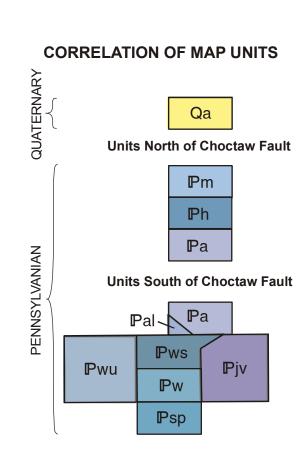


## GEOLOGIC MAP OF THE HIGGINS 7.5' QUADRANGLE LATIMER COUNTY, OKLAHOMA

Neil H. Suneson and Charles A. Ferguson Digitized by Jacob Hernandez, 2014



## DESCRIPTION OF UNITS

developed on shale. Sandstones are buff, fine-grained, thinly and regularly bedded, ripple-marked, and locally separated by thin, discontinuous shale beds. Shale varies from light gray and sandy to dark and carbonaceous. Upper part not exposed in quadrangle. Approximately 210 ft (64 m) exposed

Qa ALLUVIUM — Unconsolidated silt, sand, and gravel MCALESTER FORMATION (PENNSYLVANIAN) — Lower part consists mostly of poorly exposed and easily eroded shale, with upper Hartshorne coal near base and local thin sandstone and coal beds throughout Shale is dark, firm, platy, and contains abundant clay-ironstone concretions. Middle part characterized by as many as five sandstone members that form low ridges separated by valleys

north of Choctaw fault (Description from Hendricks, 1937)

HARTSHORNE FORMATION (PENNSYLVANIAN) — Consists of lower sandstone, middle shale, and upper sandstone. Lower sandstone is ash-gray on fresh surfaces and varies from massive, medium-grained, and pure to thin-bedded, shaly, ripple-marked, and fine-grained. Shale contains lower Hartshorne coal bed and numerous relatively thin, shaly sandstone beds; locally, shale slightly sandy, gray, and micaceous. Upper sandstone massive, coarse-grained, white, and poorly cemented. Both sandstones are well exposed and form ridges; middle shale is poorly exposed and forms valleys. Approximately 750 ft (230 m) exposed north of Choctaw fault (Description from Hendricks, 1937)

ATOKA FORMATION (PENNSYLVANIAN) — Predominantty poorly exposed dive-gray (5Y3/2) to grayish-olive (10Y4/2), slightly silty. noncalcareous, poorly laminated shale and mudstone. Contains thin beds of laminated siltstone and thicker beds of sandstone. Lower shale (Pal) in northern part of area locally mapped separately. Laminated siliceous shale near base of formation in southern part of area. Sandstone is light olive gray (5Y5/2) and grayish orange (5Y7/2) where fresh, and grayish orange (10YR7/4) where weathered. Mostly fine-grained, rarely medium-grained, poorly to moderately sorted, noncalcareous, and composed of about 95% quartz. 3% feldspar and lithic fragments, and conspicuous white mica parallel to laminations. Individual beds vary from several centimeters to several meters thick and average about 60 cm. Amalgamated beds common, forming resistant ridges and dip slopes easily identifiable on aerial photographs; some of these marker beds are mapped. One calcareous sandstone bed is present in the southwestern part of the quadrangle. Thicker beds are generally massive (corresponding to Ta of Bouma turbidite sequence) to parallel laminated (Tb); thinner beds commonly are ripple crosslaminated (Tc). Sole marks (flute, groove, and load casts, trace fossils) at base of sandstone beds locally common. Dish-and-pillar structures and ripple marks typical of some beds. Unfossiliferous except for lowermost sandstone beds immediately above Johns Valley Formation that contain molds of bryozoans. brachiopods. crinoids. and rare corals; local concentrations of plant debris on bedding planes throughout the formation. Approximately 400 ft (125 m) of upper part exposed north of

LOWER ATOKA SHALE (PENNSYLVANIAN) — Poorly exposed, olive-gray (5Y3/2) to grayish-dive (10Y4/2), noncalcareous, poorly laminated shale and mudstone with thin siltstone beds. Locally manned separately from Atoka Formation (Po) mapped separately from Atoka Formation (Pa)

Pwu WAPANUCKA FORMATION, UNDIFFERENTIATED (PENNSYLVANIAN) — Includes Spiro sandstone member (informal) and Wapanucka Formation, described below

SPIRO SANDSTONE MEMBER (INFORMAL) OF WAPANUCKA FORMATION PENNSYLVANIAN) — Well-exposed, light-brown (5Y5/6) to very pale-orange (10YR8/2) or paleellowish-orange (10YR8/6), mostly well-sorted, porous, medium-grained, stratified quartz arenite. Quartzose, mostly noncalcareous, locally with abundant trace fossils (Asterosoma) and fragments of crinoids, corals, and brachiopods. Beds typically 2 cm to 1 m thick, amalgamated, and mostly parallel-stratified, but locally planar-tabular cross-stratified. Spicular in western part of area. Granule sandstone beds with abundant shale clasts rare. Weathers to very vuggy appearance. Forms ridge and dip slope throughout area. Maximum thickness approximately 700 ft (200 m) south of Choctaw

WAPANUCKA FORMATION (PENNSYLVANIAN) — Predominantly pooriy to moderately wellexposed, medium-gray (N5) to medium-dark-gray (N4), wavy-bedded, sparsely fossiliferous crinoids, brachiopods, gastropods, corals) micrite and parallel- to rarely cross-stratified packstone and biodastic limestone. Locally slightly spicular, interbedded with spiculite in western part of area. Micrite locally nodular, slightly fetid; packstone locally sandy. Limestone interbedded with pooriy exposed shale similar to that in Atoka Formation, mostly underlying but also interfingering with Spiro Sandstone Member (informal). Maximum thickness approximately

JOHNS VALLEY FORMATION (PENNSYLVANIAN) — Predominantly pooriy exposed, medium-dark-gray (N4) to pale-brown (5Y5/2), mostly noncalcareous, pooriy laminated slightly silty shale and mudstone. Contains thin beds of noncalcareous laminated siltstone and thin- to mediumbedded sandstone similar to Atoka Formation (Pa). Sandstones mostly light brown (5Y6/4) to grayish orange (10YR7/4). varying from fine- to coarse-grained, with rare granule conglomerates, rarely calcareous or fetid, and massive to parallel- or ripple cross-laminated. Sole marks and dish-and-pHlar structures typical of some beds. Some sandstone marker beds mapped. Shale locally contains slightly- to well-rounded pebbles, cobbles, and boulders of chert and a wide variety of limestone lithdogies (micrites to biodastic grainstones and packstones). Other lithdogies within the shale indude large masses of platy to very fissile, hard, grayish-black (N2) shale with calcareous concretions. phosphatic(?) nodules, and disseminated pyrite. Limestone dasts have been correlated with lower and middle Paleozoic limestone units exposed to the north and west; chert dasts may be Woodford Formation (Devonian); and many black shale masses may correlate with the Caney Formation (Mississippian). Maximum thickness approximately 2.600 ft (800 m) south of Choctaw fault

SPRINGER1 FORMATION (PENNSYLVANIAN) — Poorty exposed, dark-gray (N3) to dive-gray (5Y4/1), locally slightly silty, mostly calcareous shale with lesser amounts of interbedded laminated siltstone. Siltstone beds locally contain abundant macrofossils (gastropods, brachiopods, nautiloids). West of mapped area unit contains 2-cm phosphatic(?) concretions, 2-cm to 30-cm limonitized siderite concretions, and local traces of pyrite. Maximum thickness approximately 1,150 ft (350 m) south of Choctaw fault

CONTACT-Dashed where approximately located \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **——————** 

THRUST FAULT-Sawteeth on upper plate; dashed where approximately located; dotted where concealed FAULT-Arrows show relative horizontal movement; dashed where approximately located

OVERTURNED ANTICLINE-Arrows show direction of dip of limbs; dashed where approximately located SYNCLINE-Showing troughline; arrow shows direction and amount of plunge where known; dashed where

approximately located; dotted where concealed OVERTURNED SYNCLINE-Arrows show direction of dip of limbs; dashed where approximately located

(crossbar if vertical) MINOR SYNCLINE-Arrow shows direction and amount of plunge where known; bar shows dip of axial plane

MODERATE ANTICLINE-Showing dip of limbs

SINISTRAL (S) ASYMMETRIC MINOR FOLD-Arrow shows direction and amount of plunge where known STRIKE AND DIP OF BEDS

<sup>70</sup> Strike and dip of beds, facing direction unknown

 Vertical beds, facing direction unknown ├<sub>70</sub> Strike and dip of beds, upright

+ Vertical beds, bail indicates top of beds

└<sup>70</sup> Strike and dip of beds, overturned

Horizontal beds ├ Inclined, Contorted

OIL AND GAS WELLS (Spudded before January 1,1988)

Gas well

Dry hole, abandoned

