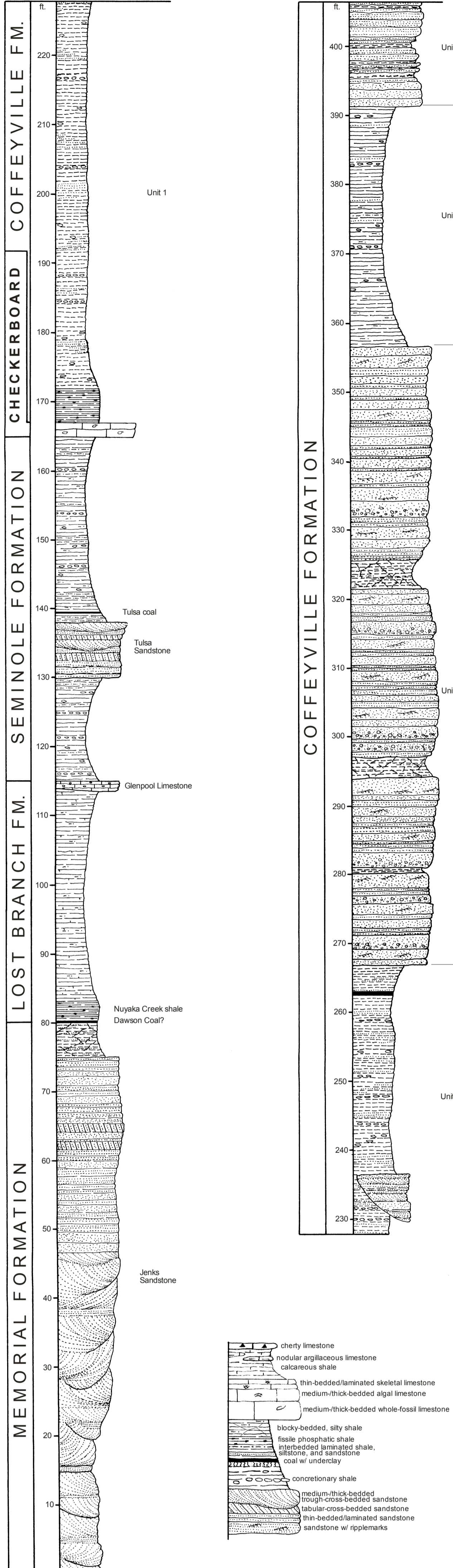
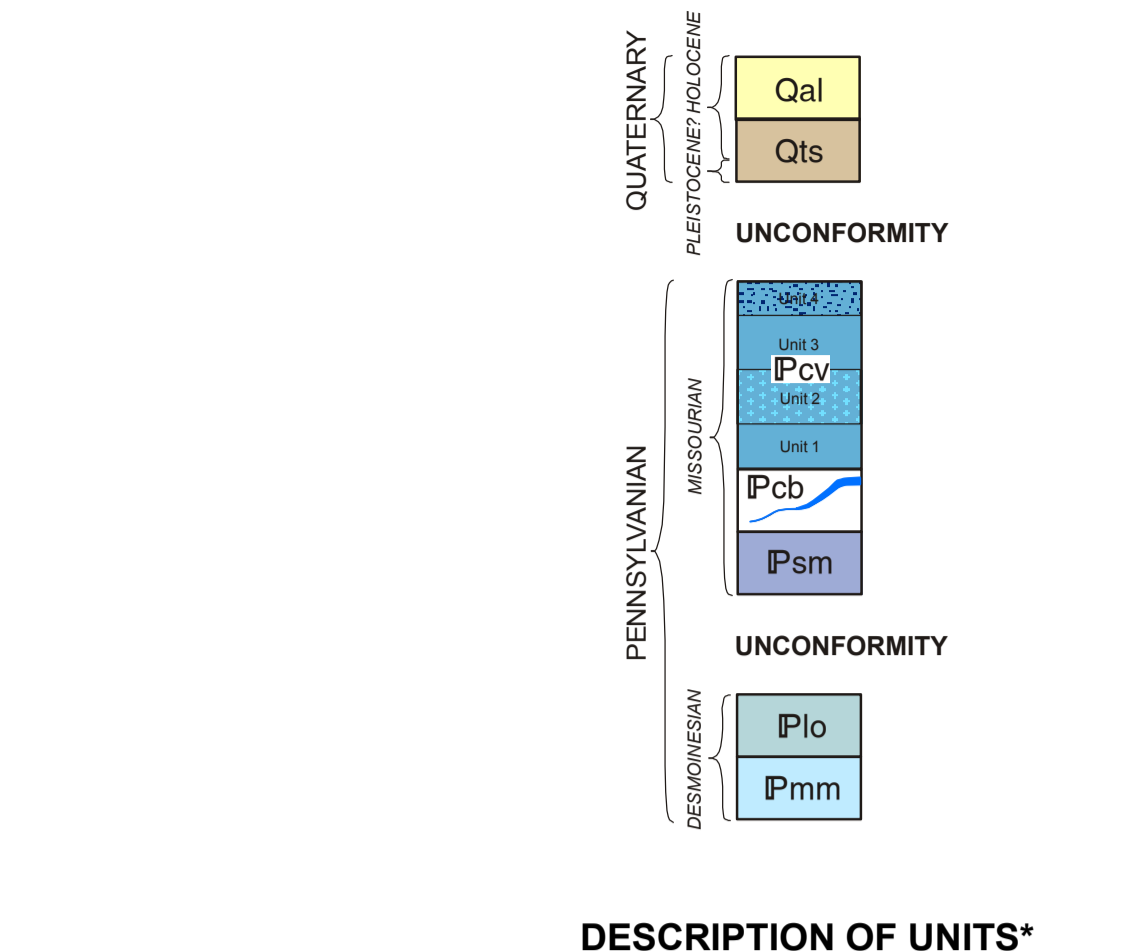


STANDARD REFERENCE SECTION

Main stratotype section for the Sapulpa South 7.5-minute quadrangle showing principal formations, members, and beds. Their relative stratigraphic positions, general lithologic textures, and average thicknesses. Formal member and bed names are indicated by capitalization (i.e., Tulsa Sandstone), while informal names are given in lowercase (i.e., Nowata flagstone). Unit names followed by a 7' indicate that the member or bed was not observed in the field area, but has been reported in adjacent areas or in the subsurface.



CORRELATION OF MAP UNITS



DESCRIPTION OF UNITS\*

- Qal** ALLUVIUM (Holocene)—Clay, silt, sand, and gravel in channels and on flood plains of modern streams. Includes terrace deposits of similar composition located directly above and adjacent to modern channels and flood plains. Thickness: 0 to about 30 ft.
- Qts** UPPER TERRACE SANDS (Holocene and Pleistocene?)—Occur as small, isolated deposits along Polecat and Boven Creeks, and consisting mainly of unconsolidated fine- to medium-grained quartz sand, silt, and clay, little to no gravel-sized material observed. Situated just above modern flood plains and drainages. Thickness: 0 ft to at most 20 ft, averages closer to 10 ft thick.
- Pcv** COFFEYVILLE FORMATION (Pennsylvanian, Missourian)—Mapped as four informal units in the Sapulpa South quadrangle. The overall thickness of the formation in this quad varies from about 330 ft as much as 440 ft thick, with the top of the formation not observed. The individual units are described in descending order:
  - Unit 4 (Pcv<sub>4</sub>): A grayish orange (10YR7/4), dark yellowish orange (10YR6/6), to a very pale orange (10YR8/2), but locally weathered to a distinct moderate yellowish brown (10YR5/4), weakly to moderately indurated, thin wavy-bedded to locally wavy-laminated, weakly calcareous, micaceous, fine-grained sandstone, bedding from 0.5' to 1' thick, but basal beds may be 12" thick; typically tops of beds ripple-marked, while base of beds are planar, and each bed is separated by a shale parting. Unit formally mapped as the 'Layton Sandstone' by Bennison and others (1972). Only the basal 30 ft of unit is exposed in the far northwest corner of the area.
  - Unit 3 (Pcv<sub>3</sub>): A light olive gray (5Y6/1), dusky yellow (5Y6/4), to medium gray (N5), well-laminated to fissile, slightly silty, concretionary clayshale; minor siltstone and very fine-grained sandstone interlaminae occur in the upper half of unit. Concretions occur as discontinuous beds and elongated nodules of no more than 2-3" thick; typically pale yellowish orange (10YR6/6) to dark yellowish orange (10YR6/6) in color. Units between 30 to 40 ft thick.
  - Unit 2 (Pcv<sub>2</sub>): This unit is extensive in the central and western parts of the Sapulpa South Quad and consists predominantly of planar, thin- to locally medium-bedded, fine-grained sandstone with intervals of interbedded mudstone and siltstone between major sandstone intervals. Sandstones are yellowish gray (5Y7/2) to grayish orange (10YR7/4) but weather to a distinct dark yellowish orange (10YR6/6) to light brown (5YR5/6), and friable to moderately indurated, planar bedded with bedding ranging from 1-14" thick, although locally some beds may be up to 24" thick; grain texture is fine, although it may be medium-grained in the upper part of the unit. Sandstones are friable to moderately indurated, planar bedded with bedding ranging from 1-14" thick, although locally some beds may be up to 24" thick; grain texture is fine, although it may be medium-grained in the upper part of the unit. Sandstones are friable to moderately indurated, planar bedded with bedding ranging from 1-14" thick, although locally some beds may be up to 24" thick; grain texture is fine, although it may be medium-grained in the upper part of the unit. Sandstones are friable to moderately indurated, planar bedded with bedding ranging from 1-14" thick, although locally some beds may be up to 24" thick; grain texture is fine, although it may be medium-grained in the upper part of the unit.
  - Unit 1 (Pcv<sub>1</sub>): Primarily a shale dominated unit. Lower 5 to 10 ft, just above the Checkerboard Limestone, consists of a dark gray (N5) to medium dark gray (N4), weathers to an olive black (5Y2/1), well-laminated to fissile, phosphatic clayshale, which grades upward into a yellowish gray (5Y7/2), light olive gray (5Y5/2), olive gray (5Y4/1), to medium gray (N5), blocky bedded, concretionary, silty claystone to mudstone with local occurrences of interbedded sandstone; concretions are dark yellowish orange (10YR6/6) to light brown (5YR5/6), nodular to discontinuously bedded, and primarily composed of hematite, sandstones are grayish orange (10YR7/4) to grayish orange pink (5YR7/2), friable to weakly indurated, thin bedded, fine- to less finely, medium-grained, individual sandstone layers typically 2' to 3' thick, although some may attain a thickness of over 8 ft in some exposures. Thin coal beds and streaks occur sporadically throughout, with one prominent, 8' thick coal bed occurring near the top of the unit. Thickness of Unit 1 varies considerably, ranging from 100 ft thick in the eastern part of the quad, but thickening to as much as 210 ft in the western part of the quad and in the subsurface.
- Pcb** CHECKERBOARD LIMESTONE (Pennsylvanian, Missourian)—The Checkerboard Limestone is medium gray (N5), greenish gray (5GY8/1), to dark greenish gray (5GY4/1), but weathers to a distinct moderate yellowish brown (10YR5/4) to dark yellowish orange (10YR6/6) color. Texturally, it is a skeletal to whole-fossil carbonate mudstone to wackestone; fossils include crinoid stems, corals, and bivalves. Thin calcite veins are present in some areas. Thickness about 2 ft.
- Psm** SEMINOLES FORMATION (Pennsylvanian, Missourian)—Formation consists of a lower sandstone interval, called the Tulsa Sandstone, and a basal and upper units of permianized, concretionary, silty clayshales, mudshales and siltstones. The Tulsa coal also occurs within the uppermost shale interval, just above the top of the Tulsa Sandstone. The Tulsa Sandstone starts where from 6 to 15 ft above the base of the formation and consists of a pale yellowish orange (10YR6/6), light brown (5YR5/6), grayish red (5R4/2), very pale orange (10YR8/2), to yellowish gray (5Y7/2), with distinct dark yellowish orange (10YR6/6) weathering spots, weak to moderately indurated, thin to medium bedded, very fine- to fine-grained argillaceous and micaceous sandstone; sandstone mostly siliceous but may have a weak calcite cement within some bedding intervals. Unit appears as a series of stacked channels sequences, where an individual sequence may vary between 2 to 4 ft thick, and which are separated by a 6-12" thick interval of interlaminated calcareous, silty clayshale and siltstone; bedding at base of each sequence is thicker (varying from 1-2-24") and has channel-form lower surfaces, which grade up into a thinner (3-5" thick), planar bedded sequences. Horizontal burrows and tool marks common along the base of beds, while tabular cross bedding evident within bed interiors. Beds often appear pitted due to the weathering out of horizontal burrows. Thickness of the member varies from 5 to 10 ft. A dark yellowish orange (10YR6/6), pale yellowish orange (10YR6/6), to light olive gray (5Y6/1), laminated, slightly silty, concretionary clayshale interlaminated with mudshale and siltstone occur above and below the Tulsa Sandstone. Siltstones are ripple-marked and also have abundant horizontal trace fossils. Concretionary material occurs as discontinuous lenses and beds within clayshales that vary from 1-6' thick. Foot chips of the Tulsa coal have been observed in various localities near the upper contact with the Tulsa Sandstone. Thickness of the Seminoles Formation varies between 50 to 90 ft thick.
- Plo** LOST BRANCH FORMATION (Pennsylvanian, Desmoinesian)—Poorly exposed, except for the Glenpool Limestone bed. Overall, a light brown (5YR6/4) to pale yellowish brown (10YR6/2), locally medium light gray (N5), laminated, slightly calcareous, micaceous, silty clayshale. Basal 3 ft of formation, just above the Dawson Coal, consists of a medium dark gray (N4) to dark gray (N3), well-laminated to fissile, phosphatic mudshale to clayshale called the Nuyaka Creek shale bed. The top of the formation is marked at the top of the Glenpool Limestone, which is a dusky yellow (5Y6/4) to pale olive (10Y8/2), 1-1.5 ft thick, locally wavy-bedded packstone to whole fossil wackestone in upper half, grading down into an argillaceous unossiliferous carbonate mudstone in lower part of bed; brachiopods, gastropods, and crinoid debris the most common fossils. Thickness of the Lost Branch ranges from 1 to 45 ft thick, averages closer to 35 ft thick across the map area.
- Pmm** MEMORIAL FORMATION (Pennsylvanian, Desmoinesian)—In the Sapulpa South Quad, unit may consist of three informal members, these are in descending order: 1, the uppermost Dawson Coal; 2, an unnamed upper shale interval; 3, the Jenks Sandstone; and 4, an unnamed lower shale interval of variable thickness. Only the uppermost 80 to 90 ft of the formation is exposed in the quad. Dawson Coal: Unobserved in map area, but has been previously reported by Oakes (1952) and Bennison and others (1972). It represents the top of the formation. Unnamed upper shale interval: consists of a light olive brown (5Y6/5), grayish orange pink (5YR7/2), to grayish yellow (5Y8/4), interbedded sandy, weakly calcareous mudstone, and friable, fine-grained sandstone. Sandstones may have light brown (5YR6/4) oxide spots. Mudstone blocky bedded, with numerous concave fractures and slickensides that are indicative of paleosol development. Sandstones generally laminated, occurring as discontinuous beds and lenses within mudstones; sandstone cement most likely clay or a weak iron-oxide. Thickness of interval varies from 2 to 8 ft thick. Jenks Sandstone: yellowish gray (5Y7/2), pale yellowish brown (10YR6/2), dark yellowish orange (10YR6/2), locally light brown (5YR5/6) to pale brown (5YR5/6), friable to weakly indurated, thin- to medium-bedded, fine-grained, locally medium-grained at base, micaceous sandstone. Lower rest of sandstone thin to medium, trough-cross-bedded, with bedding varying from 3-16" thick; rest of interval thinner bedded (with beds ranging from 0.5' to 4" thick, averaging closer to 2" thick), and having numerous shale partings and interbeds (finer bedding). Clay-ball casts and flute casts common throughout member; some tabular cross-bedding in middle of unit. The member was only observed in the southeast corner of the quad, where it attains a thickness of just over 75 ft.

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- Bennison, A.P., Chenoweth, P.A., Desjardins, L.A., and Ferris, C., 1972. Surface geology and Bouguer gravity of Tulsa County, Oklahoma, in Bennison, A.P. (ed.), Tulsa's Physical Environment: Tulsa Geological Society Digest, 37, 1 sheet, scale 1:63,360.
- Oakes, M.C., 1952. Geology and mineral resources of Tulsa County, Oklahoma (includes parts of adjacent counties). Oklahoma Geological Survey Bulletin, 69, 234 p.

SYMBOLS

- Unit contact; dashed where approximate; dotted where concealed
- × Outcrop, geologic observation
- Petroleum well. Includes oil, gas, oil and gas, dry work (water supply or injection), junked and abandoned, unknown. Modified from Natural Resources Information System database

