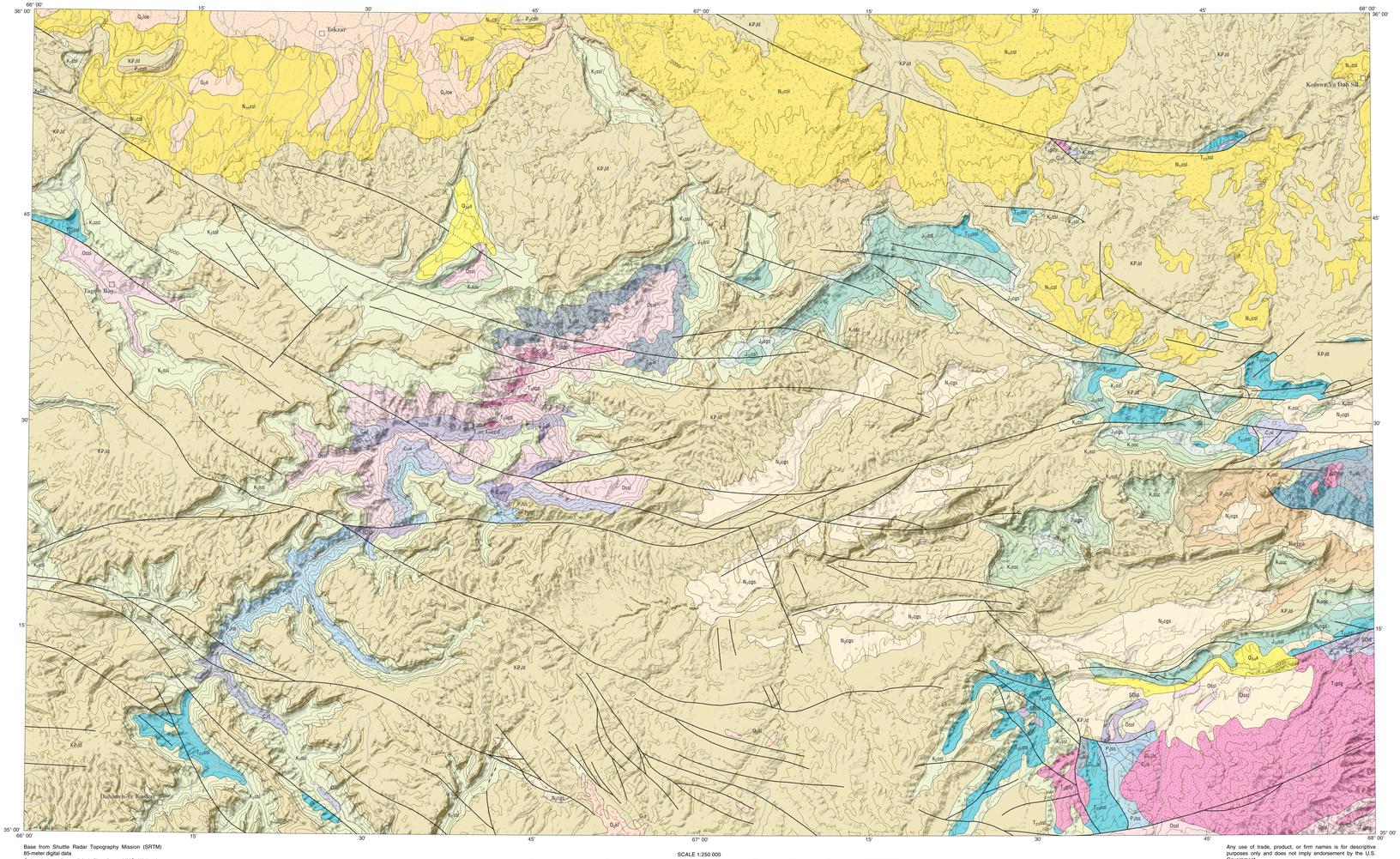
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

AFGHAN GEOLOGICAL SURVEY
Prepared in cooperation with the U.S. Geological Survey and the Afghanistan Geodesy and Cartography Head Office
Under the auspices of the U.S. Agency for International Development and the U.S. Trade and Development Agency

USGS OPEN-FILE REPORT 2005-1100-A
AGS OPEN-FILE REPORT (501/502) 2005-1100-A
USGS Afghanistan Project Product No. 006

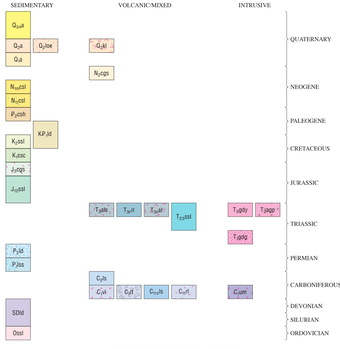


Base from Shuttle Radar Topography Mission (SRTM) 85-meter digital data
Cultural data from digital files from AIMS Web site (http://www.aims.org.af)
Projection: Universal Transverse Mercator, zone 42, WGS 84 Datum

SCALE 1:250 000
5 0 5 10 15 20 25 30 35 40 KILOMETERS
5 0 5 10 15 20 MILES
CONTOUR INTERVAL 100 METERS

Any use of trade, product, or firm names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS

Qya,a **Conglomerate and sandstone (Holocene and late Pleistocene)**—Alluvium: shingly and detrital sediments, gravel, sand and silt and clay

Qa,b **Conglomerate and sandstone (middle Pleistocene)**—Alluvium: shingly and detrital sediments, gravel, sand more abundant than silt and clay

Qa,loe **Loess (middle Pleistocene)**—Loess more abundant than sand, clay

Qa,al **Alkaline lava (middle Pleistocene)**—Trachybasalt, leucite basanite (Sarlogh Series)

Qa,a **Conglomerate and sandstone (early Pleistocene)**—Alluvium: shingly and detrital sediments, gravel, sand more abundant than silt and clay

N2cgs **Conglomerate and sandstone (Pliocene)**—Gray conglomerate, grit, sandstone more abundant than siltstone, clay, limestone, marl; gypsum, salt; acid to mafic volcanic rocks

Nmcstl **Clay and siltstone (middle Miocene)**—Brown clay, siltstone more abundant than sandstone, conglomerate, limestone

N1cstl **Clay and siltstone (early Miocene)**—Red clay, siltstone more abundant than sandstone, conglomerate, limestone

P2cstn **Clay and shale (Eocene)**—Clay, shale, siltstone more abundant than sandstone, limestone, marl, gypsum, conglomerate

KP,ld **Limestone and dolomite (Paleocene and Late Cretaceous)**—Limestone, marl, dolomite more abundant than sandstone, clay, siltstone, gypsum, conglomerate

Kcstsl **Sandstone and siltstone (Late Cretaceous)**—Sandstone, siltstone more abundant than clay, limestone, marl, conglomerate, gypsum

Kcstcc **Sandstone and conglomerate (Early Cretaceous)**—Red sandstone, conglomerate more abundant than siltstone, gypsum, clay

J3cgs **Conglomerate and sandstone (Late Jurassic)**—Conglomerate, sandstone more abundant than siltstone, clay, limestone, gypsum

J2stsl **Sandstone and siltstone (Middle and Early Jurassic)**—Sandstone, siltstone more abundant than clay, conglomerate, coal

T3grfg **Granodiorite and granosyenite (Late Triassic)**—Granodiorite, granosyenite, granophyre, granite

T3apfp **Andesite and granite porphyry (Late Triassic)**—Andesite porphyry, granite porphyry

T3ahs **Andesite lava and shale (Late Triassic)**—Shale more abundant than phyllite, andesite to basalt (greenstone altered)

T3rlf **Rhyolite lava (Late Triassic (Rhaetian))**—Rhyolite and andesite more abundant than sandstone, mudstone, conglomerate, grit

T3al **Andesite lava (Late Triassic (Rhaetian))**—Rhyolite and basalt more abundant than sandstone, mudstone, conglomerate, grit

T2,3stsl **Sandstone and siltstone (Late and Middle Triassic)**—Sandstone and siltstone more abundant than mudstone, carbonaceous shale, limestone, marl, conglomerate, acid and mafic volcanic rocks

T2grdg **Granodiorite and granite (Early Triassic)**—Granodiorite, granite; Phase I-II

P2ld **Limestone and dolomite (Late Permian)**—Limestone, dolomite more abundant than marl, conglomerate, sandstone, siltstone, shale, bauxite and bauxite-bearing rocks

P2lss **Limestone and sandstone (Early Permian)**—Color indicates Uluk and Kuberghandian horizons; limestone and sandstone more abundant than siltstone, conglomerate. Pattern and color indicate Karachatyr horizon; limestone and sandstone more abundant than siltstone, argillite, slate

C2ls **Limestone (Late Carboniferous)**—Limestone more abundant than slate, sandstone, conglomerate, siltstone, andesite to basalt volcanic rocks

C2um **Ultramafic intrusions (Early Carboniferous)**—Dunite, peridotite, serpentinite

C2rl **Lava (Early Carboniferous)**—Rhyolite to basalt volcanic rocks more abundant than limestone, slate, sandstone, conglomerate

C2rf **Rhyolite tuff (Early Carboniferous)**—Rhyolite to basalt volcanic rocks more abundant than limestone, shale, sandstone, conglomerate

C1,2ls **Limestone (Early Carboniferous (late Tournaisian and Viseam))**—Limestone more abundant than slate, sandstone, mudstone, conglomerate

C1rl **Rhyolite lava (Early Carboniferous (early Tournaisian))**—Rhyolite to andesite (greenstone altered) more abundant than sandstone, shale, siltstone

SDld **Limestone and dolomite (Devonian and Silurian)**—Limestone and dolomite more abundant than schist, sandstone

Ossl **Sandstone and siltstone (Ordovician)**—Shale, sandstone, chert

EXPLANATION OF MAP SYMBOLS

Contact

Fault—Dashed where approximately located; dotted where concealed

DATA SUMMARY

This map was produced from several larger digital datasets. Topography was derived from Shuttle Radar Topography Mission (SRTM) 85-meter digital data. Gaps in the original dataset were filled with data digitized from contours on 1:200,000-scale Soviet General Staff Sheets (1978–1997). Contours were generated by cubic convolution averaged over four pixels using TNTmips[1] surface-modeling capabilities. Cultural data were extracted from files downloaded from the Afghanistan Information Management Service (AIMS) Web site (http://www.aims.org.af). The AIMS files were originally derived from maps produced by the Afghanistan Geodesy and Cartography Head Office (AGCHO). Geologic data and the international boundary of Afghanistan were taken directly from Abdullah and Chmyriov (1977).

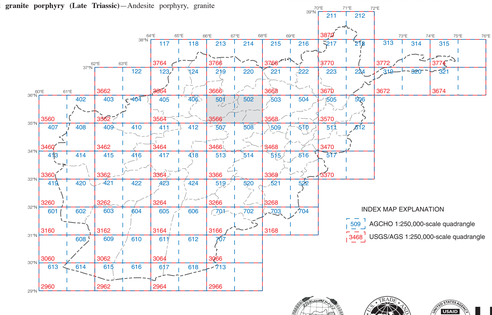
It is the primary intent of the U.S. Geological Survey (USGS) to present the geologic data in a useful format while making them publicly available. These data represent the state of geologic mapping in Afghanistan as of 2005, although the original map was released in the late 1970s (Abdullah and Chmyriov, 1977). The USGS has made no attempt to modify original geologic map-unit boundaries and faults; however, modifications to map-unit symbology, and minor modifications to map-unit descriptions, have been made to clarify lithostratigraphy and to modernize terminology. The generation of a Correlation of Map Units (CMU) diagram required interpretation of the original data, because no CMU diagram was presented by Abdullah and Chmyriov (1977).

This map is part of a series that includes a geologic map, a topographic map, a Landsat natural-color-image map, and a Landsat false-color-image map for the USGS/AGS (Afghan Geological Survey) quadrangles shown on the index map. The maps for any given quadrangle have the same open-file number but a different letter suffix, namely, -A, -B, -C, and -D for the geologic, topographic, Landsat natural-color, and Landsat false-color maps, respectively. The present map series is to be followed by a second series, in which the geology is reinterpreted on the basis of analysis of remote-sensing data, limited fieldwork, and library research. The second series is to be produced by the USGS in cooperation with the AGS and AGCHO.

REFERENCE CITED

Abdullah, Sh., and Chmyriov, V.M., eds., 1977, Map of mineral resources of Afghanistan: Kabul, Ministry of Mines and Industries of the Democratic Republic of Afghanistan, Department of Geological and Mineral Survey, V/O "Technoexport" USSR, scale 1:500,000.

[1]Geospatial analysis software developed by MicroImages, Inc., Lincoln, NE 68508-2010.



GEOLOGIC MAP OF QUADRANGLE 3566, SANG-CHARAK (501) AND SAYGHAN-O-KAMARD (502) QUADRANGLES, AFGHANISTAN

Compiled by
Kenzie J. Turner
2005

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