

# EXPLANATION

(For Plate 2)

Nourse - Ja - 1989

Plate 2  
expln

## UPPER PLATE:

### INTERMONTANE GROUP

- vb vesicular basalt: massive flows interbedded with upper continental deposits; youngest flows display columns
- ucd/cg/ss upper continental deposits: poorly sorted, weakly indurated conglomerate, lithic/tuffaceous sandstone and siltstone; interbedded with felsic tuffs and basalts
- tu felsic tuff(s), interstratified with lake beds and upper continental deposits
- lb/y/lss lake beds: siltstone, shale, gypsum-yeso (y), and lacustrine limestone (lss).
- sb siltstone+fine sandstone sedimentary breccia, highly indurated; interbedded with upper rcg/rss unit
- tu felsic tuff(s), interstratified with upper rcg/rss unit
- rss red lithic sandstone, moderately indurated, poorly sorted
- rcg red conglomerate, well indurated, poorly sorted; interbedded with red sandstone, felsic tuff, and dacite/andesite flows
- a/ab andesite flows and breccias, often highly altered; interstratified with upper sbr/ lower rcg units
- sbr/lss coarse, angular sedimentary breccia, well indurated; interbedded with lithic sandstone, siltstone, and andesite flows

Lower Miocene

Middle Tertiary?

Upper Cretaceous-  
Lower Tertiary

### VOLCANIC COMPLEX

- b Lower Miocene? basalt flows, interstratified with silicic ignimbrites in the Sierra La Lamina
- sig Middle Tertiary silicic ignimbrites and pyroclastic deposits, undifferentiated; pt-pink tuff breccia/tuffaceous sandstone; yt-yellow tuff marker horizon(s); partially mapped in the Sierras El Torreon and La Lamina
- pt/yt
- ha/ab Lower or Middle Tertiary? oxyhornblende andesite flows and breccias; includes unmapped andesites and dacites of the Sierra Ventana

### LATE TERTIARY-QUATERNARY ALLUVIUM AND COLLUVIUM

- Qal Quaternary alluvium, undifferentiated
- Qt Quaternary? terrace deposits abandoned by the Rio Magdalena and tributaries
- TQvf valley fill deposits: poorly indurated and sorted conglomerates, sandstones, siltstones, mudstones
- TQgr/Qgr alluvial fan deposits, mostly composed of granite cobbles and boulders
- TQmx/Qmx alluvial fan deposits, composed of mixed metamorphic, granitic, and rhyolitic cobbles and pebbles
- Tcg red conglomerate and sandstone, well indurated; similar clast population as older conglomerates, but additional lower plate mylonitic clasts

unconformity

### PRE-LATE CRETACEOUS ROCKS

- lbr limestone breccia, derived from Represo limestone
- Kr/lr Represo Formation (after Salas, 1968): lithic sandstone, siltstone, and shale with fossiliferous marine limestone and lime mudstone (lr)
- JKs/JKa red lithic sandstone and siltstone, tectonically interleaved with dark purple-red andesite flows and breccias; forms lower plate(s) of the La Lamina thrust complex
- Jgr leucocratic biotite granite/syenogranite, exposed only near La Cinta de Plata
- PEgr/gn micrographic granite (Aibo type) / undifferentiated gneisses; exposed as klippen in the La Lamina thrust complex (Anderson et al., 1984; Stephens + Anderson, 1986)

Lower Cretaceous

Upper Jurassic-  
Lower Cretaceous?

Jurassic?

Precambrian?

MAGDALENA DETACHMENT FAULT

# LOWER PLATE

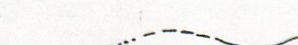

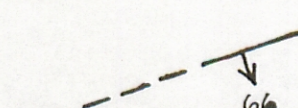

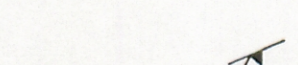
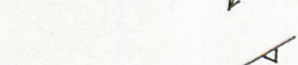
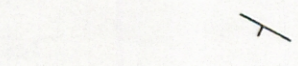
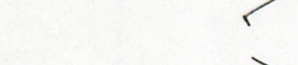
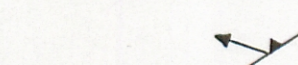

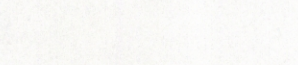
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Lower Plate

## CORRELATIVE METAMORPHOSED AND DEFORMED STRATA

## UNMETAMORPHOSED STRATA

### SYMBOLS:

-  **geologic contact**, dashed where approximately located, dotted where generalized
-  **detachment fault** (low angle brittle normal fault), dashed where approximately located, dotted where concealed or inferred. Arrow indicates dip
-  **high angle normal fault**, dashed where approximately located, dotted where concealed or inferred; arrow shows angle of dip
-  **thrust fault**, dashed where approximately located, dotted where concealed or inferred; arrow shows angle of dip
-  strike and dip of metamorphic **foliation**, showing trend and plunge of **lineation**
-  strike and dip of **igneous flow foliation**
-  strike and dip of **bedding**
-  strike and dip of **cleavage**
-  strike and dip of **joint surface**
-  strike and dip of **discrete ductile shear zone**
-  strike and dip of **dike or vein**

- pe/ph** **pelitic schist/ phyllite** (qtz+musc+feldsp+bio+staur+and+mt±gt)
- m** **impure marble** (calcite+ep+qtz±feldsp±gross)
- bfs/ms** fine-v. fine **biotite-feldspar±qtz schist** or semischist/undifferentiated metasedimentary rocks
- q** fine grained **impure quartzite** (qtz+ep+feldsp+amph+zirc+calcite±musc±bio); interlayered with qcg
- qcg** **stretched quartz+volcanic+sandstone pebble-cobble conglomerate**, interlayered with q and bfs
- mgrp** **metamorphosed granite porphyry**: medium to coarse Kspar+qtz+plag+bio+sphene±ep porphyry, pervasively recrystallized; interlayered with mqp and qss
- mvcg** **stretched volcanic conglomerate** with recrystallized rhyolite and sparse quartzite clasts / **muscovite-feldspar+qtz+bio schist** or semischist
- qss** fine grained **quartzitic sandstone**, frequently contains garnet and muscovite; interlayered with mqp
- mqp** **metamorphosed quartz porphyry**: recrystallized musc+feldsp+qtz+bio schist derived from rhy; quartz eyes in a fine grained, sugary matrix are typical
- mav/mv** **metamorphosed acidic volcanic** strata: fine grained feldsp+qtz+bio±musc hornfels/gneiss, weakly foliated; derived from a tuff? / undifferentiated **metavolcanic rocks**

- KL** Lower Cretaceous **marine basinal strata**: sandstone, siltstone, shale, and limestone correlative to the Bisbee Group (Kitz and Anderson, 1988); 2+ km thick section structurally overlies Cocospera conglomerate east of study area (Kitz, pers. comm., 1988)
- csp** **Cocospera Formation** (after Gilmont, 1978): quartzite+sandstone+volcanic pebble-cobble conglomerate interbedded with quartz rich sandstone, siltstone, and shale (**faulted**) **unconformity**
- grp** coarse grained biotite **granite porphyry**, gradational into feldspar-quartz porphyry; intrudes rhy, qss, and vcg as extensive sills
- vcg** **volcanic conglomerate**, with clasts of rhyolite porphyry and sparse quartz sandstone in a rhyolitic matrix **unconformity**
- qss** fine grained **quartz arenite**, interstratified with rhy
- rbr** **rhyolitic breccia**, highly silicified and recrystallized; probably a dynamic product of detachment faulting
- rhy** **rhyolite porphyry** with round quartz and broken feldspar phenocrysts; weak flow foliation preserved

- Lower Cretaceous
- Upper Jurassic-Lower Cretaceous
- Late Jurassic?
- Lower Jurassic

## CATACLASTIC AND MYLONITIC EQUIVALENTS

- br** **chlorite+qtz+feldspar microbreccia**, derived from mylonitic **pe and ph**
- gbr** **chlorite+qtz+feldspar microbreccia** derived from various mylonitic **granite** lithologies
- lgn** **leucogneiss**: strongly foliated and attenuated sheet-like masses of mylonitic lgr+peg interlayered with intensely sheared 2gr and bgd; occurs as mylonitic sills within structurally higher deformed supracrustal section
- mgn** **mafic gneiss**: dark mylonitic gneisses derived mainly from bgd, and intimately interlayered with lgn; locally intruded by porphyritic biotite quartz syenite
- bgagn** coarse grained **porphyritic biotite granite augen gneiss**; occurs as highly sheared, concordant sheets within mylonitic bgd, 2gr, and lgr (**Precambrian?**)

## GRANITES AND GRANITIC GNEISSES

- bq1** **biotite quartz latite dike set**: intrudes cataclastic and mylonitic fabrics of the lower plate as well as upper plate sbr unit
- qsy** coarse **porphyritic biotite quartz syenite**; intrudes mylonitic gneisses of the southern Sierra Magdalena
- P** **pegmatite** and alaskite dikes and veins, highly leucocratic; generally deformed
- lgr/bgr** **leucogranite/leucocratic biotite monzogranite**, fine to medium grained, intimately associated with garnet+musc bearing pegmatite and alaskite; CI less than 2
- 2gr** **porphyritic two mica granite**, medium to coarse grained, biotite dominant with sparse garnet; CI-2-5
- pbgr** **porphyritic biotite monzogranite**, medium to coarse grained with coarse quartz, no garnet or musc; CI-6-10
- pbgd** **porphyritic biotite granodiorite**, medium to coarse grained, no garnet or muscovite; CI-7-14

- Early Miocene
- Middle Tertiary?
- Middle Tertiary
- Oligocene?
- Early Tertiary?
- Late Cretaceous-Early Tertiary?
- Late Cretaceous