Derivative Mapping for Potential Industrial Mineral Resources in Ohio

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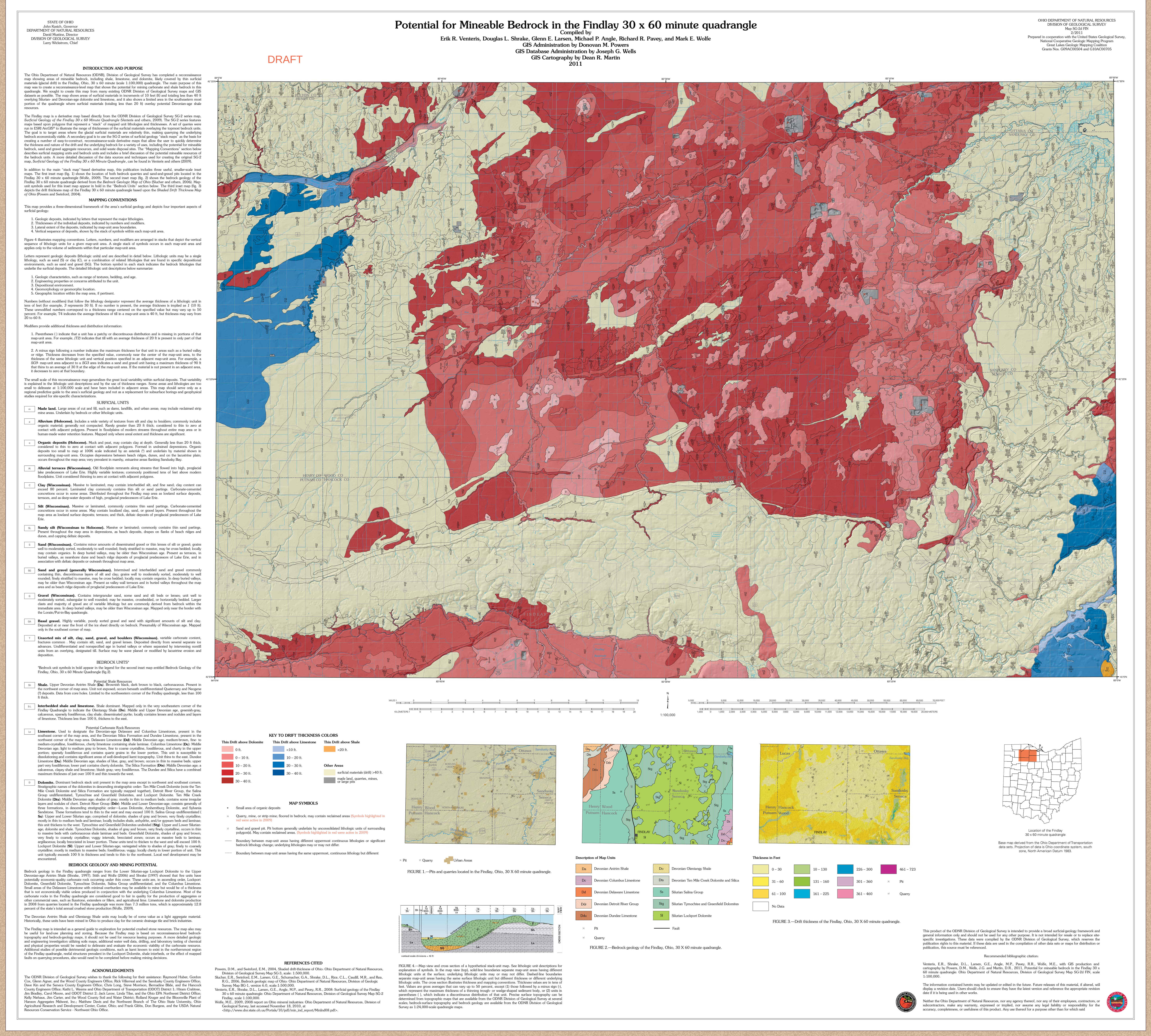
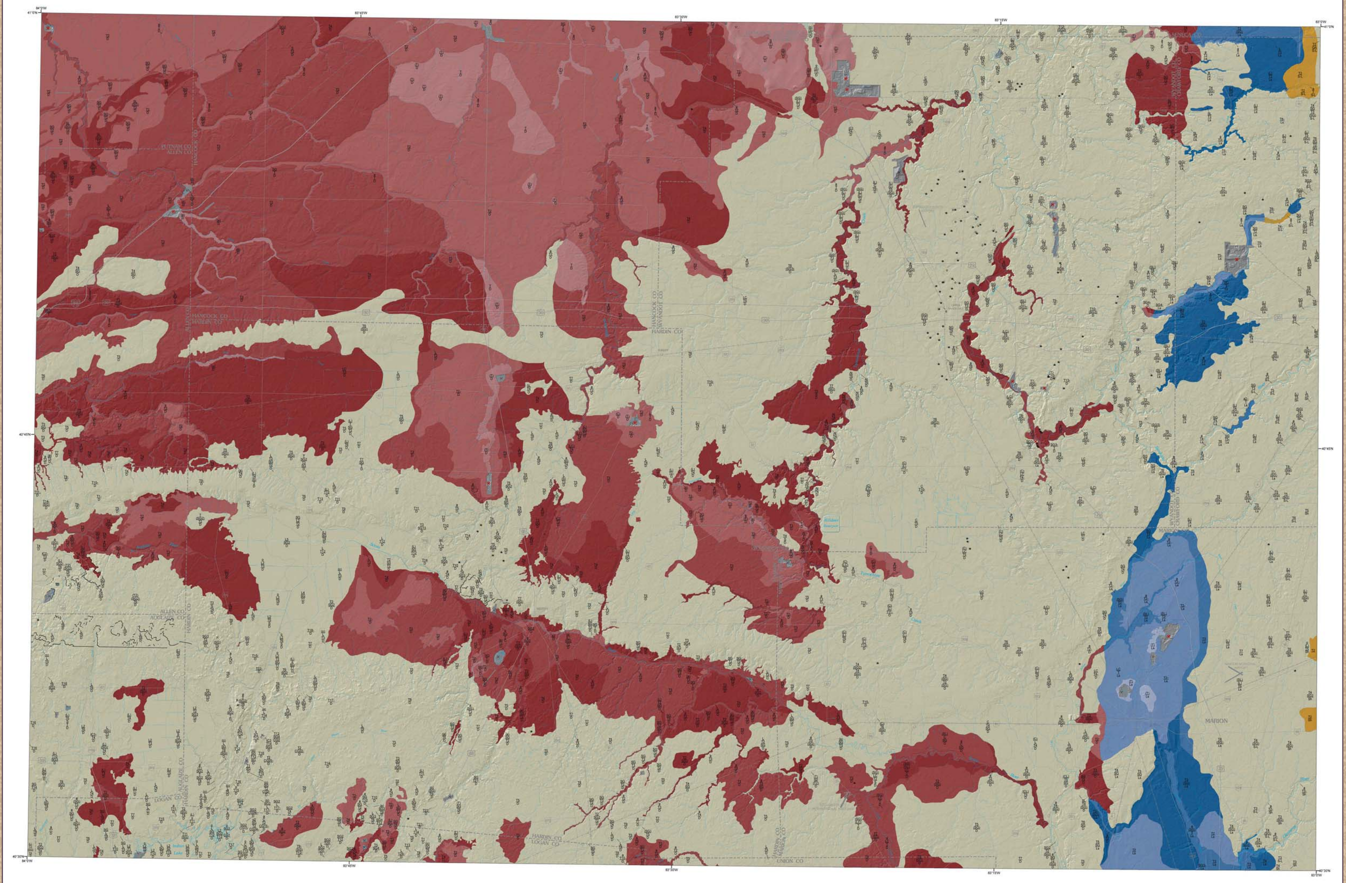
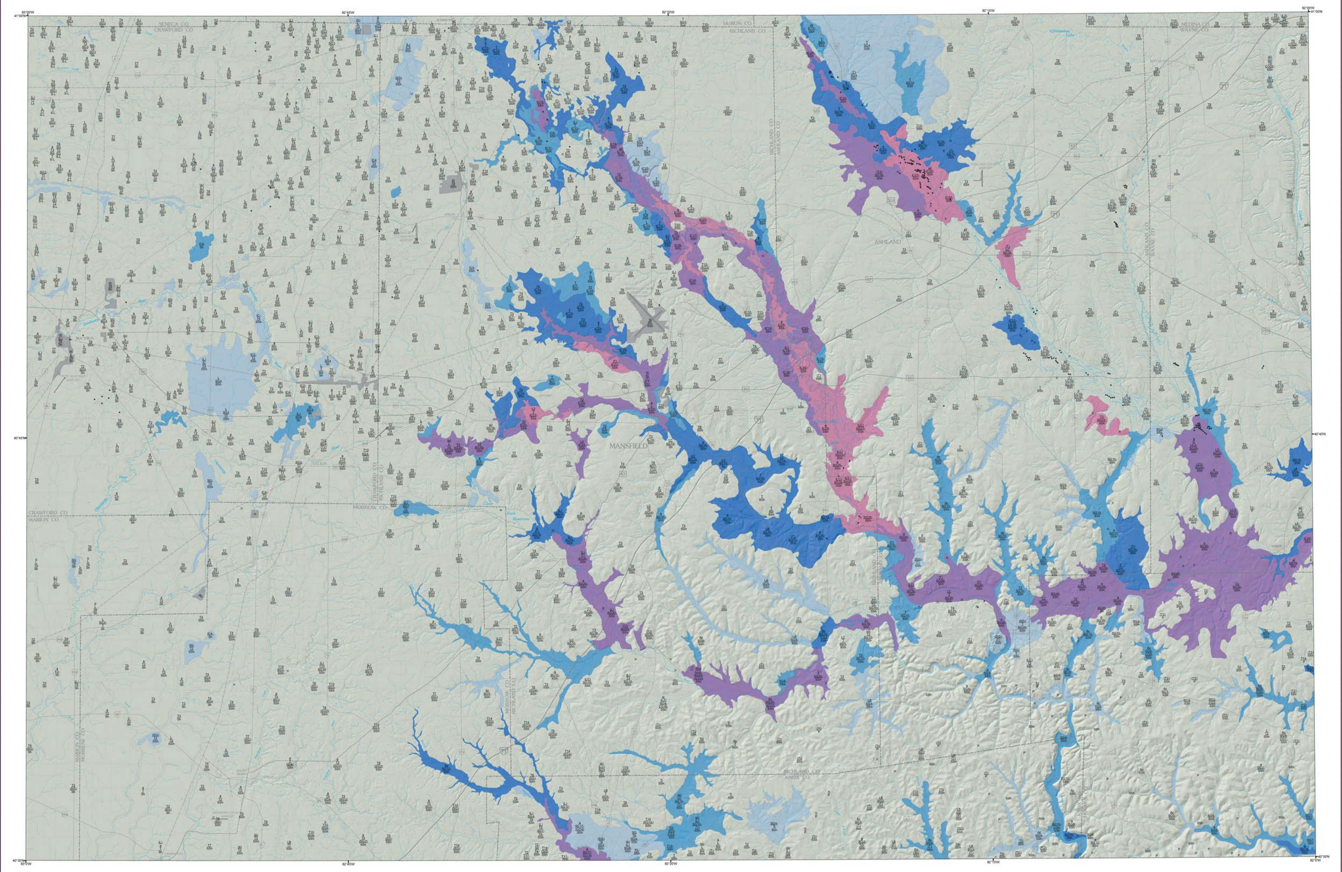
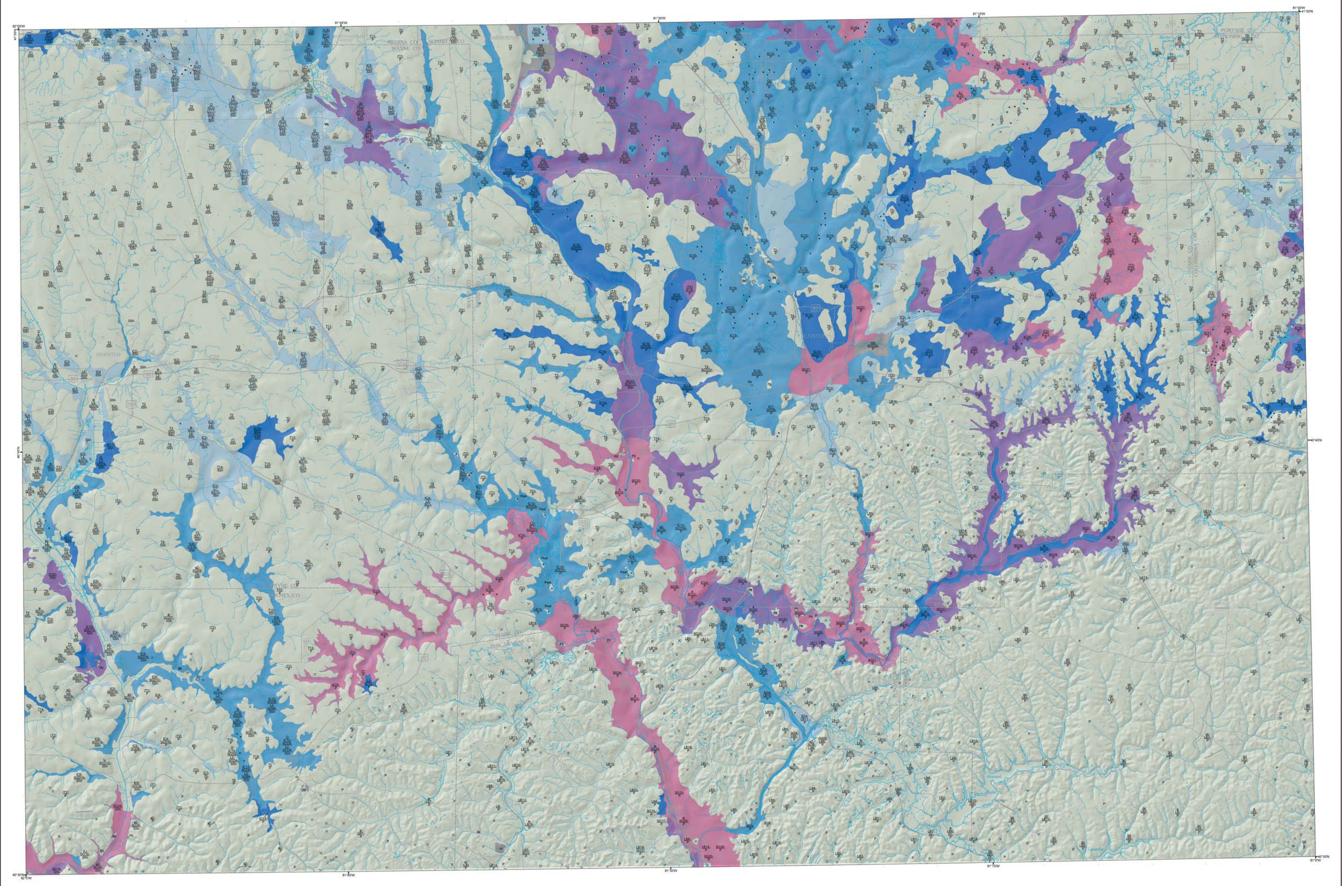




Potential for Mineable Bedrock in the Marion 30 x 60-minute quadrangle (Shrake and others, 2010).



Potential Sand and Gravel Resources of the Mansfield 30 x 60-minute quadrangle (Venteris and others, 2010).



Potential Sand and Gravel Resources of the Canton 30 x 60-minute quadrangle (Pavey and others, in press).

ABSTRACT

The Ohio Department of Natural Resources, Division of Geological Survey (also known as the Ohio Geological Survey) has an ongoing program of creating each year a surficial geology map for a 30 x 60-minute quadrangle. The main components of these maps are polygons containing three-dimensional "stacks" that summarize the gross lithologic material and thickness for the entire package of glacial/Holocene materials and identifies the appropriate bedrock lithology at the base of the stack. Common lithologies include glacial till, ice-contact deposits, silty-clayey lacustrine deposits, sand-and-gravel deposits, organic deposits, and type of bedrock. Thicknesses are measured in feet and reported in factors of 10. For example, a mapped polygon labeled *T5/SG3/T2/LS* would indicate a sequence containing approximately 50 feet of till overlying 30 feet of sand and gravel that overlies 20 feet of till above limestone bedrock. The maps are color coded according to the uppermost surficial material.

Through 2010 the Ohio Geological Survey has mapped 19 of the 34 complete or partial 30 x 60-minute quadrangles that span Ohio, including a large portion of glaciated Ohio. Map uses include regional resource analyses of potential crushed stone and sand and gravel. A potential crushed-stone resources map for the Marion, Ohio, 30 x 60-minute quadrangle was produced in 2007 using both visual and digital techniques. In 2008 the Ohio Geological Survey created the first in a series of derivative maps based upon the surficial geology in the Mansfield, Ohio, 30 x 60-minute quadrangle. Database queries verified polygons with sand-and-gravel unit thicknesses that exceeded those of overlying or interbedded, finer-grained materials by a ratio of at least 4:1. The resulting map is then color coded based upon this ratio and also the total thickness of the sand-and-gravel units. In 2010 GIS techniques were used to produce a map of the potential for mineable bedrock in the Findlay 30 x 60-minute quadrangle, a revised Mansfield sand-and-gravel resource map, and a revised Marion 30 x 60-minute quadrangle for potential of mineable bedrock. A series of three smaller inset maps provide locations of sand-and-gravel or crushed-stone mining operations, drift thicknesses, and the Quaternary or bedrock geology for the quadrangle.

The Ohio Geological Survey will continue potential industrial-mineral resources derivative mapping during 2011 in the previously completed Canton 30 x 60-minute quadrangle. The future integration of digital geologic mapping with mineral industry databases containing historical production, mined geologic units, geochemistry, and physical properties are a vital component in assessing future industrial-mineral resources in Ohio.

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References

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Venteris, E.R., Shrake, D.L., Larsen, G.E., Pavey, R.R., Schumacher, G.A., Angle, M.P., and Wolfe, M.E., 2010, Potential sand and gravel resources of the Mansfield 30 X 60-minute quadrangle: Columbus, Ohio Department of Natural Resources, Division of Geological Survey Map SG-2a MAN, scale1:100,000.