



2011

Mapped Karst Groundwater Basins in the Somerset 30 x 60 Minute Quadrangle

James C. Currens

University of Kentucky, currens@uky.edu

Randall L. Paylor

University of Kentucky

Joseph A. Ray

Kentucky Energy and Environment Cabinet

Robert J. Blair

Kentucky Energy and Environment Cabinet

Right click to open a feedback form in a new tab to let us know how this document benefits you.

Follow this and additional works at: https://uknowledge.uky.edu/kgs_mc



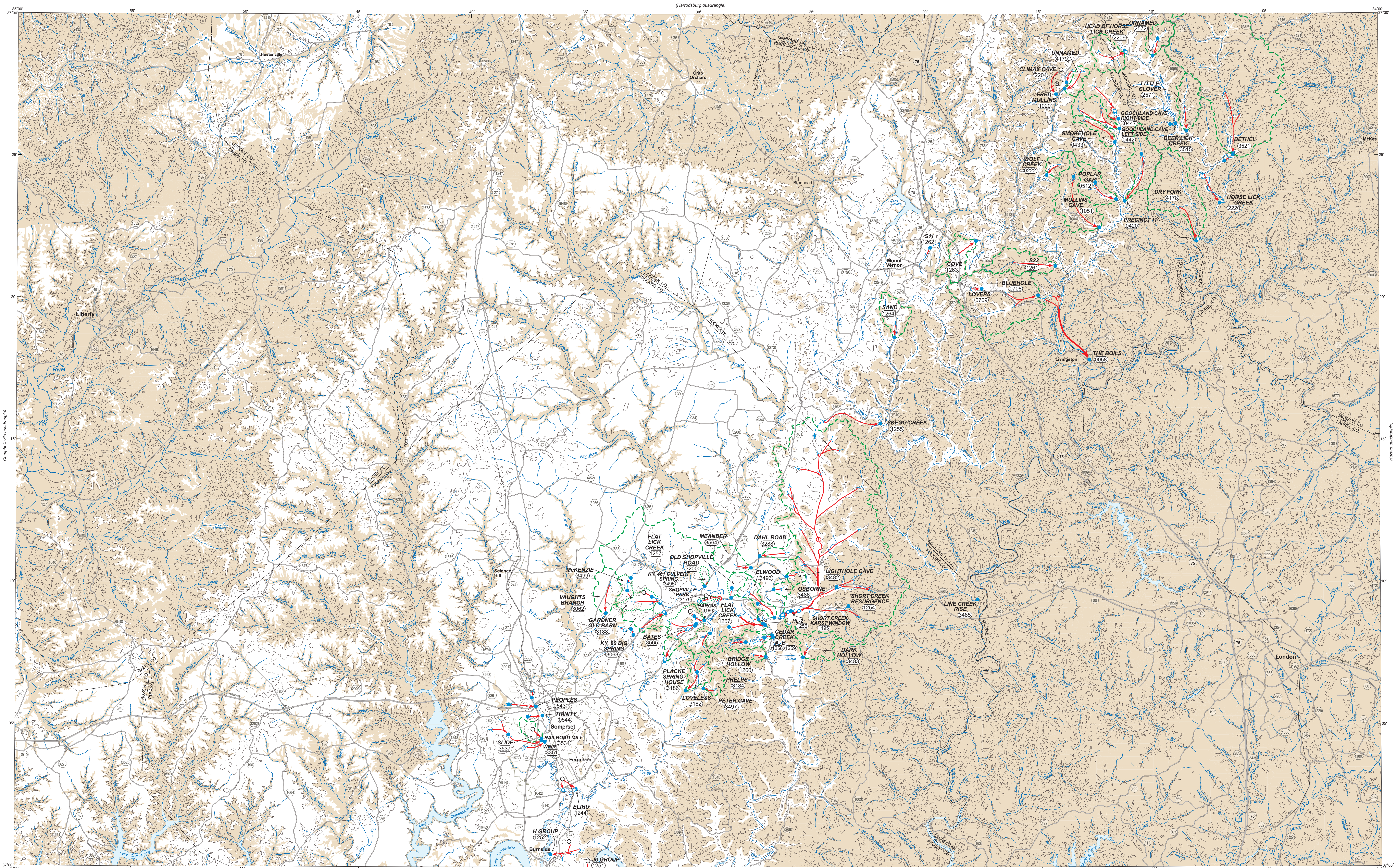
Part of the [Geology Commons](#)

Repository Citation

Currens, James C.; Paylor, Randall L.; Ray, Joseph A.; and Blair, Robert J., "Mapped Karst Groundwater Basins in the Somerset 30 x 60 Minute Quadrangle" (2011). *Kentucky Geological Survey Map and Chart*. 202.

https://uknowledge.uky.edu/kgs_mc/202

This Map and Chart is brought to you for free and open access by the Kentucky Geological Survey at UKnowledge. It has been accepted for inclusion in Kentucky Geological Survey Map and Chart by an authorized administrator of UKnowledge. For more information, please contact UKnowledge@lsv.uky.edu.



**MAPPED KARST GROUNDWATER BASINS IN THE SOMERSET
30 X 60 MINUTE QUADRANGLE**

James C. Currans and Randall L. Paylor
Kentucky Geological Survey
Joseph A. Ray (retired) and Robert J. Blair
Kentucky Energy and Environment Cabinet—
Division of Water

- LEGEND**
- Near-surface geologic units composed mainly of soluble lithologies
 - Near-surface geologic units composed mainly of insoluble lithologies
 - Inferred perennial groundwater flow route
 - Mapped perennial groundwater flow route
 - Subsurface overflow (high-flow) route
 - - - Surface overflow (high-flow) route
 - - - Groundwater basin catchment boundary
 - · - - Groundwater basin catchment sub-boundary
 - ◊ Stream sink or swallet
 - ⚡ Underflow spring (perennial)
 - ⚡ Overflow spring (high flow)
 - ⚡ Karst window or sinking spring
 - Cave stream
 - Other tracer-injection point
 - ① Kentucky Division of Water AGKWA spring identification number
- THE BOILS** Spring name

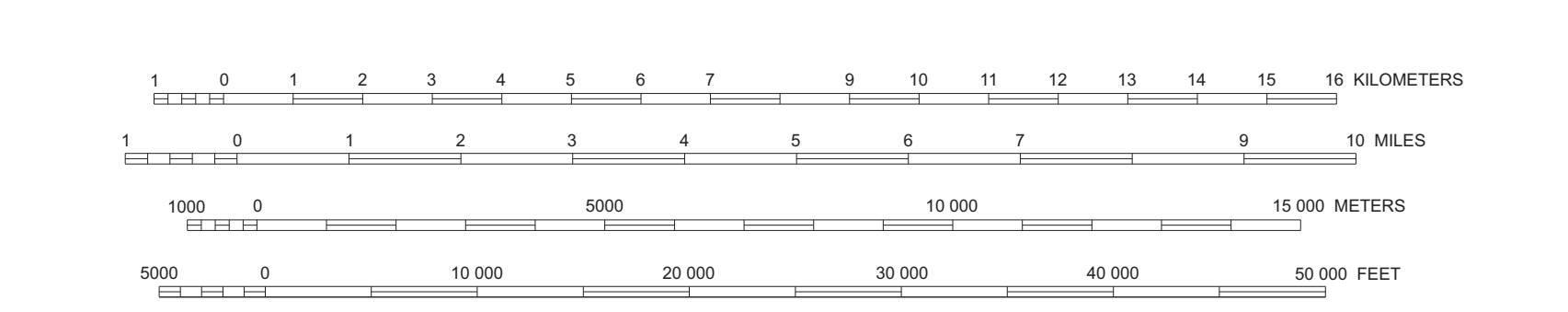
EXPLANATION

This map shows karst groundwater basins in the Somerset quadrangle, determined primarily by groundwater tracer studies. The map can be used to quickly identify the groundwater basins and springs to which a site may drain. Major springs and the relative size of their catchment areas can be evaluated for potential as water supplies. The map also serves as a geographic index to literature on karst groundwater in the area. This map is designed for regional and preliminary hydrologic investigations. Features such as springs and swallets are much too small to precisely locate on this map with a scale small enough to show regional relationships. See the literature for detailed site descriptions. The data used to compile this map were obtained by numerous investigators over the last 25 years. The perennial spring draining a groundwater basin is assigned a unique identification number, referred to as the AGKWA number (Assembled Kentucky Groundwater database). Individual basins are identified by the perennial spring name and AGKWA number. The authors of tracer data are identified by number in the "Data Source" column of the key, and are listed in "References Cited" in order of publication or research date.

Although groundwater flow routes shown here have been established by tracer studies, with the exception of mapped cave streams, the precise flow paths are unknown and are inferred or interpreted using water-level data, geologic structure, or surface features. Arrows show the direction of groundwater flow and tracer recovery locations. Conduit flow is illustrated as either thick trunk-flow lines or thin tributary-flow lines. The locations of some groundwater basins are inferred, based on the existence of a significant spring system and the delineation of adjacent basins. The position of groundwater basin boundaries should be considered approximate because of the map's scale and because boundaries can shift during high-water conditions. Also, excess flow may exit or enter a basin via surface or subsurface overflow routes. Additional overflow routes probably exist. Although most of the groundwater-tracing results shown on this map were obtained during moderate- or high-flow conditions, the groundwater basins are illustrated in base flow because base flow is the most common flow condition. The main spring draining the basin is assumed to be an underflow spring that preferentially drains base flow (Worthington, S.R.H., 1991. Karst hydrogeology of the Canadian Rocky Mountains: Hamilton, Ontario, McMaster University, doctoral dissertation, 380 p.). Generally, names of groundwater basins are derived from these main springs. Not all additional springs are shown because of the small map scale.

DISCLAIMER: This map is subject to revision upon receipt of new hydrologic data. Furthermore, areas on the map showing no karst features may actually be areas where tracer tests have not yet been conducted. Consult the cited references or authors for additional information. This map, completed December 5, 2011, replaces and supersedes Map and Chart 18, series 11, 1998.

ACKNOWLEDGMENTS
We thank the many karst investigators who have contributed data for this map. Without their cooperation, this map would not have been possible.

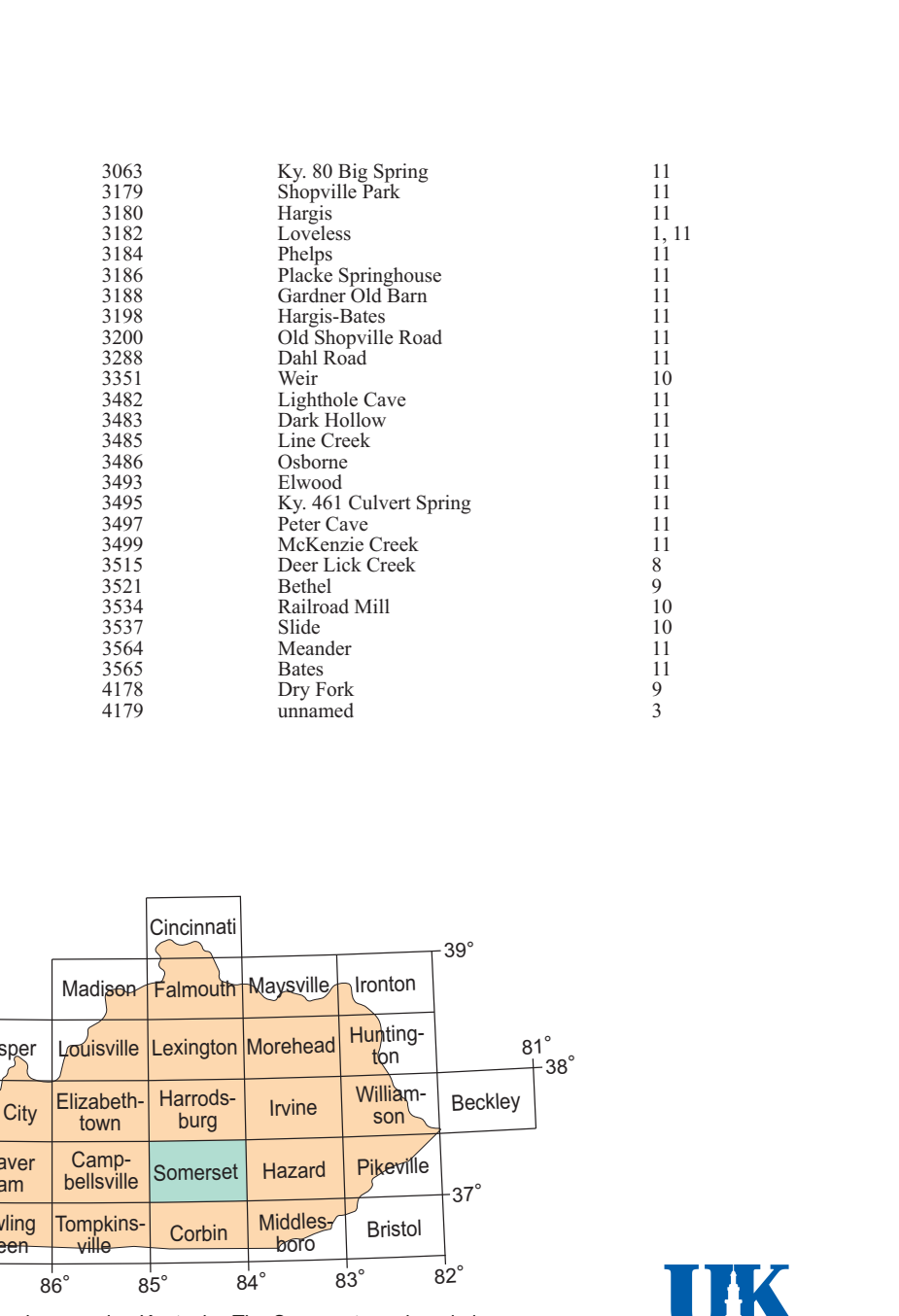


REFERENCES CITED

- (1) Morris, F.R., IV, 1983, Karst hydrogeology of Cedar Creek and adjacent basins in east-central Putnisk County, Kentucky: Richmond, Eastern Kentucky University, master's thesis, 126 p.
- (2) Romanik, P.B., 1986, Delineation of a karst groundwater basin in Sinking Valley, Putnisk County, Kentucky: Richmond, Eastern Kentucky University, master's thesis, 101 p.
- (3) Leo, D.P., 1990, Hydrogeology of a limestone spring and its recharge area in southeastern Rockcastle County, Kentucky: Richmond, Eastern Kentucky University, master's thesis, 81 p.
- (4) Sendlein, L.A., Dinger, J.S., Mims, S.A., and Sabha, A.M., 1990, Hydrogeology and groundwater monitoring of the John Sherman Cooper Power Station, Burnside Kentucky: University of Kentucky, Department of Geological Sciences, 68 p.
- (5) Ray, J.A., 1994, Documented groundwater tracing data: Kentucky Division of Water, Groundwater Branch.
- (6) Robertson, S.E., 1996, Documented groundwater tracing data: Kenfton, In.
- (7) Hutcheson, S.M., Sendlein, L.A., Dinger, J.S., Currans, J.C., and Sabha, A.M., 1997, Hydrogeology and ground-water monitoring of coal-sh disposal sites in a karst terrain near Burnside, south-central Kentucky: Kentucky Geological Survey, ser. 11, Report of Investigations 11, 21 p.
- (8) O'Dell, G.A., 2000, Documented groundwater tracing data: Kentucky Division of Water, Groundwater Branch.
- (9) Langford, D.L., 2003, A groundwater investigation of Horse Lick Creek, Daniel Boone National Forest, Jackson and Rockcastle Counties, Kentucky: Richmond, Eastern Kentucky University, master's thesis, 90 p.
- (10) Ray, J.A., 2005, Documented groundwater tracing data: Kentucky Division of Water, Groundwater Branch.
- (11) Currans, J.C., and Paylor, R.L., 2006, Delineation of karst groundwater basins along the proposed I-66 corridor, Putnisk County, with addendums. Kentucky Transportation Cabinet, Project ID 8-59.1, final report: Kentucky Geological Survey, Contract Report, 30 p.
- (12) Lips, J.M., and O'Dell, G.A., 2011, Documented groundwater tracing data: Results of Climax Church Spring trace: Morehead State University, 1 p.

Key

AGKWA No.	Spring Name	Data Source
0058	The Boils	3
0020	Wolf Creek	8
0420	Prevoid H	8
0431	Smokehole Cave	8
0442	Smokehole Cave Left Side	8
0447	Smokehole Cave Right Side	8
0512	Poplar Gap	8
0614	Peoples	5, 10
0708	Bluehole	3
0709	Lovers	7
1003	Fred Mullins	12
1001	Mullins Cave	8
1195	Short Creek East Window	2
1244	Fillip	6
1251	J6 Group	4, 7
1252	H Group	4, 7
1254	Short Creek Resurgence	2, 3
1255	Steg Creek	2
1257	HL-2	1, 2
1258	St-Alic's or Flat Lick Cave	8
1259	Cedar Creek A	1
1260	Cedar Creek B	1, 2
1261	Bridge Hollow	1
1262	S11	3
1263	Cove	3, 8
1264	Sand	3
2204	Climax Cave	3, 12
2209	Head of Horse Lick Creek	8
2210	Horse Lick Creek	8
2571	Little Clover	9
2572	unnamed	11
3062	Vaughts Branch	11



For information on obtaining copies of this map and other Kentucky Geological Survey maps and publications call:
Public Information Center
(606) 257-2696
Toll free 1-877-778-7827
View the KGS World Wide Web site at www.uky.edu/kgs

Locations of the 30 x 60 minute quadrangles covering Kentucky. The Somerset quadrangle is highlighted in green.

*Graduate student at Louisiana State University, fall 2010