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GEOLOGIC MAP OF PACE BEND QUADRANGLE, TEXAS
OPEN-FILE MAP 0221



SCALE 1:24,000

0 .5 1 1.5 2 MILES

0 .5 1 1.5 2 KILOMETERS

UNIVERSAL TRANSVERSE MERCATOR PROJECTION, ZONE 14N, NAD 83

GEOLOGIC MAP OF THE PACE BEND QUADRANGLE, TEXAS

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2015

Quaternary

Qal—Alluvium, mainly along small stream valleys but locally along margins of Lake Travis: sand, silt, and clay; local gravel; exposed thickness less than 20 ft.

Qat—Alluvium and terrace deposits along meander bends of Lake Travis, including the main course of Colorado River as well as margins of Cow Creek and Pedernales River; consists of gravel (local deposits of cobble-sized fragments), sand, silt, and clay; thickness variable but commonly 20 ft thick or more.

Qac—Alluvium and colluvium; mainly comprises breakdown of ledge-forming bedrock along steeply sloping banks of Lake Travis. Substrate consists of admixed blocks of Cow Creek Limestone and Hammett Shale. Unstable slopes pose local hazards; thickness variable but deposits cover slopes with thicknesses ranging from 10 to 20 ft thick.

Qht—Alluvial gravel, locally calichified, occurring as disjunct veneers at elevations well above Lake Travis shorelands; up to 10 ft thick.

Cretaceous

Kgru—Glen Rose Limestone (upper member): 120 to 180 ft thick. Unit forms dissected stepped terrain formed on interbedded carbonate rocks, with ledges of resistant limestone or silty dolomite beds forming caps of "risers" and floors of overlying "treads." In contrast, so-called "marly" intervals form recessive slopes (risers) beneath resistant ledges. Most recessive strata not marls, but limestone with heterogeneous fabric containing multiple irregular clay partings that weather rapidly (Woodruff and Wilding, 2008); intervals contain abundant fossils, including casts of bivalves, gastropods, and echinoids. Basal part of unit consists of leached evaporitic horizons, containing vuggy limestone, boxwork fabric, and poorly formed geodes. Upper member of Glen Rose comprises Upper Trinity Aquifer (Brune and Duffin, 1983), although viability of stratigraphic unit as water-bearing unit highly limited, owing to sloping terrain and lack of continuous sequences of strata with porosity and permeability sufficient to allow efficient hydrologic communication. Also, because of local occurrence of leached evaporate minerals, water-quality possibly inferior.

Kgrl—Glen Rose Limestone (lower member): contact between lower and upper Glen Rose marked by locally prominent marker horizon (the Corbula bed), a sequence of thin-bedded (commonly iron-stained) and well-indurated limestone that contains myriad fossils of tiny (sunflower-kernel-sized) clam initially classified as *Corbula harveyi* (Hill), although no longer of that genus or species (Molineux and Comeaux, 2008). Corbula interval forms locally prominent bench above recessive, weathered interval (*Salenia texana* interval) containing diverse fossil casts of clams, gastropods, and echinoids). This thin, ledge-forming limestone over light-colored "marly" sequence forms couplet commonly recognized on aerial photographs and in field; interval mapped across hundreds of square miles of Glen Rose outcrop. However, interval mapping difficult in parts of Pace Bend Quadrangle, owing to access problems related to land development. Contact interval marks top of 100- to 140-ft-thick sequence of stepped strata, largely dolomitic and containing horizons of silty dolomite and dolomitic limestone with vuggy porosity, as well as local rudist patch reefs. Lower Glen Rose sufficiently permeable to be upper part of Middle Trinity Aquifer, which also comprises Hensel Sand and Cow Creek Limestone (Brune and Duffin, 1983). At base, lower member of Glen Rose interfingers with underlying Hensel Sand, with fine-grained sand beds occurring between silty (and sandy) dolomite.

Khe—Hensel Sand: at gradational contact with Glen Rose Limestone, silty dolomites interfingering with fine-grained dolomitic sands. Lower in section, clastic fraction is more coarse grained and more diverse—from quartz arenite to subarkose to granule, pebble, and cobble conglomerate. Cementation predominantly calcite, from weak to moderately strong. Festoon crossbedding locally, especially near base of formation; 50 to 80 ft thick. Sandy clay soils supporting mesquite and post oak; widespread, uniform permeability allowing infiltration into Middle Trinity Aquifer; contact with underlying Cow Creek Limestone unconformable.

Kcal—Caliche facies of Cow Creek: discontinuous, weathered interval forming veneer at contact between Cow Creek Limestone and Hensel Sand, attesting to time interval when Cow Creek Limestone exposed to elements before deposition of basal part of Hensel (Stricklin and others, 1971). Paleosoil consisting of earthy, mostly friable calcareous material, with local admixed, rounded, granule- to gravel-sized clasts; thickness 10 to 15 ft.

Kcc—Cow Creek Limestone: variety of carbonate rock types varying from fine-grained marine limestone strata interfingering with underlying Hammett Shale (including local sandy and silty beds) coarsening upward to include oyster-reef deposits, shell coquinas, and crossbedded shell-fragment beach rock. Karst landforms occurring locally, especially above lake-shore bluffs, where joints are enlarged by dissolution. Infiltration and storage of groundwater in bottommost formation composing Middle Trinity Aquifer; 40 to 65 ft thick.

Kha—Hammett Shale: calcareous claystone and siltstone admixed with local lenses of sand and conglomerate; typically about 20 ft thick (locally up to 30 ft). Outcrops rare owing to interval being covered by slump blocks of overlying limestone. Along lakeshore bluffs, mappable intervals are discontinuous. Locally, light-colored bands along topographic benches formed on upper intervals of Sycamore Sand; contact with underlying Sycamore Sand unconformable; shale forms aquitard between Middle and Lower Trinity Aquifers.

Ks—Sycamore Sand: mostly conglomerate (moderately well-cemented), local sand lenses deposited on irregular (eroded) surface on underlying Paleozoic terrain; up to about 50 ft thick. Component sediment from silt-clay to cobble-boulder sizes; clasts typically well rounded, consisting of assorted durable Paleozoic and Precambrian rocks of Llano Uplift. Bedding generally indistinct, but prominent, trough-fill crossbedding locally well expressed. Typical landscape steeply cut slopes above Lake Travis and resistant caps and benches with mesquite and post oak along incised ravines. Recharge zone for Lower Trinity Aquifer.

Legend

- Unit contact; contacts drawn as solid lines are relatively more distinct in the field and on aerial photographs than those drawn as dashed lines
- Approximate contact
- Approximate queried contact
- Stream
- Intermittent stream
- Spring
- Road
- Elevation; contour interval 20 ft
- Surface water bodies; normal pool elevation of Lake Travis = 681 ft (msl)
- Normal fault; U, upthrown block; D, downthrown block; dashed where approximate; dotted where covered

Acknowledgments

The mapping of this quadrangle is based on analyses of aerial photographs and extensive fieldwork. The topographic base was created from digital files of Texas Natural Resources Information Services (TNRIS) for the U.S. Geological Survey, Pace Bend, Texas, 7.5-minute topographic quadrangle map. Digital files of roads, county boundaries, drainage, and lake shores were also obtained from TNRIS.

Part of the map is derived (and locally modified) from Woodruff (1973) and from Collins (2002). Regional mapping by Barnes (1981, 1982) provided locally helpful stratigraphic information and correlations to adjacent quadrangles. We extend thanks to Keith Rawlings, with the Travis County Parks Department, for allowing access to Pace Bend Park, and to Fredrick E. Crawford, with the Lower Colorado River Authority, for allowing repeated access to LCRA Recreational Areas (Gloster Bend, Muleshoe Bend, and part of Turkey Bend on this map).

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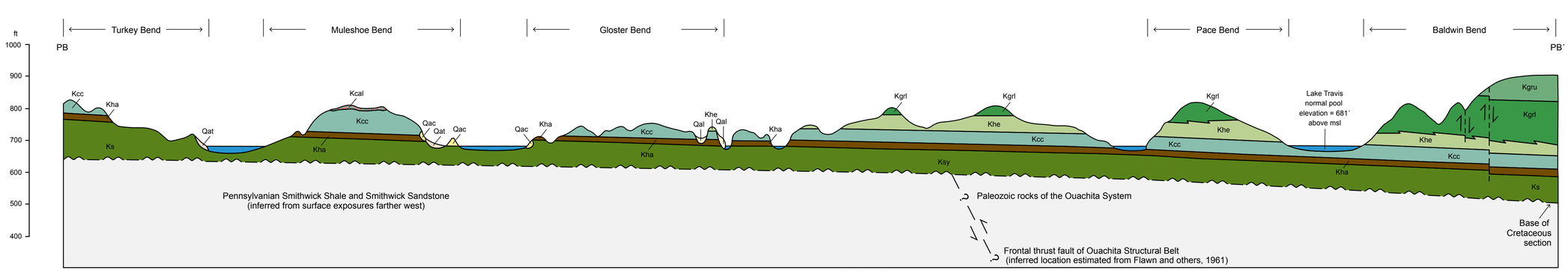
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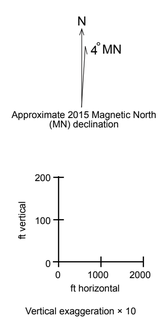
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Northwest–southeast cross section — Pace Bend Quadrangle
(view to the northeast)



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