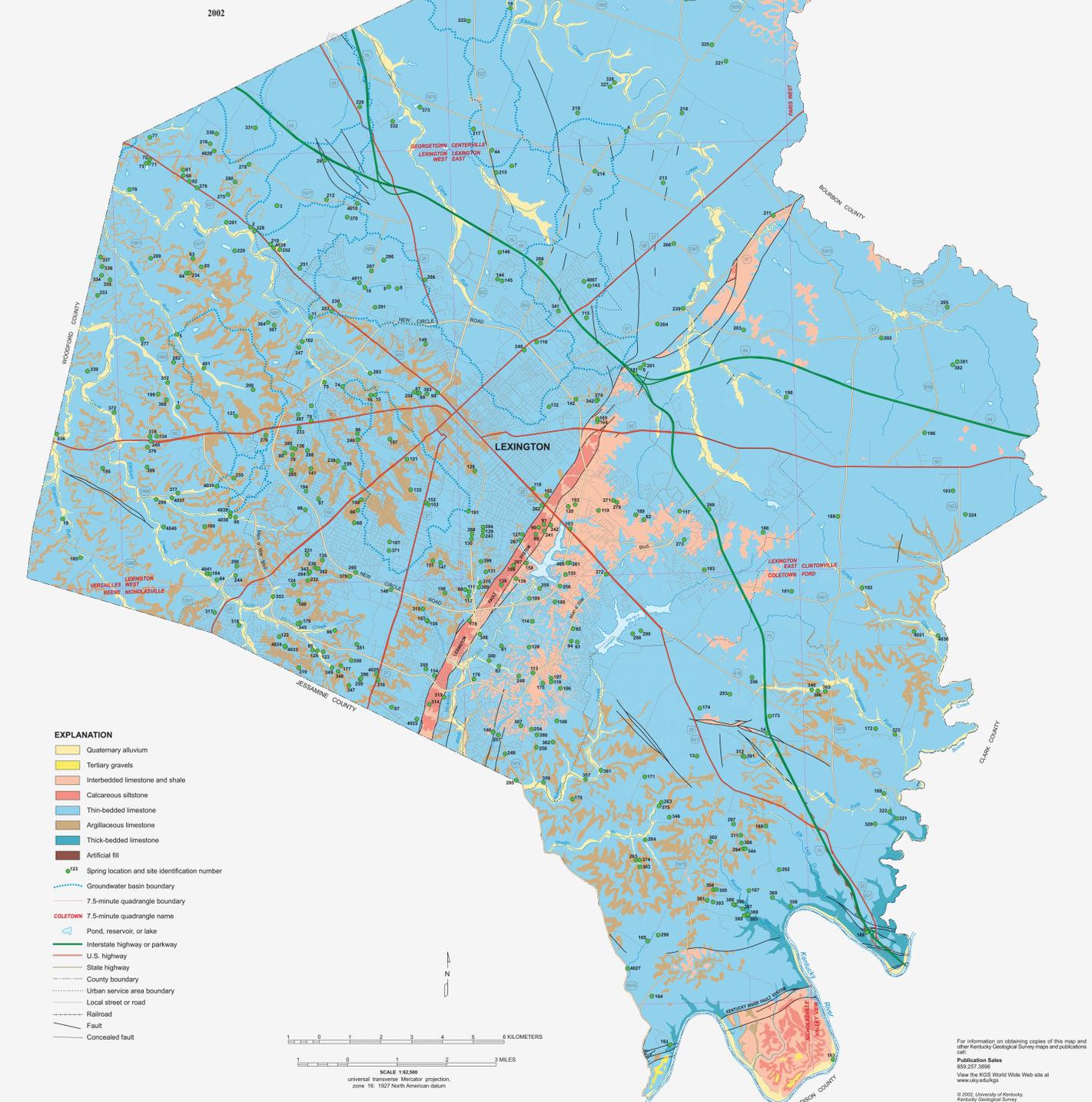


Inventory of Karst Springs of Fayette County, Kentucky

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EXPLANATION

- Quaternary alluvium
- Tertiary gravels
- Interbedded limestone and shale
- Calcareous siltstone
- Thin-bedded limestone
- Argillaceous limestone
- Thick-bedded limestone
- Artificial fill
- Spring location and site identification number
- Road, reservoir, or lake
- Interstate highway or parkway
- U.S. highway
- State highway
- County boundary
- Urban service area boundary
- Local street or road
- Concealed fault

SCALE 1:42,500
zone 18 North American datum, universal transverse Mercator projection, zone 18, 1927 North American datum

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Introduction

The purpose of this publication is to document karst springs in Fayette County and provide a resource to help the county's citizens understand the geologic hazards associated with karst development. It may be used as an aid in locating potential groundwater discharge points in case of hazardous material spills, and to provide a foundation for future studies of the karst geology and karst landscape in Fayette County.

It is also a basic historical record of the springs of Fayette County. Although over 300 springs are reported here, this inventory is not complete. At the time of publication, only 141 of a field inventory of karst springs had been investigated. Fortunately, many springs in the uninvested areas were already known and recorded in the Kentucky Geological Survey (KGS) database and are included in this publication.

The spring locations shown are mostly those discharging from karst conduits, but also include any significant number of soil seeps or water-wear springs (epikarst), and some springs apparently discharging from fractures created by faults. The springs vary in size from seasonal seeps to permanent flows with flows varying from a few gallons per minute to several million gallons per day. As the rapid pace of urban development continues in Fayette County, some natural springs reported here will become buried, and the records used to compile this publication will be an important resource in the future for reestablishing natural from man-made groundwater discharge points.

Methodology

In an urban setting such as Fayette County, many springs have been routed into culverts to control drainage and maximize the amount of buildable land. Therefore, only springs discharging from some stream beds have been reported. Also, many springs reported here as springs or thought to originate as natural groundwater discharges. This inventory was compiled from work by a variety of investigators and agencies, including geologists, hydrologists, and water users. Substantial field notes were also taken but have not been verified in the field by KGS staff. Users are cautioned to verify the suitability and accessibility of springs for their intended purpose before using in Fayette County.

Many of the data reported here were compiled into the groundwater database of the Kentucky Geological Survey from sources covering a period of several years. Some of these data were reported in the Kentucky Geological Survey's *Geology of Fayette County* (Thurhill and others, 1982). Some data are from field investigations by the Kentucky Geological Survey staff. Among the data in the database that do not have a source are data for springs reported as 900000 through the National Urban Stormwater Evaluation (NURSE) (Hoffman and Whitman, 1994), conducted by the U.S. Department of Energy. The NURSE model is a computerized field work conducted by the Kentucky Geological Survey staff.

Kentucky Geological Survey staff determined that reported sites are natural seeps or springs. The origin of flow from all discharge points was assessed using the information in the KGS database, supplemented with field notes where available, and by field investigation for some locations. The criterion used to determine if a site was a natural spring included the occurrence of rock outcroppings, the persistence and volume of flow (seasonal, intermittent, etc.), characteristics of the stream bed (strange or such as channelized) into which the spring discharges, and the presence or absence of aquatic organisms. The documented topographic and cultural settings of the discharge point, the history of the site, and the presence of man-made structures such as culverts or drainage ways were also taken into consideration. Water chemistry and temperature of the discharge were measured at those sites visited in the field. It was generally assumed that the stream water was the same as the groundwater from which the discharge originates.

The database records for the NURSE sites did not provide descriptive information. Although the accuracy of this data is largely unknown, a few of sites were checked in the field by KGS staff and, in all cases, the sites could be found, and they were determined to be natural springs.

The geologic map of Fayette County used as the basis for plotting locations was compiled from digitized representations of the geologic maps of Fayette County, Kentucky, by the Kentucky Geological Survey. The geologic map of Fayette County is based on the work of Garrison Silstone, Lexington, Lexington, and High Bridge Group have been simplified into five lithologies based on the relative abundance of carbonate (limestone) in each stratigraphic interval. Faults, as mapped on the 7.5-minute maps, are also illustrated.

Where the Springs Are Located

In the general Bluegrass Region and Fayette County has been well understood for 50 years, although the details remain mostly unknown. Springs discharge precipitation that has seeped or flowed into the subsurface within a catchment area, a karst groundwater basin. The karst geology of Fayette County is well understood, but the details of karst geology are not as well understood as a significant amount of the county remains unexplored. Research on how to locate the best location for drilling water wells into the karst aquifers has yielded some promising results. Research on how to locate the best location for drilling water wells into the karst aquifers has yielded some promising results. Research on how to locate the best location for drilling water wells into the karst aquifers has yielded some promising results.

A groundwater basin is a deep groundwater zone discharging to springs along base-level streams (Thurhill and others, 1982). Apparent evidence for the existence of a karst groundwater basin in Fayette County is the presence of karst features such as sinkholes, springs, and caves. Springs are located where geologic and hydrologic conditions result in groundwater flow being directed to the surface. Most springs in Fayette County are karst springs, and many are located in the Bluegrass Region. Springs are located where geologic and hydrologic conditions result in groundwater flow being directed to the surface. Most springs in Fayette County are karst springs, and many are located in the Bluegrass Region.

Springs occur along the banks of the larger local streams in the county because the fractures and bedding planes in the limestone are commonly filled with water. In some cases, the water in the fractures is under pressure and can flow out of the rock into the stream. Springs occur along the banks of the larger local streams in the county because the fractures and bedding planes in the limestone are commonly filled with water. In some cases, the water in the fractures is under pressure and can flow out of the rock into the stream.

The shallow perched water table near the surface is called a perched water table. Perched water tables are common in the Lexington limestone. The presence of a perched water table is not absolutely necessary for the groundwater to flow to the surface. The shallow perched water table near the surface is called a perched water table. Perched water tables are common in the Lexington limestone. The presence of a perched water table is not absolutely necessary for the groundwater to flow to the surface.

In contrast, some major local streams, especially Cave Run, have few springs along their stream channel because the groundwater is flowing deep below the channel to a larger regional, lower elevation, karst groundwater basin. The karst geology of Fayette County is well understood, but the details of karst geology are not as well understood as a significant amount of the county remains unexplored. Research on how to locate the best location for drilling water wells into the karst aquifers has yielded some promising results.

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Springs also occur in fault zones where the bedrock has been fractured by the movement of the fault in the geologic past. In some cases, the depth in the fault zone is shallow, and the water in the fractures is under pressure and can flow out of the rock into the stream. Springs also occur in fault zones where the bedrock has been fractured by the movement of the fault in the geologic past. In some cases, the depth in the fault zone is shallow, and the water in the fractures is under pressure and can flow out of the rock into the stream.

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Quadrangle Name: Centreville

ID #	AKG#A Number	Field Number	Latitude	Longitude	Elevation	Receiving Water Body	Flow Type	Flow Type
1	90000152	gfd303	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
2	90000153	gfd304	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
3	90000154	gfd305	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
4	90000155	gfd306	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
5	90000156	gfd307	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
6	90000157	gfd308	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
7	90000158	gfd309	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
8	90000159	gfd310	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
9	90000160	gfd311	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
10	90000161	gfd312	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
11	90000162	gfd313	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
12	90000163	gfd314	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
13	90000164	gfd315	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
14	90000165	gfd316	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
15	90000166	gfd317	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
16	90000167	gfd318	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
17	90000168	gfd319	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
18	90000169	gfd320	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
19	90000170	gfd321	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
20	90000171	gfd322	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
21	90000172	gfd323	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
22	90000173	gfd324	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
23	90000174	gfd325	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
24	90000175	gfd326	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
25	90000176	gfd327	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
26	90000177	gfd328	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
27	90000178	gfd329	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
28	90000179	gfd330	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
29	90000180	gfd331	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
30	90000181	gfd332	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
31	90000182	gfd333	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
32	90000183	gfd334	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
33	90000184	gfd335	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
34	90000185	gfd336	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
35	90000186	gfd337	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
36	90000187	gfd338	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
37	90000188	gfd339	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
38	90000189	gfd340	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
39	90000190	gfd341	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
40	90000191	gfd342	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
41	90000192	gfd343	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
42	90000193	gfd344	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
43	90000194	gfd345	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
44	90000195	gfd346	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
45	90000196	gfd347	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
46	90000197	gfd348	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
47	90000198	gfd349	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
48	90000199	gfd350	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
49	90000200	gfd351	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
50	90000201	gfd352	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
51	90000202	gfd353	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
52	90000203	gfd354	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
53	90000204	gfd355	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
54	90000205	gfd356	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
55	90000206	gfd357	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
56	90000207	gfd358	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
57	90000208	gfd359	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
58	90000209	gfd360	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
59	90000210	gfd361	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
60	90000211	gfd362	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
61	90000212	gfd363	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
62	90000213	gfd364	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
63	90000214	gfd365	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	perennial
64	90000215	gfd366	38° 07' 44"	84° 20' 44"	800	North Elkhorn Creek	unknown	