

CITY OF VALERA  
COLEMAN COUNTY, TEXAS  
INVESTIGATION OF GROUND-WATER CONTAMINATION

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By  
H. D. Holloway, Geologist  
Ground Water Division

Texas Water Commission  
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INTRODUCTION

On July 25, 1962, the Texas Water Commission received a request for assistance from Reverend Glenn Martin, Pastor of the Methodist Church of Valera, Coleman County in locating the source of contamination by gasoline in some water wells at Valera. The complainant reported that gasoline had been noticed several months ago in one well and that recently another nearby well which serves several families appeared to be contaminated with gasoline. In an attempt to locate the source of the gasoline, the complainant stated that a nearby service station tank was pressure checked when the gasoline was first noticed; however, the results of the test were negative.

The complaint was forwarded to the Waste Disposal Section of the Ground Water Division on July 27, 1962, for investigation to determine the source of contamination.

METHODS OF INVESTIGATION

A field investigation of the problem was made in the period from July 30 through August 3, 1962. During the course of this investigation, 22 water wells were inventoried in the immediate area, and 14 water samples were collected from water wells for chemical analysis. Pressure tests on gasoline storage tanks at two service stations were witnessed and gas-detection tests were made in 9 water wells in an attempt to determine the areal extent of contamination.

Included in this report is a map of the part of Valera presently affected by this problem, and a table of chemical analyses of water from wells in the area.

LOCATION AND ECONOMY

The town of Valera, in the west central part of Coleman County, Texas, has a population of approximately 175. The economy of the town is entirely dependent upon agriculture.

## WATER SUPPLY

The domestic water needs of Valera are supplied entirely by ground water. Water wells are owned individually with some wells supplying several families. There are a few hand dug wells in the town, but in most cases the wells are drilled. The drilled wells are completed with galvanized casing and equipped with jet or cylinder type pumps.

Most of the wells sampled during the investigation contained potable water, however, the chemical quality of the water analyzed does not, in every case meet the United States Public Health Services recommended standards for public water supply. Analyses of the water samples collected indicate that some wells have a very high sulfate content; the water from these wells, however, is not used for drinking purposes.

## GENERAL GEOLOGY

Valera is on the outcrop of the Valera shale member of the Belle Plains formation, Wichita group, Permian age. The Belle Plains formation consists of shale, calcareous marl, and limestone. Regional dip of the formation in the area is to the northwest.

The Valera shale member is reportedly a gray shale with a few thin limestone beds that occur locally throughout the member. Very little information is available on shallow subsurface conditions; however, from discussions with Mr. Clyde Duncan, a local water well driller, and with local townspeople, it appears there are two zones which yield water to wells, both of which are probably limestones. Although the areal extent of the two zones was not determined during the investigation, it appears that they do not cover a very large area.

Topographically the general slope of the area is to the south-southwest. Home Creek skirts the town of Valera on the south and west and is reportedly fed by springs below the water surface of the creek. No surface elevations are available to attempt a correlation of elevation variations between the water wells and the springs.

## SUMMARY OF CURRENT INVESTIGATION

The gasoline contamination problem at Valera was first noticed in the latter part of 1959 in a drilled well located at the Moser Service Station. Mr. Moser stated that his gasoline storage tanks were leaking and gasoline was present in his water well (Well #5). Subsequently, Mr. C. R. Lindsey pressure checked the tanks for

Mobil Oil Company and found that one tank had a broken weld at the filler pipe on top of the tank. The tank was removed by the Williams' brothers, local residents of Valera, and they stated that no moisture or odor of gasoline was present. Mr. Lindsey stated that no other leaks were found in the tank.

In September 1960, Mr. Moser had a new well (Well #6) drilled about six feet north of the old well (Well #5). The well was drilled by Mr. Duncan, who stated that it was drilled to 53 feet and water was encountered at 34 feet. Mr. Duncan further states that the odor of gasoline was present in water samples from the 34-foot zone, and that Mr. Moser said at that time that it was from an old leak in his gasoline tanks.

A third well is present on the Moser property (Well #4). It is a dug well, 36 feet deep, and two feet in diameter, walled with stone. This well has not been used since 1950. Mrs. Moser stated that her husband told her he could smell gasoline at the well but had never taken a sample to make sure that gasoline was present. During the present investigation there was approximately 4 feet of fluid in the well of which approximately 2 1/2 feet was gasoline. On August 17, 1962, approximately 75 gallons of gasoline were bailed from the well.

Adjoining the Moser property on the west is the Methodist Church Parsonage which has three wells; one hand dug well 16 feet deep (Well #7), and two drilled wells, 34 feet deep (Well #8) and 50 feet deep (Well #9). The dug well has not been used for a number of years, and when sampled during this investigation there was no odor of gasoline. The odor and taste of gasoline has reportedly been present in the 34-foot well (Well #8) for over a year. Gasoline was bailed from this well with a well bucket, however, a water seep which occurred at an approximate depth of 28 feet prevented an exact determination of the amount of gasoline present in the well.

The new well (Well #9) at the Methodist Parsonage was drilled in March 1962 by Mr. Duncan. Mr. Duncan states that there were two water zones present: one zone at 26 feet and the other at 36 feet. A gasoline odor was noted in the samples from the 26 foot zone. The well was completed with 4-inch steel casing, it was gravel packed and cement was poured on the outside of the casing to the interval 28 to 32 feet in an attempt to shut off the contaminated water. The attempt was not successful.

The Lydie Miller well (Well #11), which supplies three families, is located directly north of the Methodist Parsonage and across U. S. Highway 67. This well has the odor and taste of gasoline, but not as strong as the Moser and Methodist Parsonage

wells. Mrs. Miller states that the gasoline taste and odor is usually apparent during times of precipitation and fades out during dry weather.

Three service stations are located within the area of contamination. Two of these, a Gulf station and a Mobil station, are still in operation, and the third, a Texaco station, is closed but its gasoline storage tanks are still in the ground.

The Mobil Oil Company had the storage tanks at the Moser Station pressure checked on July 30th. There was no pressure drop or loss of fluid noted during the test.

The Gulf Service Station storage tanks were pressure checked by Mr. Lowell Chambers of Chambers Pump Company on August 3rd. A pressure drop was noted on the tank; however, this pressure loss was due to a loose union on the vent line. The union was buried about three feet below ground surface. There was no moisture or odor of gasoline present in the soil when Mr. Chambers dug a hole to repair the loose union.

Mr. Chambers stated that about 60 days prior to the pressure check he removed a 1,000 gallon tank at the Gulf Station. The tank was purchased from the Gulf Oil Company by Mr. Chambers, and a visual inspection of the tank was made during the present investigation. It was noted that all the welds on the pipe connection on top of the tank were broken. Mr. Chambers filled the tank with water to see if there were leaks elsewhere on the tank, but none were noted.

Mr. Chambers further stated that no moisture or odor of gasoline was present in the soil when the tank was removed.

Mr. A. L. Maedgen, owner of the Gulf Station, stated that he lost about 400 gallons of gasoline a year for about five years or a total of 2,000 gallons, before the tank was removed. However, in further conversation Mr. Maedgen revised this figure to a total of about 1,000 gallons in the five-year period. Normal loss by evaporation in these tanks is reportedly about 15 to 20 gallons a year.

Mr. V. C. Patterson presently owns a cafe at the location of the old Texaco Service Station. The Texaco Distributor, Mr. R. D. Boyer of Coleman, was contacted and requested to make a pressure check on the old tanks. An ownership question of the tanks between Mr. Patterson and Mr. Boyer arose, and as a result, no pressure test has been made on the tanks. However, Mr. Boyer reported that he left about 10 to 15 gallons of gasoline in each tank when they were abandoned. Mr. Patterson measured the tanks during the

investigation and verified that this amount still remained.

The present investigation revealed six wells contaminated by gasoline; three wells at the E. L. Moser Mobil Service Station, two wells at the Methodist Church Parsonage, and one well at the residence of Mrs. Lydie Miller. The exact source of gasoline was not determined, however it appears to have entered the subsurface in the past and the source is now apparently eliminated.

#### RECOMMENDATIONS

(1) Pressure tests should be made on the gasoline storage tanks at the abandoned Texaco Service Station. If leaks are noted in these tanks, they should be removed to prevent any further pollution from this source.

(2) Well #4 (dug well) at the E. L. Moser Service Station should be cleaned out. The amount of gasoline in the well makes it an explosion and contamination hazard to other wells in the area.

(3) Well #5 (drilled well) at E. L. Moser's Service Station and Well # 8 at the Methodist Parsonage, which are not in use, should be cleaned out and left open for observation.

(4) The drilled wells in use at the Moser Service Station (Well #6) and the Methodist Parsonage (Well #9) should be checked to see if a gasoline cap is present. If present the gasoline should be removed by use of a well bucket or pump; however, if a pump is used it should be set at a depth to insure the removal of the gasoline cap. The pumps presently in these wells probably do not have the capacity at their present setting to draw the wells down to remove the gasoline.

(5) Since the water zones in Wells #6 and #9 appear to be contaminated, these wells should be heavily pumped periodically over a several day period in an attempt to localize the gasoline in the two wells and flush the water zones. This pumping procedure should be supervised by Texas Water Commission personnel in order to observe the effect on surrounding wells and prevent any adverse effects to the aquifer.

Table 1. Analyses of water samples\*  
TEXAS WATER COMMISSION

Well	Owner	Depth Well (ft.)	Date of Collection	Temp. (F)	Temp. (C)	Ca. (ppm)	Mg. (ppm)	Cl. (ppm)	SO <sub>4</sub> (ppm)	Total Solids (ppm)	Alk. (ppm)	Hard. (ppm)	Chlor. (ppm)	Fluor. (ppm)	Al. (ppm)	Phos. (ppm)	Iron (ppm)	Div. Solids (ppm)	Total Solids (ppm)	Percent Sodium	Specific Conductance @ 25° C	pH	SAR
1	Patterson	38	8/1/62	-	368	61	81	342	920	65	0.9	1.3	-	-	1868	1170	-	1868	1170	-	2050	7.6	-
3	Duncan	46	8/1/62	-	318	58	70	349	796	62	.8	9	-	-	1680	1035	-	1680	1035	-	1850	7.5	-
6	Moser	44	8/1/62	-	264	51	48	405	515	54	.7	2.8	-	-	1387	870	-	1387	870	-	1550	7.5	-
7	Methodist Pars.	18	8/2/62	-	218	54	92	400	442	330	.4	4.9	-	-	1307	766	-	1307	766	-	2060	7.8	-
9	do	50	8/1/62	-	108	40	50	447	84	50	.5	3.2	-	-	798	435	-	798	435	-	980	7.6	-
10	Baker	40	8/2/62	-	66	36	98	403	96	40	.8	3.1	-	-	789	314	-	789	314	-	950	7.8	-
11	Miller	55	8/2/62	-	107	37	47	400	84	59	.6	1.1	-	-	762	427	-	762	427	-	952	7.8	-
13	H. Mitchell	45	8/2/62	-	581	92	46	381	1512	15	.7	<.4	-	-	2673	1830	-	2673	1830	-	2590	7.2	-
15	Cagle	36	8/2/62	-	200	46	50	400	363	55	.4	3.8	-	-	1169	690	-	1169	690	-	1350	7.5	-
16	C. Mitchell	29	8/2/62	-	98	38	43	388	105	45	.6	1.3	-	-	747	402	-	747	402	-	880	7.5	-
17	Maedgen	34	8/2/62	-	244	72	62	376	596	60	.5	3.2	-	-	1460	905	-	1460	905	-	1650	7.5	-
18	Gassiot	26	8/2/62	-	504	81	99	290	448	93	.9	<.4	-	-	2505	1594	-	2505	1594	-	2550	7.2	-
19	Marcus	30	8/2/62	-	287	69	50	398	668	57	.5	2.8	-	-	1574	1000	-	1574	1000	-	?	7.3	-
20	Nixon	42	4/8/54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.0	-
21	Roberts	55	8/3/62	-	271	51	76	354	668	51	.9	1.4	-	-	1502	885	-	1502	885	-	1650	7.5	-

GW-3

\* Samples Analyzed by Texas State Department of Health



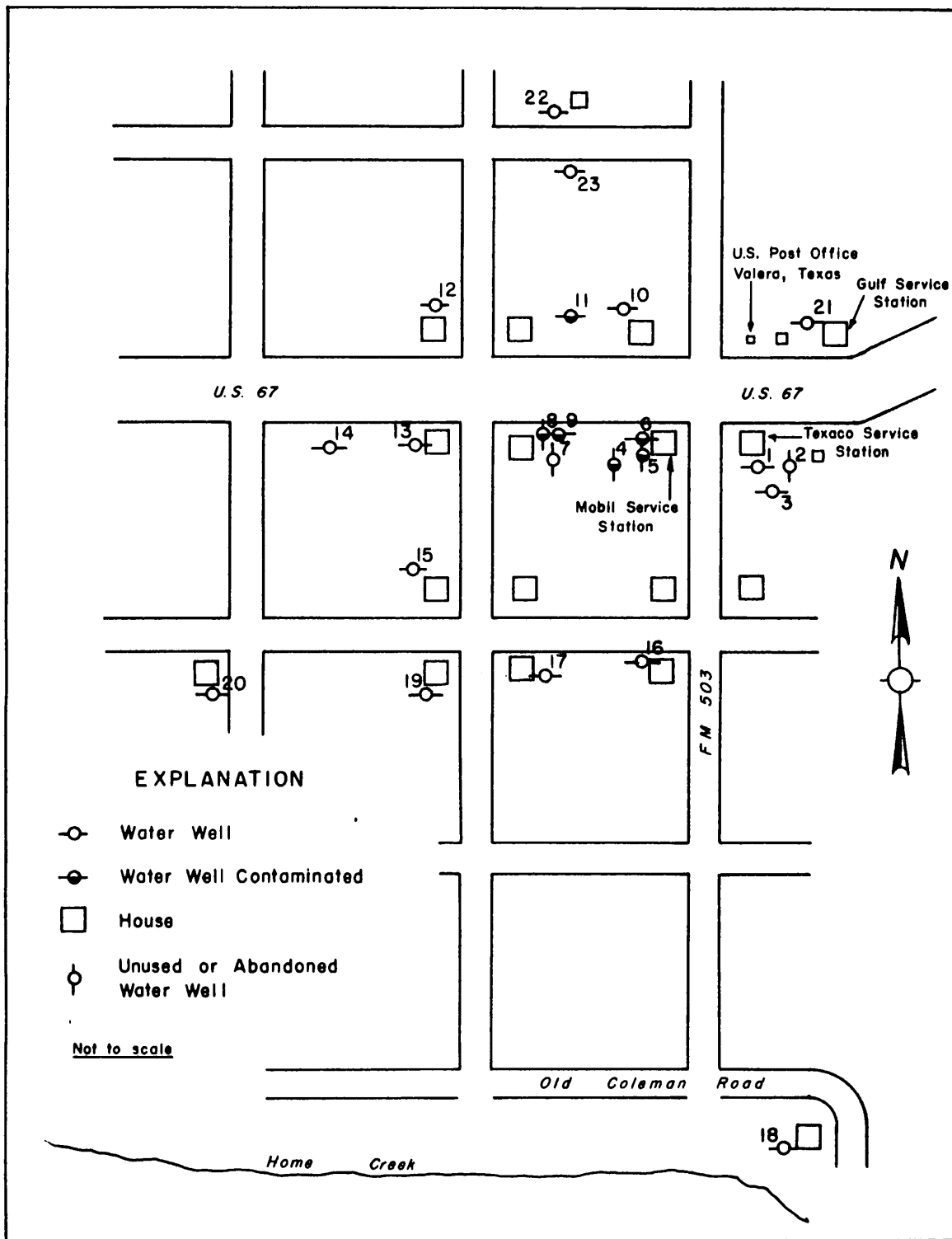


FIGURE I.- Map showing location of water wells in area of investigation, Valera, Texas