



**Contact**  
dashed where gradational or approximately located

**Fault**  
dashed where inferred; dotted where concealed; queried where existence doubtful; double arrows indicate strike-slip movement; U - upthrown side; D - downthrown side relatively

**Axis of fold**  
arrow on axis indicates direction of plunge

**Strike and dip of strata**  
conglomerate bed  
sandstone bed  
molluscan fossil locality

**Qa Qls**  
Surficial deposits  
Qa; alluvium  
Qls; landslide debris

**UNCONFORMITY**

**Qoa**  
Older alluvium

**UNCONFORMITY**

**Tps Tbs Tpt**  
Nonmarine sedimentary rocks  
Tps; weakly indurated greenish clay, silt, sand and pebble gravel  
Tb; basalt  
Tpt; tuff breccia

**Tmsl Tms Tmso**  
Marine sedimentary rocks  
Tmss; sandstone, locally pebbly, fossiliferous; south of Shell Ridge upper part may include nonmarine rocks  
Tmsl; siltstone, massive, sandy to argillaceous  
Tmsh; shale, silty to siliceous  
Tmso; Sobrante (?) Sandstone

**Tsr**  
San Ramon Formation  
Fine-grained sandstone

**UNCONFORMITY**

**Tkm Tks**  
Kreyenhagen Formation  
Tks; claystone  
Tkm; Markley Sandstone Member, arkosic sandstone, minor interbedded siltstone  
Tkn; Nortonville Shale Member, clay shale

**Tds**  
Domengine Sandstone  
Tan, thick-bedded arkosic sandstone

**Tmg**  
Meganos (?) Formation  
Claystone, thin sandstone at base

**Tmz**  
Martinez Formation  
Claystone and siltstone, minor arkosic sandstone

**UNCONFORMITY (?)**

**Kps Kp**  
Panoche Formation  
Kps; buff, bedded, arkosic sandstone, minor micaceous shale  
Kp; shale, micaceous to argillaceous to silty, minor thin interbeds of sandstone

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Geology mapped and field checked by T. W. Dibblee, Jr., 1977, modified from Lawson, 1914; H.S. Sonnenman and J.R. Switzer, Jr., unpublished data; Saul, 1967; Sharp, 1973; and Smith, 1957.

**PRELIMINARY GEOLOGIC MAP OF THE WALNUT CREEK QUADRANGLE, CONTRA COSTA COUNTY, CALIFORNIA**

by  
**Thomas W. Dibblee, Jr.**  
1980

WALNUT CREEK, CALIF.  
NO. 4 CONCORD 16 QUADRANGLE  
N3752.5-W12206.7.5

U. S. Geological Survey  
OPEN-FILE REPORT  
This report is preliminary and has not been edited or reviewed for conformity with Geological Survey Standards and nomenclature.