

## APPENDIX

Explanation of Geologic Units  
Blanton, Brazos Point, Hillsboro West, Keene,  
Lakeside Village, and Morgan Quadrangles:  
East part of Cleburne 30 × 60 Minute Quadrangle,  
South Fort Worth, Texas—Interstate 35W Corridor

## QUATERNARY

**Qal—Alluvium.** Sand, silt, clay, and gravel.

**Qt—Terrace deposits of streams.** Sand, silt, clay, and gravel.

**Qt1—Higher terrace deposits of streams.** Sand, silt, clay, and gravel.

**Qtbr1—Younger terrace deposits of Brazos River.** Sand, silt, clay, and gravel; generally 10 to 30 ft above floodplain.

**Qtbr2—Older terrace deposits of Brazos River.** Sand, silt, clay, and gravel; generally 30 to 50 ft above floodplain.

## UPPER CRETACEOUS

**Kau—Austin Chalk.** Chalk and marl; middle part is marl rich with chalk interbeds; thin bentonitic layers in lower part; greater than 200 ft thick. Thin (few inches to 3 ft) interval at base of Austin Chalk, and top of Eagle Ford Group is sandstone and conglomerate composed of quartz, glauconite, phosphate nodules, teeth, skeletal material, and carbonized wood.

**Kef—Eagle Ford Group.** Shale and lesser sandstone and sandy limestone; lower part bentonitic; sepiarian concretions in upper part locally; thickness about 300 ft. Unit weathers to thick clay-rich soils with shrink-and-swell characteristics.

**Kwb—Woodbine Formation.** Sandstone and some shale and clay. Upper part mostly ferruginous, fine-grained sandstone; some medium- to coarse-grained sandstone;

crossbeds. Lower part interbedded fine-grained sandstone, shale, and clay; sandstone ferruginous to gray. Unit sometimes contains limonite and hematite-cemented layers and concretions sometimes referred to as ironstone. Generally less than 200 ft thick. Aquifer and potential sand resource.

**Kgy—Grayson Marl.** Calcareous clay and marl and some thin limestone beds; weathers to thick clay-rich soils with shrink-and-swell characteristics; outcrops not common; as thick as 100 ft. Contacts with overlying and underlying units generally covered.

**Kgt—Georgetown Formation.** Limestone, argillaceous limestone, lesser marl and shale, some minor sandstone; nodular bedding common; marine fossils abundant. Generalized lithology in ascending order: (a) a lower, mostly limestone and some argillaceous limestone interval, 100 to 120 ft thick, equivalent to Duck Creek, Fort Worth, and lower Denton Formations north of map area; (b) a clay, marl, and argillaceous limestone interval, about 50 to 70 ft thick, equivalent to upper Denton and lower Weno Formations north of map area; and (c) an upper limestone interval, about 60 to 70 ft thick, with some argillaceous limestone, calcareous claystone and mudstone, and minor sandstone, equivalent to upper Weno, Pawpaw, and Main Street Formations north of study area. Lithologic and member subdivisions of Georgetown Formation are difficult to trace across long distances within study area because of vegetation and soil cover.

Georgetown strata are equivalent to the following formations north of the study area (descending order): Main Street Limestone: Limestone and some calcareous shale; as much as 40 ft thick in Johnson and Hill Counties. Pawpaw Formation: Calcareous claystone, mudstone, and minor fine-grained sandstone. Marine megafossils. Erodes easily and forms grass-covered slopes. About 20 ft thick in Johnson and Hill Counties. Weno

Limestone: Limestone in upper and lower part of unit. Interbedded limestone, argillaceous limestone, and calcareous clay in middle part. About 60 ft thick in Johnson and Hill Counties. Marine megafossils. Upper limestone locally forms topographic bench. Denton Clay: Interbedded calcareous clay, marl, and argillaceous limestone. Marine megafossils. Some thin, less than 1-ft-thick, *Gryphaea* beds. Less than 25 ft thick in Johnson and Hill Counties. Fort Worth Limestone: Limestone, argillaceous limestone, and calcareous clay. Marine megafossils. Thickness 25 to 35 ft in Johnson and Hill Counties. Duck Creek Formation: Limestone and argillaceous limestone. Marine megafossils. About 50 to 60 ft thick in Johnson and Hill Counties. Selected references include Hayward and Brown (1967), Hayward (1988a), Salvador and Quezada Muneton (1989), and McFarlan and Menes (1991).

**Kki—Kiamichi Clay.** Calcareous clay, argillaceous limestone, and some thin (few inches thick) minor sandstone. About 25 ft thick. Salvador and Quezada Muneton (1989) considered the Kiamichi to be upper Fredericksburg deposits, although Hayward and Brown (1967) reported the Kiamichi to be a lower member of the Washita Georgetown Formation.

**Ked—Edwards Limestone.** Limestone; fossiliferous; rudists. About 30 ft thick.

**Kc—Comanche Peak Limestone.** Limestone and argillaceous limestone; nodular bedding common; fossiliferous; about 90 ft thick.

**Kwa—Walnut Formation.** Calcareous clay, argillaceous limestone, and limestone; fossiliferous; some thin (<2 ft thick) *Gryphaea* beds. Thickness as much as 70 ft.

**Kgr—Glen Rose Formation.** Limestone and argillaceous limestone; fossiliferous; only upper part of unit exposed near Brazos River in west part of study area.