

**WATER LEVELS AND SALINITIES OF WATER WITHIN
THE EVANGELINE AQUIFER IN AN AREA
SOUTHWEST OF CORPUS CHRISTI, TEXAS**

By Paul L. Rettman

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METRIC CONVERSIONS

Factors for converting inch-pound units to metric equivalents are given in the following table:

From	Multiply by	To obtain
inch (in.)	25.40	millimeter (mm)
foot (ft)	0.3048	meter (m)
mile	1.609	kilometer
square mile	2.590	square kilometer

National Geodetic Vertical Datum of 1929 (NGVD of 1929): A geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called "mean sea level."

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ABSTRACT

During 1982, about 275 wells located in a 4,680 square-mile area southwest of Corpus Christi, Texas were measured to determine water-levels and specific conductance of water in the Evangeline aquifer. A large cone of depression with a maximum depth of 200 feet below NGVD of 1929 was identified near Kingsville. This cone of depression affects most of Kleburg County and parts of other counties.

Specific conductance, indicating the salinity of collected water samples, ranged from 940 micromhos per centimeter to 6,900 micromhos per centimeter. High values of specific conductance may be due to failure of well casings. Well casing failure is suspected in a few other wells also.

INTRODUCTION

Pumping of high-yield wells has caused the development of an extensive cone of depression and the influx of saline water into part of the Evangeline aquifer. These undesirable impacts led to this investigation which was conducted by the U.S. Geological Survey in cooperation with the Coastal Bend Council of Governments.

The purpose of this report is to present collected field data on the water levels and salinity of water in the Evangeline aquifer in an area southwest of Corpus Christi, Texas. The report presents information on water levels and salinities of water collected from about 275 wells during current (1982) conditions in the study area. The information will serve as a data base for a mathematical model of the Evangeline aquifer within the study area.

Acknowledgements

The cooperation of many well owners in the area in allowing access to their property and wells is gratefully acknowledged. The assistance of Mr. Jim Bruner of the U.S. Soil Conservation Service greatly facilitated the collection of data for this report.

Location and Extent of the Area

The study was conducted in a rectangular-shaped 4,680-square mile area that extends inland about 65 miles from the Gulf of Mexico (fig. 1). Corpus Christi, with a population of about 232,000 people, is located in the northeast corner of the area, and the city of Kingsville, with a population of about

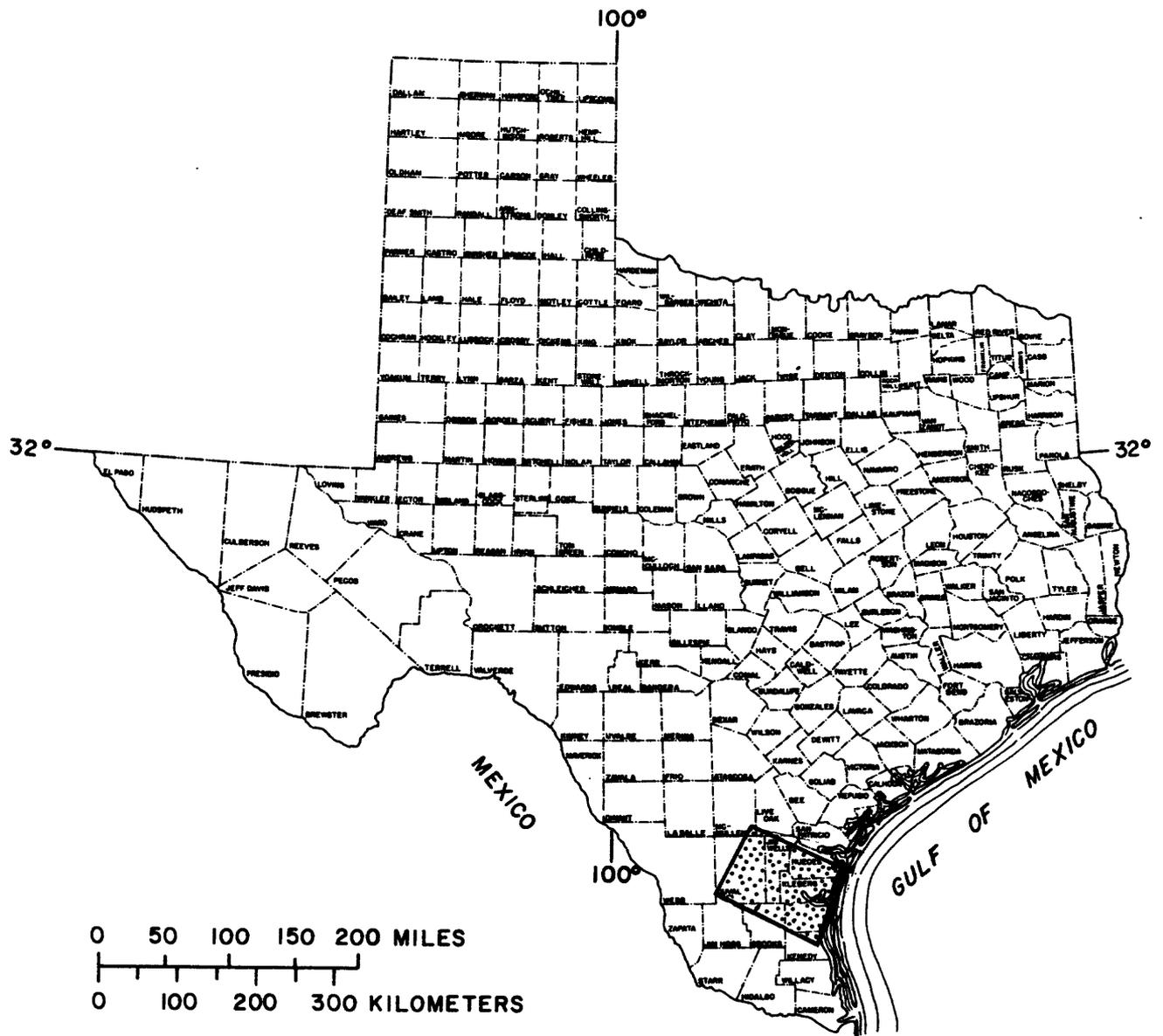


Figure 1.—Location of the study area

29,000 people, is located in the approximate center of the area. The study area includes all of Nueces and Kleberg Counties and parts of Brooks, Duval, Kenedy, Jim Wells, and Live Oak Counties.

Previous Investigations

The geology and hydrology of the study area, which is part of the Texas Gulf Coastal Plain region of south-central Texas, are the subjects of several previous reports (Shafer and Baker, 1973; Mason, 1963; and Shafer, 1968). The most recent report on the hydrology of the region describes the mathematical models of aquifers along the Texas Gulf Coast (Carr and others, 1982, Digital models for simulation of ground-water hydrology of the Chicot and Evangeline aquifers along the Gulf Coast of Texas: Texas Department of Water Resources, in press, 1983) in which reference is made to the Evangeline aquifer. In the study area, the Evangeline aquifer includes the Goliad Sand and is locally known as the Goliad Sand aquifer.

THE EVANGELINE AQUIFER AND ITS CONFINING UNITS

The Evangeline aquifer is the major source of ground water for the entire study area and is principally composed of the Goliad Sand. According to the investigative reports mentioned above, the aquifer crops out in the western part of the area (fig. 2) and dips to the east toward the Gulf Coast where it lies more than 1,400 feet below NGVD. The aquifer consists mostly of unconsolidated fine-grained sand, but also contains lenses of cemented sand and compacted clay. The thickness of the aquifer varies from a thin eroded edge within the outcrop area to about 1,100 feet downdip. The Goliad Sand is underlain by the Fleming (Lagarto) Formation and overlain by the Beaumont Clay and Lissie Formations (undivided).

The Fleming Formation forms the lower confining unit to the Evangeline aquifer; it consists predominately of clay and is not known to produce significant amounts of water. The thickness of the Fleming Formation within the study area is about 1,000 feet.

The Beaumont-Lissie unit forms the upper confining bed of the Evangeline aquifer; it consists mostly of clay, but also contains some fine-grained sand. The thickness of this unit ranges from a thin edge near its outcrop to 1,400 feet at the Gulf Coast. The Beaumont-Lissie unit is used as a source of water at places where other suitable sources are unavailable. The Beaumont-Lissie unit is used extensively in eastern Nueces County because the quality of its water is better than that of the Goliad Sand and because it is shallow.

Collection of Field Data

During 1982, mostly between June and August, 275 wells were visited to measure water levels and to collect water samples. Information on wells that had no previous published record is listed in table 1. Additional information on water wells in the area is found in Mason, 1963; Myers and Dale, 1967; Shafer, 1968; Shafer and Baker, 1973; and Shafer, 1974.

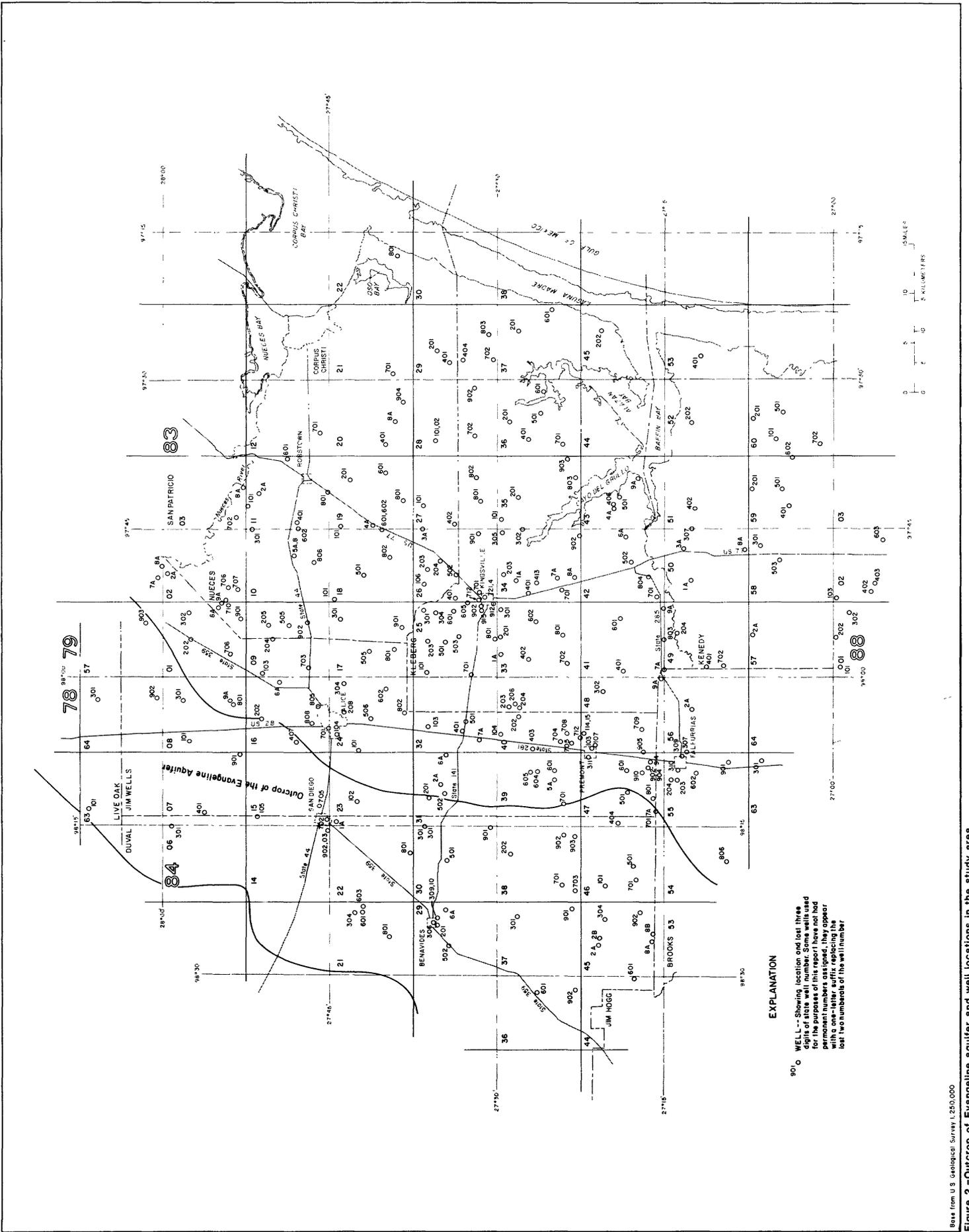


Table 1.--Record of recently inventoried wells

Note: All wells are screened in the Evangeline aquifer except as noted.
Records of wells published in previous reports are not listed.

Water use: D, domestic; S, stock; Ind, industrial; PS public supply; I, irrigation; and N, none.

Well no.	Owner	Date completed	Depth of well (ft)	Casing		Screen Interval (ft)	Land surface above NGVD of 1929 (ft)	Use of water	Remarks
				Diameter (in)	Depth (ft)				
UB-79-58-7A	Henry Knolle	1964	322	--	--	--	107	I	--
UB-79-58-8A	do.	1963	313	--	--	--	67	S	--
UB-83-01-6A	Edward Knolle	1964	506	8	506	306- 506	143	I	--
UB-83-01-706	Michael Dolan	1980	316	4	316	--	175	D	--
UB-83-01-9A	Edward Knolle	1976	498	8	498	200- 498	123	I	--
PW-83-02-2A	Joe Knolle	1965	320	--	--	--	63	I	--
UB-83-02-710	Morris Kochn	1966	230	4	230	180- 220	112	D	--
UB-83-03-8A	Mable Pointer	1974	250	4	--	--	12	D	--
UB-83-10-5A	Nueces WCID #5	1968	615	7	615	580- 615	86	PS	--
UB-83-10-5B	do.	1975	644	8	643	593- 643	86	PS	--
UB-83-11-2A	Exxon	1972	226	7	226	206- 226	91	Ind	Beaumont-Lissie unit
PW-83-17-505	King Ranch	--	--	6	--	--	128	N	--
UB-83-19-4A	Coastal Bend Youth	1972	675	5	675	655- 675	68	PS	--
UB-83-20-8A	KEDT-TV	1972	541	5	541	531- 541	50	D	Beaumont-Lissie unit
RR-83-25-915	Texas A&I	1972	760	16	760	520- 760	78	N	--
UB-83-26-106	Terry Lowman	1971	600	5	--	--	73	D	--
UB-83-26-3A	Bishop Airport	1972	718	5	718	708- 718	53	PS	--
RR-83-29-702	King Ranch	--	1,185	6	1,185	1,162-1,185	25	S	--
RR-83-33-1A	do.	1975	750	16	750	470- 745	95	I	--

Table 1.--Record of recently inventoried wells--Continued

Well no.	Owner	Date completed	Depth of well (ft)	Casing		Screen Interval (ft)	Land surface above NGVD of 1929 (ft)	Use of water	Remarks
				Diameter (in)	Depth (ft)				
RR-83-34-1A	Kleberg Co. Park	1974	798	16	798	585- 700	53	I	--
RR-83-34-413	Ronald Kellett	1973	620	7	594	570- 594	52	D	--
RR-83-34-7A	Ricardo WSC	1973	684	7	684	632- 684	52	PS	--
RR-83-34-8A	W. D. Martin	1976	686	-	683	662- 683	39	D	--
RR-83-35-903	King Ranch	1975	957	6	915	894- 915	16	S	--
RR-83-36-601	do.	1975	1,052	6	1,052	1,029-1,052	12	S	--
BP-83-41-7A	C. W. Brodnax	1968	600	12	600	--	73	S	--
RR-83-41-9A	Pete Weakly	1974	690	9	690	565- 690	50	I	--
RR-83-42-6A	Quentin Naylor	--	750	--	--	--	23	I	--
RR-83-42-804	King Ranch	--	--	6	--	--	37	S	--
RR-83-43-4A	Tony Dietz	1968	876	7	876	856- 876	12	I	--
RR-83-43-9A	Kraatz Bait Camp	1962	864	4	864	844- 864	7	PS	--
RD-83-50-1A	Santa Rosa Ranch	1981	--	7	--	--	39	S	--
RD-83-50-3A	Sarita	1979	813	7	813	730- 792	36	PS	--
RD-83-50-8A	Texas Hwy. Dept.	1978	753	6	753	683- 753	40	PS	--
RD-83-57-2A	La Paloma Ranch	1980	600	6	600	--	57	N	--
PW-84-08-9A	U.S. Naval Air	1976	660	6	--	--	240	N	--
PW-84-16-6A	Paisano Mobil Homes	1971	500	--	--	--	181	PS	--
JB-84-23-1A	Duval Co. WCD	1976	610	21	610	315- 480	323	PS	--
JB-84-29-6A	do.	1977	590	20	580	320- 580	397	PS	--
PW-84-31-2A	R. Longoria	1982	340	4	--	--	220	D	--
PW-84-31-6A	John Prukof	1977	400	4	--	--	193	D	--

Table 1.--Record of recently inventoried wells--Continued

Well no.	Owner	Date completed	Depth of well (ft)	Casing		Screen Interval (ft)	Land surface above NGVD of 1929 (ft)	Use of water	Remarks
				Diameter (in)	Depth (ft)				
PW-84-32-7A	Hi Starr Grain	1977	452	4	452	402- 452	163	H	--
PW-84-39-5A	Bob Storm	1970	500	-	500	--	183	I	--
JB-84-45-2A	K. D. Lamb	1975	465	13	463	190- 463	388	I	--
JB-84-45-2B	do.	1975	429	13	429	251- 429	355	I	--
JB-84-45-8A	R. Burleigh	1971	395	16	395	320- 395	358	I	--
JB-84-45-8B	Henry Berry	1972	412	13	403	258- 403	342	I	--
PW-84-47-7A	C. R. Burdett	1946	644	--	--	--	173	D	--
RR-84-48-9A	Hugh Oglesby	1970	600	10	600	498- 600	79	I	--
BP-84-56-2A	Ms. Cecil Rupp	1920	560	6	--	--	96	H	--

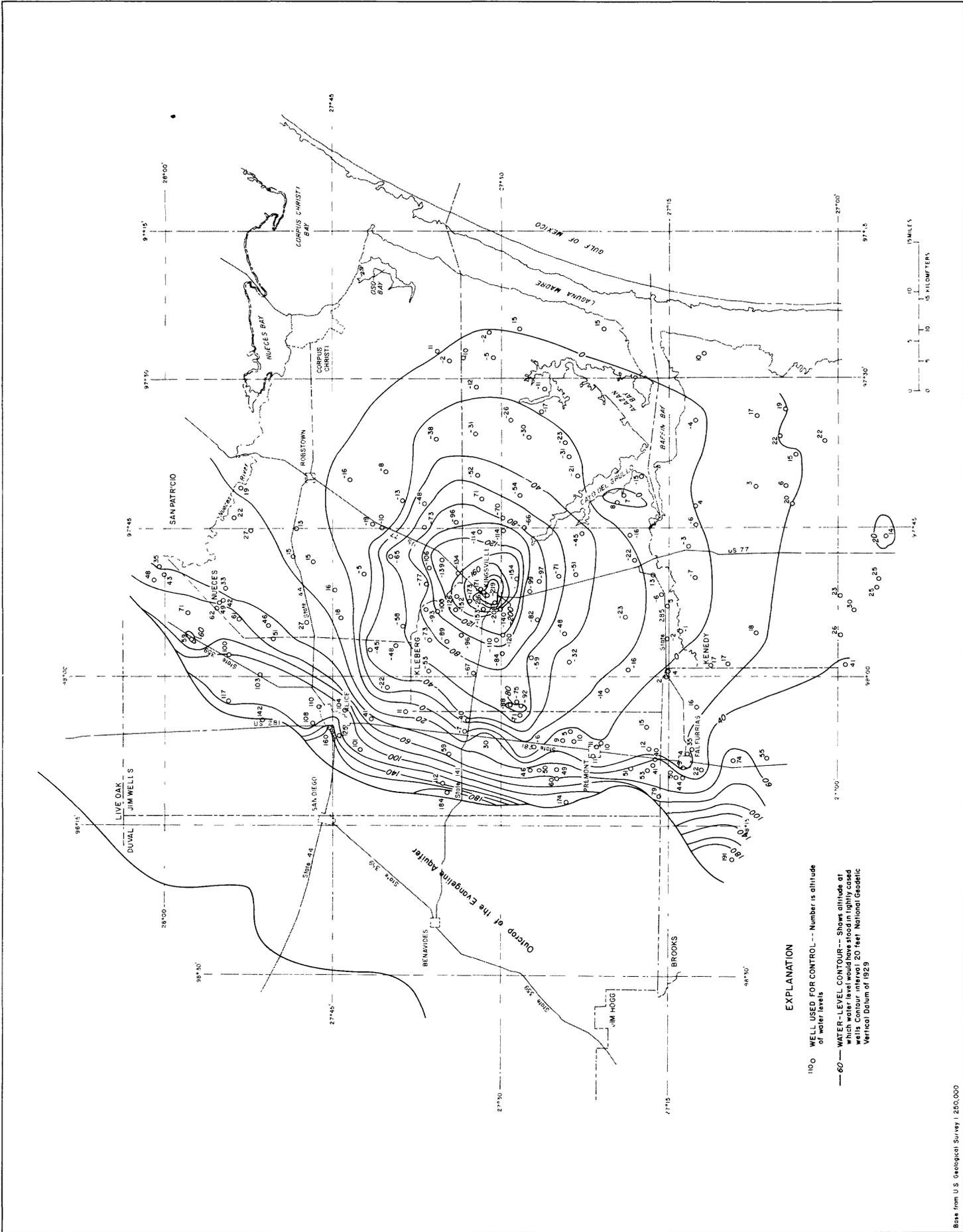
A few water levels are reported for wells in the southeastern part of the study area because access to these wells by ground transportation was difficult. This area also had several flowing wells. For these wells the height of the water level above land surface was not measured but was estimated from interviews with the ranch manager.

The well-numbering system used in this report is the one adopted by the Texas Department of Water Resources for use throughout the State. Under this system, which is based upon the divisions of latitude and longitude, each 1-degree quadrangle in the State is given a number consisting of 2 digits. These are the first 2 digits appearing in the well number. Each 1-degree quadrangle is divided into 7-1/2 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 7-1/2 minute quadrangle is subdivided into 2-1/2 minute quadrangles and given single-digit numbers from 1 to 9. This is the fifth digit of the well number. Finally, each well within a 2-1/2 minute quadrangle is given a 2-digit number in the order in which it is inventoried starting with 01. These are the last 2 digits of the well number. Thus, well 83-01-202 is in the 1-degree quadrangle number 83, in the 7-1/2 minute quadrangle 01, the 2-1/2 minute quadrangle 2, and was the second well (02) inventoried in that 2-1/2 minute quadrangle. On the well-location map of this report (fig. 2), the 7-1/2 minute quadrangles are shown and numbered in the northwest corner of each quadrangle. The 3-digit number shown with the well symbol contains the number of the 2-1/2 minute quadrangle in which the well is located and the number of the well within the quadrangle. Some wells used for the purposes of this report have not had permanent numbers assigned, they appear with a one-letter suffix replacing the last two numerals of the well number. In addition to the 7-digit well number, a 2-letter prefix is used to identify the county. The prefixes for the counties are BP, Brooks; JB, Duval; PW, Jim Wells; RD, Kenedy; RR, Kleberg; SJ, Live Oak; and UB, Nueces.

The altitudes used in this report measured above what was called sea level datum or mean sea level is referenced to NGVD (National Geodetic Vertical Datum of 1929). Previous references are commonly made to sea level datum or mean sea level. NGVD does not necessarily coincide with the local mean sea level in the study area, but they are reasonably close. The altitudes of wells used in the report are estimated from the U.S. Geological Survey topographic maps having 5- or 10-foot contour intervals.

Water Levels

Water-level measurements are listed in tables 2 and 3, and are the basis for the construction of the potentiometric map of the Evangeline aquifer (fig. 3). A large depression occurs near Kingsville, the area where most water is pumped. Water in the Evangeline aquifer is diverted toward this pumping center. The historical regional flow is generally eastward from the outcrop area toward the Gulf Coast. However, now regional flow is toward the Kingsville area. The water-level elevations presented here represent the static or non-pumping water levels in the individual wells. Many of the larger yield wells may have pumping levels that are as much as 100 feet below the nonpumping levels.



EXPLANATION

- 110 WELL USED FOR CONTROL-- Number is altitude of water levels
- 60 WATER-LEVEL CONTOUR-- Shows altitude at which water level would have stood in lightly cased wells Contour interval 20 feet National Geodetic Vertical Datum of 1929

Figure 3.- Approximate altitude of water levels in wells, 1982

Table 2.--Water level measurements and specific conductance of water samples from wells in the Evangeline aquifer

Well no.	Date of measurement or water sample	Depth to water below or above (+) land surface ^{a/} (ft)	Altitude of water above NGVD of 1929 (ft)	Specific conductance ^{b/} (micro-mhos/cm)	Remarks
SJ-78-63-101	7- 6-82	138.0	181	1,350	--
SJ-78-64-301	7- 6-82	116.3	114	2,500	--
PW-78-64-902	6-25-82	110.7	180	--	--
PW-79-57-903	6-26-82	92.8	87	1,180	--
PW-79-58-7A	6-17-82	58.9	48	--	--
PW-79-58-8A	6-17-82	32.1	35	2,250	--
PW-83-01-202	6-25-82	141.0	59	1,430	--
UB-83-01-6A	6- 5-82	81.2	62	--	--
PW-83-01-706	6-26-82	75.1	100	1,780	--
UB-83-01-901	6-14-82	59.3	61	4,900	Casing may have failed.
UB-83-01-9A	6- 5-82	73.7	49	--	--
PW-83-02-2A	6-17-82	20.3	43	--	--
UB-83-02-706	6- 5-82	68.6	33	--	--
UB-83-02-707	6- 5-82	--	--	1,700	--
UB-83-02-710	6-14-82	69.8	42	1,860	--
UB-83-03-702	6-23-82	18.0	22	3,030	--
UB-83-03-8A	6-23-82	+7.0	19	4,510	--
PW-83-09-103	6-26-82	52.0	103	--	--
PW-83-09-204	7- 6-82	83.6	51	2,420	--
UB-83-09-205	6-14-82	69.6	46	3,250	--

See footnotes at end of table.

Table 2.--Water level measurements and specific conductance of water samples from wells in the Evangeline aquifer--Continued

Well no.	Date of measurement or water sample	Depth to water below or above (+) land surface a/ (ft)	Altitude of water above NGVD of 1929 (ft)	Specific conductance b/ (micro-mhos/cm)	Remarks
UB-83-09-505	6-14-82	--	--	2,530	--
PW-83-09-703	6-24-82	34.5	125	--	Casing may have failed.
UB-83-09-902	6-14-82	100.0	27	2,490	--
UB-83-10-301	6-15-82	62.5	27	--	--
UB-83-10-5A	6- 4-82	--	--	2,860	--
UB-83-10-5B	6- 4-82	70.9	15	--	--
UB-83-10-602	6-15-82	63.0	13	3,220	--
UB-83-10-806	6-16-82	69.7	15	2,560	--
UB-83-17-301	6- 4-82	98.2	18	4,190	--
PW-83-17-505	6-23-82	172.8	-45	--	--
UB-83-17-901	6-14-82	162.5	-58	2,950	--
UB-83-18-101	6-18-82	84.3	16	2,930	--
PW-83-17-801	6-23-82	173.1	-48	--	--
UB-83-18-501	6- 4-82	95.7	-5	--	--
UB-83-18-601	6- 3-82	72.8	-10	--	--
UB-83-18-602	6- 2-82	--	--	3,380	--
UB-83-18-802	6-15-82	137.5	-65	1,970	--
UB-83-19-201	6- 4-82	80.0	-16	3,920	--
UB-83-19-4A	6-24-82	87.0	-19	2,700	--
UB-83-19-601	6- 2-82	57.0	-8	--	--

See footnotes at end of table.

Table 2.--Water level measurements and specific conductance of water samples from wells in the Evangeline aquifer--Continued

Well no.	Date of measurement or water sample	Depth to water below or above (+) land surface a/ (ft)	Altitude of water above NGVD of 1929 (ft)	Specific conductance b/ (micro-mhos/cm)	Remarks
UB-83-19-801	6- 3-82	61.4	-13	--	--
RR-83-25-101	6-23-82	187.1	-53	--	--
RR-83-25-203	6-23-82	196.7	-73	2,400	--
RR-83-25-301	6-23-82	180.7	-93	--	--
RR-83-25-304	6-23-82	192.9	-100	--	--
RR-83-25-501	6-23-82	194.7	-89	1,840	--
RR-83-25-503	6-23-82	189.2	-96	--	--
RR-83-25-601	6-23-82	210.9	-126	--	--
RR-83-25-605	6- 2-82	243.1	-173	1,640	--
RR-83-25-701	6-23-82	181.2	-67	--	--
RR-83-25-801	6-22-82	210.4	-110	1,460	--
RR-83-25-902	6- 2-82	--	--	1,585	--
RR-83-25-912	6- 2-82	276.1	-208	--	--
RR-83-25-915	6- 2-82	230.6	-153	--	--
UB-83-26-106	6-14-82	150.2	-77	1,760	--
UB-83-26-203	6-14-82	172.3	-106	1,970	--
UB-83-26-204	6- 1-82	196.5	-139	2,480	--
UB-83-26-3A	6- 2-82	125.5	-73	1,950	--
RR-83-26-401	6-26-82	206.2	-152	--	--
UB-83-26-502	6- 7-82	193.5	-135	1,800	--
RR-83-26-701	6-23-82	230.5	-177	--	--

See footnotes at end of table.

Table 2.--Water level measurements and specific conductance of water samples from wells in the Evangeline aquifer--Continued

Well no.	Date of measurement or water sample	Depth to water below or above (+) land surface ^{a/} (ft)	Altitude of water above NGVD of 1929 (ft)	Specific conductance ^{b/} (micro-mhos/cm)	Remarks
RR-83-26-712	6- 2-82	276.2	-216	--	--
RR-83-26-721	6- 2-82	286.2	-219	--	--
RR-83-26-724	6- 2-82	269.2	-215	--	--
RR-83-26-901	7- 7-82	164.6	-114	1,760	--
UB-83-27-101	6-16-82	92.6	-48	--	--
UB-83-27-402	6-16-82	141.3	-96	1,850	--
RR-83-27-801	7- 7-82	107.4	-71	5,060	Casing may have failed.
RR-83-27-802	7- 7-82	91.0	-52	2,260	--
UB-83-28-101	6-18-82	--	--	2,730	--
UB-83-28-102	6-18-82	70.5	-38	--	--
RR-83-28-702	7- 7-82	66.3	-31	--	--
RR-83-28-902	7- 7-82	41.8	-12	2,720	--
UB-83-29-201	6-16-82	14.1	11	4,400	--
UB-83-29-401	6-16-82	32.2	-2	4,090	--
RR-83-29-404	8- 2-82	34.8	-10	3,940	--
RR-83-29-702	7- 7-82	29.6	-5	4,310	--
RR-83-29-803	7- 7-82	24.6	-2	6,900	--
RR-83-33-1A	8- 4-82	178.5	-84	--	--
RR-83-33-201	6-22-82	198.9	-120	--	--
RR-83-33-301	6-22-82	214.6	-140	1,470	--

See footnotes at end of table.

Table 2.--Water level measurements and specific conductance of water samples from wells in the Evangeline aquifer--Continued

Well no.	Date of measurement or water sample	Depth to water below or above (+) land surface a/ (ft)	Altitude of water above NGVD of 1929 (ft)	Specific conductance b/ (micro-mhos/cm)	Remarks
RR-83-33-402	6-22-82	154.0	-59	--	--
RR-83-33-602	6-24-82	154.9	-82	--	--
RR-83-33-702	8- 4-82	121.8	-32	1,163	--
RR-83-33-801	8- 4-82	122.0	-48	1,116	--
RR-83-34-1A	6-21-82	207.2	-154	2,260	--
RR-83-34-203	6- 2-82	201.6	-153	1,670	--
RR-83-34-302	7- 7-82	108.0	-66	1,810	--
RR-83-34-305	7- 7-82	161.3	-114	1,740	--
RR-83-34-401	6-24-82	155.6	-99	--	--
RR-83-34-413	6-24-82	148.9	-97	--	--
RR-83-34-701	6-23-82	7.6	46	--	Casing may have failed.
RR-83-34-7A	6- 3-82	123.0	-71	1,695	--
RR-83-34-8A	6-22-82	90.3	-51	1,960	--
RR-83-34-902	6-23-82	79.9	-45	--	--
RR-83-35-101	7- 7-82	115.7	-70	2,070	--
RR-83-35-201	7- 7-82	95.2	-54	--	--
RR-83-35-803	8- 2-82	51.3	-21	--	--
RR-83-35-903	8- 2-82	46.5	-31	3,080	--
RR-83-36-201	7- 7-82	40.8	-26	2,260	--
RR-83-36-401	7- 7-82	59.9	-30	2,140	--

See footnotes at end of table.

Table 2.--Water level measurements and specific conductance of water samples from wells in the Evangeline aquifer--Continued

Well no.	Date of measurement or water sample	Depth to water below or above (+) land surface a/ (ft)	Altitude of water above NGVD of 1929 (ft)	Specific conductance b/ (micro-mhos/cm)	Remarks
RR-83-36-501	7- 7-82	37.4	-17	2,510	--
RR-83-36-601	8- 2-82	23.2	-11	3,720	--
RR-83-36-701	8- 2-82	51.4	-23	2,870	--
RR-83-37-201	7- 7-82	0.1	15	5,150	--
RR-83-41-401	6-22-82	105.2	-16	1,300	--
RR-83-41-601	6-22-82	85.7	-23	1,240	--
BP-83-41-7A	6-24-82	68.6	4	--	--
RR-83-41-803	8- 4-82	71.9	-2	1,167	--
RR-83-41-9A	7- 8-82	55.1	-5	--	--
RR-83-42-502	6- 5-82	64.2	-22	--	--
RR-83-42-6A	6- 7-82	39.3	-16	--	--
RR-83-42-701	6-24-82	53.1	-6	--	--
RR-83-42-804	6-24-82	50.4	-13	1,830	--
RR-83-43-406	6- 3-82	2.0	8	--	--
RR-83-43-4A	6- 3-82	--	--	1,800	--
RR-83-43-501	6- 7-82	17.1	7	1,750	--
RR-83-43-9A	6- 3-82	22.0	-15	2,020	Well pumped recently.
RR-83-45-202	8- 2-82	0	15	--	--
RD-83-49-204	7- 8-82	57.1	-1	1,150	--
RD-83-49-401	7- 8-82	53.6	17	984	--

See footnotes at end of table.

Table 2.--Water level measurements and specific conductance of water samples from wells in the Evangeline aquifer--Continued

Well no.	Date of measurement or water sample	Depth to water below or above (+) land surface ^{a/} (ft)	Altitude of water above NGVD of 1929 (ft)	Specific conductance ^{b/} (micro-mhos/cm)	Remarks
RD-83-49-702	7- 8-82	48.1	17	940	--
RD-83-50-1A	7- 8-82	45.8	-7	--	--
RD-83-50-307	8- 3-82	34.5	-6	1,774	--
RD-83-50-3A	8- 3-82	39.3	-3	1,805	--
RD-83-50-8A	8- 3-82	--	--	1,575	--
RD-83-51-402	8- 3-82	16.0	4	1,553	--
RD-83-52-202	8- 3-82	11.7	-4	4,490	--
RD-83-53-401	8- 3-82	+5	10	--	--
RD-83-57-2A	7- 8-82	39.5	17	--	--
RD-83-58-301	8- 3-82	--	--	1,585	--
RD-83-58-503	8- 3-82	--	--	1,439	--
RD-83-59-201	8- 3-82	15.1	3	1,899	--
RD-83-59-401	8- 3-82	5.0	20	1,830	--
RD-83-59-501	8- 3-82	13.1	6	1,944	--
RD-83-59-602	8- 3-82	10.0	15	2,910	--
RD-83-60-101	8- 3-82	+1	22	--	--
RD-83-60-201	8- 3-82	0	17	--	--
RD-83-60-501	8- 3-82	+3	19	--	--
RD-83-60-702	8- 3-82	+2	22	--	--
JB-84-06-301	9-29-82	88.0	332	2,310	--
PW-84-07-401	9-29-82	240.2	209	1,890	--

See footnotes at end of table.

Table 2.--Water level measurements and specific conductance of water samples from wells in the Evangeline aquifer--Continued

Well no.	Date of measurement or water sample	Depth to water below or above (+) land surface ^{a/} (ft)	Altitude of water above NGVD of 1929 (ft)	Specific conductance ^{b/} (micro-mhos/cm)	Remarks
PW-84-07-901	6-25-82	98.5	166	1,610	--
PW-84-08-101	6-25-82	79.0	214	3,600	--
PW-84-08-301	6-25-82	59.6	188	--	--
PW-84-08-801	6-17-82	--	--	1,360	--
PW-84-08-9A	6-17-82	122.7	117	--	--
JB-84-14-903	6- 3-82	295.1	9	--	--
JB-84-15-105	9-29-82	40.1	290	3,250	--
JB-84-15-702	6- 3-82	272.1	26	--	--
PW-84-15-705	6-24-82	134.4	171	1,810	--
PW-84-16-202	6-25-82	87.8	142	--	--
PW-84-16-407	6-25-82	99.3	141	3,190	--
PW-84-16-6A	6-25-82	--	--	3,150	--
PW-84-16-701	6-25-82	50.1	160	--	--
PW-84-16-805	6-25-82	88.1	110	--	--
PW-84-16-808	6-25-82	105.0	108	1,784	--
JB-84-21-304	7-15-82	129.2	303	--	--
JB-84-21-601	7-15-82	105.7	320	--	--
JB-84-21-603	7-15-82	104.5	311	1,620	--
JB-84-21-801	7-15-82	73.7	353	--	--
JB-84-22-801	7-15-82	29.6	295	--	--
JB-84-23-102	6-24-82	122.8	178	1,520	--

See footnotes at end of table.

Table 2.--Water level measurements and specific conductance of water samples from wells in the Evangeline aquifer--Continued

Well no.	Date of measurement or water sample	Depth to water below or above (+) land surface a/ (ft)	Altitude of water above NGVD of 1929 (ft)	Specific conductance b/ (micro-mhos/cm)	Remarks
JB-84-23-1A	6- 3-82	315.7	7	--	--
PW-84-24-101	6-24-82	133.8	101	2,490	--
PW-84-24-104	6-24-82	95.5	124	--	--
PW-84-24-208	6-24-82	96.0	104	--	--
PW-84-24-304	6-24-82	20.0	140	--	Casing may have failed.
PW-84-24-506	7- 9-82	153.7	41	2,560	--
PW-84-24-602	7- 6-82	186.6	-22	1,520	--
PW-84-24-802	6-24-82	162.6	11	2,480	--
JB-84-29-201	6- 8-82	93.1	287	--	--
JB-84-29-306	7-15-82	26.9	350	--	--
JB-84-29-309	6- 8-82	178.8	184	--	--
JB-84-29-310	6- 8-82	179.6	184	--	--
JB-84-29-502	7-25-82	81.0	344	--	--
JB-84-29-6A	6- 8-82	176.7	220	--	--
JB-84-30-301	7-17-82	33.0	242	--	--
JB-84-30-501	7-17-82	39.2	261	--	--
JB-84-30-901	7-17-82	113.9	172	--	--
PW-84-31-201	6-30-82	37.5	188	--	--
PW-84-31-2A	7-19-82	108.4	112	1,490	--
PW-84-31-502	6-30-82	26.0	184	--	--

See footnotes at end of table.

Table 2.--Water level measurements and specific conductance of water samples from wells in the Evangeline aquifer--Continued

Well no.	Date of measurement or water sample	Depth to water below or above (+) land surface a/ (ft)	Altitude of water above NGVD of 1929 (ft)	Specific conductance b/ (micro-mhos/cm)	Remarks
PW-84-31-6A	7-19-82	133.7	59	1,610	--
PW-84-32-103	6-30-82	56.9	102	--	Casing may have failed.
PW-84-32-401	6-30-82	167.9	-7	--	--
PW-84-32-501	6-23-82	173.8	-40	1,980	--
PW-84-32-7A	7-21-82	133.2	30	1,650	--
JB-84-36-601	6- 8-82	118.8	325	--	--
JB-84-36-902	7-20-82	--	--	2,625	--
JB-84-37-301	2-18-82	80.7	274	--	--
JB-84-37-901	2-18-82	40.4	285	--	--
JB-84-38-202	7-17-82	51.5	228	--	--
JB-84-38-701	7-15-82	22.8	287	--	--
JB-84-38-703	6- 8-82	66.5	235	--	--
JB-84-38-902	7-17-82	44.8	205	--	--
JB-84-38-903	7-17-82	35.0	215	--	--
PW-84-39-5A	7-16-82	123.4	60	1,100	--
PW-84-39-601	7-16-82	123.2	49	--	--
PW-84-39-604	7-19-82	133.7	50	1,240	--
PW-84-39-605	7-19-82	130.3	46	1,210	--
PW-84-39-701	7-16-82	46.2	174	--	Casing may have failed.
PW-84-40-104	7-16-82	--	--	1,320	--

See footnotes at end of table.

Table 2.--Water level measurements and specific conductance of water samples from wells in the Evangeline aquifer--Continued

Well no.	Date of measurement or water sample	Depth to water below or above (+) land surface a/ (ft)	Altitude of water above NGVD of 1929 (ft)	Specific conductance b/ (micro-mhos/cm)	Remarks
PW-84-40-202	6-29-82	203.2	-71	--	--
RR-84-40-203	6-29-82	210.6	-88	--	--
RR-84-40-204	6-29-82	223.1	-92	--	--
RR-84-40-206	6-29-82	200.2	-75	--	--
PW-84-40-403	7-20-82	155.6	-6	--	--
PW-84-40-704	6-30-82	136.6	9	1,260	--
PW-84-40-705	7-16-82	143.5	9	1,210	--
PW-84-40-708	6-10-82	138.2	5	--	--
JB-84-44-601	2-18-82	29.0	391	--	--
JB-84-45-2A	7-20-82	--	--	2,000	--
JB-84-45-2B	7-20-82	78.2	277	--	--
JB-84-45-304	2-18-82	15.6	314	--	--
JB-84-45-8A	6-26-82	62.0	296	--	--
JB-84-45-8B	6-26-82	--	--	2,360	--
JB-84-45-902	7-20-82	82.6	245	--	--
JB-84-46-101	6-28-82	--	--	4,300	--
JB-84-46-501	6-28-82	97.5	160	--	--
JB-84-46-701	6-28-82	46.3	245	--	--
PW-84-47-311	6-10-82	150.7	11	--	--
JB-84-47-404	6-28-82	87.0	113	--	--
PW-84-47-501	6-22-82	76.0	86	--	--

See footnotes at end of table.

Table 2.--Water level measurements and specific conductance of water samples from wells in the Evangeline aquifer--Continued

Well no.	Date of measurement or water sample	Depth to water below or above (+) land surface <u>a/</u> (ft)	Altitude of water above NGVD of 1929 (ft)	Specific conductance <u>b/</u> (micro-mhos/cm)	Remarks
PW-84-47-601	6-29-82	100.3	51	--	--
PW-84-47-701	6-28-82	78.2	85	--	--
PW-84-47-7A	6-28-82	77.9	95	1,080	--
PW-84-47-801	6-28-82	78.6	79	--	--
PW-84-47-902	6- 9-82	105.6	34	--	--
PW-84-47-903	6- 9-82	93.0	41	--	--
PW-84-47-904	6- 9-82	97.0	41	--	--
PW-84-47-905	6-29-82	123.8	12	--	--
PW-84-47-910	6- 9-82	89.1	53	--	--
PW-84-47-914	6- 9-82	91.5	40	--	--
PW-84-48-103	6-30-82	145.5	11	--	--
PW-84-48-107	6-30-82	139.5	0	--	--
RR-84-48-302	6-22-82	120.4	-14	1,310	--
PW-84-48-709	6-29-82	104.6	15	--	--
BP-84-48-9A	6- 5-82	77.2	2	--	--
BP-84-54-806	6-26-82	87.0	191	1,040	--
BP-84-55-203	6-26-82	93.4	44	--	--
BP-84-55-204	6-26-82	79.5	50	--	--
BP-84-55-307	6- 9-82	84.6	35	--	--
BP-84-55-309	6-26-82	126.2	4	1,120	--
BP-84-55-310	6-26-82	135.8	-9	--	--

See footnotes at end of table.

Table 2.--Water level measurements and specific conductance of water samples from wells in the Evangeline aquifer--Continued

Well no.	Date of measurement or water sample	Depth to water below or above (+) land surface <u>a/</u> (ft)	Altitude of water above NGVD of 1929 (ft)	Specific conductance <u>b/</u> (micro-mhos/cm)	Remarks
BP-84-55-602	6-26-82	92.8	22	--	--
BP-84-55-901	6-25-82	32.2	74	--	--
BP-84-56-2A	6-28-82	79.6	16	--	--
BP-84-63-301	6-26-82	55.2	55	1,180	--
RD-88-01-101	8- 4-82	12.9	41	1,794	--
RD-88-01-202	8- 4-82	18.1	26	3,030	--
RD-88-01-302	8- 4-82	12.8	30	--	--
RD-88-02-103	8- 3-82	18.1	23	1,842	--
RD-88-02-402	8- 2-82	4.2	25	--	--
RD-88-02-403	8- 3-82	3.7	25	1,890	--
RD-88-02-603	8- 3-82	10.1	14	1,848	Well pumped recently.

a/ Measured water levels are given to the nearest 0.1 foot; reported water levels are given to the nearest 1.0 foot.

b/ Micromhos per centimeters at 25° Celsius.

Table 3.--Water level measurements and specific conductance of water samples from wells in the Beaumont-Lissie unit

Well no.	Date of measurement or water sample	Depth to water below or above (+) land surface <u>a/</u> (ft)	Altitude of water above NGVD of 1929 (ft)	Specific conductance <u>b/</u> (micro-mhos/cm)	Remarks
PW-83-01-302	6-26-82	80.5	71	2,400	--
UB-83-11-101	6-15-82	68.6	28	3,300	--
UB-83-11-2A	6-15-82	--	--	3,960	--
UB-83-11-401	6-15-82	51.4	32	3,430	--
UB-83-11-601	6-15-82	46.0	25	--	--
UB-83-11-801	6-15-82	30.8	45	--	--
UB-83-12-701	6-15-82	34.6	24	--	--
UB-83-19-101	6- 4-82	41.8	26	2,730	--
UB-83-20-401	6-15-82	25.8	26	--	--
UB-83-20-8A	6- 2-82	32.7	17	3,400	--
UB-83-20-904	6-18-82	30.1	20	3,070	--
UB-83-21-701	6- 3-82	13.1	21	--	--
UB-83-22-801	6-16-82	10.6	4	--	--
RR-83-37-601	7- 7-82	45.8	-11	1,310	Well pumped recently.
PW-84-40-712	6-10-82	66.2	82	--	--
PW-84-48-114	6-10-82	57.4	89	--	--
PW-84-48-115	6-10-82	56.4	84	2,300	--

a/ Measured water levels are given to the nearest 0.1 foot; reported water levels are given to the nearest 1.0 foot.

b/ Micromhos per centimeters at 25° Celsius.

Many wells in the outcrop area of the Goliad Sand have water-level altitudes that are inconsistent with those of wells nearby. These wells are usually shallow and the changes in water levels may represent the recharge gradient in the outcrop of the Goliad Sand where water movement is more vertical than horizontal.

Some wells completed in the Evangeline aquifer where it is overlain by the Beaumont-Lissie unit have anomalously high water levels caused by leakage through that part of the well that is cased off from the Beaumont-Lissie unit. This problem is discussed in several of the reports on this area. Water levels in wells with failed casings are a composite of water levels in the Evangeline aquifer and Beaumont-Lissie unit and are not representative of the potentiometric head in either unit. Wells in the Evangeline aquifer having anomalously high water levels are noted in the tables as wells having casings that may have failed. If used at all these water levels were applied with discretion in the construction of figure 3.

Salinity of Water

In this report, specific conductance is used as an indicator of the salinity of the water. Specific conductance is a measure of the ability of a water to carry an electrical current and depends on the concentrations of ionized constituents dissolved in the water. Specific conductance may also be used to estimate the concentration of dissolved solids in the water.

Figure 4 shows well depths and the specific conductance of the water at selected wells. The specific conductance values range from 940 to 6,900 micro-mhos per centimeter. Not all wells that were visited during 1982 have pumps or pumps that were operating at the time of the field visit.

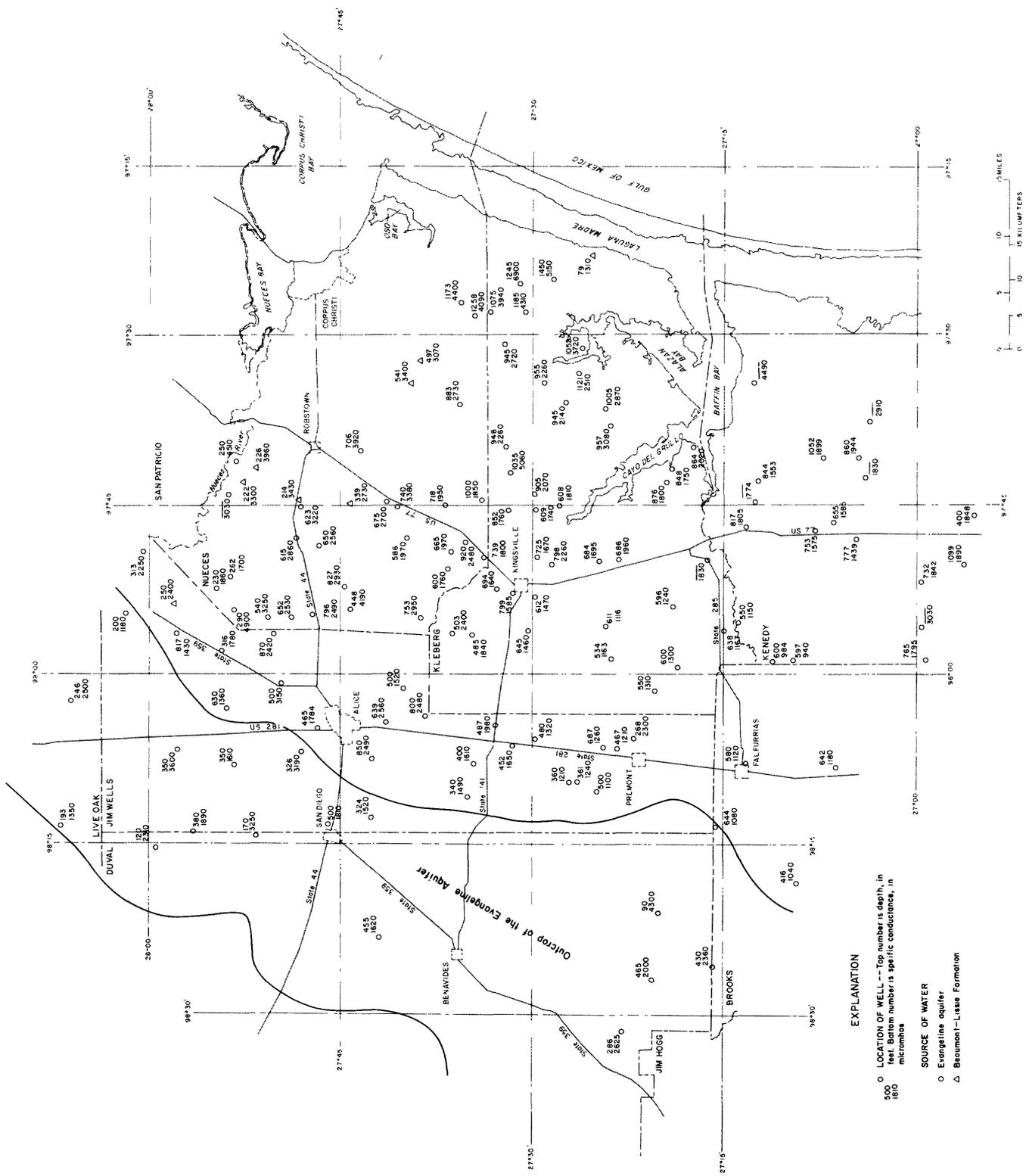
Tables 2 and 3 list specific conductance for water samples. Note that the casing in some of the wells may have failed. Data from these wells should be used with caution.

The yield and amount of time a well has been pumping may influence the quality of water. Well owners in the area occasionally notice slight changes in water quality.

SUMMARY

Information on water levels and salinities of water in wells tapping the Evangeline aquifer shows that a large cone of depression exists in the vicinity of Kingsville and the salinities of water are higher in the eastern part of the study area than in the western part of the area. The extent of the water level declines are the result of pumpage from the Evangeline aquifer.

The data will provide a base for the preparation of a mathematical model of the hydrologic conditions of the Evangeline aquifer. The results of this study can also be used by water managers to plan future water development.



EXPLANATION

500 O LOCATION OF WELL -- Top number is depth, in feet; bottom number is specific conductance, in micromhos

SOURCE OF WATER

O Evangeline aquifer

Δ Beaumont-Llase Formation

Figure 4.--Specific conductance and depth of well water in the study area

Base from U.S. Geological Survey 1:250,000

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