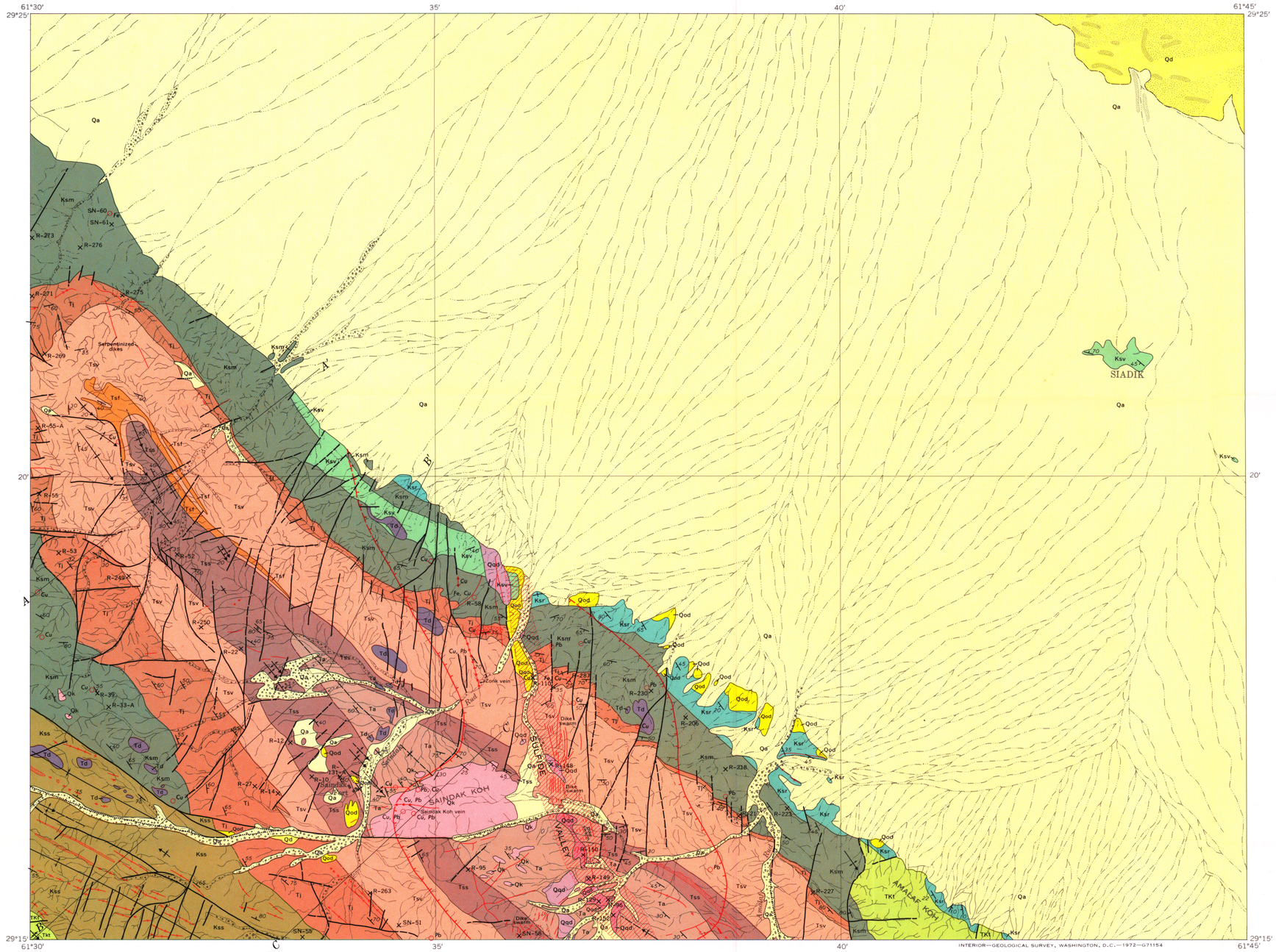
UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

MINISTRY OF INDUSTRIES AND NATURAL RESOURCES
GEOLOGICAL SURVEY OF PAKISTAN

PROFESSIONAL PAPER 716-A
PLATE 1



Base from Survey of Pakistan unedited photogrammetric manuscript, compiled for Sheet 30 G/11

INDEX TO SHEETS

30°/6	30°/10	30°/14
30°/7	30°/11	30°/15
30°/8	30°/12	30°/16

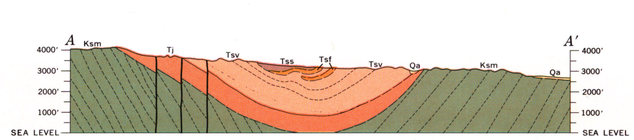
SCALE 1:50 000

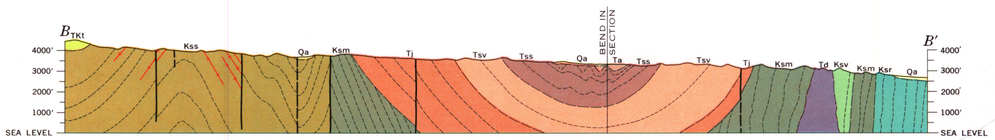
1 .5 0 1 2 3 4 5 KILOMETERS

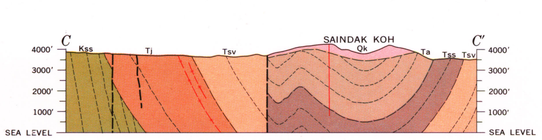
1 ½ 0 1 2 3 4 5 MILES

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D.C.—1972—G71154

Geology by R. G. Schmidt, U.S. Geological Survey, and S. N. Khan and W. Ahmed, Geological Survey of Pakistan, 1962–63







GEOLOGIC MAP OF THE SAINDAK QUADRANGLE, CHAGAI DISTRICT, WEST PAKISTAN

PREPARED UNDER THE AUSPICES OF THE
UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT

EXPLANATION

QUATERNARY

Holocene

Qa — Alluvium
Qd — Dune sand
Boulders, gravel, sand, and clay in streambeds and alluvial fans, and eolian sand in dunes

Qod — Older deposits
Mostly unconsolidated dissected gravel deposits; also include some sand and clay layers and some caliche-cemented beds

EROSIONAL UNCONFORMITY

QUATERNARY(?)

Pleistocene or older

Qk — Kamerod(?) Formation
Volcanic conglomerate and arkosic tuffaceous sand and gravel

EROSIONAL UNCONFORMITY

TERTIARY

Oligocene(?)

Ta — Amalaf Formation
Red-bed sequence of shale, siltstone, and sandstone, and a few beds of shelly sandstone and rubbly limestone

Eocene

Tss, Tsf, Tsv — Saindak Formation
Tsv, *volcanic conglomerate and agglomerate, and a few lenses and reefs of gray limestone*
Tss, *gray shale, siltstone, and fossiliferous marl, and lenses and reefs of gray limestone*
Tsf, *mafic flows*

Paleocene and Eocene

Tj — Juzzak Formation
Shale, siltstone, sandstone, and shaly limestone; locally contain pebbles and cobbles of volcanic rocks

EROSIONAL UNCONFORMITY

CRETACEOUS

Upper Cretaceous

Kss, Ksv, Ksm, Ksr — Sinjrani Formation
Comprises four general assemblages of sedimentary and volcanic rocks; Kss, *flysch-type intercalations of shale, siltstone, and unfossiliferous calcareous grit and limestone;* Ksv, *volcanic agglomerate and tuff;* Ksm, *mixed assemblage of volcanic tuff and sand and perhaps some welded tuff, interbedded with shale, siltstone, conglomerate, agglomerate, and lenses of fossiliferous limestone; and* Ksr, *red-bed sequence of shale, sandstone, and conglomerate*

IGNEOUS ROCKS

Qad — Quartz diorite
Fine-grained phanerite composed dominantly of andesine and biotite, hornblende, and 5 to 10 percent quartz. Younger than Kamerod(?) Formation but older than older gravel deposits (Qod). Metamorphism and metasomatism associated with intrusion

Td — Diorite
Generally hornblende diorite porphyry of small hornblende crystals in a dense fine matrix; in places the matrix contains ghostlike porphyroblasts of albite(?). Younger than the Saindak Formation and probably later than folding, but metamorphosed by the quartz diorite

TKt — Tanki sills
Andesite porphyry in which phenocrysts of feldspar and augite compose as much as half the rock; groundmass fine or made up of microlites; mostly chloritized and with porphyroblastic albite. Younger than Sinjrani Formation and pre-Juzzak Formation in age

Dike or sill
Of diverse ages and compositions. Include andesite porphyry, quartz diorite porphyry, and mafic rocks, including basalt. Probably most dikes near the diorite and quartz diorite stocks are offshoots of the stocks

Contact
Dashed where approximately located; dotted where concealed

Fault
Dashed where approximately located; dotted where concealed

Anticline showing plunge where known
Dashed where approximately located; dotted where concealed

Syncline showing plunge where known
Dashed where approximately located; dotted where concealed

Strike and dip of bed

Strike of vertical bed

Generalized limit of metamorphism
Hachures point to metamorphosed side; dashed where inferred

Cu, Pb
Low-grade mineral vein
Indicating metals present. Cu, *copper;* Pb, *lead*

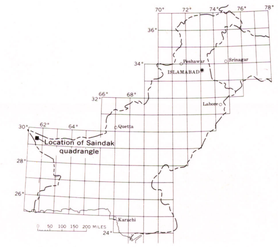
R-58 Cu, Fe
Location of small mineral vein
Showing field reference number and indicating metals present; Cu, *copper;* Fe, *iron;* Pb, *lead*

Outcrop of copper-bearing quartz diorite

Pyrrhotite-bearing area

Approximate limit of pyrite-bearing area

× SN-55
Fossil locality
Showing field reference number



INDEX MAP OF WEST PAKISTAN SHOWING THE LOCATION OF THE SAINDAK QUADRANGLE