay, blue, and sand water, white	8	78
Sand and gravel, water	23	101
Well RK-56-27-801, partial log		
Owner: P. T. Hodges well 1. Driller: Mudge Oil Co. of Texas.		
Gravel and clay	18	18
Red beds	6	24
Lime, sandy	9	33
Red beds	11	44
Sand, dry	6	50
Shale, gray	10	60
Sand streaks	27	87
Shale, gray	17	104
Red beds	17	121
Sand and gravel	9	130
Lime, sandy	11	141
Red beds	5	146
Lime	5	151
Sand	3	154
Lime	8	162
Rock, red	6	168
Lime	2	170
Sand	5	175
Lime, sandy	13	188
Shale	6	194
Gravel	9	203
Shale	9	212
Sand	7	219
Shale	3	222
Sand	7	229
Shale	12	241
Lime	7	248
Shale, blue	17	265
Total Depth		2,902
Well RK-56-36-802, partial log		
Owner: --Beasley well 1. Driller: Delvatex Petroleum Corp.		
Lime	385	385
Slate, blue	15	400
Rock, red	35	435
Slate, black	25	460
Lime, sandy	13	473
Sand, water, red	129	602
Lime, white	18	620
Slate, black	20	640
Rock, red	25	665
Lime, dark	29	694
Sand, water	16	710
Sand, red	32	742
Sand	73	815
Slate, black	350	1,165
Total Depth		2,670

	THICKNESS (FEET)	DEPTH (FEET)
Well RK-56-37-702, partial log		
Owner: Dillard Stapp well 1. Driller: Forest Development Corp.		
Surface soil	8	8
Lime, water from 55-65 ft	97	105
Shale, blue	10	115
Lime	5	120
Shale, blue	70	190
Shale, brown	20	210
Lime, gray	2	212
Shale, brown	38	250
Shale, pink	50	300
Sand, water, gray	3	303
Shale, brown	12	315
Rock, red	44	359
Sand	16	375
Shale, red, sandy	45	420
Lime, white	5	425
Sand	17	442
Rock, red	38	480
Lime	30	510
Rock, red	25	535
Clay, yellow	35	570
Shale, brown	17	587
Clay, yellow	23	610
Shale, black	435	1,045
Total Depth		4,090
Well RK-56-37-901		
Owner: V. D. Parker. Driller: Harper Pump Service Co.		
Soil	1	1
Lime	84	85
Clay, blue and shale	55	140
Clay, red, and shale	150	290
Clay, red, and sand	25	315
Sand, water	10	325

	THICKNESS (FEET)	DEPTH (FEET)
Well RK-56-44-503		
Owner: Lafay Stapp. Driller: Wesley C. Young Drilling Co.		
Limestone	241	241
Shale, blue with lime stringers	212	453
Shale, blue	127	580
Sand, water and shale, red	50	630
Shale, red	83	713
Sand, red	7	720
Limestone	38	758
Well RK-56-46-402, partial log		
Owner: A. L. Gibson well 1. Driller: O. W. Killam.		
Limestone	395	395
Shale, blue	29	424
Shale, broken, and limestone	134	558
Lime, hard	27	585
Shale and lime	40	625
Shale, red	10	635
Shale, and red beds	110	745
Lime, hard	35	780
Shale, blue	40	820
Shale with sticky streaks	110	930
Shale, broken, hard and lime, hard	8	932
Sand and lime	7	945
Lime and shale	42	987
Shale, limy	15	1,002
Shale, black	226	1,228
Total Depth		2,808

Table 5.—Chemical Analyses of Water from Wells and Springs in Kimble County

Analyzed in the laboratory of the U.S. Geological Survey at Austin, Texas, unless otherwise indicated.
Analyses given are in milligrams per liter except specific conductance, pH, percent sodium, and sodium adsorption ratio.
Water-bearing unit: Qa, Quaternary alluvium; Ke, Edwards and associated limestones; Kt, Trinity Group; Py, Paleozoic rocks, younger than Ellenburger Group; E, Ellenburger Group; C, Cambrian rocks, younger than the Hickory Sandstone Member.

WELL	DEPTH OF WELL (FT)	DATE OF COLLECTION	WATER-BEARING UNIT	SILICA (SiO_2)	IRON (Fe)	MANGANESE (Mn)	CALCIUM (Ca)	MAGNESIUM (Mg)	SODIUM (Na)	POTASSIUM (K)	BICARBONATE (HCO_3)	SULFATE (SO_4)	CHLORIDE (Cl)	FLUORIDE (F)	NITRATE (NO_3)	PHOSPHATE (PO_4)	BORON (B)	DISSOLVED SOLIDS	HARDNESS AS $CaCO_3$	PERCENT SODIUM	SODIUM ADSORPTION RATIO (SAR)	SPECIFIC CONDUCTANCE (MICROMHOS AT 25° C)	pH
RK-55-24-401	--	Oct. 10, 1962	Ke	15	--	--	51	28	* 13	--	267	19	22	0.6	4.3	--	--	284	244	--	--	493	7.8
501	270	do	Ke	16	--	--	55	35	* 26	--	255	38	42	1.0	41	--	--	379	278	8	--	620	7.8
605	190	May 13, 1966	Ke	14	--	--	61	19	9.4	1.1	246	28	12	.3	6.1	--	--	272	230	8	0.3	480	7.0
32-201	110	June 2, 1961	Ke	16	--	--	94	14	* 10	--	303	8.8	20	.3	35	--	--	347	292	7	.3	594	6.8
502	250	Mar. 24, 1966	Ke	15	0.29	--	50	28	11	.8	280	12	17	.6	3.8	--	--	276	240	9	.3	489	7.3
806	206	Apr. 6, 1966	Ke	12	--	--	86	12	5.1	.4	290	6.4	8.4	.1	26	--	--	299	264	4	.1	523	7.2
905	80	May 13, 1966	Kt	10	.40	--	115	69	556	13	316	124	980	--	5.4	--	--	2,030	570	67	10	3,690	6.9
40-202	208	July 1, 1965	Kt	10	--	--	123	82	*510	--	255	136	970	3.1	--	--	--	1,960	640	--	--	3,460	7.3
301	30	Aug. 10, 1965	Qa	16	.00	--	106	29	18	1.7	390	29	32	.3	28	--	0.22	452	384	9	.4	795	6.8
501	165	Sept. 10, 1965	Ke	12	--	--	85	16	7.0	.6	302	10	12	.3	16	--	--	308	278	5	.2	550	6.7
503	Spring	Apr. 6, 1966	Ke	14	--	--	79	15	7.3	1.2	300	7.2	12	.2	8.0	--	--	292	258	6	.2	515	7.3
605	295	Sept. 10, 1965	Ke	14	--	--	51	28	7.3	.6	274	8.2	13	.4	3.2	--	--	261	242	6	.2	479	6.9
702	200	Apr. 6, 1966	Ke	16	--	--	133	9.5	39	1.8	336	21	90	.2	40	--	--	516	371	19	.9	921	6.9
48-601	350	June 1, 1961	Ke	16	--	--	38	25	* 29	--	212	22	43	.9	3.2	--	--	281	198	24	.9	512	6.9
56-17-501	140	May 13, 1966	Ke	15	--	--	62	25	15	2.1	268	23	23	1.0	18	--	--	316	258	11	.4	546	7.3
18-401	287	Nov. 28, 1962	Ke	20	--	--	54	33	* 36	--	248	20	83	.4	3.1	--	--	371	270	--	--	674	7.6
501	170	May 18, 1966	Ke	14	--	--	66	19	14	2.9	255	16	24	.0	27	--	--	308	242	11	.4	545	7.2
19-402	120	Aug. 19, 1966	Ke	17	--	--	69	21	11	1.1	290	10	19	.3	6.9	--	--	298	258	8	.3	531	7.2
20-402	167½	May 15, 1966	Kt	13	5.1	--	70	62	32	6.1	424	74	50	.4	.0	--	--	516	430	14	.7	909	7.1
501	35	June 2, 1961	Kt	29	--	--	157	128	*151	--	518	432	220	1.3	74	--	--	1,450	918	26	2.2	2,150	6.9
504	730	Aug. 10, 1965	C	19	.08	--	85	58	42	3.8	404	105	76	.5	1.8	--	.16	590	450	17	.9	1,020	7.1
505	91	July 29, 1965	Kt	20	.09	--	128	75	83	5.3	384	260	160	.7	3.2	--	.24	924	628	22	1.4	1,510	6.8
513	90	Aug. 17, 1966	Kt	18	.37	0.05	135	77	81	5.8	412	276	154	.6	8.5	0.01	.29	959	654	21	1.4	1,530	7.6
901	880	July 28, 1965	C	18	--	--	91	50	40	4.1	352	82	101	.6	.7	--	.18	561	432	17	.8	1,030	7.0
25-505	246	Feb. 9, 1966	Kt	--	--	--	--	--	--	--	240	--	165	--	--	--	--	--	304	--	--	1,120	7.4

See footnote at end of table.

Table 5.-Chemical Analyses of Water from Wells and Springs in Kimble County-Continued

WELL	DEPTH OF WELL (FT)	DATE OF COLLECTION	WATER-BEARING UNIT	SILICA (SiO_2)	IRON (Fe)	MANGANESE (Mn)	CALCIUM (Ca)	MAGNESIUM (Mg)	SODIUM (Na)	POTASSIUM (K)	BICARBONATE (HCO_3)	SULFATE (SO_4)	CHLORIDE (Cl)	FLUORIDE (F)	NITRATE (NO_3)	PHOSPHATE (PO_4)	BORON (B)	DISSOLVED SOLIDS	HARDNESS AS $CaCO_3$	PERCENT SODIUM	SODIUM ADSORPTION RATIO (SAR)	SPECIFIC CONDUCTANCE (MICROMHOS AT 25° C)	pH
RK-56-25-505	285	Feb. 9, 1966	Kt	8.6	--	--	58	46	*119	--	246	139	166	4.0	0.5	--	--	662	332	44	2.8	1,180	7.3
601	180	Aug. 1, 1966	Ke	16	--	--	52	26	11	1.6	266	15	15	.4	6.8	--	--	275	236	9	.3	487	7.5
803	80	Aug. 23, 1966	Kt	9.0	0.99	--	86	58	190	1.7	270	164	353	1.8	2.0	--	--	1,010	453	17	3.9	1,810	7.6
901	49	Aug. 10, 1965	Qa	15	.06	--	73	22	9.1	1.9	312	14	15	.2	3.2	--	0.08	306	272	7	.2	550	7.2
905	330	Sept. 19, 1962	Kt	--	--	--	102	74	138	27	372	230	184	--	--	--	--	938	--	--	7.5	1,818	7.6
26-101	160	Aug. 1, 1966	Kt	9.3	2.4	--	124	82	318	15	246	400	536	2.9	.2	--	--	1,610	647	51	5.4	2,720	7.6
103	30	Sept. 8, 1965	Qa	16	--	--	70	24	9.9	1.9	310	15	17	.3	.2	--	--	306	273	7	.3	538	6.8
106	150	do	Ke	15	--	--	71	27	* 16	--	275	67	12	.4	11	--	--	354	288	11	.4	565	6.8
204	225	Apr. 16, 1966	Ke	16	--	--	51	29	12	1.0	238	41	25	.5	5.8	--	--	298	246	10	.3	523	7.1
805	185	Aug. 25, 1966	Kt	7.9	4.0	--	82	56	70	14	292	236	81	2.8	.0	--	--	694	435	25	1.5	1,140	7.6
901	158	Sept. 2, 1965	Kt	24	.52	--	87	83	*136	--	570	202	88	.9	63	--	--	964	558	35	2.5	1,550	7.0
903	230	Dec. 17, 1965	Kt	7.0	1.8	--	135	120	*538	--	266	230	1,090	--	4.5	--	--	2,260	830	58	8.1	4,090	7.3
27-201	200	Sept. 11, 1965	Kt	10	2.9	--	64	55	* 82	--	354	123	101	1.6	.2	--	--	611	386	32	1.8	1,060	6.9
205	240	Aug. 17, 1966	Ke	19	--	--	47	32	23	1.9	260	32	40	.5	1.5	--	--	325	249	17	.6	572	7.4
401	200	Aug. 30, 1965	Kt	10	.55	--	94	67	*163	--	254	180	325	3.0	3.2	--	--	970	510	41	3.1	1,770	7.1
701	140	Aug. 13, 1965	Kt	9.6	.01	--	39	32	*102	--	346	72	60	2.8	.2	--	--	488	229	49	2.9	857	7.4
803	195	Aug. 12, 1965	Kt	9.5	.35	--	137	106	*286	--	274	202	680	1.8	.8	--	--	1,560	778	44	4.5	2,850	6.9
804	--	Aug. 11, 1965	Qa	18	.06	--	59	26	15	1.9	296	13	23	.3	1.0	--	.10	303	254	11	.4	541	7.5
807	130	July 2, 1937	Kt	17	7.6	--	79	59	* 80	--	464	121	76	--	--	--	--	635	--	--	--	--	7.4
903	50	May 3, 1966	Qa	17	.85	--	86	29	19	2.6	360	26	32	.4	11	--	.12	400	334	11	.5	693	7.1
28-101	104	Sept. 11, 1965	Kt	25	2.4	--	93	37	* 55	--	384	43	82	.5	33	--	--	558	384	24	1.2	962	6.6
107	80	May 15, 1966	Kt	29	.02	--	149	17	82	4.1	294	104	154	.0	86	--	--	770	442	29	1.7	1,280	7.0
202	324	Dec. 11, 1965	Py	9.8	2.8	--	73	48	*896	--	368	956	730	--	2.5	--	--	2,900	380	84	20	4,510	7.4
301	925	July 29, 1966	E,C	43	.08	--	119	11	57	3.2	302	32	76	.6	107	--	--	598	342	26	1.3	949	7.3
401	--	July 29, 1965	Qa	17	--	--	48	19	10	1.7	228	12	16	.3	.2	--	.06	236	198	10	.3	420	7.3
702	130	July 28, 1966	Kt	16	.52	--	67	50	32	3.4	380	32	74	.6	1.2	--	--	465	375	15	.7	840	7.6
33-602	160	Aug. 3, 1966	Ke	16	--	--	74	16	1.4	1.2	256	12	26	.3	28	--	--	314	250	11	.4	549	7.5

See footnote at end of table.

Table 5.-Chemical Analyses of Water from Wells and Springs in Kimble County-Continued

WELL	DEPTH OF WELL (FT)	DATE OF COLLECTION	WATER-BEARING UNIT	SILICA (SiO_2)	IRON (Fe)	MANGANESE (Mn)	CALCIUM (Ca)	MAGNESIUM (Mg)	SODIUM (Na)	POTASSIUM (K)	BICARBONATE (HCO_3)	SULFATE (SO_4)	CHLORIDE (Cl)	FLUORIDE (F)	NITRATE (NO_3)	PHOSPHATE (PO_4)	BORON (B)	DISSOLVED SOLIDS	HARDNESS AS $CaCO_3$	PERCENT SODIUM	SODIUM ADSORPTION RATIO (SAR)	SPECIFIC CONDUCTANCE (MICROMHOS AT 25° C)	pH
RK-56-33-801	Spring	Aug. 25, 1966	Ke	14	--	--	72	16	6.4	1.1	278	7.6	11	0.2	8.7	--	--	304	246	5	0.2	488	7.2
34-301	32	Sept. 1, 1966	Qa	20	0.42	0.41	70	18	8.4	1.4	298	6.8	11	.2	.2	0.03	0.08	283	248	7	.2	508	7.0
303	18	do	Qa	17	.03	.22	56	14	5.5	1.4	237	5.0	8.4	.3	.0	.01	.04	225	197	6	.2	406	7.2
304	35	Aug. 11, 1965	Qa	14	.02	--	60	19	6.3	1.5	263	8.4	10	.3	4.4	--	.11	253	228	6	.2	461	7.0
305	25	Aug. 13, 1965	Qa	15	.00	.00	68	17	5.7	1.5	280	7.6	10	.2	1.2	.01	.06	264	240	5	.2	471	7.0
306	50	May 5, 1966	Kt	19	--	--	99	57	6.0	2.7	412	100	112	.5	18	--	--	671	482	21	1.2	1,150	7.0
307	21	Sept. 1, 1966	Qa	20	.10	.48	58	14	5.3	1.2	240	4.8	7.8	.3	.0	.01	.06	229	202	5	.2	408	7.2
502	32	July 12, 1966	Qa	13	.01	--	60	15	7.3	1.2	254	7.6	10	.3	.5	--	.05	240	212	7	.2	427	7.2
603	18	Aug. 11, 1965	Qa	16	.00	--	82	20	7.3	1.5	336	10	12	.3	1.8	--	.07	316	287	5	.2	564	7.0
806	Spring	Aug. 4, 1966	Ke	13	--	--	69	23	6.6	1.0	308	6.8	12	.1	4.2	--	--	287	266	5	.2	517	7.5
35-103	135	May 5, 1966	Ke	17	--	--	49	36	2.7	1.1	310	19	37	.5	.2	--	--	339	270	18	.7	613	7.0
904	213	May 6, 1966	Kt	9.5	.04	--	51	43	95	11	336	147	60	2.5	.0	--	--	584	304	39	2.4	970	7.2
36-301	200	July 29, 1966	Ke	17	--	--	60	34	43	11	286	28	94	.7	3.5	--	--	434	292	23	1.1	788	7.7
504	300	Apr. 13, 1966	Ke	17	--	--	48	30	27	1.3	256	21	53	.5	1.2	--	--	325	242	19	.8	597	7.2
703	157	May 6, 1966	Ke	17	--	--	80	27	16	1.1	314	11	30	.4	45	--	--	382	310	10	.4	657	7.4
903	160	May 6, 1966	Ke	10	--	--	56	31	15	2.5	298	19	26	.7	.2	--	--	304	267	11	.4	562	7.1
37-401	250	Apr. 14, 1966	Kt	15	.98	--	76	30	18	2.1	364	15	30	.4	9.9	--	--	375	312	11	.4	669	7.0
601	180	May 12, 1966	Kt	19	.07	--	73	55	41	2.4	428	40	77	.5	4.2	--	--	522	410	18	.9	946	7.1
901	325	July 25, 1966	Kt	13	1.6	--	54	42	28	4.6	364	22	43	.9	.2	--	--	390	311	16	.7	705	7.7
38-401	125	May 31, 1961	Kt	18	--	--	68	42	*35	--	346	33	66	.7	6.3	--	--	439	342	18	.8	785	7.0
702	130	May 12, 1966	Ke	8.8	--	--	74	34	15	1.3	384	4.6	28	.4	.2	--	--	355	324	9	.4	654	7.0
43-501	191	Aug. 25, 1966	Ke	12	--	--	56	24	7.6	1.0	274	7.2	13	.2	5.1	--	--	261	238	6	.2	478	7.1
44-402	300	May 10, 1966	Ke	13	--	--	53	30	8.0	1.0	294	7.2	15	.3	4.1	--	--	277	256	6	.2	506	7.0
501	468	May 25, 1961	Ke	14	--	--	48	32	*16	--	278	14	22	1.0	13	--	--	297	252	12	.4	540	7.0
502	168	Aug. 25, 1961	Ke	14	--	--	66	23	*12	--	287	10	22	.4	8.2	--	--	297	259	9	.3	528	6.9
503	758	May 6, 1966	Ke,Kt	12	1.3	--	50	41	36	10	344	61	19	1.9	.5	--	--	400	294	20	.9	681	7.2

See footnote at end of table.

Table 5.–Chemical Analyses of Water from Wells and Springs in Kimble County–Continued

WELL	DEPTH OF WELL (FT)	DATE OF COLLECTION	WATER-BEARING UNIT	SILICA (SiO_2)	IRON (Fe)	MANGANESE (Mn)	CALCIUM (Ca)	MAGNESIUM (Mg)	SODIUM (Na)	POTASSIUM (K)	BICARBONATE (HCO_3)	SULFATE (SO_4)	CHLORIDE (Cl)	FLUORIDE (F)	NITRATE (NO_3)	PHOSPHATE (PO_4)	BORON (B)	DISSOLVED SOLIDS	HARDNESS AS $CaCO_3$	PERCENT SODIUM	SODIUM ADSORPTION RATIO (SAR)	SPECIFIC CONDUCTANCE (MICROMHOS AT 25° C)	pH
RK-56-44-606	310	May 10, 1966	Ke	15	--	--	53	27	15	0.9	258	9.4	33	0.3	6.7	--	--	287	243	12	0.4	520	7.2
45-506	264	May 9, 1966	Ke	21	--	--	100	16	53	.8	238	34	116	.3	52	--	--	510	316	27	1.3	901	6.9
46-501	205	May 12, 1966	Ke	12	0.0	--	65	25	18	.9	296	13	32	.3	9.0	--	0.08	321	265	13	.5	583	7.1

* Sodium and potassium calculated as sodium (Na).