

LEGEND

SUMMARY GEOLOGIC MAP OF BLACK HILLS NEAR MAMMOTH
Pinal County, Arizona

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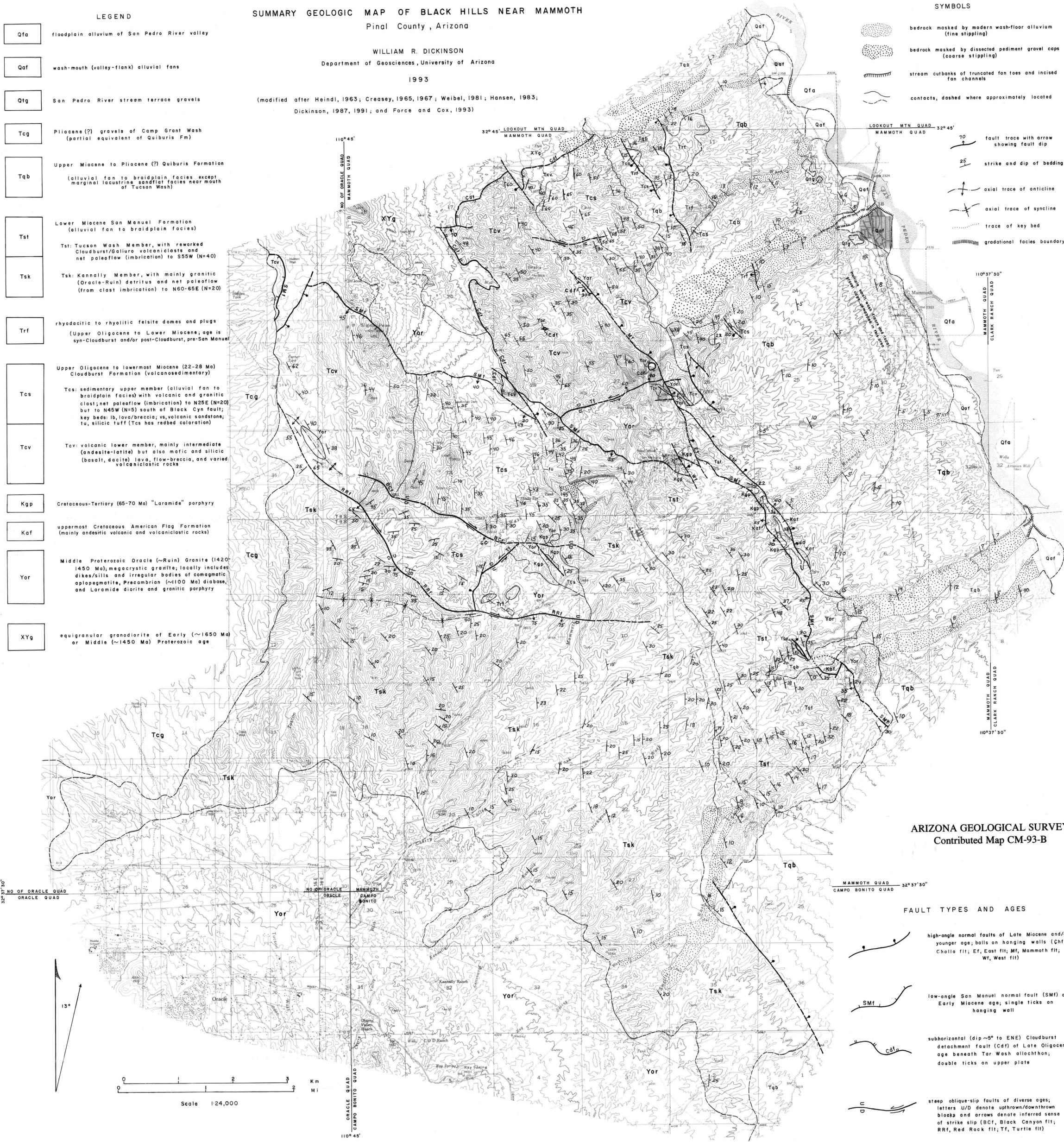
1993

(modified after Heindl, 1963; Creasey, 1965, 1967; Weibel, 1981; Hansen, 1983; Dickinson, 1987, 1991; and Force and Cox, 1993)

SYMBOLS

- Qfa** floodplain alluvium of San Pedro River valley
- Qaf** wash-mouth (valley-flank) alluvial fans
- Qtg** San Pedro River stream terrace gravels
- Tcg** Pliocene (?) gravels of Camp Grant Wash (partial equivalent of Quiburis Fm)
- Tqb** Upper Miocene to Pliocene (?) Quiburis Formation (alluvial fan to braidplain facies except marginal lacustrine sandflat facies near mouth of Tucson Wash)
- Tst** Lower Miocene San Manuel Formation (alluvial fan to braidplain facies)
Tst: Tucson Wash Member, with reworked Cloudburst/Gallura volcanoclastics and net paleoflow (imbrication) to S55W (N=40)
- Tsk** Tsk: Kannally Member, with mainly granitic (Oracle-Ruin) detritus and net paleoflow (from clast imbrication) to N60-65E (N=20)
- Trf** rhyodacitic to rhyolitic felsite domes and plugs (Upper Oligocene to Lower Miocene; age is syn-Cloudburst and/or post-Cloudburst, pre-San Manuel)
- Tcs** Upper Oligocene to lowermost Miocene (22-28 Ma) Cloudburst Formation (volcanosedimentary)
Tcs: sedimentary upper member (alluvial fan to braidplain facies) with volcanic and granitic clast; net paleoflow (imbrication) to N25E (N=20) but to N45W (N=5) south of Black Cyn fault; key beds: lb, lava/breccia; vs, volcanic sandstone; tu, sillicic tuff (Tcs has reddish coloration)
- Tcv** Tcv: volcanic lower member, mainly intermediate (andesite-latitude) but also mafic and sillicic (basalt, dacite) lava, flow-breccia, and varied volcanoclastic rocks
- Kgp** Cretaceous-Tertiary (65-70 Ma) "Laramide" porphyry
- Kaf** uppermost Cretaceous American Flag Formation (mainly andesitic volcanic and volcanoclastic rocks)
- Yor** Middle Proterozoic Oracle (~Ruin) Granite (1420-1450 Ma); megacrystic granite; locally includes dikes/sills and irregular bodies of comagmatic aplogneiss, Precambrian (~1100 Ma) diabase, and Laramide diorite and granitic porphyry
- XYg** equigranular granodiorite of Early (~1650 Ma) or Middle (~1450 Ma) Proterozoic age

- bedrock masked by modern wash-floor alluvium (fine stippling)
- bedrock masked by dissected pediment gravel caps (coarse stippling)
- stream cutbanks of truncated fan toes and incised fan channels
- contacts, dashed where approximately located
- fault trace with arrow showing fault dip
- strike and dip of bedding
- axial trace of anticline
- axial trace of syncline
- trace of key bed
- gradational facies boundary



ARIZONA GEOLOGICAL SURVEY
Contributed Map CM-93-B

FAULT TYPES AND AGES

- high-angle normal faults of Late Miocene and/or younger age; balls on hanging walls (Chf, Cholla fit; Ef, East fit; Mf, Mammoth fit; Wf, West fit)
- low-angle San Manuel normal fault (SMf) of Early Miocene age; single ticks on hanging wall
- subhorizontal (dip ~5° to ENE) Cloudburst detachment fault (Cdf) of Late Oligocene age beneath Tar Wash alluvium; double ticks on upper plate
- steep oblique-slip faults of diverse ages; letters U/D denote upthrown/downthrown blocks and arrows denote inferred sense of strike slip (BCf, Black Canyon fit; RRF, Red Rock fit; Tf, Turtle fit)