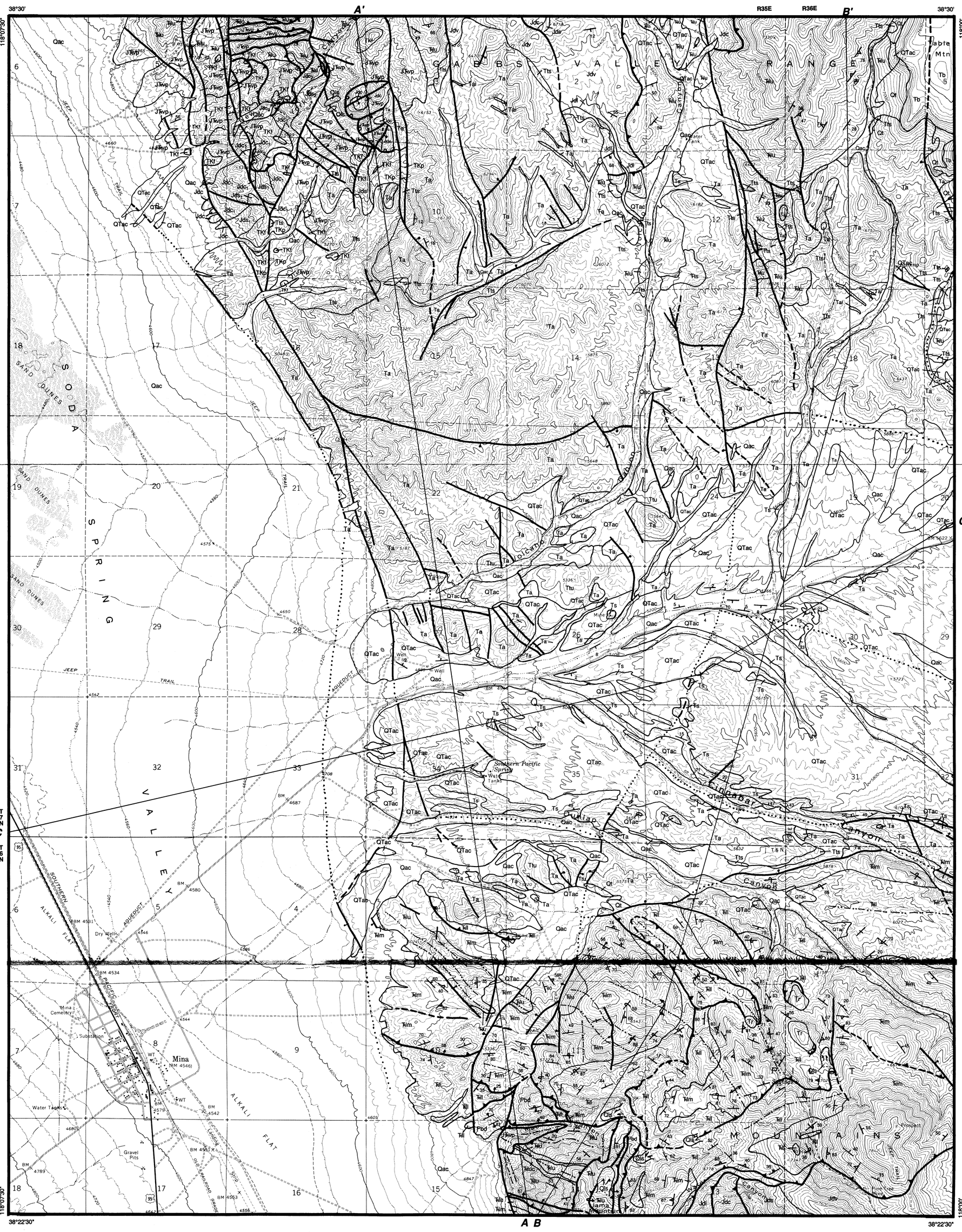

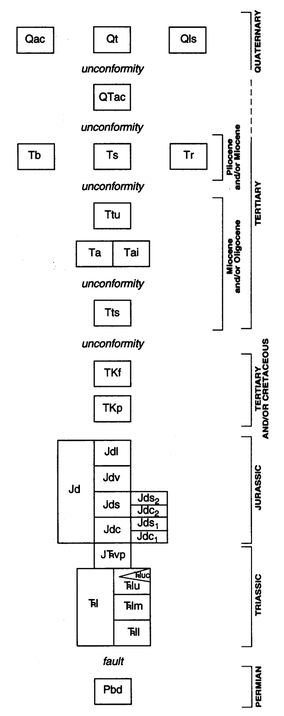

MAP SYMBOLS

Contact Dashed where approximately located.

High-angle fault Dashed where approximately located, dotted where concealed; ball on downthrown side where relative displacement known; arrows indicate relative lateral displacement when known; A and T indicate away and toward relationships of strike slip faults on cross sections.

Thrust fault Teeth on upper plate; dashed where approximately located, dotted where concealed, overturned where indicated.

Low-angle fault of uncertain origin.

40 **Dip of fault**

Stratigraphic facing direction (cross section)

75 **Strike and dip of bedding**

70 **Bedding with primary tops**

40 **Overturned bedding**

57 **Overturned bedding with primary tops**

Vertical bedding

82 **Cleavage**

Axial-trace D_1 **fold**

Axial-trace D_2 **fold**

Axial-trace D_3 **fold**

Syncline

Anticline

Antiformal syncline

Synformal anticline

0 0.5 1 KILOMETER
0 1000 METERS
0 0.5 1 MILE
0 2000 4000 FEET

Scale 1:24,000
CONTOUR INTERVAL 40 FEET

Base map: U.S. Geological Survey Mina 7.5' Quadrangle, 1967

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First edition, first printing, 1993, 500 copies
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Partial financial support for field work and field review was provided by the Geological Society of Nevada

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Qac **Alluvium and colluvium (Quaternary)** Unconsolidated sand and gravel deposits, fans, talus, slopewash deposits (including alkali flat (playa) deposits), and aeolian sand deposits.

Qt **Talus deposits (Quaternary)** Unconsolidated sand to gravelly talus deposits.

Qls **Landslide deposits (Quaternary)** Unconsolidated landslide deposits generally composed of underlying or adjacent units.

QTac **Older alluvium and colluvium (Quaternary and Tertiary)** Consolidated and unconsolidated sand and gravel deposits, fans, talus, slopewash deposits (including alkali flat (playa) deposits), and aeolian sand deposits.

Tb **Basalt and basaltic andesite (Pliocene and/or Miocene)** Dark-gray to black aphanitic flows; phenocryst-poor lavas contain small (1 mm or less) plagioclase phenocrysts.

Ts **Sedimentary rocks (Pliocene and/or Miocene)** Fine-grained volcanogenic lacustrine sediments and partially consolidated fluvial gravels and sandstones.

Tr **Rhyodacite (Pliocene and/or Miocene)** Intrusive rhyodacite, locally massive and locally containing well-developed cooling joints.

Ttu **Undifferentiated tuff (Miocene)** Crystal-rich ash-flow tuff.

Ta **Andesite (Miocene)** Extrusive andesite flows, breccia, lahars, and local hypabyssal intrusive bodies. Locally interbedded with thin volcanogenic sedimentary units.

Tai **Intrusive andesite (Miocene)** Andesite dikes, probably late-stage feeder systems to upper part of andesite unit (Ta).

Tts **Singatse Tuff (Oligocene)** Brown to red-brown, moderately to densely welded ash-flow tuff; crystal rich and contains abundant lithic fragments. Crystals are plagioclase, quartz, sanidine, biotite, and hornblende. Dated locally with K-Ar (biotite) as 27.2 ± 1.1 Ma (Proffett, 1977).

TKf **Felsite (Tertiary and/or Cretaceous)** White to light-buff aphanitic and porphyritic intrusive rocks containing phenocrysts of feldspar.

TKp **Feldspar porphyry (Tertiary and/or Cretaceous)** Mafic feldspar porphyry intrusive. Euhedral phenocrysts of feldspar ranging in size from 1 to 15 mm are contained in a dark-green aphanitic groundmass. Unit locally composed of autobreccia.

Jd **Dunlap Formation (Jurassic)** Terrigenous clastic rocks and locally, minor interbedded carbonate rocks. Terrigenous clastic rocks are characterized by coarse chert breccia, carbonate breccia, volcanic breccia, and abundant quartz and/or feldspar sandstone in a argillite matrix. The formation resides in numerous thrust nappes and may represent diverse ages and sites of deposition (Oldow and Bartel, 1987).

Jdl **Dunlap Carbonate Member** Light-gray to buff weathering resedimented limestone, consisting of carbonate breccia, calcarenite, and micrite. Carbonate interbedded with red- to green-weathering argillite and sandy argillite. Unit gradationally overlies Jdv member.

Jdv **Dunlap Volcanic/Volcanogenic Member** Interbedded red to purple argillite, feldspathic sandstone, commonly containing volcanic fragments, volcanic-lithic conglomerate with feldspathic sandstone and/or argillite matrix, and feldspar porphyry volcanic rocks. Volcanic rocks consist of flows and breccia units. Unit gradationally overlies Jds member.

Jds **Dunlap Sandstone Member** Quartz and/or quartz and feldspar arenite of lower Dunlap Formation; undifferentiated Jds_1 and Jds_2.

Jdc **Dunlap Conglomerate Member** Limestone and/or limestone and chert pebble conglomerate of lower Dunlap Formation; undifferentiated Jdc_1 and Jdc_2.

Jds_2 **Dunlap Sandstone Upper Member** Interbedded quartz and feldspar sandstone, argillite, and conglomerate containing chert and volcanic clasts. Unit gradationally overlies Jdc_2 member.

Jdc_2 **Dunlap Conglomerate Upper Member** Interbedded well-sorted, fine-grained quartz arenite and boulder to pebble conglomerate. Conglomerate composed of angular to subangular chert and limestone clasts in a quartz arenite matrix. Never seen in contact with stratigraphically lower(?) Jds_1 member.

Jds_1 **Dunlap Sandstone Lower Member** Massive to thin-bedded quartz arenite. Locally contains thin interbeds of limestone pebble conglomerate. Gradationally overlies Jdc_1 member.

Jdc_1 **Dunlap Conglomerate Lower Member** Interbedded well-sorted, fine-grained quartz arenite, fined grained limestone, and boulder to pebble conglomerate. Conglomerate composed of angular to subangular limestone clasts in a limestone matrix.

J'Tvp **Volcano Peak Formation (Jurassic and Triassic)** Interbedded limestone and calcareous mudstone. Several mappable units composed of dark-gray thin-bedded micrite and light-brown fossiliferous limestone, interbedded with calcareous mudstone and argillite containing sparse interbeds of sandstone and limestone are recognized (modified after Taylor and others, 1983). Members are not shown on map due to scale. The Volcano Peak disconformably overlies the Luning Formation.

Til **Luning Formation (Upper Triassic)** Consists of interbedded members of carbonate and terrigenous clastic rocks. Carbonates are generally thin- to medium-bedded gray to black limestone and locally dolomite. Terrigenous clastic rocks are interbedded chert-quartz sandstone, chert-pebble conglomerate, and argillite. Several members are recognized (Oldow, 1981).

Tilu **Upper Member** Medium-bedded carbonate (80%), consisting of limestone passing upward into dolomite, with about 20% interbedded argillite.

Tiluc **Dolomitic carbonate breccia of the upper member** lapse origin.

Tilm **Middle Member** Chert-pebble and boulder conglomerate, chert-quartz arenite and wacke, and massive sandy mudstone.

Till **Lower Member** Thin- to thick-bedded limestone, commonly very fossiliferous, with up to 80% interbedded argillite.

Pbd **Black Dyke Formation (Permian)** Consisting dominantly of mafic volcanic rocks and their epiclastic derivatives; K-Ar (hornblende) ages of 253 ± 3 Ma (Speed, 1977).

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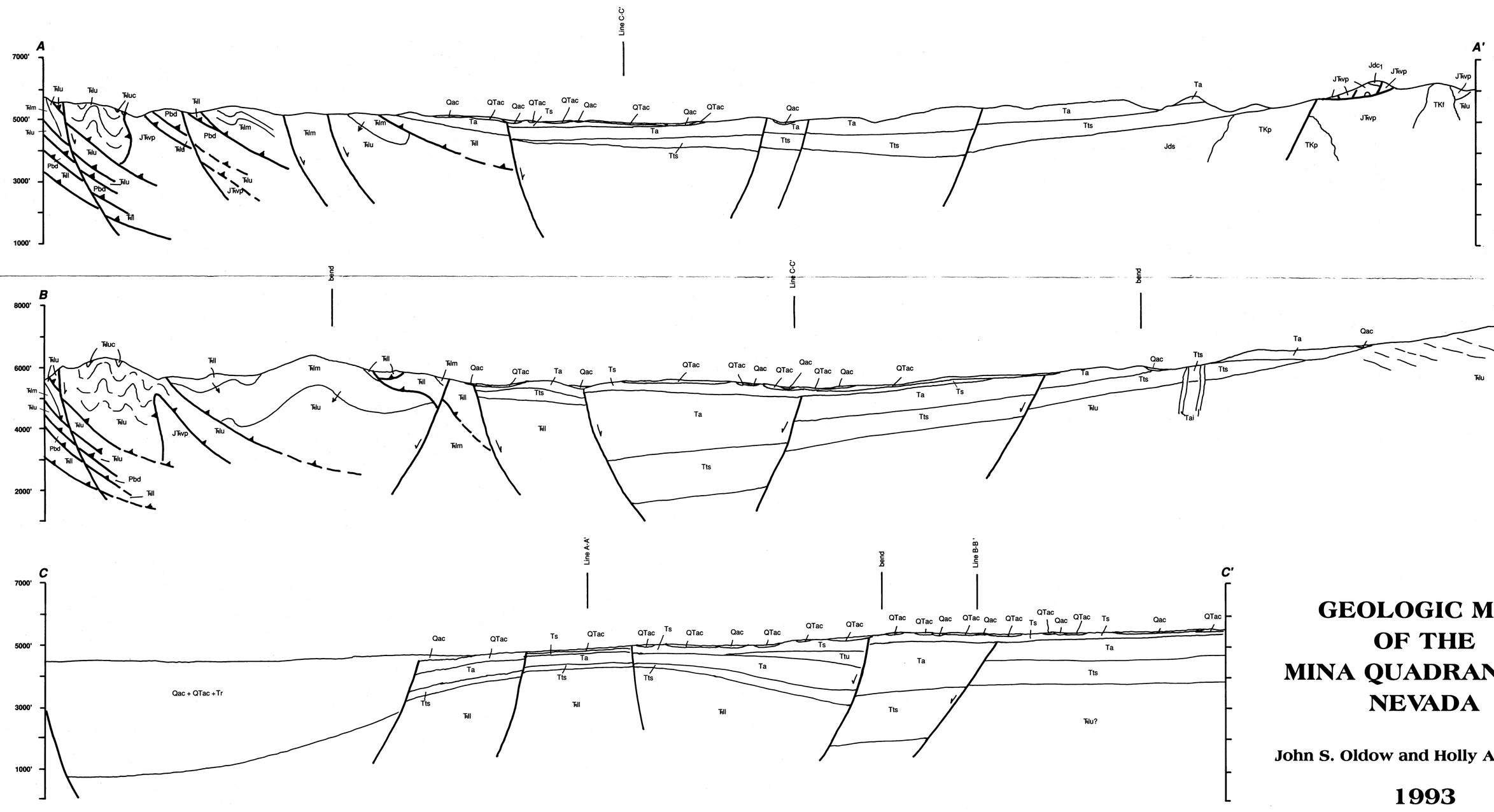

GEOLOGIC MAP OF THE MINA QUADRANGLE, NEVADA

John S. Oldow and Holly A. Dockery

1993