

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Slides showing quantitative models for mineral-resource assessment
of the Rolla 1° x 2° quadrangle, Missouri

by

Kim-Marie Walker, Susan K. Jenson, Joseph R. Francica, David A. Hastings,
and Charles M. Trautwein, Technicolor Government Services, Inc.
and Walden P. Pratt, U.S. Geological Survey

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DISCUSSION

This report consists of nineteen 35-mm color slides showing digital synthesis and quantitative modeling of five geologic recognition criteria for assessment of Mississippi Valley-type resource potential in the Rolla 1° x 2° quadrangle, Missouri. The digital synthesis and quantitative modeling (Pratt and others, 1982) was done to supplement an earlier manual synthesis and evaluation (Pratt, 1981). The five criteria synthesized in this study, and the sources of data used, are that most known deposits are:

- (1) In dolomite of the Bonneterre Formation, near the limestone-dolomite interface, which is defined as ls:dol = 1:16 (Thacker and Anderson, 1979; Kisvarsanyi, 1982);
- (2) Near areas where insoluble residues of "barren" Bonneterre Formation contain anomalously high amounts of base metals (Erickson and others, 1978);
- (3) Near areas of faults and fractures in the Bonneterre Formation or in underlying rocks (Pratt, 1982);
- (4) In "brown rock" (finely crystalline brown dolomite) near the interface with "white rock" (coarsely recrystallized, white or very light gray, vuggy, illite-bearing dolomite) (Kisvarsanyi, 1982);
- (5) Near or within favorably situated digitate reef-complex facies (Kisvarsanyi, 1982).

Eleven of the slides are direct photographs of computer-generated CRT displays, and the remaining 8 are explanatory text, as follows (P indicates photograph, T indicates text):

1. Data base configuration (T)
2. Qualitative geologic parameters (T)
3. Regional model development: ls/dol submodel (T)
4. " " " : " " (P)
5. " " " : dol-geochem partial model (T)

NOTE: "AMF" on slide 5 means "anomalous metal feet". This is a device for normalizing the analytical data. It is the ratio of reported metal content (in parts per million) to a minimum anomalous content established by inspection of the data, multiplied by the thickness of the section (in feet) through which the anomalous content occurs; see Erickson and others, 1978.

6. Regional model development: geochem submodel (P)
7. " " " : dol-geochem partial model (P)
8. " " " : dol-geochem-faults model (T)
9. " " " : fault submodel (P)
10. " " " : regional model (P)
11. Restricted model development: back-reef brown rock partial model (T)
12. " " " : brown rock submodel (P)
13. " " " : brown rock partial model (P)
14. " " " : digitate reef submodel (T)

15. Restricted model development: digitate reef submodel (P)
16. " " " : restricted model (P)
17. Quantitative assessment (T)
18. Regional model with Pb-Zn mine distribution (P)
19. Restricted model with Pb-Zn mine distribution (P)

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