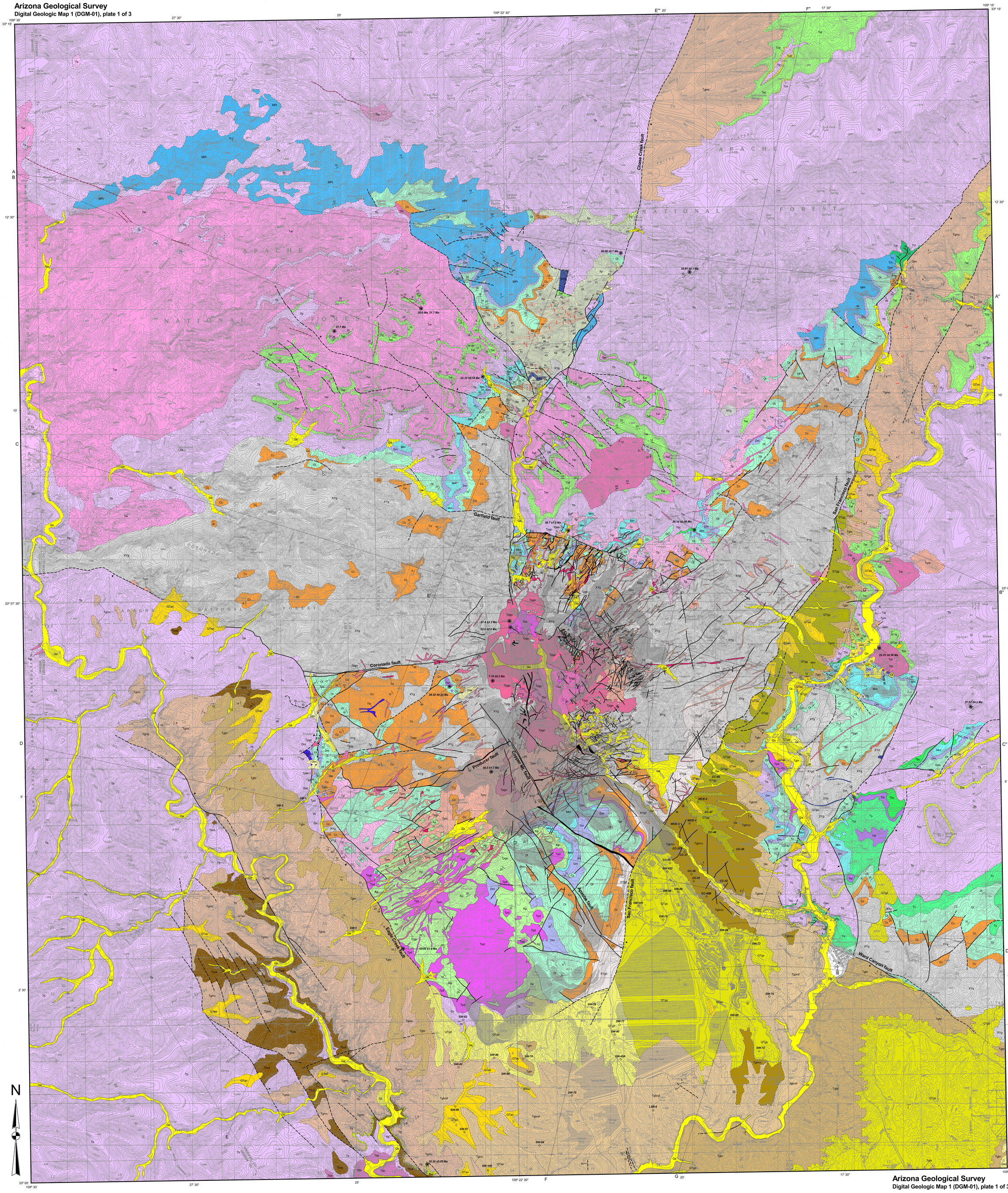

Arizona Geological Survey
Digital Geologic Map 1 (DGM-01), plate 1 of 3

Digital geologic map and cross sections of the Clifton-Morenci area, Greenlee County, Arizona

compiled by
Charles A. Ferguson[1], and M. Stephen Enders[2]
August, 2000

Arizona Geological Survey Digital Geological Map 1

derived from
Ferguson, C.A., Enders, M.S., and Orr, T.R., 2000, Geologic spatial data for the Clifton-Morenci area, Greenlee County, Arizona: Tucson, Arizona Geological Survey Digital Information Series 18 (DI-18), 5 ARC/INFO export files, 36 ArcView shapefiles, and other files.

geologic mapping in chronologic order by
Lindgren, W., Earling, R.B., Reber, L.E., Moolick, R. T., Durek, J. J., Cunningham, J. E., Richter, D. H., Lawrence, V. A., Bennett, K. C., Schern, E. M., Richardson, W. F., Pawlowski, M. R., Menzer, F. J., Preece, R. K., North, R. M., Stegen, R. J., Weiskopf, T. A., Ring, J. A., Cook, S. S., Calkins, B. T., Walker, M. A., Parker, D. B., Lee, J. S., Rodriguez, J., Gyger, P. L., Wright, E. G., Knox, M. M., Melchiorre, E. B., More, S. W., Schroeder, T. J., Young-Mitchell, M., Malkoski, M., Chillingworth, G., James, R., Lock, T., Warren, J. M., Enders, M. S., and Ferguson, C. A.

digital cartography by
Tim R. Orr[1], and J. Roberto Sotelo[2]

citation for this document:
Ferguson, C.A., and Enders, M.S., compilers, 2000, Digital geologic map and cross sections of the Clifton-Morenci area, Greenlee County, Arizona: Tucson, Arizona Geological Survey Digital Geological Map 1 (DGM-01), layout scale 1:24,000, 1 Adobe PDF file (3 plates), and other files.

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1 Arizona Geological Survey, 416 W. Congress, #100, Tucson, Arizona 85701
2 Phelps Dodge Morenci, Inc., 4521 Highway 191, Morenci, Arizona 85540

Geologic Map Units

RECENT
- R — Stockpiles, mill tailings, road embankments and other facilities

QUATERNARY
- Qt — Talus
- Qac — Colluvium
- Qa — Alluvium
- Qap — Pediment alluvium
- Qao — Older alluvium

QUATERNARY AND TERTIARY
- QTao — Older alluvial deposits

QUATERNARY AND TERTIARY GILA GROUP
- QTgs — Unit of Smuggler Canyon (Gila Group)
- QTgg — Unit of Smuggler Canyon, granite-clast facies (Gila Group)
- QTgd — Unit of Smuggler Canyon, diorite-clast facies (Gila Group)
- Tgbr — Unit of Buzzard Roost Canyon (Gila Group)
- Tgbrcc — Unit of Buzzard Roost Canyon, Chase Creek facies (Gila Group)
- Tgbrsf — Unit of Buzzard Roost Canyon, San Francisco facies (Gila Group)
- Tgmc — Conglomerate of Midnight Canyon (Gila Group)

TERTIARY UNITS OLDER THAN THE GILA GROUP
- Tcb — Basaltic conglomerate
- Tbck — Conglomerate of Bonita Creek
- Ttt — Rhyolite pyroclastic flows and ash-fall deposits
- Te — Enebro Mountain Formation
- Tet — Enebro Mountain Formation, nonwelded tuff
- Ter — Enebro Mountain Formation, lava
- Tei — Enebro Mountain Formation, intrusive
- Tb — Basaltic andesite, undivided
- Tbs — Mafic volcaniclastic and pyroclastic rocks
- Tbb — Basaltic andesite scoria and lava breccia
- Tbi — Hypabyssal bodies of basaltic andesite
- Tbc — Bloodgood Canyon Tuff
- Tbl — Lower basaltic andesite
- Tdc — Crystal-poor ash-flow tuff
- Tcl — Lower conglomerate
- Tc — Clifton Tuff

PALEOCENE AND EOCENE INTRUSIVE ROCKS
- Tbx — Intrusive breccia, undivided
- Tp — Porphyry, undivided
- Tpgy — Younger granite porphyry
- Tpgo — Older granite porphyry, undivided
- Td — Diabase
- Tpmq — Quartz monzonite porphyry
- Tpm — Monzonite porphyry
- Tpd — Diorite porphyry

MESOZOIC
- Kp — Pinkard Formation

PALEOZOIC
- MPt — Tule Springs Formation
- Mm — Modoc Formation
- Dm — Morenci Formation
- Ol — Longfellow Formation
- Cc — Coronado Quartzite

EARLY OR MIDDLE PROTEROZOIC
- XYg — Granite
- XYgd — Granodiorite
- XYd — Ferrodiorite

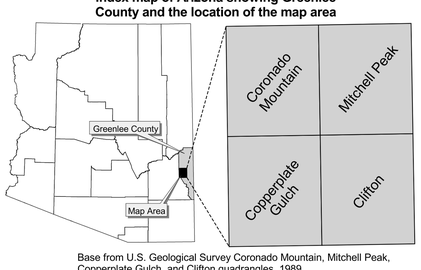
EARLY PROTEROZOIC
- Xp — Pinal Schist

Geologic Map Symbols

- Contact; dashed where location approximate
- Intraformational contact
- Mining pit escarpment
- High angle fault; dashed where location approximate, dotted where concealed; ball symbol on downdropped side; queried where identification uncertain
- Thrust fault; dotted where concealed; teeth on overriding plate
- Dike; undifferentiated; dashed where location approximate
- Anticline fold hinge surface trace; dashed where approximate
- Syncline fold hinge surface trace; dashed where approximate
- A — A' Geologic cross section lines
- Horizontal Bedding
- 17 Bedding, showing dip
- 20 Igneous Flow Foliation, showing dip
- 39 Eutaxitic Foliation, showing dip
- 80 Tectonic Foliation, showing dip
- 61 Fault Attitude, showing dip of fault surface
- 66 Fault Striae, showing plunge
- SW-98 Drill hole site with ID
- 22.25 ±0.36 Ma Sample location with sample date
- Tbx Geologic unit label with text lead-in line
- Fault zone; mixed lithology

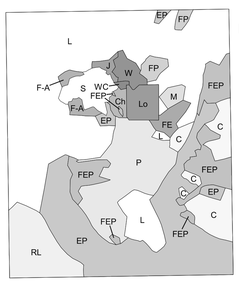
1 0 1 Miles
1000 0 1000 2000 3000 4000 5000 6000 7000 Feet
1 0 1 Kilometers

Index map of Arizona showing Greenlee County and the location of the map area



Base from U.S. Geological Survey Coronado Mountain, Mitchell Peak, Copperplate Gulch, and Clifton quadrangles, 1989

Index for Mapping Responsibility



- L — Lindgren, W., 1905
- C — Cunningham, J.E., 1981
- RL — Richter, D.H., and Lawrence, V.A., 1981
- P — Preece, R.K., 1984, and Walker, M.A., 1995
- M — More, S.W. 1995
- S — Schroeder, T.J., 1996
- FP — Ferguson, C.A., and Parker, D.B., 1998
- EP — Enders, M.S., and Parker, D.B., 1998-99
- FEP — Ferguson, C.A., and others, 1998-99
- Ch — Chillingworth, G., 1999
- F-A — Ferguson, C.A., 1999
- FE — Ferguson, C.A., and Enders, M.S., 1999
- J — James, R., 1999
- Lo — Lock, T., 1999
- W — Warren, J.M., 1999
- WC — Warren, J.M., and Chillingworth, G., 1999