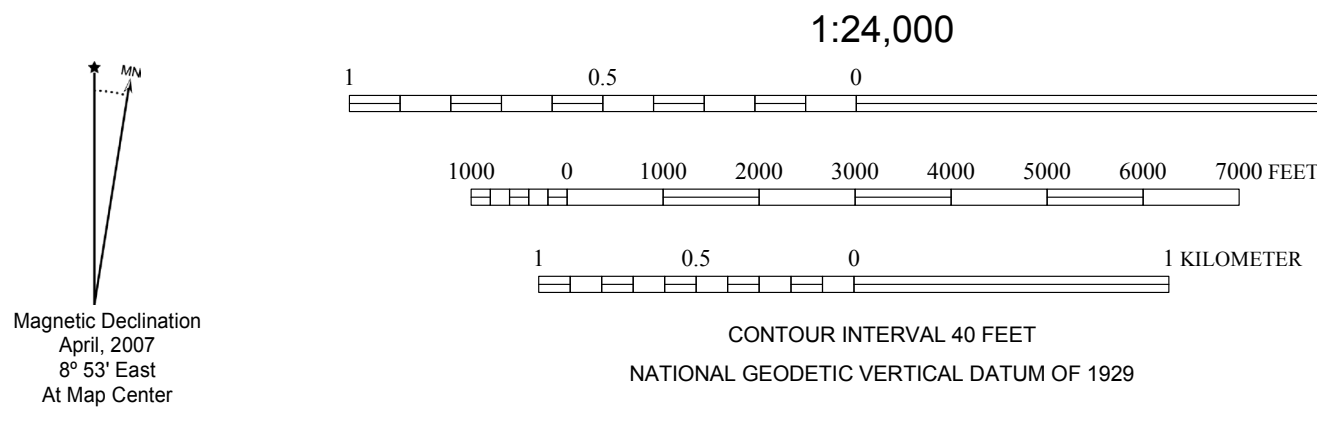
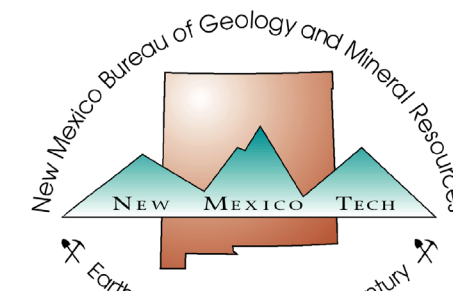


QUADRANGLE LOCATION

This draft geologic map is preliminary and will undergo revision. It was produced from either scans of hand-drafted originals or from digitally drafted original maps and figures using a wide variety of software, and is currently in cartographic production. It is being distributed in this draft form as part of the bureau's Open-file map series (OFGM), due to high demand for current geologic map data in these areas where STATEMAP quadrangles are located, and it is the bureau's policy to disseminate geologic data to the public as soon as possible.

After this map has undergone scientific peer review, editing, and final cartographic production adhering to bureau map standards, it will be released in our Geologic Map (GM) series. This final version will receive a new GM number and will supercede this preliminary open-file geologic map.

DRAFT



New Mexico Bureau of Geology and Mineral Resources
Open-file Map Series
OF-GM 177

Mapping of this quadrangle was funded by a matching funds grant from the STATEMAP program of the National Cooperative Geologic Mapping Act administered by the U.S. Geological Survey, and by the New Mexico Bureau of Geology and Mineral Resources, Dr. Peter A. Scholle, Director and State Geologist, Dr. J. Michael Timmons, Geologic Mapping Program Manager

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This and other STATEMAP quadrangles are (or soon will be) available for free download in both PDF and ArcGIS formats at:

<http://geoinfo.nmt.edu/publications/maps/geologic/ofgm/home.html>

Geologic map of the Robertson Canyon quadrangle, Otero and Chaves Counties, New Mexico.

May 2008

by
Steven J. Skotnicki
281 West Amaroso Dr., Gilbert AZ 85233

COMMENTS TO MAP USERS

A geologic map displays information on the distribution, nature, orientation, and age relationships of rock and deposits and the occurrence of structural features. Geologic and fault contacts are irregular surfaces that form boundaries between different types or ages of units. Data depicted on this geologic quadrangle map may be based on any of the following: reconnaissance field geologic mapping, compilation of published and unpublished work, and photogeologic interpretation. Locations of contacts are not surveyed, but are plotted by interpretation of the position of a given contact onto a topographic base map, therefore, the accuracy of contact locations depends on the scale of mapping and the interpretation of the geologists. Any enlargement of this map could cause misunderstanding in the detail of mapping and may result in erroneous interpretations. Site-specific conditions should be verified by detailed surface mapping or subsurface exploration. Topographic and cultural changes associated with recent development may not be shown.

Cross sections are constructed based upon the interpretations of the author made from geologic mapping, and available geophysical, and subsurface (drilled) data. Cross-sections should be used as an aid to understanding the general geologic framework of the map area, and not be the sole source of information for use in locating or designing wells, buildings, roads, or other man-made structures.

The map has not been reviewed according to New Mexico Bureau of Geology and Mineral Resources standards. The contents of the report and map should not be considered final and complete until reviewed and published by the New Mexico Bureau of Geology and Mineral Resources. The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the State of New Mexico, or the U.S. Government.

UNIT DESCRIPTIONS

Quaternary Deposits

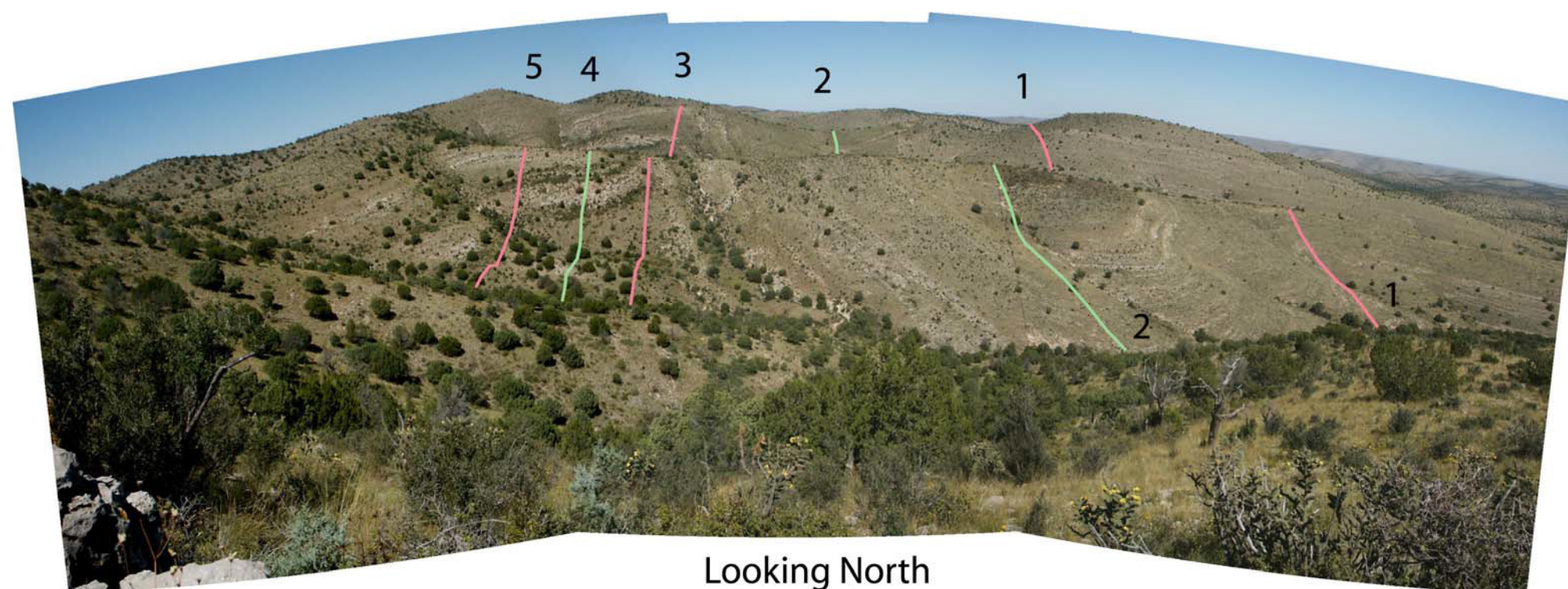
- Qp Playa deposits (Quaternary).** Closed depressions contain mostly dark tan to brown silt and clay. Top surfaces are commonly disturbed by cows.
- Qyc Modern channel deposits (Quaternary).** Dominated by unconsolidated limestone gravel and interbedded tan silt. The scratched surfaces, roughened by bedload abrasion during recent flow events, imparts a lighter gray color to these deposits that shows up prominently from a distance and on aerial photos.
- Qy Holocene alluvial deposits, undivided (Quaternary).** This unit consists of map units Qy3, Qy2, Qy1, and Qyc.
- Qy3 Holocene alluvial deposits, younger deposits (Quaternary).**
- Qy2 Holocene alluvial deposits, middle deposits (Quaternary).**
- Qy1 Holocene alluvial deposits, older deposits (Quaternary).**
- Qm Middle Quaternary alluvial deposits.** These deposits were mapped separately on the basis of aerial photographs.
- Qo Older alluvial deposits (Quaternary).** Most surfaces are mantles with thin dark brown soil. Where exposed, these deposits consist of interbedded limestone conglomerate and interbedded tan silt. Stage III and IV caliche is visible in the uppermost 1-2 meters exposed locally. As mapped, some areas contain broad swales that are likely floored by younger Holocene deposits, but were not mapped separately.
- Qs Quaternary alluvial deposits, undivided (Quaternary).** As mapped, this unit may include Quaternary sedimentary deposits of any age.

Quaternary or Tertiary Deposits

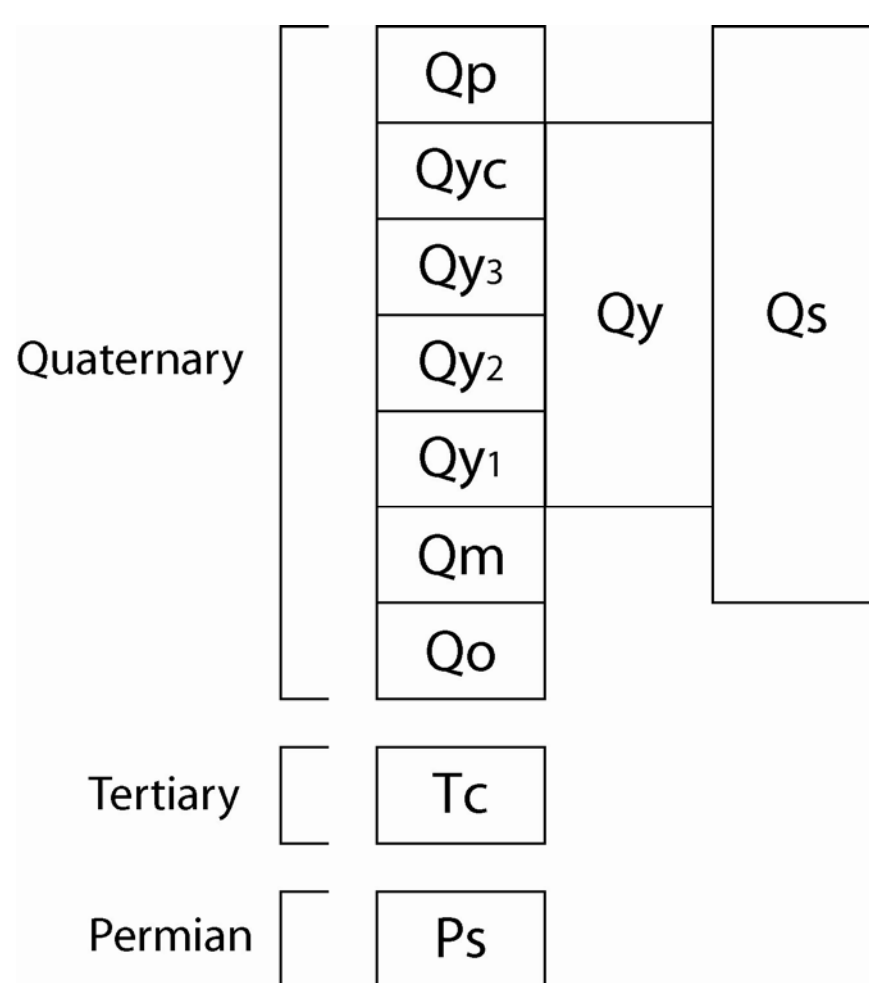
- QTe Quaternary and/or Late Tertiary sedimentary deposits.** This unit was mapped in only one place near the central part of the map, east of Dunken. It is expressed by a relatively flat, apparently constructional surface that has not been eroded. Poking through the thin dark brown soil is abundant thick laminar caliche. A small quarry exposes more than 2 meters of laminar caliche overlying reddish brown silt.

Tertiary Deposits

- Tcc Channelized Tertiary Sedimentary Deposits (Late Miocene and/or Pliocene?).** Dominated by conglomerate containing subrounded to rounded, poorly sorted pebbles to boulders derived from the San Andres Formation. The matrix is mostly strongly cemented silt and carbonate, with minor carbonate sand. Exposures are rare. No bedding or grading is visible. These deposits fill deep paleochannels locally exhibiting vertical walls, and are strongly cemented.
- Tc Mesa-capping Tertiary Sedimentary Deposits (Late Miocene and/or Pliocene?).** These deposits are nearly identical to those of Tcc. They are dominated by conglomerate containing subrounded to well rounded pebbles to boulders locally over 1 meter across, composed almost entirely of limestone, dolomite, and minor chert derived from the San Andres Formation. Where rarely exposed, matrix is lighter gray fine-grained carbonate. Conglomerates can be best distinguished from neighboring San Andres Formation by the presence of light- and dark-gray-colored clasts, and rounded clasts. Top surfaces have been altered by pedogenesis and clasts here are commonly broken and angular. Exposures are rare. No bedding or grading was seen. These deposits cap the tops of flat mesas along the central and eastern parts of the map. These exposures probably formed a continuous sheet before dissection, and may be correlative to the Ogallala Formation.



Dramatic folds in the San Andres Formation, eastern side of the Tinnie fold belt. View is to the north about 1 mile south of the northern boundary of the quadrangle. Folds are slightly exaggerated due to distortion.

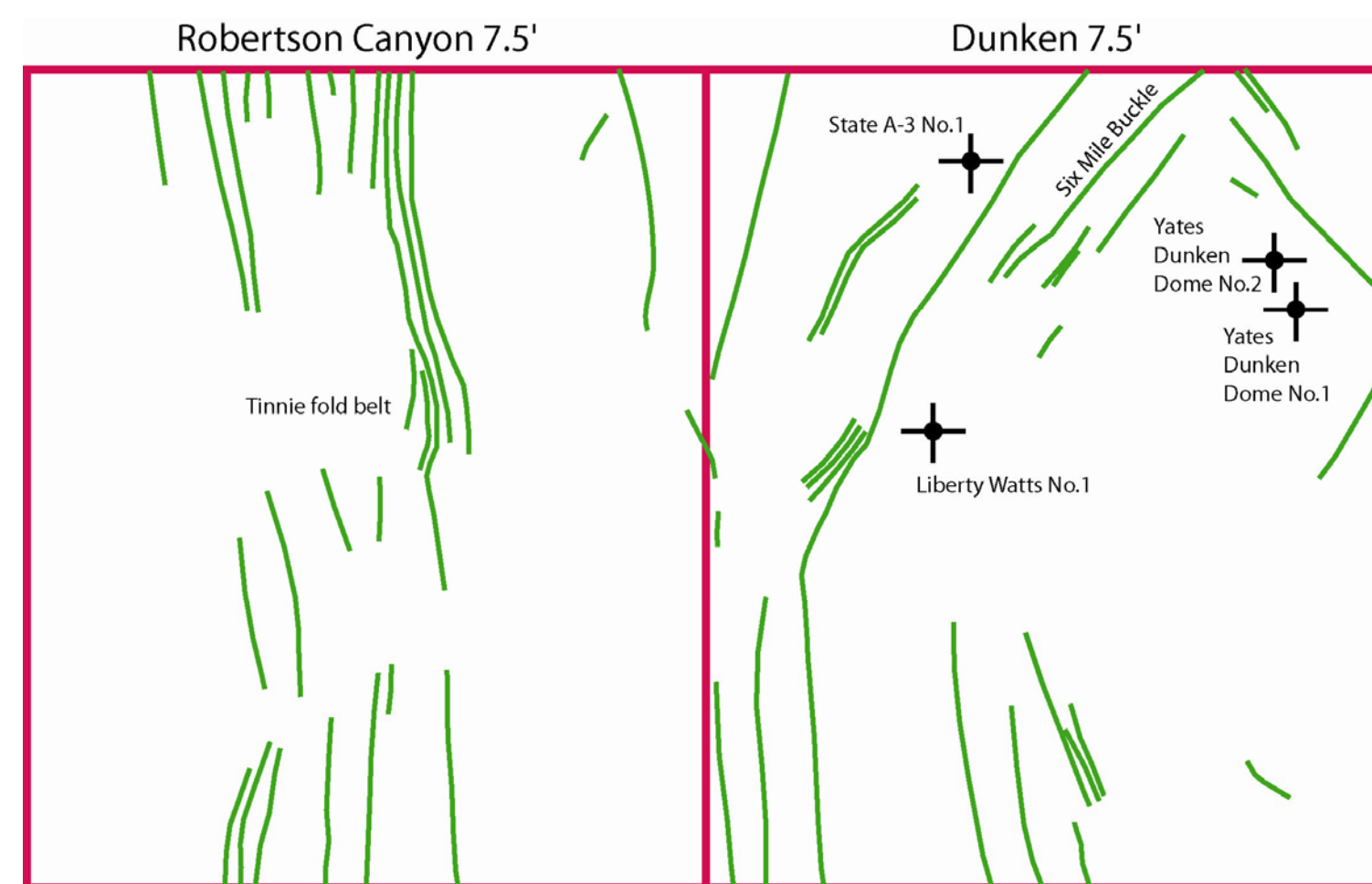


Legend
Ps = San Andres Fm.
Py = Yeso
Pt = Tubb
Pa = Abo
Pp = Pennsylvanian
M = Mississippian
F = Fusselman
Mon = Montoya
El = Ellenburger
B = Bliss

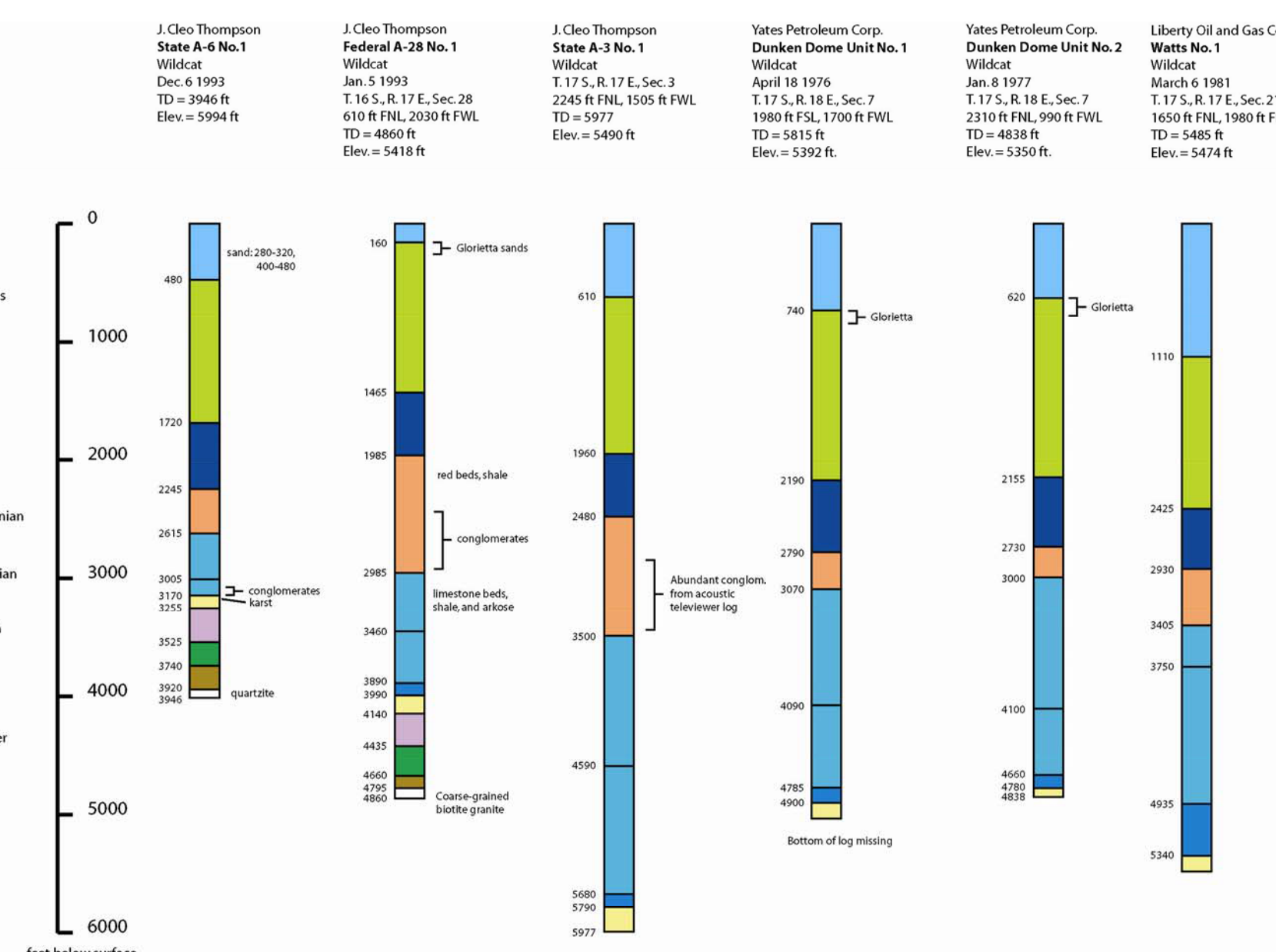
by Steve Skotnicki, 2007

Paleozoic Rocks

- Pss Breccia (post-depositional).** Poorly sorted, angular fragments of limestone and dolomite are surrounded by a fine-grained matrix of carbonate either the same color as the clasts or slightly lighter. Bedding within individual clasts is oriented randomly, indicating that the clasts have been rotated with respect to one another. Poorly exposed. Best exposures are in the north immediately east of the ?? road. Resembles cave-roof break-down breccia (cavem-collapse breccia).
- Psc Chaotic zones within the San Andres Formation (post-depositional).** Dominated by large areas where bedding is highly variable on the scale of meters to tens of meters. Up close, individual beds do not appear brecciated, but undulate, in some cases dipping up to 30 degrees or more in one direction and a few meters away dipping the same amount in another direction. These apparent folds show no preferred orientation, and many appear to form bowl-shaped structures. It is possible this chaotic bedding was formed during dissolution and removal of evaporite minerals and subsequent partial collapse of the overlying beds.
- Psd San Andres Formation, brown unit (Permian).** Alternating beds of light to dark brown and light to medium gray dolomite. Dolomite is mostly fine-grained dolomitic. The brown color is apparent in some outcrops and subtle in others. The difference between this unit and Ps is best seen on aerial photos. No evaporite minerals were seen, so correlation with the Bonney Canyon member of the San Andres Formation is speculative and may not be accurate. This unit was mapped only in the northeast part of the Dunken quadrangle where it is most clearly visible. It may exist farther south, but exposures are poor.
- Ps San Andres Formation, undivided (Permian).** Interbedded medium- to thick-bedded light to dark gray dolomite and limestone. Darker gray beds are commonly more fossiliferous than the lighter gray dolomite beds, which are commonly laminated and show no signs of bioturbation. Dissolution features include small to large vugs millimeters to several centimeters or more across, and small irregularly shaped chaotic zones filled with light yellowish gray carbonate. Dissolution features commonly form discrete zones parallel to bedding. No clay partings were seen between beds. Fossils include productid brachiopods, coiled gastropods, crinoids, and large fusulines (*Triticites?*) up to 2 cm long. Less common fossils include turritella-like gastropods, ammonites, nautiloids(?), and branching corals.



Fold axes in the Robertson Canyon and Dunken 7.5' quadrangles.



Lithologic interpretations of available well logs in the Dunken area.

