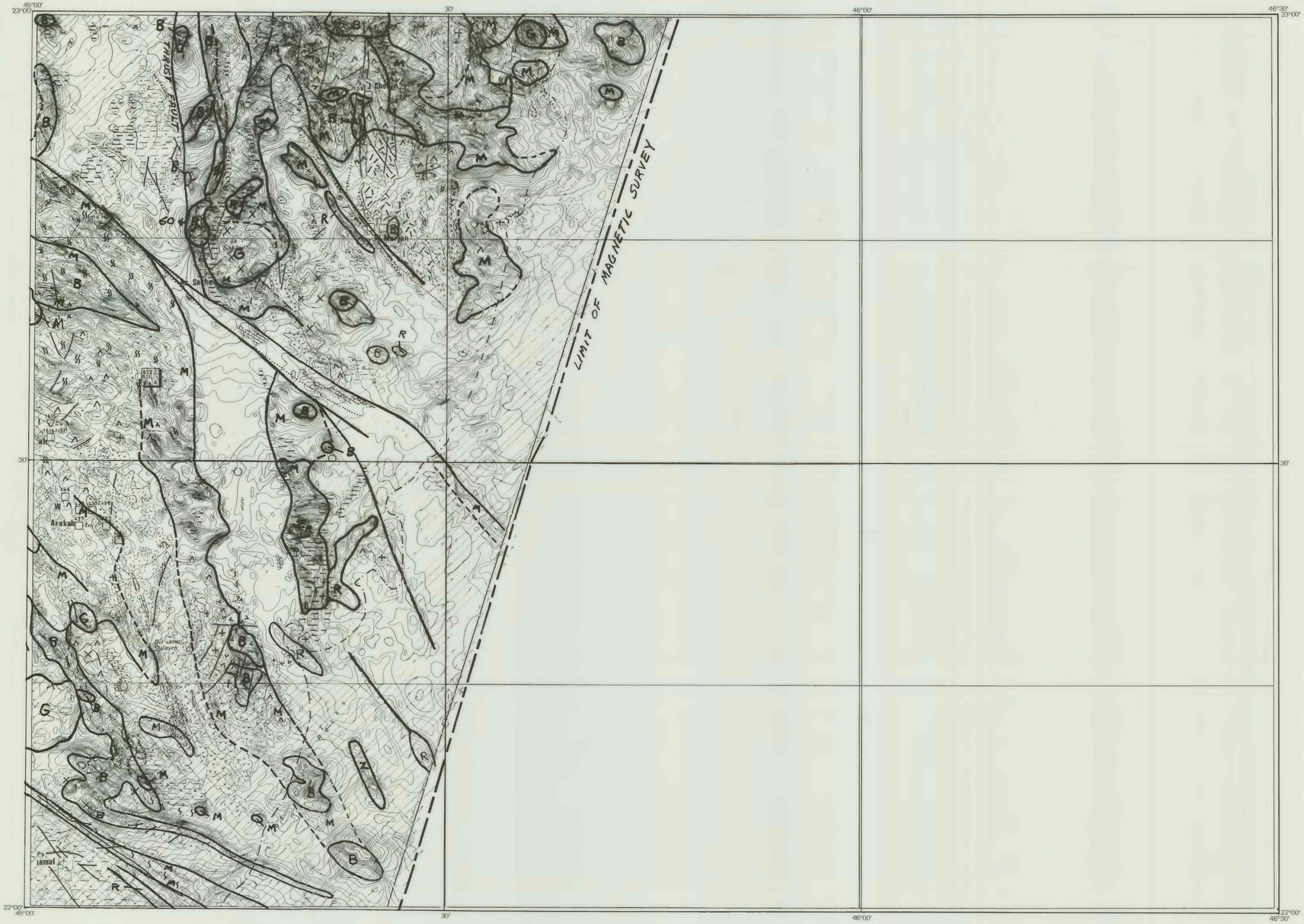


Original surveys supervised by B.R.G.M.
1:250,000 assembly by the Riofinex Geological Mission, 1980
For survey details see Airborne Magnetometer and Scintillation Counter Survey Reports of 1961–1962, 1965–1966, 1966–1967.

LEGEND

CONTOUR INTERVAL	20 GAMMAS
500 GAMMA CONTOUR	
100 GAMMA CONTOUR	
20 GAMMA CONTOUR	
MAGNETIC LOW	
RADIOMETRIC CONTOUR	
FIDUCIAL POINTS	3690
FLIGHT LINES	

SCALE 1: 250,000

5 0 5 10 15 20 25 KILOMETERS

5 0 5 10 15 20 MILES

Magnetic interpretation on a Universal Transverse Mercator projection. Geology is mosaicked to a UTM grid but geologic base adapted from lithologic maps prepared by the Riofinex Geological Mission are on Lambert Conformal projection.

Geologic base and Geologic Explanation adapted from Barnes and Johnson (1980)

MAGNETIC INTERPRETATION OF THE WADI AL MULAYH QUADRANGLE, SHEET 22H

by
Andrew Griscom
1982

This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards and stratigraphic nomenclature

EXPLANATION

MAGNETIC INTERPRETATION

Boundary between rock units of different magnetic properties or of differing magnetic patterns. Dashed where location is uncertain. Dotted where boundary is buried beneath nonmagnetic rocks. Code letters (described below), where present, indicate which side is the more magnetic rock unit.

M — Magnetic rock unit, lithology uncertain

R — Magnetic rock unit possessing reverse remanent magnetization

G, G_R — Magnetic rock unit probably granitic in composition. Subscript "R" where rock unit possesses reverse remanent magnetization

B — Magnetic rock unit probably mafic in composition

Z, Z_R — Zone of magnetic anomalies. Subscript "R" if more than half of the anomalies in the zone are magnetic lows that appear to be caused by rocks with reverse remanent magnetization

60 — Approximate dip of magnetic boundary as estimated by comparison with a set of calculated models

d — Linear magnetic anomaly probably caused by a dike

LAYERED ROCKS 1

PREDOMINANTLY VOLCANIC ROCKS: proximal volcanic sequences composed of flow rocks, volcaniclastic rocks, and minor sedimentary rocks of clastic and chemogenic origin

Undifferentiated metavolcanic rocks of mafic to felsic composition

Metavolcanic rocks of basaltic to andesitic composition; locally unit includes amphibolite and greenstone of extrusive and intrusive origin

Metavolcanic rocks of dacitic to rhyolitic composition

Metavolcanic rocks mainly of felsic composition including tuff, agglomerate, and ignimbrite; unit grades, by increase in clastic component, into distal volcanic sequences

Agglomerate and breccia; unit grades into volcaniclastic conglomerate

UNDIFFERENTIATED VOLCANIC-SEDIMENTARY ROCKS: distal volcanic sequences composed of flow and volcaniclastic rocks interbedded with sedimentary rocks of clastic and chemogenic origin

Mixed metavolcanic and metasedimentary rocks; may be present as undifferentiated chlorite-sericite schist or greenstone; volcanic composition ranges from mafic to felsic

Compositional modifier:

predominantly andesitic

predominantly dacitic

Mixed metavolcanic and metasedimentary rocks including tuff, tuffaceous sandstone, and tuffaceous siltstone; may be present as undifferentiated chlorite-sericite schist

PREDOMINANTLY SEDIMENTARY ROCKS: sedimentary sequences of clastic and chemogenic origin; locally unit includes volcanic members

Meta-arenite and siltstone, locally conglomeratic, locally with volcanic interbeds; in most places noncalcareous

Meta-arenite, mainly coarse-grained sandstone (lithic or volcaniclastic sandstone), with conglomerate and some argillite

Undifferentiated, unmetamorphosed sedimentary rocks including polymict conglomerate, sandstone, shale, limestone, and locally andesite and rhyolite

Polymict conglomerate: grades into volcanic agglomerate and breccia

Marble, including black and gray marble of calcitic and dolomitic composition, locally with chert and conglomerates

Cover Rocks (undifferentiated)

LAYERED ROCKS 2

Strongly metamorphosed and deformed; original volcanic and sedimentary character blurred or destroyed

Quartzo-feldspathic schist, inferred to be derived from sedimentary rocks

Biotite schist, mainly in zones of contact metamorphism (superimposed on other rocks)

Chlorite-sericite schist, mainly in zones of retrogressive metamorphism

Amphibolite, inferred to be mainly derived from mafic volcanic rocks

Biotite-hornblende-garnet gneiss, amphibolite, and biotite-hornblende schist, inferred to be mainly derived from mafic volcanic rocks

Heterogeneous paragneiss, including hornblende-biotite schist, amphibole gneiss, feldspathic amphibolite (metamorphosed andesite?), metarhyolite, leucocratic quartz-feldspathic gneiss (metamorphosed rhyolite?), chlorite-sericite-biotite schist and calc-schist (metamorphosed graywacke?), quartzite, marble, and calc-silicate gneiss (metamorphosed impure dolomitic marble or marl?)

INTRUSIVE ROCKS AND COMPLEXES

Alkalic granite (orthoclase-albite-soda amphibole and accessory biotite); typically posttectonic

Granite, calc-alkaline granite, quartz monzonite; locally unit includes granodiorite; may be accompanied by gabbro and diorite

Granodiorite, locally with quartz monzonite; commonly foliated (metamorphosed); in part gradational into 'Heterogeneous granitic rocks'

Heterogeneous granitic rocks; undifferentiated granitoid rocks, mainly granodiorite to quartz monzonite in composition; commonly foliated; in part gradational into 'Syntectonic granitic rocks'

Diorite and quartz diorite (commonly foliated)

Undifferentiated gabbro and diorite

Gabbro

Biotite granite containing numerous xenoliths of biotite schist and ultramafic rocks

Ultramafic rocks (serpentinite)

Graphic, microgranite porphyry, quartz porphyry, and granophyre

Syntectonic granitic rocks, orthogneiss, granite-gneiss; mainly quartz monzonite to granodiorite in composition

Migmatite zones (superimposed on other rocks)

Extrusive-intrusive complex of ultramafic to mafic composition, including gabbro, serpentinite, greenstone, pyroxenite, basalt, and various metasedimentary rocks; commonly all strongly metamorphosed; so-called 'Ophiolite Complex'

MINERALIZATION

MODS number (where available)

principal commodity — Pb Zn associated

J SELM commodity

name of occurrence

iron sulfide

iron oxide

other (shown by chemical symbols)

pyrite-rich sequence and(or) hydrothermal alteration

gold

copper

zinc

lead

silver

GEOCHRONOLOGICAL DATA

K-Ar method

Rb-Sr method

Pb-Pb method

method — reported age — rock sampled — source — location — sample

Data sources:

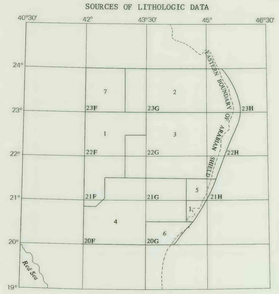
a Brown, G. F., Hedge, C. E., and Marvin, Richard, 1978, Tabulation of Rb-Sr and K-Ar ages given by rocks of the Arabian Shield: U.S. Geological Survey Saudi Arabian Project Report 240: sec. 2, p. 10-20.

b Aldrich, L. T., 1978, Radiometric age determinations of some rocks from the Arabian Shield: U.S. Geological Survey Saudi Arabian Project Report 240, sec. 1, p. 1-9.

c Kroner, A., Roobol, M. J., Ramsay, C. R., and Jackson, N. J., 1979, Pan-African ages of some gneissic rocks in the Saudi Arabian Shield: Journal of the Geological Society of London, v. 136, p. 455-461.

d Stacey, J. S., Gramlich, J. W., Delevaux, M. H., Doe, B. R., and Roberts, R. J., 1980, A lead isotope study of mineralization in the Arabian Shield: Contributions to Mineralogy and Petrology, v. 74, p. 175-188.

SOURCES OF LITHOLOGIC DATA



1. Jackson, R.O., and others, 1963
2. Riofinex Geological Mission, 1979
3. Barnes, D., and Johnson, P.R., 1980
4. Riofinex Geological Mission, 1980
5. Kashkary, A. A. R., 1974
6. Kellogg, K. S., USGS, unpublished geologic maps, 1981
7. Letalenet, J., 1979

OTHER SYMBOLS

Alluvium-bedrock boundary

Geologic boundary

Fault

Fault inferred under alluvium