

DESCRIPTION OF GEOLOGIC MAP UNITS

This map shows the distribution of geologic units west-southwest of the town of Sierra Blanca, south of Interstate Highway 10 in the Lasca Quadrangle. Geologic units were mapped, and structural elements were measured in the field, where bedrock units are covered by surficial units and vegetation, or access is limited, units were interpreted using soil data, well-drilling records, previous mapping, and surveys.

BEDROCK UNITS

Qal	Alluvium — River and stream floodplain deposits, silty sand, mud, channel gravel, rounded pebbles, and cobbles.
Qac	Undivided alluvium and colluvium — Angular bedrock fragments, gravel, silt, sand, and clay; increasing amounts of igneous material around the Tertiary intrusive units. These deposits are mostly above flood level across the desert plain, except along the river and stream channels prone to flash floods. Fluvial characteristics, such as point bars, oxbows, and abandoned-channel segments, are not well preserved.
QTb	Bolson deposits — Clay, silt, sandstone and conglomerate terrace gravels. Finer-grained material found in the central areas, coarsening to pebble and boulder conglomerates on the outer edges.
Ti	Intrusive igneous rocks — Rhyolitic laccoliths and intrusive igneous rocks. These rhyolites range in color from tan to purple to red to gray, occasionally mottled or brecciated. Textures range from aphanitic to porphyritic to microgranitic, predominantly composed of 48–53% alkali feldspar, 28–30% quartz, 6–14% sodic plagioclase, 4–5% annite biotite, 2–5% magnetite-hematite Fe-Ti oxides. At least one laccolith, Round Top, has been prospected for uranium, fluorine and rare earth element potential with exotic accessory minerals like changasite, columbite, cryolite, tantalite, thorite, yttrifluorite, and zircon.
Tqm	Quitman Mountain monzonite — Massive, gray to pink, slightly porphyritic, with megacrysts of alkali-feldspar, and compositions ranging from monzonite to quartz monzonite (>90%) to granite to syenite to alkali-feldspar syenite. Phases are gradational and presumed to be internal differentiation processes, as opposed to separate intrusive phases. Late-stage apatite and apatite porphyry phases occasionally occur as dikes and as apophyses along the flanks of the intrusion.
Tds	Andesitic / dioritic dikes and sills — Dikes and sills ranging from 1 to 20 meters thick are found in close association with rhyolitic laccoliths and plutons. They are typically gray to black, porphyritic, with zoned phenocrysts of sodic labradorite, altered olivine and clinopyroxene, in a matrix of predominantly labradorite plagioclase, olivine, augite and accessory magnetite and apatite. Contacts with the rhyolite and limestone are sharp and may have intruded earlier than the rhyolite as the mafic constituent of a bimodal volcanic event.
Tsp7	Square Peak volcanics — Thick, lithic, ash-flow tuffs, irregularly layered and differentially compacted though lateral continuous with varying degrees of welding. Columnar jointing is crude and pervasive, with lateral separations of at least five different flows. The volcanics are light gray to black, slightly porphyritic, with phenocrysts of alkali feldspar and quartz, occasionally sanidine and plagioclase, compositions range from tachyrite and quartz tachyrite to rhyolite. Tsp7 — Quitman Peak tuff, welded crystal vitric tuff. Tsp6 — Love lithic tuff, densely welded lithic crystal tuff. Tsp5 — Square Peak purple tuff, welded vitric crystal tuff. Tsp4 — Peace homblende tuff, welded crystal vitric tuff. Tsp3 — Cowan tuff, welded crystal vitric tuff.
Kb	Buda Limestone — Thin- to thick-bedded, resistant, finely crystalline, gray to brown limestone, containing some chert nodules. Occasionally interbedded with gray limestone marl, calcareous shale, and contains microscopic shell fragments (mainly gastropods, pelecypods, and foraminifera) in variable amounts throughout.
Kf	Finlay Limestone — Alternating resistant and nonresistant units of fine-grained, massive, thick-bedded, gray limestone that is fossiliferous and occasionally cherty. Interbedded with shaly, silty, and calcareous limestone, and thin beds of siltstone and sandstone. Dicyoncus warrenensis foraminifera and Exogyra texana Roemer occur throughout the unit.
Kcx	Cox Sandstone — While to various shades of red, orange, and brown; thin- to thick-bedded, occasionally cross-bedded, fine- to medium-grained, hematitic, quartz sandstone to conglomeritic sandstone cemented by authigenic silica. Rarely interbedded with thin, micritic, limestone layers, and red and green shale layers toward the base.
Kbm	Bluff Mesa Limestone — Thick beds of gray to tan, sandy, fossiliferous limestone, with thin interbeds of sandstone, siltstone, and shale. The limestone is often fragmental and sandy, with ubiquitous shell fragments and coarse quartz grains.
Kcg	Campanagra Formation — Massive- to thick-bedded, fine-grained, gray limestone, occasionally interbedded with thin layers of marl, sandstone, conglomerate, siltstone, and shale. Limestone is fossiliferous throughout, with diagnostic Orbitolina d'Orbigny foraminifera found near the base of the unit.
Ky	Yucca Formation — Thick massive beds of gray limestone with thin interbeds of shale and sandstone. Sandstone and limestone are metamorphosed to beige, pink, and white quartzite and green garnetiferous skarn at Zimplan Pass between, and in contact with the Square Peak volcanics and Quitman Mountain monzonite. Hydrothermal alteration has produced zones of hematite and quartz in the skarn region.
Ke	Etholen Conglomerate — Thick beds (3–5 meters) of gray, sandstone-limestone fragment, and calcite cemented matrix, with angular to rounded fragments of limestone and (less commonly) chert, ranging in size from 1–5 cm pebbles to 5–25 cm cobbles.

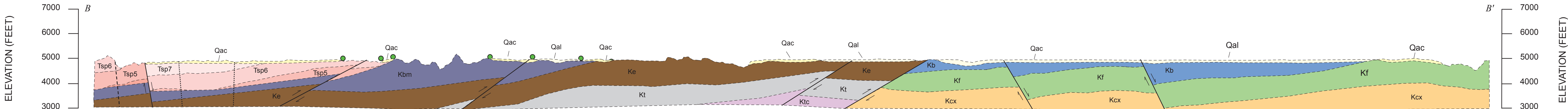
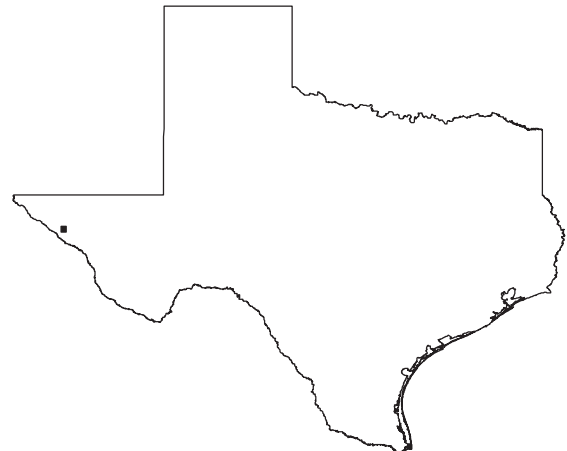
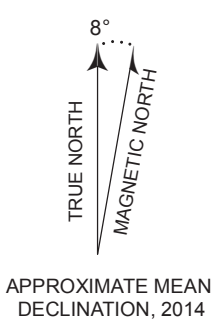
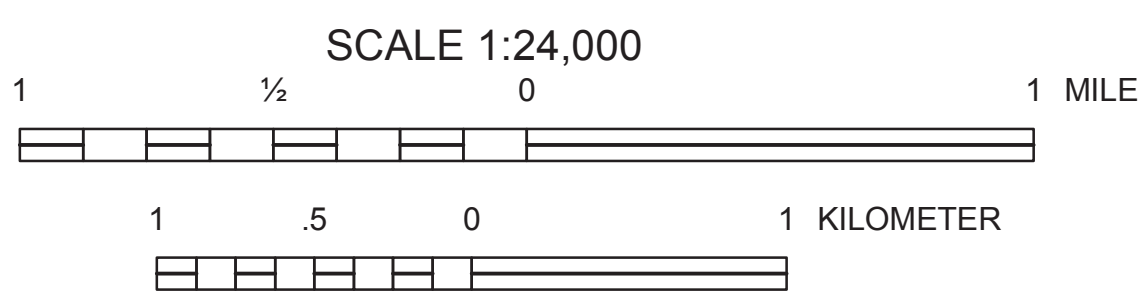
MAP SYMBOLS

(All map symbols may not appear on this sheet.)

	QUARRY		ROAD / STREET		SAMPLE LOCALITY — Location of sample taken for analytical work
	BODY OF WATER		RAILROAD		BEDDING — Sedimentary bedding plane showing strike and dip
	RIVER		INFERRED FAULT CONTACT — Showing relative shear motion		FOLIATION — Foliation plane showing strike and dip
	INTERMITTENT STREAM / CREEK		CONCEALED FAULT FISSURE / LINEAMENT		ANTICLINE — Showing direction of plunge of axis, dashed where inferred, dotted where concealed
	HIGHWAY		FAULT CONTACT — Reverse fault, sawtooth on upper block		SYNCLINE — Showing direction of plunge of axis, dashed where inferred, dotted where concealed
	CROSS-SECTION LINE		FAULT CONTACT — Showing local normal offset: U, upthrown block; D, downthrown block, with amount of displacement		HORIZONTAL BEDDING
	INFERRED LITHOLOGIC CONTACT		JOINT or FAULT — Relative movement absent or undetermined		PROSPECT / MINE

REFERENCES

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- Shannon, W. M. and Goodell, P. C., 1986, Lithogeochemistry of the intrusive rocks of the Quitman-Sierra Blanca igneous complex, Hudspeth County, Texas: *In* Price, J. G., Henry, C. D., Parker, D. F., and Barker, D. S., eds., Guidebook 23: Igneous geology of Trans-Pecos, Texas – Field trip guide and research articles, p. 225–236.
- Wiley, M. A., 1972, Geologic quadrangle map no. 40: Gravity, magnetic, and generalized geologic map of the Van Horn — Sierra Blanca region, Trans-Pecos, Texas: The University of Texas at Austin, Bureau of Economic Geology, scale 1:125,000.



UNIVERSAL TRANSVERSE MERCATOR PROJECTION, ZONE 13N, NAD 83
CONTOUR INTERVAL IS 20 FT
DATUM IS MEAN SEA LEVEL

GEOLOGIC MAP OF THE LASCA QUADRANGLE, TEXAS

Brent A. Elliott
2014

SCALE 1:24,000

Topographic base map from:
U.S. Geological Survey (1964 — edited 1979)

Projection:
Universal Transverse Mercator Zone 13N

Datum:
North American Datum of 1983

Previous bedrock geologic field investigations by:

Albritton and Smith, 1965
Dietrich et al., 1983
Hobbs and Hoffer, 1980
Mathews and Adams, 1986
McAnulty, W. N., 1984
Setter and Adams, 1986
Shannon and Goodell, 1986

Previous faults mapped by:

Albritton and Smith, 1965
Dietrich et al., 1983
Muehlberger, W. R., 1980
Wiley, M. A., 1972



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BUREAU OF ECONOMIC GEOLOGY
Jackson School of Geosciences
The University of Texas at Austin

10100 Burnet Road, Bldg. 130 • Austin, Texas 78758
Phone 512-471-7144 • Fax 512-471-0140
email: pubsales@beg.utexas.edu
website: www.beg.utexas.edu