

DEPARTMENT OF THE INTERIOR  
UNITED STATES GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH  
THE COMMONWEALTH OF KENTUCKY  
UNIVERSITY OF KENTUCKY  
KENTUCKY GEOLOGICAL SURVEY  
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GEOLOGIC  
QUADRANGLE MAPS  
OF THE  
UNITED STATES

GEOLOGY  
OF THE  
MIDDLESBORO NORTH QUADRANGLE  
KENTUCKY

By  
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INDEX MAP OF KENTUCKY

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# **GEOLOGIC MAP SYMBOLS** **COMMONLY USED ON MAPS OF THE UNITED STATES GEOLOGICAL SURVEY** (Special symbols are shown in explanation)

	Contact – Dashed where approximately located; short dashed where inferred; dotted where concealed
	Contact – Showing dip; well exposed at triangle
	Fault – Dashed where approximately located; short dashed where inferred; dotted where concealed
	Fault, showing dip – Ball and bar on downthrown side
	Normal fault – Hachured on downthrown side
	Fault – Showing relative horizontal movement
	Thrust fault – Sawteeth on upper plate
	Anticline – Showing direction of plunge; dashed where approximately located; dotted where concealed
	Asymmetric anticline – Short arrow indicates steeper limb
	Overturned anticline – Showing direction of dip of limbs
	Syncline – Showing direction of plunge; dashed where approximately located; dotted where concealed
	Asymmetric syncline – Short arrow indicates steeper limb
	Overturned syncline – Showing direction of dip of limbs
	Monocline – Showing direction of plunge of axis
	Minor anticline – Showing plunge of axis
	Minor syncline – Showing plunge of axis

Strike and dip of beds – Ball indicates top of beds known from sedimentary structures

	Inclined		Horizontal
	Vertical		Overturned

Strike and dip of foliation

	Inclined		Vertical		Horizontal
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Strike and dip of cleavage

	Inclined		Vertical		Horizontal
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Bearing and plunge of lineation

	Inclined		Vertical		Horizontal
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Strike and dip of joints

	Inclined		Vertical		Horizontal
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Note: planar symbols (strike and dip of beds, foliation or schistosity, and cleavage) may be combined with linear symbols to record data observed at same locality by superimposed symbols at point of observation. Coexisting planar symbols are shown intersecting at point of observation.

Shafts

	Vertical		Inclined
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Adit, tunnel, or slope

	Accessible		Inaccessible
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Prospect

Quarry

	Active		Abandoned
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Gravel pit

	Active		Abandoned
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Oil well

	Drilling		Shut-in		Dry hole abandoned
	Gas		Show of gas		
	Oil		Show of oil		