GEOLOGIC ATLAS OF TEXAS
SHERMAN SHEET

WALTER SCOTT ADKINS MEMORIAL EDITION

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Alluvium, Qal, windblown deposits, Qds and Qs, fluviatile terrace deposits, Qt, and surficial deposits undivided, Qu

Alluvium, Qal, floodplain and channel deposits; sand, silt, clay, and gravel; includes lowest terrace deposits near floodplain level and locally bedrock in stream channels. Thickness of alluvium about 30 feet

Windblown deposits; dunes and dune ridges, Qds, and sheet deposits, Qs, separately mapped. Dunes and dune ridges, Qds, sand and silt. Sheet deposits, Qs, silt, sand, and clay, orange-brown, massive with crude vertical joints, subdued dune topography

Fluviatile terrace deposits, Qt, gravel, sand, and silt. Gravel, sandy, lenticular, stratified, crossbedded, locally cemented by calcite; clasts granule- to cobble-size, well-rounded to subangular, composed of metamorphic rocks, quartzite, milky quartz, chert, and fine-grained igneous rock from distant westerly sources, also minor clasts of local bedrock; contiguous terraces of different ages separated by solid line

Surficial deposits undivided, Qu, sand, clay, silt, and gravel. In Oklahoma includes remnants of older terraces, colluvium, dunes and dune ridges, and sheet deposits. In Texas mostly colluvium and minor alluvium

**Kincaid Formation**

Mostly clay; various shades of gray, weathers to medium-gray, in part silty and sandy, calcareous, glauconitic, selenitic, locally phosphatic near base, some thin beds of well-indurated gray limestone in upper part; marine megafossils. Thickness of Kincaid Formation approximately 150 feet

**Kemp Clay, Kke, Nacatoch Sand, Kns, and Navarro Group (undivided), Kna**

Kemp Clay, Kke, mostly clay, medium-dark-gray, weathers to medium-gray, silty, calcareous; concretionary masses and beds of calcareous, well-indurated fine sandstone near top, some interbeds of fine sandstone near base; marine megafossils. Thickness of Kemp Clay approximately 250 feet

Nacatoch Sand, Kns, quartz sand, light- to medium-gray, fine-grained, silty, calcareous concretions in discontinuous beds locally, marine megafossils. Thickness of Nacatoch Sand approximately 200 feet

Navarro Group (undivided), Kna, undivided east of Sabine River
Neylandville Marl
Clay, medium-gray, weathers to light-gray, calcareous, silty, sandy; forms irregular topography; marine megafossils scarce. Thickness of Neylandville Marl approximately 75 feet.

Marlbrook Marl
Clay, light-yellowish-gray, weathers light-gray with poor fissility, variable amount of silt and glauconite, marine megafossils scarce; limestone bed in southern Collin County 10 to 13 inches thick, light-gray, aphanitic, forms persistent scarp 180 feet above base. Thickness of Marlbrook Marl approximately 300 feet.

Pecan Gap Chalk
In northern and central Collin County, upper 45 feet composed of alternating intervals of dark-bluish-gray, well-indurated, granular limestone and light- to medium-olive-gray, soft lime sand; both lithologies are glauconitic, but most glauconite is in lime sand; glauconite decreases in abundance southward, phosphate pebbles scattered throughout, burrows common, thin- to very thin bedded, lime sand minutely crossbedded, marine megafossils abundant; southward, lime sand replaced by bluish-gray, silty, calcareous clay; eastward in Hunt County and beyond, lime sand grades to bluish-white, partly sandy, well-bedded chalk; marine megafossils scarce. Lower 5 feet composed of chalk and marl, bluish-gray, weathers to light-gray to white; soft, sandy with marine megafossils. Thickness of Pecan Gap Chalk 50 to 70 feet.

Wolfe City Sand
Upper part, sand and silt, medium-yellowish-gray, weathers to light-yellowish-gray, calcareous; sand is very fine grained; sandy calcareous concretions locally abundant in discontinuous beds; marine megafossils. Lower part, mudstone, dark-gray, weathers to light- to medium-gray; calcareous, marine megafossils abundant. Thickness of Wolfe City Sand approximately 75 feet.

Ozan Formation
Clay, dark-gray, weathers to light-brownish-gray with weak fissility, calcareous, poorly bedded, variable amounts of silt and glauconite, some siltstone beds, marine megafossils. Thickness of Ozan Formation approximately 425 feet.
Austin Chalk

Austin Chalk, Kau, undivided southward. Upper and lower parts, chalk, light-gray, massive, some interbeds and partings of calcareous clay, marine megafossils scarce. Middle part, mostly thin-bedded marl with interbeds of massive chalk, light-gray, weathers white, marine megafossils scarce. Austin Chalk subdivided eastward into six units: Roxton Limestone, Kr, Gober Chalk, Kgc, Brownstown Marl, Kbr, Blossom Sand, Kbl, Bonham Marl, Kbn, and Ector Chalk, Ker. Thickness of Austin Chalk (undivided) approximately 600 feet.

Roxton Limestone, Kr, sandy, glauconitic, soft, tough, red, marine megafossils common. Thickness of Roxton Limestone 10 feet, feathers out westward in Fannin County.

Gober Chalk, Kgc, bluish-gray, weathers white, brittle, argillaceous; thickness approximately 400 feet, thins eastward.

Brownstown Marl, Kbr, clay, medium-yellowish-gray, weathers to light-yellowish-gray, calcareous, silty, poorly bedded to massive, marine megafossils scarce. Thickness of Brownstown Marl approximately 80 feet, feathers out westward near Bonham.

Blossom Sand, Kbl, quartz sand grading westward into clay. Sand, brown, weathers to reddish-brown and red, very fine grained to fine-grained, calcareous, glauconitic, ferruginous, calcareous concretions and septaria common, some thin clay interbeds. Clay, medium-yellowish-gray, weathers to light-yellowish-gray, silty, calcareous, poorly bedded to massive, some interbeds of silt, marine megafossils scarce. Thickness of Blossom Sand approximately 20 feet, feathers out westward in Fannin County.

Bonham Marl, Kbn, marl and clay, medium- to light-gray, weathers from light-gray to yellowish-gray with weak fissility, silty, progressively more calcareous westward, variable amount of glauconite but most abundant near middle, poorly to thinly bedded, marine megafossils. Thickness of Bonham Marl approximately 400 feet.

Ector Chalk, Ker, chalk, light-gray, weathers to white, argillaceous, brittle. Thickness of Ector Chalk approximately 35 feet, feathers out eastward in Fannin County.

Eagle Ford Formation

Shale, medium- to dark-gray, selenitic, bituminous, calcareous concretions and septaria common, some thin platy beds of sandstone and sandy limestone in middle and upper parts, marine megafossils. In Oklahoma, only lower 25 feet of formation is exposed; composed of limestone, bluish-gray, weathers to yellow, silty, thin-bedded, flaggy, thin beds of blue calcareous siltstone and blue silty shale. Thickness of Eagle Ford Formation 300 to 400 feet.
Woodbine Formation

Woodbine Formation, Kwb, undivided south of Cooke County; in Cooke and Grayson Counties and in Oklahoma, subdivided into four units: Templeton Member, Kwt, Lewisville Member, Kwl, Red Branch Member, Kwr, and Dexter Member, Kwd

Templeton Member, Kwt, shale, gray, glauconitic, some lenses of gray to yellowish-brown sand, marine megafossils. Thickness of Templeton Member in Texas 70 to 80 feet. In Oklahoma, shale, dark-gray, weathers to brown, iron-stained, some beds of yellow sandstone and clay ironstone, phosphatic nodules and calcareous concretions common. Thickness of Templeton Member in Oklahoma 60 to 70 feet

Lewisville Member, Kwl, sandstone, gray to brown and yellowish-brown, glauconitic, minor shale beds, some lenses of tuffaceous clay and sandstone, marine megafossils, oyster concentrations locally. Thickness of Lewisville Member in Texas 75 to 95 feet. In Oklahoma, sandstone, yellow to reddish-brown, ferruginous, glauconitic, thin to thick-bedded, crossbedded, interbedded with tan to brown shale. Thickness of Lewisville Member in Oklahoma approximately 120 feet

Red Branch Member, Kwr, sandstone, shale, and lignite; sandstone, tuffaceous, in part ferruginous; shale, gray, brown, yellowish-brown, grayish-black, carbonaceous, in part sandy. Thickness of Red Branch Member in Texas 25 to 80 feet, southward indistinguishable from Lewisville Member. In Oklahoma, sandstone, shale, and lignite; sandstone is in part ferruginous and tuffaceous; shale, gray, brown, yellowish-brown to black, contains several lignite and thin coal beds, thin-bedded and platy siltstone beds in upper part. Thickness of Red Branch Member in Oklahoma 60 to 70 feet

Dexter Member, Kwd, sandstone, white to red, brown, brownish-yellow, gray, ferruginous and siliceous cement, some silty clay lenses, carbonaceous clay at base, a persistent 20- to 30-ft interval of varicolored mottled clay at top, some leaf and wood impressions. Thickness of Dexter Member in Texas 100 to 140 feet. In Oklahoma, sandstone with subordinate shale; sandstone, yellowish-brown, fine- to medium-grained, ferruginous, crossbedded; some ferruginous concretions, clay ironstones, and carbonized wood; uppermost part of member (Rainbow Clay, unmapped) consists of 40 feet of variegated clay shale. Thickness of Dexter Member in Oklahoma 120 to 130 feet

Grayson Marl and Main Street, Kgm, Grayson Marl and Bennington Limestone, Kgb, and Bennington Limestones, Kb

Grayson Marl and Main Street Limestone undivided in Texas, Kgm; Grayson Marl and Bennington Limestone undivided in Oklahoma, Kgb; and Bennington Limestone, Kb, crops out east of pinch-out of Grayson Marl in Oklahoma

Grayson Marl, mostly marl, light-greenish-gray to medium-gray, weathers to grayish-yellow; thin interbeds of limestone near top, gray, nodular, slightly sandy, fossiliferous. Thickness of Grayson Marl in Texas 15 to 60 feet. In Oklahoma, marlstone, gray to light-greenish-gray, interbeds of gray to white nodular limestone, fossiliferous with abundant *Ilymatogyrus*
arietina (Roemer) and Texigryphaea graysonana (Stanton). Thickness of Grayson Marl in Oklahoma 0 to 27 feet
Main Street Limestone, yellowish-gray, light-brown, weathers to dull grayish-yellow, coarse-grained, well-indurated, thick-bedded, some interbedded thin marl. Thickness of Main Street Limestone 10 to 20 feet
Bennington Limestone, Kb, bluish-gray to yellowish-brown, fine- to medium-grained, crystalline, massive, fossiliferous with Ilmenogyra arietina (Roemer), weathers pitted and honeycombed. Thickness of Bennington Limestone 7 to 13 feet

Pawpaw Formation, Kpp, Weno Limestone, Kwe, and Denton Clay, Kd, each composing members of the Bokchito Formation in Oklahoma, and undivided in Texas, Kpd

Pawpaw Formation, Kpp, sandstone, some sandy clay, ferruginous, ironstone concretions, loosely cemented, crossbedded; in Cooke and northern Denton Counties, alternates with red clay beds; at base 1- to 4-feet-thick "Quarry" limestone (McNutt Limestone Member, unmapped, in Oklahoma), sandy, well-indurated, weathers to sandy ferruginous soil with abundant iron oxide concretions and rubble. Thickness of Pawpaw Formation in Texas 25 to 60 feet, thins southward. In Oklahoma, Pawpaw Sandstone Member, Kbp, sandstone, yellow to brownish-red, ferruginous, interbedded with gray to brown sandy clay
Weno Limestone, Kwe, marl and limestone; marl, dark-gray, shaly, sandy, ferruginous, abundant clay-ironstone concretions, some thick limestone beds in uppermost and lowermost parts. In Oklahoma, Weno Clay Member, Kbw, brownish shales and thin interbeds of yellowish-brown ferruginous sandstone with selenite crystals common. Thickness of Weno Limestone and Weno Clay Member 70 to 135 feet, thin southward
Denton Clay, Kd, mostly clay, brownish-gray, calcareous, shaly; basal 5 feet marly, upper 3 to 5 feet composed of impure limestone with abundant Gryphaea; some reddish-brown to yellow sandstone in Oklahoma. Thickness of Denton Clay in Texas approximately 45 feet. In Oklahoma, Denton Clay Member, Kbd, bluish-gray shale with thin interbeds of siltstone in middle part and marly limestone near top. Thickness of Denton Clay Member in Oklahoma 150 to 200 feet
Pawpaw Formation, Weno Limestone, and Denton Clay, Kpd, undifferentiated from northern Denton County southward

Fort Worth Limestone, Kfw, and Duck Creek Formation, Kdc, composing Caddo Formation, Kc, in Oklahoma
Fort Worth Limestone, Kfw, limestone, gray, aphanitic, beds 6 to 12 inches thick, interbedded with gray marl 2 feet or less thick, upper 8 to 10 feet mostly limestone. In Oklahoma, limestone, white to gray, cream-colored in upper 7 feet. Thickness of Fort Worth Limestone approximately 35 feet
Duck Creek Formation, Kdc, upper part mostly marl interbedded with thin beds of marly limestone; lower part comprises 6- to 12-inch-thick limestone beds intercalated with gray to greenish-gray marly clay. In Oklahoma, finely laminated blue-gray shale and gray, silty, shaly limestone containing abundant large cephalopods. Thickness of Duck Creek Formation approximately 100 feet

Fort Worth Limestone and Duck Creek Formation, Kfd, undifferentiated from northern Denton County southward

Kiamichi Formation

Kiamichi Formation, Kki, marl and limestone; mostly marl, yellowish-gray to medium-gray, shaly, in part sandy, carbonaceous; limestone, gray, sandy, platy, fossiliferous; some thin beds of fissile sandstone. In Oklahoma, mostly black, shaly clay. Thickness of Kiamichi Formation 20 to 50 feet

Goodland Limestone and Walnut Clay (undivided)

Goodland Limestone and Walnut Clay (undivided), Kgw, mostly Goodland Limestone, fine-grained, well-indurated, massive, nodular toward base, grades downward to Walnut Clay, interbedded coquinite and dark-gray, marly shale. Thickness of Goodland Limestone and Walnut Clay (undivided) in Texas 13 to 20 feet, 20 to 25 feet thick in Oklahoma

Paluxy Sand, Kpa, Glen Rose Limestone, Kgr, Twin Mountains Formation, Ktm, and Antlers Sand, Ka

Paluxy Sand, Kpa, sand and clay; sand, light-brownish-yellow to light-gray, very fine grained to fine-grained, in part argillaceous and silty, thin-bedded to massive, crossbedded; clay, light-gray to light-red, thin-bedded to massive. Thickness of Paluxy Sand approximately 225 feet

Glen Rose Limestone, Kgr, limestone, clay, and sand; limestone, brownish-yellow, gray, argillaceous, silty, sandy, thin-bedded; clay, in part sandy, sand, gray to brownish-yellow. Thickness of Glen Rose Limestone approximately 40 feet, pinches out northward

Twin Mountains Formation, Ktm, sand, clay, and conglomerate; sand, brownish-yellow, locally weathers to red, fine- to coarse-grained, conglomeratic in lower part, thin-bedded to massive, crossbedded; clay, red, gray, green, silty, thin-bedded to massive; conglomerate composed of chert, quartz, and quartzite clasts. Thickness of Twin Mountains Formation 175 to 200 feet

Antlers Sand (basal Cretaceous or "Trinity Sand"), Ka, sand, clay, and conglomerate. Lower and upper parts chiefly sand; middle part mostly clay; formation grades northward to interbedded sand and clay. Sand, brownish-yellow, weathers to brownish-yellow to locally variegated, fine- to coarse-grained, conglomeratic mostly in lower part, argillaceous in upper
part. Clay, red, yellow, in part variegated, interbedded with fine-grained sand. Conglomerate with granule- and pebble-size clasts of chert, quartz, and quartzite. In Oklahoma, sand, white to yellowish-brown, fine- to medium-grained, poorly cemented, ferruginous, cross-bedded, interbeds of varicolored gray, black, and purple ferruginous clay. Thickness of Antlers Sand 500 to 650 feet

Petrolia Formation (new)

Mudstone, sandstone, and conglomerate; sandstones, ss4, ss3, ss2, and ss1, separately mapped. Mudstone, reddish-brown, locally gray and olive, massive to thick-bedded, unstratified and crudely stratified calcareous nodules common, lenses of gray and variegated claystone locally; laminated, cross-laminated, and crossbedded sandstone in lentils and small channel-fill bodies throughout.

Sandstones, ss4, ss3, ss2, and ss1, brown, reddish-brown, fine- to medium-grained, local chert-pebble and mud-clast conglomerate in lenses near base of units, thick-bedded to massive, soft-sediment deformation common, laminated, crossbedded, friable to moderately well cemented by hematite, limonite, and silica, poorly exposed across a gently rolling terrain, thickness of individual members 3 to 25 feet. Upper part of formation does not crop out within area of Sherman Sheet. Most of Petrolia Formation (new) and underlying Pennsylvanian and Permian units (Nocona, Archer City, Markley Formations) are exposed in area depicted on adjacent Wichita Falls - Lawton Sheet. Regional stratigraphic relations, lithologic characteristics, and stratotypes are discussed in Hentz (1988, Lithostratigraphy and Paleoenvironments of Upper Paleozoic Continental Red Beds, North-Central Texas: Bowie (new) and Wichita (revised) Groups, Univ. of Texas, Austin, Bur. Econ. Geol. Rept. Inv. No. 170); a schematic illustration of the Paleozoic stratigraphy of the western Sherman Sheet area is presented on the Wichita Falls - Lawton Sheet. Thickness of Petrolia Formation (new) in map area approximately 120 feet.
Nocona Formation (new)

Mudstone, sandstone, siltstone, and conglomerate; sandstones and conglomerates, ss11, ss6, ss5, ss4, ss3, ss2, and ss1, separately mapped. Mudstone, reddish-brown, yellowish-brown, locally gray and olive, unstratified and thick-bedded, calcareous nodules and ferruginous concretions locally common; sandstone and siltstone in lentils and platy thin beds throughout, laminated, cross-laminated, crossbedded

Sandstones and conglomerates, ss11, ss6, ss5, ss4, ss3, ss2, and ss1; sandstone in broad channel-fill bodies, tan to dark-reddish-brown, fine-grained to very coarse grained, thin- to thick-bedded, soft-sediment deformation typical in thicker beds, large-scale crossbeds common, friable to moderately well cemented with silica, limonite, and hematite; chert-pebble conglomerate mostly near base of thicker units; individual members locally exhibit multistory configuration of beds; thickness of sandstone members 5 to 40 feet. Wolfcamp/Leonard Series boundary located approximately at or near base of ss11. Thickness of Nocona Formation (new) 330 to 350 feet
Archer City Formation (new)

Mudstone, sandstone, siltstone, and conglomerate; sandstones and conglomerates, ss9, ss8, ss6, ss5, ss4, and ss3, separately mapped. Mostly mudstone best exposed below cuesta-forming sandstones, reddish-brown, minor tan and variegated, thick-bedded and massive in units 10 to 50 feet thick, calcareous nodules and ferruginous concretions locally common, thin siltstone beds throughout, sparse vertebrate fossils; sandstone in lentils and sheets 1 to 3 feet thick, brown, grayish-green, gray, very fine grained to fine-grained, locally calcareous, thin-bedded to massive, laminated, ripple cross-laminated, small-scale crossbeds, a few unmapped channel-fill bodies

Sandstones and conglomerates, ss9, ss8, ss6, ss5, ss4, and ss3; sandstone, brown, fine-grained to very coarse grained, units typically upward-fining, thick-bedded to massive, commonly soft-sediment-deformed, small- to large-scale crossbeds, friable to moderately well cemented, clay clasts and ferruginous concretions common near base of units, local coarse plant fragments; chert-pebble conglomerate and gravelly sandstone mostly at base of thicker units; individual members are in part composed of multiple superimposed or closely spaced units; thickness of sandstone members 5 to 40 feet. Thickness of Archer City Formation (new) 370 to 400 feet
Markley Formation (new), $Pm$, and Thrifty and Graham Formations (undivided), $Ptg$

Markley Formation (new), $Pm$, with sandstones and conglomerates, ss14, ss13, ss12, ss10, ss9, ss8, ss7, ss6, and ss5; limestone, ls; and sandstones and conglomerates, ss4, ss3, ss2, and ss1; separately mapped. Mudstone, shale, sandstone, conglomerate, coal, and limestone; mudstone above ss12 in units 10 to 40 feet thick, mostly brown and reddish-brown, local thin beds of very fine sandstone; mudstone and shale below ss12 in units 5 to 45 feet thick, brown, gray, greenish-gray, reddish-brown, thin- to thick-bedded, coal and carbonaceous and gypsiferous gray shale in beds 3 to 8 inches thick alternating with variegated mudstone locally below ss9 and ss7, carbonaceous plant fragments common in gray and variegated beds throughout, very fossiliferous (mostly *Myalina* pelecypods and crinoid fragments) tan and greenish-gray mudstone with single lentil of argillaceous and bioclastic limestone below ss4 west of Lake Amon G. Carter dam, marine megafossils in mudstone uncommon elsewhere, small channel-fill bodies and calcareous thin beds of laminated and ripple cross-laminated very fine and fine sandstone throughout. Sandstones and conglomerates, ss14, ss13, ss12, ss10, ss9, ss8,
ss7, ss6, and ss5; sandstone, tan to dark-brown, fine-grained to very coarse grained, friable to moderately well indurated, silica and ferruginous cement, small- to large-scale crossbeds, locally massive, commonly soft-sediment-deformed, mudstone intraclasts locally; clast- and matrix-supported chert-pebble conglomerate and gravelly sandstone near base of units; members commonly comprise two or more superimposed or closely spaced units; ss14 forms broad dip slope and marks drainage divide between Red and Trinity Rivers; ss5 possibly equivalent to Avis Sandstone exposed in area depicted on adjacent Wichita Falls - Lawton Sheet; thickness of sandstone and conglomerate members 10 to 50 feet. Limestone, ls, gray, weathers to yellowish-brown, fine-grained, argillaceous, sandy, sparsely fossiliferous, poorly exposed as single thin bed 4 to 8 inches thick in discontinuous outcrops on mudstone slopes below ss5 in northwestern Wise and southwestern Montague Counties, locally grades laterally into calcareous sheet sandstone, probably equivalent to ls1 of Thrifty and Graham Formations (undivided). Sandstones and conglomerates, ss4, ss3, ss2, and ss1; sandstone, brown, fine-grained to very coarse grained, hematite and silica cement, local calcite cement, large-scale crossbeds, in part massive, soft-sediment deformation common, ferruginous concretions and laminae, mudstone intraclasts locally abundant at base of units; chert-pebble conglomerate especially characteristic of ss4, crudely stratified, clast- and matrix-supported, occurs as broad lenses within sandstone; sandstone and conglomerate members form rounded benches; thickness of sandstone and conglomerate members 5 to 25 feet. Virgil/Wolfcamp Series boundary located approximately at or near base of ss12. Thickness of Markley Formation (new) 550 to 600 feet.

Thrifty and Graham Formations (undivided), \( P_{tg} \), with limestone, \( l_{s1} \), Lower Gunsight Limestone, \( P_{gl} \), and Bunger Limestone, \( P_{bu} \), separately mapped. Mudstone, shale, limestone, and sandstone; mostly mudstone and shale in units 5 to 30 feet thick, light-gray, weather to greenish-gray and tan, poorly exposed; laminated and cross-laminated calcareous sandstone in platy thin beds throughout; fine-grained sheet sandstone 2 to 4 feet thick locally in interval between Lower Gunsight Limestone and Bunger Limestone, calcareous, in part conglomeratic with limestone clasts, laminated, locally bioturbated. Limestone, \( l_{s1} \), locally comprises two limestone units separated by gray shale 4 feet thick; upper limestone, gray to tan, fine-grained, sandy, argillaceous, sparsely fossiliferous, single thin bed 4 to 8 inches thick, becomes sandier westward; lower limestone present in eastern outcrops, gray, medium- to coarse-grained, bioclastic, thin and irregular beds; thickness 1 to 3 feet. Lower Gunsight Limestone, \( P_{gl} \), light-gray, fine-grained, thin-bedded to wavy-nodular, sparsely fossiliferous, thickness 2 to 5 feet. Bunger Limestone, \( P_{bu} \), light-gray, coarse-grained, thin-bedded, bioclastic, fossils mostly crinoid fragments and fusulinids, thickness 2 to 4 feet. The contact between the Thrifty and Graham Formations (undivided) and the Markley Formation (new) is marked by a stratigraphic cutoff that coincides with a local overlap of Cretaceous rocks (Antlers Sand) in northeastern Jack and southwestern Montague Counties. Thickness of Thrifty and Graham Formations (undivided) less than 200 feet.
Colony Creek Shale, \( \text{Pcc} \)

Shale, sandstone, conglomerate, and limestone; sandstone and shale, ss2; sandstone, conglomerate, and shale, ss1; and Cundiff Limestone, \( \text{Pcd} \); separately mapped. Shale, gray, greenish-gray, weathers to light-brown, minor maroon and black, some laminated and burrowed siltstone, sparse ferruginous nodules throughout, locally calcareous and gypsiferous; local thin to medium beds of fine-grained sandstone, laminated, burrowed, ripple-marked; thin argillaceous limestone lentil locally below ss1, coarse-grained, bioclastic

Sandstone and shale, ss2; sandstone, brown, fine- to medium-grained with sparse lenses of chert pebbles, in part soft-sediment-deformed, massive, and crossbedded in unit 10 to 25 feet thick, friable to well-cemented with mostly hematite or limonite, minor calcite and silica cement; locally interbedded shale; top of ss2 marks top of Canyon Group in northern Jack County

Sandstone, conglomerate, and shale, ss1; sandstone, brown, reddish-brown, fine- to coarse-grained, lenses of clay clasts and chert pebbles, mostly massive and soft-sediment-deformed, in part crossbedded; minor interbedded tan and gray shale containing discontinuous bioclastic limestone lentil; thickness 20 to 45 feet

Cundiff Limestone, \( \text{Pcd} \), gray, brown, coarse-grained, bioclastic with mostly algae and crinoid fragments, comprises two discontinuous beds 1 to 2 feet thick. Upper contact of Colony Creek Shale coincides with top of ss2 in northeastern Jack County; part of contact is extrapolated to Cretaceous rocks. Home Creek Limestone lies between Colony Creek Shale and Thrifty and Graham Formations (undivided) in outcrops southwest of map area but pinches out in southwestern Jack County. Thickness of Colony Creek Shale 200 to 220 feet

Ranger Limestone

Limestone and shale; mostly limestone, gray, weathers to yellowish-white and tan, fine- to coarse-grained, locally intraclastic and brecciated, thin- to thick-bedded, wavy-nodular, massive, sparse chert nodules, locally interbedded thin ferruginous shale beds bearing abundant bryozoans and brachiopods, similar low-diversity fauna in lower concentration in limestone, forms moderately prominent bench and broad dip slope; equivalent to the lower of two limestone units that compose the Ranger Limestone in the Brazos River drainage area depicted on the adjacent Wichita Falls - Lawton Sheet. Thickness of Ranger Limestone 10 to 25 feet
Ventioner Formation (revised)

Shale, mudstone, sandstone, siltstone, and limestone; limestone, ls, and sandstones and shales, ss3, ss2, and ss1, separately mapped. Shale and mudstone, gray, black, maroon, weather to tan and reddish-brown, silty, sandy, locally laminated, thick-bedded in units 5 to 60 feet thick, ferruginous nodules locally common, marine megafossils uncommon, fine-grained plant debris locally abundant; numerous sandy and silty lenses and flaggy thin to medium beds with horizontal lamination, ripple cross-stratification, horizontal feeding trails, fine plant fragments, locally graded with load and flute casts; some unmapped channel-fill sandstone bodies as much as 15 feet thick, trough-crossbedded, soft-sediment-deformed, thick-bedded, carbonized plant stems and fronds common, mudstone intraclasts concentrated near bases

Limestone, ls, tan, gray, yellowish-white, fine- to medium-grained, thin-bedded, wavy-nodular, bioclastic with mostly algae, crinoid fragments, fusulinids, and brachiopods; restricted to east-central Jack County; merges with Ranger Limestone in subsurface; thickness 10 to 15 feet

Sandstone and shale, ss3; sandstone, brown, reddish-brown, very fine grained to medium-grained, locally conglomeratic with chert pebbles, commonly complexly soft-sediment-deformed and penecontemporaneously faulted in units 5 to 25 feet thick, massive, in part trough-crossbedded, primary sedimentary structures poorly preserved, coarse plant fossils (Calamites) common; locally comprise two or more superimposed or closely spaced channel-fill bodies separated by shale units; also occur in closely spaced and extensive sheetlike bodies in units 3 to 30 feet thick, thin- to thick-bedded, horizontally laminated, trough-crossbedded, ripple-marked, soft-sediment-deformed, abundant plant debris, clay clasts locally common; ss3 comprises two thick sandstone units separated by 20 to 40 feet of sandy shale in northern outcrops; thickness 5 to 100 feet

Sandstone and shale, ss2, discontinuous zones of thick, channel-fill bodies and evenly bedded sandstone locally interbedded with shale, share most characteristics with ss3 and ss4; locally marks base of Ventioner Formation (revised); thickness 5 to 50 feet

Sandstone and shale, ss1; sandstone units mostly in sheetlike bodies interbedded with shale, tan to dark-brown, very fine grained to fine-grained, locally calcareous, thin- to thick-bedded, laminated, ripple cross-laminated, soft-sediment deformation especially common at bases of beds, coarse woody debris including stems and whole leaves concentrated on bedding planes; also broad channel-fill bodies locally superimposed in upper part of unit, possibly incised into Devils Den Limestone in southern outcrops; intervening shale beds, gray, tan, pale-reddish-brown, silty, single thin bed of fusulinid-rich limestone locally in northernmost outcrops; thickness 15 to 40 feet. Ventioner Formation (revised) equivalent to Placid Shale, Winchell Limestone, and upper part of Wolf Mountain Shale that are exposed in area depicted on adjacent Wichita Falls - Lawton Sheet. Thickness of Ventioner Formation (revised) 280 to 300 feet.
Jasper Creek Formation (revised), \( \text{Pjc} \), and Chico Ridge Limestone (revised), \( \text{Pcr} \)

Jasper Creek Formation (revised), \( \text{Pjc} \), with sandstones, ss5, ss4, ss3, ss2, and ss1, separately mapped. Above Rock Hill Limestone member of partly equivalent Chico Ridge Limestone-shale, sandstone, and siltstone (Jasper Creek Beds, unmapped); mostly shale in units 5 to 60 feet thick, gray, reddish-gray, greenish-gray, tan, silty, sandy, locally calcareous and very fossiliferous below Devils Den Limestone, fossils include crinoids, sponges, bryozoans, algae, fusulinids, orthocone nautiloids, and pelecypods, locally abundant ferruginous nodules, laminae and thin beds of siltstone throughout; sandstone as isolated thin beds and as closely spaced thin to medium beds in units up to 12 feet thick, light-gray, tan, very fine grained to fine-grained, laminated, ripple-marked, horizontal burrows, flute and drag casts; also as massive lenses up to 5 feet thick, fine-grained, burrowed, soft-sediment-deformed, abundant plant debris, locally sparsely fossiliferous with pelecypods. Below Rock Hill Limestone-shale and sandstone (Lake Bridgeport Shales, unmapped); shale, gray, weathers to tan and yellowish-brown, locally dark-gray to black near base, silty, thin limestone lentils in northern outcrops, abundantly fossiliferous in at least four levels, fossils include pelecypods, gastropods, ammonoids, nautiloids, fusulinids, crinoids, brachiopods, and trilobites; sandstone mostly in upper part, light-brown, grayish-white, very fine grained to fine-grained, locally calcareous, isolated flaggy thin and lenticular thick beds, laminated, ripple-marked. Sandstones, ss5, ss4, ss3, ss2, and ss1; brown, reddish-brown, very fine grained to fine-grained, locally calcareous, isolated flaggy thin and lenticular thick beds, laminated, ripple cross-laminated, crossbedded, in part massive, locally intensely soft-sediment-deformed, occur as broad channel-fill bodies and as thick sequences of evenly bedded sandstone interstratified with shale; form rounded benches; thickness 15 to 40 feet. Jasper Creek Formation (revised) equivalent to lower part of Wolf Mountain Shale and Palo Pinto Formation exposed in area depicted on adjacent Wichita Falls - Lawton Sheet. Thickness of Jasper Creek Formation (revised) 310 to 330 feet.

Chico Ridge Limestone (revised), \( \text{Pcr} \), with Devils Den Limestone Member, \( \text{Pdd} \), and Rock Hill Limestone Member, \( \text{Prh} \), separately mapped. Limestone and shale; mostly limestone, gray, yellowish-gray, weathers to yellowish-brown, fine- to coarse-grained, thin- to thick-bedded, irregularly bedded, marine megafauna includes algae, crinoids, mollusks, echinoids, fusulinids, and bryozoans; shale in units 2 to 8 feet thick locally interbedded with limestone in southern outcrops, dark-gray, weathers to greenish-gray and yellowish-brown, carbonaceous, locally calcareous, sparsely fossiliferous. Devils Den Limestone, \( \text{Pdd} \), medium-gray, weathers to yellowish-brown, unevenly and irregularly bedded, beds up to 1.5 feet thick, bioclastic with mostly phylloid algae, crinoids, bryozoans, and locally solitary corals; forms
broad dip slope; northern limit at West Fork of Trinity River; equivalent to, and merges with, uppermost part of thick Chico Ridge Limestone; stratigraphically lies approximately 150 to 200 feet below northern pinch-out of Winchell Limestone in southern Jack County (illustrated on adjacent Wichita Falls - Lawton Sheet); thickness of Devils Den Limestone 3 to 25 feet, thins southward. Rock Hill Limestone, PRh, mottled pale-yellowish-brown, well-indurated, characteristically brecciated with angular intraclasts up to 2 inches long, thick-bedded, massive, clasts and fossils weather in relief; interval between PRh and base of Jasper Creek Formation increases noticeably to the north; equivalent to, and merges with, lower part of thick Chico Ridge Limestone; thickness of Rock Hill Limestone 2 feet, thickens northward. Thickness of Chico Ridge Limestone approximately 170 to 200 feet, thickens rapidly in subsurface to approximately 300 feet

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Willow Point Formation (revised)

Shale, claystone, limestone, sandstone, and coal; Willow Point Limestone Member, Pwp1, and sandstone, ss1, separately mapped. Shale and claystone in units 8 to 40 feet thick, medium- and dark-gray, grayish-purple, weather to tan and yellowish-brown, locally silty and sandy, ferruginous concretions throughout, locally very fossiliferous with brachiopods, corals, gastropods, pelecypods, cephalopods, and crinoids; at least five unmapped limestone beds (Balsora, Sanders Bridge, Boone Creek, Martin Lake, and Hudson Bridge Limestones) in lower part locally exposed in streamcuts along contact with Cretaceous deposits, correlation of unmapped limestone beds between discontinuous outcrops uncertain, medium-gray, light-brown, reddish-brown, fine- to coarse-grained, well-indurated, bioclastic, thin- to thick-bedded, irregularly bedded, 1 to 7 feet thick; local thin beds of calcareous, very fine sandstone; coal (Bridgeport Coal, unmapped) in single bed 18 to 22 inches thick and 32 to 55 feet below Willow Point Limestone Member

Willow Point Limestone Member, Pwp1, light-gray, weathers to yellowish-brown, fine- to coarse-grained, locally fossiliferous, thin- to thick-bedded, a few thin shale interbeds; forms erosional bench and dip slope; locally covered by Cretaceous deposits; thickness 3 to 6 feet

Sandstone, ss1, brown, fine- to medium-grained, locally conglomeratic, mostly massive, locally crossbedded, friable, ferruginous cement; poorly exposed in stream valleys; thickness 10 to 20 feet. Willow Point Formation (revised) equivalent to lower and middle Palo Pinto Formation exposed southwest of map area. Thickness of Willow Point Formation (revised) approximately 100 to 150 feet

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Dornick Hills Group (undivided)

Probably Bostwick Formation. Conglomerate, limestone, and sandstone; crops out within area of Sherman Sheet as single inlier in southern Love County, Oklahoma
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