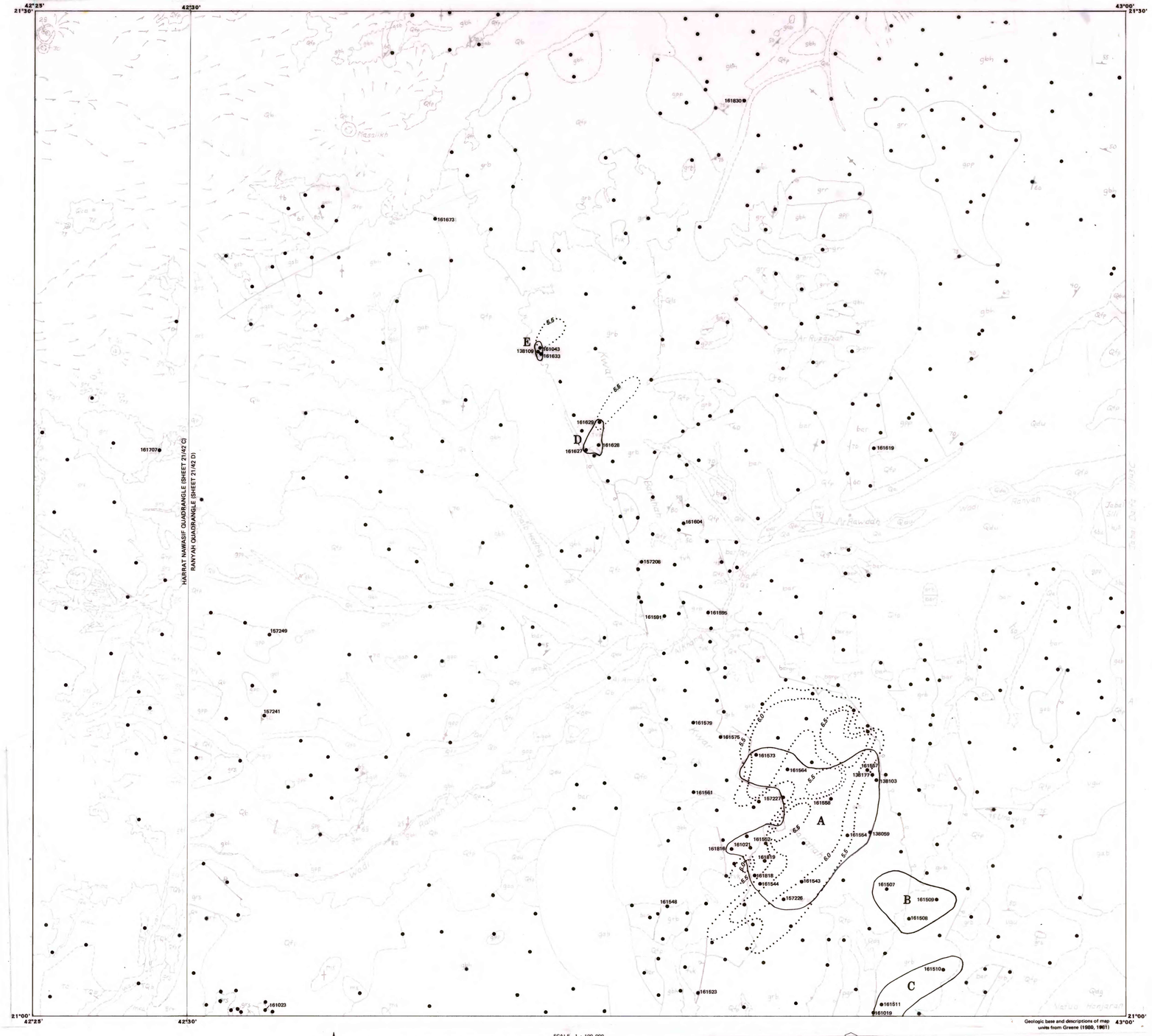
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

KINGDOM OF SAUDI ARABIA

OPEN-FILE REPORT 83-372
PLATE 1



MAP SHOWING AREAS OF MINERAL POTENTIAL IN THE HARRAT NAWASIF AND RANYAH QUADRANGLES, SHEETS 21/42 C AND 21/42 D, KINGDOM OF SAUDI ARABIA

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1983

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

EXPLANATION

DESCRIPTION OF MAP UNITS, HARRAT NAWASIF QUADRANGLE

- Qa — ALLUVIUM
- Qs — SILT AND CLAY
- Qfp — SAND AND GRAVEL OF ALLUVIAL FANS AND PEDIMENTS

VOLCANIC ROCKS MAPPED AS LANDFORMS

- Ql — Lava cones--Small, steep-sided cones of basalt flow rocks
- Qsh — Shield volcanoes--Broad cones of low slope, composed of basalt flow rocks
- Qco — Composite cones--Interlayered basalt flow rocks and cinders
- Qc — Cinder cones and rings--Steep-sided cones of well-bedded, reddish-brown cinder; crater top commonly capped with spatter; some cones reduced by erosion to rings or small remnants
- QTb — Basalt flow--Olivine basalt, black, fresh, aphanitic to fine-grained; flows from 1 to 10 m thick; small areas within unit are overlain by alluvium and wind-blown silt not shown
- QTp — Volcanic plugs--Massive basalt
- grf — PERTHITE GRANITE, FINE GRAINED
- grs — PERTHITE GRANITE OF JABAL SUILY--Yellowish-gray, reddish-brown, locally pink, porphyritic, coarse-grained granite consisting of perthite, quartz, hornblende, biotite, opaque minerals, and locally alkali amphibole
- gpp — PINK PORPHYRITIC GRANITE--Medium- to coarse-grained granite with pink potassium feldspar phenocrysts in gray groundmass of plagioclase, quartz, hornblende, biotite, and opaque minerals
- to — TONALITE--Coarse-grained tonalite composed of gray, greenish-gray, or pink plagioclase, quartz, and abundant green hornblende
- gbh — GNEISS AND METABASALT OF SHAIB HADHAQ
- ry — RHYOLITE--Pale-brown to light-gray, aphanitic flow rhyolite and tuff breccia
- mba — METABASALT AND META-ANDESITE--Dark-gray to greenish-gray, fine-grained, locally porphyritic rocks composed mostly of plagioclase, actinolite, chlorite, and epidote

SYMBOLS

- Contact
- Fault--bar and ball on downthrown side
- 199 — Volcano number
- Crater
- Direction of flow of lava

DESCRIPTION OF MAP UNITS, RANYAH QUADRANGLE

- Qa — ALLUVIUM
- Qdu — URUQ DUNES
- Qdg — GIANT DUNES
- Qfp — SAND AND GRAVEL OF ALLUVIAL FANS AND PEDIMENTS
- Qls — LANDSLIDE
- Qg — BOULDER GRAVEL
- Qc — CINDER CONE
- QTb — BASALT FLOWS--Olivine basalt, black, fresh, aphanitic to fine-grained, in flows from 5 to 20 m thick
- QTp — VOLCANIC PLUG
- RHYOLITE DIKES
- ANDESITE AND DACITE DIKES
- grb — PERTHITE GRANITE OF KWAR BARAHAH--Yellowish-gray to gray, pink, and reddish-brown, mostly coarse- to very coarse grained granite consisting mainly of perthite, quartz, hornblende, and opaque minerals. Some contains alkali amphibole, plagioclase, or biotite
- grr — GRANITE OF AR RUZAYLAH--Pink, coarse-grained granite composed of slightly perthitic potassium feldspar, plagioclase, and quartz, with hornblende, biotite, and opaque minerals
- pgr — PORPHYRITIC GRANITE OF KWAR BARAHAH--Light-gray, medium-grained granite with pink potassium felsdpar phenocrysts
- grs — PERTHITE GRANITE OF JABAL SUILY--Yellowish-gray, reddish-brown, locally pink, porphyritic, coarse-grained granite consisting of perthite, quartz, hornblende, biotite, opaque minerals, and local alkali amphibole
- grf — PERTHITE GRANITE, FINE-GRAINED
- gab — GABBRO--Medium-gray to black, coarse-grained gabbro consisting of calcic plagioclase, olivine, clinopyroxene, and opaque minerals; locally with hornblende and biotite
- gpp — PINK PORPHYRITIC GRANITE--Medium- to coarse-grained granite with pink potassium feldspar phenocrysts in gray groundmass of plagioclase, quartz, hornblende, biotite, and opaque minerals
- bargr — METABASALT AND META-ANDESITE OF RAWDAH--Intruded by perthite granite of Kwar Barahah
- gbh — GNEISS AND METABASALT OF SHA'IB HADHAQ--Pink, fine- to coarse-grained gneissic granite and granodiorite consisting of potassium feldspar, plagioclase, quartz, biotite, opaque minerals, and some hornblende; gray, medium-grained tonalite gneiss consisting mostly of plagioclase, quartz, and hornblende; dark-gray to black, fine-grained basalt
- tb — BIOTITE TONALITE--Dark- to light-gray, medium-grained tonalite gneiss consisting mostly of plagioclase, quartz, and biotite
- vgu — VOLCANIC AND GRANITIC ROCKS OF URAYYIQ
- fvk — FELSIC VOLCANIC ROCKS OF AL KHANIQ--Dusky-red to brownish-gray rhyolite flow rocks, tuff, and breccia; dark-gray to dark-greenish-gray dacite and andesite
- bar — METABASALT AND META-ANDESITE OF RAWDAH--Medium- to dark-gray, fine-grained to aphanitic metabasalt and meta-andesite; much is porphyritic with abundant plagioclase phenocrysts and rare clinopyroxene
- ch — CHERT--Medium-dark, brownish- and olive-gray chert, chert breccia, and chert pebble conglomerate
- sbc — SERPENTINITE, METABASALT, AND CARBONATE ROCKS
- bjs — METABASALT OF JABAL SILI--Black, fine-grained, mela-metabasalt
- ms — METASILTSTONE--Dark-gray, thin-bedded metasiltstone
- gsb — GRANULITE, SCHIST, AND METABASALT

- CONTACT--Dashed where bounding Quaternary units
- FAULT--Dotted where concealed, bar and ball on downthrown side
- STRIKE OF FOLIATION OR LAYERING--Observed on aerial photographs
- RHYOLITE DIKE
- ANDESITE OR DACITE DIKE

STRIKE AND DIP OF BEDS

- 70 — Inclined
- Vertical

STRIKE AND DIP OF FOLIATION

- Vertical
- 60 — Inclined
- 45 — Inclined, showing plunging lineation
- 30 — Inclined, showing horizontal lineation

BEARING AND PLUNGE OF LINEATION

- 35 — Plunging
- Horizontal

- FLOW DIRECTION IN BASALT
- CRATER RIM

- A — Potentially favorable mineral resource area
- 6.5 — Areal radiometric anomaly
- Sample location
- 161511 — Location and Rock Analysis Storage System (RASS) number of anomalous sample
- Ancient mine or prospect
- 01451 — Mineral Occurrence Documentation System (MODS) number