DESCRIPTION OF UNITS

CORRELATION OF MAP UNITS

UNITS NORTH OF CHOCTAW FAULT

PENNSYLVANIAN - | coal

PENNSYLVANIAN- Pa

Qa ALLUVIUM (Quaternary) – Gravel, sand, silt, and clay on flood plains of present-day streams

Qt TERRACE DEPOSITS (QUATERNARY) – Subangular to subrounded cobbles, gravel, sand, and silt, forming a veneer, generally about 4-10 ft thick, on the surfaces of terraces that stand about 40-50 ft

above the beds of present-day streams UNITS PRESENT NORTH OF CHOCTAW FAULT

Pb BOGGY FORMATION (PENNSYLVANIAN) – Predominantly sandy, silty, grayish-black (N 2) to olive-gray (5Y 4/1) to dark-yellowish-brown (10YR 4/2) shales and siltstones (Pb) with several mappable, scarp-forming, fine- to very fine-grained sandstones (Pbbj, Pb₂, Pb₃, Pb₄). At base is the Bluejacket Sandstone Member (Pbbj), mostly moderate-yellowish-brown (10YR 5/4), about 250-300 ft thick. Pb₂, Pb₃, Pb₄ are predominantly light-brown (5YR 5/6) to dark-yellowish-brown (10YR 4/2), very fine-grained, noncalcareous sandstones with abundant sedimentary structures such as ripples, cross-stratification, sole marks, and soft-sediment-deformation features. A thin (4-in.) coal bed, which probably correlates with the Lower Witterville coal on Cavanal Mountain, occurs in the upper part of the Bluckjacket Sandstone. Pbbj includes shale beds of varying thickness. The Secor coal bed occurs in shale interval between Pbbj and Pb₂. It is known to be split into as many as 4 seams having a cumulative thickness of about 4 ft in places in secs. 17 and 18, T. 6 N., R. 24 E. Thin, unmappable sandstone lenses are present in the shale units. Top of formation eroded. Thickness: approximately

Psv SAVANNA FORMATION (PENNSYLVANIAN) – Predominantly pale-yellowish-brown (10YR 6/2) to olive-gray (5Y 3/2) to medium-dark-gray (N 4) shales (IPsv) with several mappable moderate-brown (5YR 4/4) to grayish-orange (10YR 7/4) to moderate-reddish-brown (10R 4/6), fine- to very finegrained, noncalcareous sandstone units (Psv₁, Psv₂, Psv₃, Psv₄, Psv₅, Psv₆, Psv₇). The sandstones are massive to thin bedded and shaly. They commonly are cross bedded and ripple marked and in places contain abundant soft-sediment deformation features. Sole marks (trace fossils; brush and prod marks; flute, groove, and load casts) at the base of some sandstone beds are locally common. Psv₁ is mappable only in the north-central part of the area. It forms a low ridge east of Little Caston Creek for a distance of about 1 mi, but then disappears under the alluvium of Caston Creek. Where exposed, the base of Psv, marks the base of the Savanna Formation. Just west of Caston Creek, in the SW1/4 sec. 30, T. 6 N., R. 23 E., a thin (0.2 ft), fossiliferous, marine limestone is exposed in a shale interval below Psv₂ in approximately the same position stratigraphically as the Spaniard Limestone Member of the shelf area of northeastern Oklahoma. The base of the Spaniard Limestone marks the base of the Savanna Formation in the shelf area. The marine sandstone in sec. 30 is tentatively correlated with the Spaniard Limestone. In the absence of Psv₁ in the area west of Caston Creek, it marks the base of the formation. Its outcrop is shown by X on the map, and it is labeled SvSP(?) in the stratigraphic column. A second marine limestone occurs in the stratigraphic interval between Psv, and Psv₃, approximately in the same position as the Sam Creek Limestone Member of the shelf area. It is predominantly olive-gray (5Y 4/1), impure, silty, fossiliferous, and about 1.2-1.6 ft thick. It is tentatively correlated with the Sam Creek Limestone of the shelf area. It is labeled SvSc(?) in the stratigraphic column, and its outcrops are shown by \triangle s on the map. \mathbb{P} sv, thins markedly east of Caston Creek. Psv₃ pinches out near the east edge of the map. Psv₄ is thin and shaly and mappable for a distance of only about 2 mi in the north-central part of the map. All Psv sandstone units locally contain shale beds. Most shales include thin, unmappable sandstone units. The Cavanal coal bed (20-22 in. thick) occurs in the shale interval just below Psv₅. Thickness: 1,400-1,600 ft

Pm McALESTER FORMATION (PENNSYLVANIAN) – Predominantly dark-gray (N 3) to black (N 1), blocky shales containing abundant ironstone concretions. McCurtain Shale Member (IPmm) at the base is approximately 650-700 ft thick. The Warner Sandstone Member (IPmw) overlies the McCurtain Shale Member. It is resistant, moderate-reddish-brown (10R 4/6) to grayish-orange (10YR 7/4) to moderate-yellowish-brown (10YR 5/4) fine-grained, cross-bedded sandstone of variable thickness (250-290 ft). It includes upper and lower, ridge-forming units separated by shale. Three, named, moderate-brown (5YR 3/4) to brownish-gray (5YR 4/1) to moderate-yellowish-brown (10YR 5/4), fine-grained, thin-bedded sandstone occur in the shale interval above the Warner Sandstone Member: Cameron Sandstone Member (IPmc), 10-40 ft thick; Tamaha Sandstone Member (IPmt) about 3-30 ft thick; and Keota Sandstone Member (IPmk), which generally consists of 3 or more sandstone beds (not mapped separately) separated by shale and siltstone intervals of varying thickness. Contains poorly exposed McAlester coal in the shale interval just above the Cameron Sandstone Member. Total thickness: 2,000-2,200 ft

Ph HARTSHORNE FORMATION (PENNSYLVANIAN) — Grayish-orange (10YR 7/4) to moderate-reddish-orange (10YR 6/6) to very light-gray (N 8), very fine-grained, ripple-marked, bioturbated, thin-bedded to massive sandstone interbedded with silty, medium-gray (N 5) shale. Contains the Lower and Upper Hartshorne coal beds. Thickness: approximately 250-325 ft

Pa ATOKA FORMATION (PENNSYLVANIAN) – Predominantly silty, medium-dark-gray (N 4) to olive-gray (5Y 2/1) noncalcareous shale (Pa) with thin, brownish-gray (5YR 3/4) siltstone beds. Includes numerous, continuous to discontinuous, ridge-forming, moderate-yellowish-brown (10YR 5/4) to dark-yellowish-orange (10YR 6/6), very fine-grained, silty, micaceous sandstones (Pass) containing plant fragments, sole markings, and trace fossils. Approximately 7,400 ft of upper part exposed northeast of the Choctaw fault

UNITS PRESENT SOUTH OF CHOCTAW FAULT

Pa ATOKA FORMATION (PENNSYLVANIAN) – Predominantly poorly exposed olive-gray (5Y 3/2) to grayish-olive (10Y 4/2), slightly silty, noncalcareous, poorly laminated shale and mudstone. Contains thin beds of laminated siltstone and thicker beds of sandstone. Sandstone is light olive-gray (5Y 5/2) and yellowish-gray (5Y 7/2) where fresh, and grayish-orange (10YR 7/4) 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 inches to several feet thick and average about 2 ft. Thicker beds are generally massive (corresponding to Ta of Bouma turbidite sequence) to parallel laminated (Tb); thinner beds commonly are ripple cross-laminated (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 local concentrations of plant debris on bedding planes. Stratigraphic position of Atoka Formation exposed immediately south of trace of Choctaw fault unknown. Approximately 2,000 ft exposed in southwestern part of quadrangle

SAMBOI S

- ——— CONTACT Dashed where approximately located ———— MARKER BED
- COAL BOUNDARY Approximate outcrop of coal bed (named on map); triangle indicated exposure of coal; queried where probable
- THRUST FAULT Sawteeth on upper plate; dashed where approximately located; dotted where concealed; queried where probable
- FAULT Arrows show relative horizontal movement; dashed where approximately located; dotted where concealed
- determined; dotted where concealed

 SYNCLINE Showing troughline; arrow shows direction of plunge,
- concealed; queried where doubtful

 MINOR ANTICLINE Showing direction and amount of plunge, if

if determined; dashed where approximately located; dotted where

- determined
- △ Outcrop, Sam Creek (?) Limestone
 × Outcrop, Spaniard (?) Limestone
- Abandoned small coal mine, stone quarry, or open shale pit
- - STRIKE AND DIP OF BEDS
- •32, Strike and dip of beds, upright position confirmed

Arrow pointing to location of measurement

- ──⁷⁵ Strike and dip of beds, overturned
- → Vertical beds, ball indicated top of beds
- ⊕ Horizontal beds

Strike and dip of beds

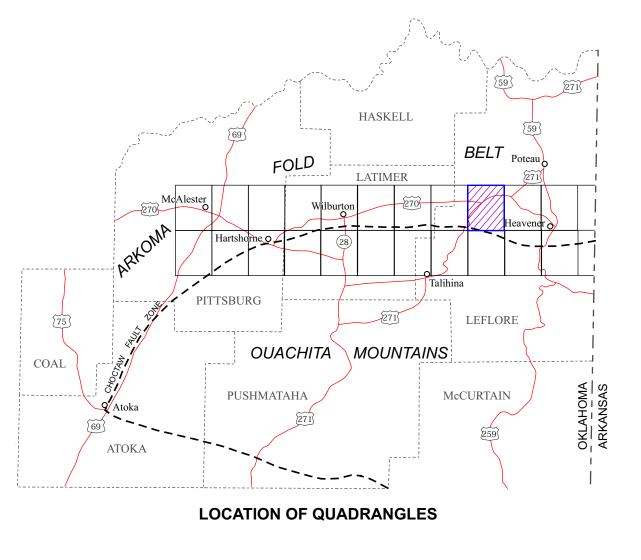
Bedrock dip projected onto cross section lines (cross sections only)

OIL AND GAS WELLS

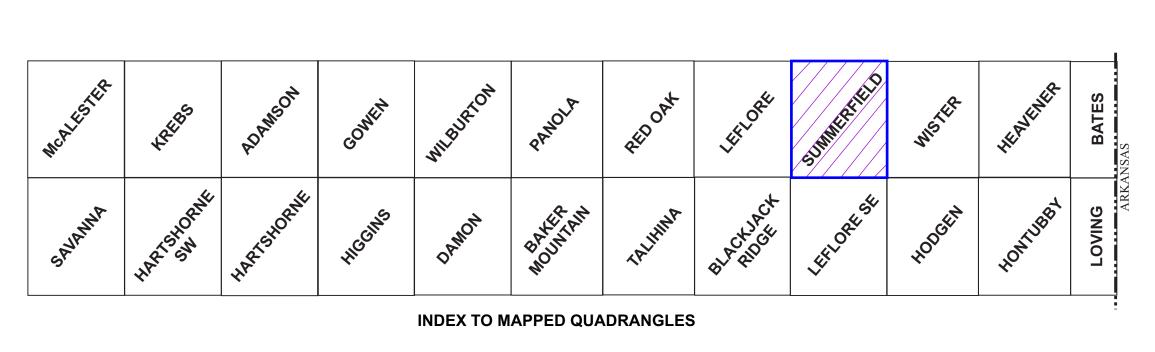
→ Dry hole, abandoned

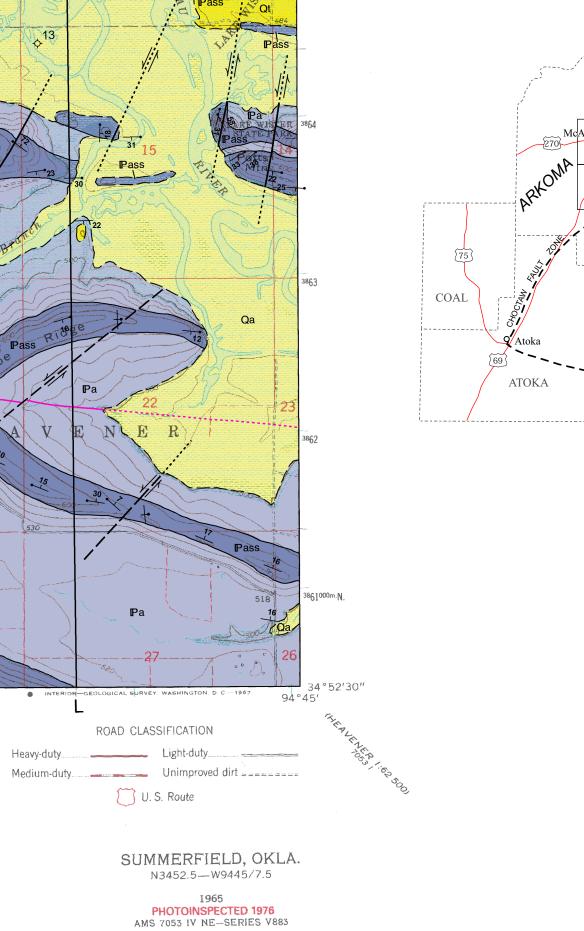
Number on map corresponds to list of wells

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| AP IO. | OPERATOR | LEASE | SPUD DATE | TOTAL DEPTH (FT) |
|-----------|--|-------------------------|--------------------------|---------------------|
| 1 | TXO Production Corp. | 1 Reed T | 2/5/84 | 6,600 |
| 2 | ARCO Oil & Gas Co. | 1 J. L. Scheffler Ranch | 4/20/82 | 6,650 |
| 3 | ARCO Oil & Gas Co. | 1 R. D. Mitchell | 3/21/82 | 6,785 |
| 4 | Humble Oil and Refining Co. | 1 Noble Thompson | 5/28/66 | 14,630 |
| 4 | Horizon Oil Tool & Service (work over) | 1 Noble Thompson | 5/28/66 | 14,630 |
| 5 | Branscum Petroleum, Inc. & Laporte Energy Co. | 1 Mitchell | 8/15/82 | 14,610 |
| 6 | Stephens Production Co. | 1-27 Le Flore | 7/9/73 | 976 |
| 7 | Stephens Production Co. | 1-27-A Le Flore | 7/22/73 | 8,861 |
| 8 | Eberly & Meade, Inc. | 1-29 Humphreyville | 4/24/80 | 3,260 |
| 9 | Jacobs-Stewart-Coleman | 1 Jackson Judy | 9/28/91 | 2,700 |
| 0 | Max Pray | 1 Christine C. Jackson | 11/27/64 | 8,547 |
| 1 | Whitmar Exploration Co. | 1-34 Buttrill | 7/21/81 | 15,230 |
| 2 | Ark-La Gas | USA | Unknown (Compl. 3-64) | 12,251 |
| 3 | Shaffer Oil & Refining Co. | 1 Willy Humphrey | 5/27/15 | 3,395 |
| 4 | American Quasar Petroleum Co. of New Mexico | 1 S. L. Sutton | 1/21/74 | 14,590 |





GEOLOGIC MAP OF THE SUMMERFIELD 7.5' QUADRANGLE, LE FLORE COUNTY, OKLAHOMA By LeRoy A. Hemish and Colin Mazengarb 1992

SCALE 1:24 000

1 .5 U 1

CONTOUR INTERVAL 20 FEET

DOTTED LINES REPRESENT 10-FOOT CONTOURS DATUM IS MEAN SEA LEVEL

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS

FOR SALE BY U.S. GEOLOGICAL SURVEY

DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092

A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

Geology by L. Hemish and C. Mazengarb, 1992 Digitized by S. C. Evans and G. R. Standridge, 2019

Mapped, edited, and published by the Geological Survey

10,000-foot grid based on Oklahoma coordinate system, south zone

Fine red dashed lines indicate selected fence and field lines where

generally visible on aerial photographs. This information is unchecked

Topography by photogrammetric methods from aerial photographs taken 1964. Field checked 1965

Polyconic projection. 1927 North American datum

1000-meter Universal Transverse Mercator grid ticks,

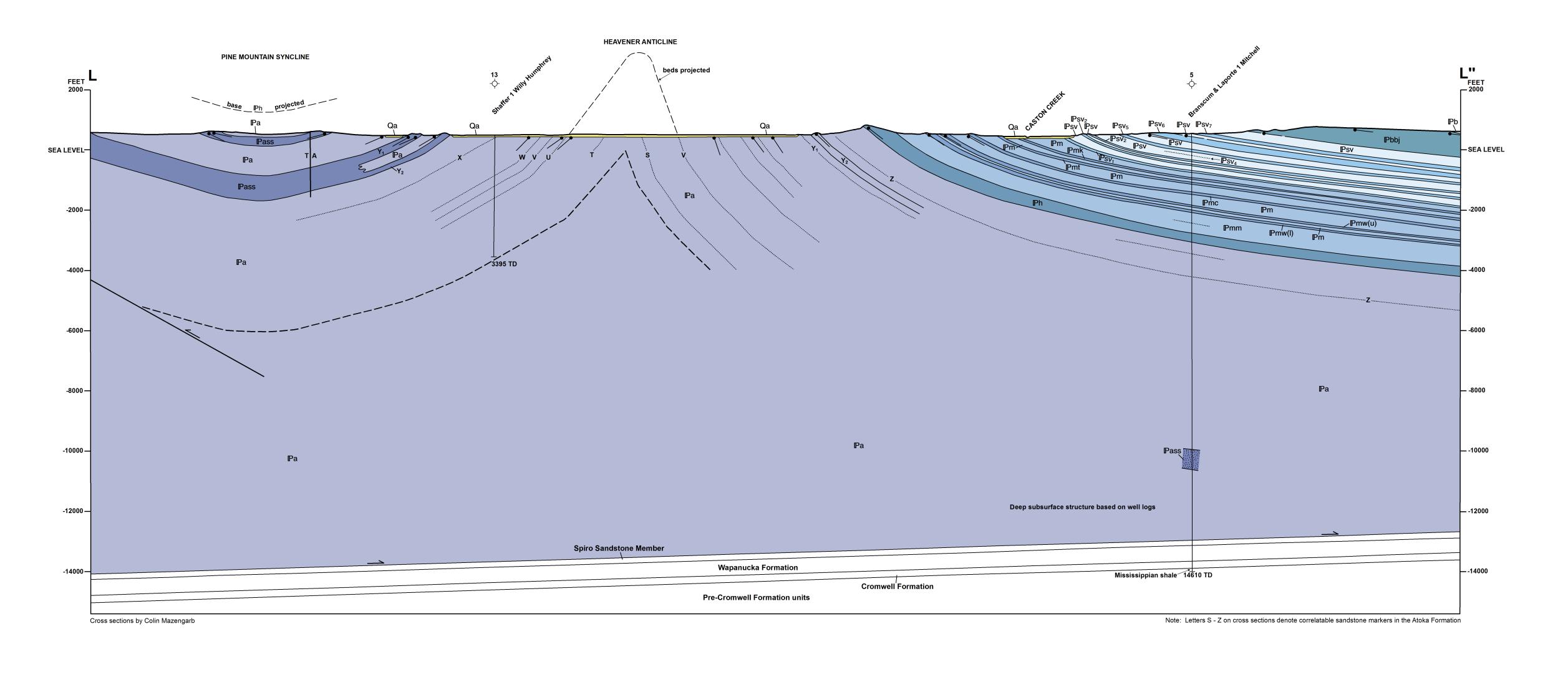
Control by USGS and USC&GS

Areas covered by dashed light-blue pattern

Map photoinspected 1976 No major culture or drainage changes observed

are subject to controlled inundation

zone 15, shown in blue



Sub-Spiro Units