

Explanation

The geologic sections illustrate the geometry of major rock units, dikes, foliation, and faults in the White Tank metamorphic core complex. The oldest rock units are high-grade Proterozoic metamorphic rocks, gabbro, and local ultramafic rocks. These were intruded by two Proterozoic plutons: a tonalite to the south and a granodiorite-granite to the north. Both plutons were injected as a series of sills now parallel to foliation in the metamorphic rocks. The metamorphic rocks and plutons are pervaded by a regional northeast-trending gneissic foliation, interpreted as S1 (the first planar fabric). Orientations of S1 define several large, upright folds. In the western part of the range, the S1 foliation is cut and overprinted by a younger (S2) fabric in shear zones, and some, but not all, upright folds appear to be related to these shear zones.

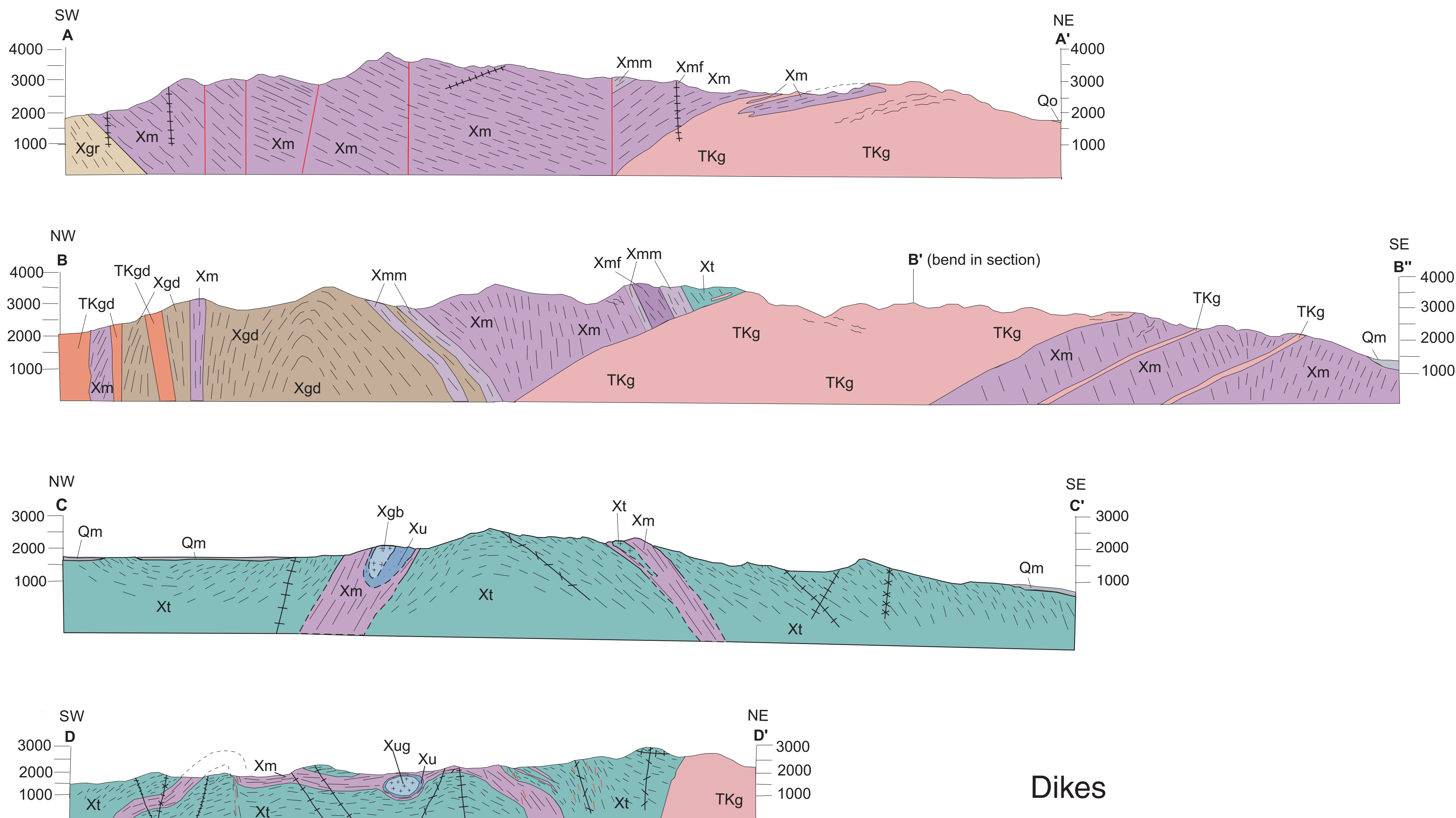
These rocks and fabrics were intruded by an undeformed Late Cretaceous to Early Tertiary granodiorite and the Early Tertiary (?) White Tank Granite. The White Tank Granite was emplaced as a mile-thick, gently west-dipping sill and as numerous smaller sills. The main pluton and especially the sills locally have a syn-emplacment foliation and are overprinted, commonly in thin shear zones, by mid-Tertiary mylonitic foliation with northeast-trending lineation. This mylonitic fabric is also present in some mid-Tertiary dikes and is related to regional mid-Tertiary crustal extension.

A mid-Tertiary detachment fault is located just west of section A-A'. The fault dips gently to the west but displacement of the hangingwall was to the northeast, prior to doming of the fault over the range. Even younger structures are northwest-trending, high-angle faults. Some of these have their southwest sides down, but slickenlines document some lateral movement as well. Quaternary deposits surround the embayed range.

Units on the Sections

Qm	Younger middle alluvium (Late Quaternary; 10-100 Ka)
TKg	White Tank Granite (Late Cretaceous to early Tertiary): biotite granite and two-mica granite, with associated granodiorite, pegmatite, and felsite; main pluton and sills are locally overprinted by Tertiary mylonitic fabric
TKgd	Granodiorite (Late Cretaceous to early Tertiary): medium-grained granodiorite with diorite, granite, and porphyritic rocks; rock unit is undeformed
Xgr	Granitic rocks and pegmatite (Proterozoic): coarse- to medium-grained granite and garnet-bearing pegmatite; contains some S2 foliation, but lacks S1
Xgd	Granodiorite and Granite (Proterozoic): foliated to gneissic granodiorite and granite; local K-feldspar phenocrysts; important component of unit Xmf
Xt	Tonalite (Proterozoic): foliated tonalite and granodiorite, with less abundant granite, diorite, and gabbro; locally gneissic with S1 foliation
Xug	Gabbro (Proterozoic): amphibole-pyroxene gabbro, weakly foliated; associated with ultramafic rocks
Xu	Ultramafic rocks (Proterozoic): pyroxene-amphibole ultramafic and mafic rocks
Xm	Undifferentiated metamorphic rocks (Proterozoic): foliated and banded quartzofeldspathic gneiss, amphibolitic gneiss, and biotite schist, interlayered with strongly foliated tonalite, granodiorite, granite, and pegmatite
Xmf	Quartzofeldspathic and granitic gneiss (Proterozoic): foliated to banded gneiss with abundant felsic layers, including granitic and pegmatitic sills related to unit Xgd
Xmm	Amphibolitic gneiss (Proterozoic): foliated to banded amphibolitic gneiss and amphibolite with quartzofeldspathic layers and epidote-rich rocks

Note: Locations of the sections are shown on the accompanying geologic map (sheet 1). Sections C and D are modified after Wood (1997; ASU M.S. thesis); scale and elevations on these sections were estimated by comparing the original sections to contacts and topography on the map presented here. Sections A and B are new sections drawn directly from the map by S. Reynolds. Julia K. Johnson helped digitize the sections and Steve Richard of the AZGS helped with file conversions. This project was funded in part by the USGS EDMAP and STATEMAP programs.



Dikes

- Felsic dike (Tertiary)
- Intermediate or composite dike (Tertiary)
- Mafic dike (Tertiary)

Symbols

- Depositional or intrusive contact
- Fault
- Mid-Tertiary foliation with lineation
- Proterozoic foliation: S1 (black) and S2 (red) foliation

Geologic Sections of the White Tank Mountains, Central Arizona

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Arizona Geological Survey Digital Geologic Map DGM-14
Sheet 2 of 2
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