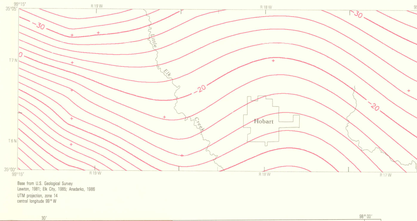
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

CONVERSION FACTORS

Multiply	By	To obtain
inches (in)	2.54	centimeters (cm)
feet (ft)	0.3048	meters (m)
miles (mi)	1.609	kilometers (km)



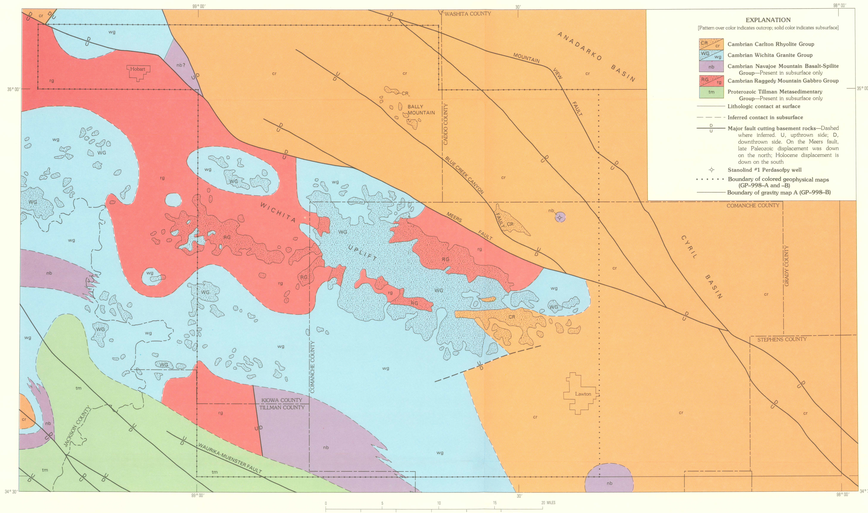


Figure 1. Map showing basement geology and areas covered by the aeromagnetic maps (GP-998–A) and the gravity maps (GP-998–B) relative to the surface and subsurface rocks interpreted from well data (after Ham and others, 1964). Location of the Stanolind #1 Pevehouse well is shown with rocks of the Navajoe Mountain Basalt-Spilite Group indicating presence of this group below the Carlton Rhyolite Group. ESRI's ARC/INFO was used to digitize parts of the geology and faults from plate 1 of Ham and others (1964). The digitized data were fitted using ARC/INFO's "rubber sheeting" to a Universal Transverse Mercator projection and enlarged to a scale of 1:250,000. The detail and accuracy of the data are less than mapping at 1:250,000 would produce.

Table 1. *Dry and saturated bulk-density measurements of igneous rocks from study area*

[Summary for density localities shown in figure 2. NA, not applicable; "unweighed" means that rock sample is not assigned to a particular zone of unit. From Bradley and Jones-Cecil (1991)]

Age	Group	Formation	Member	Map locality (number of measurements in parentheses)	Range of saturated bulk density (g/cm^3)	Mean saturated bulk density and standard deviation (g/cm^3)	Range of dry bulk density (g/cm^3)	Mean dry bulk density and standard deviation (g/cm^3)
[1]525 ± 25 m.y.	Wichita Granite	Saddle Mountain Granite	NA	28(3)	2.63-2.67	2.65 ± 0.02	2.62-2.65	2.64 ± 0.02
		Mount Scott Granite	NA	23(4) 30(5) --------- 23 + 30(9)	2.56-2.62 2.63-2.66 --------- 2.56-2.66	2.59 ± 0.03 2.65 ± 0.01 --------- 2.62 ± 0.04	2.55-2.63 2.65-2.66 --------- 2.55-2.66	2.60 ± 0.04 2.65 ± 0.00 --------- 2.63 ± 0.04
[1]525 ± 25 m.y.	Carlton Rhyolite	Exposures at Bally Mountain	NA	21(4)	2.60-2.62	2.61 ± 0.01	2.59-2.62	2.61 ± 0.01
		Blue Creek Canyon	NA	8(3) --------- 8 + 21(7)	2.63-2.65 --------- 2.60-2.65	2.64 ± 0.01 --------- 2.62 ± 0.02	2.63-2.65 --------- 2.59-2.65	2.64 ± 0.01 --------- 2.62 ± 0.02
[1]552 ± 7 m.y.	Raggedy Mountain	Roosevelt Gabbros	Sandy Creek Gabbro Member	16(8)	2.97-2.99	2.98 ± 0.01	2.97-3.00	2.96 ± 0.09
			Mount Sheridan Gabbro Member	4(3) 5(5) --------- 4 + 5(8)	2.92-2.99 3.01-3.08 --------- 2.92-3.08	2.96 ± 0.04 3.04 ± 0.03 --------- 3.01 ± 0.05	2.93-3.00 3.02-3.09 --------- 2.93-3.09	2.97 ± 0.04 3.04 ± 0.03 --------- 3.02 ± 0.05
[1]577 ± 165 m.y.		Glen Mountains Layered Complex	Unassigned	10(4)	2.72-2.76	2.74 ± 0.02	2.74-2.75	2.74 ± 0.01
			M zone	18(5)	2.67-2.71	2.69 ± 0.02	2.68-2.72	2.70 ± 0.02
			L zone	29(4) 17(6) --------- 17 + 18 + 29(15)	2.70-2.75 2.68-2.70 --------- 2.67-2.75	2.72 ± 0.02 2.69 ± 0.01 --------- 2.70 ± 0.02	2.72-2.75 2.69-2.72 --------- 2.68-2.75	2.73 ± 0.02 2.71 ± 0.01 --------- 2.71 ± 0.02

[1]Approximate age from Ham and others (1964).
[2]Bowring and Hoppe (1982).
[3]Lambert and others (1988).

Table 2. *Densities for igneous and sedimentary rock types exposed within study area*

[—, no information or not applicable; do., ditto]

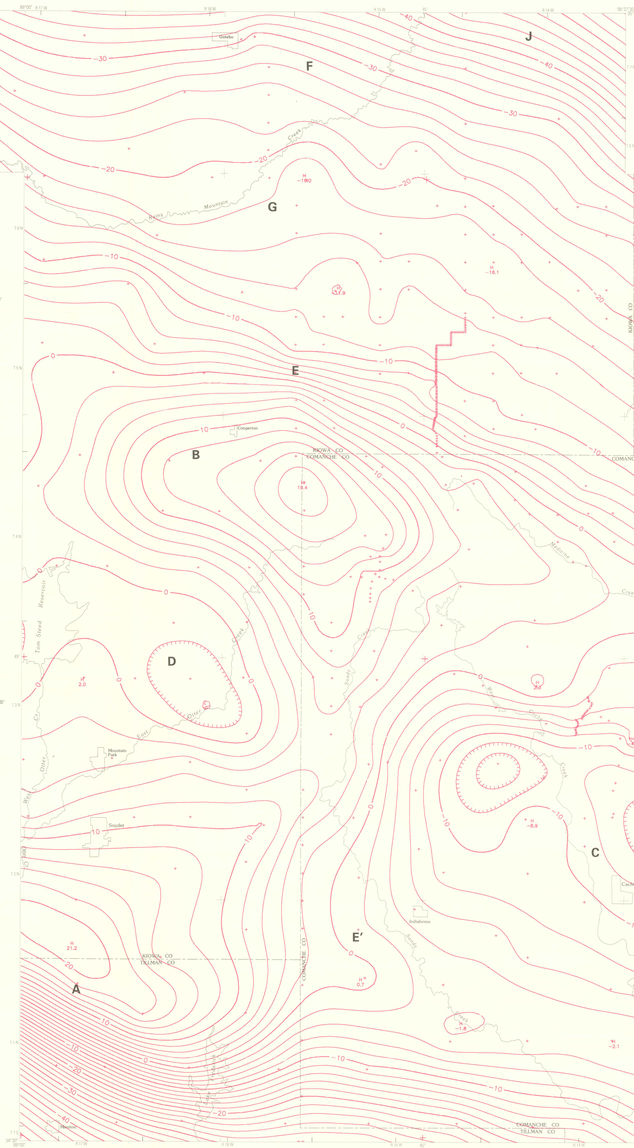
Rock type and (or) formation or locality	Age	Depth (feet)	Range of densities (g/cm^3)	Mean density (g/cm^3)
Shale, Oklahoma	Pennsylvanian	1,000	---	[2]2.42
Do.	do.	3,000	---	[2]2.59
Do.	do.	5,000	---	[2]2.66
Limestone and dolomite, Llano County, Texas.	Ordovician	---	---	[2]2.75
Granite	---	---	[2]2.516-2.809	[2]2.667
Granite, Wichita Granite Group	[3]525 ± 25 m.y.	---	[2]2.550-2.811	---
Rhyolite, Carlton Rhyolite Group.	[3]525 ± 25 m.y.	---	[4]2.576-2.628	---
Gabbro	---	---	[2]2.850-3.120	[2]2.976
Gabbro, Raggedy Mountain Gabbro Group	Early Cambrian.	---	[4]2.831-3.237	---
Anorthosite	---	---	[2]2.640-2.920	[2]2.734
Anorthosite, Raggedy Mountain Gabbro Group	[3]577 ± 165 m.y.	---	[4]2.687-2.707	---
Troctolite, Raggedy Mountain Gabbro Group.	do.	---	---	[4]2.961

[1]Saturated bulk density from Daly and others(1966).
[2]From Dobrin(1976). Values for igneous rock types compiled from unspecified locations.
[3]Approximate age from Ham and others (1964).
[4]From Chase and others (1956). Values compiled from igneous rock samples in or near study area. Anorthosite and troctolite are roughly equivalent to Glen Mountains Layered Complex, table 1. Gabbro includes both Roosevelt Gabbros and the unassigned Glen Mountains Layered Complex in the eastern part of the Wichita uplift (see fig. 2 and table 1).
[5]Age from Lambert and others (1988).
[6]Single value.

EXPLANATION

- Quaternary surficial deposits and Permian rocks
- Ordovician and Cambrian rocks—Arbuckle and Timbered Hills Groups
- Cambrian rocks (500–525 Ma)
- Cold Springs Breccia
- Wichita Granite Group
  - Coarse-grained sills—Reformatory Granite in west; Quanah Granite in east
  - Fine-grained sills
- Carlton Rhyolite Group
- Cambrian rocks (552–577 Ma)
- Raggedy Mountain Gabbro Group
  - Roosevelt Gabbros
- Glen Mountains Layered Complex
- Contact
- Fault—Dashed where inferred. U, upthrown side; D, downthrown side
- Locality for density measurement—Numbers correspond to entries in table 1
- Location of Oklahoma Geological Survey drill hole

Figure 2. Localities for density measurements (after Bradley and Jones-Cecil, 1991), Geology, showing minor differences from figure 1, was adapted from figure 1 of Powell and others (1980) and shows surface exposures of igneous rocks in the area. Numbers show locations where hand samples were taken for dry and saturated bulk density determinations (see Bradley and Jones-Cecil, 1991, for description of laboratory methods used). See table 1 for summary of the measured values. The median dry bulk density for sheared and altered gabbroic and dioritic rock from Oklahoma City drill hole shown on map is 2.88 g/cm^3.


Hobart
Gotebo
Cloud Chief
Mountain View
Carter
Cordell
Colony
Eakly
Anadarko
Binger
Gracemont
Cement
Chickasha
Rush Springs
Duncan
Comanche
Waurika
Temple
Walters
Terral
Ringling
Ardmore
Marietta
Thomas
Hydro
Weatherford
Clinton
Elk City
Sayre
Cheyenne
Erick
Sentinel
Granite
Mangum
Altus
Blair
Snyder
Mountain Park
Roosevelt
Apache
Elgin
Sterling
Medicine Park
Fort Sill
Geronimo
Indiahoma
Lawton
Cyril
Chattanooga
Grandfield
Ryan