

U.S. DEPARTMENT OF THE INTERIOR  
U.S. GEOLOGICAL SURVEY

PRELIMINARY GEOLOGIC MAP OF THE MOUNT JESUS QUADRANGLE AND PARTS OF THE  
MOUNT JESUS NW, LEXINGTON, AND TURKEY CREEK QUADRANGLES, CLARK COUNTY  
KANSAS

By

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Open-File Report 94-656

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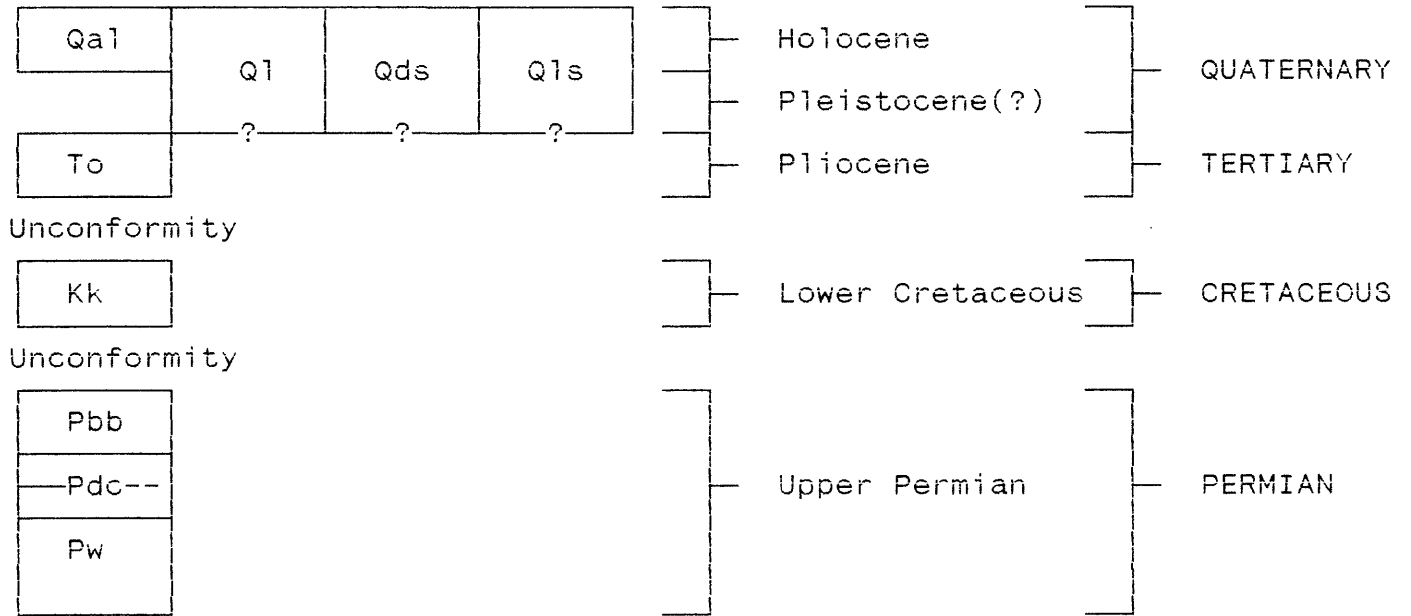
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U.S. Geological Survey Open-File Report 94-656

Preliminary Geologic map of the Mount Jesus quadrangle and parts of the Mount Jesus NW, Lexington, and Turkey Creek quadrangles, Clark County, Kansas

By Morris W. Green and George M. Fairer

CORRELATION OF MAP UNITS



## DESCRIPTION OF MAP UNITS

Qa1

Alluvium (Holocene)--Unconsolidated gravel, sand, silt, and clay within and adjacent to major stream channels and flood plains. Locally includes dune sand, slopewash, colluvium, and terrace deposits; locally intertongues with loess (Q1) and eolian sand (Qds) deposits

Q1

Loess deposits (Holocene and Pleistocene?)--Eolian deposits of nonstratified silt and minor amounts of sand (5-15 percent) and clay; deposits are porous and calcareous; commonly contain nodules, carbonate-filled root casts, fossil plants, and fossil animals. Cementation and the cohesiveness of sediment particles cause loess deposits to form characteristic near-vertical scarps in dissected deposits; locally includes slopewash and colluvium; mantles bedrock and other associated surficial deposits; locally forms dunes. Thickness 0-40 ft

Qds

Eolian dune sand (Holocene and Pleistocene?)--Eolian deposits of stratified and nonstratified fine to very fine sand and minor amounts of silt and clay in irregularly shaped eolian dunes which may be locally altered and reworked in ephemeral ponds and on flood plains by fluvial processes; deposits are porous and locally calcareous; commonly contain nodules, sand concretions, and carbonate-filled root casts. Locally intertongues with slopewash, alluvium, and colluvium; mantles bedrock and associated loess deposits (Q1) and occurs dominantly in proximity to major streams and tributary drainages; locally includes deposits of sandy loess. Thickness 0-50 ft

Q1s

Landslide deposits (Holocene and Pleistocene?)--Loosely consolidated deposits of bedrock material (Ogallala and Kiowa Formations) displaced by gravity sliding on oversteepened slopes; composed of cobble- and boulder-sized rubble in matrix of finer grained material. A single deposit located in sec. 3, T. 31 S., R. 22 W.

To

**Ogallala Formation (Pliocene)**--Composed of arkosic, conglomeratic sandstone, calcareous siltstone, eolian sandstone, and calcrete. Conglomeratic sandstone occurs as fluvial channel fill, is trough crossbedded, and contains granules, pebbles, and cobbles of chert, feldspar, and rock fragments, including granite and quartzite. Larger clasts are black, red, reddish brown, pink, and yellowish brown and are supported in a matrix of medium- to fine-grained sandstone; matrix colors are light brown, pinkish gray, yellowish brown, and buff. Sandstone is grayish brown and consists of sand cemented with calcium carbonate. Siltstone is white to grayish brown and consists mainly of loess cemented with calcium carbonate. Calcrete is white to grayish brown and consists of well-indurated beds of calcium carbonate containing a significant portion of loess. Locally, calcrete has been replaced by opaline silica. Calcrete generally forms an erosion-resistant caprock in the northern part of the map area where the formation underlies alluvium and wind-blown deposits.

Pre-Ogallala erosion truncates underlying formations in an east-southeasterly direction across the map area. Both Kiowa and Big Basin Formations are not present in the southeastern part of the map area for this reason. The Ogallala Formation thus rests in contact with Permian age rocks of the Whitehorse Formation.

Deposition of the Ogallala Formation apparently occurred under arid fluvial, and eolian conditions. Formation ranges from 0 to 80 ft in thickness

Kk

**Kiowa Formation (Lower Cretaceous)**--Dark-gray to black gypsiferous shale; locally contains thin beds of light- to medium-gray coquinoidal limestone and light-yellowish-brown calcareous sandstone. Commonly includes thin beds and lenses of selenite and limestone with cone-in-cone concretionary structure. Shale contains finely disseminated flecks of coaly carbonaceous plant matter in the silt and clay fractions of the formation sediment. Deposition of the formation apparently occurred a considerable distance offshore in a shallow epeiric sea or marine embayment.

The formation overlies progressively older rocks in an easterly direction because of pre-Kiowa erosion. Where the underlying Day Creek Formation has been eroded the formation is in unconformable contact with the underlying Whitehorse Formation. It is truncated by pre-Ogallala erosion in the eastern and southeastern part of the map area. Formation ranges from 0 to about 70 ft in thickness

Pbb

**Big Basin Formation (Upper Permian)**--Dark-reddish-brown argillaceous siltstone mottled greenish gray and white; locally dolomitic and montmorillonitic; contains thin beds of silty shale, silty very fine grained sandstone, and gypsum/anhydrite. Where dolomitic, siltstone is well indurated and has hackly fracture; weathered montmorillonitic layers form crusty surfaces; presence of montmorillonite in the unit probably marks the advent of volcanically derived sediment in Permian rocks in this region. Deposition of sediment in this formation apparently occurred as suspended sediment settling and chemical precipitation from sea water in a restricted marine embayment under arid climatic conditions. The formation is truncated in an east-southeasterly direction across the map area by pre-Kiowa erosion and is thus not present in the eastern part of the map area. Formation ranges from 0 to about 80 ft in thickness

Pdc--

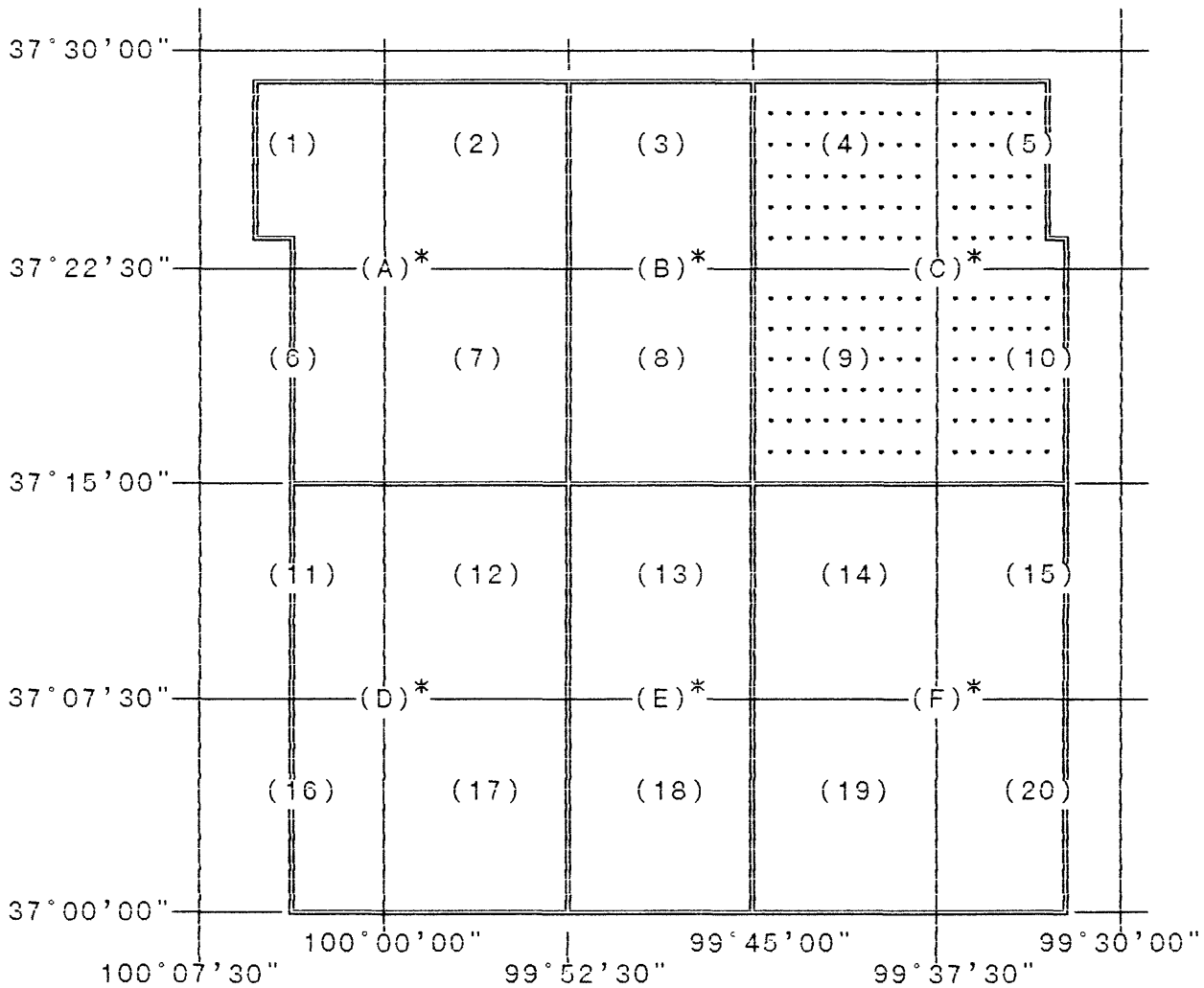
**Day Creek Dolomite (Upper Permian)**--Light-gray, pink, and white, dense, very fine grained crystalline dolomite; locally contains chert nodules and disseminated chert grains. Deposition apparently occurred by chemical precipitation from sea water in a restricted marine embayment under arid conditions. Where the formation crops out, it forms an erosion-resistant bench or caprock conformably overlying the Whitehorse Formation. In the western part of the map area the formation is conformably overlain by Big Basin Formation rocks. In the central and eastern part of the area pre-Kiowa erosion progressively strips Big Basin rocks from the Day Creek erosion surface. In these areas Kiowa Formation rocks unconformably overly the Day Creek Formation. The Day Creek Formation is truncated by pre-Kiowa erosion in the eastern part of the map area. Where present, the Day Creek is shown as a dashed contact between the formation above and the formation below. Formation is as much as 2 ft thick

Pw

**Whitehorse Formation (Upper Permian)**--Reddish-orange nonstratified, argillaceous siltstone; locally includes some thin beds of very fine grained, locally crossbedded, silty sandstone and thin beds of dolomite; contains beds of gypsum and anhydrite in subsurface. Unit is locally bleached white along bedding planes, is moderately friable, and contains sandy calcareous concretions that resemble musket balls. Silt and sand are well sorted, well rounded, and consist mostly of iron oxide-stained quartz but also some dark accessory minerals. Upper part of unit is locally impregnated with secondary calcium carbonate. Sediment deposition apparently occurred subaqueously from the settling of suspended sediment in relatively shallow marine waters of a restricted embayment. The character of the detrital fraction of Whitehorse rocks suggests that detrital sediment was transported into the embayment primarily as loess winnowed by eolian activity from dune fields adjacent to the embayment; apparently subaqueous currents acted locally to form low-angle crossbedded units. Beds are characteristically wavy because of deformation caused by dissolution of gypsum and anhydrite. Base of formation not exposed in map area. Exposed thickness is about 150 ft

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**CONTACT**--Position of the Day Creek Dolomite (Pdc) shown by a dashed line



Index map of Clark County showing the location of 7.5' quadrangles (1-20), this geologic map report (C), and other published geologic maps (A, B, and D-F) covering the county. \*, map report listed by letter in References Cited

7.5' quadrangles:

- |                    |                   |
|--------------------|-------------------|
| (1) Minneola       | (11) Profitt Lake |
| (2) Bloom          | (12) Ashland NW   |
| (3) Simmons Creek  | (13) Ashland      |
| (4) Mount Jesus NW | (14) Sitka        |
| (5) Turkey Creek   | (15) Sugarloaf    |
| (6) Fowler SE      | (16) Mount Helen  |
| (7) Bloom SW       | (17) Englewood    |
| (8) Bloom SE       | (18) Ashland SE   |
| (9) Mount Jesus    | (19) Sitka SW     |
| (10) Lexington     | (20) Trout Creek  |

## References Cited

- (A) Fairer, George M. and Green, Morris W., 1992, Preliminary geologic map of the Bloom SW quadrangle and parts of the Bloom, Minneola, and Fowler SE quadrangles, Clark County, Kansas: U.S. Geological Survey Open-file Report 92-698, 1 pl., 10 p., scale 1:24,000.
- (D) Fairer, George M. and Green, Morris W., 1994, Preliminary geologic map of the Ashland NW quadrangle and parts of the Englewood, Profitt Lake, and Mount Helen quadrangles, Clark County, Kansas: U.S. Geological Survey Open-file Report 94-655, 1 pl., 7 p., scale 1:24,000.
- (E) Fairer, George M. and Green, Morris W., 1994, Preliminary geologic map of the Ashland quadrangle and part of the Ashland SE quadrangle, Clark County, Kansas: U.S. Geological Survey Open-file Report 94-657, 1 pl., 6 p., scale 1:24,000.
- (B) Green, Morris W. and Fairer, George M., 1992, Preliminary geologic map of the Bloom SE quadrangle and part of the Simmons Creek quadrangle, Clark County, Kansas: U.S. Geological Survey Open-file Report 92-697, 1 pl., 7 p., scale 1:24,000.
- (F) Green, Morris W. and Fairer, George M., 1994, Preliminary geologic map of the Sitka quadrangle and parts of the Sitka SW, Sugarloaf, and Trout Creek quadrangles, Clark County, Kansas: U.S. Geological Survey Open-file Report 94-658, 1 pl., 7 p., scale 1:24,000.