

FIGURE 1.—MAP SHOWING AVAILABILITY OF GROUND WATER, LOCATION OF WELLS AND A SPRING, AND QUALITY OF WATER

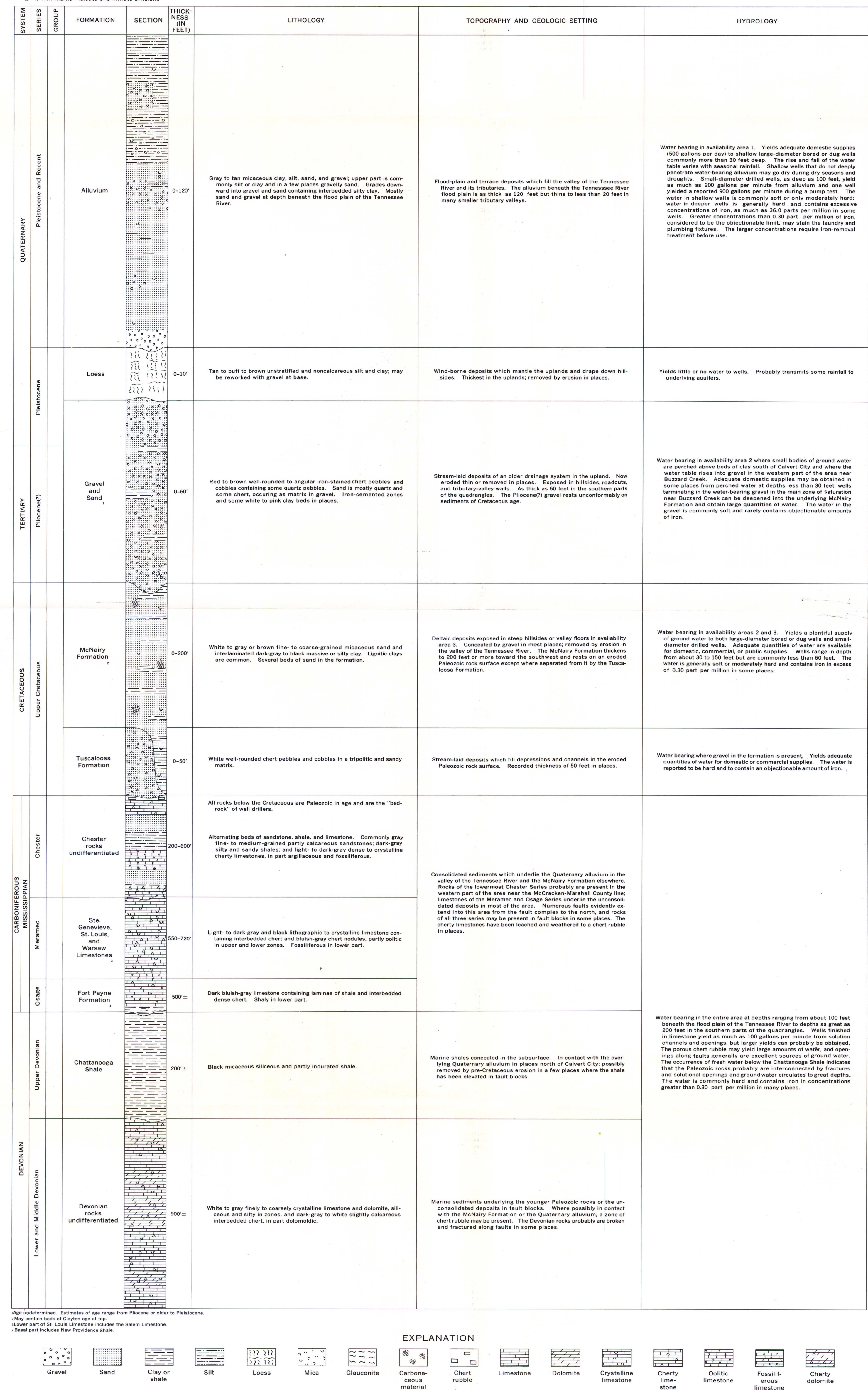


FIGURE 2.—GENERALIZED COLUMNAR SECTION AND WATER-BEARING CHARACTER OF THE GEOLOGIC FORMATIONS

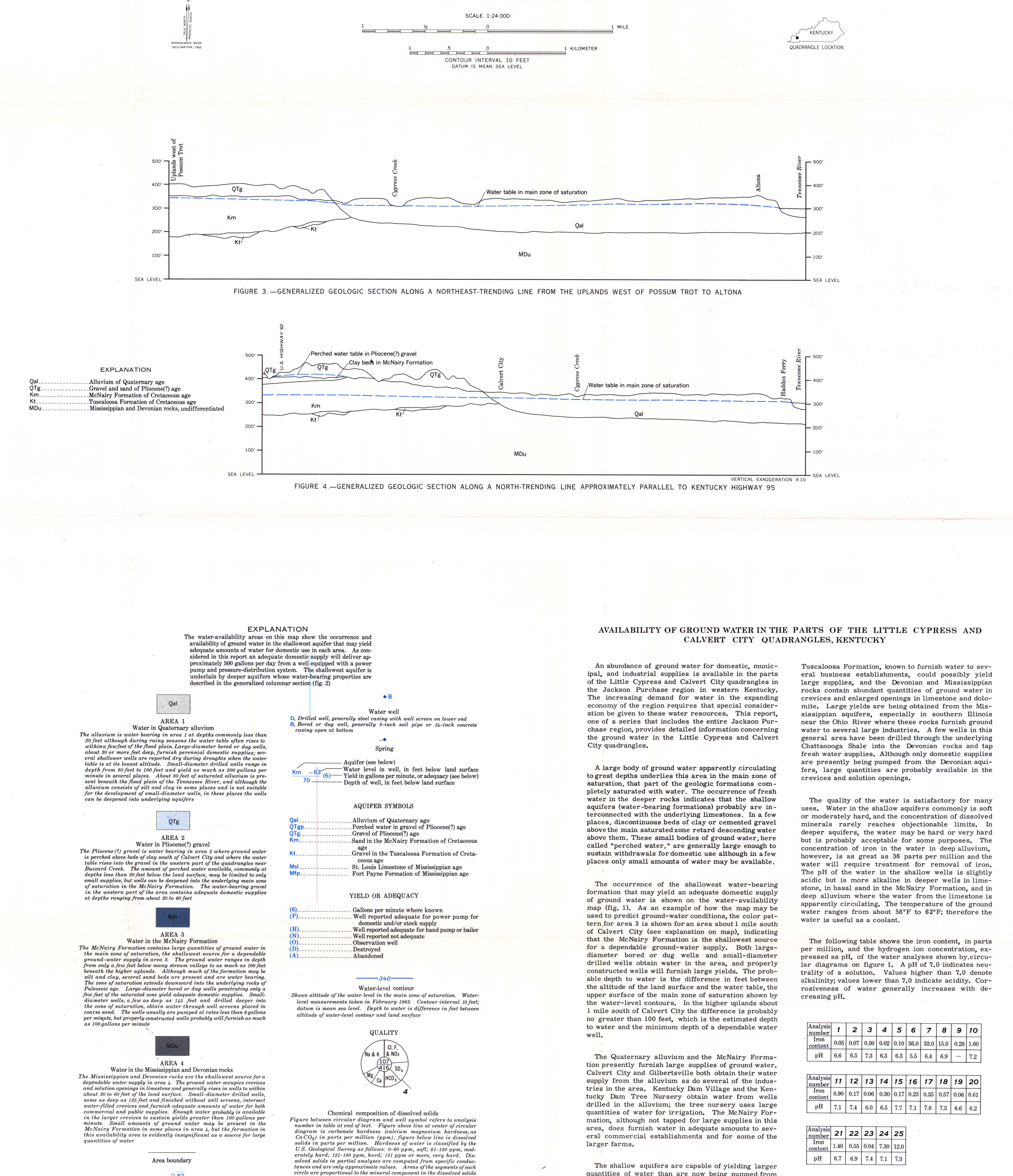


FIGURE 3.—GENERALIZED GEOLOGIC SECTION ALONG A NORTHEAST-TRENDING LINE FROM THE UPLANDS WEST OF POSSUM TROT TO ALTONA

FIGURE 4.—GENERALIZED GEOLOGIC SECTION ALONG A NORTH-TRENDING LINE APPROXIMATELY PARALLEL TO KENTUCKY HIGHWAY 95

AVAILABILITY OF GROUND WATER IN THE PARTS OF THE LITTLE CYPRESS AND CALVERT CITY QUADRANGLES, KENTUCKY

An abundance of ground water for domestic, municipal, and industrial supplies is available in the parts of the Little Cypress and Calvert City quadrangles in the Jackson Purchase region in western Kentucky. The increasing demand for water in the expanding economy of the region requires that special consideration be given to these water resources. This report, one of a series that includes the entire Jackson Purchase region, provides detailed information concerning the ground water in the Little Cypress and Calvert City quadrangles.

A large body of ground water apparently circulating to great depths underlies this area in the main zone of saturation, that part of the geologic formations completely saturated with water. The occurrence of fresh water in the deeper rocks indicates that the shallow aquifers (water-bearing formations) probably are interconnected with the underlying limestones. In a few places, discontinuous beds of clay or cemented gravel above the main saturated zone retard descending water above them. These small bodies of water, here called "perched water," are generally large enough to sustain withdrawals for domestic use although in a few places only small amounts of water may be available.

The occurrence of the shallowest water-bearing formation that may yield an adequate domestic supply of ground water is shown on the water-availability map (fig. 1). As an example of how the map may be used to predict ground-water conditions, the water patterns for area 3 is shown for an area about 1 mile south of Calvert City (see explanation on map), indicating that the McNairy Formation is the shallowest source for a dependable ground-water supply. Both large-diameter bored or dug wells and small-diameter drilled wells obtain water in the area, and properly constructed wells will furnish large yields. The probable depth to water is the difference in feet between the altitude of the land surface and the water table, the upper surface of the main zone of saturation shown by the water-level contours. In the higher uplands about 1 mile south of Calvert City the difference is probably no greater than 100 feet, which is the estimated depth to water and the minimum depth of a dependable water well.

The following table shows the iron content, in parts per million, and the hydrogen ion concentration, expressed as pH, of the water analyses shown by circular diagrams on figure 1. A pH of 7.0 indicates neutrality of a solution. Values higher than 7.0 denote alkalinity; values lower than 7.0 indicate acidity. Corrosiveness of water generally increases with decreasing pH.

Analysis number	1	2	3	4	5	6	7	8	9	10
Iron content	0.06	0.07	0.30	0.02	0.10	36.0	33.0	15.0	0.28	1.60
pH	6.6	6.5	7.3	6.3	6.3	5.5	6.4	6.9	—	7.2

Analysis number	11	12	13	14	15	16	17	18	19	20
Iron content	8.06	0.17	0.06	0.30	0.17	0.20	0.30	0.07	0.08	0.61
pH	7.1	7.4	6.0	6.5	7.7	7.1	7.3	7.3	6.6	6.2

Analysis number	21	22	23	24	25
Iron content	1.60	0.65	0.04	7.30	12.0
pH	6.7	6.9	7.4	7.1	7.3

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