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AVAILABILITY
OF
GROUND WATER FOR DOMESTIC USE
IN
JEFFERSON COUNTY, KENTUCKY

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DEPARTMENT OF THE INTERIOR
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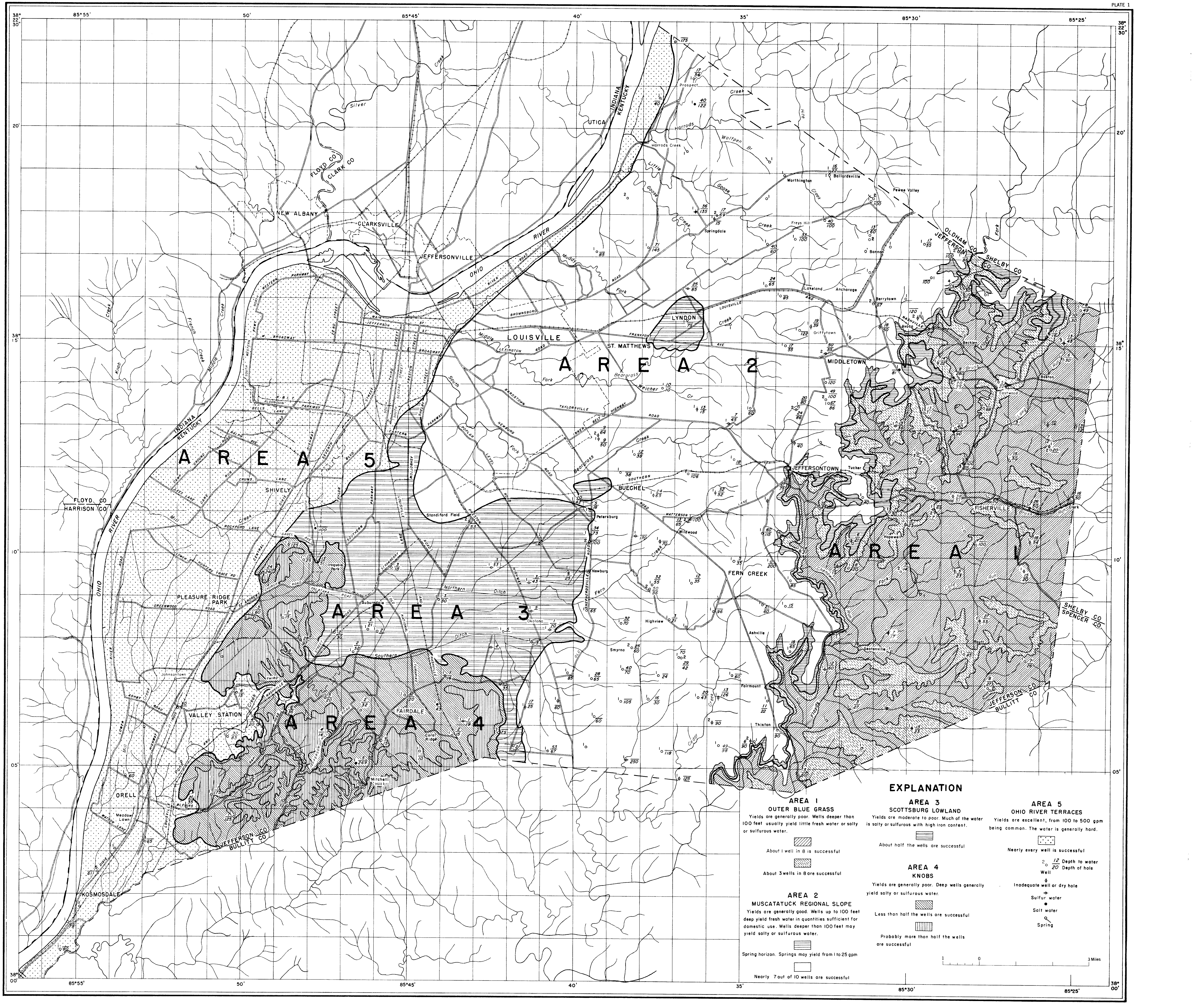

MAP OF JEFFERSON COUNTY, KENTUCKY, SHOWING THE AVAILABILITY OF GROUND WATER TO DRILLED WELLS, DEPTH OF WELL, AND DEPTH TO WATER

INTRODUCTION

This atlas showing the availability of ground water for domestic use in Jefferson County, Ky., is presented to make ground-water information available to residents and drillers of the region. Because the cost of drilling a domestic well is several dollars a foot, it is advantageous to both driller and owner to know the probability of success of a well before drilling is begun. The map and tables will make it possible to estimate the chances of success of a drilled domestic well anywhere in the county.

Jefferson County borders the Ohio River in the north-central part of Kentucky and covers an area of 394 square miles. Louisville, the county seat, is the largest city in the State. Many good Federal and State highways traverse the county and hard-surfaced rural roads make most of the region accessible in all weather conditions.

SURFACE FEATURES

Jefferson County lies on the west flank of the Cincinnati arch, a major structural feature within the Interior Low Plateaus physiographic province (Fenneman, 1938). The topography of the area ranges from nearly flat to fairly rugged. The eastern part of the county is drained by Floyds Fork, and the rest of the county by smaller tributaries of the Ohio River. The physiographic units, based on topography and geology, include the Outer Blue Grass, Muscatatuck regional slope, Scottsburg lowland, and Knobs. The Muscatatuck regional slope and the Scottsburg lowland are subdivisions of the Outer Blue Grass, but they are treated as separate units in this report. The alluvial terraces along the Ohio River constitute a fifth physiographic subdivision.

That part of the county lying east of a line through Thixton, Jeffersontown, and Avoca is in the Outer Blue Grass. This dissected area, a part of the Lexington peneplain, is underlain by shale and limestone of Late Ordovician age. To the west the Outer Blue Grass grades into the Muscatatuck regional slope, a rolling surface developed on Silurian and Devonian limestones. Along a line connecting Okolona, Buechel, and Louisville the regional slope merges with the Scottsburg lowland, a plain of low relief which is underlain by shale of Late Devonian age. West and south of the lowland lies the Knobs, a highly dissected area developed on shale, sandstone, and limestone of Mississippian age. The eastern edge of this upland forms the so-called Knobstone escarpment.

The alluvial terraces along the Ohio River form a distinct physiographic unit. The river has carved a deep, wide channel through rocks ranging in age from Ordovician to Mississippian. Throughout nearly all its length in Jefferson County the river flows on glacial outwash, which has filled the old channel to a depth of 100 feet or more. The only exception to this is at the Falls of the Ohio where the river flows on exposed bedrock of Devonian age.

AVAILABILITY OF GROUND WATER

The occurrence of ground water in Jefferson County is controlled by several factors among which the nature of the openings in the rocks and the westerly regional dip are of prime importance. Limestone, sandstone, and shale make up the bulk of the consolidated rocks. Limestone may transmit large amounts of water through openings along joints and bedding planes enlarged by solution. Sandstone may transmit water through openings along bedding planes and joints and also through intergranular pores. Shale beds are important, not generally as water carriers, but because they may impede the upward or downward motion of water from other beds. Large quantities of ground water move through the intergranular openings in the unconsolidated sand and gravel of the alluvium (glacial outwash) along the Ohio River. Ground water moves in the bedrocks westward down the regional dip, and to some extent northward or northwestward across the dip, to discharge into the alluvium and thence to the Ohio River.

Except in the area of alluvial terraces along the Ohio River, about half the wells drilled in Jefferson County are failures as sources of household water supplies, because they either yield salty or sulfurous water or do not yield enough water. The following discussion explains the chances of obtaining a successful well in each of the physiographic subdivisions of the county. These subdivisions are outlined and numbered on plate 1. The water-bearing properties of the rock formations in the county are summarized in table 1; information on individual wells and springs is presented in tables 2 and 3; table 4 lists chemical analyses of water from some typical wells and springs; and figure 1 shows graphically the results of these analyses.

Area 1--Outer Blue Grass

The Outer Blue Grass, which includes about one-fifth the area of the county along the eastern boundary, is underlain by shale and limestone of Late Ordovician age. The shale beds total about 150 feet in thickness and erode to produce ridges separated by relatively broad, flat stream valleys.

The Outer Blue Grass is generally a poor place to try for a well. Of the 29 wells inventoried in this upland, only 11 yield enough water of a quality suitable for household use. Local drillers' reports suggest that the chances of obtaining a successful well are even poorer than indicated by these figures, because unsuccessful wells are filled up and eventually forgotten.

The Arnheim formation, 80 to 100 feet thick, is mostly coarse gray shale alternating with thin beds of blue limestone. This formation underlies most of the stream valleys in the Outer Blue Grass. Owing to its topographic position, much of the Arnheim formation is below the zone of effective ground water circulation, which does not extend far below stream level, and because of this produces salty or sulfurous water.

Above the Arnheim, the Waynesville limestone, about 40 feet thick, crops out along the valley sides. This argillaceous greenish limestone and shale yields water to a few drilled wells in its small outcrop area, and a few seeps are found along its contact with the Arnheim formation.

The Liberty formation overlying the Waynesville limestone, is a 40-foot bed of coarse blue shale and thin crystalline limestone. It is a poor prospect for a drilled well.

The Saluda limestone, a thick-bedded fine-grained dolomitic limestone, is about 40 feet thick. This limestone overlies the Liberty formation and caps most of the ridges in the Outer Blue Grass. Perched water generally occurs at the base of the Saluda, held up by the shales in the underlying Liberty formation. The outcrop areas of the Saluda limestone on the ridge tops are the most favorable sites for drilled wells in the Outer Blue Grass.

One sample of water collected for analysis contained 1.9 ppm of fluoride (well 28-12-1, table 4). This content is slightly but not markedly above the limit of 1.5 ppm recommended by the Public Health Service. No other sample collected for this report in the Outer Blue Grass or elsewhere in the county contained as much as 1.5 ppm.

Area 2--Muscatatuck Regional Slope

The Muscatatuck regional slope includes about two-fifths of the area of the county in a broad belt extending north to south across the central part of the county. A low eastward-facing cuesta separates the regional slope from the more highly dissected Outer Blue Grass (Butts, 1915). With the exception of the alluvial terraces along the Ohio River, the Muscatatuck regional slope is the most favorable area in the county to try for a drilled well. Of the 98 drilled wells inventoried, 68 yielded fresh water in amounts large enough for household and stock use. Twelve of the drilled wells yielded sulfur water and 18 were dry holes.

The Brassfield limestone is only 4 feet thick in Jefferson County and crops out as a narrow, irregular band along the east margin of the regional slope. The small thickness and area of outcrop make it of little importance as a source of water.

The Osgood formation, a calcareous gray shale and dolomitic limestone, also crops out in an irregular band west of Floyds Fork and in a few isolated patches to the east. The Osgood consists of a 6- to 8-foot layer of limestone and an underlying layer of shale about 20 feet thick. Water percolating down through fractures in the limestone reaches a perched water table held up by the underlying shale. Springs and seeps are common in the Osgood where the contact of the limestone and the underlying shale is exposed. Some springs yield as much as 25 gallons per minute (gpm) during the wet seasons. One spring, 8528-3816-4, yielded an estimated 25 gpm in March 1953 and was down to about half that flow by late July of that year. It is probable that some of the smaller springs dry up during extended summer droughts. The spring horizon is usually best developed where the formation crops out near the top of a ridge. Springs are rarely found where the contact of the limestone over shale is covered by a thick mantle of overburden.

The Laurel dolomite, a fine-grained bluish-gray dolomite about 40 feet thick, crops out in the valleys of east- and south-flowing streams in the vicinity of Middletown, Jeffersontown, and Fairmount. It yields water to some wells in its small outcrop area, but it is not likely to yield fresh water where it is overlain by the Waldron shale. More than half the wells inventoried in this formation are dry or yield salty or sulfurous water. A cavernous ledge several feet thick, near the base of the Laurel dolomite is the source of several springs.

The Waldron shale, a calcareous greenish-gray shale about 10 feet thick, caps the Laurel dolomite and underlies the Louisville limestone. It probably yields no water to wells, but it is important in that it holds up the water in the overlying Louisville limestone and restricts circulation of water in the underlying Laurel dolomite. At many exposures and road cuts, seeps can be found along contact between the Waldron and the overlying limestone.

The Louisville limestone, a thick-bedded dolomitic gray limestone, crops out over a broad north-south belt across the east-central part of the county. It is the principal aquifer in the Muscatatuck regional slope and its outcrop area covers about 60 square miles. The limestone is about 40 feet thick in the eastern part of its outcrop area and thickens to about 100 feet in the central part of the county. At many places the limestone is cavernous along joints and bedding planes and wells that intersect these openings usually yield a good supply of water. About 2 of 3 wells drilled in the Louisville limestone produce enough fresh water for household use. Many of the wells are equipped with electric lift or jet pumps. A few springs were found in the Louisville limestone just above the contact with the underlying Waldron shale.

The Jeffersonville limestone is a thick-bedded coarse-grained light- to dark-gray limestone about 20 feet thick. Above it is the Sellersburg limestone, a 14-foot limestone of variable character. These two limestones cap the highland areas in the northern part of the county and descend to valley level in places along the border of the Ohio River alluvial terraces. About 3 of 4 wells drilled in these limestones produce enough fresh water for household use. One spring in the Sellersburg limestone formerly served 11 tenant houses and a dairy barn but is now abandoned because a municipal water supply has become available.

Area 3--Scottsburg Lowland

The Scottsburg lowland, which includes a small area in the south-central part of the county, offers a better chance for a successful drilled well than the Outer Blue Grass but not so good as the Muscatatuck regional slope. Of the 12 drilled wells inventoried in the lowland, 6 produced enough fresh water for household use and 6 produced salty or sulfurous water.

The New Albany shale, a black fissile carbonaceous shale about 100 feet thick, underlies almost the entire lowland. It is probable that water obtained in wells comes from openings along fractures in the shale. According to one driller, wells can be obtained to depths as great as 40 feet. Below this depth openings in the shale are very small and no water or only a little salty or sulfurous water is generally obtained. The water in some of the wells contains enough iron to stain laundry and bathroom fixtures.

Because of the poor drainage in the tight shale, the water table during wet seasons stands within a few feet of the surface in much of the lowland area. Failure of septic tanks to function properly is common in this area.

Area 4--Knobs

The Knobs, a region of ridges, spurs, and knobs, is a small area in the southwestern part of the county. Some of the ridges are flat-topped, owing to a capping of thin but resistant limestones and sandstones. The typical knobs develop where these resistant caps are small or missing. The chances of obtaining a successful drilled well are about the same in the Knobs as in the Scottsburg lowland. However, the topography and geology of the Knobs are much more varied, and the chances of obtaining a successful well in some parts of the upland are much better than in other parts. Of 13 drilled wells inventoried in the Knobs, 8 produced enough fresh water for domestic use.

The New Providence shale, a soft green shale about 150 feet thick, crops out in the lower parts of the Knobs, especially along the eastern and northern boundaries where it merges with the Scottsburg lowland. A few successful wells were found in the outcrop area of the New Providence shale, but it is probable that less than half the wells drilled will be successful. The shale slakes readily and thus has a tendency to fill up any uncased hole in the formation.

The Kenwood sandstone, consisting of 40 feet of fine-grained gray to brown sandstone alternating with shale, caps a few of the knobs and low hills and crops out along the sides of the higher ridges. It yields water to a few wells in its outcrop area.

The Rosewood shale, a blue-gray siliceous shale about 190 feet thick, crops out in the southwestern third of the Knobs. A few successful wells have been obtained in the Rosewood shale in its outcrop area.

The Holtsclaw sandstone, a thick-bedded fine-grained blue-gray sandstone, is only 20 feet thick and crops out as a very narrow band near the top of the highest ridges in the Knobs. It probably yields some water to wells that are drilled into it through the overlying Warsaw limestone.

The Warsaw limestone is a fine-grained siliceous, argillaceous limestone containing geodes and chert. This 65- to 80-foot limestone caps the highest ridges in the Knobs. Some of the wells drilled on top of these ridges probably obtain water from the limestone and some from the underlying Holtsclaw sandstone.

Area 5--Ohio River Alluvial Terraces

The alluvial terraces on the Ohio River along the northwest boundary of the area include about one-fifth of the county. Almost every well drilled in the alluvium yields enough water of a quality satisfactory for household use. The water is generally hard, but can be softened for household use by commercial softeners.

Most of the wells in this area obtain water from the alluvium, but some industrial wells produce from the limestone bedrock beneath the alluvial sand and gravel. In 1952 about 25 million gallons of water per day was pumped from the alluvium for industrial use. Yields of about 100 gpm are average for industrial users and yields of more than 500 gpm are not uncommon.

The ground water conditions in this area have been described in detail by Rorabaugh (1946, 1956) and Rorabaugh, Schrader, and Laird (1953).

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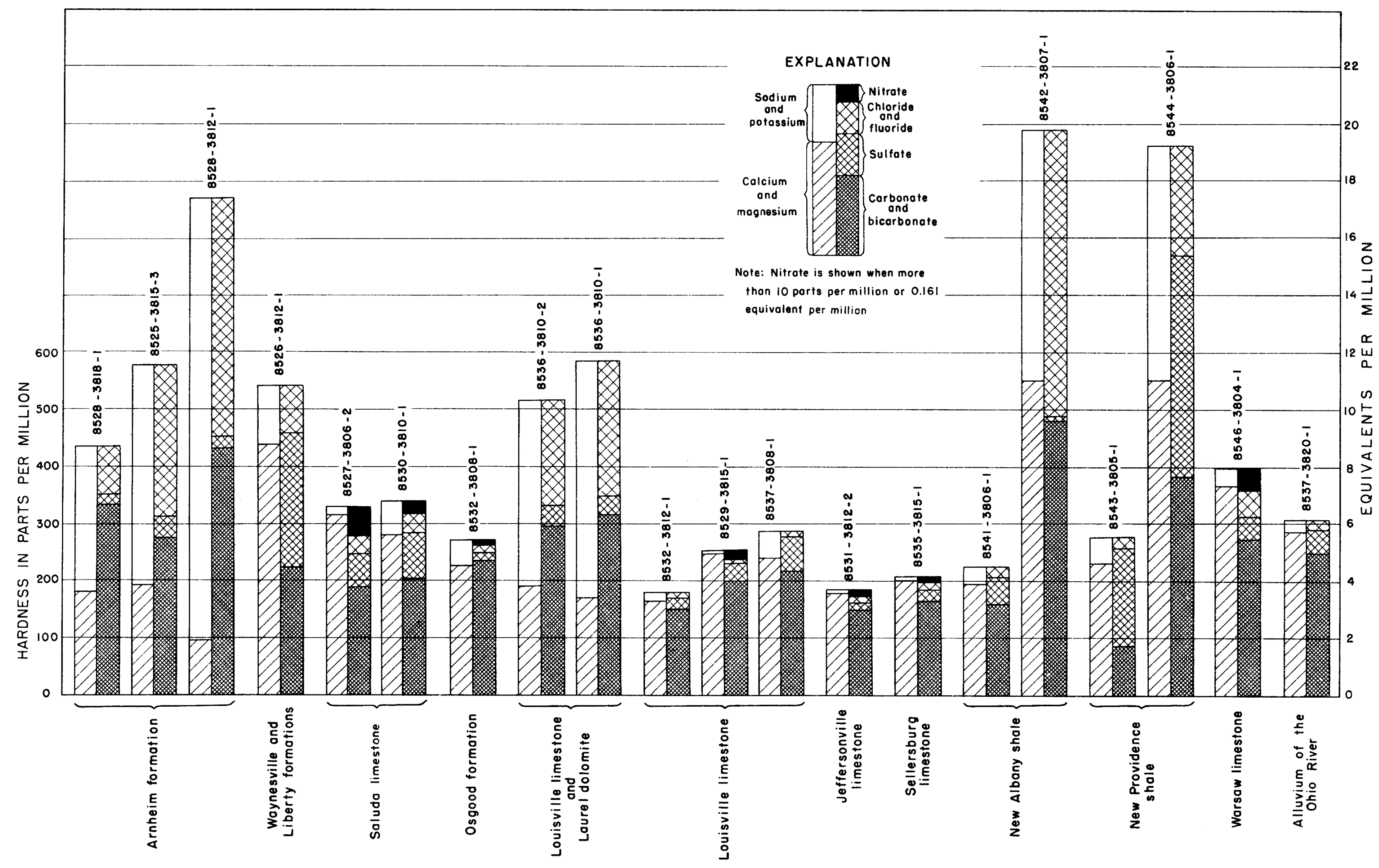

Figure 1--Bar diagram showing quality of water by formation in Jefferson County

Table 1.—Water-bearing formations in Jefferson County, Ky.

System	Series	Group	Formation	Thickness (feet)	Character of material	Water-bearing properties
Quaternary	Recent		Alluvium		Soil, clay, fine sand.	Not important as an aquifer.
	Pleistocene		Alluvium of glacial-outwash origin along the Ohio River	0-130	Gravel, sand, and clay deposited in the buried valley of the Ohio River.	Stores large quantities of fresh water. Yields of 100 to 500 gpm are common.
Mississippian		Meramec	Warsaw limestone	65-80	Fine-grained limestone with geodes and chert, siliceous and argillaceous. Some shale.	Yield some water to ridge-top wells.
		Osage	Holtsclaw sandstone	15-25	Fine-grained sandstone, thick-bedded, soft.	
			Rosewood shale	190	Bluish shale with thin lenses of limestone.	Not commonly a source of water.
			Kenwood sandstone	40	Thin beds of fine-grained greenish sandstone in bluish shale.	Yields some water to domestic wells.
			New Providence shale	150-160	Soft clay shale, green or bluish.	Not commonly a source of water.
Devonian	Upper		New Albany shale	90-100	Black shale, carbonaceous and fissile.	Yields water from openings along fractures. Water generally has high iron content.
	Middle		Sellersburg limestone	12-24	Light-gray limestone, thick bedded; upper bed coarse grained; lower bed fine grained.	Yield fresh water to wells in uplands. Springs occur along the contact between these limestones.
			Jeffersonville limestone	20-25	Coarse-grained dark-gray limestone, thick bedded	
Silurian	Niagara		Louisville limestone	40-100	Fine-grained thick-bedded dolomitic limestone.	Yields fresh water over most of its outcrop area.
			Waldron shale	8-12	Greenish shale, calcareous and magnesian.	Does not produce water. Impedes upward or downward movement of water.
			Laurel dolomite	30-40	Fine-grained dolomite, medium thick bedded.	Generally yields salty or sulfurous water. Many holes are dry.
			Osgood formation	22-30	Thick limestone bed with underlying bed of shale.	Forms spring horizon in many localities.
			Brassfield limestone	3-7	Coarsely crystalline limestone.	Not important as an aquifer owing to small thickness.
Ordovician	Cincinnatian	Richmond	Saluda limestone	30-40	Fine-grained limestone, thick bedded, magnesian.	Yields water to ridge-top wells.
			Liberty formation	36-50	Alternating shale and thin limestone.	Not commonly a source of ground water. Salty or sulfurous water occurs at shallow depths. Many holes are dry.
			Waynesville limestone	40-50	Thick-bedded limestone; shale at top and bottom.	
			Arnheim formation	80-100	Thin limestone interbedded with shale.	

WELL-NUMBERING SYSTEM USED IN JEFFERSON COUNTY

Jefferson County lies between 85°24' and 85°57' west longitude and 38°00' and 38°22' north latitude. The area has been subdivided by a grid of 1-minute meridians of longitude and 1-minute parallels of latitude. The wells and springs in each of these quadrangles are numbered, beginning with 1, in the order inventoried. A well is designated by a composite of three numbers: the first indicates the minute of longitude as the south edge of the quadrangle; the second, the minute of latitude as the east edge; and the third, the number of the well in that quadrangle. Thus, well 39-05-1 is the first well inventoried in the 1-minute quadrangle west of longitude 85°39' W. and north of latitude 38°05' N. The complete number is shown in the table; only the third part of the number is shown on the map.

Table 2.—Records of wells in Jefferson County, Ky., excluding large industrial wells in the Louisville alluvial area

Location: For location of wells see map.
Type of well: Dr, drilled; Du, dug; Dn, driven.
Depth of well: r, reported.
Geologic horizon: Al, Alluvium; Ar, Arnheim formation; B, Brassfield limestone; H, Holtsclaw sandstone; J, Jeffersonville limestone; K, Kenwood sandstone; L, Laurel dolomite; Li, Liberty formation; Lo, Louisville limestone; M, Maysville group; Na, New Albany shale; Np, New Providence shale; O, Osgood formation; R, Rosewood shale; S, Saluda limestone; Se, Sellersburg limestone; W, Waldron shale; Wa, Warsaw limestone; Wy, Waynesville limestone.
Below land surface: r, reported.
Lift: A, air lift; Ba, bailer; Bu, bucket; Ch, chain; Cy, cylinder; E, electric; H, hand; J, jet; P, piston; Tu, turbine; W, windmill.
Use: C, commercial; D, domestic; In, industrial; P, public supply; S, stock; U, unused.
Taste: 1, reported.

Well No.	Location	Owner or user	Driller	Date completed	Topographic situation	Altitude above sea level (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Geologic horizon of principal water-bearing bed	Water level: Below land surface measured (feet)	Water level: Date of measurement	Lift	Use	Taste	Remarks
24-13-1	1 mile south of Long Run	J. Harrod			Flat ridge top	770	Du	r32	48	Li,Wy	13.41	3-19-53	-	D,S	Good ^{1}	Never dry; unused at present.
24-15-1	¾ mile north of Long Run Church	M. H. Satterly			Stream bottom	650	Dr	48.9	6	Ar	8.36	3-16-53	J	D,S	do	Adequate; never dry.
25-11-1	Clark	J. Lashbrook		1950	Side of ridge	680	Dr	r50	6	Wy ?	16.03	4-22-53	Ba	D	do ^{1}	Never dry.
25-12-1	2 miles southeast of Eastwood	Frank Black			Ridge top	728	Du	11.8	-	Li	7.10	3-19-53	Cy,H	D	do ^{1}	Goes dry.
25-12-2	do	do			Stream valley	700	Dr	-	6	Wy,Ar	20.48	3-19-53	-	U	-	Never dry.
25-13-1	¾ mile southwest of Long Run	H. V. Bastion			Top of ridge	730	Dr	-	6	Li	9.79	3-18-53	-	U	-	Dry.
25-14-1	1 mile northeast of Boston	Paul Kelly			Valley bottom	640	Dr	r30-40	6	Ar	r6-7	3-17-53	E	D,S	Good ^{1}	Never dry.
25-15-1	1 mile north of Boston	R. L. Twyman			Upland	750	Du	16.4	48	O	10.67	3-16-53	E	D	do ^{1}	Goes dry; very hard water.
25-15-2	2 miles north of Long Run	J. W. Stafford			do	730	Dr	30	6	O	9.89	3-16-53	Cy,H	S	do	Never dry.
25-15-3	1½ miles northeast of Boston	J. E. Mitchell		1941	Ridge	640	Dr	44.5	6	Ar	12.54	3-17-53	J	S	Sulfur	Goes dry. Chemical analysis in table 4.
26-07-1	1½ miles east of Routt	Daniel Hawkins			Top of ridge	765	Du	25.8	48	Li	6.96	3-19-53	-	D	Good ^{1}	Never dry.
26-09-1	2 miles southwest of Clark	Clifton Allen			do	690	Du	27.5	48	Wy	15.49	3-19-53	Ch	S	do ^{1}	Goes dry.
26-10-1	2 miles southeast of Fisherville	P. A. Halbleib			Side of ridge	720	Dr	53.8	6	Li	18.34	3-19-53	Cy,H	U	-	Inadequate; goes dry.
26-11-1	1½ miles east of Fisherville	J. E. Wisehart			Small valley	620	Dr	r50	6	Ar	26.42	4-22-53	Cy,H	D	Good ^{1}	Inadequate; never dry.
26-12-1	1 mile northeast of Fisherville	Frank J. Schmid			Top of ridge	700	Du	r30	-	Li, Wy	15.06	3-18-53	Cy,H	D	do ^{1}	Never dry. Chemical analysis in table 4.
26-13-1	1 mile south of Eastwood	Mrs. Kate Harvin			Side of ridge	610	Du	-	60	Ar	3.07	4-22-53	Cy,H	D	do ^{1}	Goes dry.
26-14-1	½ mile west of Boston	Mary Monroe			Top of ridge	750	Du	-	-	S	-	-	Cy,H	D	do	
26-16-1	2½ miles north of Boston	Gilbert Hall		1911	Upland	760	Dr	-	6	L	-	-	Cy,H	U	do ^{1}	Never dry; hard water.
27-06-1	1¼ miles south of Routt	J. H. Shake			Top of ridge	740	Du	r27	96	S	8.18	3-20-53	Ch	D	do ^{1}	23 ft in rock; never dry.
27-06-2	do	do			do	743	Du	r30	204	S	-	-	Cy,H	S	Iron	23 ft in rock; never dry. Chemical analysis in table 4.
27-08-1	½ mile north of Routt	Mrs. Hattie M. Davis		1915	do	670	Dr	52.5	6	Ar	26.57	3-19-53	-	U	Good ^{1}	Inadequate.
27-10-1	1 mile south of Fisherville	Mr. Martion			do	720	Dr	r100	6	S,Li	-	-	-	U	do ^{1}	Never dry.
27-11-1	Fisherville	Mr. Robinson			Valley bottom	560	Dr	r50	6	Ar	-	-	Cy,H	D	do ^{1}	Inadequate; never dry.
27-13-1	½ mile south of Eastwood	Albert Bradshaw		1910	Top of ridge	710	Dr	r68	6	S,Li	1.30	3-18-53	Cy,H	D	do ^{1}	Never dry.
27-14-1	Eastwood	S. W. Singleton			Small stream valley	660	Du	21.5	60	Wy	4.65	4-22-53	Cy,H	U	do ^{1}	Do.
28-07-1	½ mile southwest of Routt	Mrs. H. R. Shelburne			Top of ridge	760	Du	r45-50	48	S	-	-	Cy,H	D	do ^{1}	Do.
28-09-1	½ mile east of confluence of Cane Run and Floyds Fork.	J. J. Butler			Stream bottom	580	Du	23.1	48	Al	5.16	3-19-53	Ch	D	do ^{1}	Do.
28-10-1	1 mile southwest of Fisherville	Mrs. Alfred Knapp			Top of ridge	712	Du	-	-	Li	-	-	Cy,H	D	do ^{1}	Do.
28-11-1	½ mile west of Fisherville	Ralph Baskett			Stream bottom	553	Dr	51	6	Ar	37.71	3-19-53	J,E	U	Salt	Inadequate; goes dry.
28-12-1	2 miles southwest of Eastwood	L. Oesterritter			do	570	Dr	r90	6	Ar	-	-	J,E	S	do	Never dry. Chemical analysis in table 4.
28-12-2	1 mile northwest of Fisherville	Grosscurth Distillery			do	575	Dr	r100	8	Ar,M	-	-	Tu,E	In	Sulfur	Inadequate. Rate of yield 125 gpm reported.
28-12-3	do	do			do	-	Dr	r60	8	Ar	-	-	Tu,E	In	Good ^{1}	
28-13-1	2 miles southwest of Eastwood	L. Oesterritter			do	570	Dr	r40	6	Ar	r7	3-18-53	J,E	D,S	do ^{1}	Adequate; never dry. Chemical analysis in table 4.
28-14-1	1¼ miles west of Eastwood	Walter Osborne			Side of ridge	700	Dr	r280	6	Ar,M	8.15	3-18-53	Cy,H	U	Salt	Well begins in Liberty formation and ends in Eden formation. Never dry.
28-14-2	do	do			do	695	Du	25	36	Li	19.8	3-18-53	Cy,H	D	Good ^{1}	Goes dry.
28-16-1	1¼ miles north of Beckley	William S. Kammerer			Top of ridge	645	Du	29.8	36	Li	11.50	3-16-53	Cy,H	U	do ^{1}	Do.
28-17-1	2½ miles north of Beckley	Henry Rothenburger			do	690	Dr	r86	6	L	-	-	Cy,H	C	do ^{1}	Never dry.
28-17-2	do	do			do	690	Dr	r100	6	O	-	-	Cy,E	S	do ^{1}	Do.
29-05-1	2 miles west of Whitfield	Arch Brown			do	700	Du	22.5	48	O	12.68	3-20-53	J,E	D	do ^{1}	Goes dry.
29-11-1	2 miles west of Fisherville	Judge J. Hancock	Albert Shacklette	1953	Stream bottom	550	Dr	r65	6	Ar	-	-	Cy,H	U	Sulfur	
29-11-2	do	do			do	550	Du	-	60	Ar	6.86	4-22-53	-	U	Good ^{1}	Goes dry. Well polluted.
29-12-2	2½ miles northwest of Fisherville.	Mrs. Marvin Gaddie			Side of ridge	610	Du	12	36	Wy	1.94	3-18-53	Cy,H	D	do ^{1}	Never dry.
29-13-1	2 miles southwest of Eastwood	A. C. Durr			do	670	Du	30.5	48	S,Li	12.81	3-18-53	Bu	S	-	Do.
29-14-1	1¾ miles northwest of Eastwood	E. C. Thompson			Small ravine	715	Du	21.5	60	Li	14.40	4-22-53	Ch	D	Good ^{1}	Goes dry in winter.
29-15-2	¼ mile northeast of Avoca	Nick Verberg			Top of ridge	720	Dr	r120	8	Lo	-	-	-	U	-	Cased to 10 ft. Dry.
29-16-1	1½ miles south of Pewee Valley	Will Bush			Small valley	695	Dr	r100	-	L,O	-	-	Cy,H	D,S	Good	Well begun in Waldron shale. Never dry.
29-17-1	1 mile south of Pewee Valley	Karl Klemenz			Top of ridge	700	Dr	r55-60	6	L	17.10	3-17-53	Cy,H	D	do	Never dry. Iron deposit.
30-06-1	2 miles east of Thixton	Lawrence Davenport			Stream bottom	550	Dr	-	6	Wy,Ar	-	-	Cy,H	D	Sulfur	Never dry.
30-08-1	¼ mile northeast of Seatonsville	Mr. Skaggs			do	515	Du	16.7	36	Ar	6.75	3-24-53	Cy,H	D	Good	Goes dry.
30-09-2	1 mile south of Hopewell	W. E. Francis			Top of ridge	680	Du	r14	-	Li	2.76	3-26-53	Ch	D	do ^{1}	Never dry.
30-10-1	½ mile northeast of Hopewell	Mrs. R. E. Patterson			do	730	Du	23	-	S	3.61	3-26-53	Cy,E	D	-	Goes dry. Chemical analysis in table 4.
30-11-1	¾ mile north of Hopewell	Howard Moody			Ravine	710	Du	r30	48	S	6.59	3-25-53	Cy,H	D	Good	Never dry.
30-13-1	2 miles northeast of Tucker	W. J. Deppen			Top of ridge	705	Dr	36	6	S	13.49	4- 3-53	Cy,H	D,S	Slight sulfur	Do.
30-14-1	1½ miles east of Middletown	C. Combest			Upland	770	Dr	r81	6	L,O	-	-	Cy,H	S	Iron salt ?	Never dry. Chemical analysis in table 4.
36-06-1	2 miles west of Fairmount	J. F. Farmer			Upland	690	Dr	r43	6	Lo	20.25	3-23-53	J,E	D	Good	Never dry.
36-07-1	3 miles southwest of Fern Creek	Paul Stine			Rolling plain	680	Dr	r70	6	Lo	-	-	J,E	D	do	Do.
36-07-2	do	do			do	680	Dr	41.5	6	Lo	29.04	3-27-53	Cy,H	U	do ^{1}	Adequate.
36-08-1	2 miles southwest of Fern Creek	G. M. Cahoe			Rolling upland	660	Dr	-	6	Lo	-	-	J,E	D	do	Never dry.
36-09-1	1 mile west of Fern Creek	Mrs. Znarski			do	680	Dr	35	6	Lo	12.27	3-27-53	Cy,H	S	do	Do.
36-10-1	½ mile north of Wildwood	James A. Sippel			Creek bottom	585	Dr	r100	6	Lo,L	-	-	J,E	D	Sulfur	Never dry. Polluted. Chemical analysis in table 4.
36-10-2	do	do			do	585	Dr	r65	6	Lo,L	13.14	3-27-53	Cy,H	U	do	Never dry. Water is black. Chemical analysis in table 4.
36-11-1	2 miles west of Jeffersontown	H. M. Shehan	John Harden	1951	Rolling upland	610	Dr	r106	6	Lo	-	-	J,E	D	Good ^{1}	Never dry.
36-13-1	1¾ miles south of Lyndon	Ray McPike			Rolling upland	600	Du	15	-	Lo	12.50	3-27-53	Cy,H	D	-	Inadequate. Water muddy.
36-15-1	Lyndon	Mr. Grandstaff			Flat upland	565	Dr	r75	6	Na,Se	-	-	J,E	D	Good ^{1}	Never dry.
36-16-1	½ mile north of Lyndon	C. Nachard			Rolling upland	580	Dr	r85	6	J,Lo	25.47	3- 2-53	Cy,H	D	do	Well located at approximate contact of Devonian, Sellersburg, and Jeffersonville limestones. Never dry. Slightly sulfurous with heavy use.
36-18-1	½ mile northwest of Springdale	B. F. Eifler			Flat upland	630	Dr	r135	6	J,Lo	35.50	4- 2-53	Cy,H	U	Slight sulfur	Inadequate.
36-20-1	¾ mile south of Prospect	L. L. Downer			End of ridge	560	Dr	r122	6	Lo	39.60	4- 2-53	None	U	Salt ^{1}	Never dry. Water became salty with disuse.
36-21-1	Prospect	Mr. Hensley	Mr. Collier (tenant)	1948	Stream bank	490	Dr	r34	6	Al	r17	4- 2-53	J,E	D	Good ^{1}	34 ft to rock. Never dry.
37-05-1	3¼ miles west of Thixton	V. Senniger			Rolling upland	630	Dr	r118	6	Lo	-	-	J,E	D	do ^{1}	Never dry.
37-06-1	4 miles west of Fairmount	Ed Kaufman			Stream valley	610	Dr	r30	6	Lo	15.86	4- 7-53	Ba	D,S	do ^{1}	Do.
37-07-1	3 miles west of Fairmount	W. Kaufman			do	633	Dr	r24	6	Lo	-	-	J,E	D,S	do ^{1}	Do.
37-08-1	Highview	William O. Gotthardt			Flat plain	680	Dr	21	6	Lo	3.02	3-27-53	Ba	D	do	Never dry. Chemical analysis in table 4.
37-09-1	2 miles northeast of Smyrna	John H. Kiefer			Top of ridge	640	Dr	55	6	Lo	31.60	4- 9-53	A,E	D	do ^{1}	Never dry.
37-09-2	do	do			do	640	Dr	86	6	Lo	50±	4- 9-53	Cy,W	D,S	do	Do.
37-10-1	2 miles west of Fern Creek	Mrs. Kattau			Rolling upland	590	Dr	r70	6	Lo	-	-	Cy,H	U	do ^{1}	Inadequate; goes dry.
37-11-1	1¼ miles east of Buechel	W. Foreman			Flat lowland	555	Dr	r65	6	Lo	23.64	4-10-53	Cy,H	D	do ^{1}	Goes dry.
37-13-1	¾ mile north of Hikes Point	Mr. Monahan			Rolling upland	535	Du	10	60	J	9.6	4-23-53	Bu	D	do ^{1}	Only 0.4 ft of water in well.
37-17-1	2½ miles northeast of St. Matthews.	Mr. Kruer	Diehl Pump & Co. Supply	1945	Flat upland	595	Dr	r145	6	J,Lo	71.00	4- 6-53	J,E	D	do	Never dry.
37-20-1	¼ mile west of Prospect	Mr. Trowel		1923 ?	River bottom	460	Dn	r40	1½	Al	-	-	Cy,H	D,S	do	Never dry. Temperature 51°F. Chemical analysis in table 4.
37-22-1	1 mile northeast of Prospect	Mrs. Schmiedeknecht			do	460	Dr	r175	6	-	-	-	Cy,H	D	do ^{1}	Never dry.
38-05-1	5½ miles east of Coral Ridge	W. Dolt			Creek bank	530	Dr	r250	6	Lo	-	-	J,E	D	Slight sulfur	Do.
38-06-1	5 miles east of Coral Ridge	Mr. Wieseman			Flat upland	630	Dr	r105	6	Lo	-	-	? E	D	Good ^{1}	Do.
38-07-1	4 miles west of Fairmount	Mr. Cummins			do	630	Dr	r70	6	Lo	40.40	4- 7-53	Cy,H	D	do	Do.
38-07-2	¼ mile east of Smyrna	New subdivision	John Harden	4-22-53?	Rolling upland	630	Dr	r40	6	Lo	r25	4-21-53	None	D	-	Hole will be 60 ft when completed. Depth to top of water-bearing bed, 6 ft.
38-08-1	¾ mile north of Smyrna	C. A. Goatley	Mark Smyser	1948	Top of ridge	610	Dr	r70	6	Lo	32.34	4- 9-53	Cy,H	D,S	Good	Never dry.
38-10-1	1 mile east of Petersburg	L. Bishoff			Upland	550	Dr	r170	6	Lo,L	-	-	Cy,H	D,S	Sulfur ^{1}	Do.
38-11-1	Buechel	Mrs. C. P. Kaiser			Flat lowland	510	Dr	r38	6	Se,J	-	-	Cy,H	D	Good ^{1}	Do.
38-12-1	1 mile northeast of Buechel	A. Snider			-	510	Dr	38	6	Lo	12.31	4-13-53	Cy,H	D	do	Never dry. Gets sulfurous in summer.
38-18-2	½ mile southeast of Goose Creek	J. A. Wilcox			Dissected upland	575	Dr	-	6	Lo	-	-	Cy,H	U	-	Adequacy unknown.
39-05-1	4 miles east of Coral Ridge	C. Faulkner			Head of small stream	590	Dr	-	6	Lo	-	-	Cy,H	D	Good ^{1}	Never dry.
39-06-1	do	W. Ferring			do	585	Dr	r60	6	Lo	-	-	Cy,H	D	do ^{1}	Do.
39-07-1	2 miles southeast of Okolona	Mr. Farmer			Dissected flatland	585	Dr	r65	6	Lo	28.15	4- 7-53	Cy,H	D	do	Do.
39-08-1	2 miles east of Okolona	W. B. Bradley			do	510	Dr	r65	6	Lo	-	-	J,E	D,S	do ^{1}	Do.
39-10-1	½ mile south of Petersburg	Mr. Burgess			Flat upland	500	Dr	r73	6	Se,Lo	34.30	4-10-53	Cy,E	D	Strong sulfur	Do.
39-10-2	do	do			do	490	Dr	r100	6	Se,Lo	-	-	Cy,H	D	Good ^{1}	Do.
39-11-1	1 mile southwest of Buechel	Mrs. Mary Starks			do	490	Du	r18	48	Na,Se	4.73	4-13-53	Bu	D	do ^{1}	Do.
39-12-1	1 mile north of Buechel	F. J. Hahn			do	495	Dr	r50	6	Se,J	8.50	4-13-53	Cy,H	D	do ^{1}	Goes dry. Owner reports wells 80 ft or more get salt water.
39-12-2	do	do			do	495	Dr	r64	6	Se,J	8.84	4-13-53	None	U	-	Dry hole.
39-17-1	2 miles north of St. Matthews	Mrs. J. Waters			Head of ravine	560	Dr	r85	-	-	-	-	-	U	-	Well unused since 1914.
40-05-1	3 miles east of Coral Ridge	E. Shepherd			Flat lowland	555	Dr	r67	6	Lo	52.54	4- 7-53	Cy,H	D	Good ^{1}	Never dry.
40-06-1	2 miles south of Okolona	O. Alexander			Stream valley	535	Dr	r60	6	Lo	-	-	Cy,H	U	do	Inadequate, never dry.
40-07-1	1½ miles southeast of Okolona	Mr. Manning			Dissected flatland	550	Dr	r85	6	Lo	-	-	Cy,H	U	do ^{1}	Never dry.
40-08-1	Okolona	Albert Markwell			Flat lowland	471	Dr	r70	6	Na,Se	.74	4-13-53	Cy,H	D	Sulfur ^{1}	Do.

30-15-1	1 mile east of Anchorage	T. E. Hagan			Bank of creek	680	Dr	50	6	Lo,L	18.13	4- 1-53	Cy,H	D	Good	Goes dry.
30-16-1	1 mile east of Berrytown	Elmo Wilson			Stream valley	693	Dr	-	-	Lo	-	-	J,E	D,S	do	Never dry.
30-17-1	O'Bannon	J. H. Pritchard			Rolling upland	765	Dr	-	6	J	-	-	Cy,H	D,S	do	Do.
31-05-1	2½ miles east of Thixton	J. I. Greer			Top of ridge	690	Du	-	48	L,O	-	-	Cy,H	D	do[1]	Do.
31-06-1	do	T. L. Ellingsworth			Creek bottom	500	Dr	r27	6	Ar	3.15	3-20-53	Cy,H	D	Sulfur	Do.
31-07-1	Seatonsville	Mrs. Jean			Side of creek	530	Dr	-	6	Ar	-	-	Cy,H	S	Iron	Goes dry.
31-09-1	2 miles north of Seatonsville	Mrs. William McMahan			Top of ridge	670	Du	20	-	S	8.08	3-24-53	Cy,H	U	Muddy[1]	Never dry.
31-10-1	1 mile west of Hopewell	Mrs. B. B. Miller			do	715	Du	21	36	B,S	6.26	3-24-53	Bu	D	Good[1]	Do.
31-11-1	½ mile south of Tucker	Mrs. Burton			Flat upland	740	Dr	r40	6	L	-	-	J,E	D	do	Do.
31-15-1	Anchorage	Mr. Peggre			Flat upland	730	Dr	-	6	Lo	-	-	Cy,H	U	Good[1]	Goes dry with pumping.
31-15-2	Berrytown	Dr. J. Johnson	Mr. Weller	1936	Small valley	730	Dr	r67	6	J,Lo	-	-	Cy,E	D	do[1]	Never dry.
31-16-1	½ mile north of Berrytown	Mr. McKercher			Low ridge	745	Dr	-	6	J	-	-	Cy,E	D	do[1]	Goes dry with pumping. Polluted.
31-17-1	¼ mile northwest of O'Bannon	Crawford Arterburn	Albert Shacklette		Small valley	735	Dr	r60	6	Lo	13.16	4- 1-53	Cy,H	D	do	Never dry.
31-18-1	1 mile southwest of Pewee Valley	Mrs. Marvin Keys			Stream bank	730	Dr	r100	6	Lo,L	-	-	J,E	D	do[1]	Do.
32-06-1	1 mile east of Thixton	Mrs. Virginia Wheeler			Foot of ridge	515	Du ?	-	24 ?	Wy,Ar	-	-	Cy,H	D	do	Do.
32-07-1	1½ miles southwest of Seatonsville.	Willis Rosson	John Harden	1949	Stream bottom	505	Dr	r60	6	Ar	12.33	3-20-53	Ba	D	Sulfur	Rock at 22 ft. Never dry.
32-09-1	2½ miles northwest of Seatonsville.	Albert Bryant			Top of ridge	670	Du	15	-	S	5.30	3-24-53	Ch	D	Good[1]	Inadequate.
32-11-1	1 mile east of Jeffersontown	Mrs. Roy Gaddie			Flat upland	670	Du	25	-	S	15.72	3-25-53	Cy,H	S	do	Never dry.
32-13-1	2½ miles northeast of Jeffersontown.	D. R. Hickey			Rolling upland	740	Dr	86	6	Lo,L	66.88	3-30-53	Cy,H	U	do[1]	Never dry. Some sulfur when drilled.
32-13-2	do	E. G. Hinman	Albert Shacklette	1953	do	725	Dr	r100	6	Lo	48.82	3-30-53	None	-	do[1]	New well; 150 gallons per hour on bailer.
32-14-1	½ mile south of Middletown	Mrs. L. A. Poleo	John Harden	1952	do	724	Dr	r120	6	Lo	-	-	J,E	D	do[1]	New well; 180 gallons per hour on pump.
32-14-2	Middletown	Site of new filling station on U. S. Highway 60.	Mr. Birdwell	1953	Low valley	685	Dr	r55	6	L	r50	3-26-53	None	C	Sulfur[1]	Being drilled. Depth to top of water-bearing bed, 7 ft. Log available.
32-15-1	Griffytown	Mr. Welsh			Rolling upland	710	Dr	39	6	Lo	18.64	4- 1-53	Cy,H	S	Good	Inadequate.
32-17-1	2 miles north of Anchorage	A. L. Rothenburg	Albert Shacklette		do	717	Dr	r100	6	J,Lo	39.97	4- 1-53	J,E	D	do[1]	Never dry.
32-19-1	Ballardsville	W. P. Moore			Small valley	720	Du	22	-	Lo	16.27	4- 1-53	None	U.	do[1]	Adequacy unknown.
33-04-1	1½ miles southeast of Thixton	Albert T. Dennis			Side of ridge	500	Dr	r60	6	Wy	2.67	3-20-53	Cy,H	D	do[1]	Never dry.
33-05-1	¼ mile south of Thixton	Mr. Carrithers			Flat upland	678	Dr	r90	6	L,O	-	-	Cy,H	D	do[1]	Do.
33-06-1	½ mile east of Fairmount	Charles Farman			Side of valley	490	Dr	-	6	Wy	-	-	Cy,H	D,S	do[1]	Do.
33-07-1	1 mile west of Ashville	James Caudill	John Harden		Flat upland	675	Dr	r65	6	L,O	18.37	3-20-53	Cy,H	D	do[1]	Do.
33-08-1	1½ miles southeast of Fern Creek	Mrs. Robert Haag			Rolling upland	695	Dr	-	6	L	14.60	3-25-53	Cy,H	U	-	Do.
33-09-1	2 miles east of Fern Creek	T. A. Berry			Head of ravine	730	Dr	r85	6	Lo,L	-	-	Cy,H	D	Good[1]	Do.
33-10-1	2 miles south of Jeffersontown	Mrs. James C. Goodman			Top of hill	640	Du	21	36	S	14.43	3-26-53	None	U	-	Goes dry.
33-11-1	Jeffersontown	E. L. Snider			Side of hill	685	Dr	75	6	O,S	27.19	3-26-53	Cy,H	D	Good	Never dry.
33-12-1	½ mile north of Jeffersontown	Bundine Courtney	Mr. Weller	1947 ?	Creek bottom	655	Dr	r40	6	L,O	-	-	Cy,H	D	do	Inadequate.
33-13-1	1½ miles north of Jeffersontown	Noble Wellard			Creek bank	690	Dr	r80	6	L,O	19.64	3-26-53	Ba	D	do[1]	Well starts in Waldron shale; bottoms in Brassfield limestone. Never dry.
33-13-2	do	J. A. Boner			Dissected upland	700	Dr	86	6	L,O	24.04	3-26-53	None	U	Sulfur[1]	Adequacy unknown.
33-14-1	1 mile west of Middletown	C. E. Peyton			Rolling upland	680	Dr	54.5	6	J,Lo	16.65	3-30-53	Cy,E	D	Good[1]	Never dry. Polluted.
33-15-1	¼ mile northwest of Griffytown	Mrs. Ross	Albert Shacklette	1952	Flat upland	700	Dr	r122	6	J,Lo	-	-	J,E	D	do[1]	Adequacy unknown.
33-16-1	½ mile west of Lakeland	B. H. Kinkaid	do	1949 ?	do	675	Dr	r85	6	Lo	-	-	J,E	D	do[1]	Never dry.
33-17-1	1 mile north of Lakeland	Mr. Wiegel	William Zaring	1950	Rolling upland	700	Dr	r100	6	J,Lo	33.23	4- 1-53	J,E	D	do[1]	Never dry. Temperature 54° F. Chemical analysis in table 4.
33-18-1	Worthington	Mrs. Sims			Flat upland	695	Dr	-	6	J	-	-	Cy,H	D	do[1]	Adequacy unknown.
34-05-2	½ mile southwest of Thixton	Mrs. L. Parker	John Harden	1947	Rolling upland	650	Dr	90	6	L,O,S	5.78	3-23-53	None	U	-	Dry hole.
34-06-1	½ mile north of Thixton	H. V. Lancoster			do	687	Dr	21.5	6	Lo	10.80	3-23-53	Cy,H	D,S	Good	Never dry.
34-08-1	1¼ miles southeast of Fern Creek	J. W. Hill	Albert Shacklette	1945	do	680	Dr	r60	6	L,O	20.88	3-25-53	Ba	D	do[1]	Do.
34-09-1	1 mile east of Fern Creek	L. Workman	Mr. Dillingham	1952	do	735	Dr	r200	6	Lo	-	-	J,E	D	do[1]	Do.
34-10-1	1¼ miles south of Jeffersontown	New subdivision	do	3-25-53	Flat upland	740	Dr	r115	6	Lo,L	r60	3-25-53	None	D	-	Depth to top of water-bearing bed, 22 ft. Cased to 26 ft. 150 gallons per hour on bailer. Log available.
34-11-1	Jeffersontown	Mr. Kern			do	720	Dr		6	Lo	-	-	Cy,H	D	Good[1]	Probably inadequate.
34-13-1	2 miles northwest of Jeffersontown.	Fred Hoke			Rolling upland	670	Dr	r60	6	Lo	-	-	Cy,H	D,S	do[1]	Never dry.
34-16-1	½ mile west of Lakeland	Mr. Meissner			Flat upland	665	Dr	r65	6	J	24	4- 3-53	Cy,H	D,S	do[1]	Do.
34-17-1	1½ miles northwest of Lakeland	L. J. Kaelin			Rolling upland	670	Dr	r60	6	J,Lo	41.30	4- 1-53	Cy,H	S	do[1]	Do.
34-18-1	½ mile southwest of Worthington	E. A. Burger			Flat upland	680	Dr	-	6	J	-	-	Cy,H	D	do[1]	Do.
35-05-1	1½ miles southwest of Thixton	H. E. Thacker			Upland	675	Dr	r98	6	Lo ?	48.51	3-23-53	J,E	D	do[1]	Do.
35-06-1	1 mile west of Fairmount	C. F. Wallingsford			Creek bank	615	Dr	r126	6	L	13.18	3-23-53	Ba	S	do[1]	Inadequate.
35-06-2	1½ miles west of Fairmount	Mr. Gray	Albert Shacklette	4-21-53	Rolling upland	630	Dr	r90	6	Lo	-	-	None	D	-	Depth to top of water-bearing bed, 2 ft. Cased to 5½ ft. Very little water. Log available.
35-07-1	½ mile east of Fairmount	Farmer Brown			Stream valley	660	Dr	r60	6	Lo	-	-	Cy,H	S	Good[1]	Never dry.
35-08-1	1 mile southwest of Fern Creek	Mrs. L. F. Marlow			Rolling upland	690	Dr	r96	6	Lo	-	-	J,E	D	do[1]	Do.
35-09-1	¼ mile north of Fern Creek	Mrs. V. Wise	Mr. Rush		Head of ravine	720	Dr	r35	6	Lo	4.62	3-27-53	Cy,H	D	do	Do.
35-11-1	2 miles west of Jeffersontown	F. E. Strait			Top of hill	663	Dr	r52	6	Lo	32.11	3-27-53	Cy,H	D,S	do[1]	Inadequate.
35-12-1	½ mile west of Jeffersontown	E. W. Flick			Flat upland	672	Dr	-	6	Lo	17.60	3-27-53	Cy,H	D	do	Never dry.
35-13-1	2 miles northwest of Jeffersontown.	Mrs. J. E. Bischoff			Rolling upland	650	Dr	45	6	Lo	7.48	3-30-53	Cy,H	U	Sulfur[1]	Adequacy unknown.
35-17-1	Springdale	E. Schneider			Flat upland	635	Dr	15.5	6	J	-	-	None	U	-	Dry.
35-17-2	do	do			do	635	Dr	69	6	J,Lo	17.09	4- 2-53	Cy,H	U	Good[1]	Adequacy unknown.
36-04-1	3 miles southwest of Thixton	Otis Reed	Mr. William Smith	1949 ?	Upland	570	Dr	r125	6	L,O	-	-	Cy,H	D	do	Well starts in Laurel dolomite; bottoms in Saluda limestone. Goes dry.
40-09-1	½ mile west of Newburg	Mrs. G. T. Kaufman			do	473	Dr	25	6	Na	5.71	4-13-53	None	U	Iron[1]	Do.
40-11-1	1 mile southwest of Buechel	Site of former church			do	480	Dr	41.5	6	Na	10.33	4-13-53	Cy,H	U	-	Adequacy unknown.
41-05-1	2 miles east of Coral Ridge	E. E. McCawley			do	520	Dr	-	6	Na,Se	2.38	4- 7-53	P	D	Iron[1]	Never dry. Chemical analysis in table 4.
41-06-1	2½ miles east of Coral Ridge	J. Black			do	505	Dr	24.5	6	Lo	16.53	4- 7-53	Ba	D	Good[1]	Goes dry.
41-07-1	½ mile south of Okolona	Mr. Akridge			do	467	Dr	-	6	Na	2.71	4-13-53	J,E	D	Sulfur[1]	Never dry.
41-08-1	Okolona	Marion Mobley			do	462	Dr	-	6	Na	4.94	4-13-53	Cy,H	U	do[1]	Do.
41-09-1	1½ miles northeast of Okolona	Mr. Cox			do	460	Dr	r43	6	Na	2.36	4-13-53	Cy,H	U	do[1]	Do.
41-10-1	2 miles north of Okolona	James Shain			do	470	Dr	-	6	Na	5.54	4-13-53	Cy,H	S	Muddy[1]	Do.
42-05-1	2 miles east of Coral Ridge	Mr. Phillips			Side of hill	540	Dr	r75	6	Na,J	-	-	? E	D	Good[1]	Do.
42-06-1	2 miles northeast of Coral Ridge	W. M. Reed			Foot of hill	480	Dr	r35	6	Na	1.12	4- 7-53	Ba	D	do[1]	Do.
42-07-1	2 miles southwest of Okolona	Joseph Pendelton			Flat lowland	460	Dr	-	6	Na	3.58	4-13-53	Cy,H	U	Sulfur[1]	Never dry. Chemical analysis in table 4.
42-08-1	Okolona	Jeff Harvey			do	465	Dr	-	6	Na	4.95	4-13-53	None	U	-	Well plugged below water level.
42-09-1	1¾ miles northwest of Okolona	G. T. Herbert	Mr. Birdwell	1948	do	460	Dr	r53	6	Na	r3	4-14-53	Cy,H	D	Sulfur	Never dry. Water is black; sulfurous odor.
43-05-1	Coral Ridge	Mr. Shaughnessy			Foot of hill	500	Du	15	36	Np	2.20	4- 9-53	P	D,S	Good[1]	Never dry. Polluted. Chemical analysis in table 4.
43-06-1	1 mile northeast of Coral Ridge	Albert Gibson			do	515	Du	r19	48	Np	.91	4- 9-53	None	D	Sulfur	New well; adequacy unknown. Chemical analysis in table 4. Log available.
43-07-1	1¼ miles north of Coral Ridge	M. Brown			Flat lowland	475	Du	16	36	Np	1.33	4- 9-53	Bu	D	do	Never dry.
43-10-2	1 mile east of Standiford Field	J. George Young			do	480	Dr	r52.5	6	Na,Se	-	-	Cy,H	D	Iron	Do.
44-05-1	½ mile southwest of Coral Ridge	Mr. Dezern			Side of hill	530	Du	r10	96	Np	-	-	None	D	Good[1]	This is a cistern which produces a good flow of water from the top of the New Providence shale.
44-06-1	Coral Ridge	A. Graham			Flat lowland	470	Dr	r43	6	Np	-	-	Cy,H	S	Salt	Never dry. Chemical analysis in table 4.
44-08-1	2¾ miles west of Okolona	George Shultheis			do	455	Du	r30	36	Na	2.90	4-14-53	Cy,H	S	Good[1]	Never dry.
45-05-1	1 mile south of Fairdale	Mr. Hutcherson			Valley	500	Du	r15	48	Np	6.15	4-17-53	Bu	D	do[1]	Do.
45-06-1	½ mile northeast of Fairdale	C. R. Churchman			Flat lowland	465	Du	r20	48	Np	2.34	4-17-53	None	U	do[1]	Do.
45-08-1	1 mile south of Auburndale	Mrs. Josephine Sheeley			do	460	Du	-	60	Na	2.09	4-15-53	Ch	U	do[1]	Do.
45-09-1	Strawberry Lane, Louisville	E. R. Thacker			do	475	Du	18	72	Na	2.67	4-15-53	None	D	do[1]	Do.
46-04-1	Mitchell Hill	Jess Weick			Top of ridge	850	Dr	r90	6	Wa,H	-	-	Cy,H	D	Iron[1]	Never dry. Chemical analysis in table 4.
46-05-1	2 miles southwest of Fairdale	Tom Wallace Lake	Mr. Birdwell	7-20-48	Small ravine	610	Dr	r269	6	Np,Na	4.96	4-17-53	None	U	Salt[1]	Adequacy unknown. Log available.
46-06-1	¾ mile west of Fairdale	Mr. Martin			Foot of ridge	475	Du	r32	48	Np	1.58	4-16-53	Cy,H	D	Good[1]	Never dry.
46-07-1	2 miles northwest of Fairdale	F. C. Churchman			Side of ridge	460	Du	r32	60	Na	2.13	4-15-53	None	U	do[1]	Well bottomed in shale at 32 ft. Never dry.
46-08-1	¾ mile south of Auburndale	Robert Gesler			Flat lowland	457	Du,Dr	21	48-6	Na	2.03	4-15-53	Cy,E	S	Iron[1]	Never dry.
47-05-1	1½ miles southwest of Fairdale	Phillip Fisher			Valley	525	Du	r14	48	Np	4.10	4-17-53	Bu	D	Good[1]	Adequate for four families. Never dry.
47-06-1	2 miles west of Fairdale	Mr. Meschade			Foot of hill	460	Du	r20	48	Na	2.98	4-16-53	Cy,E	D	Sulfur	Goes dry.
47-08-1	1 mile southwest of Auburndale	H. Baker			do	460	Du	r30	48	Na	1.60	4-15-53	None	U	Iron	Never dry.
47-09-1	2 miles south of Shively	Mr. Nichols			Side of ridge	550	Du	50.5	60	Np	12.75	4-14-53	Cy,H	-	-	Adequacy unknown.
47-10-1	1¼ miles southeast of Shively	R. W. Bradley	Mr. Birdwell	1952	do	520	Dr	r100	6	Na,Np	-	-	J,E	D	Salt	Never dry.
48-04-1	2 miles west of Mitchell Hill	William H. Wilson			do	590	Dr	r72	6	R	r10	4-16-53	Cy,H	D	Iron	Do.
48-05-1	3 miles southeast of Valley Station.	Mr. Davenport			do	515	Du	-	48	Al	-	-	Cy,H	D	-	Do.
48-06-1	3 miles east of Valley Station	O. B. Tilford			Foot of hill	450	Dr	r36	4	Al,Np	7.57	4-16-53	Cy,H	D	Iron	Yields about 30 gallons per hour. Inadequate.
48-07-1	2 miles southeast of Pleasure Ridge.	W. Wells			Valley	540	Du	-	-	Np	8.50	4-14-53	Cy,H	D	Good[1]	Never dry. Chemical analysis in table 4.
48-07-2	do	Mr. Dittebenner			Small ravine	520	Dr	r97	6	Np	28.39	4-14-53	None	U	-	Dry; some gas.
48-08-1	1½ miles east of Pleasure Ridge	John Kippes			Top of ridge	645	Du	r15	60	R	1.70	4-14-53	Bu	S	Good[1]	Never dry.
48-09-1	1 mile west of Iroquois Park	George Hargesheimer			End of ridge	540	Du	r25	60	Np	14.96	4-14-53	Cy,H	D	do[1]	Do.
48-10-1	1½ miles south of Shively	R. A. Eades	Mr. Birdwell	1948	Top of ridge	570	Dr	r125	6	Np,Na	-	-	Cy,H	D	do[1]	Inadequate; 30 gpd.
49-04-1	3 miles southeast of Valley Station.	C. H. Koch			Small ravine	500	Du	16	48	Np	5.39	4-16-53	Cy,H	D	do[1]	Never dry.
49-05-1	2 miles east of Valley Station	A. Embry			Foot of ridge	465	Du	r20	48	Al	3.95	4-16-53	Cy,H	D	do	Do.
49-08-1	1 mile southeast of Pleasure Ridge.	John Janes			Side of ridge	520	Du	r60	-	R,K	3.01	4-15-53	Bu	D	do[1]	Do.
49-09-1	1 mile northeast of Pleasure Ridge.	Mr. Caplinger	Mr. Birdwell		Top of ridge	530	Du,Dr	r240	72-6	Np,Na	23.65	4-14-53	Cy,H	U	do[1]	Do.
50-03-1	3 miles east of Meadow Lawn	Jefferson County Forest	do		Deep ravine	545	Dr	r125	6	R,K	-	-	Cy,H	P	do	Adequacy unknown.
50-04-1	2¾ miles southeast of Valley Station.	Mr. Spiess			Stream valley	475	Dr	r175	6	K	2.48	4-16-53	Cy,H	D	Iron	Never dry.
50-05-1	2 miles southeast of Valley Station.	J. M. Orange	W. T. Birdwell		do	455	Dr	r85	6	Al,Np	r30	4-17-53	J,E	D	Good[1]	Do.
50-06-1	1¼ miles east of Valley Station	A. C. Thieneman			Flat lowland	480	Du	15	36	Al	6.10	4-15-53	Cy,H	U	do[1]	Do.
50-07-1	1 mile south of Pleasure Ridge	Mrs. P. Pence			Side of ridge	500	Dr	-	6	R,K	-	-	Cy,H	D	do	Formerly supplied five families. Never dry.
51-04-1	1 mile east of Meadow Lawn	Frank Franzell			Foot of ridge	480	Du	r35	48	Al	21.46	4-17-53	Cy,H	D	do[1]	Never dry.
51-05-1	1½ miles south of Valley Station	Mrs. A. B. Chism			River flood plain	460	Dr	-	6	Al	-	-	Cy,E	D	do[1]	Do.
51-06-1	Valley Station	L. M. Sanders			do	450	Dr	-	6	Al	30±	4-15-53	Cy,H	U	do	Do.
52-03-1	½ mile southeast of Meadow Lawn	Mr. Williams			do	440	Dn	r65-70	1½	Al	-	-	Cy,E	D,S	do[1]	Do.
52-04-1	Orel	A. Seely			do	440	Dn	-	1½	Al	-	-	Cy,H	U	-	Adequacy unknown.
52-05-1	1½ miles east of Valley Station	C. W. Caswell			do	455	Dr	-	6	Al	-	-	Cy,E	S	Good[1]	Never dry.
53-03-1	¾ mile southwest of Meadow Lawn	Mr. Nail			do	440	Dn	-	1½	Al	-	-	Cy,H	D	-	Do.
53-04-1	¼ mile northwest of Orel	J. P. Kelly			do	435	Dr	r60	4	Al	-	-	Cy,E	D	Good[1]	Do.
54-01-1	Kosmosdale	Mrs. C. Wright			do	440	Dn	-	2	Al	-	-	Cy,E	D,S	do[1]	Do.
54-02-5	¼ mile north of Kosmosdale	J. T. Davis			do	440	Dn	r61	2	Al	-	-	J,E	S	do[1]	Do.
55-00-1	2 miles southwest of Kosmosdale	Mr. Eubank			do	435	Dn	r80	2	Al	-	-	Cy,H	D	Iron[1]	Do.
55-01-1	1 mile southwest of Kosmosdale	R. Thompson			do	430	Dn	r78	2	Al	-	-	Cy,H	D	Good[1]	Do.

Table 3.--Records of springs in Jefferson County, Ky.

Geologic horizon: Ar, Arnheim formation; J, Jeffersonville limestone; Li, Liberty formation; Lo, Louisville limestone; O, Osgood formation; S, Saluda limestone; Se, Sellersburg limestone; Wy, Waynesville limestone.
Use: D, Domestic; S, Stock.

Number	Location (on pl. 1)	Owner or name	Topographic situation	Altitude above mean sea level (feet)	Principal water-bearing bed		Structure	Openings		Improvements	Estimated yield (gpm)	Date of measurement	Dependability	Use	Taste	Odor	Color	Temperature (°F)	Remarks
					Character	Geologic horizon		Number	Character										
27-15-1	1 1/2 miles north of Eastwood	Fore O'Bryen	Side of ridge	680	Limestone	S	Flat-lying beds	-	Bedding planes	Bricked up, overflow pipe and galvanized tank	5	3-17-53	Goes dry	S	Good	None	Clear	54	Chemical analysis in table 4.
27-16-1	1 2/5 miles north of Beckley	A. W. Debold	Hillside	690	do	S	do	-	Joints and bedding	Stone springhouse	5	3-16-53	Never dry	S	-	do	do	49	
28-15-1	1/2 mile northeast of Beckley	Ralph Drury	Gentle slope	675	do	Li	do	-	Bedding planes	Tile pipe and watering trough	4	3-16-53	Goes dry in summer	S	-	do	do	54	
28-16-2	1 1/4 miles north of Beckley	William S. Kammerer	Bluff on side of stream	640	do	Li	do	-	Joints and bedding	Stone retaining wall	3	3-16-53	do	S	-	do	do	59	
28-16-3	1 1/2 miles north of Beckley	Mrs. Carl Woods	Side of hill	680	do	O	do	-	Bedding planes	Concrete tank, electric pump	1-2	3-16-53	Never dry	D	Good	do	do	52	
28-16-4	do	do	do	680	do	O	do	-	Bedding and joints	None	25	3-16-53	do	None	do	do	do	53	Good flow even in summer (personal observation).
29-09-1	1 3/4 miles north of Seatonville	R. Reed	Bank of stream	540	Limestone and shale	Ar	do	-	Bedding planes	Stone retaining wall	3	4-22-53	Goes dry in summer	D,S	do	do	do	52	
29-12-1	2 1/2 miles northwest of Fisherville	Marvin Gaddie	Side of ridge	620	Limestone	Wy	do	-	do	Stone springhouse	5	3-18-53	Never dry	S	-	do	do	54	
29-15-1	1/2 mile northeast of Avoca	James A. Marson	Top of ridge	720	do	Lo	do	1	Crevice	Springhouse, hand-lift pump	-	-	do	D	Good	do	do	53	Chemical analysis in table 4.
30-07-1	1/2 mile east of Seatonville	Joe Morsey	Side of ridge	525	do	Ar	do	1	Bedding plane	None	1-2	3-24-53	do	D	do	do	do	50	
30-09-1	1 mile northeast of Seatonville	Mrs. Miller Elridge	Stream bottom	520	do	O	do	-	-	Springhouse, electric pump	2-3	3-24-53	do	D	do	do	do	53	
31-12-1	1 mile north of Tucker	Herman Knauer	Side of low bluff	700	do	O	do	1	Bedding and joints	Large springhouse, concrete tank, electric pump	7	3-30-53	do	D,S	do	do	do	53	Used to supply public swimming pool. Chemical analysis in table 4.
31-13-1	1 mile south of Middletown	H. Helmers	Side of small hill	670	do	O	do	1	Bedding planes	Springhouse	2-3	4- 3-53	do	None	do	do	do	53	
31-17-1	1/2 mile north of O'Bannon	Crawford Arterburn	Stream valley	730	do	J	do	1	do	None	7-10	4- 1-53	do	do	do	do	do	54	Spring is on Jeffersonville Louisville contact. Chemical analysis in table 4.
31-18-2	1 mile southwest of Pewee Valley	Marvin Keys	do	720	do	Lo	do	1	Bedding and joints	Stone wall with storage basin	1-2	4- 1-53	do	S	-	-	-	52	
32-08-1	1 mile northwest of Seatonville	J. R. Johnson	Bluff on side of stream	660	do	O	do	1	Bedding planes	Storage basin and pipeline to house	3-4	3-24-53	do	D	Good	None	Clear	53	Chemical analysis in table 4.
32-12-1	1 1/2 miles northeast of Jeffersontown	Joe Jeffries	Side of small stream	715	do	Lo	do	1	do	Stone retaining wall	3-4	3-30-53	Goes dry in summer	S	do	do	do	51	Spring is on Louisville-Waldron contact. Chemical analysis in table 4.
32-18-1	Ballardsville	W. P. Moore	Creek bottom	690	do	Lo	do	-	do	Brick springhouse electric pump	-	-	-	D	do	do	do	52	Do.
34-05-1	1/2 mile southwest of Thixton	Mrs. Lloyd Parker	do	640	do	O	do	1	Bedding and joints	Discharge pipe	1	3-23-53	Goes dry in summer	D	do	do	do	54	
34-19-1	1/2 mile northwest of Worthington	E. Von Almen	Head of stream valley	645	do	J	do	-	Bedding planes	Springhouse, reservoir, electric pump	3-4	4- 2-53	Never dry	D	do	do	do	53	
35-15-1	1 mile east of Lyndon	Mr. Eline	Small stream valley	585	do	Se	do	-	do	Springhouse and electric pump	4	4- 3-53	do	D,S	do	do	do	54	Beargrass Creek now ponded and floods spring. Chemical analysis in table 4.
35-16-1	1 1/2 miles northeast of Lyndon	J. Van Greenwell	do	610	do	Lo	do	-	do	Springhouse and reservoir	-	-	do	S	-	do	do	47	Supplies 28 head of cattle.
36-19-1	2 miles south of Prospect	Mr. McCurdy	Side of small stream	550	do	Lo	do	-	do	Springhouse and electric pump	2-3	4- 2-53	do	D	Good	do	do	54	
39-09-1	Newburg	J. W. Oliver	Lowlands	480	do	Lo	do	-	do	do	-	-	do	D,S	do	do	do	-	

Table 4.—Chemical analyses of water from wells and springs in Jefferson County, Ky.

Analyses U. S. Geological Survey

[Chemical constituents given in parts per million. Iron: a, in sediment and solution]

Well number	Depth of well (feet)	Water-bearing formation	Date of collection	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$	Specific conductance at 25°C (micromhos)	pH
Area 1-Outer Blue Grass																					
Wells																					
25-15-3	49	Arnheim	3-17-53	-	-	0.41	-	-	-	-	-	336	0	36	186	0.7	1.8	-	194	1,150	-
26-12-1	30	Liberty, Waynesville	3-18-53	-	-	1.4	-	-	-	-	-	274	0	226	59	.2	1.3	-	440	950	-
27-06-2	30	Saluda	3-20-53	-	-	1.4	-	-	-	-	-	190	20	57	22	.2	60	-	316	628	-
28-12-1	90	Arnheim	3-18-53	-	-	.25	-	-	-	-	-	440	43	19	255	1.9	5.1	-	98	1,600	-
28-13-1	40	do	4-21-53	-	-	.29	-	-	-	-	-	362	24	17	52	.8	3.6	-	180	794	-
30-10-1	23	Saluda	3-26-53	-	-	.35	-	-	-	-	-	248	0	78	22	.2	26	-	280	630	-
Springs																					
27-15-1	-	do	3-17-53	54	-	.51	-	-	-	-	-	230	0	39	14	.1	74	-	308	603	-
31-12-1	-	Osgood	3-30-53	53	-	.28	-	-	-	-	-	226	0	25	4.5	.0	9.7	-	262	402	-
32-08-1	-	do	3-24-53	53	-	.44	-	-	-	-	-	284	0	14	8.5	.0	12	-	224	475	-
Area 2-Muscatatuck Regional Slope																					
Wells																					
30-14-1	81	Osgood, Laurel	3-26-53	-	-	8.9	-	-	-	-	-	480	0	1,580	12	.4	.3	-	2,000	2,870	-
33-17-1	100	Jeffersonville, Louisville	4- 1-53	54	-	.23	-	-	-	-	-	310	0	22	7.5	.0	15	-	302	516	-
36-10-1	100	Louisville, Laurel	3-27-53	-	-	.45	-	-	-	-	-	386	0	32	163	1.3	.8	-	170	1,150	-
36-10-2	65	do	3-27-53	-	-	a.69	-	-	-	-	-	360	0	35	126	1.1	4.4	-	192	1,030	-
37-08-1	21	Louisville	3-27-53	-	-	1.1	-	-	-	-	-	266	0	58	4.0	.4	4.1	-	242	515	-
Springs																					
29-15-1	-	do	3-17-53	53	11	.49	.00	52	29	3.1	1.0	226	9	29	5.0	.1	21	275	248	460	8.3
31-17-2	-	Jeffersonville	4- 1-53	54	-	.27	-	-	-	-	-	184	0	12	7.5	.1	14	-	180	321	-
32-12-1	-	Louisville	3-30-53	51	-	.16	-	-	-	-	-	186	0	18	3.1	.1	5.9	-	164	323	-
35-15-1	-	Sellersburg	4- 3-53	54	-	.33	-	-	-	-	-	200	0	20	9.5	.0	13	-	202	377	-
Area 3-Scottsburg Lowland																					
Wells																					
41-05-1	?	New Albany	4- 7-53	-	-	25	-	-	-	-	-	196	0	46	12	.2	.2	-	196	409	-
42-07-1	?	do	4-13-53	56	-	.37	-	-	-	-	-	588	0	7.8	350	.4	5.8	-	552	1,910	-
Area 4-Knobs																					
Wells																					
43-05-1	15	New Providence	4- 9-53	50	-	.77	-	-	-	-	-	106	0	165	8.0	.1	8.0	-	230	517	-
43-06-1	19	do	4- 9-53	51	-	.56	-	-	-	-	-	74	0	64	17	.2	4.7	-	158	309	-
44-06-1	43	do	4- 9-53	59	-	14	-	-	-	-	-	468	0	372	132	.5	2.2	-	550	1,700	-
46-04-1	90	Warsaw	4-17-53	57	-	.68	-	-	-	-	-	330	0	40	34	.0	46	-	366	736	-
48-07-1	?	New Providence	4-14-53	53	-	13	-	-	-	-	-	32	0	47	13	.2	27	-	178	258	-
Area 5-Ohio River Terraces																					
Wells																					
37-20-1	40	Alluvium	4- 3-53	51	-	1.9	-	-	-	-	-	302	0	41	10	.0	3.8	-	288	531	-