OKLAHOMA GEOLOGICAL SURVEY
Charles J. Mankin, *Director*

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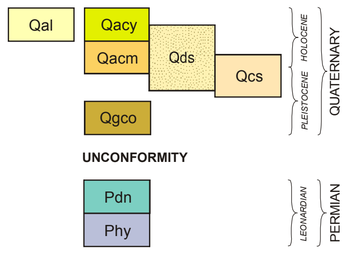
Oklahoma Geologic Quadrangle **OGQ-28**
Geologic Map of the Newcastle
7.5′ Quadrangle
(previously Open-File Report OF4-2002)

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

Qacy — ALLUVIUM OF CANADIAN RIVER (Holocene)—Clay, silt, sand, and gravel in channels and on flood plain of the Canadian River. Area probably subject to frequent flooding. Thickness: generally 0 to 40 ft; rarely more than 40 ft

Qacm — ALLUVIUM OF CANADIAN RIVER (Holocene)—Clay, silt, sand, and gravel on recent flood plain of the Canadian River and about 5-10 ft above Qacy. Area rarely subject to flooding. Thickness: unknown, possibly as much as 40 ft

Qds — DUNE SAND (Holocene and Pleistocene?)—Fine- to coarse-grained, moderately to poorly sorted, unconsolidated sand. Consists mainly of rounded to subrounded quartz grains with some silt- and clay-size material. Probably represents aeolian reworking of Pleistocene terrace deposit Qgco. Thickness: 0 to 20 ft

Qcs — COVER SAND (Holocene and Pleistocene)—Unconsolidated, very fine grained sand to coarse-grained silt and clay, moderately to poorly sorted. Consists mainly of rounded to subrounded quartz grains with abundant silt- and clay-size material. Forms extensive nearly flat topographic surfaces as much as 50 ft above modern alluvial valleys. Probably represents aeolian reworking of Pleistocene-aged and younger terrrace and sand dune deposits. Thickness: from a thin veneer to as much as 35 ft, averages closer to 5 ft

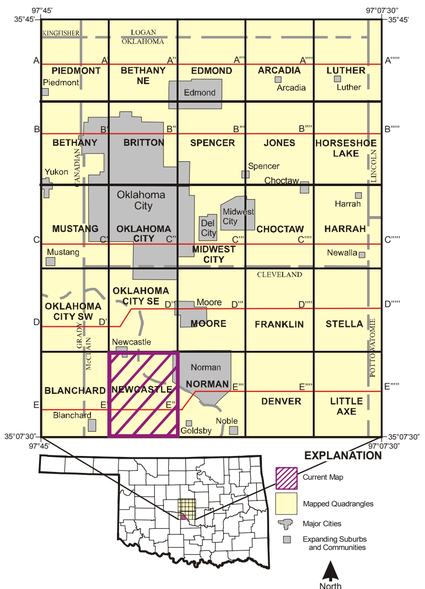
Qgco — REMNANTS OF OLDER TERRACE DEPOSITS (Pleistocene)—Clay, silt, sand, and gravel adjacent to the flood plain of the Canadian River. Sand commonly is medium- to coarse-grained and light brown to buff colored; gravel locally consists of concentrations of distally derived pebbles and cobbles, mostly well rounded and sub-discoidal quartz and metaquartzites more commonly found near base of deposit. Base of unit is about 0 to 20 ft above the modern flood plain and ranges in elevation from 1130 ft to 1150 ft above sea level. The top of the unit is as much as 100 ft above the modern flood plain and is as high as 1230 ft above sea level. Thickness: 0 to an average of 50 ft

Pdn — DUNCAN FORMATION (Permian)—Sandstone, fine- to very fine grained, rarely medium-grained, with mudstone- and siltstone-pebble conglomerates; thin siltstone interbeds locally. Basal parts of section consisting of moderate reddish orange (10R6/6) thin- to medium-bedded, fine-grained sandstone, siltstone, and siltstone-pebble conglomerates that locally fine upward to moderate reddish brown (10YR5/4) to moderate reddish orange (10R6/6) very fine grained sandstone. Trough cross-laminations and parting lineations common. Conglomerates consist of indurated siltstone and shale clasts set within a fine-grained, quartz-rich sandstone matrix; typically pale brown (5YR5/2) in color; well cemented with calcite. Clasts may be imbricated or loosely oriented into planar cross-beds. Up section, unit consists of inter-bedded friable sandstones and moderately indurated mudstone- and siltstone- pebble conglomerates. Sandstones are massive, rarely exhibiting internal bedding; are moderate reddish brown (10YR5/4 and 10R4/6), moderate reddish orange (10R6/6), to pale brown (5YR5/2) in color; and are texurally fine- to very fine grained quartz-rich sandstones. Iron oxide is predominant cement, although calcite cement does occur in patches. Sandstones may laterally grade into moderately indurated siltstone- and/or shale-pebble conglomerates. Locally, greenish gray (5GY6/1), trough cross-bedded bands, beds, and irregular splotches occur in sandstones, siltstones and shales; burrow and root casts common. Contact with underlying Hennessey Formation placed at base of lowest mappable fine-grained sandstone. Thickness: 0 to 230 ft, top eroded across map area

Phy — HENNESSEY FORMATION (Permian)—Mostly a poorly exposed, moderate reddish brown (10R4/6), moderate red (5R4/6), to moderate reddish orange (10R6/6) muddy siltstone, silty shale, and minor very fine grained sandstone; locally with conspicuous light greenish gray (5GY8/1) to pale green (10G6/2) iron-reduction spots and bands. Spots average ¼ in. in diameter, occurring throughout interval; bands usually oriented sub-parallel to bedding, and are more common in lower third of unit. Minor lenticular beds of very fine grained sandstone and siltstone-pebble conglomerate also occur, with conglomerates common in basal half, rare in upper half. Where exposed, shales common in upper 20 ft of unit; locally interbedded with more resistant siltstone beds; shale typically unstratified, with small-scale slickensides that are indicative of paleosol development. Siltstone moderately to well stratified with thin to laminated trough-cross-stratification and/or ripple-marks. Locally, sandstone cross-stratified, but rarely forming channel deposits. Siltstone and sandstone exhibit platy to flaggy weathering, and occur as resistant beds that may cap tops of hills and ridges. Overall, unit is expressed as highly weathered, muddy soil. Thickness: Only upper 50 ft to 100 ft exposed in map area, maximum thickness of 550 ft based on cross section

SYMBOLS

- Unit contact; dashed where approximate
- Mappable bed
- Edge of terrace deposit
- × Outcrop, geologic observation
- • Petroleum well. Includes oil, gas, oil and gas, dry service (water supply or injection), junked and abandoned, unknown. Modified from Natural Resources Information System database

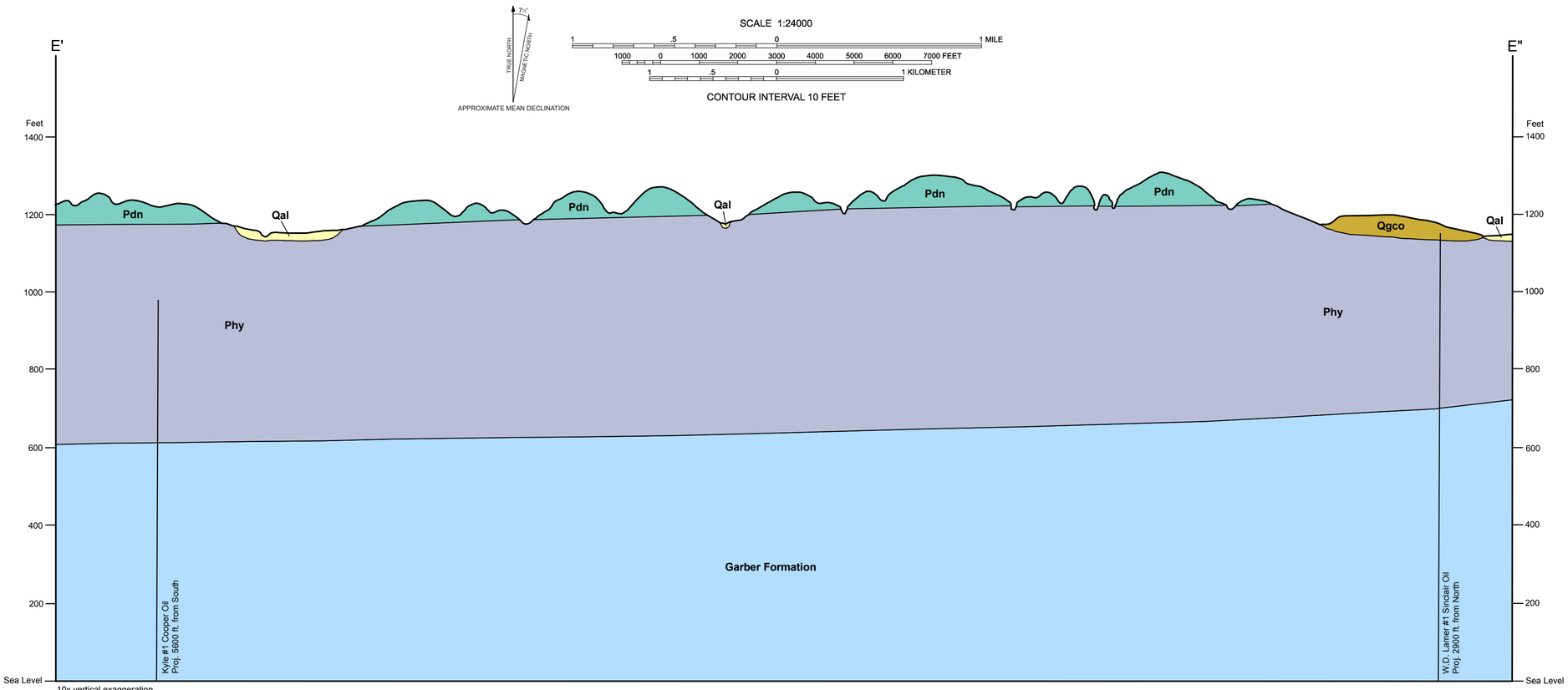


Base Map Credits

The base map was compiled by the U.S. Geological Survey and planimetry revised from aerial photographs taken 1962. Field checked 1965. Photorevised from aerial photographs taken 1981 and other sources. Map edited 1983. Universal Transverse Mercator (UTM) projection. 1927 North American Datum. 10,000-foot grid ticks based on Oklahoma coordinate system, south zone. 1,000-meter UTM grid, zone 14.

Geologic Map Credits

Geology by Galen W. Miller and Thomas M. Stanley, 2001-2002. Assisted by Ivan London and Nicole Baylor. Research supported by the U.S. Geological Survey, National Cooperative Geologic Mapping Program, under Assistance Award Number 01HQAG0107. The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the U.S. Government. Originally published as Open-File Report OF4-2002. Map revised and published as OGQ-28. Cartography and layout prepared by G. Russell Standridge, 2002.



10x vertical exaggeration.
Formation contacts based on wireline-log interpretations by T.M. Stanley and surface mapping by authors.
Lines show logs used in interpretations.

GEOLOGIC MAP OF THE NEWCASTLE 7.5′ QUADRANGLE, CLEVELAND AND McCLAIN COUNTIES, OKLAHOMA

Galen W. Miller and Thomas M. Stanley

2002