

OKLAHOMA GEOLOGICAL SURVEY

GUIDE BOOK VI

SUBSURFACE STRATIGRAPHIC NAMES

OF

OKLAHOMA

by

LOUISE JORDAN

NORMAN

1957

ABBREVIATIONS

- AAPG** Amer. Assoc. Petroleum Geologists, Bulletin.
- AGS** Ardmore Geological Society.
- AIME** American Institute of Mining and Metallurgical Engineers, Bulletin.
- GSA** Geological Society of America, Bulletin.
- NOSLA** National Oil Scouts and Landmen's Association, Yearbook.
- OAS** Oklahoma Academy of Science, Proceedings.
- OCGS** Oklahoma City Geological Society, "Shale Shaker", and "Shale Shaker Digest". (1955).
- OGJ** Oil and Gas Journal.
- OGS** Oklahoma Geological Survey, Bulletin.
- PGSO** Amer. Assoc. Petroleum Geologists, "Petroleum Geology of Southern Oklahoma".
- SGS** Shawnee Geological Society.
- STAOF** Amer. Assoc. Petroleum Geologists, "Structure of Typical American Oil Fields".
- STOF** Amer. Assoc. Petroleum Geologists, "Stratigraphic Type Oil Fields".
- TGS** Tulsa Geological Society, Digest.
- USBM** United States Bureau of Mines.
- USGS** U. S. Geological Survey Bulletin.

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SUBSURFACE STRATIGRAPHIC NAMES OF OKLAHOMA

Louise Jordan

INTRODUCTION

In December, 1954, a preliminary list of Oklahoma subsurface stratigraphic names compiled by Carl C. Branson and issued (*The Hopper*, vol. 14, no. 12) in the hope that information about the names and the named units would be elicited from oil geologists. A great deal of new information, of corrections, of additional names, and of other data has been sent in by men who are familiar with local nomenclature and with early nomenclatorial history.

Insofar as is now possible enough data are given to establish the typical area and rock unit of each named subsurface marker and pay zone. In some cases a recommendation is made or a notation added to try to aid in simplifying and stabilizing the nomenclature used. The earlier list was issued with the surface names omitted, even those widely used in subsurface. Many geologists have criticized the omission, and since this publication is printed primarily for the use of subsurface geologists, surface names used extensively in subsurface are here given with a brief discussion of each.

The compilers have been aided by a large number of geologists. Of these, Frederick J. Smith of Sinclair Oil & Gas Co. has been particularly helpful and has persuaded 35 geologists to turn in data. Dr. Ed. Bloesch sent in a long list of notes based upon the experience of half a century. David M. Logan, Frank Gouin, Jerry B. Newby, Gerald C. Maddox, I. Curtis Hicks, Everett C. Parker, C. W. Tomlinson, Frank H. Worrell, D. M. Putman, L. R. Brant, Jerome Westheimer, A. J. Montgomery, H. R. Segnar and C. A. McAlister contributed invaluable information on older fields. Lists of names, corrections, and additional data were contributed by Robert L. Fienning, George E. Carver, Jr., John G. Newell, C. B. Branam, Daniel H. Swartz, Wilbur E. McMurtry, B. Osborne Prescott, Joe R. Horkey, Eugene F. Culp, L. M. Wilshire, M. E. Hestbeck, G. D. Reavis, William McBee, Jr., Robert J. Lantz, L. W. Curtis, George T. Crouse, H. L. Crockett, J. L. Gartner, W. M. Decker, William B. O'Heran, W. W. Solter, Donald M. Brown, R. L. Beasley, Bruce H. Harlton, R. B. Rutledge, G. L. Meholin, Lon B. Turk, John L. Hoard, Walter Lacy Mullen, W. R. Johnson, V. Marcelle Mousley, A. M. Meyer, Dan Kozak, H. G. Wessman, Rick P. Clinton, Vernon R. Baker, Hollis B. Fender, R. F. Krueger, Fred B. Jones, Jr., W. M. Stirtz, A. R. Edwards, Don L. Hyatt, Robert M. Becker, F. E. O'Brien, W. E. Atkinson, F. Mabry Hoover, Robert Helton, Richard M. Berry, John W. Mayes, J. Edward Green, Glen C. Norville, John T. Bado, L. D. Ford, Lee R. Riley, M. D. Maravich, S. H. Woods, Neal Neece, Jr., Suzanne Takken.

Geologists in any older and geologically complex oil producing area are plagued by numerous subsurface names. These fall into a variety of categories:

1. Names of another oil region imported by drillers or by transplanted geologists. Examples: Big lime, Salt sand, Canyon lime.
2. Descriptive names, indicative of color, texture, compactness, paleontologic features. Examples: Irish sand, Golf Ball zone, Dense lime, Fusulinid sand, Black Ostracod lime, Birdseye lime.
3. Surface names used in subsurface. Examples: Verdigris, Oswego (invalid on surface because of prior usage), Simpson, Calvin, Hogshooter, Pawhuska.
4. Names derived from farm owners. Examples: Mollman sand, School Land sand, Hotson sand, Endicott sand, Mollie Miller sand, Hammer-Haindl sand.
5. Names of companies, operators, or drillers. Examples: Wilcox sand, Nichlos sand, Fortuna sand, Bilbo sand.
6. Names modified to retrieve miscorrelations. Examples: Osage-Layton sand, Oklahoma City Checkerboard, Glenn-of-Morris sand, Ada Mayes, Avant-Dewey lime.
7. Names derived from oil pools. Examples: Hewitt sand, Seminole sand, Red Fork sand, Burbank sand.

8. Invented, humorous, or contrived names. Examples: Section Two sand, Chicken Farm sand, Flattop sand, Ninety-sixth Meridian sand, Thirteen Finger lime.

9. Formally named units. Examples: Moore formation, Sledge conglomerate, Dolman formation.

The misunderstandings and errors arising from this system of nomenclature are myriad. Names are used informally by an oil operator, use spreads to other persons in the oil industry, then the names appear in print without original authorship, correlation, or definition. Misspellings are inevitable: Kistler, Kessler, Kewster; Nichlos, Nicholas, Nichols; Mussellem, Musselem, Musselman; Misener, Misner, Meisner; Sims, Simms, Symmes; McEwan, McEwin, McEwen. Misspellings because of similar pronunciation: Keys, Keyes; Weiser, Wiser; Spiers, Spears. Duplications are assured: 3 Smith, 3 Ramsey, 3 Thomas, 2 Lowery. Seldom is the type well mentioned or is a previous reference cited. It would seem that the oil industry would abandon excess names, but it is not done for many reasons. An oil company's records are voluminous and can not readily be altered, the other name may not actually be that of an equivalent unit, sands are in many cases local in distribution, and geologists may not agree on the best name for the unit and often have little control over the naming.

In the following listing surface names are preceded by an asterisk, obsolete names are italicized, local little-used names and names not recommended are in roman type, subsurface names thought to be in good regional usage are in boldface. The original author or first author to use a name in print is given together with page reference. The origin of the name is given if known, a brief description of each unit and a notation of its stratigraphic position is given. In those cases where it has been found possible an electric log is reproduced showing the unit in the type well or a nearby well deep enough to show markers above and below the unit. Copies of each of these illustrations and discussions were sent to at least two geologists who were familiar with the area for their comments. Although there was normally little disagreement concerning the position of the unit being described, there was in many instances lack of unanimity in the placement and names of markers which were brought in by correlation. In southern Oklahoma any named unit above or below the unit being discussed, which is not in or close to its type locality, may or may not be correct, but expresses the opinion of several geologists or has been published by a geologist. In northern Oklahoma most formally named surface units are thought to be correlative to those illustrated in the cross-sections of L. H. Lukert (1949, AAPG, vol. 33, p. 131).

In the opinion of the Oklahoma Geological Survey, terms which are used in the oil industry for productive units and subsurface markers are informal unless they have been formally defined following Article 17 of the code of Classification and Nomenclature of Rock Units (Amer. Assoc. of Petroleum Geologists, vol. 32, pp. 367-371, 1948, and vol. 33, pp. 1280-82, 1949) and registered with the Geologic Names Committee of the United States Geological Survey. Many of the subsurface terms which are used in Oklahoma conflict with named surface units in Oklahoma or in the United States. In publication of these informal names, it has been the custom of geologists for many years to use in the subsurface work the word 'sand', implying pay zone, and 'lime', a marker, (e.g. Wilcox sand, Pink lime). This method of describing units, which has been established by common usage in the oil industry, in most instances without the control of geologists, differentiates these informal terms from formally named stratigraphic rock units over which the Geologic Names Committee was established to preside in 1899 and for which the above-mentioned code was written in 1932 and later revised by the American Commission on Stratigraphic Nomenclature. For this reason it is considered editorially correct to use the word 'sand' or 'lime' in the name of a subsurface unit which has not been approved by and registered with the Geologic Names Committee. In some areas of the United States, the word 'pay' is used and is to be preferred over 'sand', as this obliterates the need of indicating the lithology of the pay zone in its name, which in many instances is not properly determined and in others the unit changes in lithology from place to place. Under the policy of the Oklahoma Geological Survey, therefore such markers as Pink, Brown, County Line, Doyle, Marlow, Tussy are followed by the word 'lime' as part of their names and names of pays include the word 'sand'.

It is suggested that when a name for a productive unit or subsurface marker is introduced into the literature that it be identified as to 1) source of name, 2) specific 'spot' location and elevation of the type well or a well nearby with which there is no question about the correlation and in which sufficient rock column has been penetrated to allow identification of named pay zones and or markers below the unit, and 3) upper and lower limits in feet of depth of named unit and those above and below.

Abernathy lime

Missourian

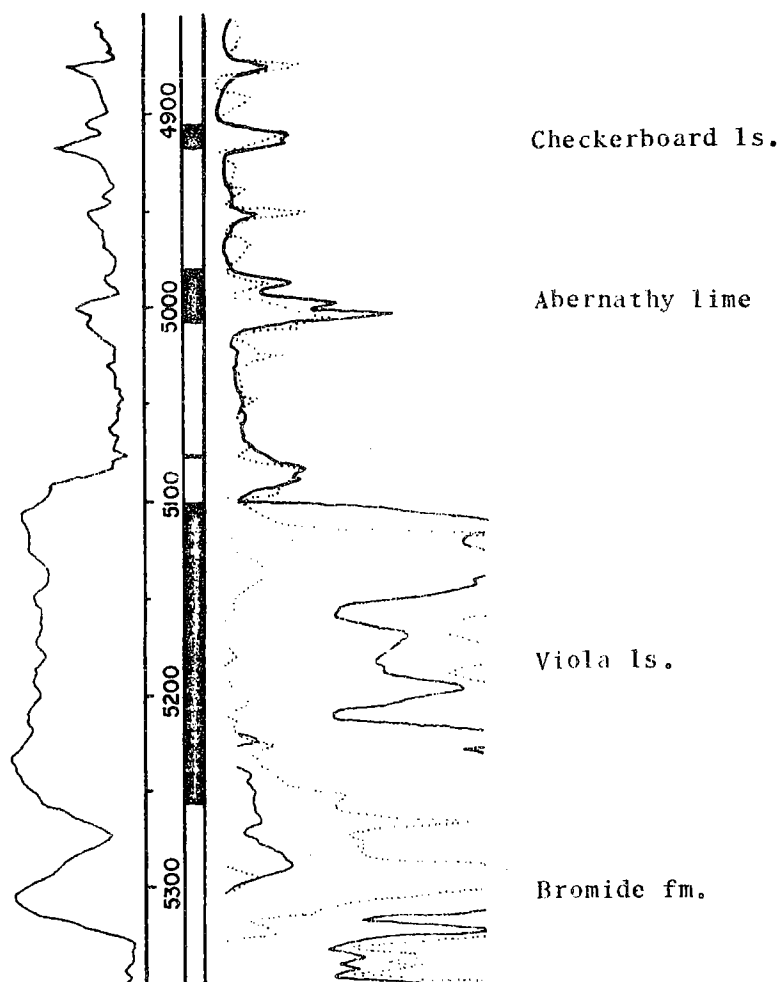
Pennsylvanian

Name published by Wallace (1954), OCGS, vol. 4, no. 7, p. 6; (1955), p. 246.

Named for Abernathy lease of Cities Service by P. B. Nichols of Magnolia; discovery of Bromide production from 5,494-5,502 feet in No. 1, SE SW SE 13-3N-2W, August 1944, East Antioch district, Garvin County.

Although shown on Figure 5 by Wallace as equivalent to First Deese of Chitwood area and below what he called Second Checkerboard, it is reported by other geologists that the Abernathy lime is the Second or Lower Checkerboard of the area, and the only persistent "Checkerboard" in the Golden Trend area. The Abernathy lime is also considered to be, in part at least, equivalent to the Melton zone of the Cement-Chickasha area.

Illustration: Cities Service No. 1 Abernathy.



Ada Mayes

Meramecian

Mississippian

Mayes fm. as identified in subsurface in SC Oklahoma.

Mayes fm. included Moorefield fm. and basal Chester in type (Mayes Co.) area.

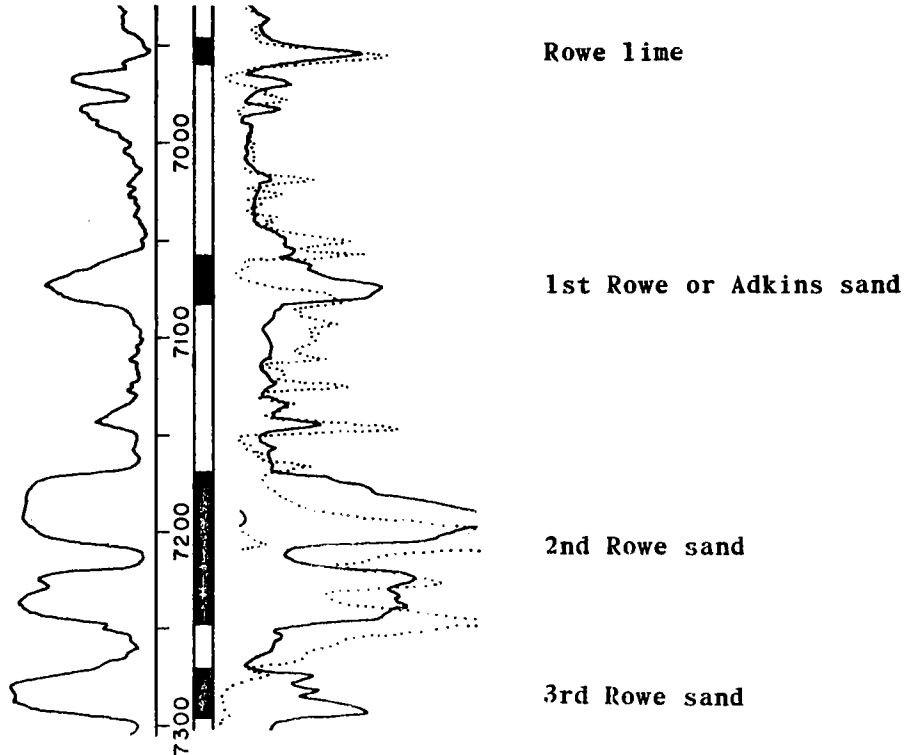
Consists of sandy limestone (Sycamore ls.) grading laterally into calcareous shale not separable from rest of Caney sh. Named Ahlosa (corrected to Ahloso) member of Caney shale by Elias (1956), PGSO, vol. 1, p. 60.

Name published by Hayes (1952), OCGS, vol. 3, no. 2, p. 7; (1955), p. 101.

Named for Adkins lease of Peppers, discovery in No. 1, NW NW SE 4-2N-8W, Beaver field, Stephens Co.

Also called First Rowe sand in Beaver field according to W.W. Solter, Oct. 1956. See also illustration of Hervey sand.

Illustration: Peppers No. 2 Adkins, NE NE SE 4-2N-8W.



Aldridge sand

Springeran

Pennsylvanian

Ref. - Selk (1951), AAPG, vol. 35, p. 605, fig. 18. Name published on OCGS (1952), Stratigraphic Cross-section 1-1; Rutledge (1953), Petrol. Eng., vol. 25, no. 13, p. B-14.

Named for Aldridge lease of Skelly. Production discovered in No. 2, NW NW SE 16-1S-4W, 1948, North Alma field, Stephens Co.

Uppermost Springeran sand in North Alma field, Second Springeran sand in Sholom Alechem, below Markham and above Humphreys sand. May be equal to Lake Ardmore sandstone. Misspelled Aldrich.

Illustration: Skelly No. 2 Aldridge.



Allen sand

Desmoinesian

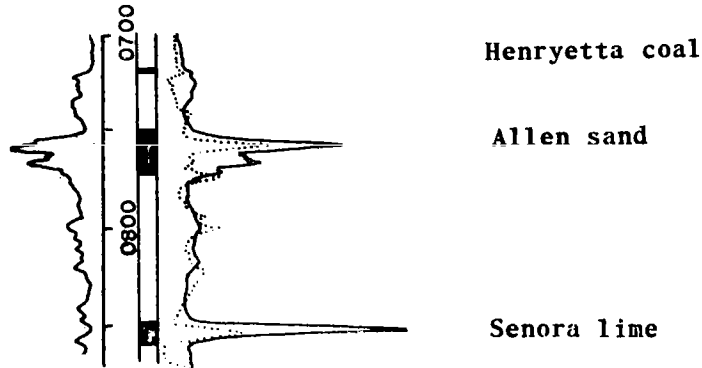
Pennsylvanian

Name published by Buchanan (1927), OGS 40-S, p. 25, footnote; 40, vol. III, p. 129.

Named for Allen pool and village in S $\frac{1}{2}$ of 5N-8E, Pontotoc Co.

Sand lies in Senora fm. below Henryetta (now named Croweburg) coal and above Senora lime (Fred Smith, Dec. 1955). Productive in Allen field and vicinity, Pontotoc and Hughes Counties. Same as Olympic sand.

Illustration: Murray No. 2 Whiteley, NE NE NE 27-5N-8E.



Henryetta coal

Allen sand

Senora lime

***Anadarche limestone**

Missourian

Pennsylvanian

Tomlinson (1928), OGS 40-Z, p. 16.

Named for Anadarche Creek, Carter Co.

Dense bluish gray limestone, conglomeratic at base. Thickness 5 to 30 feet. Lies 500 to 800 feet above Crinerville ls., 500 feet below Daube ls. in Hoxbar group.

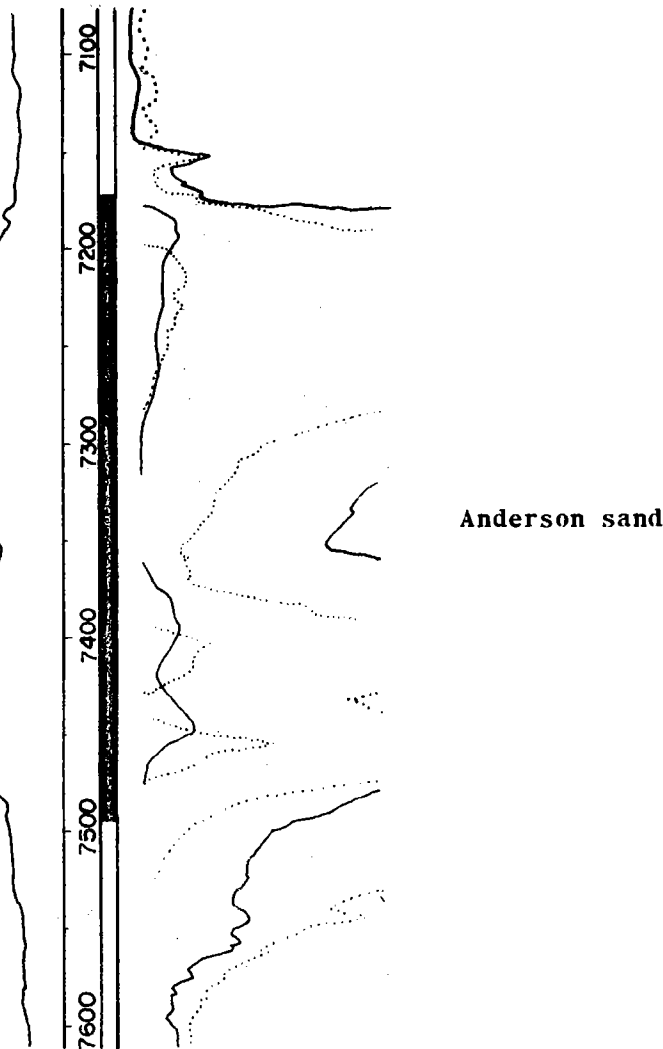
Identified in subsurface in area. May be same as County Line lime in part. See AGS (1956), Cross-section A-A'.

Name published by Pate (1953), OCGS, vol. 4, no. 3, p. 11; (1955), p. 218.

Named for Anderson lease of Amerada, discovery in No. 1, SE NE SE 36-4N-6W, Carter-Knox field, Grady Co. in 1948.

Lies 750 feet below top of Hutson sand in illustrated well. Apparent thickness of sand in illustration may be due to high dip. Lowest Springeran sand in Carter-Knox field. May be equal to Boatwright sand of Cement field (W. E. McMurry).

Illustration: Amerada No. 1 Anderson.



*Arbuckle lime

Canadian

Ordovician

Name of surface group consisting of 8 limestone and dolomite formations. Eroded top called in subsurface.

Porosity in Tulsa area is in top and is called Turkey Mountain lime. In Kansas and Granite Ridge area such porosity is called "Siliceous lime". Production is from West Spring Creek formation. Recently production from lower beds was developed in Arbuckle Mountain region.

"Arbuckle sand"

Trinity

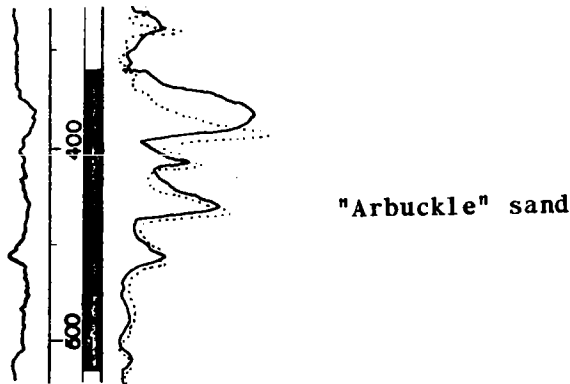
L. Cretaceous

First ref. - Hopkins et al. (1922), USGS Bull. 736, p. 34.

Named for Arbuckle lease of Schwirke Oil Co. in SE SW 25-5S-6E, 1915, Madill pool at approximately 500 feet, Marshall Co.

Sand in Paluxy formation in Marshall and Bryan Cos. Called Preston Arbuckle in Enos field, 7S-6E, Marshall Co. Name is objectionable because of conflict with surface Arbuckle group (notes by S. H. Woods, Neal Neece, Jr.). See Bilbo sand, which would be better name for these sands.

Illustration: Brillhart & Phillips No. 1 Neff Fee, SE NE NW SE 25-5S-5E.

**Armstrong sand and lime**

Virgilian

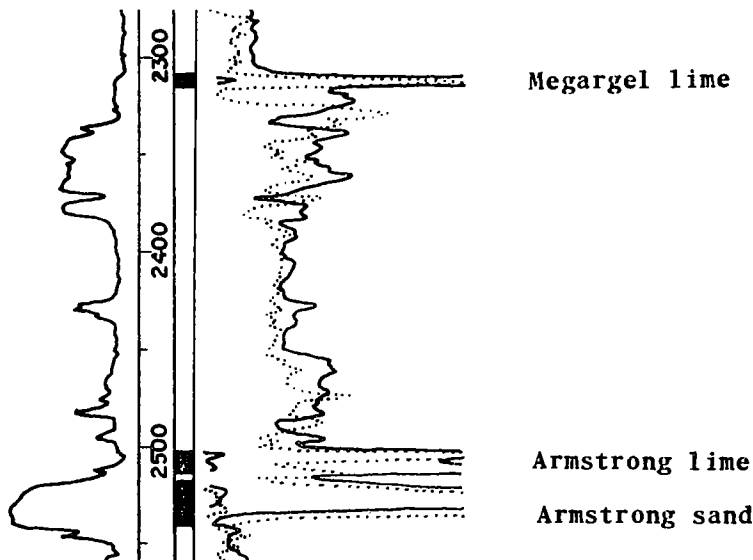
Pennsylvanian

First ref. - Putman (1956), PGSO, vol. 1, p. 321.

Named for Armstrong lease of T. H. McCasland, discoverer in No. 1, SW SW SE 24-1S-9W, at 2,521 feet, Dec. 1943, West Duncan field, Stephens Co.

Lies just below a limestone which appears to be correlative with Gunsight ls. of North Texas (Putman, *ibid.*, p. 323), and which is called Armstrong lime on AGS (1956), Cross-section C-C' and correlated with Rowe lime. If the limestone is equivalent to Gunsight ls., the sands would be equivalent to the Gunsight or Swastika sands of North Texas (Putman).

Illustration: McCasland No. 1 Armstrong.



Tomlinson (1928), OGS 40-2, p. 15.

Named for Arnold's Reef in 33-35-1E, Carter Co.

Member of Deese group. Thin-bedded argillaceous limestone about 50 feet thick.

Lies about 2,000 feet above Devils' Kitchen member.

Ashshalintubbi sand

Desmoinesian

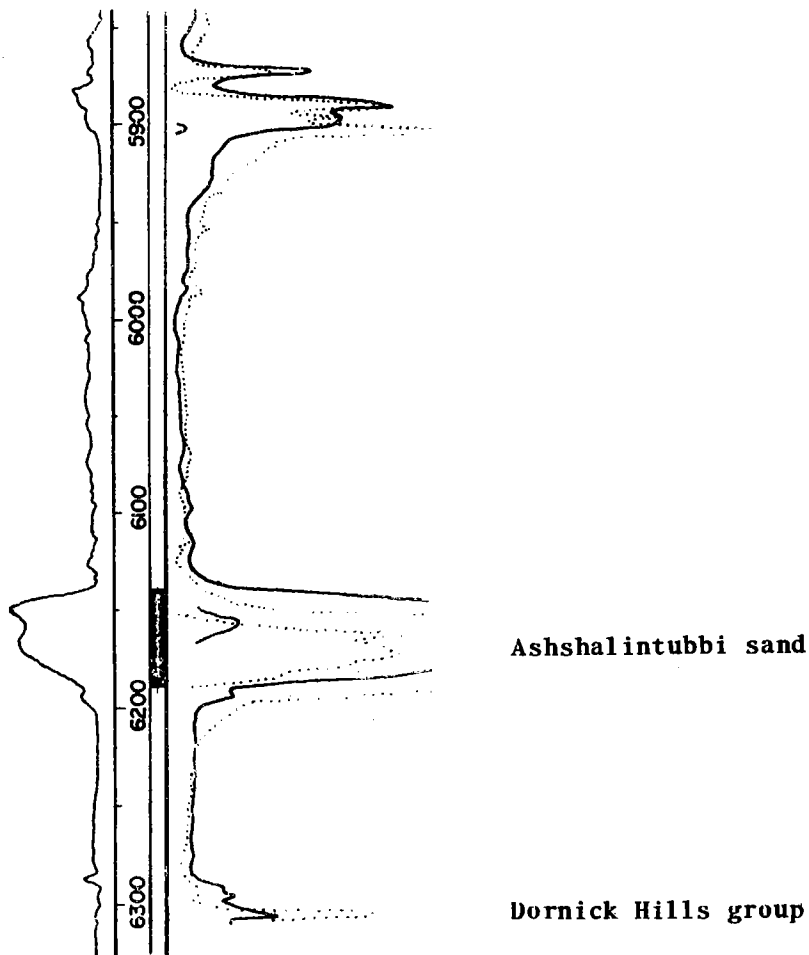
Pennsylvanian

Name published on AGS (1956) Cross-section B-B', Wells Nos. 16-17, in 1N-5W.

Named from Wichita River No. 2-A Ashshalintubbi, NE SW NW 11-1N-5W, discoverer at 6,138 to 95 feet, 1944, Doyle field, Stephens, Co.

Lies in lower part of Deese, above Hefner sand. On AGS (1956) Cross-section B-B' shown to be equivalent to Second Carpenter and Basal Tussy sand (not Lower Basal Tussy). Notes by G. D. Reavis, 6-28-55.

Illustration: Ven-Mex Oil No. 2-A Ashshalintubbi, NE SW NW 11-1N-5W.



Atlantic sand

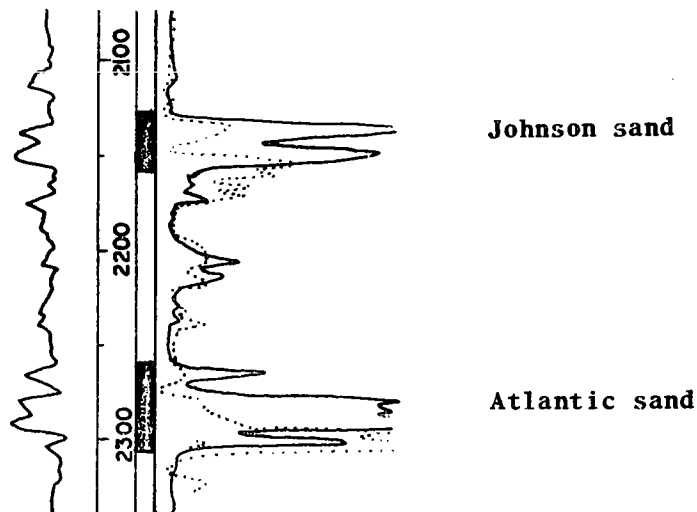
Desmoinesian

Pennsylvanian

First ref. - Tomlinson and Storm (1924), AAPG, vol. 8, p. 605.

Named for Atlantic Oil Co., discoverer in N $\frac{1}{2}$ 25-2S-3W, Graham field, Carter Co. Lies below Johnson sand in the lower part of the Lower Fusulina (or Lower Fusulinid, Fusulina) zone readily separated from the Johnson sand. George and Bunn (1924) used the term "Johnson sand" for the "Johnson-Atlantic sand zone" of Tomlinson and Storm and therefore this usage corresponds with the interval usually called Lower Fusulinid (originally Fusulina or Fusulinid sand) by recent subsurface workers. Fusulinids which give the zone its modern name occur mostly in limy or marly portions of the Atlantic sand zone and are correlated with those found in the Arnold limestone outcrops of the Deese (note by C. W. Tomlinson, 7-26-56). See illustration of Johnson sand, discussion of Johnson-Atlantic.

Illustration: Carter No. 1 Brooks, NW NE NE 25-2S-3W.



*Atoka formation

Atokan

Pennsylvanian

Taff and Adams (1900), USGS, 21st Ann. Rept., pt. 2, p. 293.

Named for town of Atoka, Atoka Co.

Consists of up to 9,000 feet of shales, sandstones, local limestones.

Contains Dutcher, Gilcrease, Spiro (subsurface) and other productive sands. Lies below Hartshorne or McAlester fm., above rocks of Morrowan age in subsurface.

*Avant limestone

Missourian

Pennsylvanian

Ohern (1910), Okla. Univ. Research Bull., 4, p. 31.

Named for village of Avant, Osage Co.

Gray to white massive limestone. Upper member of the Iola formation. Name as used in subsurface is most often misapplied to Wildhorse dolo., but also to limestone in upper part of Nelly Bly fm. or to Dewey ls.

The name Avant is being applied to a gas productive horizon in Lucien field, 31-20N-3W, Garfield Co. Perry sand would be a better term as this pay is not at the horizon of the true Avant ls.

First ref. - Bullard (1928), OGS 40-Q, p. 159.

Origin of name not determined.

Timber Ridge pool, sections 10-15, 14N-17E, Muskogee Co. at 1,285-1,407 feet. Considered to be equal to Georges Fork mem. of Atoka fm. by Wilson (1937, OGS, vol. 57, Plate VI, also p. 109).

Baker sand

Missourian

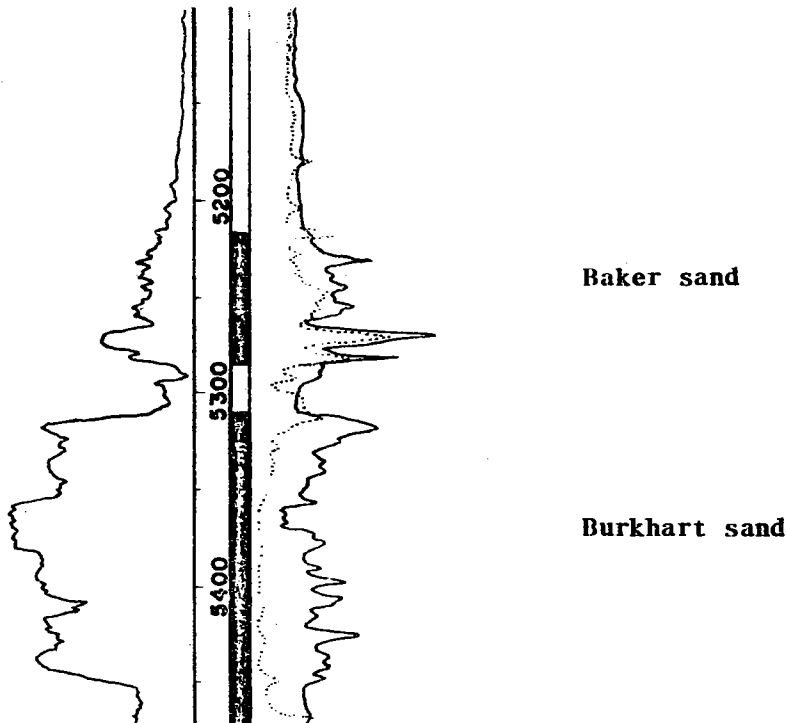
Pennsylvanian

Shown on AGS (1956), Cross-section B-B', Well Nos. 15, 16, where term Baker-Burkhart sand is used.

Named for Eason No. 1 Baker, NE NW NW 35-1N-5W, Prairiedale field, Stephens Co., sand producing from 5,215-85 feet, 1954.

Upper tongue of Baker-Burkhart sand considered to be basal Missourian sands in this area. Reported to be correlative of Marchand sand of Cement (G. D. Reavis, 6-28-55). See illustration of Burkhart sand.

Illustration: Eason No. 1 Baker.



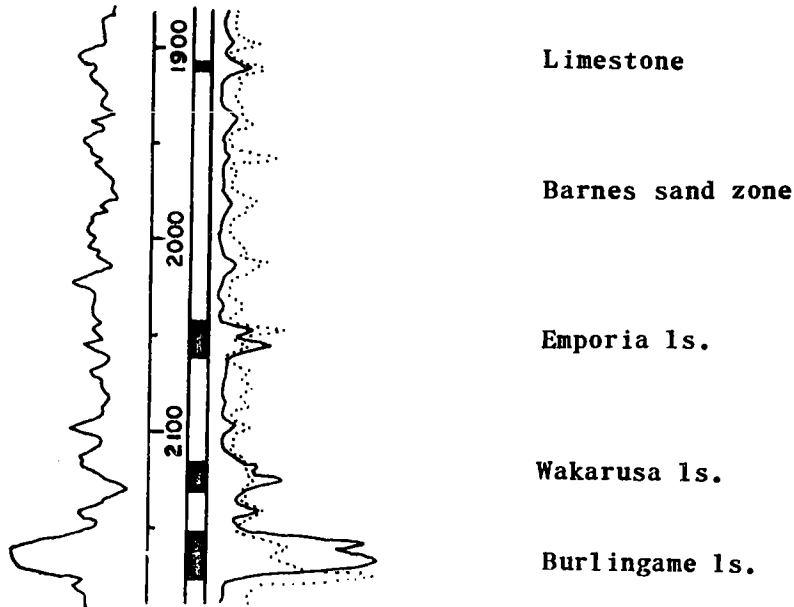
Barnes sand

First ref. - Snider (1920), Oil and Gas in Mid-Cont. fields, p. 230.

Named for Barnes field, Garfield Co., which was named for Barnes lease of Oil State Petroleum Co., discovery in SW NE NW 15-23N-3W, at 2,030-37 feet, elev. 1,051, in 1918.

Appears to be approximately equivalent to a sand in Crews sand zone of Garber field, within the interval of approximately 100 feet above Emporia (Elmont-Reading) ls. and below undesignated limestone. It is suggested that the limestone labelled Wakarusa may be the Burlingame. The name Barnes sand is not in use at present. Not Barnes sand of Big Mineral Creek pool, Grayson Co., Texas.

Illustration: Deep Rock No. 1 Dunn, SE SE NE 15-23N-3W.



Barnett sand

First ref. - Ohern and Garrett (1912), OGS 16, p. 16.

Origin of name not determined. May be for Jackson Barnett. May be Skinner sand. Used in NC Oklahoma.

Name should remain unused. Conflicts with Barnett sh. (Chester) of Texas.

First ref. - Hutchison (1911), OGS 2, p. 186.

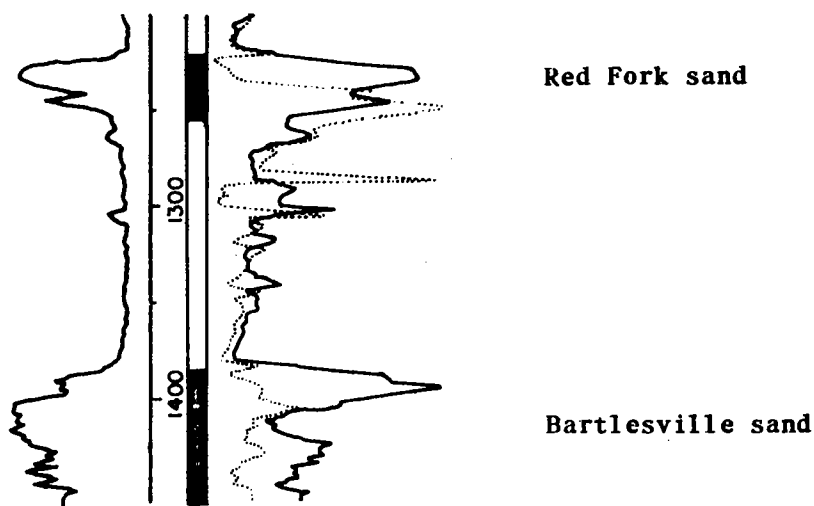
Named for city of Bartlesville, Washington Co. Discovery in Cudahy Oil Company No. 1 Nellie Johnstone, NE NE NE 12-26N-12E at 1,303 feet, Bartlesville field, Washington Co.

Term used in C and NE Oklahoma for sand below Inola ls. and above Savannah "Brown limes". Fine to medium-grained discontinuous sandstone.

True Bartlesville sand is not present in NC Oklahoma where it is absent by marine overlap. The lower Cherokee sandstone seen in wells in NC Oklahoma is younger than Bartlesville and approximately equivalent or equivalent to Red Fork-Burbank sand (notes from A. R. Edwards, 11-1956).

Equal to Bluejacket ss. member of Boggy fm.

Illustration: Bonaventure No. 0-1-B Pierce, 1-26N-13E, June 1954.



Name used on AGS (1956), Cross-section D-D', 26-2N-8W, West Marlow field.

Shown as below Marlow lime and above Lower Gregory lime, the name in this case refers to the M. A. Bateman sand. See also J. N. Bateman sand which occurs in the same field above Helm sand. This type of nomenclature invariably leads to confusion as the J. N. Bateman sand is also called Bateman.

Bayou sands

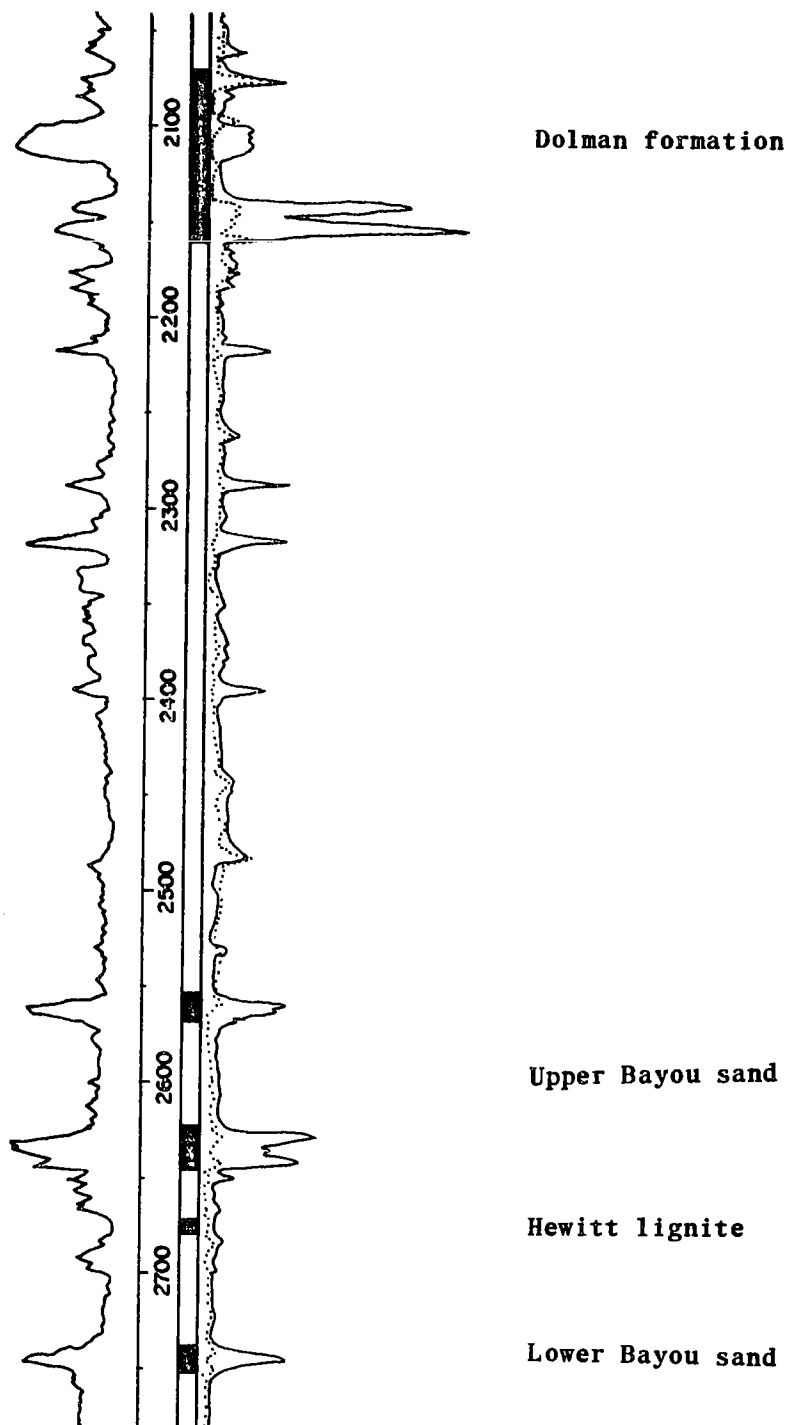
Missourian

Pennsylvanian

Name published by Williams (1954), OCGS, vol. 4, no. 9, p. 7; (1956), p. 284. See also Westheimer and Schweers (1956), PGSO, vol. 1, p. 147.

Named for Bayou field, Carter Co. Divided into Upper Bayou sands above Hewitt lignite, and Lower Bayou below. Below Dolman fm. and above Chubbee sand, which in illustrated well has partially graded into shale (note by Westheimer, Nov. 1956).

Illustration: Jones Oil Co. No. 1-A Wallace, NW NW NW 6-5S-1W.



Morgan (1924), Bureau Geology, Bull. 2, p. 123.

Named for town of Belle City, Seminole Co.

Two limestone beds and intervening shale. Lies below Hilltop fm., above Francis sh. Age is same as upper part of Nellie Bly sh., slightly older than Dewey ls. Used in subsurface in Seminole area.

Belleville sand

Misspelling of Belveal.

Belveal sand (Garber field)

Wolfcampian

Permian

First ref. - Vanderpool (1925), OAS, vol. 6, p. 288.

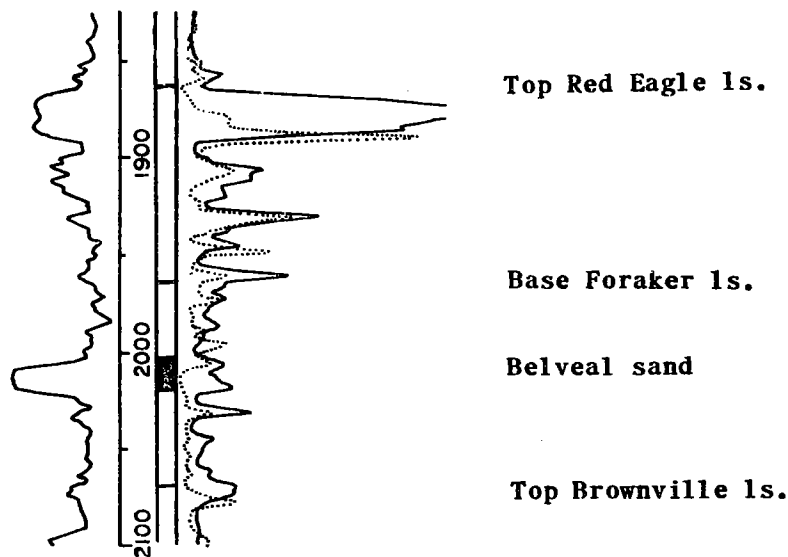
Named for F. M. Belveal lease of Exchange Oil Co., NE 24-22N-4W, Garber field, Garfield Co.

Vanderpool placed the Belveal sand 90 feet below top of the Walker sand, which he placed immediately below the Foraker limestone. Sinclair geologists consider the Belveal sand zone as below the Foraker ls. and above the Brownville ls. in the Garber field.

Confusion some years ago between the Belveal-Campbell nomenclature as well as the need for a name for a sand in the interval 0-50 feet above the Red Eagle limestone and below the Neva-Burr, resulted in calling this sand, "Belveal", as shown by L. W. Cary (1955) OCGS, vol. 5, no. 6, p. 6; (1956), p. 385 (notes by Vernon R. Baker, 10-19-56).

The use of the same name for sands in different horizons is deplorable and finally renders the name useless. The Hoxsey sand with type locality in 16-21N-2W (see illustration of Hoxsey sand) is in the same stratigraphic position as the sand outside of the Garber field now being called "Belveal". It would seem reasonable to confine the use of Belveal sand in its original sense to the Garber field, and to use the term Hoxsey sand for sands below the Neva-Burr and above the Red Eagle ls. V. R. Baker suggests the possibility of using Red Eagle sand zone for this interval, but in most cases where a limestone name is used for a sand, the sand is below the limestone rather than above. The name Burr is preoccupied. See Hoxsey and Walker sands.

Illustration: Bendorf No. 1 Way, NW NW SW 36-22N-4W.



Bennett sand

Desmoinesian

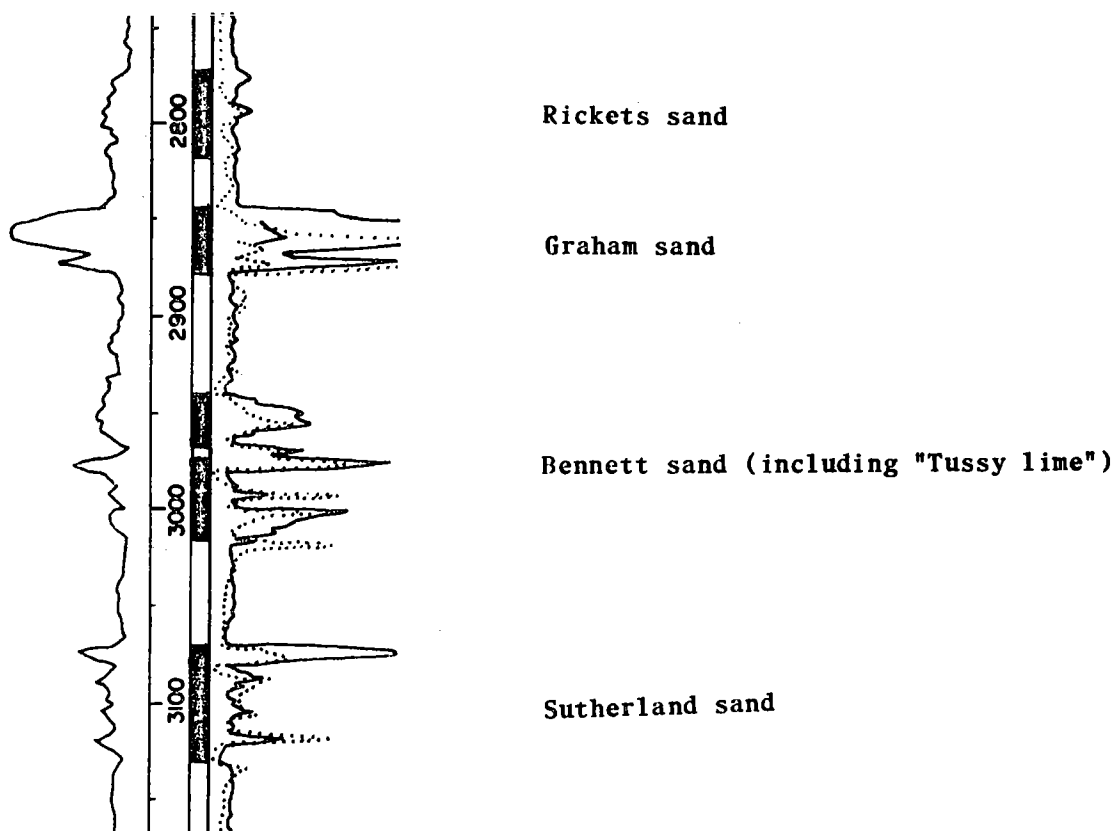
Pennsylvanian

First ref. - Tomlinson and Storm (1924), AAPG, vol. 8, p. 608.

Named for J. F. Bennett lease, NW 31-2S-2W, Graham field, Carter Co.

Below Graham sand, above Sutherland sand. Like the Graham sand, this sand contains productive lenses throughout most of Graham field, at most places a group of two or more sands, each not over 10 feet thick, in a zone some 50 feet thick. It includes the "Tussy lime" (not the true Tussy lime of Sholom Alechem and Tussy-Tatums fields, which there is applied to a higher limestone between sands equivalent to Graham and Bennett sands), which is best developed in the northwest portion of the field, but characteristically appears in the central and southeastern portions as a thin (2 or 3 feet) lime cap on one of the sands, normally second from top. This lime is correlated with one of a pair of limestones which appear in the Ardmore basin, in sporadic outcrops only, between the Devil's Kitchen and Arnold members (letter from C. W. Tomlinson, 7-26-56). See also illustrations of Graham and Sutherland sands.

Illustration: Magnolia No. 16 Bennett, C NW NW 31-2S-2W.



Big Lime

Desmoinesian

Pennsylvanian

Name originated by drillers in Pennsylvania where it is applied to a Middle Mississippian ls.

Applied to Oologah ls., Altamont ls. at places, and to a Permian lime in Panhandle. In C, NE and NC Oklahoma also used by drillers for Mississippi lime. In NW Oklahoma applied to limestones younger than Oologah. Should be called Oologah ls. in eastern half of Oklahoma.

Author not identified.

Named for Geo. W. Bilbo, partner in discovery well of Madill pool, SE 24-5S-5E, Marshall Co. about 1905. Productive sand in Paluxy fm. This term would be better than "Arbuckle" which has been used in Enos and Madill areas.

Birdseye lime

Simpson group

M. Ordovician

First ref. - Hyatt (1926), AAPG, vol. 20, p. 955.

Descriptive of spotted appearance made by areas of clear calcite in lithographic ls. in the McLish fm. of SC Oklahoma.
Name should not be used formally.

Billings sand

Virgilian

Pennsylvanian

First ref. - Vanderpool (1925), OAS, vol. 6, p. 288.

Named for Billings field, Noble Co. Name appears to have been used for Hoover sand occurring at average depth of 2,030 feet.

Bixler sand

Desmoinesian

Pennsylvanian

First ref. - Ohern and Garrett (1912), OGS 16, p. 16.

Named for Nancy Bixler lease of Midland Oil Co., SW 11-26N-13E, Hogshooter field, Washington Co.

Used in Hogshooter field, probably Prue sand.

Black and Simons sand

Morrowan

Pennsylvanian

Name listed by White and Green (1931), AAPG, vol. 5, p. 405.

Named for E. R. Black and George Simons, operators in Okmulgee who discovered Black and Simons field (12-14N-11E), Okmulgee Co. (note by D. M. Logan, 2-6-55).
Equal to Cromwell sand.

Black Ostracod lime

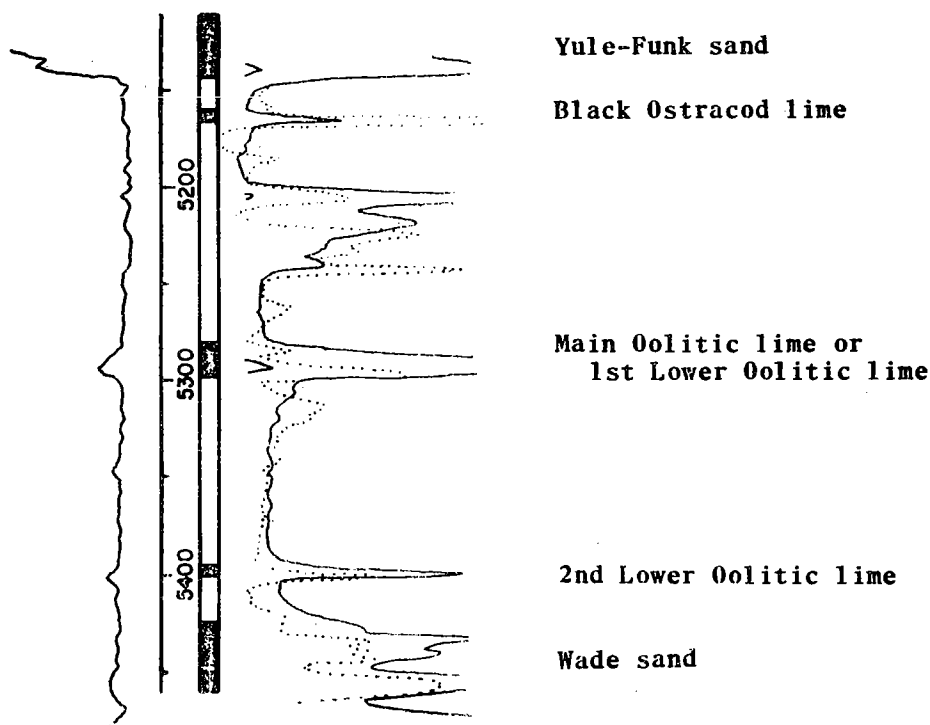
Missourian

Pennsylvanian

First ref. - Hayes (1952), OCGS, vol. 3, no. 2, p. 9; (1955), p. 101.

Descriptive of black ostracode shells in cream-colored, dense limestone. Lies below First or Upper Oolitic lime immediately below Yule-Funk sand, above Main or Lower Oolitic lime, in Cement and Chickasha fields, Caddo and Grady Cos. F. H. Worrell reports that the ostracodes were identified as "Jonesina gregaria" by R. W. Harris and that for a while the limestone was called "Jonesina" lime. Coal is present just below the limestone. Also called Ostracod lime. See also Yule-Funk sand and Oolitic lime, item 5.

Illustration: Stephens Petr. No. 1 Funk, SW SW SE 1-5N-9W.

*Black lime*

Meramecian-Chesterian

Mississippian

First ref. - Aurin, Clark and Trager (1921), AAPG, vol. 5, p. 127.

Descriptive of dark color. Applied to Moorefield fm., Hindsville ls. and limestone of Fayetteville fm. in Okmulgee Co. Name should not be in formal use.

Blackwell sand

Wolfcampian

Permian

First ref. - Fohs and Gardner (1914), Fuel Oil Jour., Aug. suppl.

Name from Blackwell field (now called Dillworth), 28 and 29N-1W and 1E, Kay Co. At average depth of 760 feet in Blackwell field according to Fohs and Gardner who were referring probably to wells drilled in secs. 13, 14, 24 or 25, 28N-1W. In the Corporation Commission files, the Blackwell Oil and Gas No. 1 J. R. Whiteside, SW SW 25-28N-1W, discovered gas at 742-48 feet, finished drilling and capped well on April 1, 1909. Other gas wells were found in 1909. According to Clark and Daniels (1929, STAOF, vol. 1, p. 167), the shallowest production of consequence in the Blackwell (now Dillworth) field was gas found in the Neva ls. at depths ranging from 700 to 750 feet. This pay was known as the Blackwell sand.

Bland sand

Pennsylvanian

Whiteside (1936), TGS, Digest, p. 3. No further data located.

Blaydes sand

Virgilian

Pennsylvanian

First ref. - Gouin (1926), OGS 40-E, p. 41.

Name from Blaydes lease of Climax, discovery of production in SE NW NE 32-1S-8W, Empire field, Stephens Co. at 2,200 feet. Misspelled Blades.

100 feet below Brown sand, 100 feet above Kagay sand. One of the many lensing sands in "Upper Cisco" (note from D. M. Putman, 7-1956).

Boatwright sand

Springeran

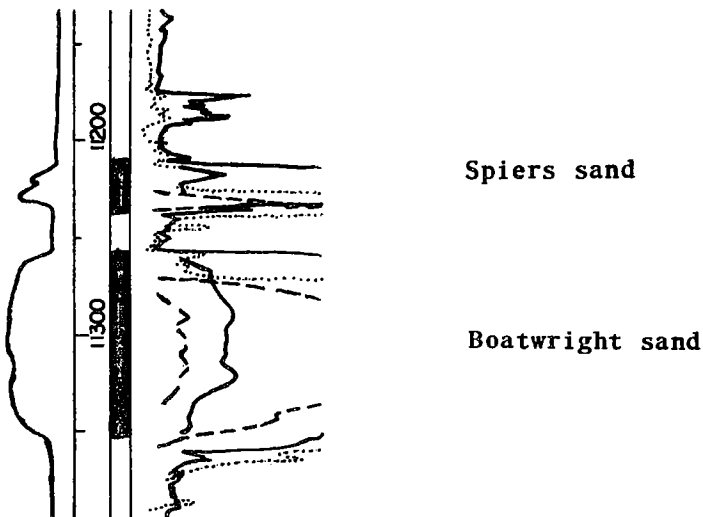
Pennsylvanian

First ref. - Wallace (1954), OCGS, vol. 4, no. 7, p. 10; (1955), p. 246.

Name from Ira Boatwright lease of Magnolia, discovered in No. 1, NW SE NE 33-5N-6W, Chitwood field, Grady Co., Mar. 1947.

Lies below Spiers sand, fourth and lowest Springeran ss. in Chitwood area, lying above some 1,400 feet of shale called Goddard.

Illustration: Magnolia No. 1 Boatwright.



*Bois d'Arc limestone

Hunton group

Devonian

Reeds (1911), Amer. Jour. Sci., vol. 182, p. 256.

Named for Bois d'Arc Creek, Pontotoc County.

Lies above Haragan marlstone, below Woodford sh., below Frisco ls. locally. Main pay in W Edmond and Short Junction pools; productive in SC Oklahoma.

Booch sand

Desmoinesian

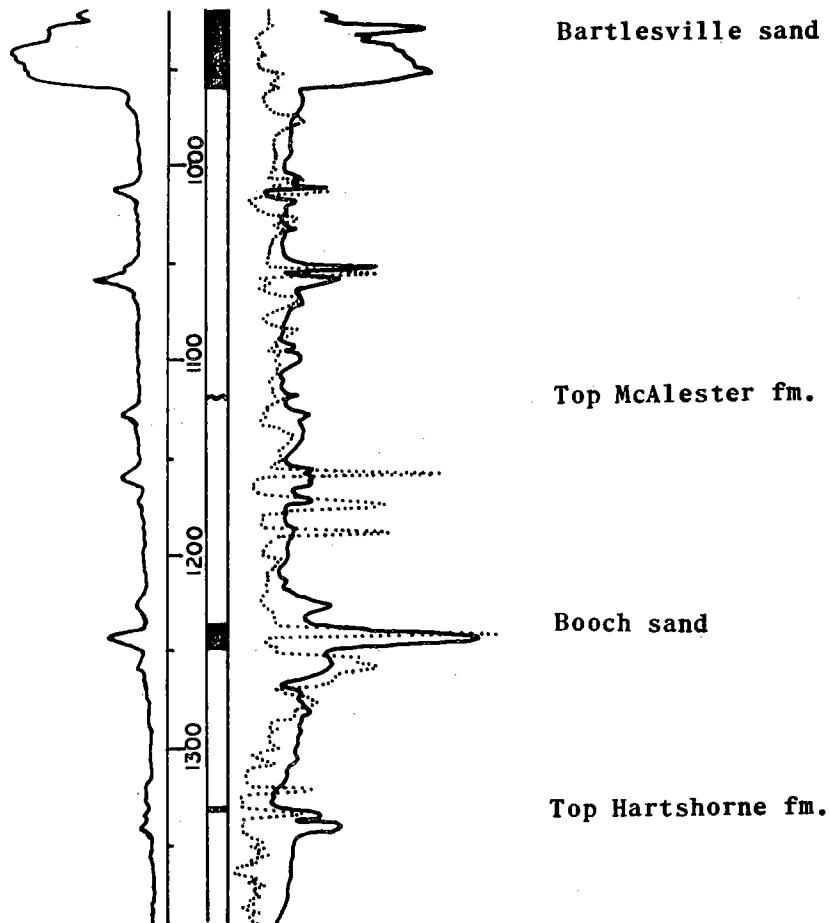
Pennsylvanian

First ref. - Fohs and Gardner (1914), Fuel Oil Jour., Aug. Suppl.

Named for Booch farm, 20-13N-14E, Morris field, Okmulgee Co.

C Oklahoma. Equal to Warner ss. At places Upper, Lower, First, Second, Third Booch. At places over 150 feet thick. Equal to Taneha sand. See also Youngstown sand.

Illustration: Mid-Continent No. 1 Alexander, NW SE NW 11-13N-14E.

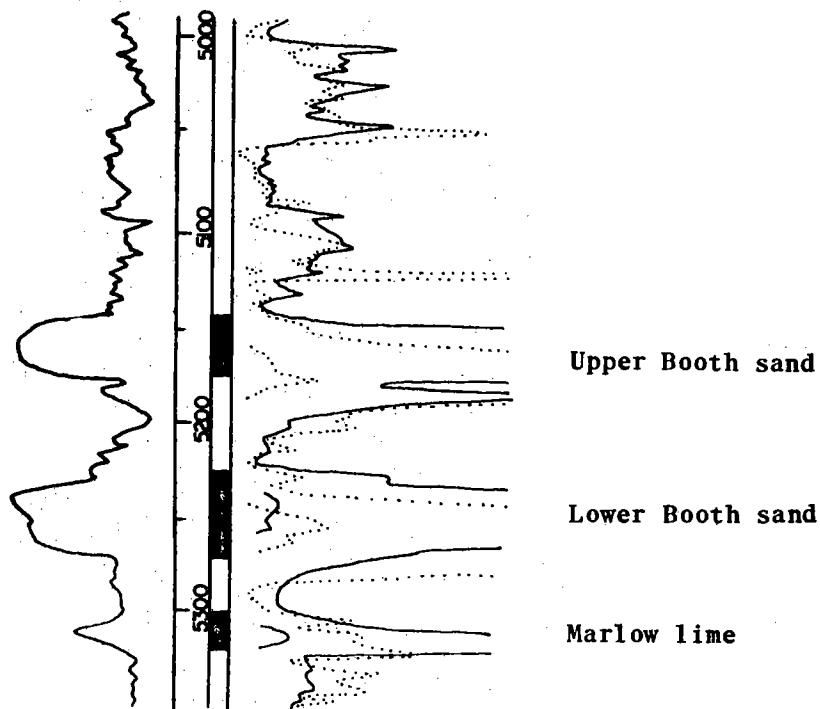


First ref. - Hayes (1952), OCGS, vol. 3, no. 2, p. 7; (1955), p. 101.

Named for D. Booth lease of The Texas Company, discovery in No. 1, SW NW NW 21-2N-8W, West Marlow field, Stephens Co.

Upper and Lower Booth sands, below Helm sand, above Marlow lime and M. A. Bate-man sand. Not equivalent to Griffin sand of Cement (see AGS, 1956 Cross-section C-C', Well No. 5).

Illustration: Texas No. 1 Booth.



First ref. - Wright et al. (1957), USBM Rept. of Invest. 5326, p. 42.

Name from Boucher lease of Gypsy, discovery in 1935 in No. 1, NW SW SW 32-1N-19W, Tipton field, Cotton Co., pay 2,593-2,607 feet, total depth. This production is stated to be from Arbuckle lime (NOSLA, 1937, p. 209).

Data in cited reference for well in 31-1N-19W: pay at 2,593-2,690 feet, elevation, 1,259. This is undoubtedly Gypsy No. 1 Leona Southern, NE SE SE, completed Dec. 15, 1935, producing 45 barrels of oil in first 24 hours. On driller's log of No. 2 Southern, SE SE SE, Boucher pay is listed at 2,554-2,652 feet and described as granite wash and conglomerate, Arbuckle lime at 2,652-2,655 feet, elevation 1,258.

Boucher pay is recorded in many logs filed with Corporation Commission by Gypsy (Gulf) indicating production from Desmoinesian granite wash in most instances, but may have also included oil from the Arbuckle. Name is no longer in use.

Bowles sand

Morrowan

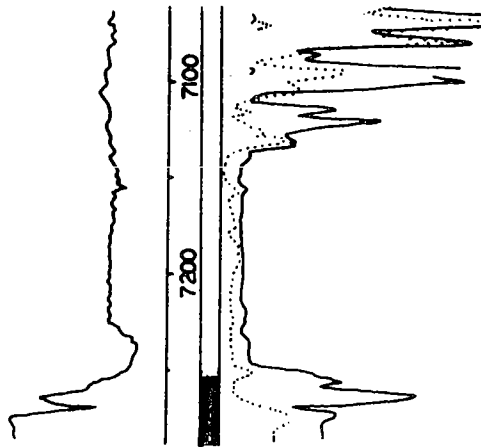
Pennsylvanian

First ref. - Barby (1956), OCGS, vol. 6, no. 10, p. 12.

Named for Warren Petroleum No. 1 Bowles, SE SE NW 22-1N-20ECM, oil discoverer of East Camrick field, Beaver Co., completed 11-17-55.

Considered "Upper Morrow" sand, equivalent to Purdy. Not widely used. Top of Morrowan rocks placed at 7,138 feet by various geologists.

Illustration: Warren Petroleum No. 1 Bowles.



Bowles sand

Boynton sand

Atokan

Pennsylvanian

First ref. - Fohs and Gardner (1914), Fuel Oil Jour., Aug. suppl.

Named for town of Boynton, Muskogee Co.

At 1,550 feet in Boynton field according to Fohs and Gardner; 140 feet below Leidecker sand in 14N-16E according to F. Aurin (1917).

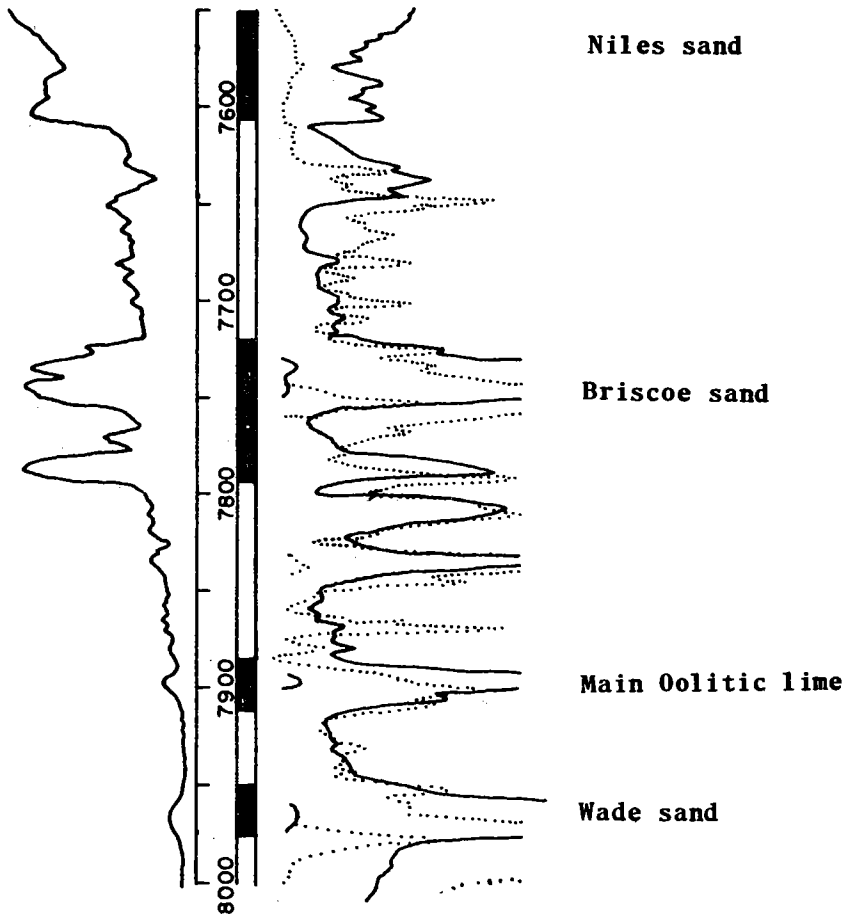
Equivalent to sand in Atokan Dutcher, Gilcrease sand zone.

First ref. - NOSLA (1955), vol. 25, p. 609.

Name from Briscoe Estate lease of Gulf, discoverer of gas from 7,731-7,772 feet in No. 1, C SE NW 36-2N-8W, Aug. 1945, S Marlow field, Stephens Co.

Shown on AGS (1956), Cross-section D-D', in Gulf No. 1 Jones, in Hoxbar group above Main Oolitic lime. This sand appears to be in a stratigraphic position similar to that of the Yule-Funk sand of the Cement field if the correlation of Main Oolitic lime is correct. Some geologists would place the Main Oolitic lime at 7,950-79 feet.

Illustration: Gulf No. 1 Jones, C SE SE 26-2N-8W.



Britt sand

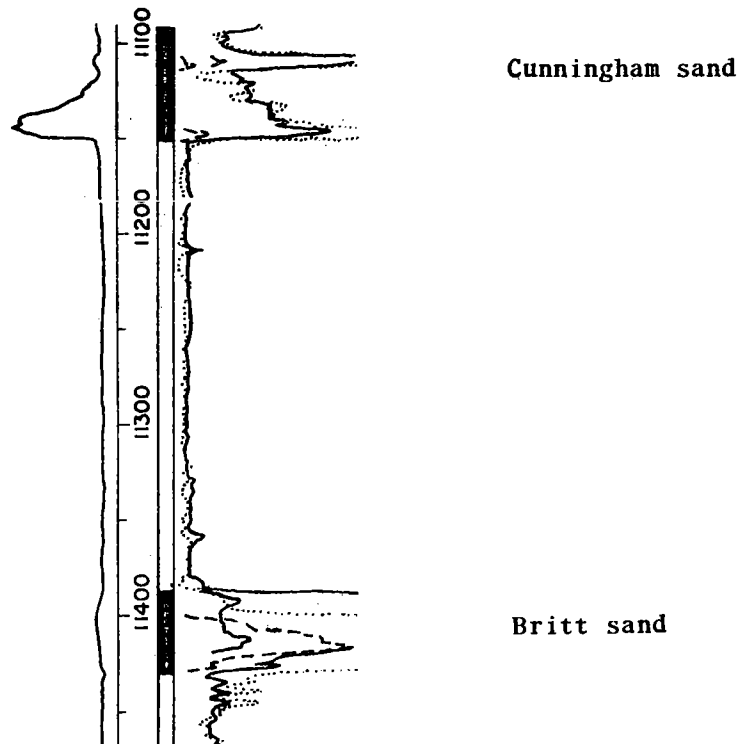
Springeran

Pennsylvanian

First ref. - Wallace (1954), OCGS, vol. 4, no. 7, p. 10; (1955), p. 247.

Named for A. Britt lease of Magnolia, SW 3-4N-6W, Chitwood field, Grady Co. Fine-grained tight sandstone 80 to 90 feet thick, 200-300 feet below Cunningham sand, 100 feet above Spiers sand. Second Springeran sand of Chitwood area.

Illustration: Magnolia No. 1 Britt Unit, SW NW SW 3-4N-6W.



Bromide Dense

Simpson group

M. Ordovician

Term used in subsurface for a lithographic limestone, 10-20 feet thick, below Viola ls., above a section of 100-175 feet of ls. and dolomitic ls., underlain by green shale. The unit below the Bromide Dense and above the green shale, which overlies the First Bromide zone, is called Bromide dolomite (notes from W. M. Decker, Mar. 1957).

See illustration of Bromide sands.

*Bromide formation

Simpson group

M. Ordovician

Ulrich (1911), GSA, vol. 22, p. 37.

Named for village of Bromide, Johnston Co.

Upper unit of Simpson group. Consists of sandy limestone, sandstone with frosted quartz grains, greenish shale partings. Lies upon Tulip Creek fm., overlain by Viola ls.

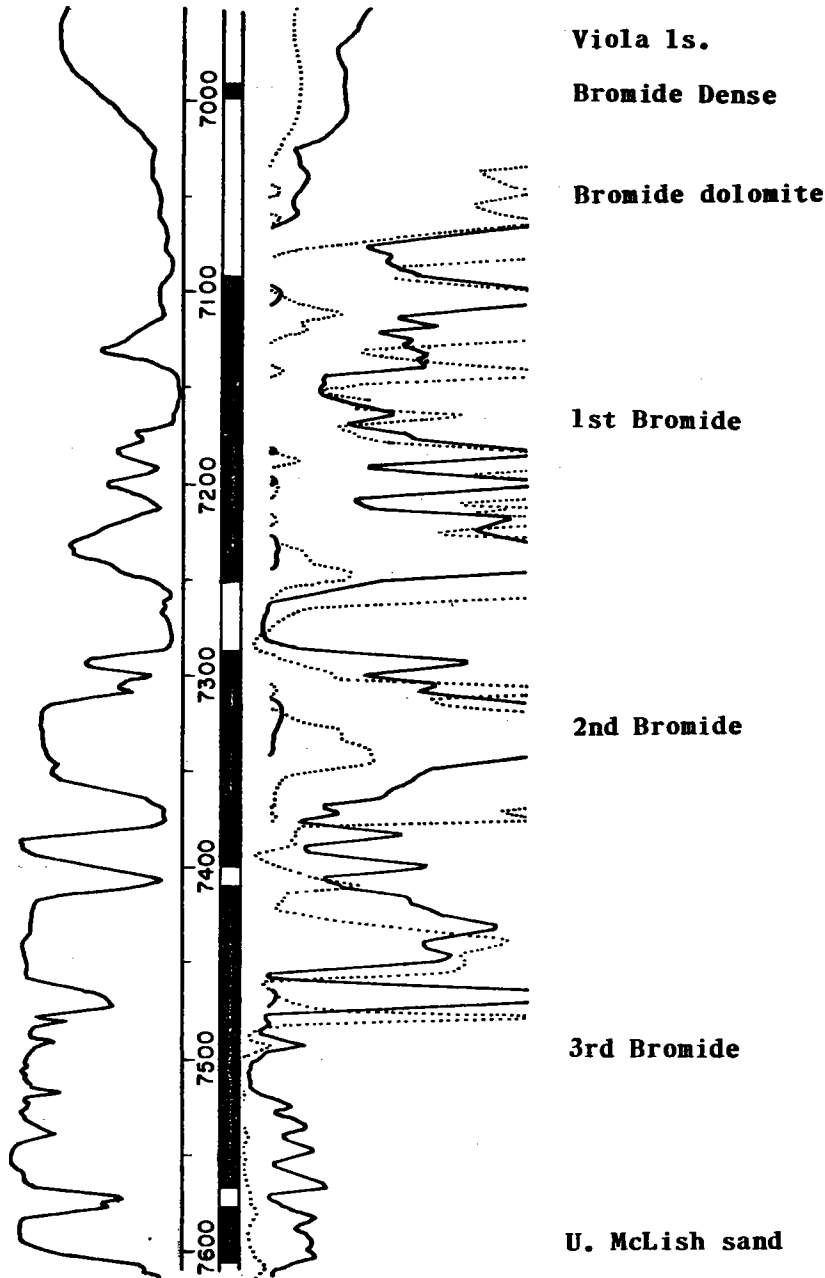
Occurs on surface in Arbuckle Mt. area, in subsurface over most of Oklahoma.

First, Second and Third Bromide as used in subsurface in Pauls Valley field area, Garvin Co., where the names were first applied.

First and Second Bromide zones in Bromide fm., Third Bromide sand probably in Tulip Creek fm., but, at places, can not be separated from Second Bromide. Below limestone, dolomitic limestone and a green shale, the First Bromide consists of sandstone with coarse frosted quartz grains interbedded with shale and limestone. Sandstones in the Second Bromide normally contain medium subangular grains. Third Bromide sand grains are normally fine to medium and well-rounded. In the basal unit the presence of a black mineral gives the appearance of a "pepper" sand.

First and Second Bromide sands are separated by a green shale (notes from W. M. Decker, Mar. 1957).

Illustration: Cities Service No. 3 Weatherford, NE SW SW 31-4N-2W.



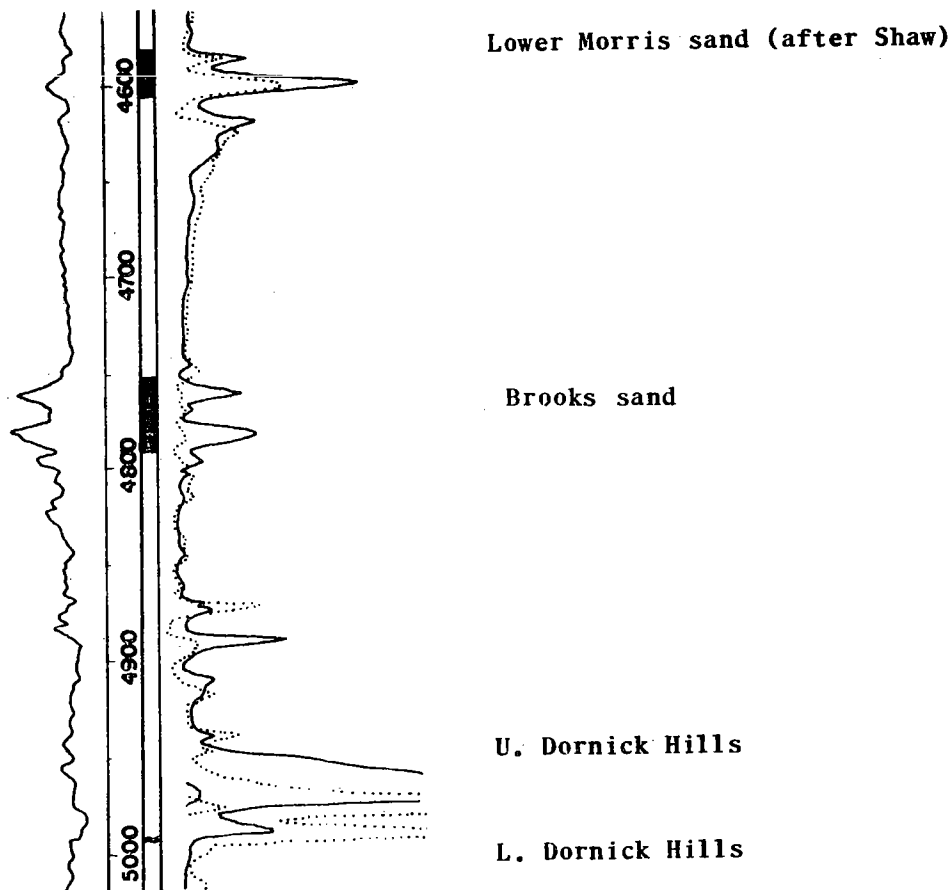
Published by Shaw (1954), OCGS, vol. 5, no. 3, p. 9; (1955), p. 346.

Name from Brooks lease of Magnolia (well-developed sand but not productive in illustrated well), NE 11-2S-3W, Sholom Alechem field, Carter Co.

Calcareous glauconitic sandstone considered by Shaw as oldest recognizable member of Deese in 2S-1W, missing throughout most of southern half of township.

According to R. L. Beasley (7-56), this term is not widely used. He differs from Shaw and considers that the Brooks sand probably correlates with Upper Dornick Hills sandstones developed in SE Graham field, 3S-2W. The unconformity between Upper and Lower Dornick Hills is placed at 4,993 feet.

Illustration: Magnolia No. 3 C. E. Brooks, NW SW NE 11-2S-3W.



Name published by Rogatz (1935), AAPG, vol. 19, p. 97.

Name descriptive of color and lithology.

First used in Panhandle gas field of Texas. Applied to highest unit of Chase group. Name used in Beckham Co. Brown dolomite of Pampa area, Texas, is lower zone than that in Panhandle gas field (notes of L. W. Curtis, 8-26-55).

Brown limeDesmoinesianPennsylvanian

First ref. - Brandenthaler, Morris, and Bopp (1930), USBM, Eng. Rept. No. 2997, p. 15.

Named Little Brown lime by Oscar Hatcher of Gypsy Oil Co. and R. C. Quiett of I.T.I.O. during development of Little River pool in 7N-6E, Seminole Co., about 1925. First called in I.T.I.O. No. 1 House, NW NW 1-7N-6E.

Name shortened to Brown lime, original bed in base of Savanna fm., probably Spaniard ls. member. In Hughes and Okfuskee Counties there are three Savanna Brown limes, probably Doneley, Sam Creek and Spaniard limestones.

Name is descriptive of normal color of sideritic limestone. Used in C and NE Oklahoma (notes from F. J. Smith, 1955).

Brown limeMississippian

Dr. E. Bloesch (1955) writes that the name has been used for Mississippian lime in Muskogee and Okmulgee Cos.

The name should not be so used since it is certain to be confused with that of the Savanna markers.

Brown sandVirgilianPennsylvanian

First ref. - Gouin (1926), OGS 40-E, p. 28.

Named for Brown lease of Lone Star Gas Co., NE 30-1S-8W, Empire field, Stephens Co.

Sand occurs at 2,100 feet, 100 feet above Blaydes sand, 100 feet below Smith sand. One of the many lensing sands in rocks of Virgilian age "Upper Cisco" (note by D. M. Putman, 7-1956).

Broyles-Layton sandMissourianPennsylvanian

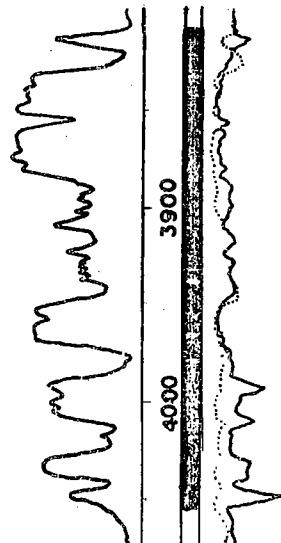
Named for Broyles field, 18N-4E, Payne Co.
Same as Cottage Grove sandstone.

Bruhlmeier sandDesmoinesianPennsylvanian

Name brought into Oklahoma by subsurface correlation from Texas.

Occurs below Cox sand and above Hudspeth sand in NE Thackerville field, Love Co., Oklahoma. Name used in Love Co.

Illustration: Sinclair No. 1 Evans, NE SE SW 34-8S-2E.



Bruhlmeier sand

Brundage sand

First ref. - NOSLA (1949), (1948, vol. 19, p. 506.

Misspelling of Brundidge sand.

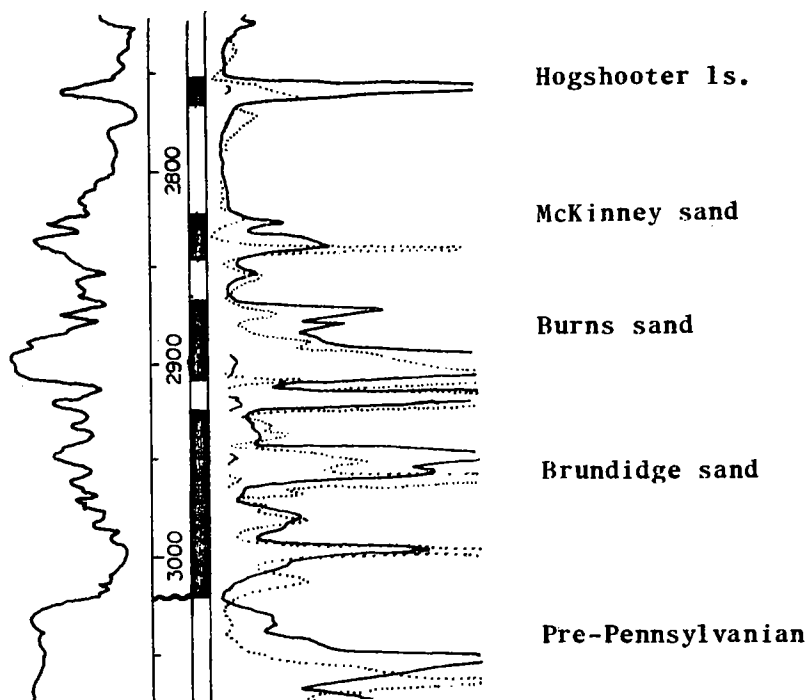
Brundidge sandMissourianPennsylvanian

Named after Brundidge lease of Ohio Oil Co. No. 1, NW SE NE 17-3N-2E, East Pauls Valley field, Garvin Co.

Frost and Crockett (1950), TGS, vol. 18, p. 60, called it "Detrital zone" in their paper although at that time it was known as Brundidge sand, a conglomeratic zone, 1 to 386 feet thick, which lies below the Burns sand and rests unconformably upon pre-Pennsylvanian rocks (note from H. L. Crockett, Dec. 1955).

The section would appear to be an equivalent of the Seminole fm. Illustrated well produces from Brundidge sand (note from F. E. O'Brien, 1956).

Illustration: Ohio Oil No. 1 Brundidge.

Bruner sandPennsylvanian

Ref. - Brandenthaler, Sclater, and Kent (1926), USBM Eng. Rept. on Davenport field, Lincoln Co., p. 4.

Name used for water sand 150 to 200 feet above "Layton" sand, which White (1941, STOF, p. 390) identified as Cleveland sand.

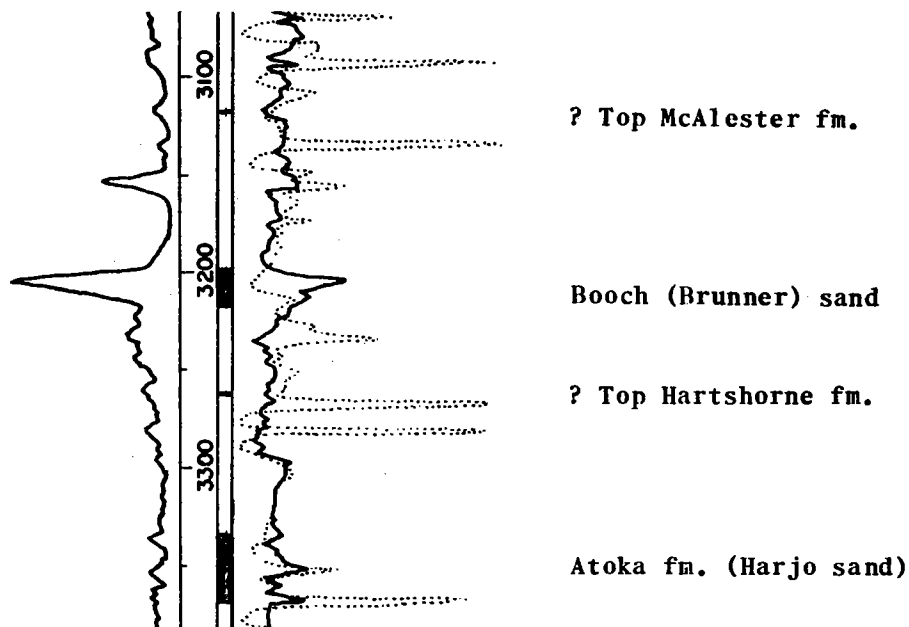
The name Bruner was a common family name and the term has been used at various places. Corporation Commission files carry logs recording Bruner gas sand on logs in the Cushing field dated as early as 1915, recorded in 1923. The log of Cosden Oil and Gas No. 1 E. White, NE NE SW 24-17N-7E, Creek Co. shows Bruner gas sand at 1,055 to 63 feet. There are several Bruner leases in 17N-7E. This sand is called 400 to 450 feet above the Hogshooter in this area.

The term should not be used.

Rison and Bunn (1924), USBM Petr. Eng. Cromwell field, p. 6.

Named for Brunner lease of Wilcox Oil and Gas Co. SW 15-10N-8E, Cromwell field, Seminole Co. Discovery at 3,018 feet, October 2, 1923. Averages 10-35 feet thick, 300 to 370 feet above top of Cromwell sand.
Equal to Booch sand. Name is obsolete.

Illustration: S. Texas Dev. Co. No. 1 Harjo, SE NW NE 21-10N-8E.

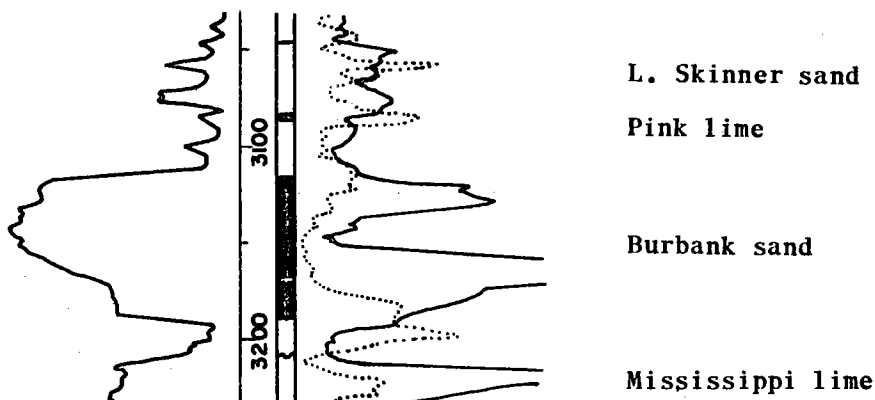


Ref. - Sands (1924), AAPG, vol. 8, p. 585.

Named for town of Burbank and Burbank oil field. Discovery in May 1920 by Marland in SE 36-27N-5E, Osage Co. Sand at 2,950 feet with initial production of 760 barrels per day.

Sandstone considered to be a Red Fork equivalent, in upper part of Boggy fm. Some recent stratigraphic work suggests that it could be equivalent to lower part of Boggy fm. or both Red Fork and Bartlesville.

Illustration: Wilcox Oil No. 2 Graham, NW SW SE 21-27N-5E.



Burgen lime

Simpson group

M. Ordovician

Boyle (1929), OGS 40-KK; (1930) OGS 40, vol. 2, p. 437.

Named for Burgen ss., which lies immediately below; below Tyner fm.

Marker bed representing lowest limestone of Simpson fm. in Okfuskee Co. northeastern Oklahoma.

**Burgen sandstone*

Simpson group

M. Ordovician

Taff (1905), USGS, Folio 122, p. 2.

Named for Burgen Hollow, NE of Tahlequah, Cherokee Co.

Thick light-buff sandstone equal to basal Oil Creek ss. Lies below Tyner fm. and upon Cotter dolomite.

Burgess sand

Desmoinesian

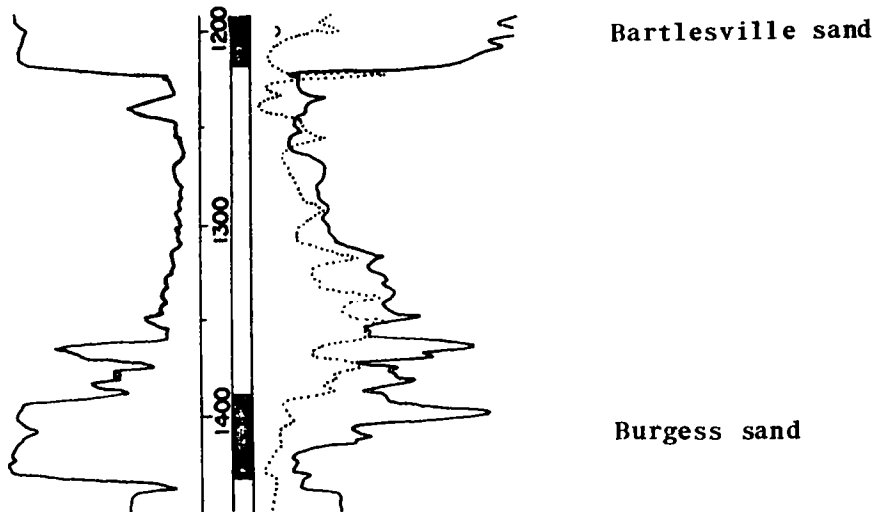
Pennsylvanian

First ref. - Ohern and Garrett (1912), OGS 16, p. 16.

Named for C. Burgess lease of Prairie, SW 32-21N-13E, drilled in 1910, Bird Creek field, Tulsa Co.

Detrital sand and conglomerate at base of Des Moines, probably older than Savanna and resting upon Mississippian. Loose usage of the names, Burgess and Mississippi Chat, results in confusion. Although it is difficult to separate the two zones even by sample and electric log studies in some areas, it is suggested that the term Burgess should be reserved for the detrital sand-conglomerate zone (particularly in SE Osage Co.) resting upon rocks of Mississippian age. The term Mississippi Chat should be used only for the cherty residue resulting from weathering in situ of Mississippian limestone at or near pre-Pennsylvanian unconformity as seen in most of NC Oklahoma (note from J. C. Threet, 9-1956).

Illustration: Webb No. 1 Phillips, NW SW 30-21N-13E.



First ref. - Wright et al. (1957), USBM, Rept. Invest. 5326, p. 24.

Name from Burkes lease, 16 or 17-3N-5W, Knox field, Grady Co.

Listed as oil pay at 2,475-2,540 feet in 17-3N-5W with elevation of 1,213 feet. One of many lensing sandstones considered by most geologists to be of Permian age and generally not named because of limited extent and erratic distribution.

Burkhart sand

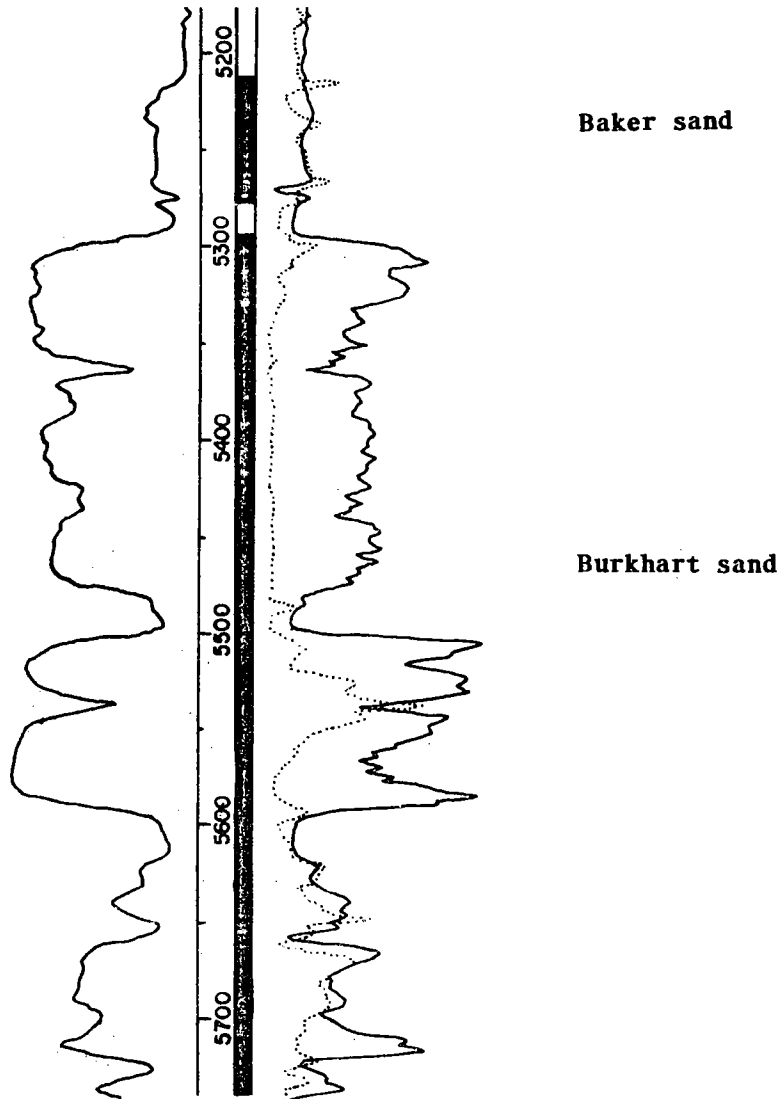
Missourian

Pennsylvanian

Shown on AGS (1956), Cross-section B-B', Well Nos. 15, 16 where term Baker-Burkhart sand is used.

Named for Burkhart lease of Vickers, SE 27-1N-5W, Prairiedale field, Stephens Co. Baker-Burkhart sand is main pay of Prairiedale field (notes by C. B. Branan, Jr., 8-1955). Shown as basal Missourian sands in area. See illustration of Baker sand.

Illustration: Vickers Exploration No. 1 Burkhart, C NE SE 27-1N-5W.



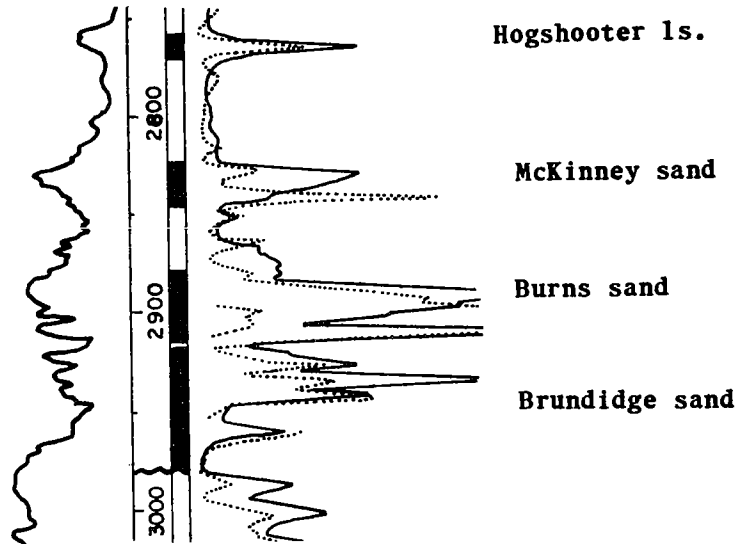
Burns sandMissourianPennsylvanian

First ref. - Frost and Crockett (1950), TGS, vol. 18, p. 64.

Named for Burns lease of Ohio Oil Co. discovery well, No. 1, of East Pauls Valley field, Garvin Co., which found gas and caught fire, 1943.

Below McKinney sand, above Brundidge sand, equivalent to lower sand of Layton sand, while McKinney sand is equivalent to upper sand (note from H. L. Crockett, 1955).

Illustration: Ohio No. 1-A Burns, SE NE SW 17-3N-2E, relief hole for discovery well.

Burr sandSpringeranPennsylvanian

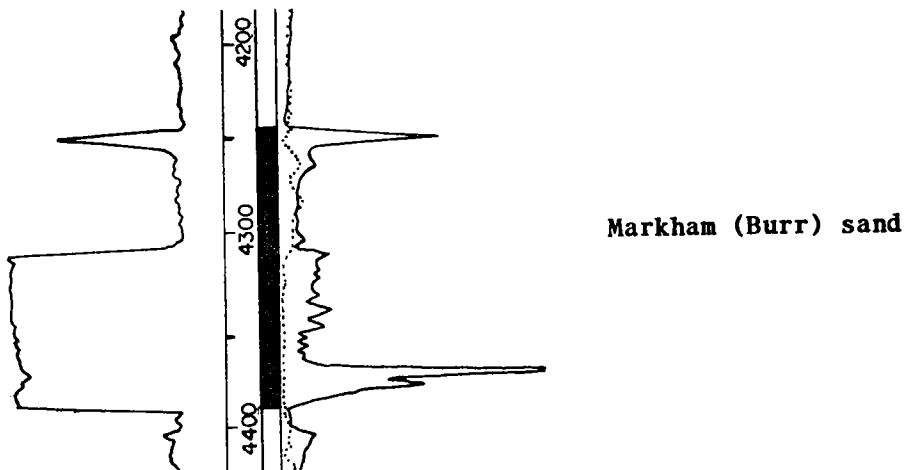
First ref. - Hoard (1956), PGS0, vol. 1, p. 196.

Named for Burr lease of Magnolia, 31-1N-3W, Tussy sector of Tatums field, Garvin Co.

Uppermost Springer sand, 200 feet above Aldridge sand. Same as Markham sand, which is the more widely used term. The name Burr sand is used only locally in the Tussy area (notes from M. E. Hestbeck and L. R. Riley, 1955).

Name of member of Grenola ls. (Wolfcampian), below Neva ls. used in both surface and subsurface in Kansas and N Oklahoma. Name should not be placed in regional usage.

Illustration: Magnolia No. 1 Burr, NW SE NE 31-1N-3W.



Green and Aurin (1925), OGJ, vol. 24, no. 21, Oct. 15, insert opp. p. 80.

Driller's name descriptive of white clabbered mud produced by cable tool drilling (note from McMurtry, 1955).
Equal to "Fernvale" limestone.

Buzzard sand

Missourian

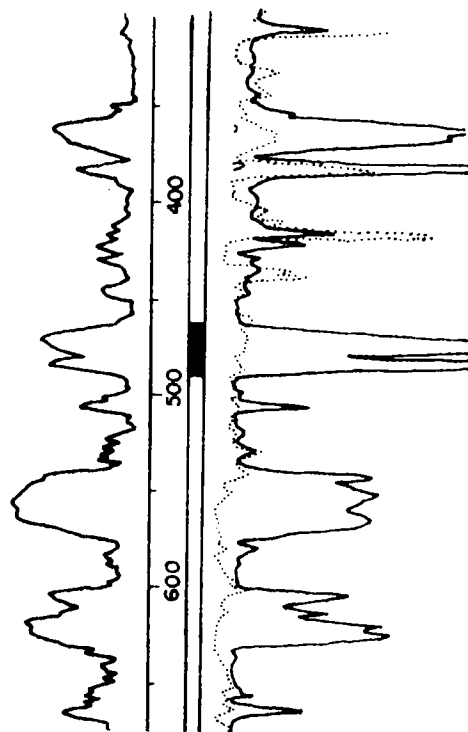
Pennsylvanian

Name first used in plugging report in 1928.

Named for Chester Buzzard, production man for Charles B. Peters. Show in sand at 495 to 515 feet in Peters and Leahy No. 1, (NW NW NE 30-23N-9E, Manion field, Osage Co., completed 3-31-1919 as 10 barrel well in Bartlesville), was observed by Ira Cowles, who notified Chester Buzzard. Buzzard developed production in the sand, probably in Wrightsman No. 1, SW SW SE 19-23N-9E, at 464 to 484 feet, completed 3-18-1920.

Name has been loosely applied to some three to four different shallow sands, but the Buzzard sand in sections 19 and 20 is in the upper part of the Barnsdall fm. (notes from Jerry B. Newby, 1955, 1956). Production found in sand in both Osage and Payne Cos.

Illustration: Hamon and Cox No. S-42, Manion Unit, S $\frac{1}{2}$ 19-23N-9E.



Buzzard sand

Cache Creek sand zone

Virgilian

Pennsylvanian

Ref. - Pate (1948), World Oil, vol. 128, no. 6, p. 1926.

Name apparently from Cache Creek, Cotton Co.

Shown on type lithologic log of Cotton Co. as lenticular sandstones above Breckenridge ls. J. S. Bridwell completed in May 1946 the No. 1 Houghton, SE NW NW 23-3S-11W, to discover Essaquanahdale field in sandstone from 1,490 to 1,500 feet. Cache Creek, East Cache Creek and Soldier Creek fields were discovered later this year and apparently the term Cache Creek or Soldier Creek refers to sandstones in a similar stratigraphic position in all fields. In upper part of Cisco group (D. M. Putman, 5-1957).

Caddo sand

Leonardian

Permian

Reeves (1922), USGS, Bull. 726, p. 72.

Named for Caddo Petroleum Co., discoverer in No. 2 Rowe, E $\frac{1}{2}$ SE NE 36-6N-10W, at 1,807 feet, total depth 1,821 feet, elevation 1,443, Cement field, Caddo Co.

Equal to Nichlos sand, the preferred name. Caddo ls. is a Lower Cretaceous fm. in SE Oklahoma, and Caddo lime is a producing horizon in the Smithwick in NC Texas.

**Calvin sandstone*

Desmoinesian

Pennsylvanian

Taff (1901), USGS Coalgate folio, no. 74.

Named for exposures at Calvin, 6N-10E, Hughes Co.

Thick-bedded sandstone, 145 to 240 feet thick, becoming friable, ferruginous and shaly toward south. Overlies Senora fm. and underlies Wetumka sh.

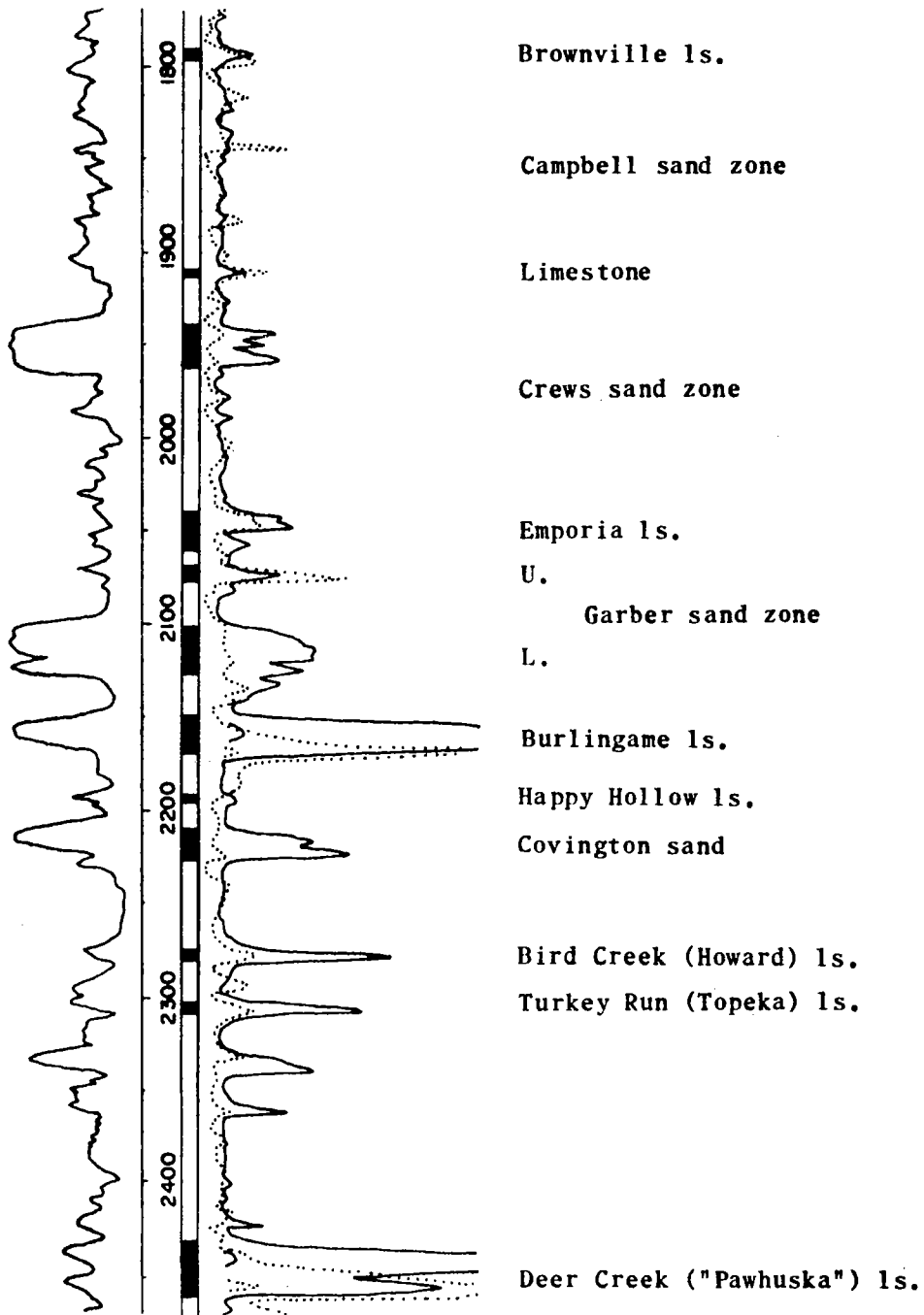
Use of term Calvin sands in subsurface originated during development of Cromwell field, 10N-8E, Seminole Co. (Levorsen, 1927, AAPG, vol. 11, p. 659). Illustration of Wanette sand shows Calvin sands in 6N-3E.

Bullard (1928), OGS 40-Q, p. 62.

Named for Thomas Campbell lease of Sinclair, discovery in No. 1, NW NE NW 30-22N-3W, Garber field, Garfield Co., 1919, at 1,870 feet.

Using driller's logs of No. 1 and No. 5, the Campbell sand falls within the interval below the Brownville ls. and above the unnamed limestone above the Crews sand. Sandstones found within this interval are now being called Campbell in Garber field area. Ragan and Sams sands appear to be in lower part of Campbell zone.

Illustration: Sinclair No. 35 Campbell, SE NE NW 30-22N-3W.



Cantrell sand

Virgilian

Pennsylvanian

Gouin (1926), OGS 40-E, p. 28; (1930), OGS 40, vol. 2, p. 42.

Named for Cantrell lease of Empire Gas and Fuel Co. E½ SW 32-1S-8W, at 1,800 feet in Empire field, Stephens Co.

Lies 100 feet below Surber sand, 100 feet above Shelton sand. One of the lensing sands below Pontotoc group in rocks of Virgilian age, "Upper Cisco" (note from D. M. Putman, 7-1956).

Canyon lime

Missourian

Pennsylvanian

Name used in SW Oklahoma by some geologists for a Hoxbar reefy limestone. Canyon series is Missourian of NC Texas.

Carmichael sand

Virgilian

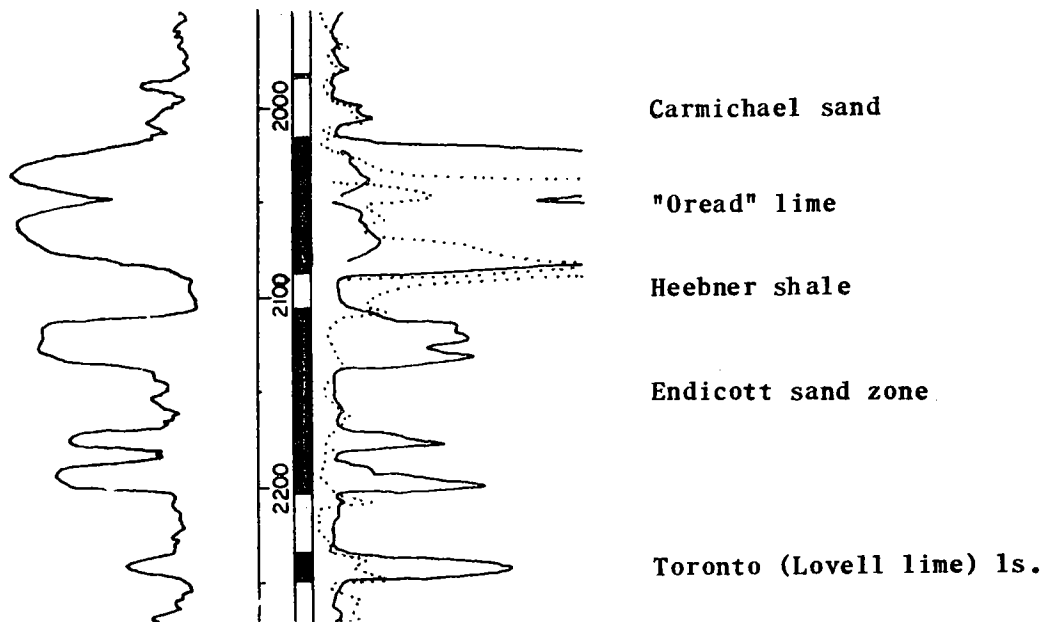
Pennsylvanian

Ross (1923), USBM, Rept. on Tonkawa field, p. 9.

Named for J. C. Carmichael lease of Comar Oil Co., No. 1-A, SW SW NE 3-24N-1W, Tonkawa field, Noble Co., at 2,176 to 2,185 feet, elevation 1,051 feet.

Also called by Ross "2,200-foot Lime", a porous limestone (cored), below Lower Hoover sand. Hosterman (1924), AAPG, vol. 8, p. 298, reports a difference of opinion as to whether it is a sand or porous limestone but notes 15 wells producing 70 to 100 feet below top of Hoover sand from Carmichael sand. This places the "sand" either in the "Oread" lime or just above. Top of Pawhuska (Deer Creek) in discovery well was at 1,920 feet or 275 feet above Carmichael "porous lime", with top of Lower Hoover at 2,100 feet. At any rate, the Carmichael sand as originally used was not below the "Oread" lime.

Illustration: Blackwell No. 1 Endicott, SE NE SE 34-25N-1W.

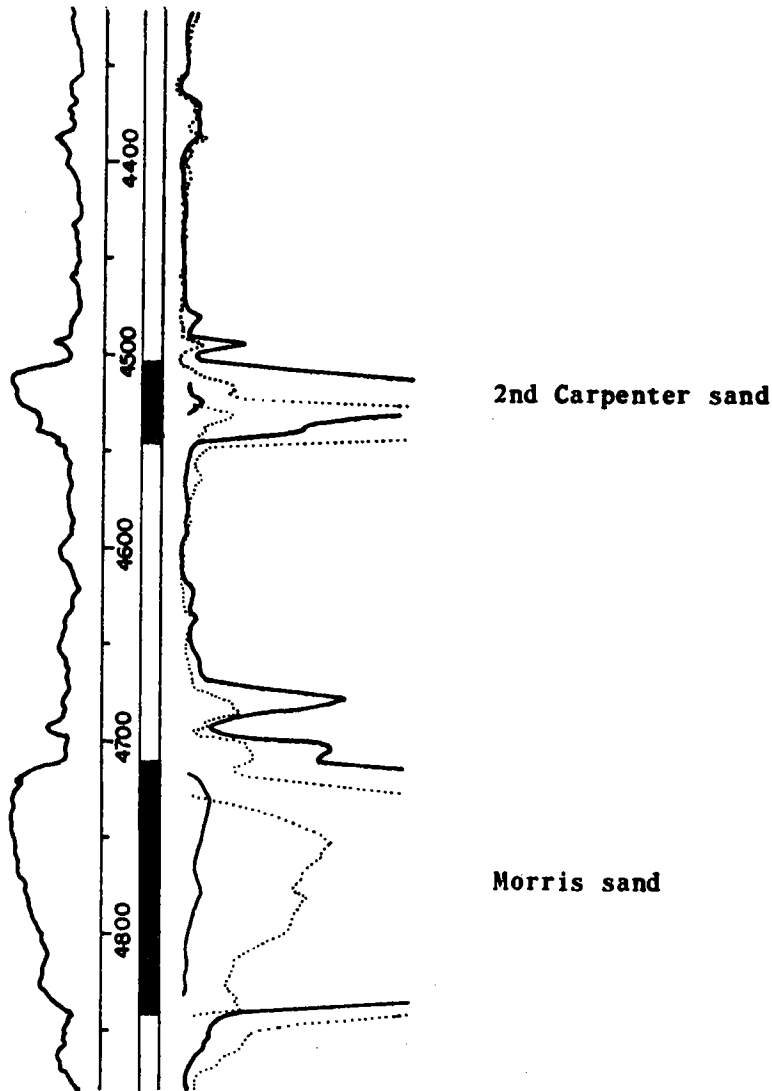


Published by Shaw (1954), OCGS, vol. 5, no. 3, p. 2; (1955), p. 346.

Named by well sitters and scouts from Carpenter lease in sections 15 or 22, 2S-3W, Fox-Graham field, Carter Co.

First and Second Carpenter sands in Deese group above Morris sand. Equal to Basal Tussy sand of Camp field (Parker, PGSO, vol. 1, p. 179); to upper sandstone of Tussy-Five zone in Tussy sector of Tatums field (Hoard, *ibid*, p. 194). Below Sutherland sand of Graham field. Equivalent to Williams and Bay sand of N Alma (R. L. Beasley, 1946). See illustrations of Sutherland and Bennett sands for First Carpenter, and Smith sand for both First and Second Carpenter.

Illustration: Nichols and Duncan, No. 1 Carpenter, SE SW SE 15-2S-3W.



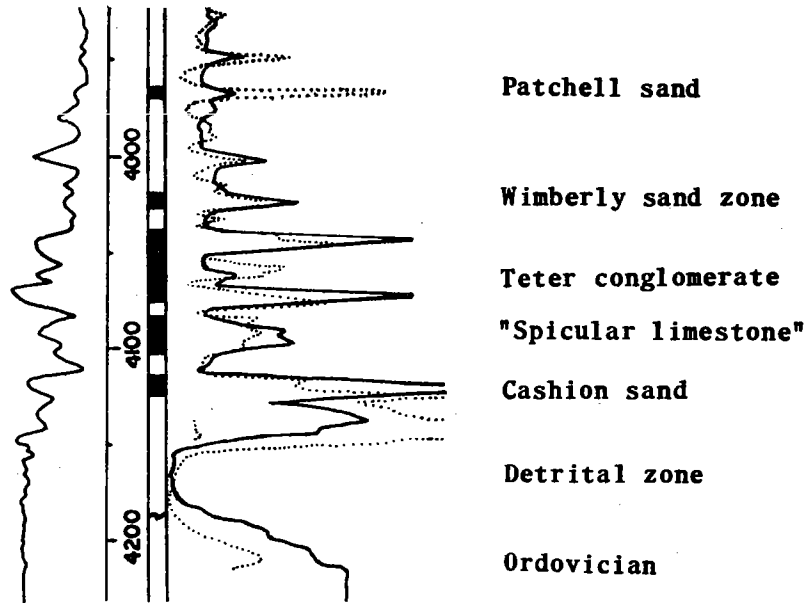
Cashion sandDesmoinesianPennsylvanian

Hicks (1956), PGSO, vol. 1, p. 343.

Named for Cashion Unit lease of Stanolind, in No. 1, NW NE SE 31-4N-1E, Pauls Valley field, Garvin Co.

Medium- to coarse-grained sandstone composed of rounded, frosted quartz grains, probably derived from Ordovician ss. In base of Wewoka fm., onlaps a detrital zone on the flanks of the structure.

Illustration: Stanolind No. 1 Cashion Unit, type locality.

Castle Rock sandSpringeranPennsylvanian

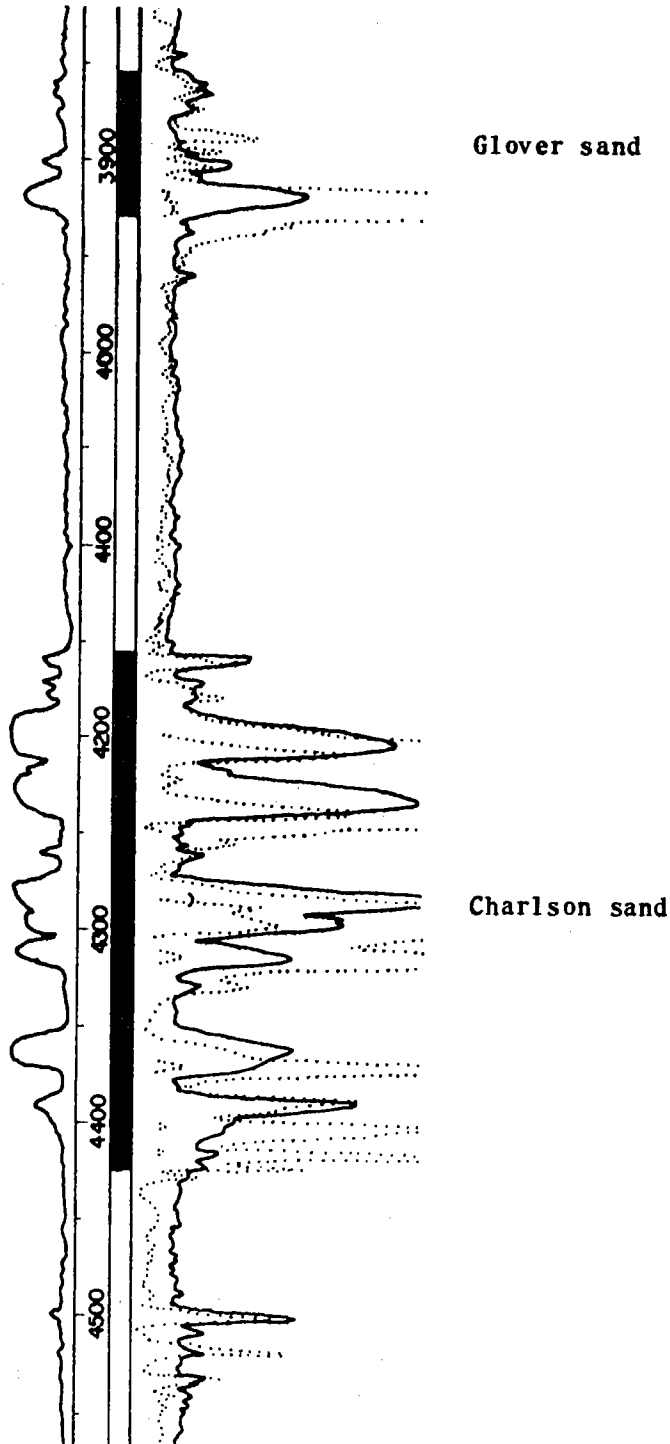
Mentioned by Roth (1938), Econ. Geol., vol. 23, p. 45.

Apparently a manuscript surface name, here applied to a sandstone at 2,250 feet in Schermerhorn-Ardmore Co., No. 1 Jolliff, NE NW NW 24-5S-1E, Carter Co., a dry test drilled in 1926.

Ref. - Ingram (1941), OGJ, vol. 40, no. 9, July 10, p. 23.

Named for Charlson lease of Sinclair, SE 22-5N-8W, Chickasha field, Grady Co. Charlson sand zone from 4,154 to 4,424 feet in illustrated well, consisting of white sandstone interbedded with shale. Lies in Deese group below Glover sand, above Pooler sand. Equal to Kistler sand of Cement field (note by A. J. Montgomery, 1955).

Illustration: Sinclair Prairie No. 8 Charlson, C NW SE 22-5N-8W.

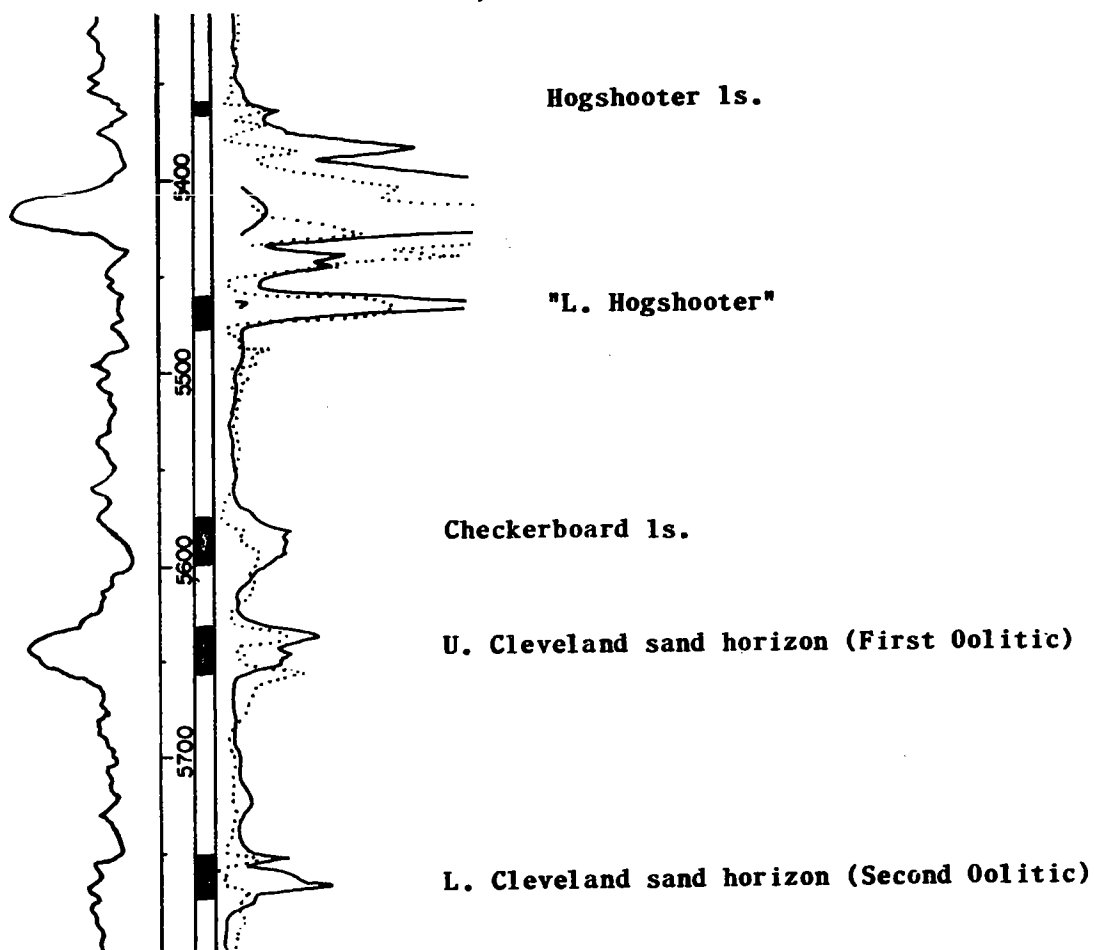


Charles (1929), AAPG, vol. 14, p. 1519.

Called in Oklahoma City field, 11 and 12N-3W, Oklahoma Co.

The "Oklahoma City Checkerboard lime" is probably equivalent to the Hogshooter ls. (at least the lower part of the Hogshooter) plus the true Layton sand of the Coffeyville fm. below (note from G. M. Maddox, 1956). This also appears to be the condition in 16 and 17 N, 1W and 1E, as shown by McKenney (1953, OCGS, vol. 3, no. 6, p. 6; (1955), p. 149). His "Layton" sand, however, is Cottage Grove sandstone (Osage Layton).

Illustration: Briscoe No. 1 Block 18, SW SW SW SE 13-11N-3W.



*Checkerboard limestone

Missourian

Pennsylvanian

Named by Hutchison (1911), OGS 2, p. 151.

Surface name originally descriptive of joint pattern. Name validated by giving name of Checkerboard to a creek in 22-15N-11E, Okmulgee Co. (Gould, 1925, OGS 35, p. 72).

Consists of one to three limestone beds overlain by black fissile shale. Below Coffeyville fm. and above Seminole fm. Widely used subsurface marker bed, but name applied to limestone not necessarily at same horizon as surface unit.

Checkerboard sand

Missourian

Pennsylvanian

Daniel H. Swartz reports production in Cabot Carbon No. 1 Hodges, NW SE 1-5N-24 ECM, W Mocane field, Beaver Co., completed 2-23-55, 100 feet thick, at 5,314 feet. See Hodges zone, the better name.

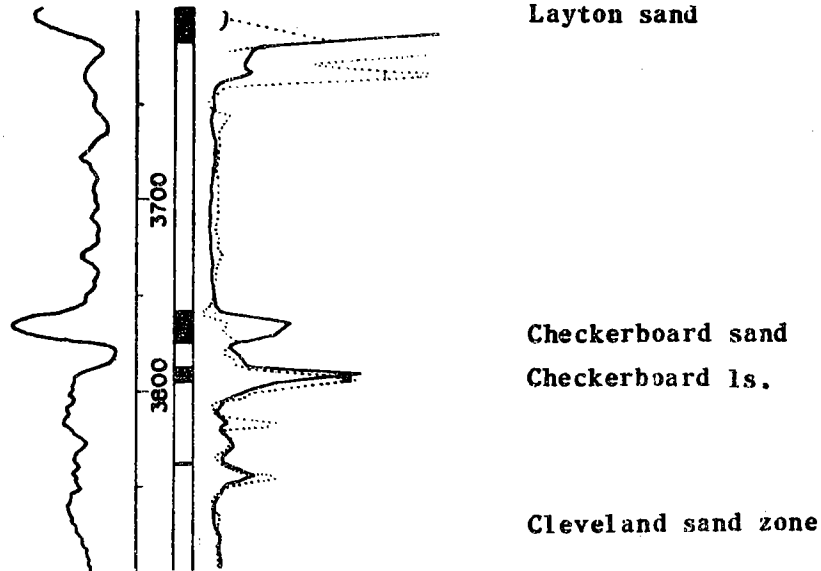
Name first used in Scout check in 1951.

Named for Checkerboard ls., which is 0 to 40 feet below.

Discovery in Sinclair No. 1 Tansel, NE NE SW 8-14N-2E, West Wellston field, Lincoln Co. in Sept. 1951. Sand at 3,750 to 3,850 feet in pool (notes from B. O. Prescott, 2-55).

The term Checkerboard sand has also been applied to the sandstone (Cleveland sand) below the Checkerboard ls. in 16N-5E (SGS, 1949, Cross-section No. 1). It is thought that the term Checkerboard has already lost its stratigraphic usefulness in the subsurface and should not be applied to pays in new areas such as NW Oklahoma.

Illustration: Sinclair No. 1 Tansel.



Haworth and Kirk (1894), Kans. Univ. Quart., vol. 2, p. 105.

Named for Cherokee County, Kansas.

Originally as Cherokee sh., to include strata from base of Oswego ls. (Ft. Scott ls.) or base of Swallow ls. (Breezy Hill ls.?) to top of Mississippian (then thought to be Galena ls.).

Redefined to extend from base of Ft. Scott to base of Desmoinesian strata. In subsurface the unit extends from the base of the Oswego lime (base of Breezy Hill ls.) to base of Desmoinesian. Name abandoned on surface in Oklahoma as useless grouping defined from poorly exposed type area, and name preoccupied by Cherokee slates of North Carolina, Cherokee ls. of Missouri and Kansas.

Worthen (1860), AAAS, Proc., vol. 13, p. 312.

Named for city of Chester, Randolph Co., Ill.

Originally as formation. In Oklahoma, the series is represented by Pitkin ls., Fayetteville sh., Hindsville ls. (NE Oklahoma); Caney sh. (S Oklahoma); and occurs in subsurface in NW Oklahoma and in Panhandle. Manning zone of Ringwood pool is Chesterian. A "Chester lime" of Beaver Co. proved productive in Sinclair No. 1 Maple (SW NE 26-5N-24ECM) on 9-18-52 at 6,548 feet (note by Swartz, 1955).

Chickasha sand

Leonardian

Permian

First ref. - NOSLA (1943), vol. 13, p. 444.

General reference to gas sand in Chickasha field, Grady Co.

Chicken Farm sand

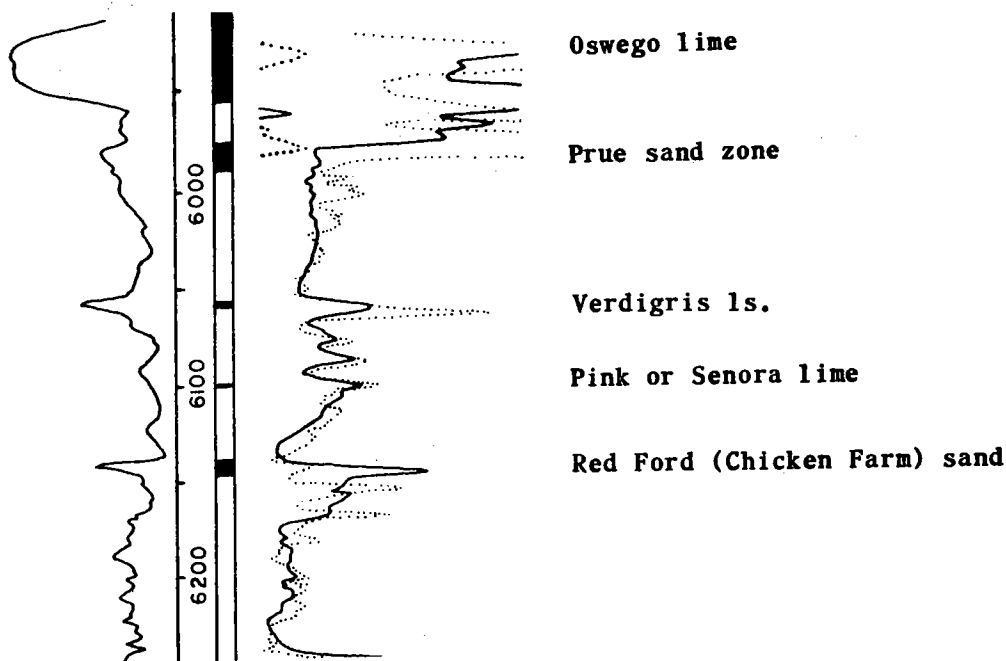
Desmoinesian

Pennsylvanian

Named for a chicken farm in Nicoma Park field at discovery well, Mid-Kansas and Ramsey No. 1 Trosper "A" (NE NE NW 19-12N-1W), Oklahoma Co., drilled in Sept. 1929 to a total depth of 6,904 feet.

Also called Chicken Ranch sand. Equivalent to Red Fork sand. Name in use since 1934 (notes from G. C. Maddox, J. G. Newell).

Illustration: Harper-Turner-British American No. 1 Whitt, NE NE NE 24-12N-2W from 6,140-6,146 feet.



*Chimneyhill formation

Hunton group

Silurian

Reeds (1911), Amer. Jour. Sci., vol. 182, p. 256.

Named for Chimney Hill Creek, 4-2N-6E, Pontotoc Co.

Lies upon Sylvan sh. Consists of basal oolitic limestone, limestone with scattered glauconite grains and of dense limestone with pink columnals of crinoids. In subsurface, the units are called Oolitic, Glauconitic, Pink Crinoidal limes. It would be clearer to refer to Chimneyhill Glauconitic and Chimneyhill Oolitic limes.

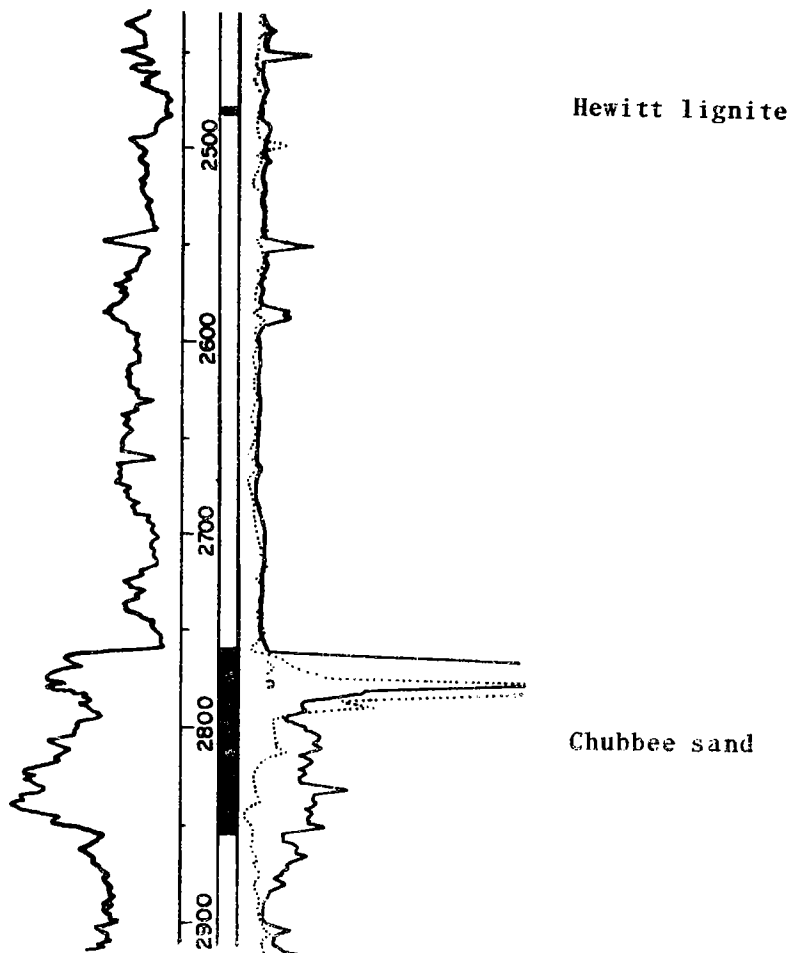
First ref. - Westheimer and Schweers in Selk (1951), AAPG, vol. 35, p. 597.

Named for Chubbee lease of Texas, discovery in No. 1 Chubbee, NW NW SW 5-5S-1W, SW Lone Grove field, Carter Co. in May 1944 at 2,760 to 2,784 feet.

Sandstone, medium coarse, subrounded, generally loosely bonded, containing some devitrified chert, glauconite and small green-gray shale fragments. Downward in the section, the sandstone becomes generally finer grained, slightly more angular and at places calcareous, 100 to 200 feet thick. Lies approximately 300 feet below Hewitt lignite and traced eastward immediately underlies the Confederate ls. (notes from J. M. Westheimer, 8-31-56). See Westheimer and Schweers (1956), PGSO, vol. 1, p. 147.

Productive in part of Bayou field, SW Lone Grove and NW Hewitt.

Illustration: Texas No. 1 Chubbee.



Dumble (1890), Tex. Geol. Surv. 1st Ann. Rept., pl. 3, p. lxxvii.

Named for Cisco, Eastland Co., Texas.

Sellards (1933), included (descending) Pueblo, Harpersville, Thrifty and Graham formations in Cisco group. Cheney raised group to series, revising boundaries so that it was approximate Texas equivalent of Virgil series of Mid-Centinet region.

Applied in subsurface in southern Oklahoma to rocks of partly marine facies of upper part of Hoxbar group or lower part of Pontotoc, Virgilian in age, limiting the term Hoxbar group to rocks of Missourian age. Divided into Upper and Lower Cisco. See index of AAPG (1956), PGSO, vol. 1.

Mentioned by Roth (1928), *Econ. Geol.*, vol. 23, p. 45.

Used for Overbrook ss. in Schermerhorn-Ardmore Co. No. 1 Jolliff, NE NW NW 24-5S-1E, Carter Co. Name never in common use.

Cleveland sand

Missourian

Pennsylvanian

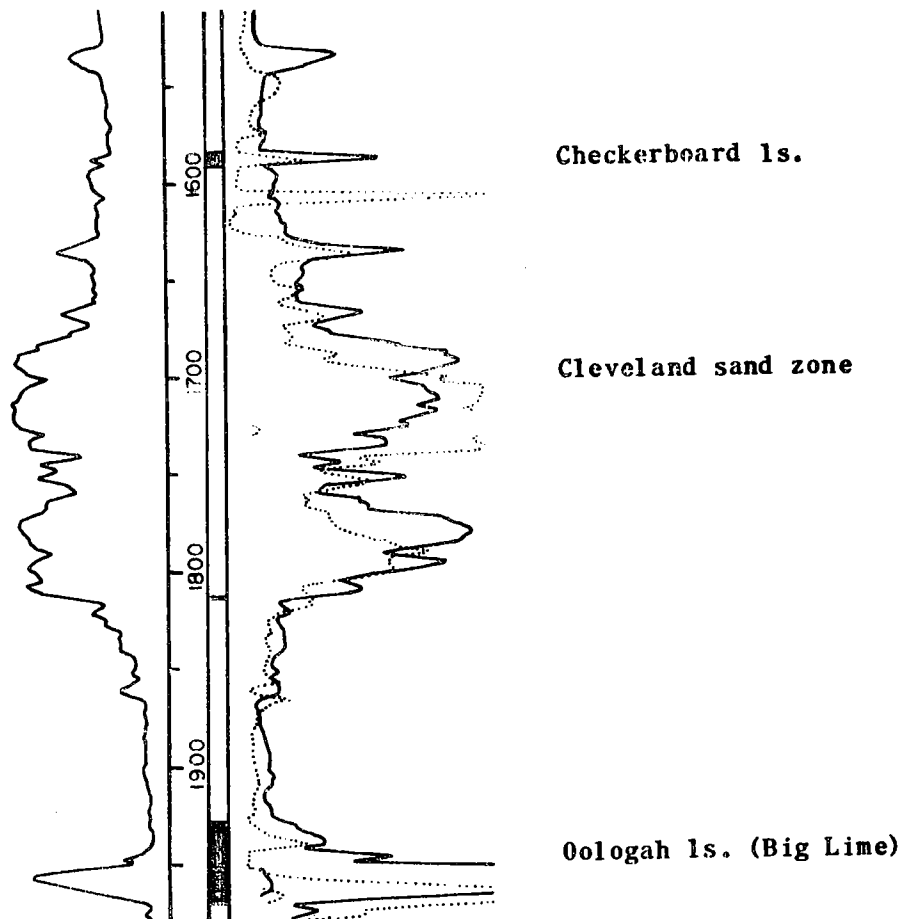
Hutchison (1911), OGS 2, p. 198.

Named for city of Cleveland and Cleveland field, 21N-8E, Pawnee Co.

Porous sandstone in upper part of Seminole fm., below Checkerboard ls. and above rocks of Marmaton group. Divided into Upper Cleveland and Lower Cleveland, at many places with Dawson coal separating the two sand zones. Upper Cleveland locally called Jones sand, and Lower, Dillard sand.

Name used in C, NC, NW Oklahoma.

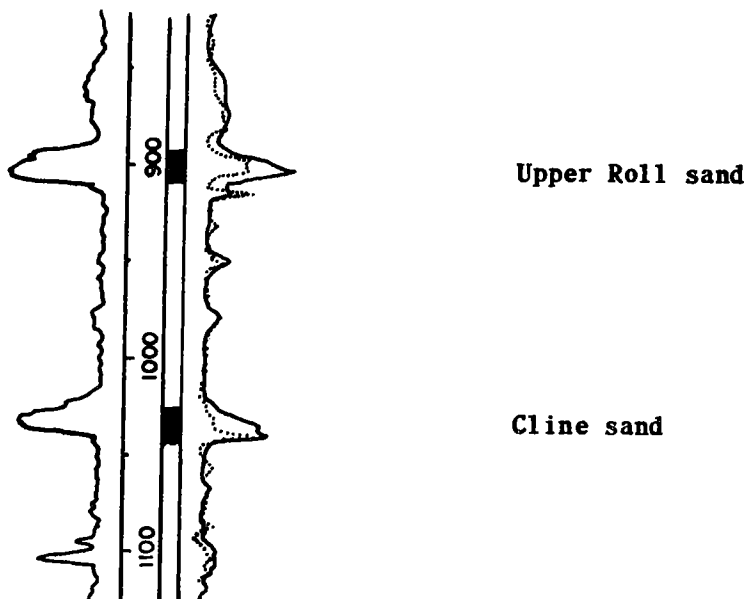
Illustration: Sinclair No. 46 J. A. Jones, CNW 20-21-N-8E.



Listed in table by Hayes (1952), OCGS, vol. 3, no. 2, p. 7; (1955), p. 101.

Named for Cline lease of Texas, NE 8-3N-10W, Fort Sill field, Comanche Co.
Lensing sands in Wellington fm., 50 to 150 feet below Roll sands.

Illustration: Texas No. 1 Cline NW NE 8-3N-10W.



Fohs and Gardner (1914), Fuel Oil Jour., Aug. Supplement.

Named for Colbert pool, Tulsa Co.
Equal to a Dutcher sand. Name not in use. Name conflicts with Colbert porphyry
of W Arbuckle Mts.

Cole wash

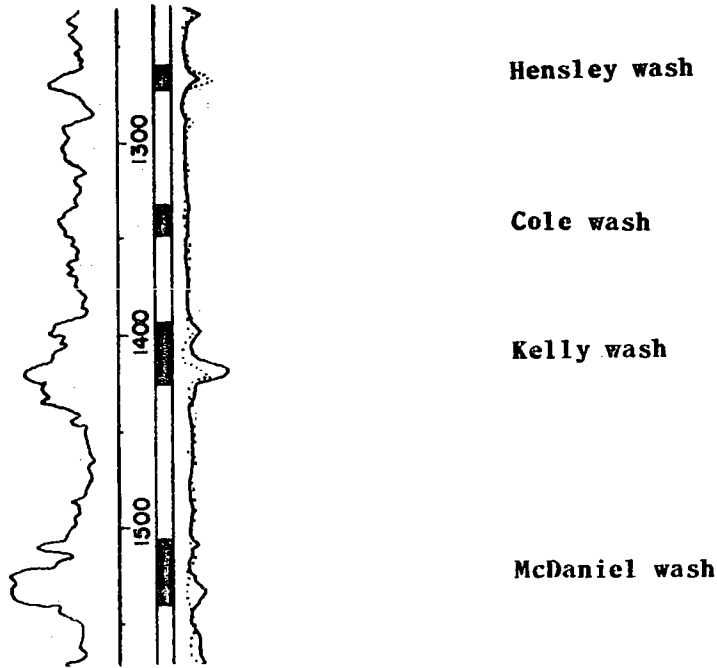
Wolfcampian

Permian

Named for Mid-Continent No. 1 Guy Cole lease, SE SE NW 3-1N-20W, Altus field, Jackson Co.

Granite wash production, 500 feet below top of Pontotoc. Below Hensley wash, above Kelly wash. Assignment of age by Charles Ryniker, 10-1956.

Illustration: Gulf No. 4 McDaniel, SE SW NE 3-1N-20W.

*Coline sand* (NW Marlow)

Missourian

Pennsylvanian

Named for Coline Oil Co. Discovery in No. 1-A Johnson, SW NE NW 1-2N-8W from 9,015 to 9,150 feet, Stephens Co. Name as applied here is declared obsolete.

At the time of discovery, it was impossible to correlate this test with wells in the nearest fields, namely Chickasha and Cement fields. The wildcat activity to the north of this test in recent years has enabled most geologists to correlate the No. 1-A Johnson into the Chickasha-Cement type section. This was done in the AGS (1956), Cross-section C-C' in Well No. 6, Coline No. 1 Cooper Johnson, SE NW SE 1-2N-8W, which definitely establishes the fact that this "Coline" sand is equivalent to the Wade sand of Cement and Chickasha fields. Since the usage of "Wade" sand antedates the drilling of the No. 1-A Johnson, it is suggested that the term "Coline" sand in this test and NW Marlow field be declared obsolete; that the type locality of the Coline sand be declared to be in the W Marlow field, where by jump correlation from the No. 1-A Johnson to the first wells in W Marlow field, the term was applied to sands now considered to be of Virgilian age, above the Olson and Sears sands which are thought to be equivalents of Rowe sands of Cement field (notes from W. B. O'Hearn, 1-11-57).

It might also be appropriate to note here that the placement of the boundary between the Virgil and Missouri series on the Ardmore Geological Society (1956) Cross-sections 1956 was a point of considerable and strong disagreement among geologists working in that area. In the Coline No. 1-A Johnson some geologists would place the Cisco-Hoxbar unconformity at approximately 8,800 feet in this well, which is considerably below where it is placed on the Cross-section C-C', contending that the unconformity at this lower position can be readily correlated from the line of cross-sections eastward through Chitwood, Carter-Knox and into the Golden Trend area where a tie may be made with L. H. Lukert's cross-section, which traverses Northern and Central Oklahoma (1949, AAPG vol. 33 pl. 2), in a north-south line to the Golden Trend area (W. B. O'Hearn, 1-11-57).

Name published by Hayes (1952), OCGS, vol. 3, no. 2, p. 7; (1955), p. 101.

Type locality designated by W. B. O'Hearn in Texas Co. No. 1 Williams, SW NW SW 22-2N-8W, Upper Coline sand from 6,220 to 6,280 feet, Lower Coline sand from 6,355 to 6,480 feet, elevation, 1,121 feet, a well drilled in W Marlow field where the Coline sand name has been applied during the development of W Marlow field, Stephens Co.

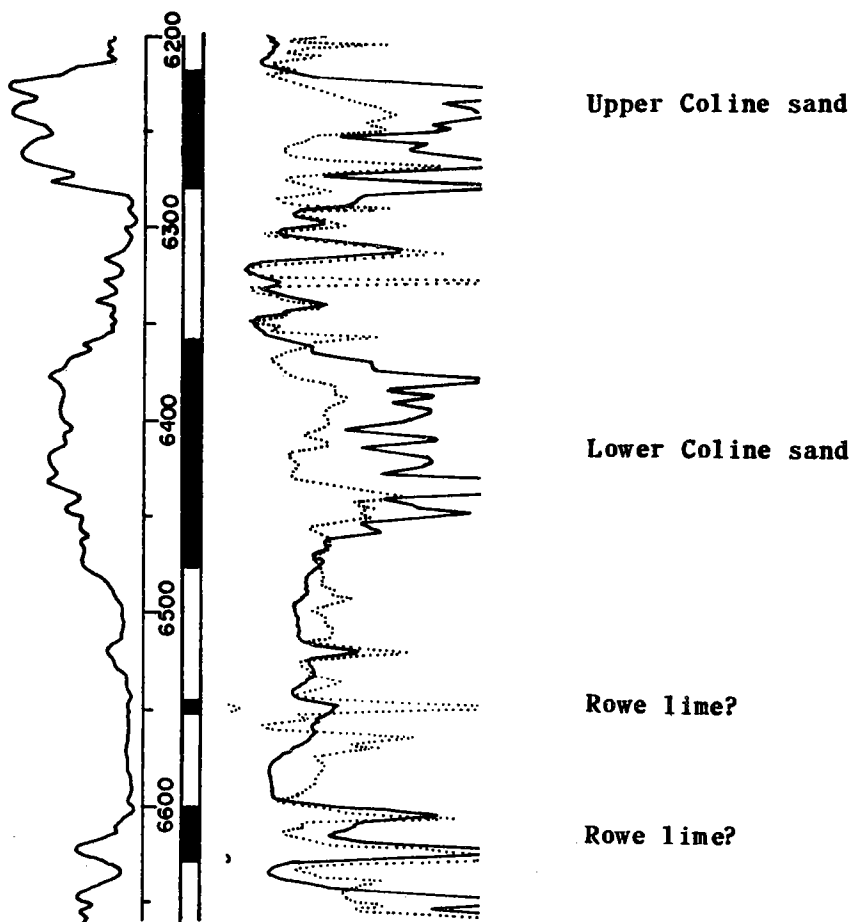
Upper Coline sand is normally less than 50 feet thick, thin to absent in many wells, lies below a prominent limestone marker which is called "Lower Gregory lime" on AGS (1956), Cross-sections C-C' and D-D', and above Lower Coline sand. This limestone is present in illustrated well from 6,085-6,100 feet.

Lower Coline sand is well-developed in most wells in W Marlow, approximate thickness from 100-150 feet, lies below Upper Coline sand and above Rowe line (notes from W. W. Solter, W. B. O'Hearn, 1957).

Correlation of Rowe line into this log is placed differently by geologists.

According to Hayes, the Upper Coline was correlated with Rowe sands and Lower Coline with Niles sand of Cement field. This correlation is now considered incorrect. On AGS (1956), Cross-section C-C', Well No. 1 (Gulf No. 1 Jones, C SE SE 26-2N-8W), the sands called Coline in W Marlow field are below Lower Gregory lime and above Rowe line. If these correlations are correct, the Coline sands are equivalent to the Griffin sands of Cement.

Illustration: Texas No. 1 Williams, SW NW SW 22-2N-8W, designated type locality.



Cooper sand

Virgilian

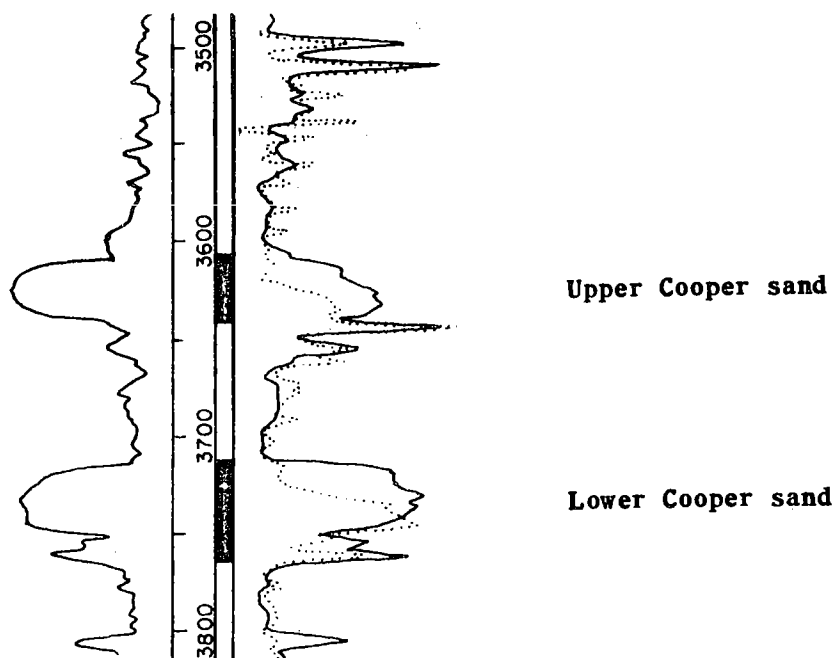
Pennsylvanian

Name shown on AGS (1956), Cross-section C-C', Wells Nos. 4, 6.

Named for Cooper lease of the Texas Co. Discovery in No. 1 Cooper, SW SW SW 16-2N-8W, W Marlow field, Stephens Co.

Divided into Upper and Lower Cooper sands, over 1,000 feet above Booth sands, and below Noble Olson sands.

Illustration: Texas No. 1 Cooper.

**Cosden sand**

Desmoinesian

Pennsylvanian

First ref. - Clark and Bauer (1921), AAPG, vol. 5, p. 289.

Named for Cosden Oil Co. Productive at 500 feet in Okmulgee district, Okmulgee Co. In Boggy fm. (?); is probably not the same sand in all parts of Okmulgee district.

***Cottage Grove sandstone**

Missourian

Pennsylvanian

Moore (1932), Kans. Geol. Soc. 6th Ann. Field Conf. Guidebook, pp. 92, 97. Quoted by Moore as named by N. D. Newell.

In central and southern Kansas the Chanute includes a persistent bed of sandstone (Cottage Grove), and just beneath the sandstone is Thayer coal. These beds persist into northern Oklahoma.

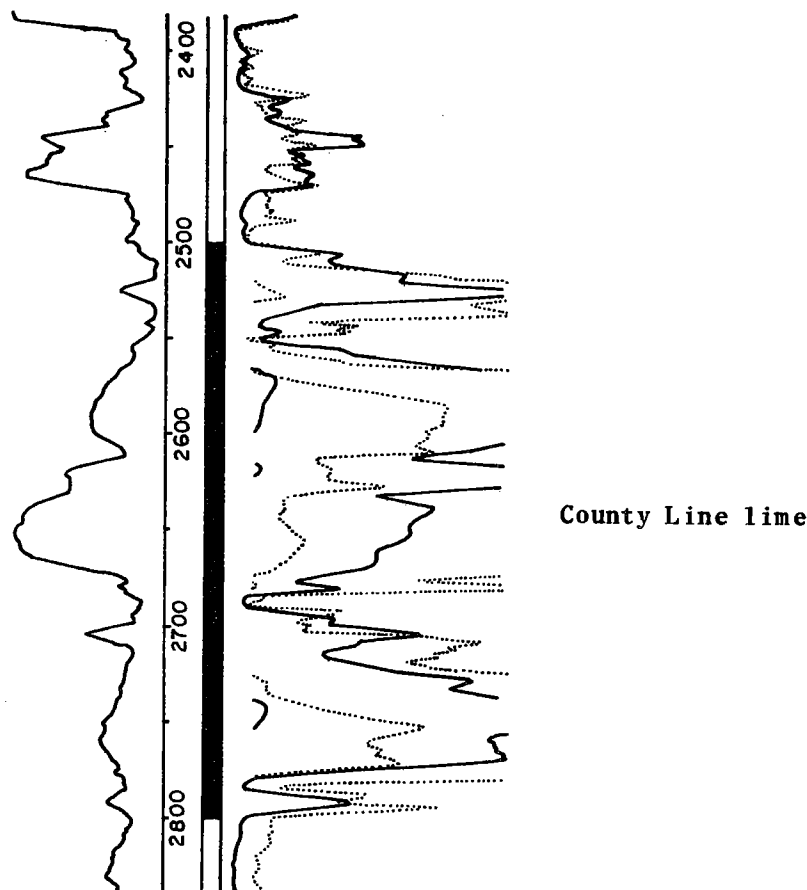
Many terms have been applied to this sandstone in subsurface, including Layton (not true Layton of Creek Co., which is equivalent to Dodds Creek ss.), Peoples-Layton, Osage-Layton, Lower Tonkawa and others. It is suggested that all these terms, which are confusing, should be dropped and name Cottage Grove ss. should be used.

First ref. - Mallory (1948), AAPG, vol. 32, p. 1953.

Named for County Line community in early development of Sholom Alechem field, Stephens and Grady Cos.

In upper part of Hoxbar group. Thought to be equal in part to Anadarche ls. (Parker, 1956, PGSO, vol. 1, p. 176). The unit in illustrated well is essentially limestone, but in other areas consists of interbedded limestone, shale and sandstone. On AGS (1956), Cross-section D-D', Well No. 5, Skelly No. 1 Williams, SE SW NE 16-1S-4W, the nomenclature is not clear, but could be interpreted as meaning that the Doyle and County Line limes are equivalent. Productive in many fields. See also Doyle lime.

Illustration: Atlantic No. 8 Taylor, SW SW NW 12-1S-4W, in the area in which the term County Line lime was applied as early as 1928.



First ref. - Bullard (1928), OGS 40-0, p. 62.

Named for Covington Oil and Gas Co., in Garber field, Garfield Co. 100 feet below "Garber" sand in Garber field, Garfield Co. Sand below Burlingame ls. and above Bird Creek ls. (Howard ls.). See illustration of Campbell sand.

Cox sand

Desmoinesian

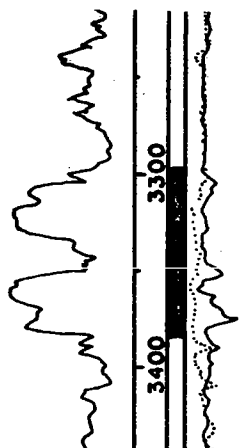
Pennsylvanian

Name of producing oil sand in Walnut Bend field, Cooke Co., Texas.

Name brought into Oklahoma by subsurface correlation and used in Love Co.

Above Bruhlmeier sand in NE Thackerville field, Love Co. (notes from F. B. Jones, 9-1956).

Illustration: Sinclair No. 1 Evans, NE SE SW 34-8S-2E.

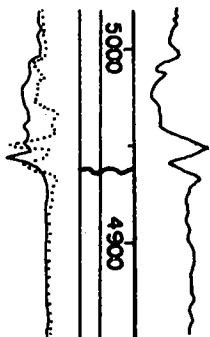


Cox sand

Cravens unconformity

First ref. - AGS (1956) Cross-section B-B'. Below Willie sand, above Baker-Burkhart sand in Hoxbar group.

Illustration: Vickers No. 1 Burkhart, C NE SE 27-1N-5W.



Cravens unconformity

Crews sand

Virgilian

Pennsylvanian

First ref. - Bullard (1928), OGS 40-Q, p. 62.

Named for Crews lease of Exchange Oil Co., part of SW 19-22N-3W, Garber field, Garfield Co.

Sand in the interval above Elmont-Reading (Emporia) ls., and below an undesignated ls. at least 100 feet below the Brownville ls. Below the Campbell sand zone and above the "Garber" sand zone. Vertz sand appears to be a sand in base of Crews sand zone.

See illustration of Campbell sand.

Name used in Cement pool to describe a limestone with abundant crinoid columnals. Equal to Marlow lime.

Cromwell sand

Morrowan

Pennsylvanian

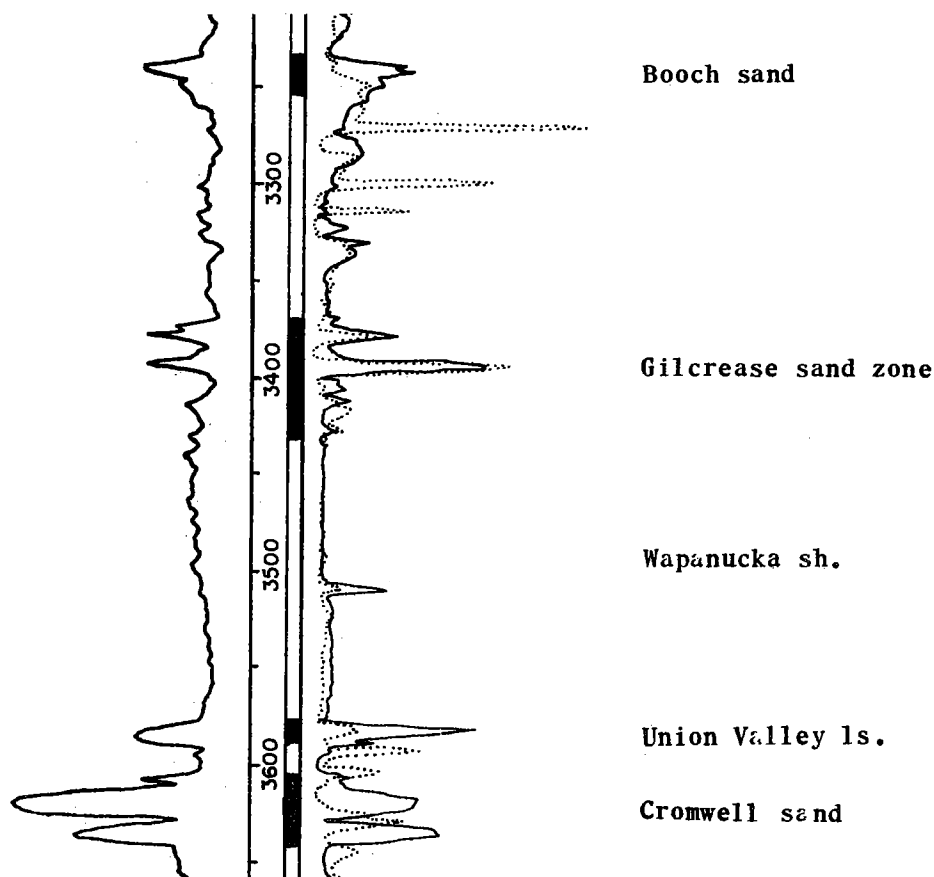
First ref. - Rison and Bunn (1924), USBM, Petr. Eng. Cromwell field, p. 7.

Named for Cromwell Oil and Gas Co. or for Joe Cromwell of the company, discovery at 3,300 feet in 15-10N-8E, Cromwell field, Seminole Co.

Calcareous sandstone with 2 to 30 feet of porosity. Equal to Union Valley ss. Synonyms are Black and Simons, Papoose, Lyons-Quinn, First Cromwell-Smith, Second Cromwell-Sykes, Lyons, Jefferson, Ingram (note by L. M. Wilshire, 1956).

In the above reference, Booch sand was called "Brunner" and Gilcrease called "Harjo".

Illustration: Portable Drilling Co. No. 1 Key, SE SW SE 21-10N-8E.

**Cross sand**

Springeran

Pennsylvanian

Ref. - Parker (1956), PGSO, vol. 1, p. 180.

Named for Continental No. 1 Cross, SW SE NE 7-2S-3W, Camp field, Carter Co.

Below Sims sands or included in Sims sand zone and above Goodwin sand zone in Camp field according to Parker.

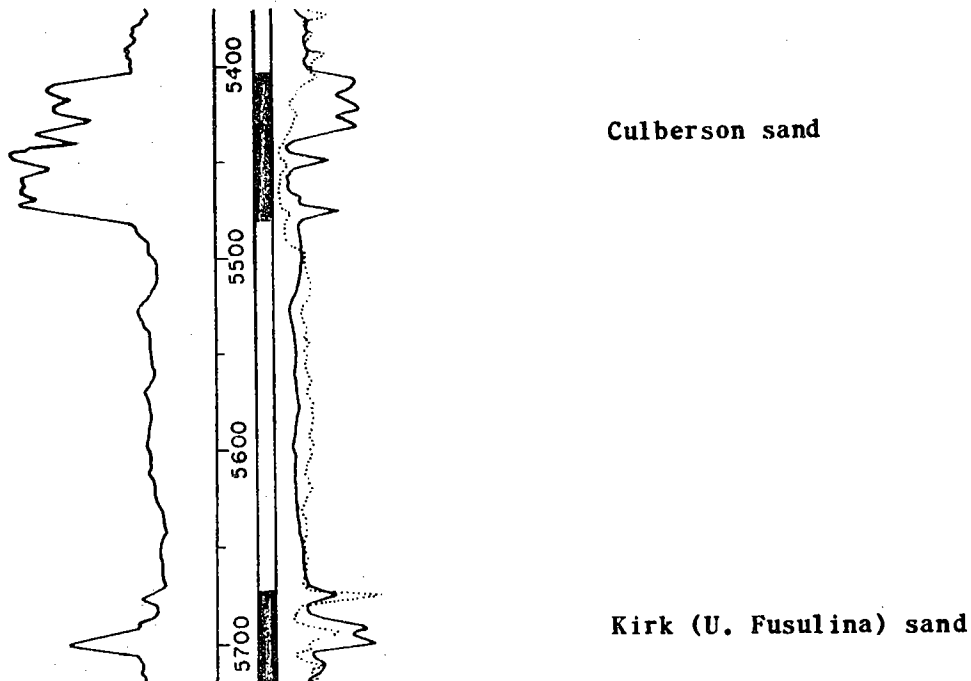
Name has been superseded by the term Flattop sand. See illustration of Flattop sand, which is log of type Cross sand.

First ref. - Mallory (1948), AAPG, vol. 12, p. 1963.

Name is from Phillips Petroleum No. 1 Culberson, NW NW SE 4-1N-5W, discovery in Doyle field, Stephens Co., where it was applied to the first sandstone (at 5,592-5,616 feet) below the Hoxbar Oolitic lime. This sandstone is now known to be the Fusulina (L. Fusulina, L. Fusulinid, Johnson-Atlantic) sand. The sandstone, now called Culberson sand, is absent on the highest part of the Doyle structure. At present, the name is being applied to the Deese ss. above the Kirk (U. Fusulina, U. Fusulinid) sand. Since the sand is absent in the type well and the name has become well-established, G. D. Reavis designates the Phillips Petroleum Co. No. 1 Hitchcock, NW SW NW 18-1N-4W, (drilling completed 7-2-50, elevation, 1,069 feet) as type locality for the Culberson sand, which occurs from 5,405-5,480 feet, above the Kirk sand at 5,674 feet and below the Hoxbar Oolitic lime and post-Deese unconformity.

Culberson sand was also miscalled in the Velma field as the first sand below the post-Deese unconformity, which in some wells is a Second or Third Deese sand. E. C. Parker (1956), PGSO, vol. 1, p. 176, states that this general horizon, 100-150 feet thick, was named Moyer gas sand by Tomlinson and Storm (1924) in Graham field. In the Camp field, the base of the Culberson is 150 feet above the top of the Kirk sand.

Illustration: Phillips No. 1 Hitchcock, NW SW NW 18-1N-4W, designated type locality.

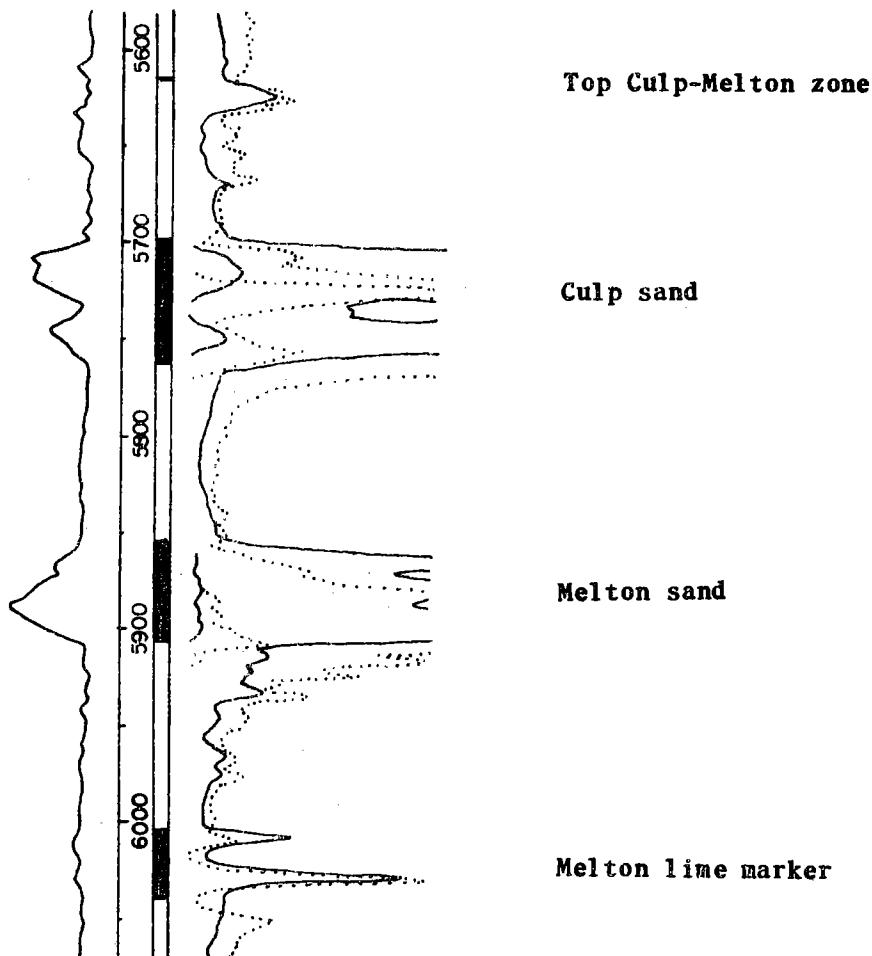


Ref. - Wheeler (1947), World Oil, vol. 127, no. 5, p. 46.

Named for Culp lease of Mid-Kansas (Ohio), in No. 6, NW NW NE 6-5N-9W, Cement field, Caddo Co., where it was first noted but not productive.

Culp sand is the upper well-developed essentially oolitic limestone of the Culp-Melton zone (also called Melton oolitic zone) below Marchand sand and above the type Melton. Where called Melton oolitic zone, the Culp is the upper Melton. On the illustrated log, the Culp-Melton or Melton zone is in the interval 5,610-6,035 feet, below the Marchand sand and above the Glover sand. H. R. Segnar reports that, in the Cement field area, the limestone from 6,005-6,035 feet has been called the Melton lime marker. Culp-Melton zone shown on AGS (1956), Cross-section C-C' in Magnolia No. 1-A Miller, C NW NE 14-6N-9W. See also Melton sand.

Illustration: Peppers and Stanolind No. 1 Culp, SW NW NE 6-5N-9W.



Cunningham sand

Springeran

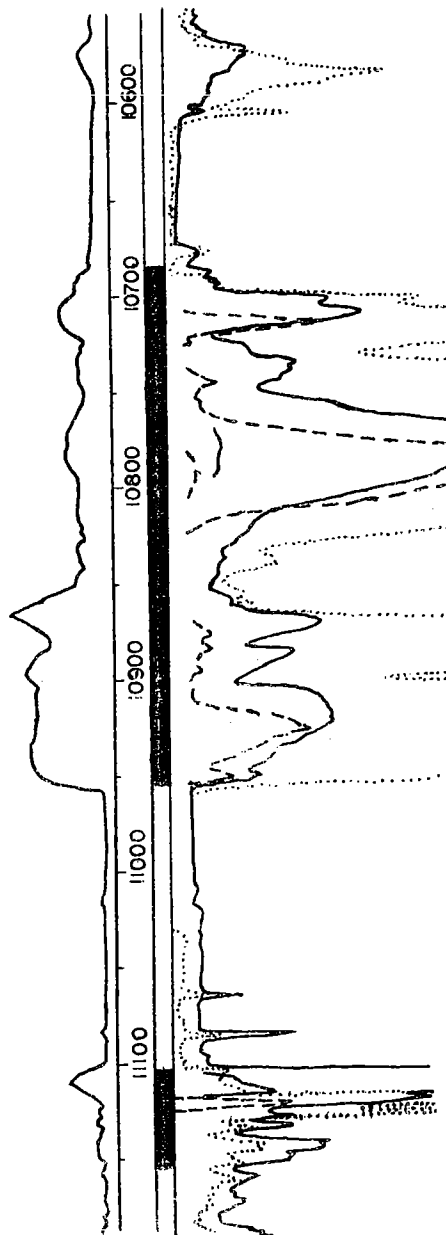
Pennsylvanian

First ref. - Wallace (1954), OCGS, vol. 4, no. 7, p. 9.

Named for W. D. Cunningham lease of Magnolia, discovered in No. 1, C SE SE 33-5N-6W, Chitwood field, Grady Co.

Tan sandstone up to 220 feet thick, highest Springeran sand in Chitwood area, above Britt sand. May be equal to Woods sand of Carter-Knox field, and Aldridge of North Alma field (note by R. M. Becker, 9-1956). Equivalent to Parks sand of SE Purdy field (note by R. L. Beasley, 12-1956).

Illustration: Magnolia Petroleum No. 2 Cunningham, C NE SE 33-5N-6W.



Cunningham sand

Britt sand

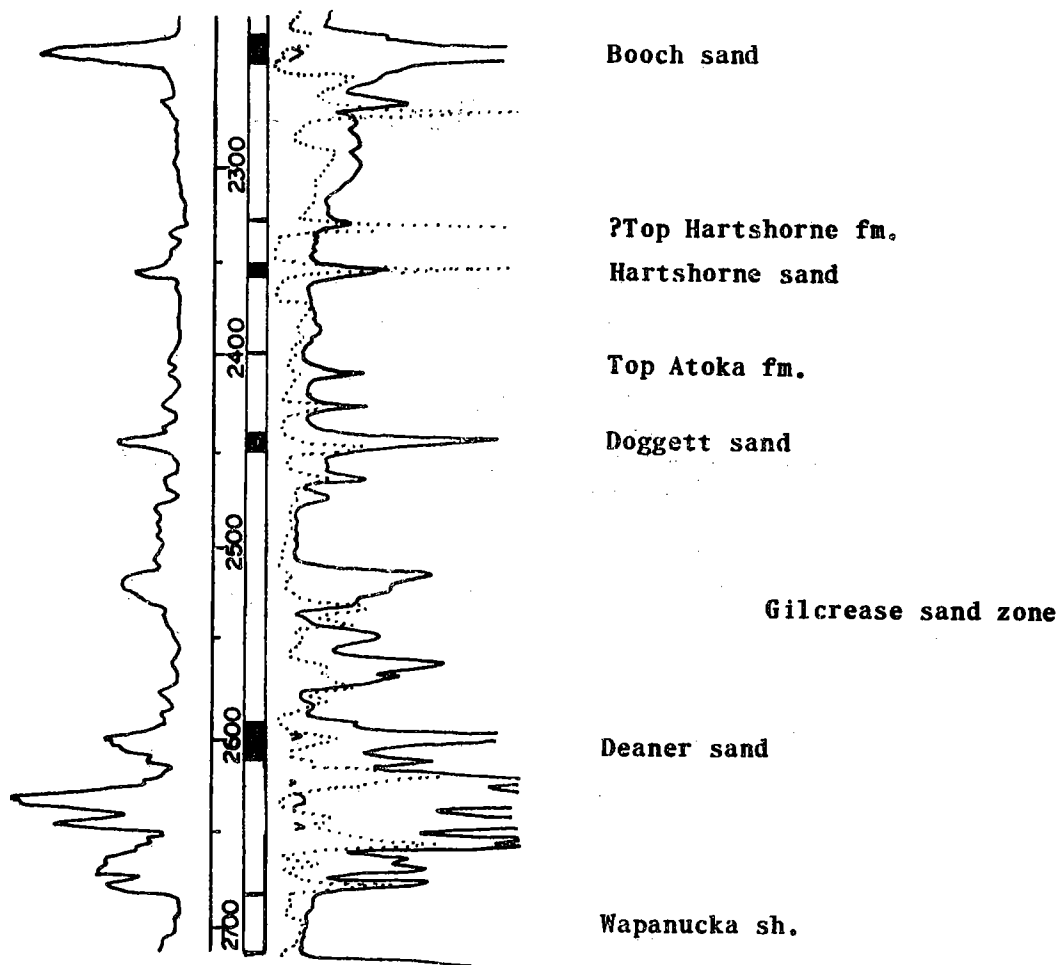
Named for town of Cushing, Payne Co. Applied to Red Eagle ls., widely used as a marker in surface mapping.

Kirwan and Schwarzenbek (1921), USBM, Rept. Deaner field, p. 5.

Named for Dr. J. J. Deaner of Deaner and Jameson, discoverers of gas in No. 1 Red Holmes, NE NE NW 22-11N-11E, Sept. 1919, Deaner field, Okfuskee Co.

Authors stated that samples indicated that Deaner and Kingwood "sands" consisted of limestone and sandy limestone in this field. In discovery well, Booch is at 2,058, Doggett at 2,262 and Deaner at 2,410 feet. Top of Deaner "sand" averages about 150 feet below top of Doggett "sand" in field. In the illustration, the Deaner and Doggett "sands" are placed by correlation with the nearest wells shown on the cross sections prepared by the above authors. Kingwood "sand" below Wapanucka sh. considered Union Valley and younger (notes from L. M. Wilshire). Pay zone in the Gilcrease sand zone.

Illustration: Seran Drilling Co. No. 1 Douglas, NW SW NW 22-11N-11E.



***Deese group**

Desmoinesian

Pennsylvanian

Goldston (1922), AAPG, vol. 6, p. 8.

Named for village of Deese, 33-3S-1E, Carter Co.

Considered a formation including beds from base of Confederate ls. to top of Pumpkin Creek ls. Raised to group status in 1953. In descending order contains Natsy ls., Williams ls., Rocky Point cg., Arnold ls., Devil's Kitchen ss. and intervening shale and sandstone. Lies below Hoxbar group, above Big Branch fm. of Dornick Hills group.

Equivalent to Desmoinesian series exclusive of McAlester and Hartshorne fms.

According to AGS (1956) Cross-section B-B', Second Deese is equivalent to Upper Fusulina (Kirk) sand; Third Deese to Lower Fusulina (Johnson-Atlantic) and Gibson sand; Fourth Deese to Upper Tussy (Eason) sand and Hart sand.

Deese Maroon shale

Desmoinesian

Pennsylvanian

McBee and Vaughan (1956), PGSO, vol. 1, p. 360.

Name is descriptive of age and lithology.

Maroon shale of Deese age in subsurface of Jefferson County, 1,000 feet, with seams of coal, thin limes. In S Oklahoma, the term, Deese Maroon sh., is informally applied specifically to the occurrence of maroon clay between the 6th and 7th Lone Grove sands, 3rd and 4th Hewitt sands. The top of this unit is considered by some geologists to be the Missourian-Desmoinesian boundary (see Lone Grove and Hewitt sands), but others believe that the boundary is higher in the stratigraphic section.

Dense lime

Ordovician

Descriptive of lithographic or compact limestone.

Used in Oklahoma for upper unit of Bromide fm., better called Bromide Dense. Mistaken for Trenton Dense or Viola Dense at places. In Permian Basin, the Dense is a widely used marker at base of San Andres Dolomite.

Detrick sand

Ordovician

Clark and Bauer (1921), AAPG, vol. 5, p. 291.

Named for Mr. Detrick, discoverer in Morris pool, Okmulgee Co. Probably sandstone in Tyner fm.

Detrital zone

Used for several zones of detrital material such as basal Hoxbar in S. Palacine, basal Desmoinesian in Oklahoma City. Should in each case be modified by age of deposition indicator such as Hoxbar detrital, Cherokee detrital.

Dillard sand

Missourian

Pennsylvanian

First ref. - Greene (1928), OGS 40-CC, p. 11.

Name used in Pawnee Co. for Lower Cleveland sand.

First ref. - Kirwan and Schwarzenbek (1921), USBM, Rept. Deaner field, p. 4.

Named for Doggett lease of Deaner and Jameson, SW NW 15-11N-11E, Deaner field, Okfuskee Co., discovered in October 1920.

Above Deaner sand; a pay zone in Gilcrease zone, varying in thickness from 5 to 145 feet. See illustration and discussion of Deaner sand.

Dolman formation

Missourian

Pennsylvanian

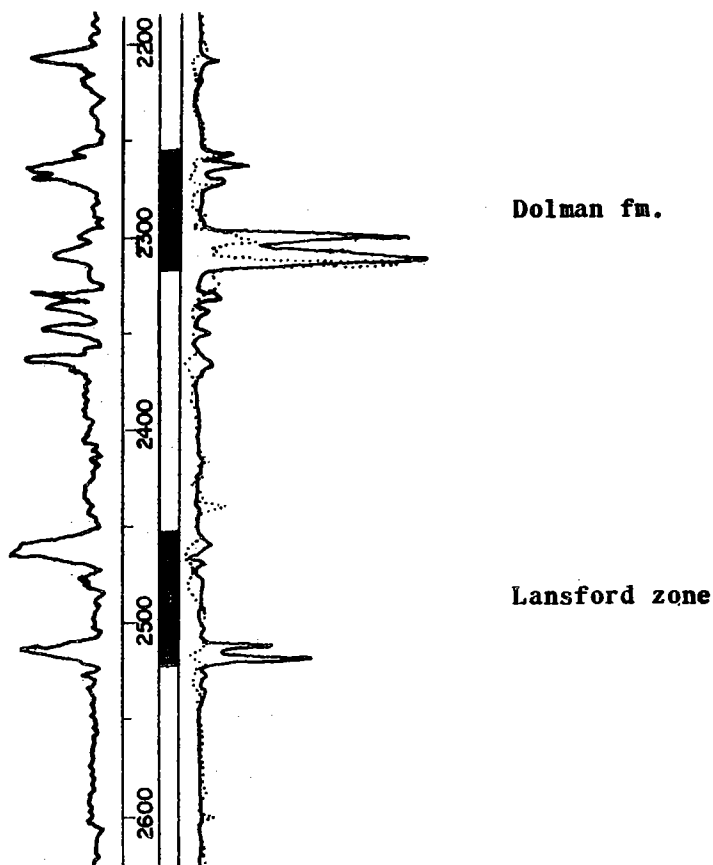
First ref. - Westheimer and Schweers (1956), PG50, vol. 1, p. 146.

Named by Westheimer and Schweers after Dolman lease of Samedan Oil Corp. in No. C-12, NE SW NE 7-5S-1W, SW Lone Grove field, Carter Co.; upper limestone member from 2,252-2,257 feet and lower from 2,293-2,313 feet.

"About 250 feet below the Anadarche ls. are two distinctive limestones about 40 feet apart. These beds are between the Anadarche ls. and the Crinerville ls. of the surface section, and have no recognizable surface equivalent. As these beds are persistent for many miles in the subsurface the name Dolman fm. is applied. The upper member, generally 5-10 feet thick, is an amber-colored, generally finely arenaceous, fossiliferous limestone commonly containing "Ammovertella". The lower limestone, about 20 feet thick, is finely sucrose, white to buff, and generally contains crinoid fragments." This formation has recently been recognized and mapped on the surface in the Brock anticline (E. A. Frederickson, 5-1957).

Lies about 250 feet below Anadarche ls. and about 450 feet above the Hewitt lignite in the Hoxbar group in SW Lone Grove field.

Illustration: Samedan No. C-12 Dolman, type locality.



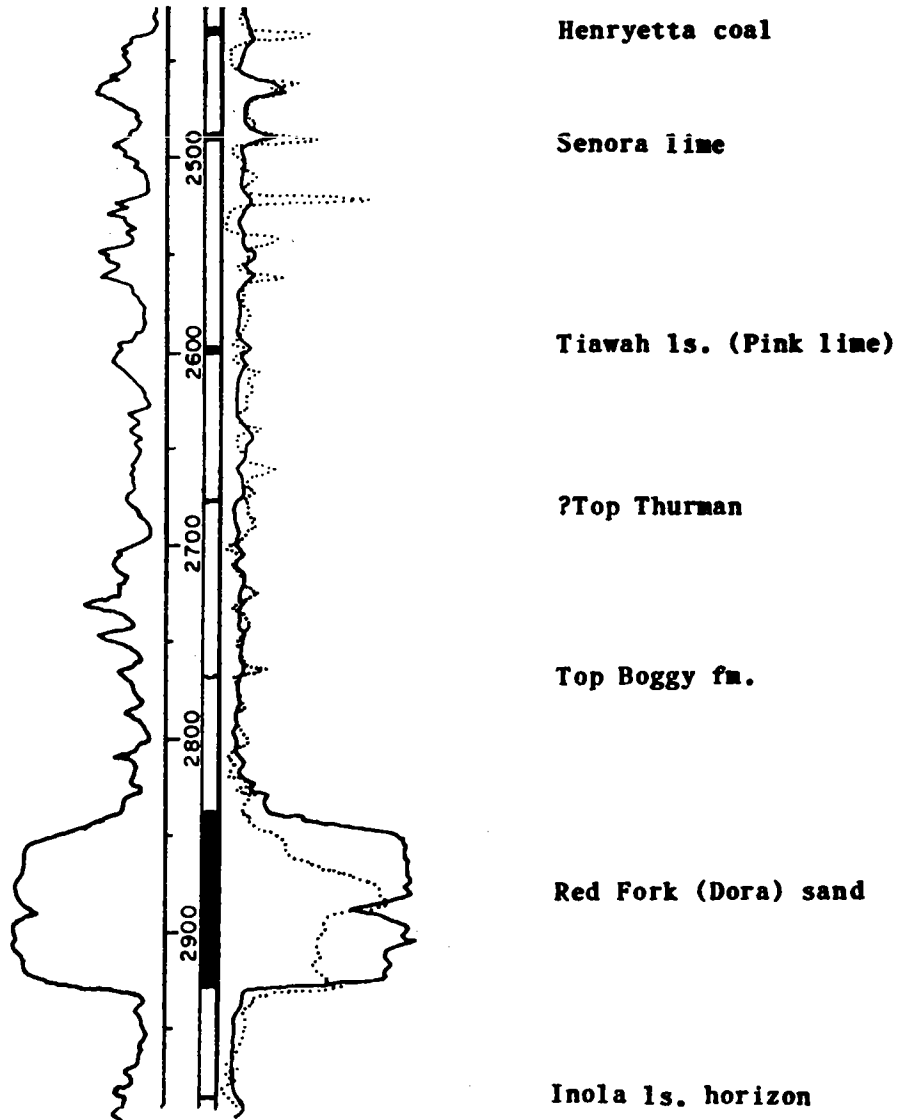
First ref. - Ingham (1939), AAPG, vol. 23, p. 694.

Named for Dora pool, discovered by Malernee in No. 1 West, SE SE NW 33-7N-6E, at 2,934 to 2,959 feet, Seminole Co.

In reference quoted, Ingham states that the Dora sand is 280 to 330 feet below the Senora lime and is within the Thurman fm. However, it is known to be within the Boggy fm., equivalent to Red Fork and Earlsboro sands, below the Thurman and above the Inola.

Name no longer in use except in Dora field (notes from F. J. Smith and D. L. Hyatt).

Illustration: Bradley Producing No. 1 Shelton, SE NE SE 33-7N-6E.

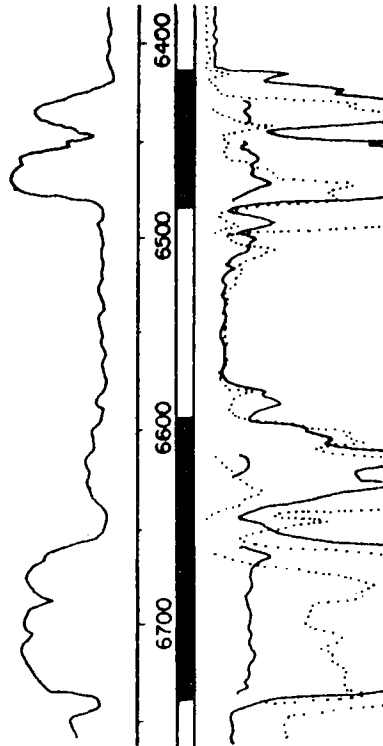


First ref. - Shaw (1954), OCGS, vol. 5, no. 3, p. 10; (1955), p. 345.

Named for Dotson lease of Continental, discovery in SW NW NE 7-2S-3W at 6,355 to 6,440 feet, completed 5-21-45, Camp field, Carter Co.

Equal to and generally called Second Sims sand in Camp field (Parker, 1956, PGSO, vol. 1, p. 174), below First Sims (Martin) sand, which is below Humphreys sand.

Illustration: Continental No. 1 Martin, SW NE NW 7-2S-3W.



First Sims (Martin) sand

Second Sims (Dotson) sand

Term used first in Texas Panhandle for a sand at the base of the Virgil considered to be in the Douglas group. Term used in NW and Panhandle Oklahoma for pay sands below the Heebner sh. and above top of the Missourian rocks. In the area of 3N-24ECM, Beaver Co., the name Douglas sand on scout tickets is being applied to pay sands immediately below the Heebner sh., also to a zone 300 to 350 feet below, which is variously called Douglas, Lower Douglas or Tonkawa.

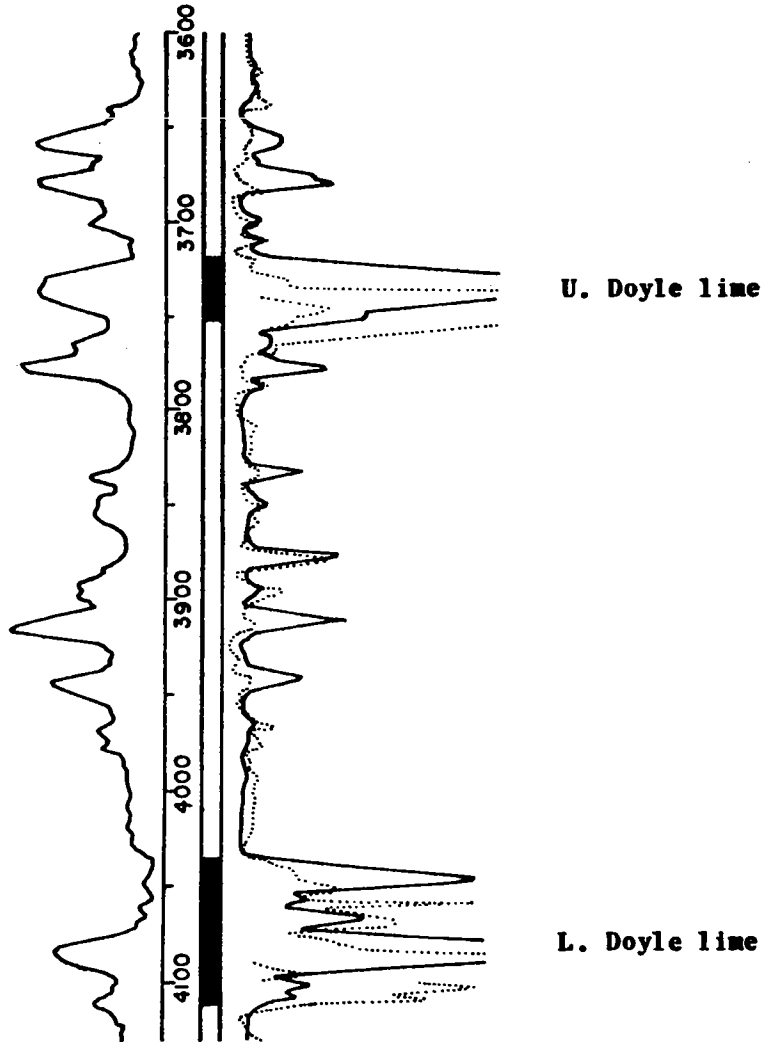
If the Heebner sh. and Toronto ls. are equivalents to those so-named in the Tonkawa field, Kay Co., the sand below the Heebner and above the Toronto would be equivalent to the Endicott sand. (See illustration of Carmichael sand.) However, it is much better practice to use a local pay sand name than to make a jump correlation which could result in the same name for sands in quite different stratigraphic horizons.

Name shown on AGS (1956), Cross-section B-B' in Texas No. 1 Creel, SW SW NW 3-1N-5W, Doyle field, Stephens Co.

Named for Doyle field, Stephens Co.

The original Doyle lime is now termed Upper Doyle lime in the field. The limestone called Lower Doyle lime in the field is shown as County Line lime on Cross-section B-B' (notes from G. D. Reavis, 1957). Name conflicts with surface Doyle sh. of Chase group. See also County Line lime.

Illustration: Phillips No. 1 Hitchcock, NW SW NW 18-1N-4W.



Reported by Wilmarth (1938), USGS Bull. 896, p. 643.

Once used for an Ordovician sand in Healdton field, Carter Co.

Smith (1914), USGS 541, pl. III.

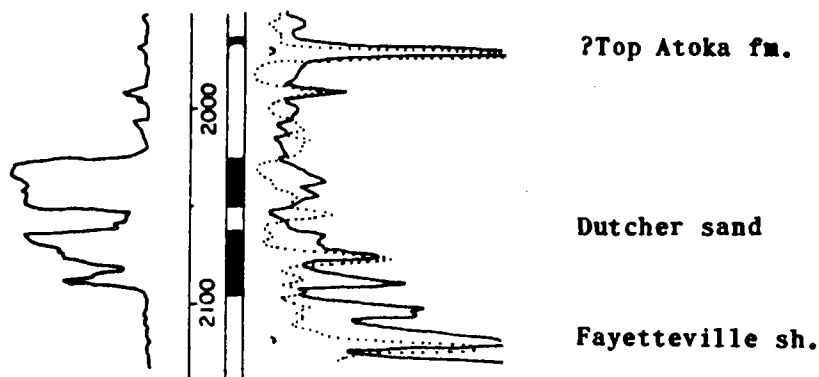
Named after Tom Dutcher (or Dutcher Oil and Gas) who lived on Dora Cloud allotment, was her guardian and later married her. Probably first wells in which name was applied were on this allotment in SW 22-17N-11E, Creek Co.

Many geologists have indicated that the first call of "Dutcher" was in Gypsy's No. 1 King, NE SW SE 22-17N-11E, which was deepened to the Dutcher, September 1, 1911. The Oklahoma City files of the Gulf Oil Corporation has an old scout ticket giving a driller's log of the No. 4 Dora Cloud, NE NE SW, drilled by Dutcher Oil and Gas, completed 3-13-1911, which shows Dutcher sand at 2,096 feet; Oswego, 1,020-75; Verdigris, 1,190-1,210; Inola, 1,675; hard limestone, 2,040-50; and sandstone, 2,096-2,146 feet, total depth. No logs were available for Nos. 1 through 3.

In the illustrated well, it is thought that the upper sandstone is Atokan, lower Morrowan.

In this area, most of Creek, southern Tulsa, northern Okmulgee and Okfuskee Cos., the name Dutcher has been applied to pay sands above the Mississippian Fayetteville or Pitkin and may include sands of Atokan age and also those equivalent to Hale or Cromwell. In the Okmulgee area, operators call Dutcher sand for any sandstone below the Booch sand and above Mississippian rocks (notes from R. A. Brant, D. M. Logan, J. L. Gartner, 1955, 1956).

Illustration: Steed No. 1 Bruce, SW SE NE 23-17N-11E.

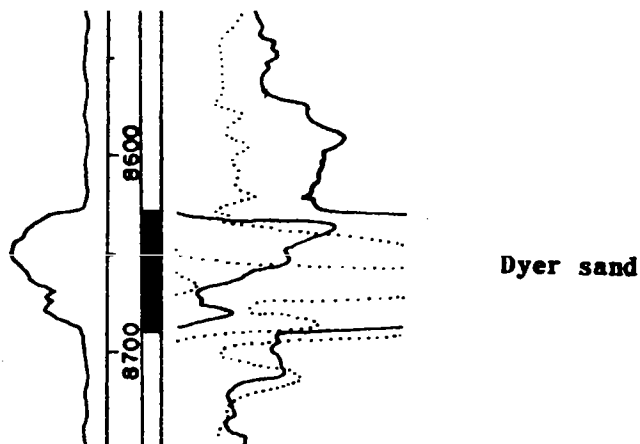


Name published by Hardwich (1950), AAPG, vol. 34, p. 1113.

Named for Dyer lease of Continental, No. 1 Dyer, C NW SW 31-2N-7W, drilled in 1948, South Marlow field, Stephens Co.

Below Briscoe sand, Main Oolitic lime and Wade sand horizon and correlated with Willie sand on AGS (1956), Cross-section D-D' in Well No. 1 at 8,256 to 93 feet (note by A. J. Montgomery, 1955).

Illustration: Continental No. 1 Dyer.

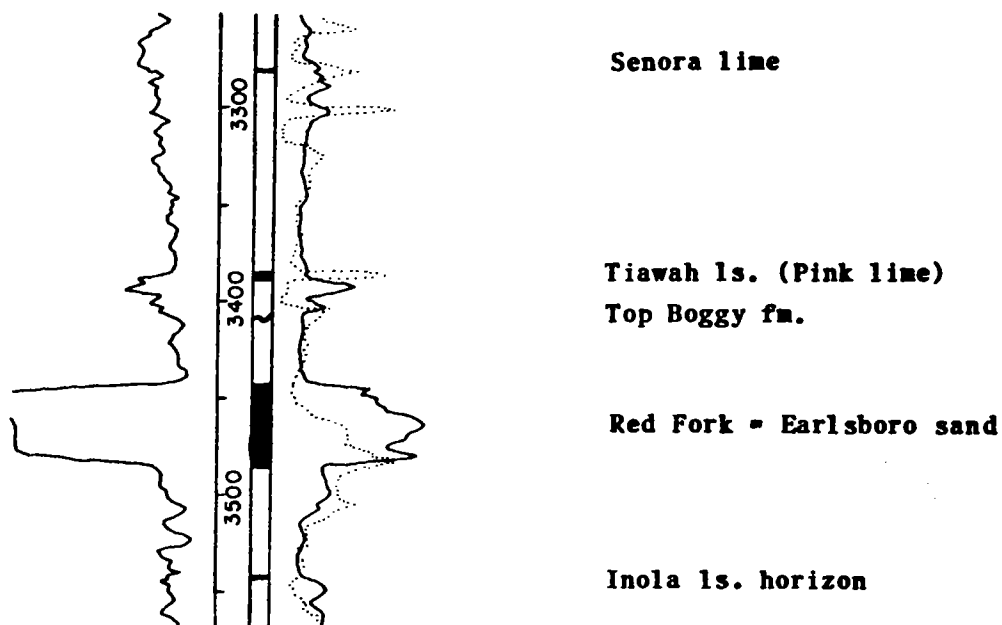


First ref. - Powers (1927), AAPG, vol. 11, p. 1098.

Named for town of Earlsboro and Earlsboro field.

Equal to Red Fork sand in Boggy fm., below Tiawah (Pink lime) ls. and above Inola ls. At places has been applied to Bartlesville sand.

Illustration: Sinclair No. B-14 Stidham, NW SE NE 11-9N-5E.



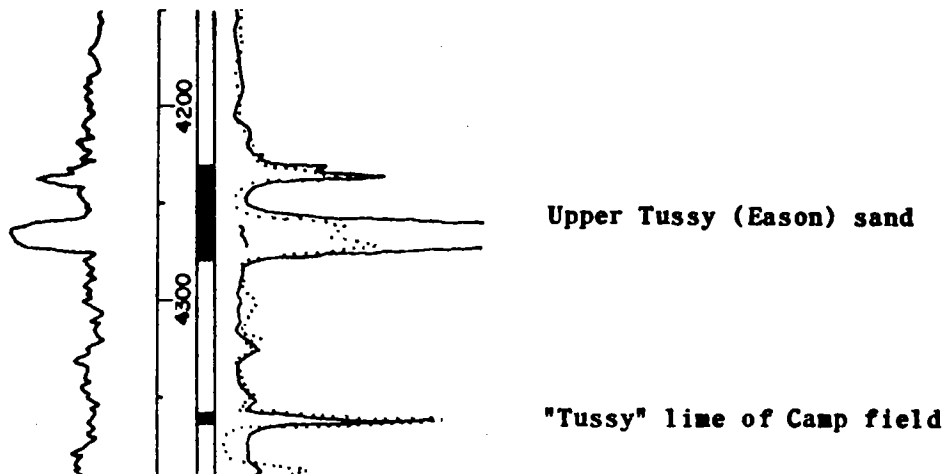
First ref. - Engleman (1951), AAPG, vol. 35, p. 1243.

Named for Sidney Eason lease of Continental in No. 1 SW NW NW 6-2S-3W, Camp field, Carter Co.

Consists of buff calcareous sandstone in Tussy zone about 100 feet above the "Tussy lime" marker of Camp field (not true Tussy lime, which is 30 to 40 feet above this in Sholom Alechem field and named in Tussy sector centering in 32-1N-3W according to Parker (1956, PGSO, vol. 1, p. 178).

This sand is now called Upper or First Tussy sand in Camp field. Parker (1956, p. 178) considers this equivalent to the Graham sand of Tomlinson and Storm. Tomlinson (7-26-55) considers it in the main equivalent to the Graham sand, but it may locally include some equivalent of the Rickets sand.

Illustration: Continental No. 1 Eason.



First ref. - Wright et al. (1957), USBM, Rept. Invest. 5326, p. 16.

Name from Ebert lease in SE 1-22N-4W, Garber field, Garfield Co.

Same as "Garber" sand of Garber field, name used in north end of field (note from C. A. McAlister, 5-1-1957).

Norville (1956), PGSO, vol. 1, p. 11, 285.

Name from Edwards lease of Van Grisso, discovery in No. 1, NW NE NE 9-1S-4W, North Alma field, Stephens Co.

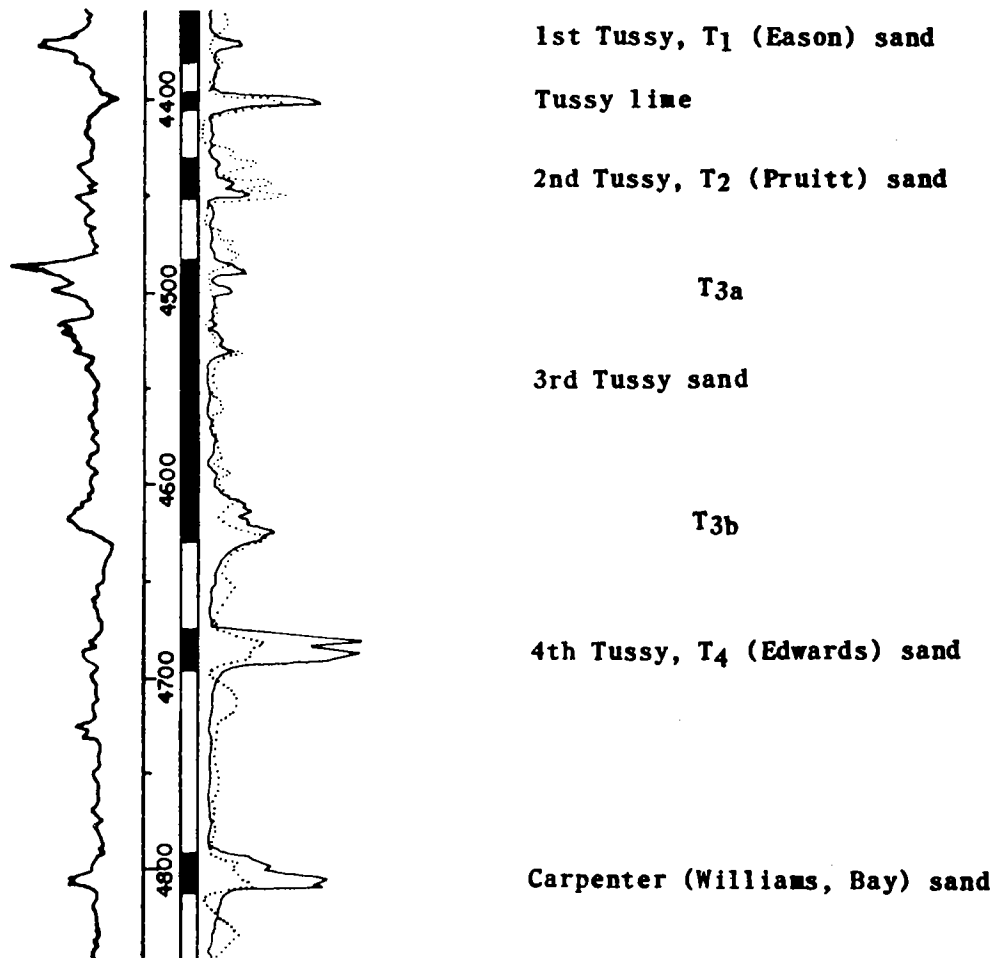
In Tussy zone about 250 feet below Tussy lime, about 100 feet above Williams sand which is correlated with Carpenter sand of Fox-Graham area.

Also called Fourth Tussy sand in North Alma by various geologists (Beasley, 6-1956). Equal to Fourth Tussy sand of Santa Fe field (Beasley, 1956, PGSO, vol. 1, fig. 4, p. 240). Probably in part at least equivalent to Fourth Tussy sand of Tussy sector of Tatums field (Hoard, *ibid*, p. 194), to Lower Tussy sand of Camp field (Parker, *ibid*, p. 178) as both authors indicate that sand is above Carpenter sand. Nomenclature on illustrated log furnished by R. L. Beasley (6-1956).

Name is unfortunate as it conflicts with name of extremely widespread and well-known Edwards ls. of Texas and with Edwards sand of N Ringling field. The Tussy zone and lower Deese have dozens of individual sand names most originating from lease names in an area of production.

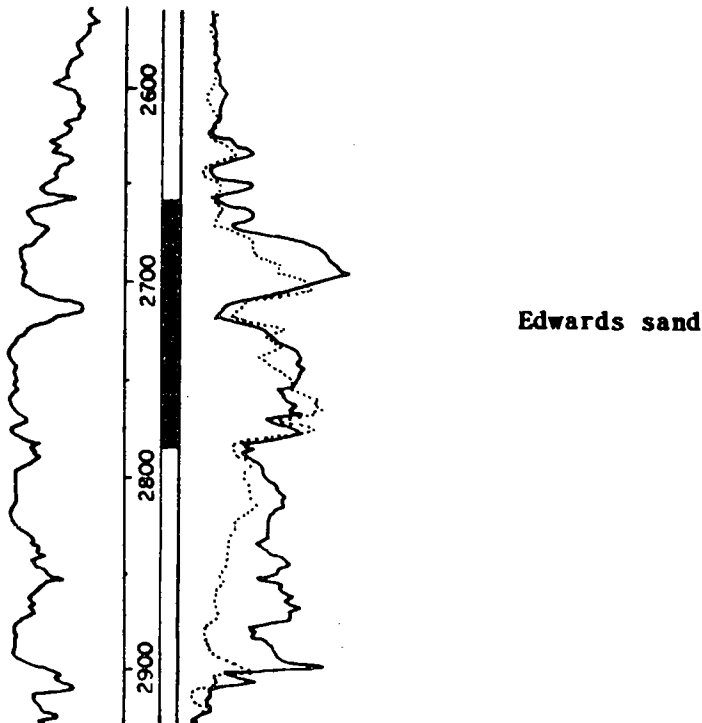
This name could easily be suppressed at least from publication.

Illustration: Van Grisso and Norville, No. 1 Edwards, NW NE NE 9-1S-4W.



Name published in NOSLA (1954), vol. 24, p. 523.

Named for Edwards lease of Amerada, discovery in No. 1 F. M. Edwards, NW SE SE 4-4S-4W, completed Dec. 4, 1948, N Ringling field, Jefferson Co.
Sand in lower Bayou zone. See above.

**Endicott sand**

Virgilian

Pennsylvanian

First ref. - Clark and Aurin (1924), AAPG, vol. 8, p. 278.

Named for Pennock Endicott lease in No. 5 Endicott, NW SW SE 34-25N-1W, Tonkawa field, Kay and Noble Cos.

Lies below Oread lime (Plattsmouth ls., Heebner sh. and Leavenworth ls.) and above Toronto ls. (Lovell lime). Equal to Wynona ss.

Locally divided into Lower, Middle and Upper Endicott sands.

See illustrations under Carmichael and Turk sands.

Enscore sand

Misspelling of Inscore sand.

Enterprise sand

Desmoinesian

Pennsylvanian

Listed by Lowman (1932), TGS, Summaries and absts.

Same as Bluejacket ss. (Bartlesville sand).

Name not used since 1925.

False Mayes

Chesterian

Mississippian

Used in Seminole area in 1926-1929 for calcareous zone in Caney sh. which has lithology similar to Mayes below (note by R. A. Brant).

**"Fernvale" limestone*

Cincinnatian

Ordovician

Hayes and Ulrich (1903), USGS, Folio 95, p. 2.

Named for town of Fernvale, Williamson Co., Tenn.

Almost certainly the Oklahoma formation called Fernvale is not properly so-called. Consists of gray crystalline, fossiliferous limestone above Viola ls., below Sylvan sh. In subsurface called Fernvale Viola by some geologists.

Fields (Field) sand

Atokan-Morrowan

Pennsylvanian

First ref. - Fohs and Gardner (1914), Fuel Oil Jour., Aug. suppl.

Named probably in the Okmulgee district as term is still applied there (13N-14E) to pay sands below the "Glenn" (Glenn-of-Morris) sand. It is considered a "Dutcher sand" in this area where the Dutcher includes both Atokan Dutcher or Gilcrease sands and Cromwell sands. In this area (eastern part of Okmulgee Co.) the sands named in descending order are as Fohs and Gardner showed them, and as Clark listed them (OGS 40, vol. III, p. 50): Morris, "Glenn", Fields, (First and Second). The term Cromwell does not seem to be applied by independent operators in this area, and few electric logs are available.

First and Second Fields sands may both be in lower part of Atokan Dutcher, in Gilcrease zone, but in some cases, the Second Fields sand may be equivalent to the Cromwell sand.

D. M. Logan (12-1956) gives the following tops in Robinson Oil Co. No. S-1 McMurray, NW SW SW 1-13N-14E, Okmulgee Co., to illustrate how some Okmulgee County operators call the sands: 820-970, Salt sand; 1,230-50, Booch; 1,465-95, Red Fork (uppermost Dutcher sand); 1,650-70, Morris; 1,790-1,850, Glenn (Glenn-of-Morris); 1,900-1,980, First Fields; 2,065-2,095, Second Fields (Cromwell).

First Bromide sand

See Bromide formation.

First Oolitic lime (Oklahoma City field)

See Oolitic lime, item 7, and illustration of "Checkerboard lime" of Oklahoma City field.

First Oolitic lime (Cement field)

See Oolitic lime, items 4 and 5, and illustration of Yule-Funk sand.

First Wilcox sand

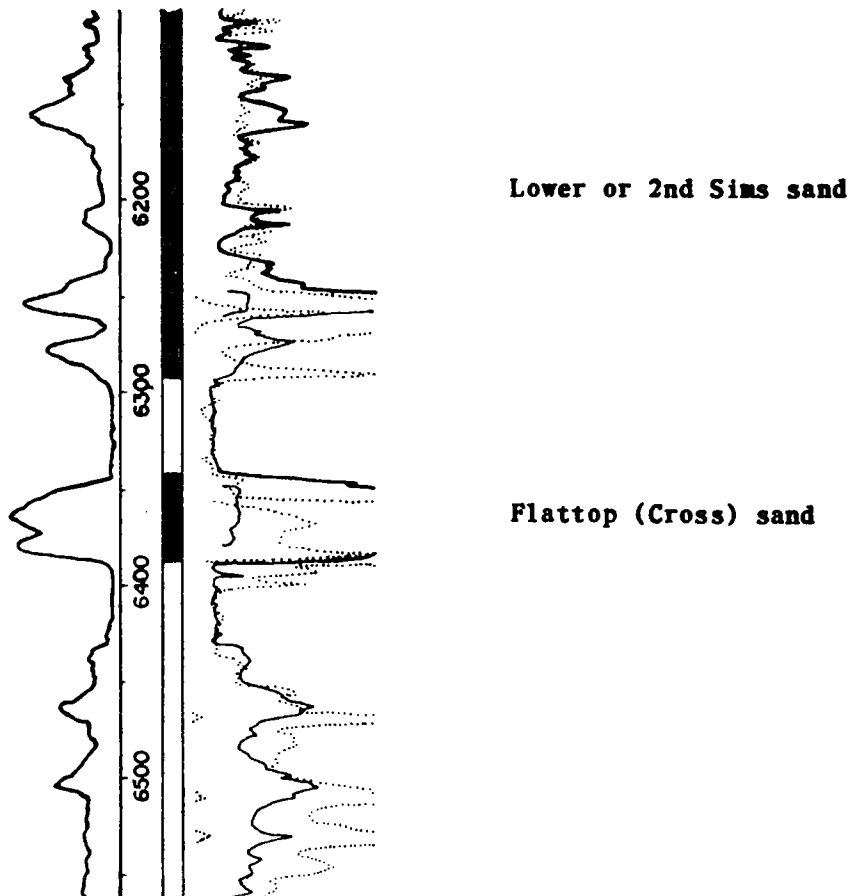
See Wilcox sand.

First ref. - Parker (1956), PGSO, vol. 1, p. 180.

Named for flat top of resistivity curve (Billingsley, *ibid*, footnote, p. 301). Originally called Cross sand in Camp field, this term has been superseded by Flat-top. In Camp field, below or included in Sims sand zone and above Goodwin sand zone. Parker places top of Goodwin sand at approximately 6,605 feet in illustrated well. In Sholom Alechem field, Goodwin "Flattop" considered uppermost sand in Goodwin zone.

Cross sand and Flattop sand are not widely used terms, and for convenience are placed in Goodwin zone by many geologists. The illustration is in an area of steeply dipping beds where definite correlations are difficult in Springeran sands (note from R. L. Beasley, 12-28-56). See Goodwin and Sims sands.

Illustration: Continental No. 1 Cross, SW SE NE 7-2S-3W.



Fort Sill sand

Leonardian

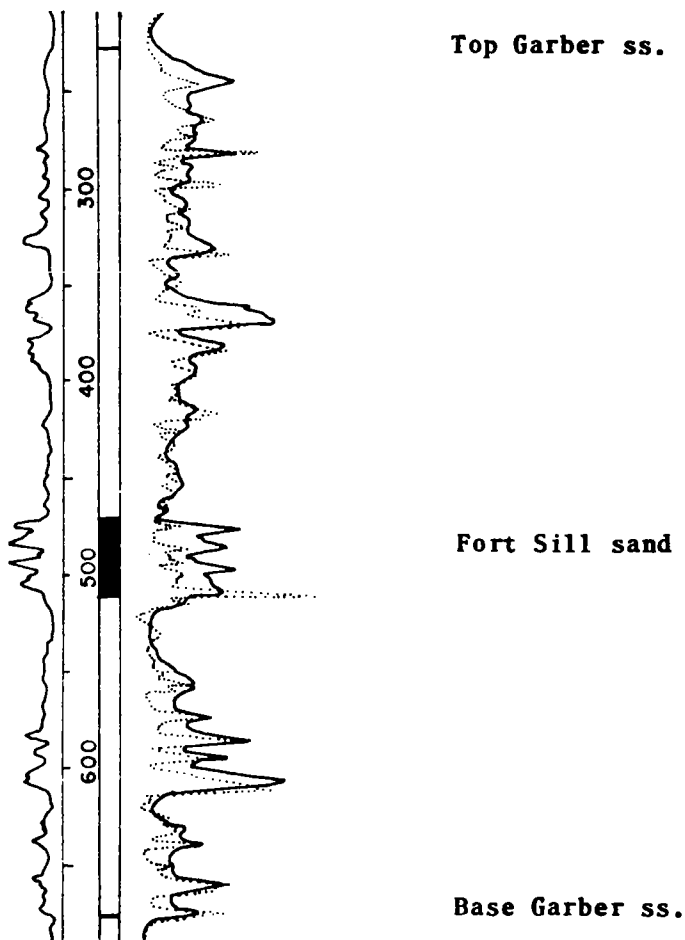
Permian

Named for Fort Sill, Comanche Co.

Pay horizon in Garber sandstone in Fort Sill field, 3N-10W, Comanche Co.

Called Lawton sand by Hayes (OCGS, 1956, vol. 3, no. 2, p. 7; 1955, p. 101), but reported by geologists to be called Fort Sill sand. Not to be confused with Fort Sill ls. (Cambrian) of Arbuckle group.

Illustration: Texas No. 1 Spencer, NW NW 8-3N-10W.



Fortuna sand

Wolfcampian

Permian

First ref. - Clapp (1921), Amer. Inst. Min. Eng., Trans., vol. 65, p. 161.

Named for Fortuna Oil Co. in No. 1 Gregory, SW SW SW 31-6N-9W, at 2,340 feet, 1917, Cement field, Caddo Co. Abbreviated to "Fort" in some reports.

Equal to Ramsey sand of Chickasha field, above Noble-Olson sand of Cement field.

*Francis formation

Missourian

Pennsylvanian

Morgan (1924), [Okla.] Bureau Geol., Bull. 2.

Named for town of Francis, Pontotoc Co.

Equivalent to Coffeyville and Nellie Bly fms.

Francis sand (lower)

Missourian

Pennsylvanian

First ref. - Ingram (1941), STOF, p. 410.

Named as producing sand in lower part of Francis fm. above DeNay ls.
Used in Dora pool, 6 and 7N, 6 and 7E, Seminole Co. Equivalent to true Layton sand in Coffeyville fm.

**Frensley limestone member*

Atokan

Pennsylvanian

Westheimer (1936), Sigma Gamma Epsilon conference, mimeographed proceedings. Harlton (1956), PGSO, vol. 1, p. 137.

Named for Frensley farm, SE 30-3S-2E, Carter Co.

Uppermost member of Lake Murray fm. of Dornick Hills group, Ardmore basin. Dark gray to black shale with sandy argillaceous limestone. Below Big Branch fm., above Lester ls. member.

Frensley sand

Wolfcampian

Permian

Named for Frensley lease of Producers Oil Co., SW 36-1S-5W, Velma field, Stephens Co., discovered 1917, total depth 575 feet.

Name should not be revived because of conflict with established surface name.

**Frisco formation*

Deerparkian

M. Devonian

Reeds (1911), Amer. Jour. Sci., vol. 182, p. 256.

Named for town of Frisco, 2N-7E, Pontotoc Co., exposed in NE 11-2N-6E.

A fossiliferous calcarenite, maximum thickness 41 feet, at top of Hunton group above Bois d'Arc, below Woodford sh.

Fulton sand

Desmoinesian

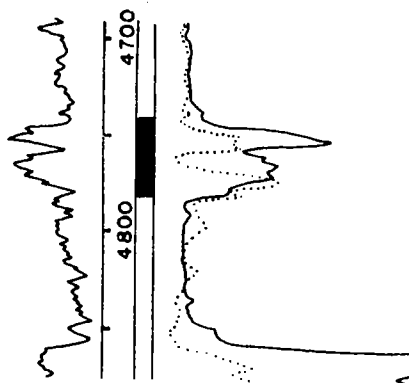
Pennsylvanian

First ref. - Williams (1954), Shale Shaker, vol. 4, no. 9, p. 6; (1955), p. 284.

Named for Fulton lease of J. D. Lewis. Discovery in No. 1 Fulton, NE NW SW 1-5S-2W, Bayou field, Carter Co.

Sandstone in Deese group below Lone Grove sands on flank of Bayou field, locally productive.

Illustration: Lewis No. 1 Fulton.



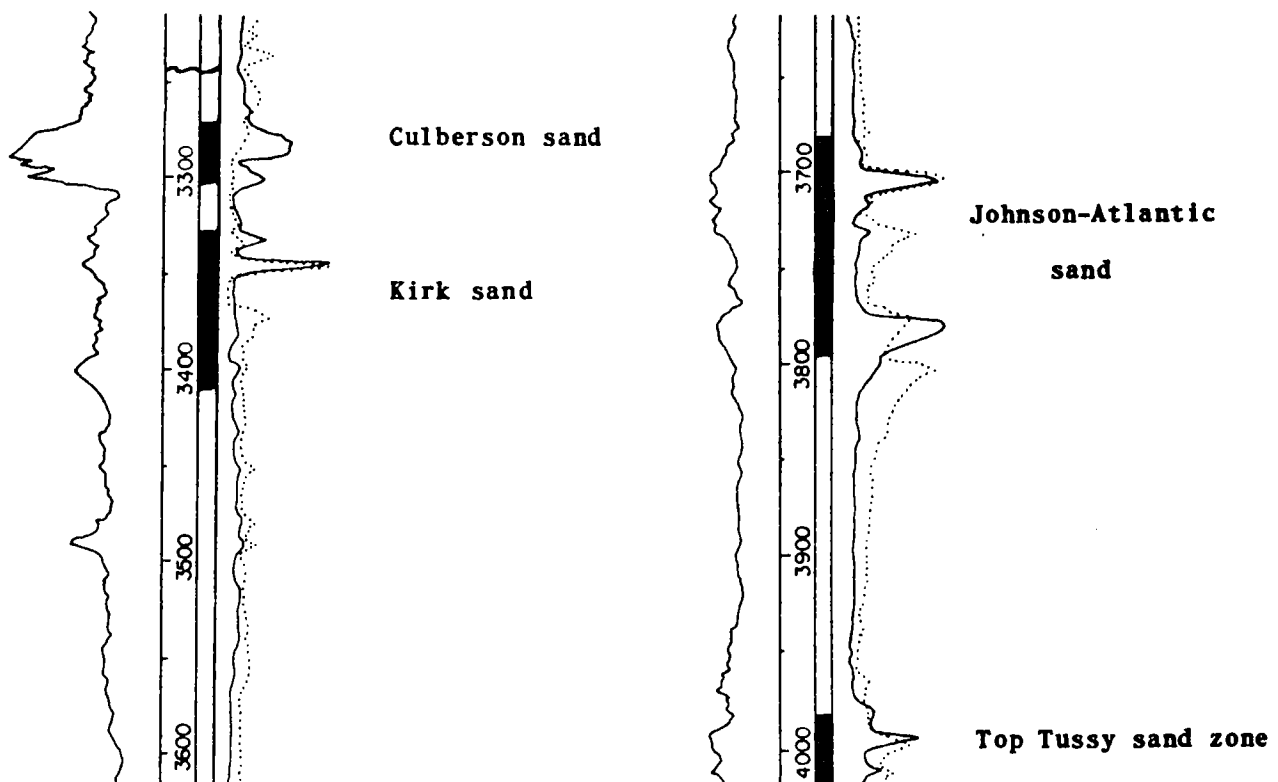
Fulton sand

Named by Lynn Farish (Parker, 1956, PGSO, vol. 1, p. 178) for a subsurface calcareous sandstone containing specimens of "Fusulina" in the Deese group of Camp, Tatum-Tussy, Velma and Sante Fe fields, above the Tussy zone and below the Kirk sand. Also called "Lower Fusulina" and "Lower Fusulinid" sand.

Equal to the Johnson-Atlantic sand named in Graham field by Tomlinson and Storm, to the Johnson sand of George and Bunn, to the Gibson sand or Third Deese of the Golden Trend. Equal in part to the Arnold member of the Deese, which Tomlinson described to include the overlying sandstone and underlying limestone carrying "Fusulina" (notes from C. W. Tomlinson, 8-1-56).

In certain areas, a higher sand above the Fusulina sand, but below the Culberson sand is called Upper Fusulina or Upper Fusulinid sand. This sand is equivalent to the Kirk sand of Tomlinson and Storm, named in the Graham field, to the Second Deese of the Golden Trend (see AGS, 1956, Cross-section B-B'). Hoard (*op. cit.*, p. 193) suggests that the older term "Kirk" sand be used in place of Upper Fusulina or Upper Fusulinid sand. It is also suggested that the name Johnson-Atlantic be used in lieu of Fusulina, Lower Fusulina or Lower Fusulinid sand, at least in publications. Sand zones or limes should not be named after fossils which are so common throughout the Pennsylvanian.

Illustration: Skelly No. A-8 Humphreys, SW SE SW 13-1S-5W.



Cipriani (1956), PGSO, vol. 1, p. 312.

A limestone with two types of "Triticites" spp. from samples, 1,550-1,570 feet, in Farris No. 1 Poolaw, SW SE NE 28-5S-12W, Cotton Co. Age of "Triticites" spp., according to R. V. Hollingsworth, is Virgilian, Shawnee, (cf. lower Deer Creek), or post-Zuckerman (upper Graham).

Above Thomas sand in SW Randlett field.

First ref. - Mallory (1948), AAPG, vol. 32, p. 1957.

Description of faunal content of calcareous ss. Applied to sandstone from 2,938 to 2,970 feet in Gulf No. 5 Spears, NW NW SE 14-1S-5W, Velma field, Stephens Co. Identical to Fusulina, Lower Fusulina, Lower Fusulinid, Johnson-Atlantic.

Gardner (1917), GSA, vol. 28, p. 693.

Named for Garber field, Garfield Co. and used in this field.

Name conflicts with that of surface Garber ss., Leonardian in age, and should remain unused.

Sandstone below the Emporia (Elmont-Reading) ls. and above the Burlingame ls. See illustration of Campbell sand, in which two sand developments, upper and lower, are present in "Garber" zone.

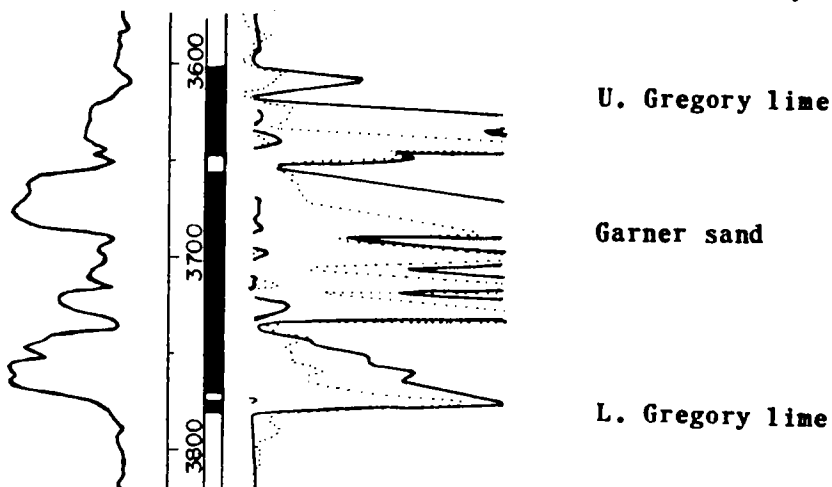
Ref. - Ingram (1941), OGJ, vol. 40, no. 9, July 10, p. 23.

Named for Col. Garner lease of Miller, discovered in SE SE SW 26-6N-10W, Cement field, Caddo Co.

Below Gregory lime in upper Virgilian according to Hayes (1952).

In sample logs of W. L. Moreman, F. M. Hoover, H. R. Segnar, Garner sand is shown between the Upper and Lower Gregory limes. See also illustrations for Gregory lime and Griffin sand.

Illustration: Miller No. 5 Garner, SE SE SW 26-6N-10W.



Garrett zone

Missourian

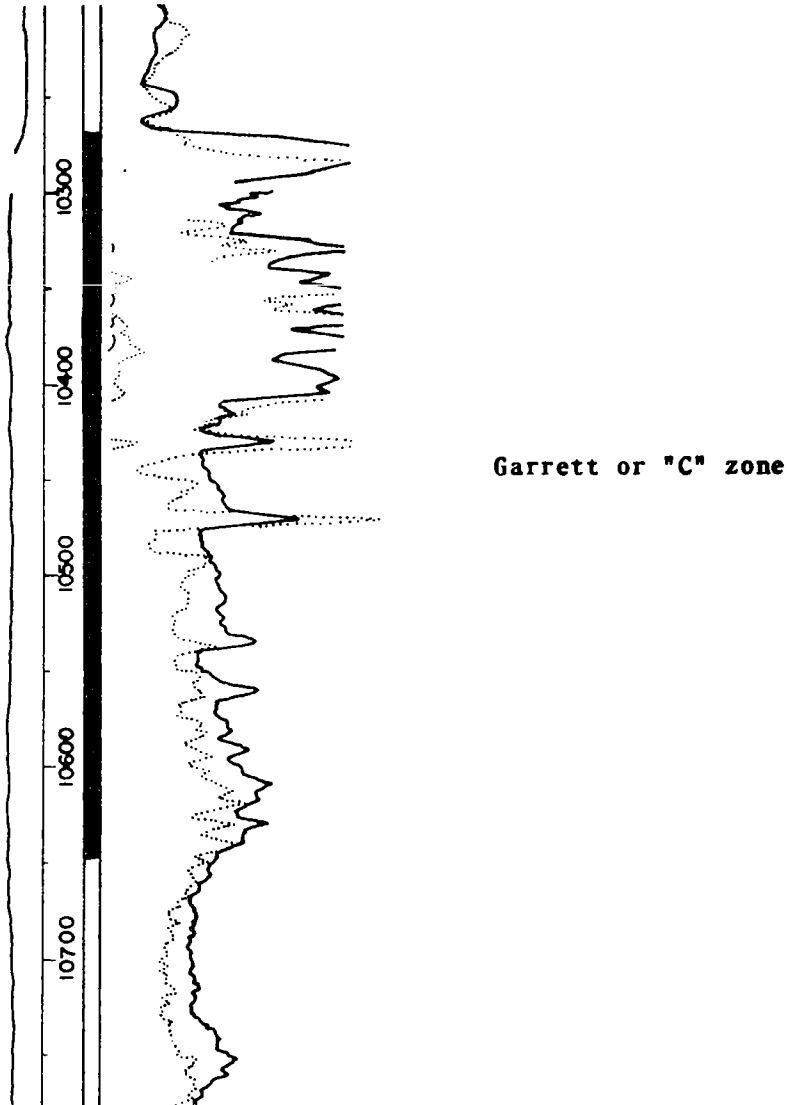
Pennsylvanian

Ref. - McNeal (1953), AAPG, vol. 37, p. 2686; OCGS (1955), p. 83.

Named for Cora Garrett lease of Carter, discovery in No. 1, SE SE SE 32-11N-25W, Elk City field, Beckham Co. Also called Zone "C".

Consists of arkosic sandstone to granite wash interbedded with marine gray shales.

Illustration: Carter No. 1 Garrett.

*Garvin beds*

Leonardian-Wolfcampian

Permian

First ref. - Denison (1923), AAPG, vol. 7, p. 627.

Named for Garvin Co.

Used in discussion of Robberson field (1N-3W), consists of first 1,200 feet of alternating "red beds, gumbo and gravel with one or two limestone beds". Lie above Mauldin producing horizon, a series of gas sands alternating with red and blue shales from 1,200 to 1,400 feet.

Gibson sand

Desmoinesian

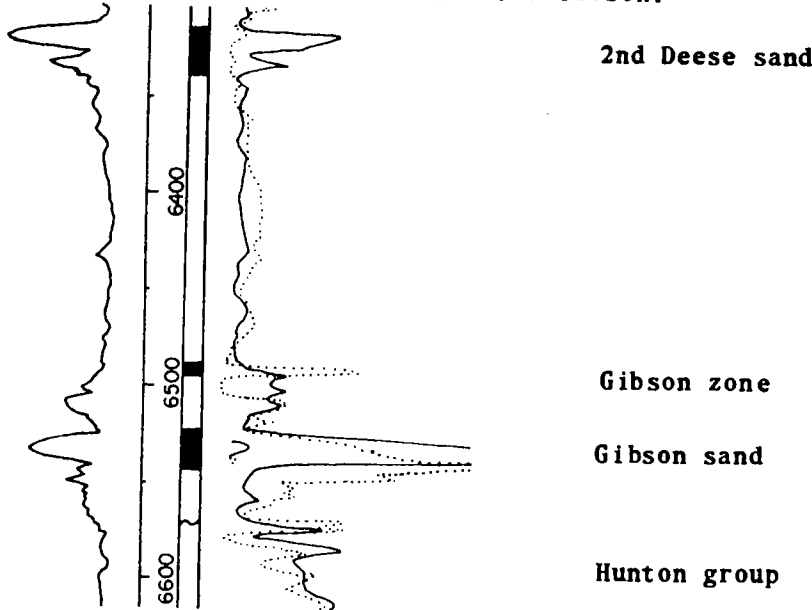
Pennsylvanian

First ref. - Cullen (1947), AAPG, vol. 31, p. 1010.

Named for Melinda Gibson lease of Globe and Vickers, SE NE 30-3N-2W, SW Antioch field, Garvin Co. at 6,525-41 feet.

Above Hart sand or Fourth Deese, below Second Deese of area. Equal to Prue sand (G. T. Crouse, 9-20-55). Equal to Third Deese of Golden Trend, Fusulina, L. Fusulinid, L. Fusulina, Johnson-Atlantic of Sho-Vel-Tum district. See AGS (1956), Cross-section B-B'. OCGS (1952), Cross-section No. 3 implies that Gibson sand is above horizon of Prue sand of Oklahoma City area. See Hart lime and sand, Gibson zone.

Illustration: Globe and Vickers No. 1 Gibson.



Gibson zone

Desmoinesian

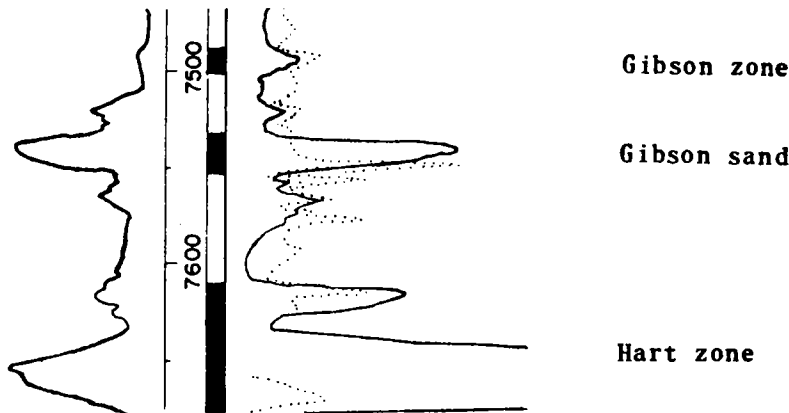
Pennsylvanian

First ref. - Jacobson (1949), AAPG, vol. 33, p. 698, fig. 7.

Name from associated Gibson sand in Garvin Co.

Thin limestone above Third Deese sand known as the Gibson zone. The term Gibson zone is also applied to limestone and Gibson sand below. In 5N-5W, the Gibson zone contains thin beds of brown cryptocrystalline limestone, thin coal beds also common. See illustration of Hart lime.

Illustration: Magnolia No. 1 Martin Rose, C NW NE 1-4N-4W.



Gilcrease sand zone

Atokan

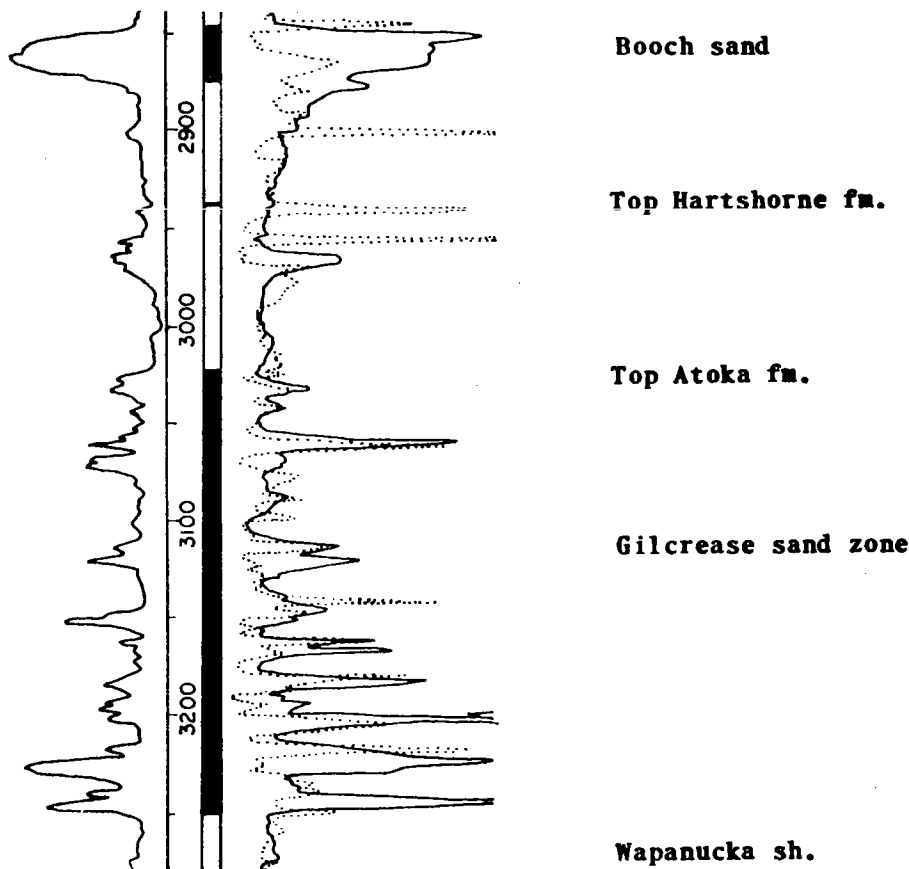
Pennsylvanian

First ref. - Roark (1926), OGS 36, p. 17.

Named for Gilcrease Oil Co., discovery in NW NW NE 20-9N-9E, Gilcrease field, Hughes Co. at 3,048 feet, Oct. 1923.

According to Roark, the zone consists of limestone, sandstone and sandy limestone, 160-230 feet thick in Papoose field and producing sands occurred in lower part of sandstone and limestone zone. Roark incorrectly correlated the zone with the Hartshorne sandstone of the surface.

Illustration: Shell No. 1 Meadors A, SW NE SW 20-9N-9E.



Glauconitic lime

Hunton group

L. Silurian

Reeds (1911), Amer. Jour. Sci., vol. 182, p. 260. Informal use of term for middle member of Hunton group on surface.

Name used in Seminole area about 1930, in Oklahoma City area in 1936 in subsurface. Published by Swesnik (1950, AAPG, vol. 34, p. 397). Name is descriptive of light gray, finely crystalline limestone with scattered pellets of dark green glauconite.

Now named Cochrane member of Chimneyhill formation, below Clarita member (Pink Crinoidal lime) and above Keel member (Oolitic lime), it occurs on surface in Arbuckle Mts., in subsurface over much of the State.

*Glenn formation

Pennsylvanian

Taff (1903), USGS Tishomingo folio, No. 98.

Named for Glenn, Carter Co.

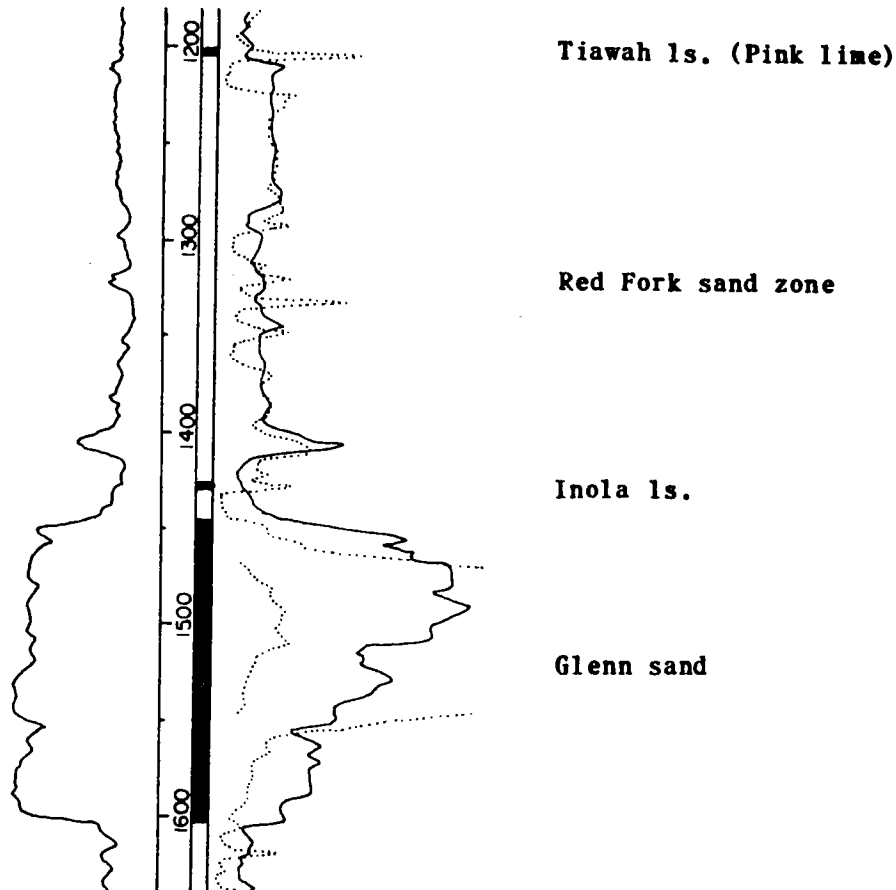
Applied to Pennsylvanian rocks overlying Caney sh. in Tishomingo quadrangle. This term was used in surface and subsurface for rocks from Springer to Hoxbar inclusive. Its meaning became confused and the term was dropped (USGS Bull. 896, p. 828).

First ref. - Snider (1913), Petr. Nat. Gas in Okla., p. 108.

Named for Ada Glenn farm, SW 10-17N-12E, Glennpool field, Creek Co.

Called in Glennpool and surrounding fields in Creek, Tulsa and Okmulgee Cos. Equal to the Bartlesville sand of subsurface, and to the Bluejacket ss. of surface. See below.

Illustration: Gulf Oil Corp. No. 1-S Berryhill, NE 17-17N-12E.



First ref. - Fohs and Gardner (1914), Fuel Oil Jour., Aug. Suppl.

Misidentification of Glenn sand by Bob Galbraith in 1908 who came down from Glennpool, drilled a good well in 22-15N-14E, Bald Hill field, and found sand around 1,700 feet, being the same depth as Glenn sand in Glennpool. This term, Glenn sand, is still used in this area for sand below Morris sand and above the Fields or Field sand (D. M. Logan, 12-1-56).

According to Fohs and Gardner, Glenn-of-Morris sand occurred at an average depth of 1,724 feet, 60 feet thick, in Morris field, 13N-14E, Okmulgee Co.

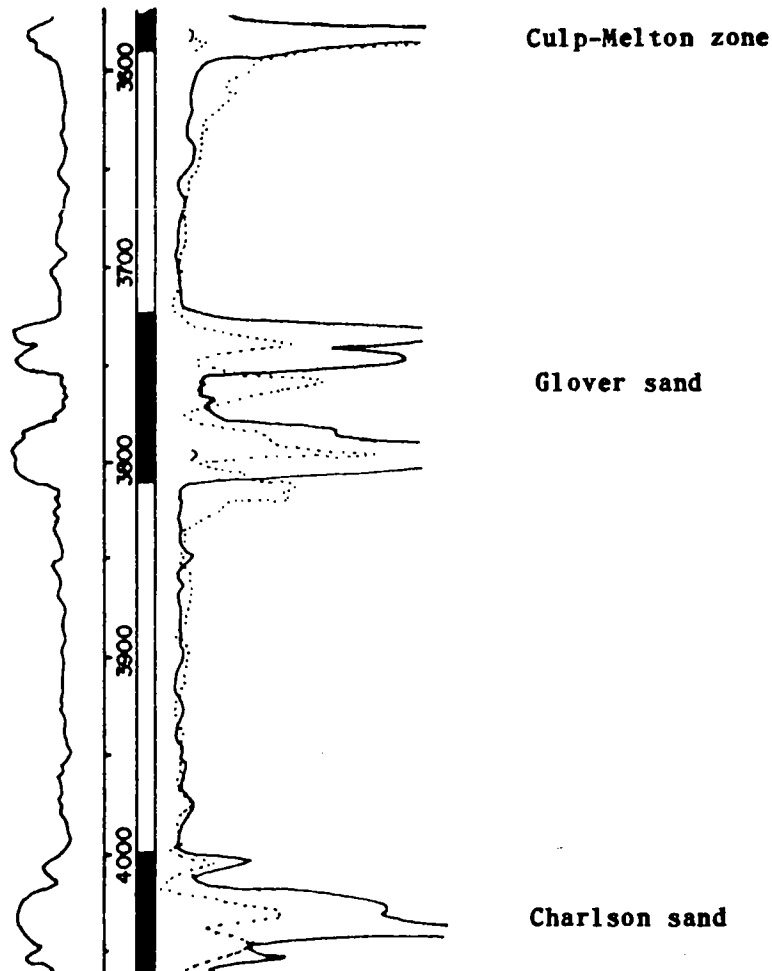
This "sand" is in the Gilcrease sand zone. See discussion of Fields sand.

First ref. - Hayes (1952), OCGS, vol. 3, no. 2, p. 10; (1955), p. 101.

Name from Glover lease of Little Nick Oil Co., NE 27-5N-8W, Chickasha field, Grady Co.

Uppermost sand of Deese fm. in field, above Charlson sand, which is considered equal to Kistler sand of Cement field; below Culp-Melton zone. Pooler sand, which lies below Charlson sand, is considered equivalent to Hart sand and Upper Tussy sand (AGS, 1956, Cross-sections B-B' and C-C').

Illustration: Little Nick Oil Co., No. 4 Glover, NW NE NE 27-5N-8W.



*Goddard formation

Chesterian

Mississippian

First ref. - AGS Field Trip (June 18, 19, 1948), Plate II. Westheimer (1956), PGSO, vol. 1, p. 393-396; Elias, *ibid.*, p. 74.

Named for Goddard Ranch, sections 17-20, 3S-4E, Johnston Co. Name proposed by Westheimer, type locality described by Elias, for 2,850 feet of shale with some interbedded sandstone below the Rod Club ss. member of the Springer fm. and above a restricted Caney sh.

Goddard sh. is used in the subsurface for shales below the Goodwin sand zone, "but Goddard sh. as defined in surface outcrops may extend up to the base of the Sims sand zone if that proves to correlate with the surface Rod Club ss." (Tomlinson, 1956, PGSO, vol. 1, p. 180, footnote). "A group of sandstones in the lower part of the subsurface Goddard fm. constitute one of the important producing zones in the North Ardmore field located on the Caddo anticline in 3S-1E. These sandstones occur from 100 to 500 feet above the top of the Mississippian Caney". (Westheimer, *ibid.*, p. 396).

Descriptive of large frosted quartz grains in Bromide fm.
Top of Second Wilcox in Oklahoma City area.

Goodwin sand

Springeran

Pennsylvanian?

First ref. - Selk (1951), AAPG, vol. 35, p. 591.

Name from Goodwin lease of Magnolia, No. 1 in SE SW SE 3-1S-4W, Sholom Alechem field, Stephens Co.

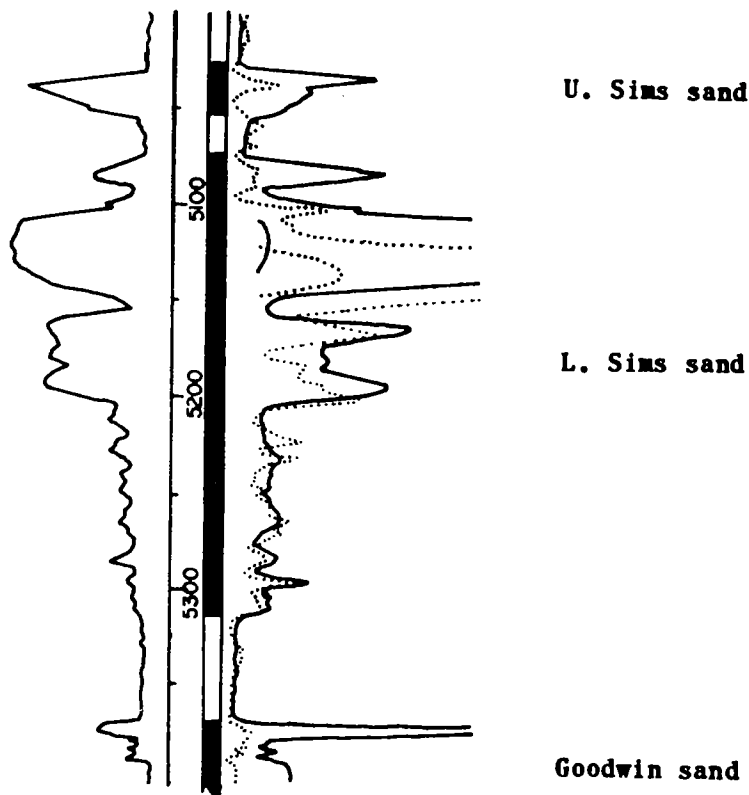
Sand below Second or Lower Sims sand zone, separated from it by 50 to 75 feet of shale. Called Goodwin "Flat-top", uppermost sandstone in Goodwin zone which consists of 200 to 300 feet of interbedded lenticular sandstones and shale in Sholom Alechem field (Billingsley, 1956, PGSO, vol. 1, p. 301).

Goodwin sand zone in Camp field (Parker, 1956, *ibid.*, p. 180, 184) is below Flat-top (Cross) sand, which is considered member of Sims zone.

Westheimer (1956), *ibid.*, p. 396, states that "it seems reasonably well established that the Goodwin ss. in the subsurface falls within the Goddard fm., and it is also possible that the Sims ss. might be correlated with upper part of this same formation."

Name used in Sho-Vel-Tum district, also Doyle and Homer fields. See illustration of Sims sand, which is from a well very close to type locality of Goodwin sand.

Illustration: Magnolia No. 1 Martin Goodwin.



First ref. - Clapp (1921), Amer. Inst. Min. Eng., Trans., vol. 65, p. 162.

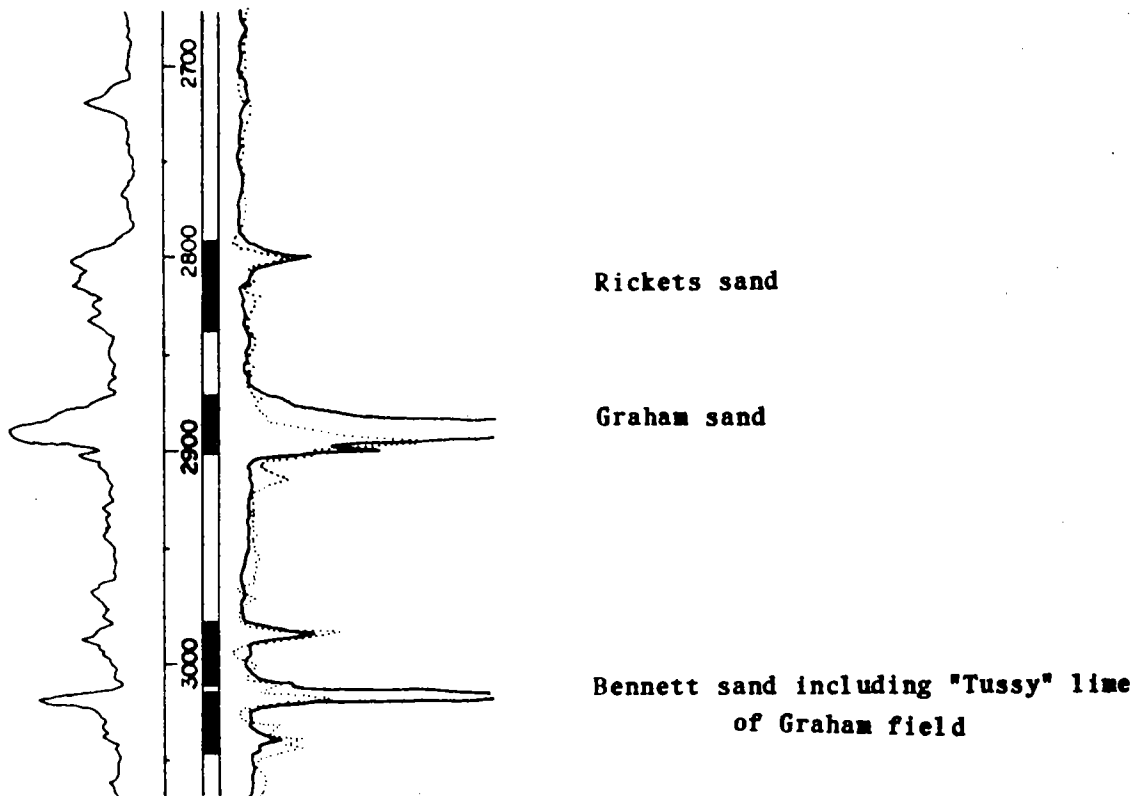
Named for Graham Mineral Trust, organized by Schermerhorn and Merrick in 1921, and drilled for Graham Mineral Trust and Kirk Oil Co. in 31-2S-2W, Graham field, Carter Co. Above Bennett sand, below Rickets sand; in Tussy sand zone and above "Tussy lime" (not Tussy lime of Tussy). Equal to Upper Tussy sand of Camp field (Parker, 1956, PGSO, vol. 1, p. 176).

Tomlinson and Storm used this term only for a sand member, 20 to 40 feet in ordinary thickness which proved productive throughout the originally developed Graham field. George and Bunn considered the Rickets and Graham sands identical and also extended the term "Graham sand horizon" to include Bennett and Sutherland (misspelled Southerland) sands of Tomlinson and Storm. All four of these sands with names introduced by Tomlinson and Storm are represented within the "Tussy ss. zone" of Shaw (1954), OCGS, vol. 5, no. 3.

The Graham sand in all cases is separated from the Rickets sand zone above by a thin shale about 30 to 40 feet thick, and from the Bennett sand below by a somewhat thicker shale, normally about 75 feet in thickness. These intervals are substantially increased by steep dips in some flank wells.

The "Eason" sand or upper Tussy of the Sholom Alechem and Camp pools, above the Tussy lime, is probably in the main an equivalent of the Graham sand. It may locally include some equivalent to the Rickets (letter from C. W. Tomlinson, 7-26-56). See also illustration of Bennett sand.

Illustration: Continental No. 1 Moyer, NW NW SE 31-2S-2W.



Reported by Wilmarth (1938), USGS, Bull. 896, p. 643.

Used for a Virgilian sand in Osage Co., supposedly in Pawhuska fm.

Gregory lime

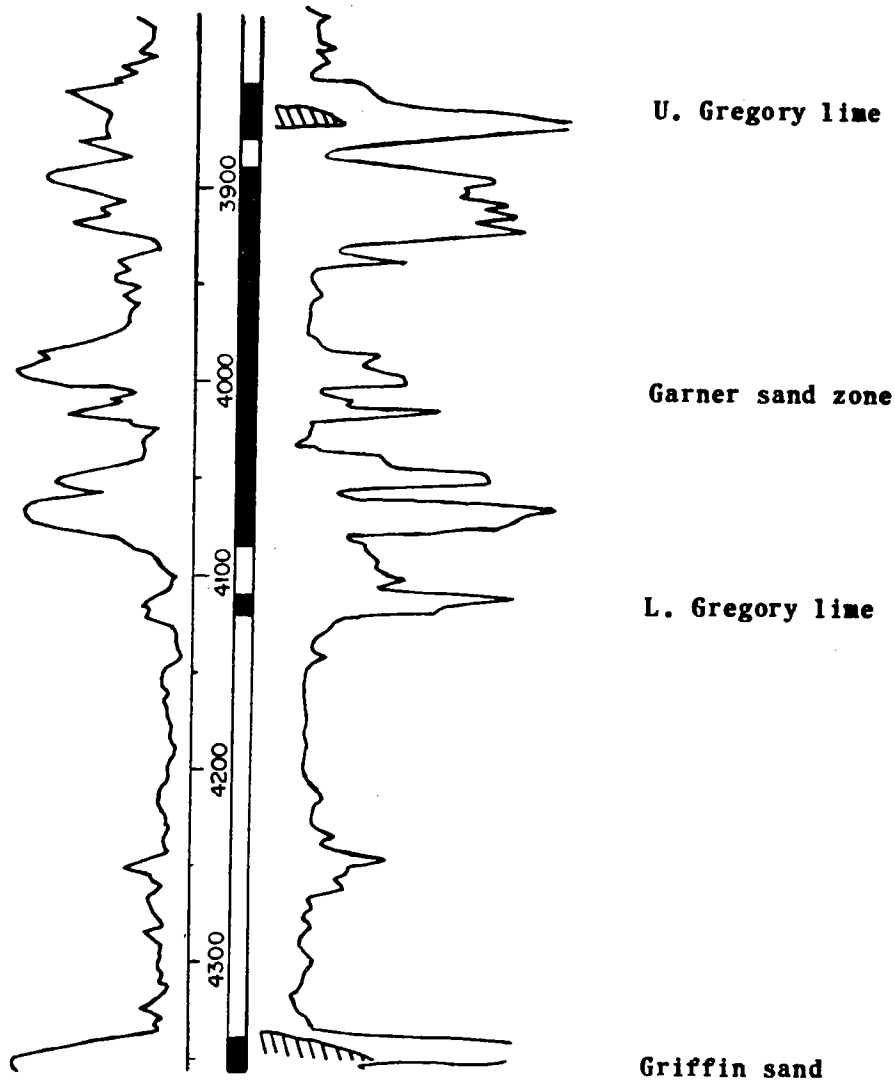
Virgilian

Pennsylvanian

Ref. - Hayes (1952), OCGS, vol. 3, no. 2, p. 7; (1955), p. 101.

Named for Gregory lease of Magnolia, W $\frac{1}{2}$ SW 31-6N-9W, Cement field, Caddo Co. The electric log used for illustration of Upper and Lower Gregory limes is not at the type locality, but was used because sample logs made in 1937-1944 were available designating the limestones. Whether these are the same horizons called Upper and Lower Gregory in AGS (1956), Cross section C-C', and Gregory lime by Hayes (1952) is not known. See also Garner and Griffin sands.

Illustration: Stephens No. 2 Griffin, SE NE SE 27-6N-10W.



Griffin lime

Virgilian

Pennsylvanian

Name published by Hayes (1952), OCGS, vol. 3, no. 2, p. 7; (1955), p. 101.

Apparently named for associated sand, a brown impure limestone about 10 feet thick. It is reported that this limestone was local and erratic in development and the name was not widely used. Name was not used by W. L. Moreman, F. M. Hoover, A. J. Montgomery, and F. H. Worrell.

Griffin sand

Virgilian

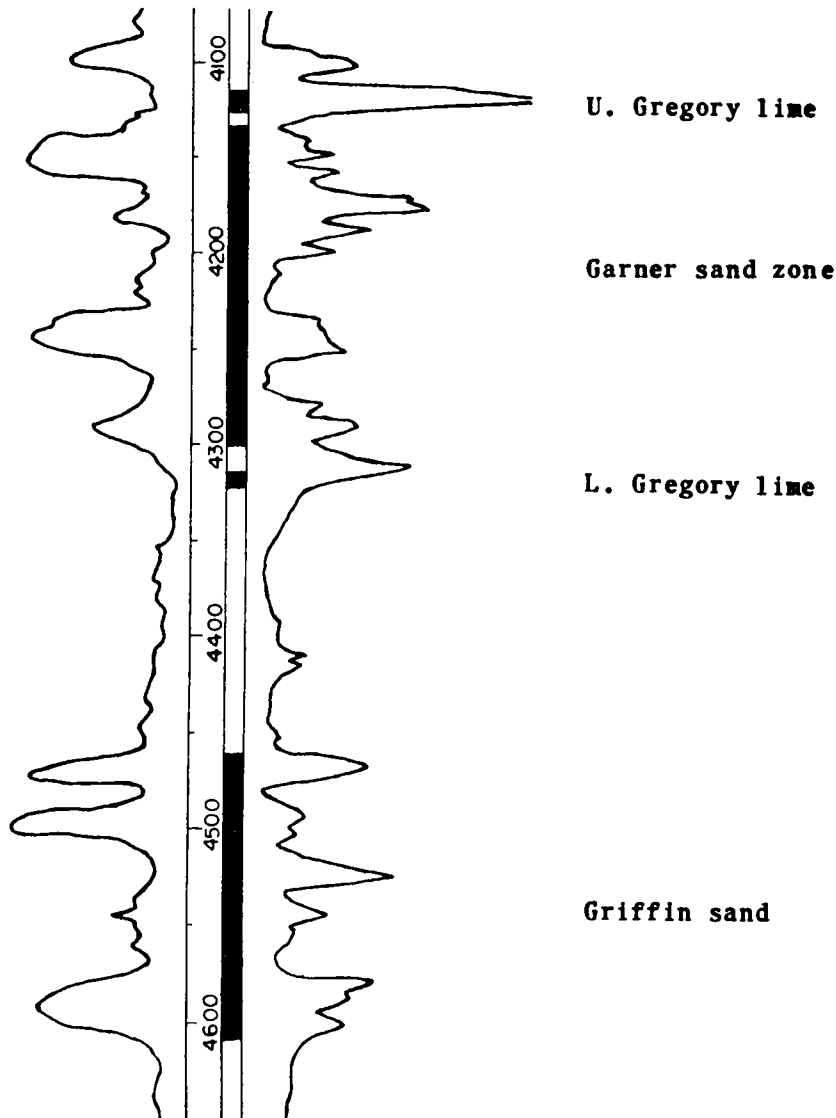
Pennsylvanian

Ref. - Ingram (1941), OGJ, vol. 40, no. 9, July 10, p. 23.

Named for Griffin lease of Roy Stephens, Inc., SE NE 27-6N-10W, Cement field, Caddo Co.

Conglomeratic ss. below Lower Gregory lime and above Rowe lime, contains granite and chert grains. See illustration of Gregory lime.

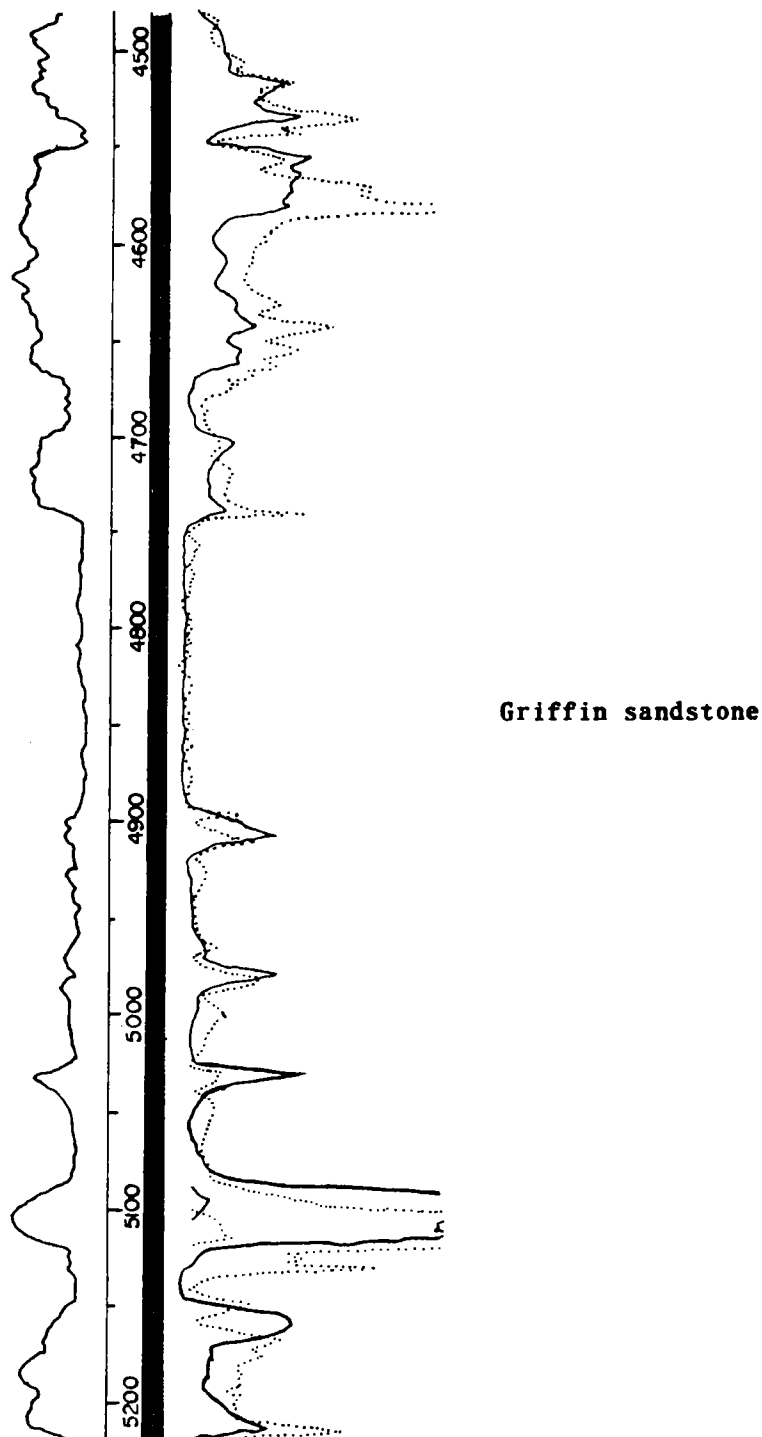
Illustration: Stephens No. 1-A Griffin, SW SE NE 27-6N-10W.



Named by Harlton (1956), PGSO, vol. 1, p. 140, 225.

Middle member of Lake Murray fm., below Frensley mem. and above Bostwick mem. Named in subsurface, type locality in Amerada No. 1 Belle Griffin, NW NW NW 29-1S-5W, elevation, 1,136 feet. Upper Griffin ss. from 4,480-4,745 feet, lower Griffin from 4,745-5,218, West Velma field, Stephens Co. (letter from Harlton, 6-25-56). This name was cleared by Geologic Names and Correlations Committee, Washington, D.C.

Illustration: Amerada No. 1 Belle Griffin, type locality.



Grindstone grit

Reported as equal to Goodwin sand in E Ardmore Basin.

*Gunsight limestoneVirgilianPennsylvanian

Plummer (1919), AAPG, vol. 3, p. 133.

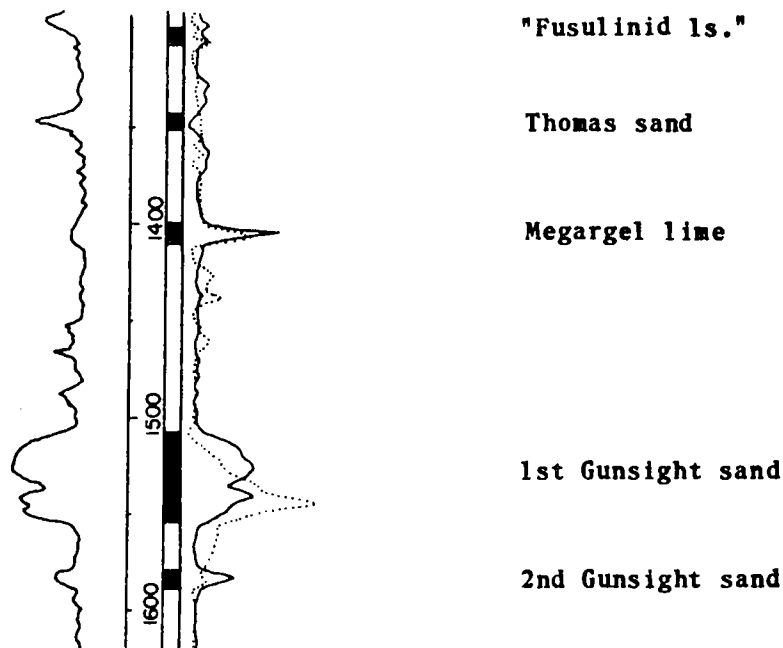
Named for village of Gunsight, Stephens Co. Texas.

Limestone member of Graham fm., Cisco group. Marker bed in Hollis basin. Below Megargel lime, considered equivalent to Armstrong lime as shown on AGS (1956), Cross-section C-C' correlated with Rowe lime of Cement field. See illustration of Henderson sand.

Gunsight sandVirgilianPennsylvanian

Producing sand between 1,558 to 1,628 feet in Red River field, 5S-14W, Tillman Co.; below Thomas sand (SW Randlett field), above Henderson sand (Henderson field). Named for association below Gunsight ls., which is not apparent in illustrated well. Name used south of Wichita Mts. See illustration of Henderson sand.

Illustration: Anderson-Helton No. 1 Owen, SE NE 7-5S-14W.



Hallet sand

Missourian or Desmoinesian

Pennsylvanian

First ref. - Bullard (1928), OGS 40-Q, p. 68.

Named for village of Hallett, Hallett pool, 20N-7E, Pawnee Co.
Equal to a lower lense in Cleveland sand zone of Missourian age or to Wayside sand (?), a sand in the Nowata. It should be made obsolete.

Hamilton Switch sand

Atokan

Pennsylvanian

First ref. - Clark (1926), OGS 40-F, p. 10; vol. III, p. 50.

Named for Hamilton Switch village and pool in area centering around discovery well, SE 11-14N-12E, drilled by Alex Preston in 1909, Okmulgee Co.

In this general area the sands were called First and Second Hamilton Switch or Preston sands, but later were called First and Second Dutcher. It is possible that the Second sand is Morrowan in age, but the discovery sand was Atokan Dutcher, in Gilcrease sand zone.

Hammer-Haindl sand

Simpson group

M. Ordovician

First ref. - McGee and Clawson (1932), AAPG, vol. 16, p. 974.

Named for Rose Hammer and Margaret Haindl, SW 11-11N-3W, leases of I.T.I.O., Oklahoma City field, Oklahoma Co.

Sandstone in McLish fm., below "Mollman" sand, name still used in Oklahoma City field.

Hargan formation

Hunton group

L. Devonian

Reeds (1911), Amer. Jour. Sci., vol. 182, p. 263.

Name taken from a small creek (named by Reeds) in SW 17-2S-3E, Murray Co.

A thin-bedded, fossiliferous, argillaceous, and silty calcilutite called a marlstone, formation of Hunton group.

Harjo sand

Atokan

Pennsylvanian

First ref. - Rison and Bunn (1924), USBM, Petr. Eng. Rept. on Cromwell field, p. 6.

Named for Independent Oil and Gas No. 1 Hannah Harjo, SE NW NE 21-10N-8E, which had initial production of 300 barrels daily from 3,376 to 3,386 feet, Cromwell field, Seminole Co.

Lies 175 to 250 feet above top of Cromwell sand at depths from 3,180 to 3,380. See Atoka fm. on illustration of Brunner sand in well on Harjo lease.

Name no longer used. Equal to Atokan Dutcher, Gilcrease sand.

Harryman sand

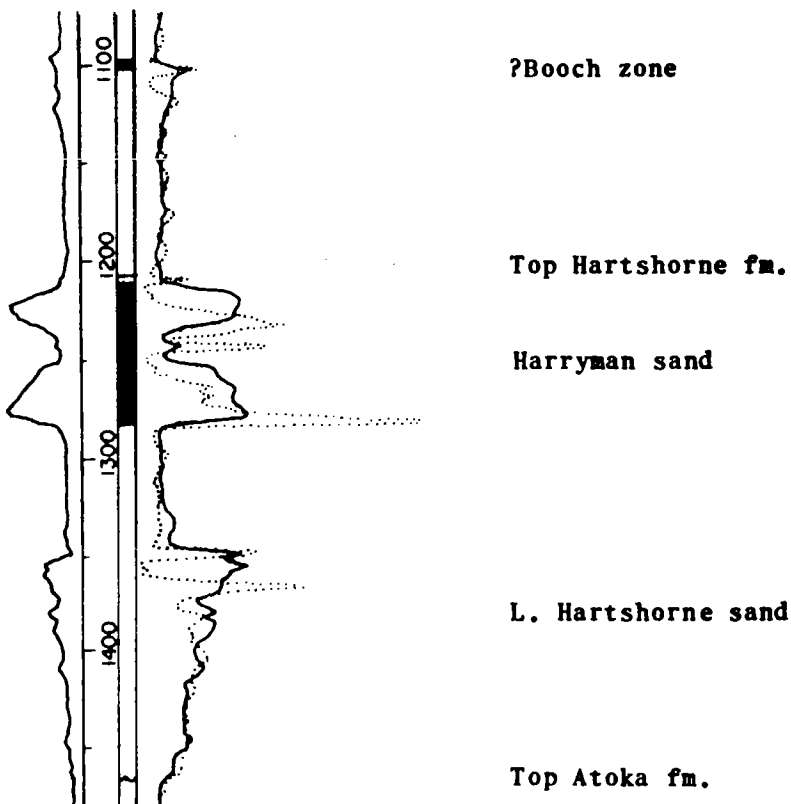
Desmoinesian

Pennsylvanian

First ref. - Dannenberg (1952), OCGS, vol. 2, no. 9, p. 13; (1955), p. 72.

Named for Harryman lease of Ramsey Petroleum Co., discovery in No. 1, C S $\frac{1}{2}$ NW 27-2N-9E, at 1,208-1,275 feet, Centrahoma field, Coal Co., drilled in 1941.
Equal to upper sand of Hartshorne fm. (notes from L. M. Wilshire, J. E. Orr).

Illustration: Ramsey No. 1 Harryman.

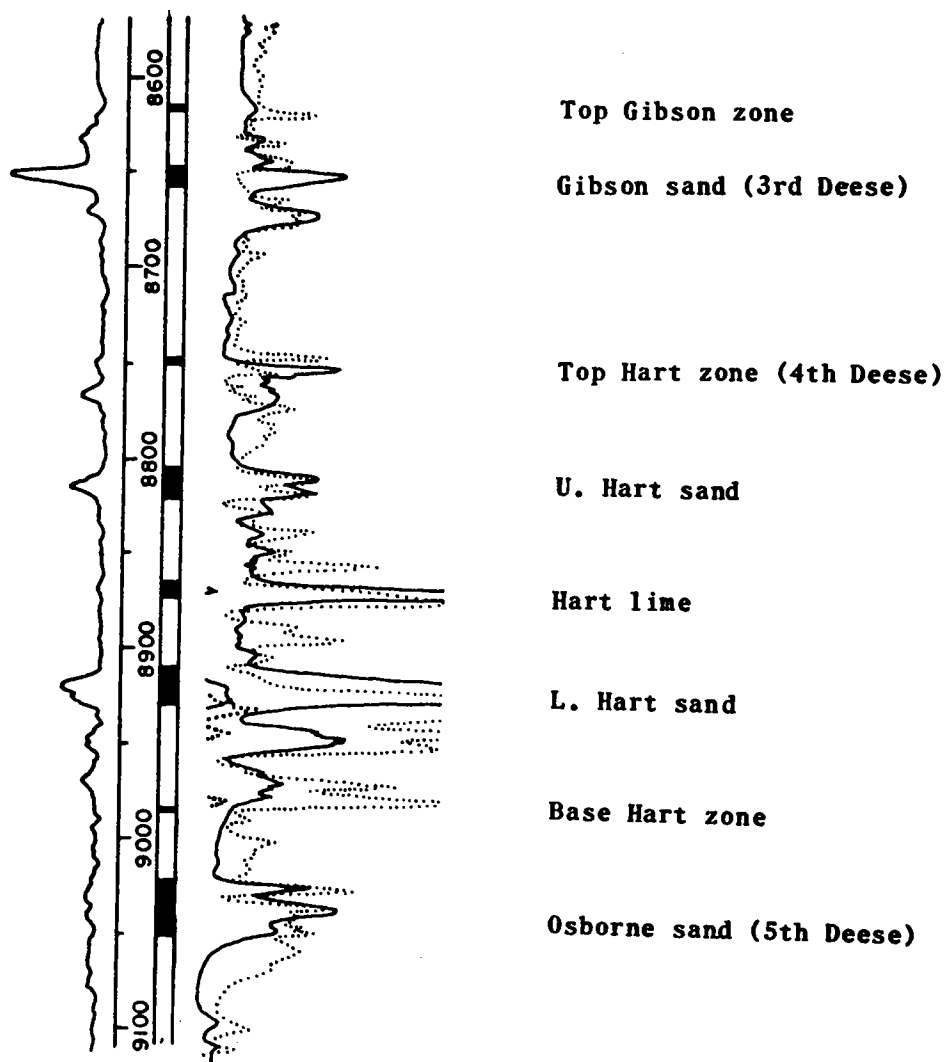


Named for associated Hart sand in the Golden Trend area.

Cryptocrystalline limestone which, though not everywhere present, and not as persistent as the calcareous zone at the top of the Hart zone, occurs between the Upper and Lower Hart sands. Both the Upper and Lower Hart may have one or more sand members separated by shale. In the Lindsay-Bradley area, maroon, red brown, rust and green shales occur immediately below the base of the Upper Hart sand, while above, the shales are gray. These variegated shales persist at least below the Osborne sand (notes from R. F. Krueger, 12-12-56).

Name is unfortunate because of older name Hart ls., member of Stratford fm. on surface in same general area.

Illustration: Gulf No. 1 J. L. Charles, C NE SW 13-5N-5W.

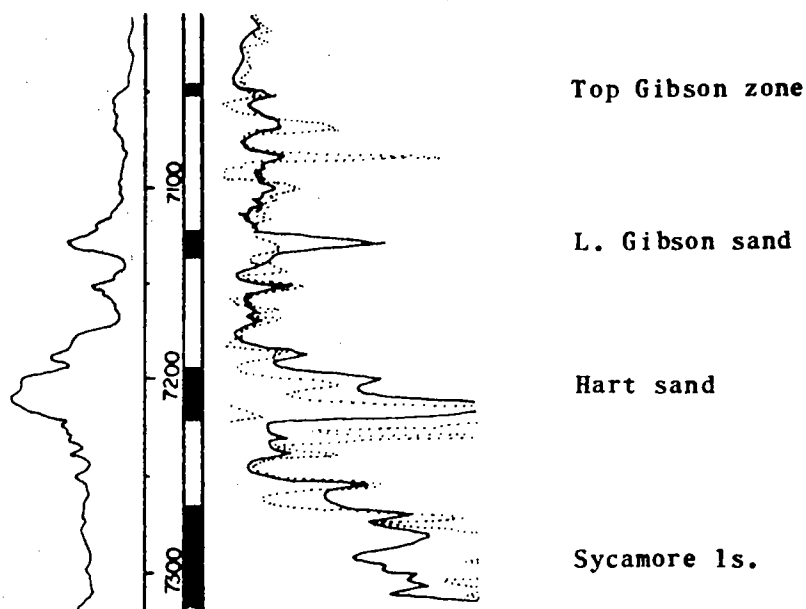


Name published by Wheeler (1947), World Oil, vol. 127, no. 5, pp. 46.

Name from Hart lease of Carter, discoverer in 1946 in No. 1, SE SE 23-3N-3W, Panther Creek field (now Golden Trend), Garvin Co., sand from 7,197-7,221 feet. This sand was named by Lon B. Turk, who, together with many geologists, opposes the use of numerical labels for sands, especially when there is controversy as to correlation with already numerically-designated sands. Turk was the geologist on this well, which was drilled to 7,179 feet and abandoned by Mid-Continent. He tried unsuccessfully to get permission to go deeper. After several months he acquired the leases and Carter, reaching bottom in 10 hours, drilled 7 feet of new hole, topped a saturated sand, drilled 17 feet of stained shaly sand, cored 13 feet of saturated, porous sand. On drill-stem test, the well made an estimated 4 million wet gas, with recovery of 70 feet of free distillate, 290 feet of distillate and gas cut mud (long letter from L. B. Turk, 4-13-56).

Equal to Fourth Deese of Golden Trend, below Gibson sand and above Osborne sand. Upper and lower sand at places separated by Hart lime. Shown as equivalent to Pooler sand and Upper Tussy (Eason) sand in AGS (1956) Cross-sections B-B' and C-C'. OCGS (1952) Cross-section No. 3 implies that Prue sand of Oklahoma City area is same as Hart sand of Antioch area, not Gibson sand. See also illustration of Hart lime.

Illustration: Carter No. 1 Hart.



Moore (1913), Kan. Geol. Soc., Guidebook 5th Ann. Field Conf., chart.

Named for Haskell Inst., Lawrence, Kansas.

Member of Stranger fm. Bluish gray compact limestone, oolitic at places. Marker bed in NW Oklahoma in subsurface, called Tonkawa lime, above Tonkawa sand.

Healdton sand

Missourian

Pennsylvanian

First ref. - Powers (1918), AIME, vol. 59, p. 574.

Named for town and Healdton pool, 3 and 4S-3W, Carter Co.

On AGS (1956), Cross-section B-B'; Healdton sand? is shown as correlative of Upper Bayou sands. Others report that First, Second and Third Healdton sands are all in Lower Bayou.

Hedlund sand

Missourian

Pennsylvanian

Name published as "Hedland" by Hayes (1952), OCGS, vol. 3, no. 2, p. 10; (1955), p. 101.

Named for Hedlund lease, NE 11-5N-9W, Cement field, Caddo Co., but does not appear to have been developed on this lease.

Hayes placed the Hedlund sand equivalent to a School Land sand below the Wade sand and above Medrano sand in text, but in Table 1, below Medrano sand and above Marchand. A. J. Montgomery and H. R. Segnar (1-31-57) report that it is below Wade sand and a thick shale section and above the Medrano sand. See illustration of Medrano sand, in which the most typical development of Hedlund is a sandy shale zone.

Hefner sand

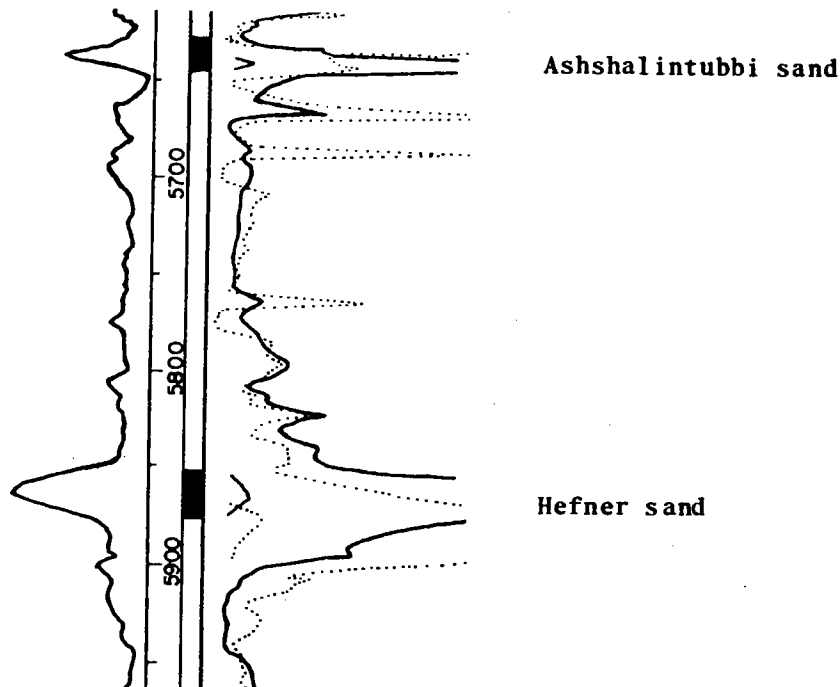
Desmoinesian

Pennsylvanian

Shaw (1954) OCGS, vol. 5, no. 3, p. 9; (1955), p. 348.

Named for Robert A. Hefner lease of Sunray in NW 12-1N-5W, Doyle field, Stephens Co. Equal to Desmoinesian Morris sand, Pickens and Lower Basal Tussy sand according to AGS (1956), Cross-section B-B'. Below Ashshalintubbi (Second Carpenter) sand in Doyle field.

Illustration: Sunray No. 4 Hefner SW SE NW 12-1N-5W.



Helm sand

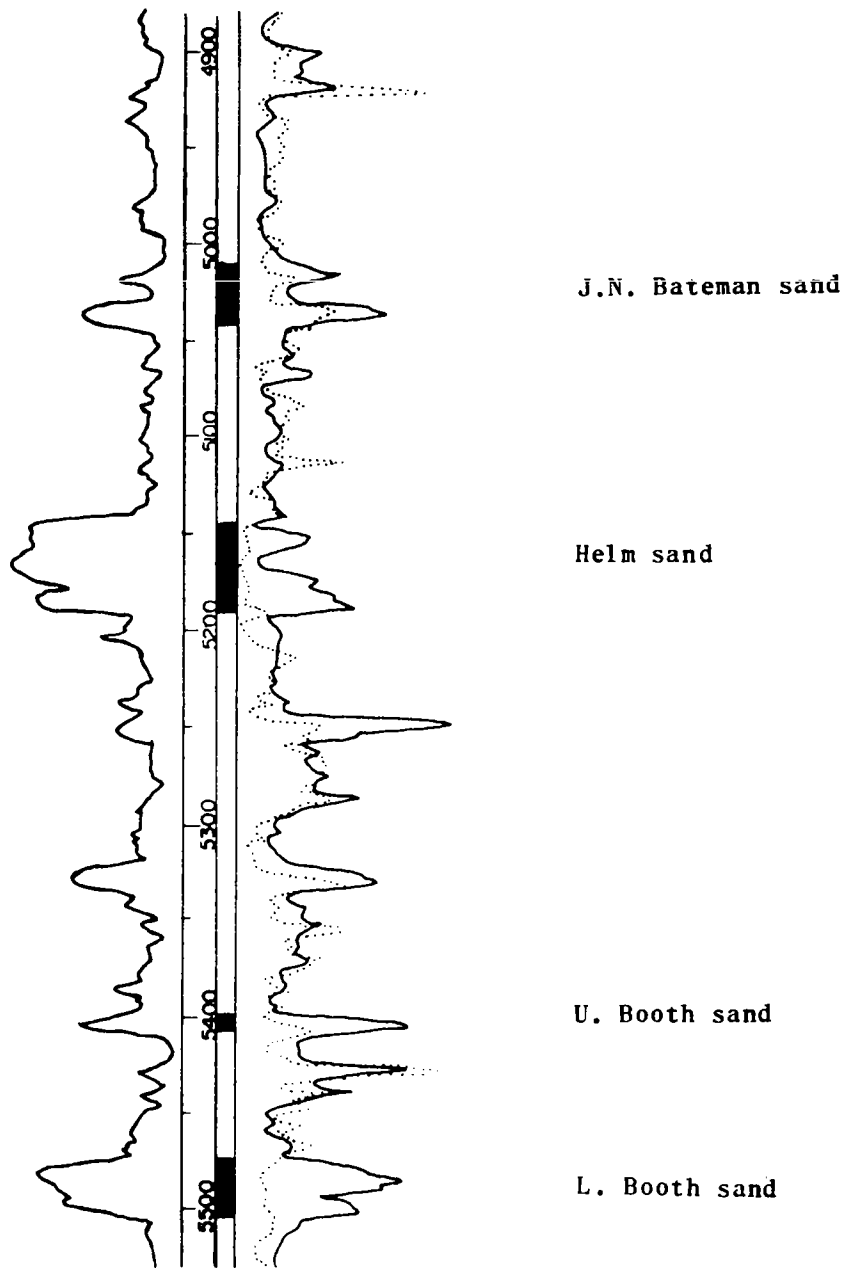
Virgilian

Pennsylvanian

Listed as Helms sand by Hayes (1952), OCGS, vol. 3, no. 2, p. 7; (1955), p. 101.

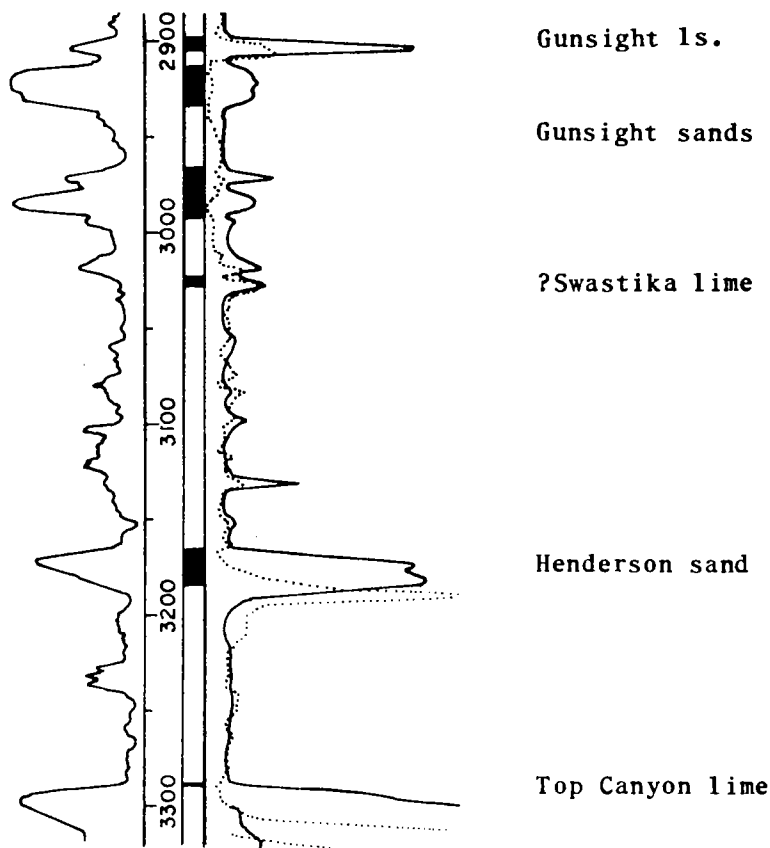
Named for S. J. Helm lease of Texas, NW 21-2N-8W, W Marlow field, Stephens Co.
Lies below J. N. Bateman sand, above Booth sands.

Illustration: Texas No. 2 Helm, SW SW NW 21-2N-8W.



Name from Henderson field, Tillman Co.
 Production discovered in SW SW 6-3S-17W. Approximately correlative with Swastika sand of Texas (note from J. E. Green, 3-1-57).

Illustration: McMahon No. 1 Valentine, SW SW NW 10-3S-18W.



Hendon sand

Dornick Hills group

Pennsylvanian

Name from Hendon lease of Trice Production Co., NE NE 29-6S-2E, NE Greenville field, Love Co.

Reported as main producing sandstone in NE Greenville field, 0-55 feet thick, medium-grained sandstone shaly toward the base at places, with 10-12 feet of porosity. Data given: Beard No. 2 Conrad, SE NW NE 29-6S-2E, elevation 725 feet, top of Dornick Hills at 4,317 feet, Hendon sand 4,767-4,790 feet.

*Henryhouse fm.

Hunton group

Silurian

Reeds (1910), OGS, fig. 10.

Named for Henryhouse Creek, Carter Co.

Gray to reddish marlstone and granular limestone, formation of Hunton group.

Hensley wash

Wolfcampian

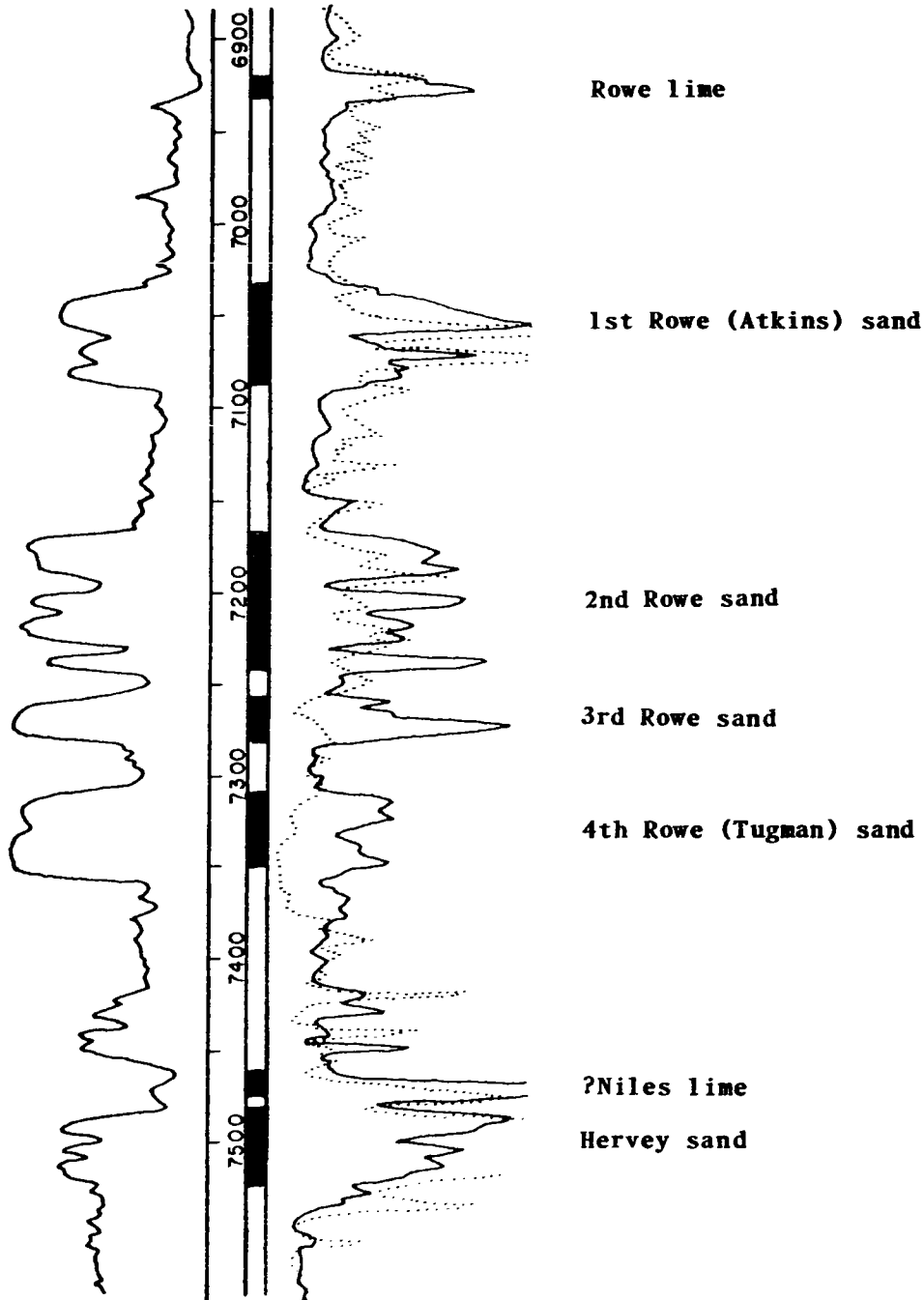
Permian

Named for Hensley lease of Gulf, 10-1N-20W, Altus field, Jackson Co.
 Granite wash production above Cole wash. See illustration of Cole wash.

Named in Beaver field, Stephens Co., for Hervey lease of Peppers, discovery in No. 2 Hervey SE SE NE 4-2N-8W, Beaver field, Stephens Co., at 7,522-7,550 feet.

Used in Beaver and SE Beaver field, below Rowe sands. Considered equivalent to Niles sand of Cement field. Oolitic ls. above Hervey sand is thought by some to be equal to Niles lime of Cement field (notes from W. W. Solter, 1956).

Illustration: Peppers No. 2-A, Hervey, SW SW NE 4-2N-8W.

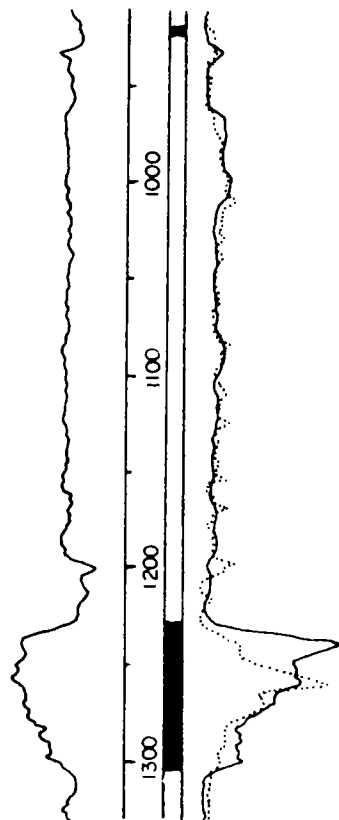


First ref. - Westheimer and Schweers in Selk (1951), AAPG, vol. 35, p. 598, fig. 12.

Named for Hewitt field, Carter Co. The "Hewitt lignite" was first noticed and used as a datum by D. V. Callahan in the W Hewitt field. It consists of impure gray to black shaly lignite or carbonaceous clay recognized by low self-potential on electric log, particularly evident in Bayou and SW Lone Grove fields. In W Hewitt and Hewitt, it is less evident on the logs due to its thinness.

Lies within "Upper Bayou sand zone" of Bayou field and SW Lone Grove fields, a marker zone in lower part of Hoxbar group. Approximately 300 feet above First Hewitt (Chubbee sand) in Hewitt field. See illustrations of Bayou and Chubbee sands for more typical development of Hewitt lignite (notes from J. M. Westheimer, 10-56). A second Hewitt lignite associated with maroon clay is present between 3rd and 4th Hewitt sands (see Hewitt sands).

Illustration: Jones Oil Co. No. 11 Oklahoma Dillard, SW SW NW NE 22-4S-2W.



Hewitt lignite

1st Hewitt (Chubbee) sand

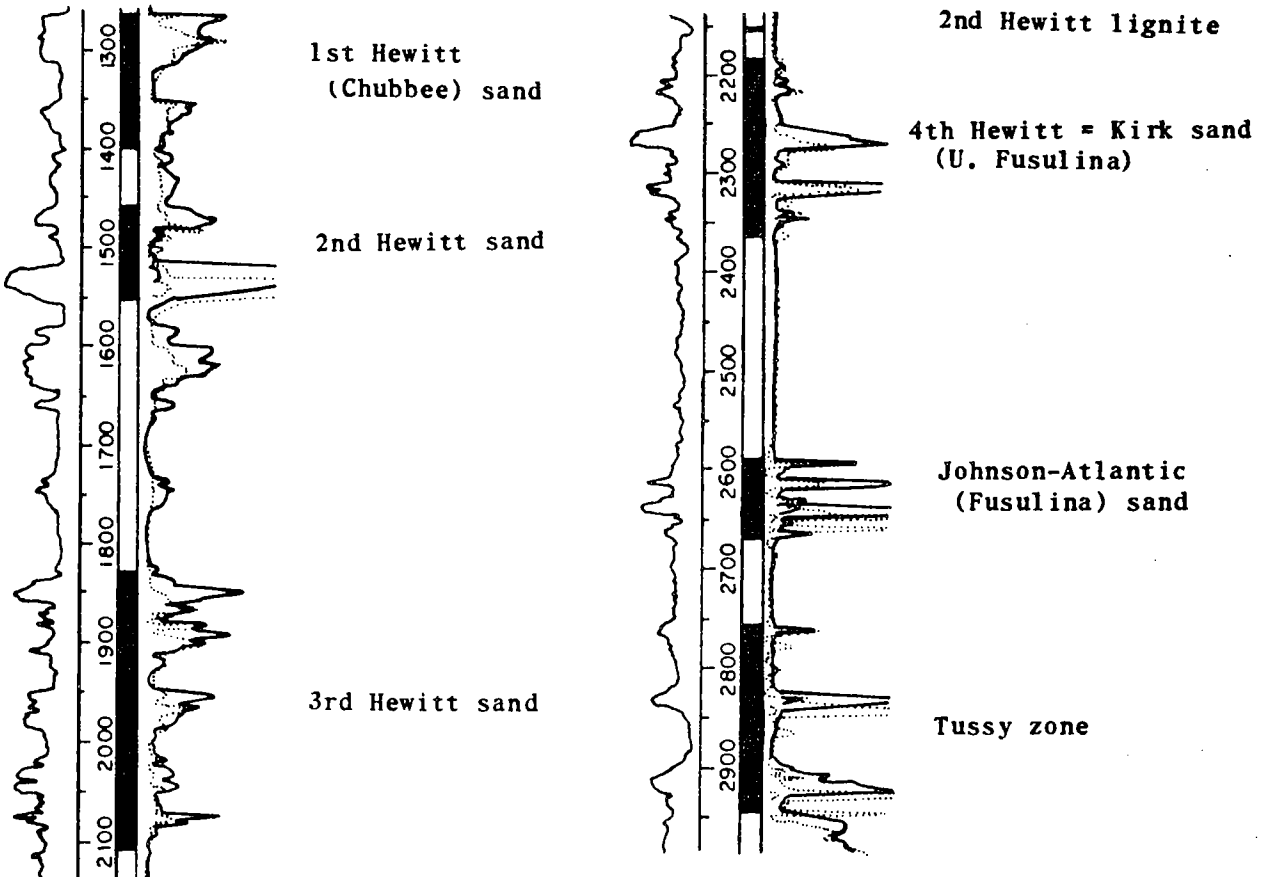
First ref. - Swigart and Schwarzenbek (1921), USBM Rept. of Hewitt field, p. 19.

Named for Hewitt field, Carter Co. Discovery of field and First Hewitt by Texas No. 1 A. E. Denny, NW NW NW 27-4S-2W, 6-5-1919.

According to Mullen (1956), PGS0, vol. 1, p. 155: 1st Hewitt, near top of Deese group, equal to Chubbee sand; 2nd Hewitt, includes Norris sand; 3rd Hewitt, equal to upper portion of Lone Grove sands, or Lone Grove 1 through 6 of Westheimer and Schweers; 4th Hewitt equal to Kirk sand (also called U. Fusulina or U. Fusulinid) and equal to basal portion of Lone Grove sands. Hewitt sands lie above Fusulina sand (L. Fusulina or L. Fusulinid, Johnson-Atlantic) and Tussy sands. Swigart and Schwarzenbek recognized seven producing sands in a defined interval of 700 feet without intervening water sands. Their method of numbering is not the same as that of Mullen.

In illustrated well, 1st Hewitt lignite occurs at approximately 995 feet; 2nd lignite at 2,150 feet; maroon "plastic" shale and siderite are present from 2,120 to 2,180 feet. Missourian-Desmoinesian boundary is thought to be between 3rd and 4th Hewitt sands (notes from W. L. Mullen, 3-1-57). Geologists in the Ardmore area disagree about this boundary.

Illustration: Simpson-Fell No. 3-A Walker-Voorhees, C SE SE 9-4S-2W.



Hickman sand

Pennsylvanian

Whiteside (1936), TGS, vol. 5, p. 3.

Used at one time in Burbank field, Osage Co.

Hodges sand

Wolfcampian

Permian

First ref. - Maravich (1953), AAPG, vol. 37, p. 1344.

Published term for gas sand at 1,420 to 1,443 feet in Panda Drilling Company (J. E. Grooms) No. 2 Cassody, NW NW SE 23-22N-3W, discovery well of SE Duff field, Garfield Co., in October 1952.

This sand is in the Whitney sand zone, below the Wreford ls. and above the Cottonwood ls. (L. W. Cary, Shale Shaker Digest, 1955, p. 395). The term Hodges arose in the following way and suggests some of the problems of nomenclature which arise. According to Vernon R. Baker, "Operators incorrectly identified the Whitney sand with the Hotson sand of the Garber area. However, due to lack of familiarity with the nomenclature of the area and some similarity of names, misunderstood and applied the name "Hodges" (since production had been discovered on the Hodges lease of Olson Oil Company, No. 1 in SW SW NW 3-21N-3W, just prior to this time from the "Crews" interval)." The name Hodges should be suppressed in this area.

Hodges zone

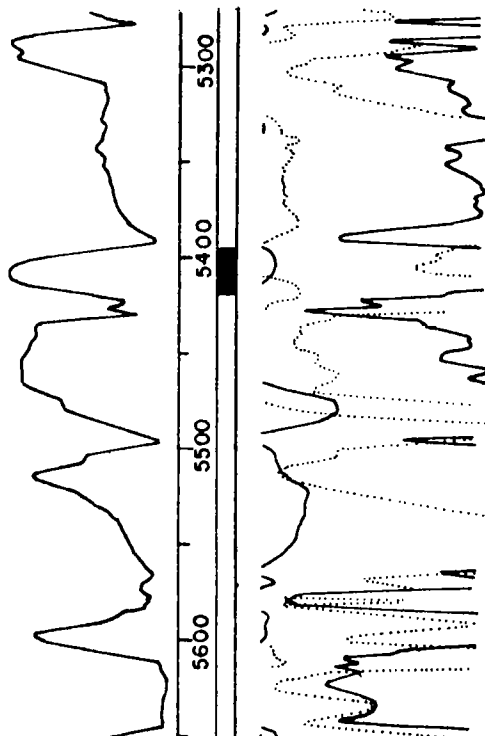
Missourian

Pennsylvanian

Name from Cabot Carbon No. 1 Hodges, C SW NE 1-5N-24ECM, oil discovery well in NW Mocane field, Beaver Co., 2-23-55.

Producing zone, 5,317-38 feet, a porous limestone called both Hodges and Checkerboard. It is thought that Hodges should be preferred since the term Checkerboard has been applied in other areas in several ways.

Illustration: Cabot Carbon No. 1 Judy, C NE SE 1-5N-24ECM.



Hodges zone

*Hogshooter limestone

Missourian

Pennsylvanian

Gould et al. (1910), Okla. Univ. Res. Bull. 3, p. 12.

Named for Hogshooter Creek, Washington Co.

Lies in Skiatook group below Nellie Bly sh. and above Coffeyville fm. Dodds Creek ss. (true Layton sand) immediately below. Limestone from 1 to 50 feet thick, gray massive-to thin-bedded, locally oolitic.

Widely used marker in C and NE Oklahoma.

Hogshooter sand

Desmoinesian

Pennsylvanian

First ref. - Berger (1918), AAPG, vol. 2, p. 212.

Named for Hogshooter pool, Washington Co.

Equal to Burgess sand. Name should be left unused because of conflict with Hogshooter ls.

Holland sand

Desmoinesian

Pennsylvanian

First ref. - Ohern and Garrett (1912), OGS 16, p. 16.

Named for Birdie Holland lease of Wolverine Oil Co., NW 4-25N-13E, Bartlesville-Dewey field, Washington Co.

Equal to Peru sand. Name is not needed.

*Hollenberg limestone

Leonardian

Permian

Condra and Upp (1931), Nebr. Geol. Survey, 2nd Ser., Bull. 6, p. 63.

Named for town of Hollenberg, Washington Co., Kansas.

Impure dolomite in lower part of Wellington fm. Used as marker in NW Oklahoma subsurface. Produces gas in Hugoton gas field.

Hominy lime

Virgilian

Pennsylvanian

Named for Hominy town and pool, 22N-8 and 9E., Osage Co.
Subsurface marker equal to Lecompton ls.

Hominy sand

Ordovician

First ref. - White and Greene (1924), OGJ, vol. 23, no. 15, p. 68.

Named for Hominy town and pool, Osage Co.

Rests on "Siliceous lime" (West Spring Creek fm.) and below Tyner fm. Equal to Burgen ss. or lower Simpson sand.

Hoopes sand

Ordovician

First ref. - McGee and Clawson (1932), AAPG, vol. 16, p. 974.

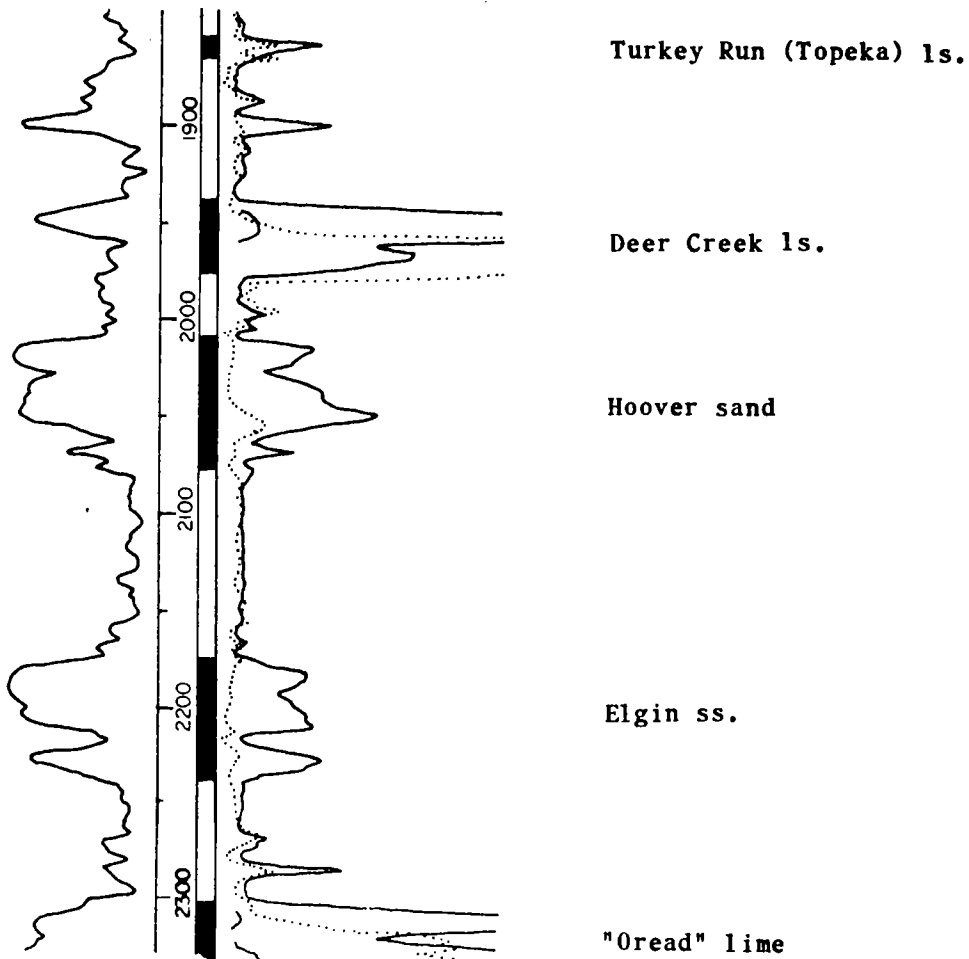
Named for Hoopes lease of Skelly, NE 31-11N-2W, Oklahoma City field, Oklahoma Co. Sandstone in base of Oil Creek fm.

First ref. - Snider (1920), Oil and Gas in Mid-Cont. fields, p. 229.

Named for Hoover lease of Mid-Co Oil, discovery in No. 2 Hoover, C NE NW 22-23N-2W, at 2,115-2,136 feet, 1917, Billings field, Noble Co.

Hoover sand is Upper Hoover, and Elgin ss. is Lower Hoover, below Deer Creek ls. and above Oread lime. Entire zone is called Elgin-Hoover by some geologists. Hoover sand and Elgin ss. is preferred to upper and lower terminology (G. C. Maddox, 10-24-56).

Illustration: Mid-Co Oil No. 12-A Washburn, SE NE SW 15-23N-2W.



Horton sand

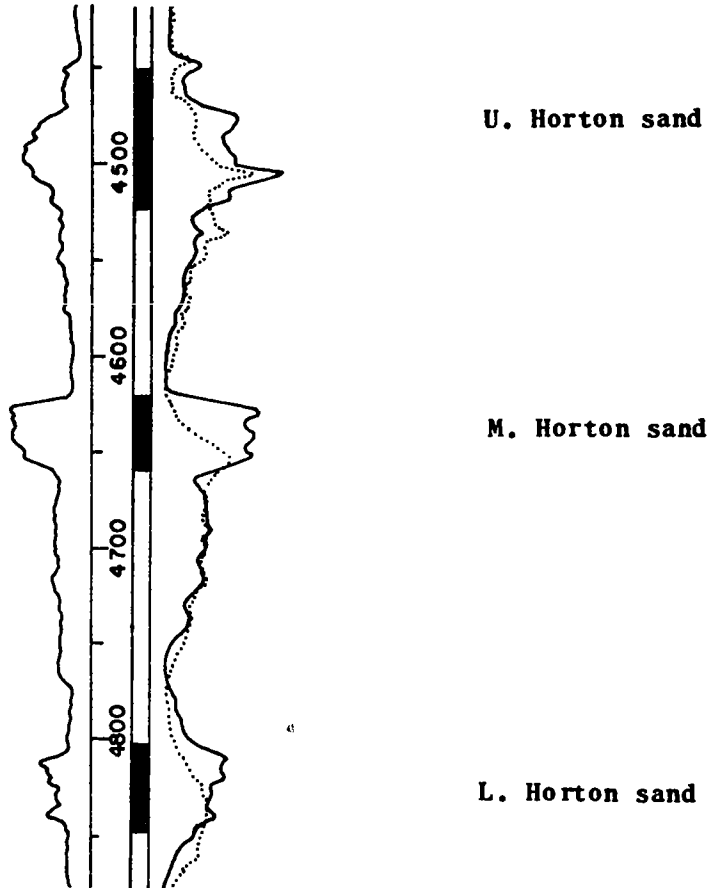
Springeran

Pennsylvanian

Named for Horton lease of Republic Natural Gas, NW 8-3N-5W, Carter-Knox field, Grady Co.

Production found in sandstones below the Woods sand and above the Hutson sand, divided into upper, middle and lower Horton sands (note from R. B. Harrington, 3-1-57).

Illustration: Republic Nat. Gas No. 9 Horton, NW SW NW 8-3N-5W, in which Woods sand is from 3,875-4,255 feet, and Hutson sand is from 5,230-60 feet.

**Hotson sand**

Wolfcampian

Permian

Snider (1920), Oil and Gas in Mid-Cont. Fields, p. 228.

Named for D. Hotson lease of Empire, SE SW SE NW 25-22N-4W, at 1,523 feet, Garber field, Garfield Co.

Lies below Cottonwood ls., and above the Neva ls. See illustration of Hoy sand.

House sand

Permian

Name given in Research Oil Reports for sand from 2,470-2,480 feet with no show of oil or gas, completed 10-22-1954, in Marlow Drlg. Co. No. 1 Cheek, NE NE NE 30-2N-8W, N Nellie district, Stephens Co.

Name from House lease, NW 29-2N-8W, that had several wells drilled on it with shows but none ever produced. In Corporation Commission files, well drilled in 1929, Smythe No. 1 Johnson, SE NE NE NE 30-2N-8W, is reported to have produced 20 barrels of oil, first and second 24 hours period with 15 barrels of water from this sand (notes from W. W. Solter, 4-30-1957).

Goldston (1922), AAPG, vol. 6, no. 1, p. 10.

Named for town of Hoxbar, Carter Co.; thickness of member 4,000 feet, upper part characterized by white sandstones separated by light blue to yellow and red shale. Basal sediments characterized by several brown limestones, one of which is a prolific fusulinid horizon, Tomlinson (1928). Underlies Pontotoc and overlies Deese, with basal member named Confederate ls. member.

Currently used in subsurface for strata, considered to be of Missourian age. See note under Coline sand.

"Hoxbar water" sand

Missourian

Pennsylvanian

Shown on AGS (1956), Cross-sections B-B' and D-D', below Doyle lime and above Cravens unconformity from 1S-5W to 2N-4W and from 1S-5W to 1N-6W.
Same as Willie sand, the preferred name.

Hoxsey sand

Wolfcampian

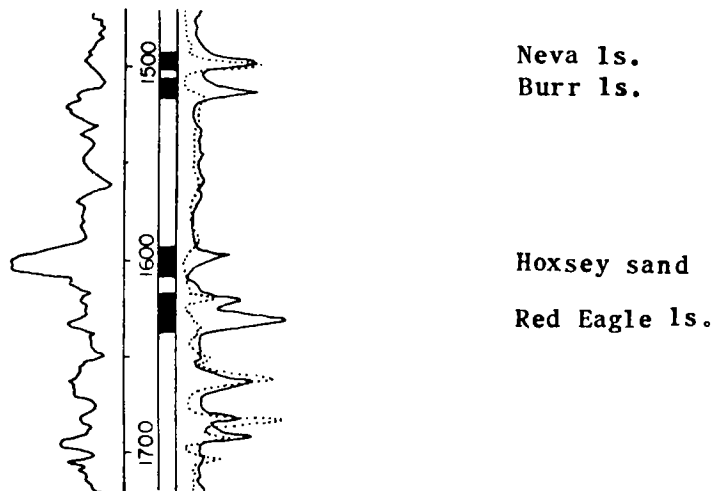
Permian

First ref. - Page (1955), OCGS, vol. 5, no. 10, p. 7 as "Hoxey"; (1955), p. 450.

Named for H. M. Hoxsey, an operator. Discovery in Dobson and Hoxsey No. 1 Young in Sams field. Produces in secs. 15 and 16, 21N-2W, Noble Co.

Lies just above Red Eagle ls., is whitish calcareous sandstone about 10 feet thick. See discussion of Belveal and Walker sands.

Illustration: Dobson and Hoxsey No. 4 Young, NW SW NE 16-21N-2W.



Hoy sand

Wolfcampian

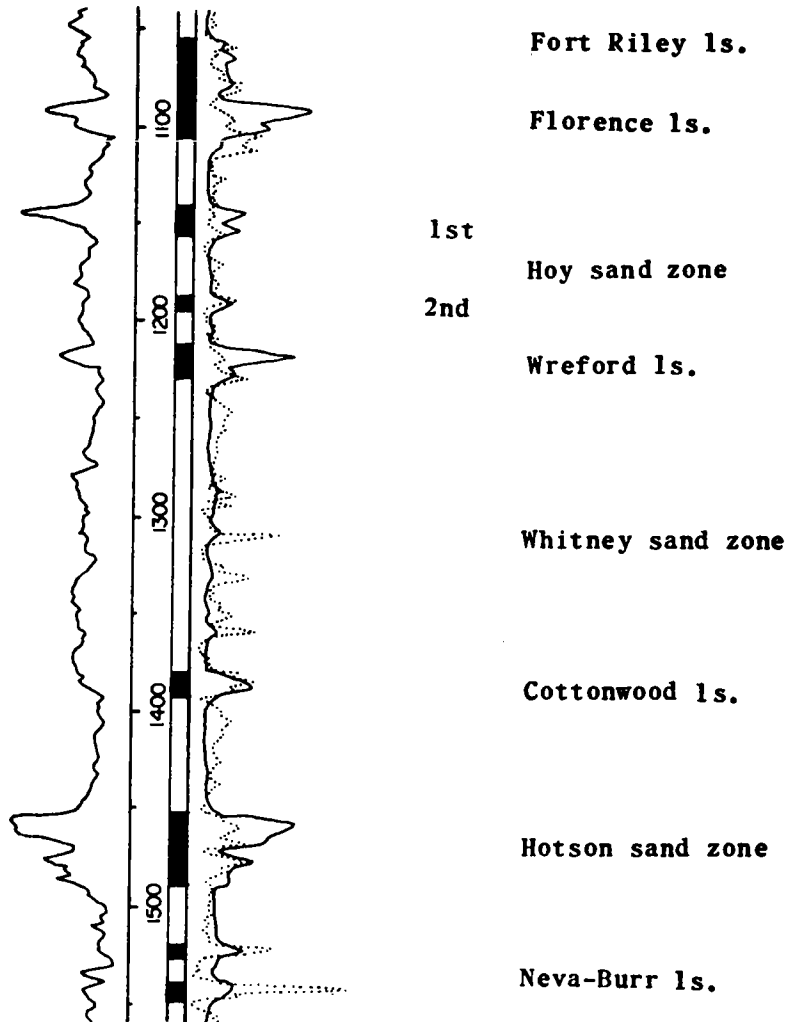
Permian

Snider (1920), Oil and Gas in Mid-Cont. fields, p. 228.

Named for Hoy lease of Exchange (Garfield) Oil Co. Discovery of field and sand in No. 1 Hoy, NE NE NE 25-22N-4W, at 1,138-1,150 feet, 11-6-1916, Garber field, Garfield Co.

Hoy sand zone is below Fort Riley ls., above Wreford ls., may have 1st and 2nd Hoy sands.

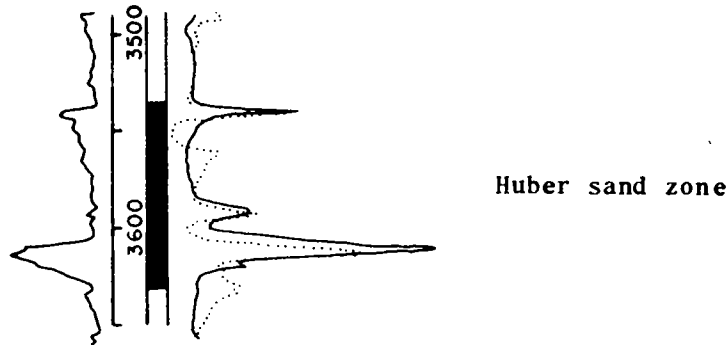
Illustration: Sinclair No. 28 Hoy, NE SE NE 25-22N-4W.



Named for Huber lease of Carter, SE 11-1N-1W, N Hoover field, Garvin Co.

Production discovered in three sands directly below Third Tuley sand. These three sands were given the names First, Second and Third Huber and classified as a common source. First Huber from 3,598 to 3,613 feet and Second Huber from 3,673 to 3,694 feet were discovered in Carter No. 3 Huber, SW SW SE 11-1N-1W; Third Huber was found productive in Carter No. 2 Dougherty-Paul, NW SE SW 11-1N-1W, from 3,533 to 3,569 feet. The Huber sand zone equivalent in White Eagle No. 9 Tuley is from 3,538 to 3,630 feet. Below Tuley sand zone and above Randolph sand zone (notes from L. D. Ford, 10-4-56).

Illustration: White Eagle No. 9 Tuley, C N $\frac{1}{2}$ NE 13-1N-1W.

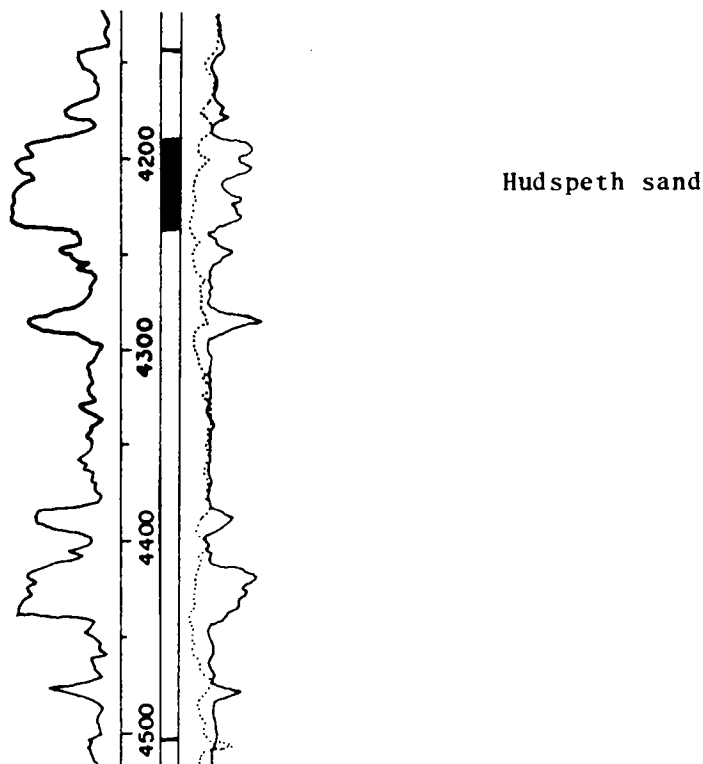


First ref. - Maravich (1953), AAPG, vol. 37, p. 1344.

Name brought into Oklahoma by subsurface correlation from Texas.

Producing sand in Sinclair No. 1 Evans, NE SE SW 34-8S-2E, NE Thackerville field, Love Co. from 4,189 to 4,240 feet. The section from 4,145 to 4,505 feet is referred to as the Hudspeth zone. Lies below the Bruhlmeier sand (notes from M. D. Maravich and F. B. Jones, 1956).

Illustration: Sinclair No. 1 Evans.



Humphreys sand

Springeran

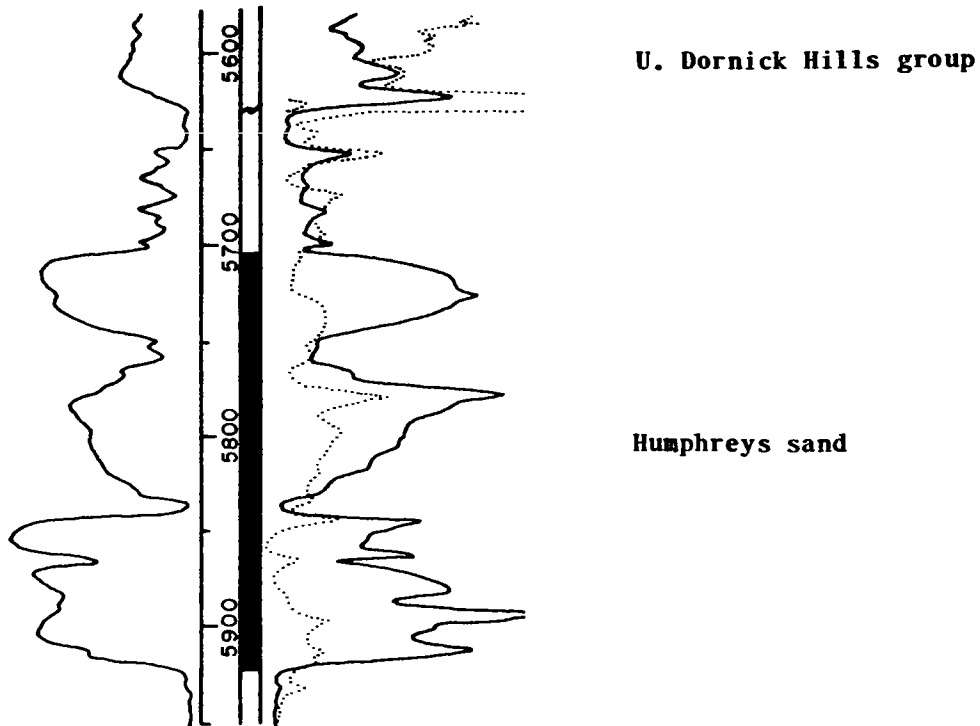
Pennsylvanian

Selk (1951), AAPG, vol. 35, p. 594, fig. 8 as Humphries; p. 604 as Humphrey. Humphrey zone published on OCGS (1952), Stratigraphic Cross-section 1-1; as Humphries by Rutledge (1953), Petr. Eng., vol. 25, no. 13, p. B-41.

Name from L. L. Humphreys lease of Skelly, SW 13-1S-5W, Velma field, Stephens Co., where sand is water-bearing. Production established by Magnolia No. 3 Humphreys, NW SE NE 11-1S-4W, Sept. 14, 1947.

Equal to Third Springer sand of Sholom Alechem field, is Second Springer sand in Velma, SW Velma and N Alma fields. Lies above Sims sand, below Aldridge sand. May be equal to Overbrook ss. (notes from Frank Gouin, R. L. Fienning, R. L. Beasley).

Illustration: Skelly No. A-10 Humphreys, SE NW SE 13-1S-5W, in which Aldridge sand and Springeran sh. are missing due to pre-Dornick Hills erosion.



*Hunton group

Devonian

Taff (1902), USGS, Atoka folio, no. 79 described formation; raised to group status by C. A. Reeds (1911 and 1926), who divided it into five formations (descending): Frisco ls., Bois d'Arc ls., Haragan sh., Henryhouse sh., and Chimneyhill ls. Unconformably overlies Sylvan sh. and is unconformably overlain by Woodford sh.

Named for exposures near former hamlet of Hunton, 8-1S-8E, which is near the present town of Clarita, Coal Co.

Amsden (1957, OGS Circ. 44) discusses the stratigraphy of the Hunton group, its formations and members.

Hunton lime is the term used in subsurface where the group is undifferentiated and may refer to any part of the group. See Bois d'Arc, Haragan, Henryhouse, Chimneyhill, Pink Crinoidal, Oolitic, and Glauconitic.

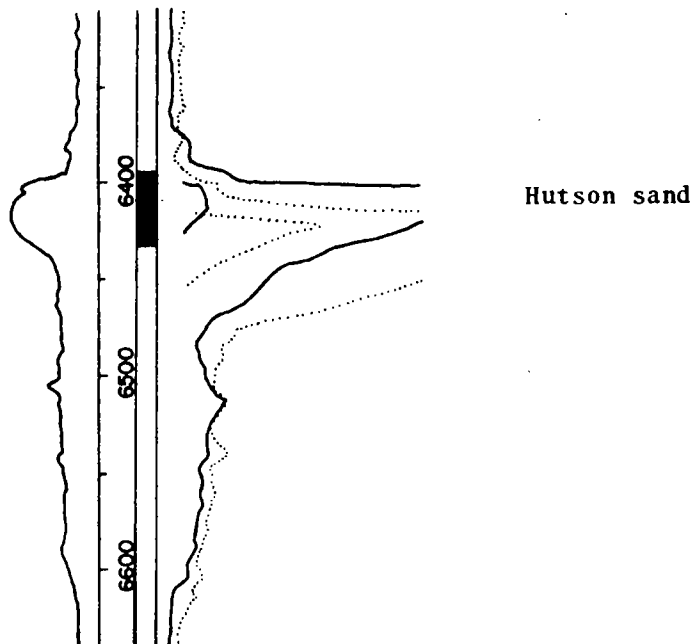
Hutson sandSpringeranPennsylvanian

Name published by Pate (1953), OCGS, vol. 4, no. 3, p. 11; (1955), p. 218.

Named for Hutson lease of Texas, discovery in No. 1, SW SE SW 31-4N-5W, Carter-Knox field, Grady Co.

Lies above Anderson sand, below Horton sand. May be equivalent to Britt sand of Chitwood area.

Illustration: Amerada No. 1 Anderson, SE NE SE 36-4N-6W.

Independence sandDesmoinesianPennsylvanian

Reported by Wilmarth (1938), USGS 896, p. 1008.

It may have been used as a shallow sand name in northern Oklahoma due to the proximity to the Independence field of Kansas. Was not connected with the Independent pool in Creek Co. (D. M. Logan, 6-1956). May be equivalent to Bartlesville or Red Fork sand.

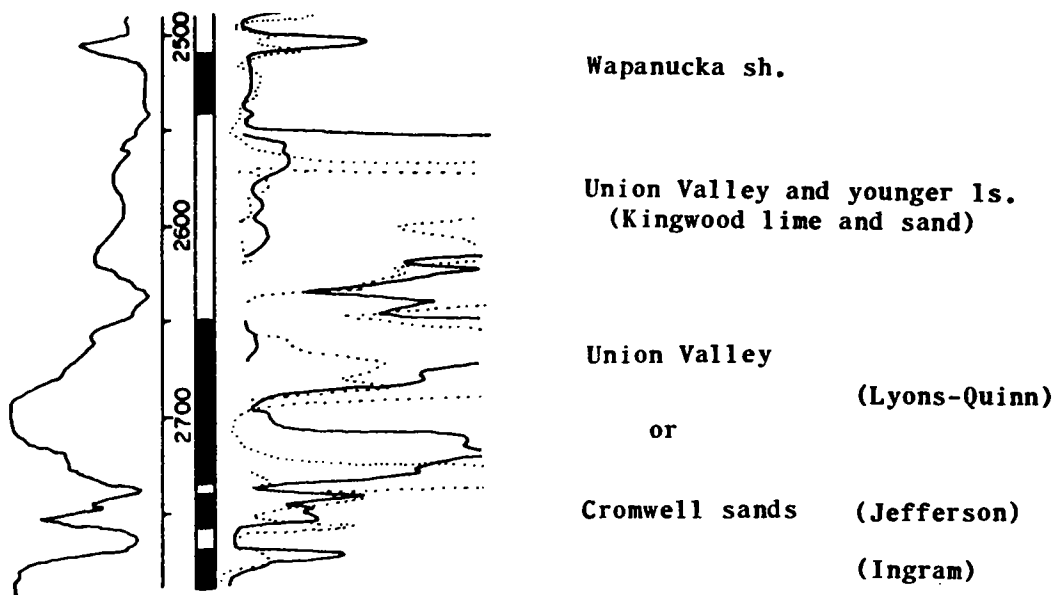
Kirwan (1924), USBM, Rept. Invest. 2612, p. 4.

Named for Ingram lease of Lyons-French, discovery in No. 4 Ingram, C W $\frac{1}{2}$ E $\frac{1}{2}$ SE NW 13-11N-11E, in Lyons-Quinn field, Okfuskee Co. Drillers log of this well (elev. 795, Kirwan) reports Lyons sand, 2,672-93 feet; sand and ls., 2,693-2,750; black shale, 2,750-65; ls., 2,765-66; and Ingram sand, 2,766-73, total depth.

A well drilled in 1954 (Charles Joels No. 2 Johnson, elev. 807), and a close diagonal offset is used to illustrate the Jefferson and Ingram sands, as they were indicated in the report of Kirwan. The Jefferson sand was not indicated as present in the No. 4 Ingram, but in other diagrams, he showed the Jefferson sand above a black shale 20-30 feet above the top of the Ingram sand.

Equal to a Cromwell sand. By some geologists considered older than Morrowan, possibly Springeran or Mississippian. (See also Jefferson sand illustration).

Illustration: Joels No. 2 Johnson, SE SE NW 13-11N-11E.



Lowman (1932), TGS, Summ. Abst.

Named for town of Inola, Rogers Co.

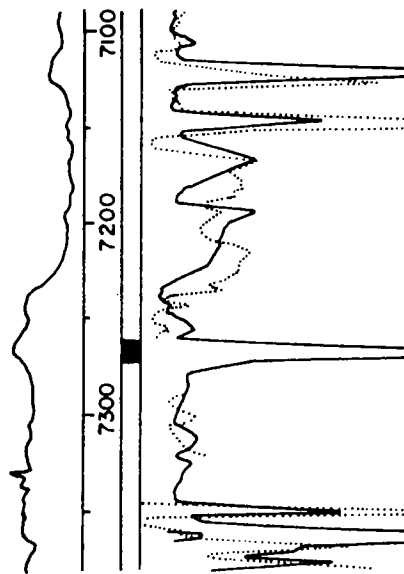
One to four thin limestone beds above Bluejacket ss. in Boggy fm. Lowest bed is more persistent and carries fusulinids.

First ref. - Wright et al. (1957), USBM, Rept. Invest. 5326, p. 28.

Name apparently from Inola ls. Used by some operators in 11-19N-9E, E Mannford field, Creek Co. Depth given as 2,376-2,386 feet, elevation 688 feet. Subsea depth indicates that this sand is a basal Desmoinesian ss. resting upon Mississippian and should be called Burgess sand. Name should be suppressed for this usage.

However, the term Inola sand is being used for a pay which is considered to be the horizon of the Inola ls. in western Oklahoma. Utah Southern No. 1 Pope, SW SE NW 10-18N-9W, SW Lacey field, Kingfisher Co., discovered gas at 7,265-7,275 feet at this Inola ls. horizon, where porosity is developed in a sandy limestone or calcareous sandstone.

Illustration: Utah Southern No. 1 Pope.



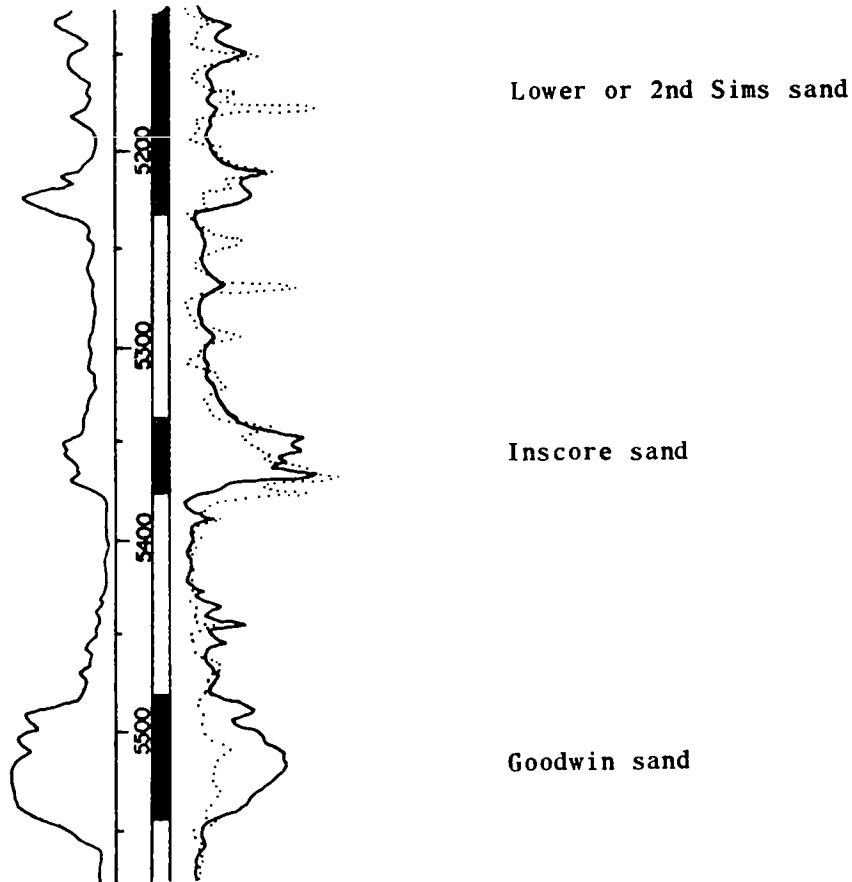
Inola sand

Name published on AGS (1956), Cross-section D-D', wells 5, 6.

Name from Inscore lease of Skelly, discovery in Unit B-1, SE NE SE 24-1S-4W, Sholom Alechem field, Stephens Co. Inscore is misspelling.

Sand developed between Lower Sims sand and Goodwin according to R. L. Beasley, 9-1956. Shown on AGS Cross-section D-D' as equivalent to Flattop sand above Goodwin sand; and to First Goodwin sand above Second Goodwin sand; below Sims sand zone.

Illustration: Skelly No. B-1 Inscore Unit.



First ref. - White and Greene (1921), AAPG, vol. 5, p. 406.

Humorous name, from green color.
Sandstone in Tyner fm. of Tulsa area.

Jackson sand

Pennsylvanian

Snider (1920), Oil and Gas in Mid-Cont. Fields, p. 237.

Named for Simeon Jackson lease of Gates Oil Co., NE 16-4S-3W, Healdton field, Carter Co.

Lies below Healdton sand, above Simpson sand of Snider (? not Ordovician). Name not established. Conflicts with Jackson group, U. Eocene of Gulf Coast.

Jacob sand

Missourian

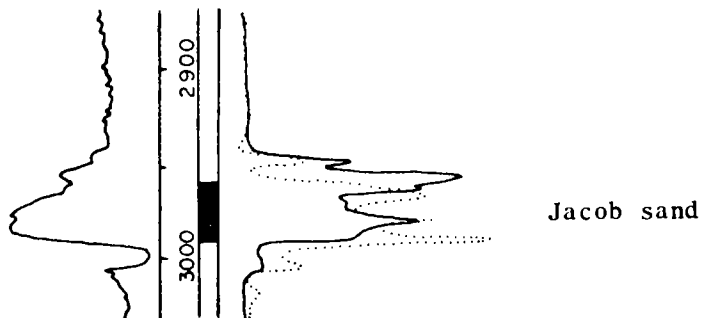
Pennsylvanian

First ref. - Harlton (1956), PGSO, vol. 1, p. 10 and 223.

Name from Amerada No. 1 Jacob, SW SE NE 13-1S-6W, at depth of 2,960-2,992 feet, elevation 1,094 feet, W Velma field, Stephens Co.

In lower part of Hoxbar group (note from B. H. Harlton, 9-11-56).

Illustration: Amerada No. 1 Jacob.



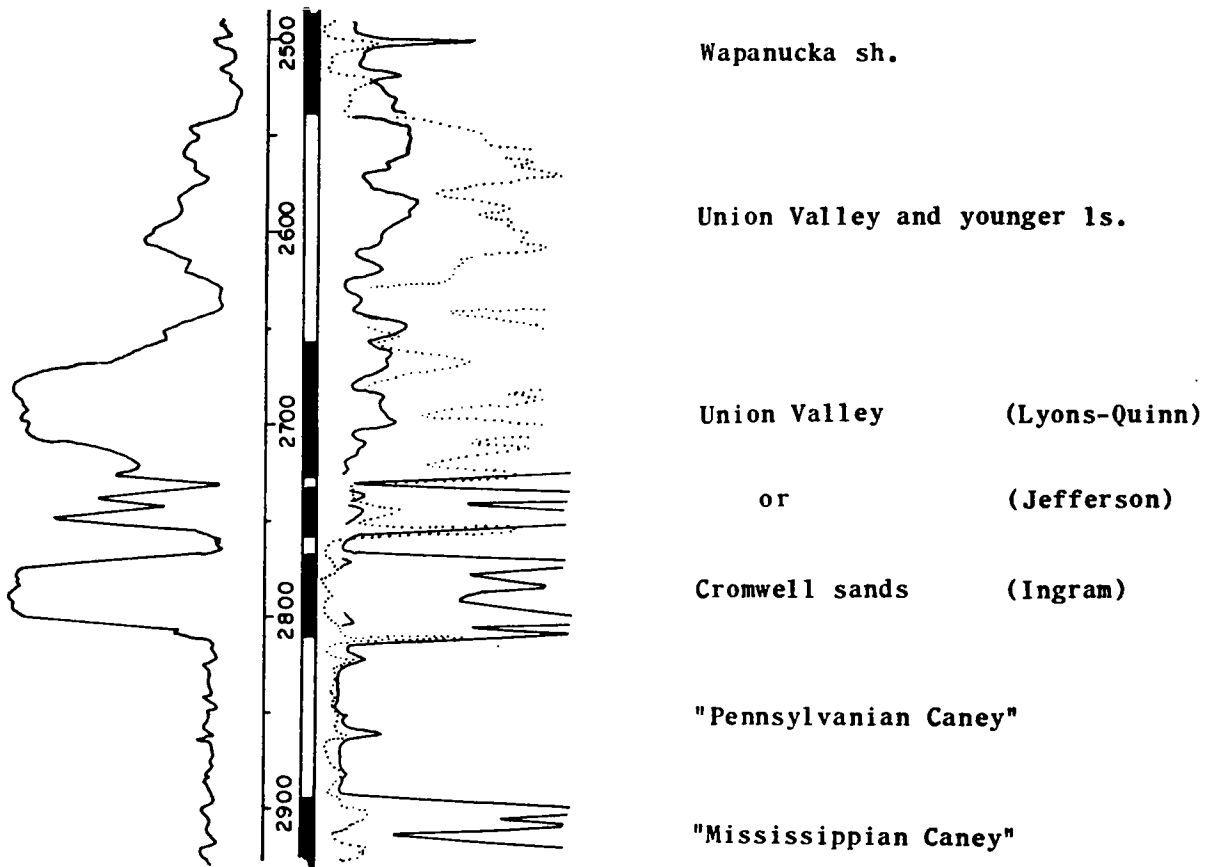
Kirwan (1924), USBM, Rept. Invest. 2612, p. 4.

Discovery in 1921 in No. 6 Jane Jefferson of Waite Phillips, C E $\frac{1}{2}$ E $\frac{1}{2}$ NW SE 13-11N-11E, at 2,769 feet, 59 feet below Lyons sand, Lyons-Quinn field, Okfuskee Co.

Sand averages 60 feet below top of Lyons sand and is separated from Ingram sand below by a 15-foot shale break.

The three sands shown above are all now called Cromwell or Union Valley sands, while the term Jefferson is being incorrectly applied to a sand below in the unit called "Pennsylvanian Caney", which may be Springeran or Mississippian in age. The name "Mississippi Caney" is applied to the unit from 2,895-3,185 feet in the illustrated well. This unit is probably equivalent to Pitkin-Fayetteville-Hindsville of the outcrop and part of the Moorefield fm. (See Ingram sand, Jefferson sand below).

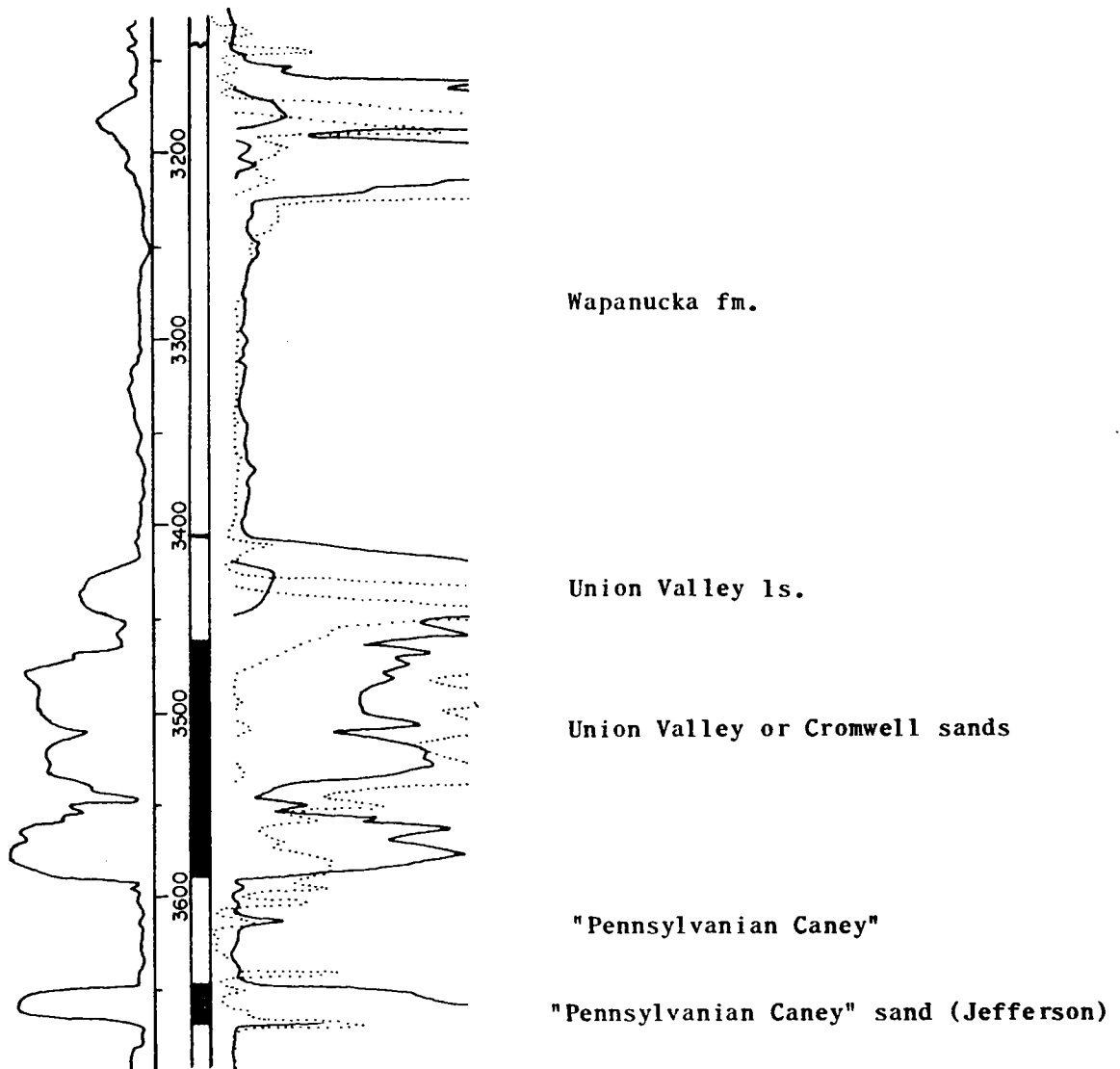
Illustration: Mid-Continent No. 1 Trunk, NE NE SE 14-11N-11E.



While the original term, Jefferson sand, was used to define one of the sands within the Cromwell (as shown on the illustration using the log of the Mid-Continent No. 1 Trunk, NE NE SE 14-11N-11E), current usage of the name Jefferson sand by the Oklahoma Oil Scouts and many geologists is for a sand some 50 to 60 feet below the base of the Cromwell, and in the upper part of "Pennsylvanian Caney" sh. as shown on illustration. The Shawnee Scout Check reported the following tops in this well as: Wapanucka, 3,152 feet; Union Valley, 3,407 feet; Cromwell, 3,539 feet; Upper Jefferson, 3,644 feet.

Lithologically the Jefferson sand resembles the overlying Cromwell sands. It is recommended that this usage of Jefferson sand be dropped due to existing confusion (notes from F. J. Smith, 12-56).

Illustration: Jones-Shelburne and Pellow No. 1 Foster, C SE NW 13-9N-12E.



Jesse lime

Marker bed in Jesse field, Pontotoc and Coal Cos.

May have been Atokan ls. marker which W. B. Boyd (1938, AAPG, vol. 22, p. 1568) described as "buff to white finely crystalline to cryptocrystalline limestone about 15 feet thick" as a good marker and used in figures 7 and 8.

Jester sand

Guadalupean

Permian

First ref. - Becker (1930), AAPG, vol. 14, p. 56.

Named for town of Jester, Carter Co.

Sandstone at base of Flowerpot sh. Name conflicts with Jester dolomite of Blaine fm. in same area.

J. N. Bateman sand

Virgilian

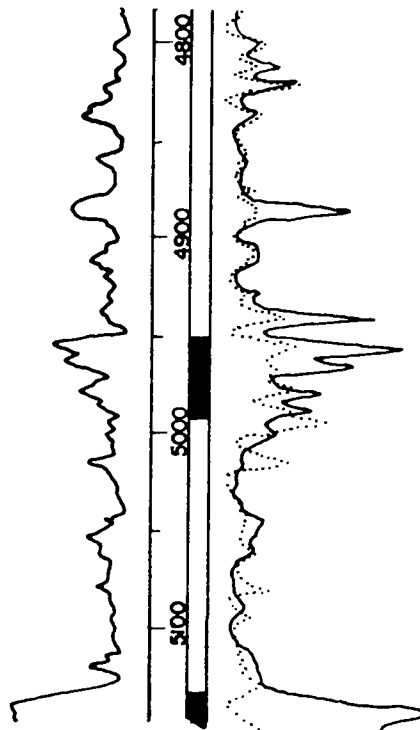
Pennsylvanian

First ref. - Hayes (1952), OCGS, vol. 3, no. 2, p. 7; (1955), p. 101.

Named for J. N. Bateman lease of Texas, discovery in No. 1 SW NW NE 21-2N-8W, West Marlow field, Stephens Co.

In upper part of Virgil series, above Helm sand, below "Lower Maroon" sh.

Illustration: Texas No. 1 J. N. Bateman.



J.N. Bateman sand

Helm sand

First ref. - Tomlinson and Storm (1924), AAPG, vol. 8, p. 604.

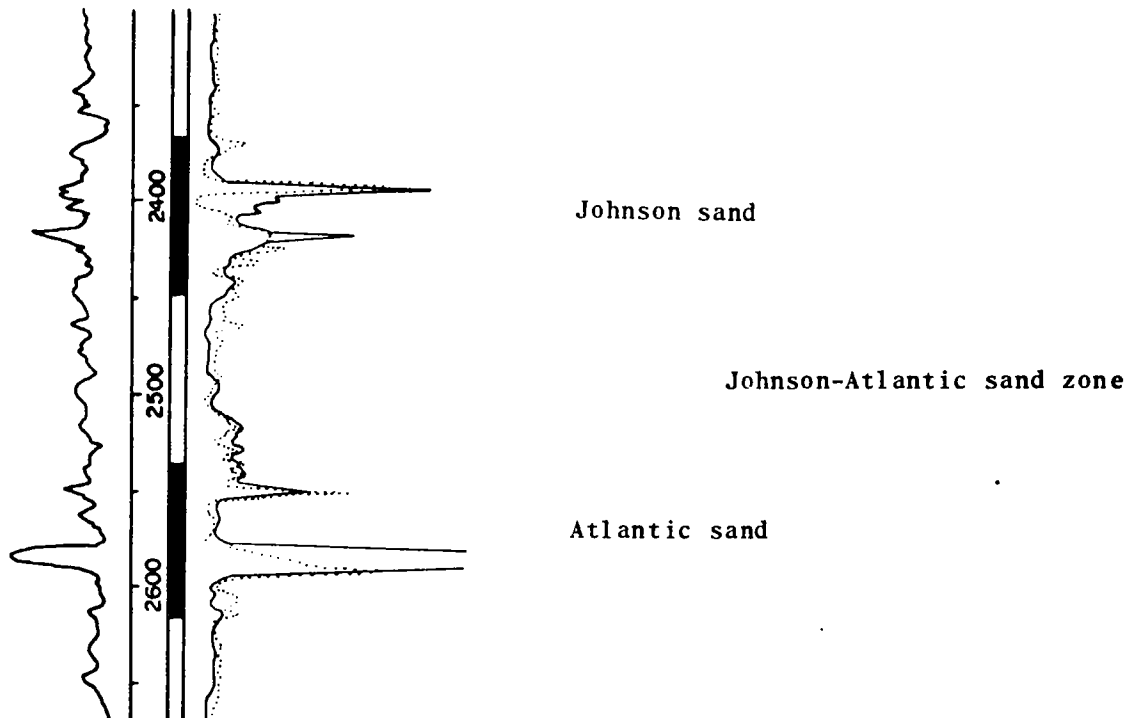
Combination of Atlantic and Johnson sands in Graham field by the authors. This is the sandstone zone which is being called Fusulina, Lower Fusulina or Lower Fusulinid by present subsurface geologists. It is suggested that this name, Johnson-Atlantic, be used for publication purposes rather than any of the above names, all of which unfortunately were used in the symposium "Petroleum Geology of Southern Oklahoma." See discussion of Johnson and Atlantic sands.

First ref. - Tomlinson and Storm (1924), AAPG, vol. 8, p. 604.

Named for Roy M. Johnson lease of Healdton Petroleum Co., discovery in SW SW NE 31-2S-2W, Graham field, Carter Co.

Below the Kirk sand, separated by a thick shale interval, commonly about 350 feet in the Graham field; above the Atlantic sand. George and Bunn included in their Johnson sand all of what Tomlinson and Storm called Johnson-Atlantic sand zone. This unit corresponds to that now called Lower Fusulinid (originally called Fusulina or Fusulinid sand). It is suggested that Johnson-Atlantic be used in place of the fossil generic term, at least when published (notes from C. W. Tomlinson 7-26-56). See also illustration of Atlantic sand.

Illustration: Continental No. 1 Moyer, NW NW SE 31-2S-2W.



Johnson sand (Oklahoma City field)

Simpson group

M. Ordovician

First ref. - McGee and Clawson (1932), AAPG, vol. 16, p. 974.

Named for Bertha Johnson lease of I.T.I.O., NW 25-11N-3W, Oklahoma City field, Oklahoma Co.

Equal to sandstone in Oil Creek fm.

*Joins formation

Simpson group

M. Ordovician

Ulrich (1930), US Nat. Mus. Proc., vol. 76, pp. 73,77.

Named for exposures on Joins Ranch, 2S-1W, Carter Co.

Basal formation of Simpson group, underlies Oil Creek fm. See Simpson group.

Jones sand

Missourian

Pennsylvanian

First ref. - Snider (1913), Petr. Nat. Gas in Okla., p. 127.

Origin of name not determined. Not to be confused with well-known Jones sand (Jurassic) of Arkansas and Louisiana.

Used in Creek Co. and NE Oklahoma. Equal to Upper Cleveland sand in Seminole fm., just below Checkerboard ls.

Name is at present being improperly applied in 14N-1E, 14N-2E and 15N-2E to a productive sandstone several hundred feet below Checkerboard ls. and about 200 feet above the Oswego lime, below the typical Cleveland sand horizon. Sandstone may be in Seminole fm. but may also be Desmoinesian in age in the Holdenville or Wewoka fm. The name should be suppressed in this area and probably a new name should be given this pay horizon. See Cleveland sand for long-established use of name.

Kagay sand

Virgilian

Pennsylvanian

First ref. - Gouin (1926), OGS 40-E, p. 28.

Named for Kagay lease of Magnolia, SW 34-1S-8W, at 2,300 feet.

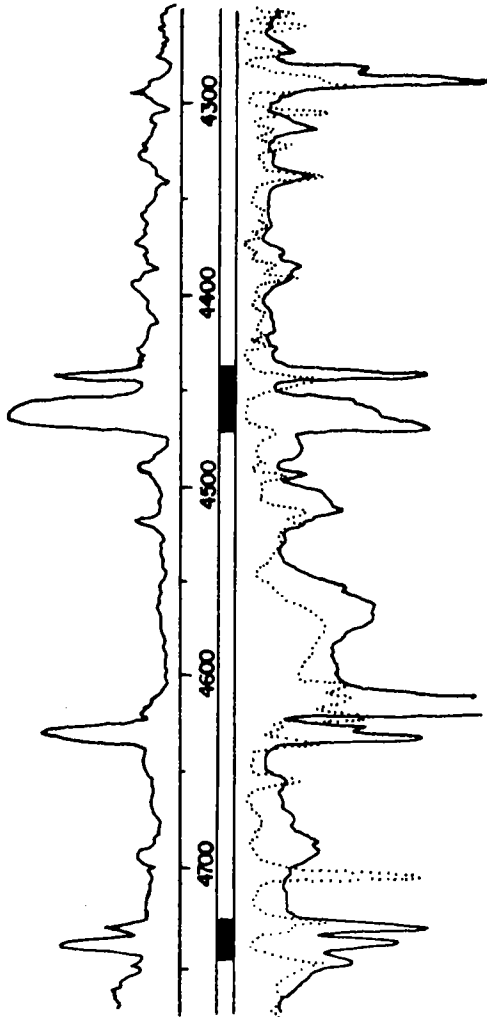
Empire and Duncan pools, 100 feet below Blaydes sand, one of many lensing sands.

First ref. - World Oil, January 1955, p. 96.

Named for F. T. Kelly lease of United Carbon, No. 1, C SE NE 2-4N-10ECM, discovery of NE Eva field, at 4,411-26 feet, Texas Co., Oklahoma.

Called upper Morrow sand by many; is considered equivalent to Purdy and Sturgis sands. Purdy is preferred name.

Illustration: United Carbon No. 2 Kelly, C NW NE 2-4N-10ECM.



Purdy (Kelly, Sturgis, U. Morrow) sand

Keyes (L. Morrow) sand

Named for Kelly lease of Gulf, NE 10-1N-20W, Altus field, Jackson Co.

Granite wash production, lies below Cole wash, above McDaniel wash. See illustration of Cole wash.

Kelso sand

Missourian

Pennsylvanian

First ref. - Hutchison (1911), OGS 2, p. 198.

Named for Kelso farm southwest of town of Cleveland, Pawnee Co., possibly located in south half of 19-21N-8E. Bullard (1928, p. 35) records this sand at approximately 500 feet, 800 feet above Layton sand.

**Kessler limestone mem.*

Morrowan

Pennsylvanian

Simonds (1891), Ark. Geol. Surv. Ann. Rept. vol. 4, p. 26.

Named for Kessler Mountain, Washington Co., Ark. A member of Bloyd fm., lies 0-190 feet below top of Bloyd.

Kessler sand

Misspelling of Kistler sand in Cement field. Name conflicts with Kessler ls. and should be eliminated.

Kewster

First ref. - Maravich (1955), AAPG, vol. 39, p. 899.

Notes from Maravich (April 5, 1956), "Kewster" is typographic error and should be Kessler. Reference made to deepest formation penetrated in LeFlore Gas Co. No. 1 Parnell 18-9N-27E, gas discovery well of SW Cedars field, LeFlore Co.
Lies below Spiro sand, presumably refers to Kessler ls. mem. of Bloyd fm.

Keyes sand

Morrowan?

Pennsylvanian

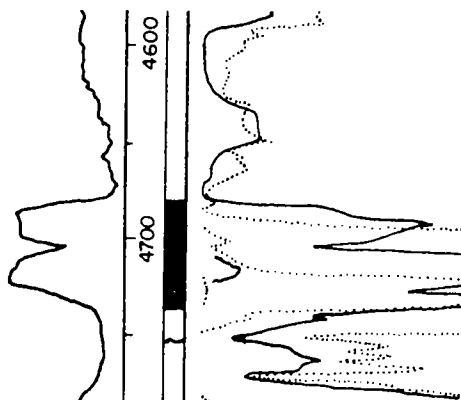
First ref. - NOSLA (1950), vol. 20, p. 481.

Named for Keyes gas field and Keyes village by Pure geologists in 1943 when discovered in Pure No. 1 Cox, SE SW NE 16-5N-8ECM, Cimarron Co.

Considered basal sand of Morrowan age and called Lower Morrow sand by many geologists. Top of Morrow is placed at 4,475 feet in this well by some geologists. Keyes sand considered pre-Desmoinesian and post-Morrowan by R. Roth. See also illustration of Purdy sand.

Keyes sand is the preferred name. The use of a time term for a pay sand should be discouraged.

Illustration: Pure No. 1 Cox.



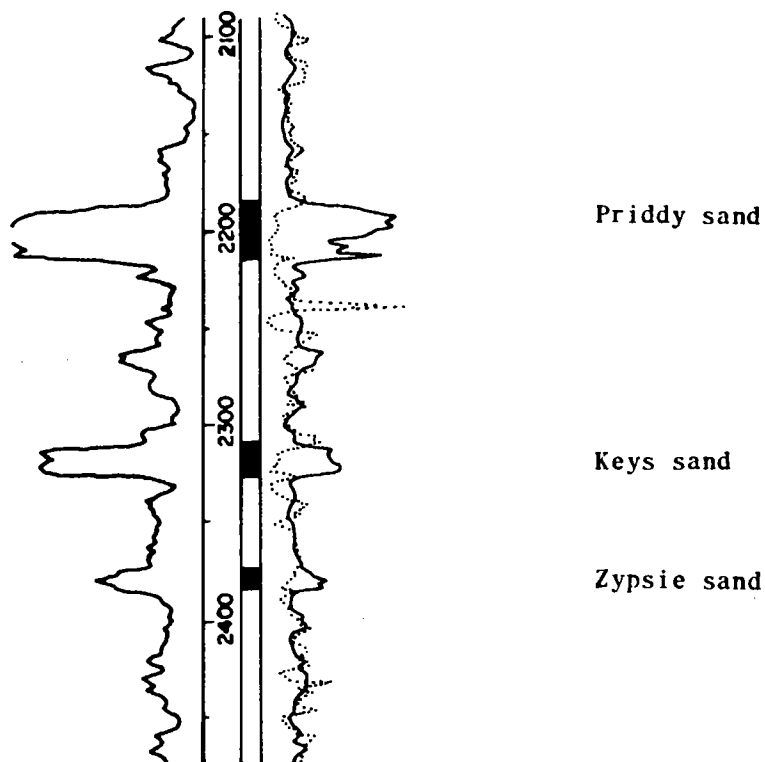
Keyes sand

Mississippian

First ref. - Swigart (1920), USBM, Rept. Walters field, p. 3.

Named for J. C. Keys, operator in 1S-10W, Walters field, Cotton Co.
Above Zypsie sand, below Priddy sand. Shown as below Megargel lime by Pate (1948),
World Oil, vol. 128, no. 6, p. 126).

Illustration: Stanolind No. 9 Moore, C S $\frac{1}{2}$ NE SW 2-2S-10W.



Named for Kiefer pool (now Glennpool) on L. R. Kiefer farm, Creek Co.
Name no longer in use.

Boyle (1929), OGS 40-KK, p. 16.

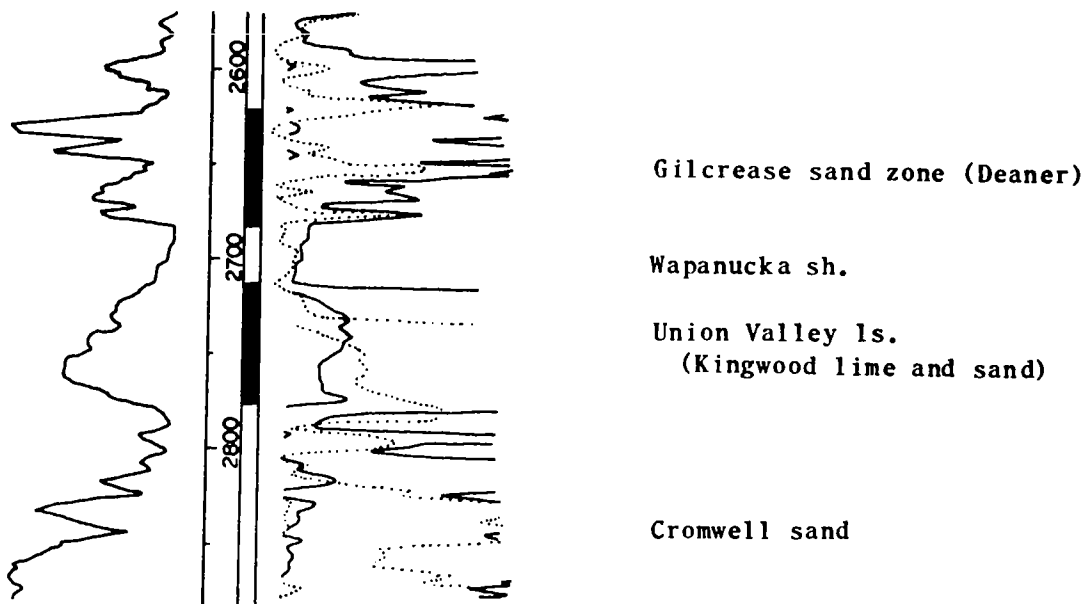
Named for associated Kingwood sand, main productive pay in Deaner field.
Dense limestone, 5-15 feet thick, at top of Kingwood sand. See below. Equal to
Union Valley or younger ls. Used in Okfuskee Co.

Kirwan and Schwarzenbek (1921), USBM, Rept. Deaner oil field, p. 5.

Named for Kingwood Oil Co., discovery in No. 7 Hilderbrandt, SE SE NE 16-11N-11E at 2,650 feet, 250 feet thick, 120 feet below top of Deaner sand, Sept. 1930, Sheldon field, Okfuskee Co.

Name once used in Okfuskee and Okmulgee Cos. Equal to porous development in Union Valley lime which may include younger ls. than Union Valley. Kingwood "sand" in Lyons-Quinn field is unproductive 120 feet of limestone, with "Deaner sand" about 80 feet above (notes from L. W. Wilshire, J. E. Orr).

Illustration: Seran Drlg. No. 1 Douglas, NW SW NW 22-11N-11E.



First ref. - McGee and Clawson (1930), AAPG, vol. 16, p. 966.

Named for Kinter lease of Sinclair and Amerada, SE 30-11N-2W, Oklahoma City field Oklahoma Co.

Below Hammer-Haindl sand. Equal to sandstone in Oil Creek fm.

First ref. - Tomlinson and Storm (1924), AAPG, vol. 8, p. 603.

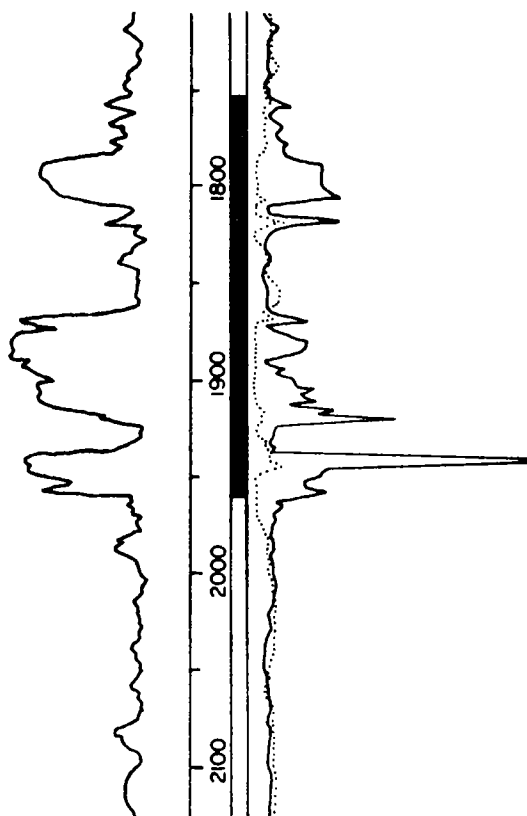
Named for Kirk Oil Co., discovery in 31-2S-2W, Graham field, Carter Co. at 1,490 feet in 1918.

In Deese group, above Johnson-Atlantic sand zone of Tomlinson and Storm, or Johnson sand of George and Bunn, and below Moyer sand in Graham field, below Culberson sand in Tatum-Tussy, Camp and Velma fields. It is unquestionably identical with the sand now called Upper Fusulinid (Upper Fusulina) by subsurface workers.

On Shaw's cross-section (1954, OCGS, vol. 5, no. 3, p. 20-21), the Kirk sand of Graham field occupies in most wells only the lower half of what he labels "Upper Fusulinid ss. zone." Additional sands appear in a few wells in the upper part of his zone though they are everywhere separated from the Moyer sand by a clean-cut shale unit ordinarily at least 200 feet in thickness (letter from C. W. Tomlinson, 7-26-56).

Hoard (1956, PGSO, vol. 1, p. 193) recommends that the term Kirk sand be used in place of Upper Fusulinid (U. Fusulina) sand or zone. The Johnson sand in the illustrated well is the upper part of the zone being called Lower Fusulinid (Fusulina or Lower Fusulina). See illustration of Moyer sand and discussion under Johnson and Atlantic sands, and Johnson-Atlantic sand zone.

Illustration: Continental No. 1 Moyer, NW NW SE 31-2S-2W.



Kirk (U. Fusulina, U. Fusulinid) sand

First ref. - Bullard (1928), OGS 40-Q, p. 62.

Named for R. R. Kisner lease of Exchange Oil Co., parts N $\frac{1}{2}$ 19-22N-3W, Garber field, Garfield Co.

At 700 feet, 10 feet thick, producing gas according to Bullard. Not mentioned by Gish and Carr, or Vanderpool, although the former does record a "900-foot" gas sand.

Kistler sand

Desmoinesian

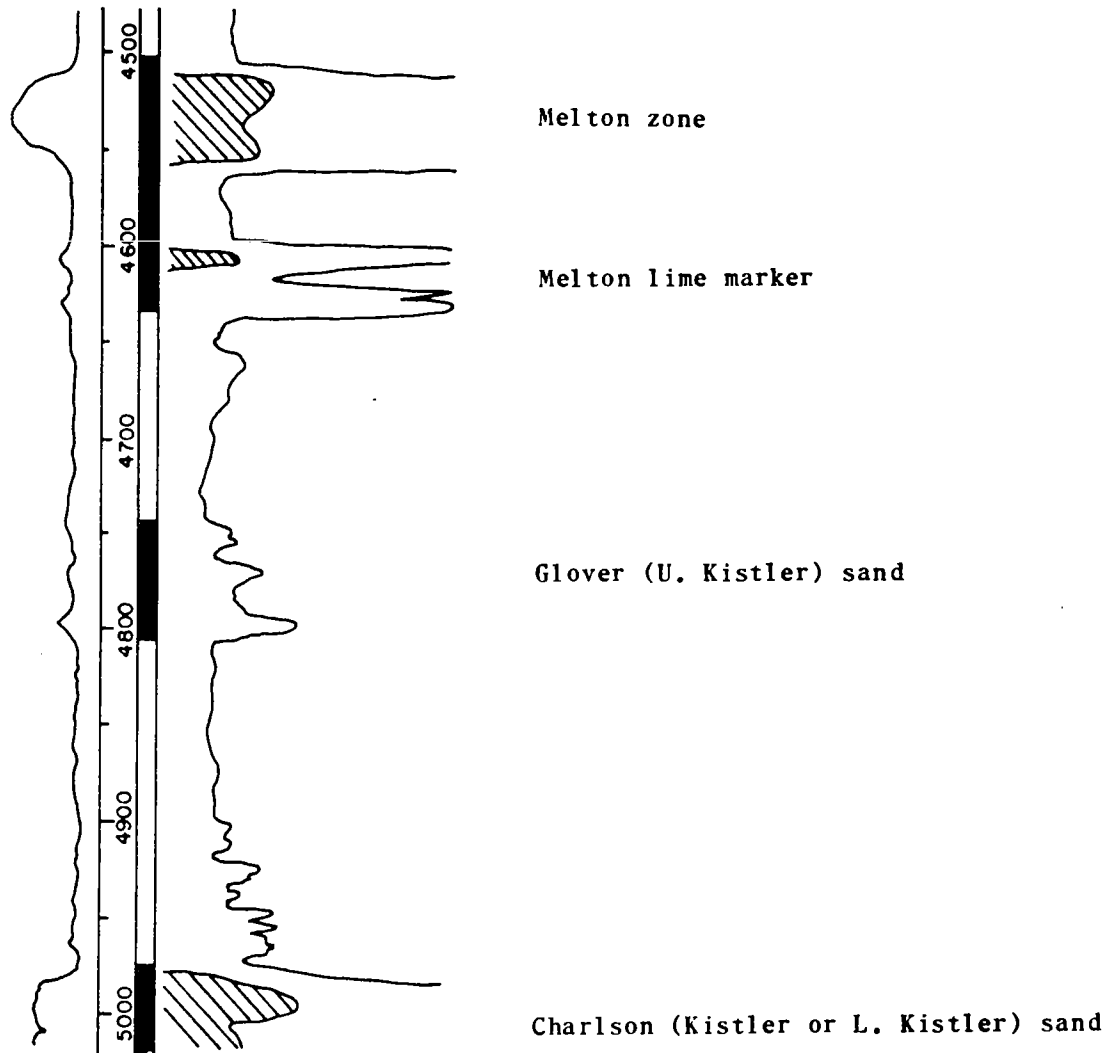
Pennsylvanian

Name published by Hayes (1952), OCGS, vol. 3, no. 2, p. 7; (1955), p. 101.

Named for W. L. Kistler, operator. Discovery in NE 11-5N-9W, Cement field, Caddo Co. Misspelled "Kessler".

Second producing sand of Deese fm. below Melton zone in Cement field. Equal to Charlson sand of Chickasha field (notes from A. J. Montgomery, F. H. Worrell). Sample log of illustrated well showed Upper and Lower Kistler sands.

Illustration: Kistler No. 1 Hedlund, SW NE NE 11-5N-9W, 2-26-38.

Knox sand

Leonardian

Permian

First ref. - Becker (1930), AAPG, vol. 14, p. 48.

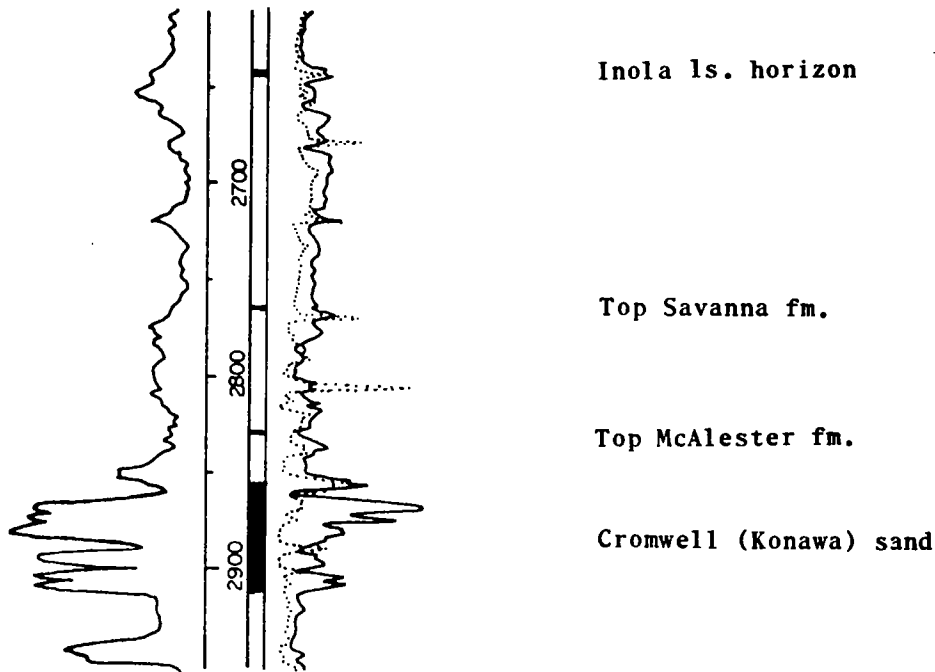
Named for Knox pool, Grady Co. At base of Wellington fm.

First ref. - NOSLA (1936), vol. 6, p. 297.

Named for Konawa field and town, Seminole Co. Discovery in Harris and Droppleman No. 1 Harjochee, SE NE SE 8-6N-6E. Completed at 2,860-2,865 feet, Nov. 1929. Term used in early development of field, then called Cromwell.

Is a Cromwell sand or older (?Springeran). Note from F. J. Smith. Name conflicts with Konawa fm. (Permian) on surface in same area.

Illustration: Konawa Operating Co., No. 1 Woods, SW SW SW 9-6N-6E.



First ref. - Wheeler (1947), World Oil, vol. 127, no. 5, p. 46.

Named for Lackey lease, NW 11-5N-9W, Cement field, Caddo Co.

Reported to be a productive sandstone below Marchand sand and above Culp-Melton zone. Name not used extensively.

Lael sand

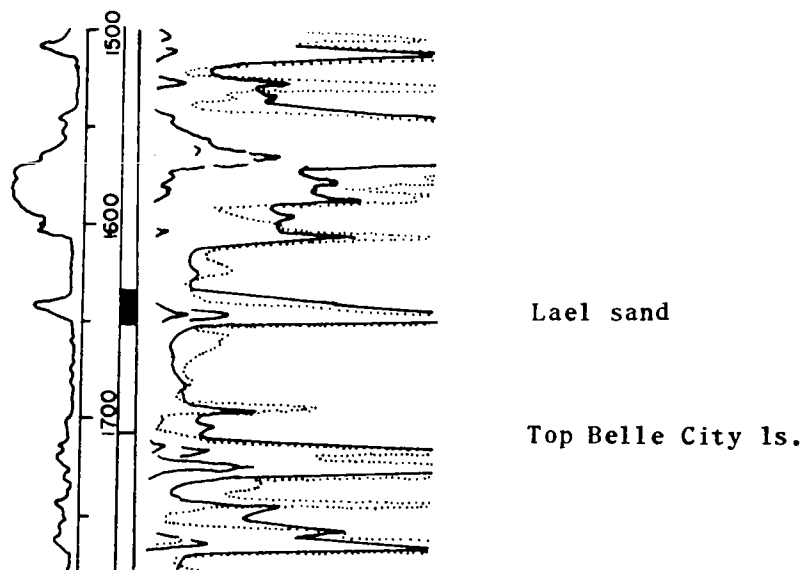
Missourian

Pennsylvanian

Name first used by William Pine in his No. 2 Lael, NE SE SW 20-3N-3E, Lewis field, Garvin Co. for a sand at 1,676-88 feet, drilling completed 11-8-53.

Sandstone in lower part of Hoxbar group about 70 feet above Belle City ls. Also called "Pine" sand on some scout tickets. This sandstone is found in 3N-3E and the southern half of 4N-3E but cannot be carried westward with any certainty (notes by J. R. Horkey, F. E. O'Brien).

Illustration: Sinclair Prairie No. 3 Allred, NE SW SE 20-3N-3E.



Lansford zone

Missourian

Pennsylvanian

Westheimer and Schweers (1956), PGSO, vol. 1, p. 146, fig. 2.

Calcareous sandstones about 50 feet thick in SW Lone Grove field, Carter Co., equal to Crinerville ls., about 150 feet below the base of Dolman fm. and about 260 feet above Hewitt lignite. See illustration of Dolman fm.

Lawton sand

Leonardian

Permian

Name published by Hayes (1952), OCGS, vol. 3, no. 2, p. 7; (1955), p. 101.

Named for Lawton field and city, 2N-10 and 11W, Comanche Co.

The term Lawton sand has been used in the Lawton field area for any one of the lenticular shallow producing sandstones in the Permian which occur in or below the base of the Garber ss. Hayes applied the name in the Fort Sill area to a sandstone which is generally known as the Fort Sill sand. Because of the lensing character of the sandstones, it is very doubtful that this sand could be correlated with those in the Lawton field.

First ref. - Beal (1917), USGS 658, p. 14.

Named for associated True Layton sand in Creek Co.
Equal to Hogshooter ls.

Layton sand

Missourian

Pennsylvanian

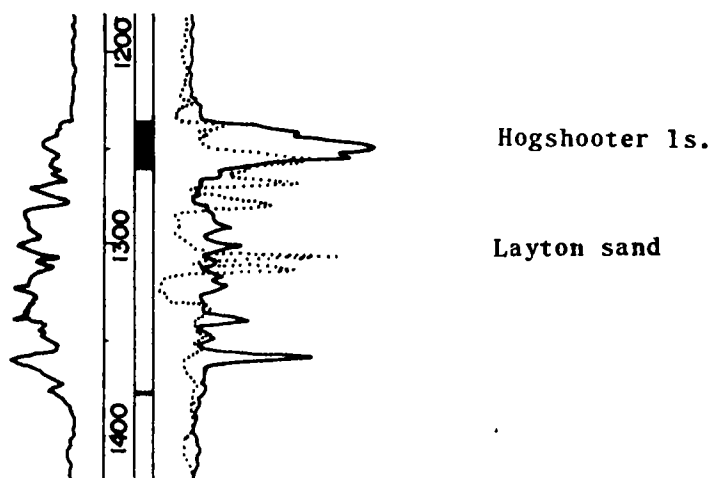
First ref. - Snider (1913), Petr. and Nat. Gas in Okla., p. 127.

Named for Layton farm in Cleveland field, NW 2-20N-8E, Pawnee Co.

Sandstones below Hogshooter ls., equal to Dodds Creek ss. member of Coffeyville fm., above Checkerboard ls. Called True Layton sand to distinguish the sand from mis-called units.

Osage Layton sand, also called "Layton", is Cottage Grove ss. member of Chanute fm. and should be so-called.

Illustration: Tidewater No. 11 Sewell, SW SE NE 35-21N-8E.

*Leidecker sand*

Atokan

Pennsylvanian

First ref. - Fohs and Gardner (1914), Fuel Oil Jour., Aug. supp.

Named for operator in area. Reported by Fohs and Gardner as a producing oil sand at 1,970 feet at Honey Creek (13N-12E), 1,915 feet at Mission (14N-13E), and at 1,915 at SE Okmulgee (13N-13E). Reported by F. Aurin (1917, OGS 19 p. 526), as a 20-foot sand producing oil in Boynton field (14N-16E), 140 feet above Muskogee-Boynton sand.

In Gilcrease sand zone. Name no longer used and never commonly in Muskogee and Okmulgee Cos.

Lips sand

Atokan

Pennsylvanian

Ref. - NOSLA (1950), vol. 20, p. 682.

Name from Lips lease of Sinclair, in No. 2 from 8,110-8,165 feet, discoverer of gas production in Lips field, Roberts Co., Texas.

Considered Atokan in age by some, equivalent to "Upper Morrow" sand by others. The term, "Atokan Lips", is applied to Upper Morrow sand in Oklahoma Panhandle (Panhandle Geotimes, 1955, vol. 2, no. 2, p. 13).

Little lime

Desmoinesian

Pennsylvanian

First Okla. ref. - Green (1918), AAPG, vol. 2, p. 120.

Common Appalachian term for limestone above Big lime; Loyalhanna ls. above Greenbrier ls.

Used in Oklahoma for Lenapah ls. above Oologah ls. Name should be left unused.

Little Oswego lime

Desmoinesian

Pennsylvanian

First ref. - Greene (1928), OGS 40-CC, p. 10.

Equal to Verdigris ls., first persistent ls. below Oswego lime (Ft. Scott ls. and Breezy Hill ls.).

Name is not needed in place of Verdigris.

Little River Brown lime

See Brown lime.

Loco lime

Missourian

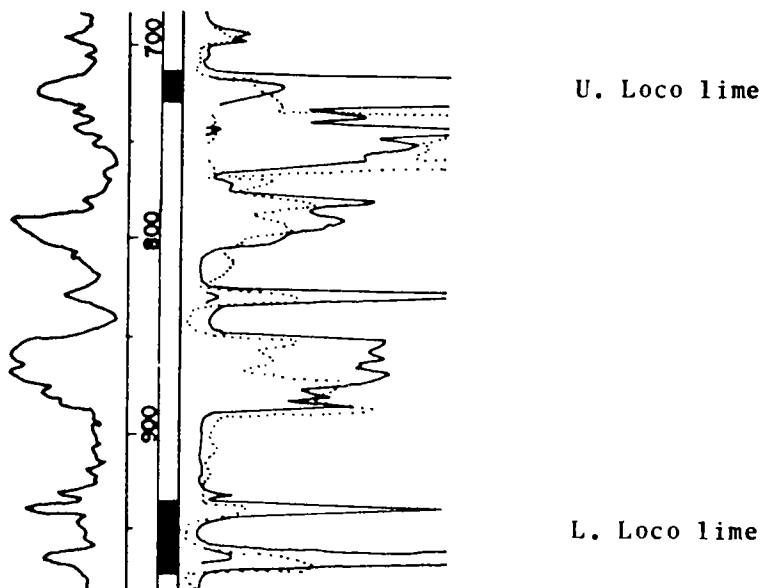
Pennsylvanian

First ref. - Gouin (1947), Oil Weekly vol. 126, no. 4, p. 37.

Named for Loco village and field, 3S-5W, Stephens Co.

Highest limestone in Hoxbar group, probably equal to Zuckermann calcareous ss. and Daube ls. A highly erratic zone in which sandstones develop between upper and lower limestones. May be equal to upper part of County Line lime. Divided into Upper and Lower Loco lime on AGS (1956), Cross-section B-B' in 3-5S-6W. Loco sand is the name applied to any pay sand within the zone, as in S Palacine field (Atkinson, 1955, OCGS, p. 124, fig. 10). Name was originally applied to the upper limestone, a marker bed of buff limestone about 10 feet thick.

Illustration: Scott No. 1-A Wilson, SE NW 9-3S-5W.



First ref. - Westheimer and Schweers in Selk (1951), AAPG, vol. 35, p. 596.

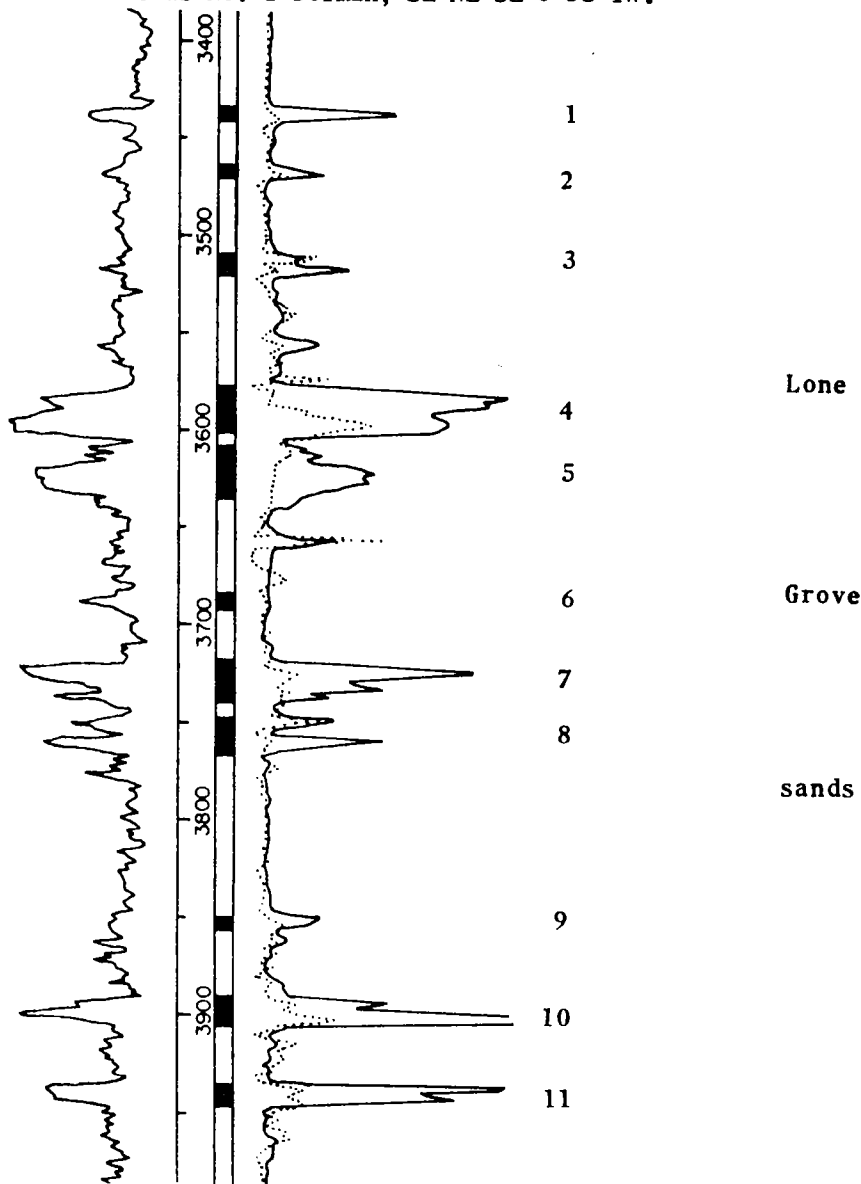
Named for Lone Grove village and SW Lone Grove field, 5-8, 5S-1W, Carter Co.

Lenticular sandstones, shales and thin limestones about 500 feet thick with 12 individual pay sands in SW Lone Grove field (Westheimer and Schweers, 1956, PGSO, vol. 1, p. 146). Occurs below "Lower Oolitic" lime (possibly equivalent to Natsy ls.) and thought to be younger than Fusulina sand (Johnson-Atlantic, Lower Fusulina, Lower Fusulinid).

Between the 6th and 7th Lone Grove sands, "plastic" maroon shale or clay makes its first appearance and is found interbedded with dark gray shales to the base of the Deese group. This same "plastic" maroon shale occurs 300 feet below the Williams ls. member of the surface. Divided into upper, middle and lower Lone Grove in Bayou field by Williams (1955, OCGS, p. 285), who mentions maroon shale between upper and middle Lone Grove. It is thought by many geologists in the area that this horizon is the position of the Missourian-Desmoinesian boundary. Geologists in the Ardmore area disagree about this boundary.

In illustrated well, "Lower Oolitic" lime is at 3,160-74 feet; base of Pennsylvanian top of Simpson sands at 4,116 feet. See also Hewitt sands.

Illustration: Texas No. 1 Dolman, SE NE SE 6-5S-1W.



Lovell lime

Virgilian

Pennsylvanian

First ref. - Lukert (1949), AAPG, vol. 33, footnote p. 141. Credited to M. D. Scruggs.

Named for associated sand.

Equal at places to Toronto ls., basal member of the Oread ls. In some areas, lower limes are called 2nd, 3rd Lovell, etc.

Lovell sand

Virgilian

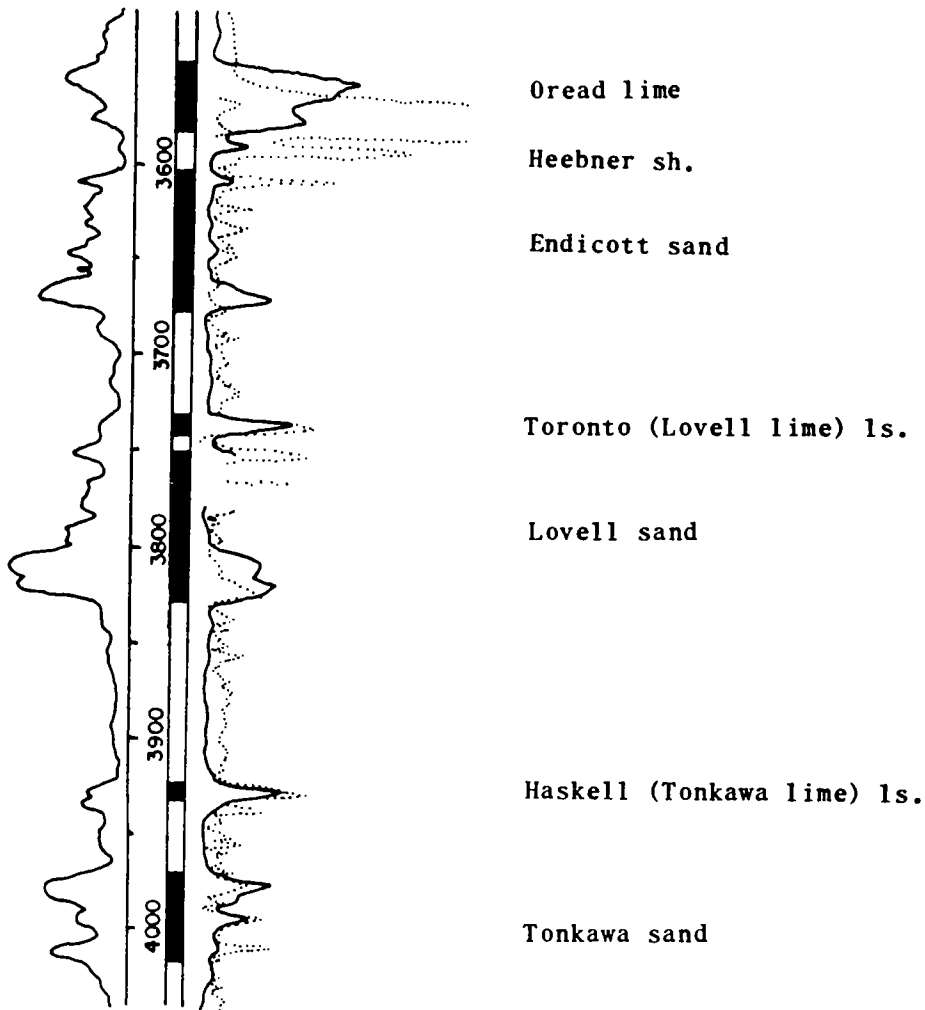
Pennsylvanian

First ref. - Page (1955), OCGS, vol. 5, no. 10, p. 7; (1955), p. 451.

Named for Lovell lease of Welch et al., discovery in SW SW NW 9-18N-4W, Lovell field, Logan Co.

White, calcareous sandstone up to 500 feet thick, below Endicott sand, above Tonkawa sand. Below Toronto ls. (Lovell lime), above Haskell ls. (Tonkawa lime).

Illustration: Champlin No. 1 McCinty, SW SE SE 9-18N-4W.



Lowery sand (Cleveland field)

Missourian

Pennsylvanian

Apparently named for discovery well of Cleveland field, Pawnee Co., which was drilled in September 1904 on the "Bill Lowery farm on the south edge of the townsite." According to Hutchison (1911, OGS 2, p. 198), this well, known as "Uncle Bill No. 1," had oil sand from 1,570-1,590 and 1,605-1,615 feet, total depth. National Oil Well Index lists an Amanda Lowery lease in NE 17-21N-7E which was producing oil at approximately 1,600 feet at least as early as 1905.

Below Checkerboard ls., same as Cleveland sand.

Lowery sand (Oklahoma City)

Simpson group

M. Ordovician

First ref. - McGee and Clawson (1926), AAPG, vol. 16, p. 974.

Named for Bill Lowery lease of Wirt Franklin, N $\frac{1}{2}$ NW 12-11N-3W, Oklahoma City field in 1930. Equal to sandstone in Oil Creek fm.

Lydecker sand

Misspelling of Leidecker sand

Lyons lime

Morrowan

Pennsylvanian

First ref. - Levorsen (1928), OGS 40-BB, p. 43.

Named for Lyons pool, Okmulgee district. Equal to Union Valley ls.

Lyons sand

Morrowan

Pennsylvanian

Name published by Kirwan (1924), USBM Rept. Invest. 2612, p. 4.

Named for James G. Lyons, operator in Lyons pool. Discovery in 1921 in Independent Oil & Gas Company No. 1 A. Holmes, SW SW SE 13-11N-11E, at 2,718 feet, later called Lyons-Quinn sand; equal to Cromwell sand (note by Dave Logan, 2-6-55). See illustration of Jefferson sand.

Lyons-Quinn sand

Morrowan

Pennsylvanian

Name published by Clark (1926), OGS 40-F, p. 10.

See Lyons sand and Quinn sand for sources of name. Equal to Cromwell sand.

McCallister sand

Misspelling of McAlester.

McDaniel wash

Wolfcampian

Permian

Named for W. J. McDaniel lease of Gulf, NE 3-1N-20W, Altus field, Jackson Co. Granite wash production below Kelly wash. See illustration of Cole Wash.

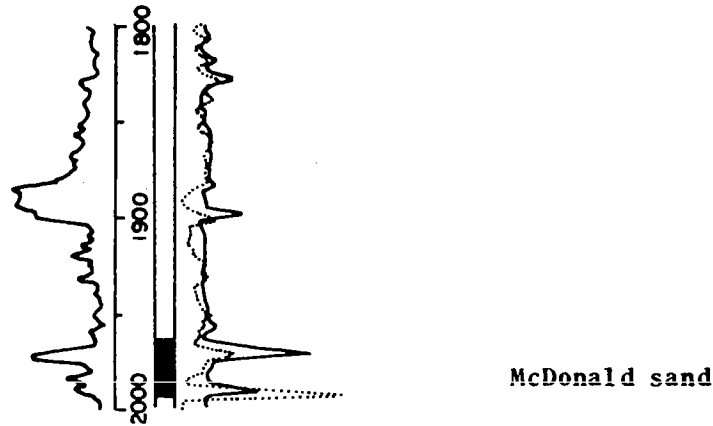
McDonald sand

Virgilian

Pennsylvanian

Named for C. M. McDonald lease of Austin and Price, SW 13-2S-11W, Walters district, Cotton Co.

Illustration: Austin and Price No. 1 McDonald, SW SE SW 13-2S-11W.



McKwin sand

Pennsylvanian

First ref. - Fohs and Gardner (1914), Fuel Oil jour., Aug. suppl.

Used for Cleveland or Wayside sand in Bartlesville-Dewey area.

McKinney sand

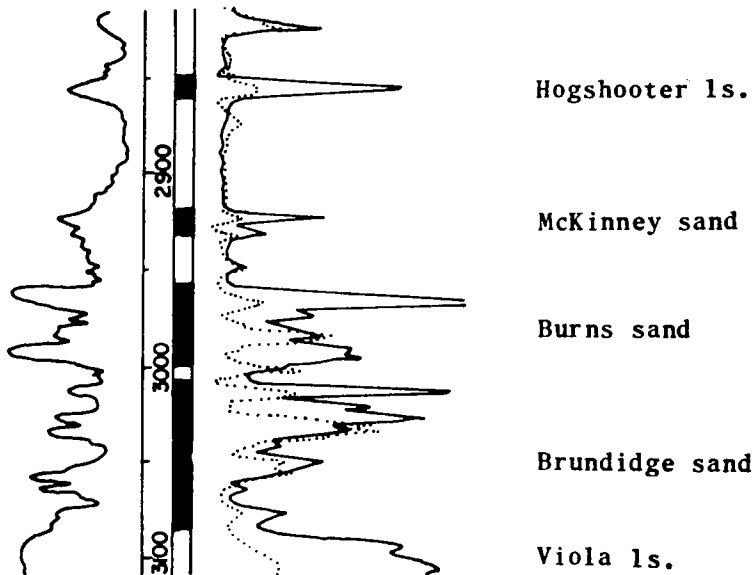
Missourian

Pennsylvanian

Named for McKinney lease of Ohio, discovery well in SE NE SE 18-3N-2E, East Pauls Valley field, Garvin Co.

H. L. Crockett reports that the sand lies 65 feet below the Hogshooter lime and is the upper bench of the Layton sand (12-1-1955). Area of production of McKinney sand is small, only 4 wells producing in 1950. Well illustrated produces from Burns sand (F. E. O'Brien, 10-8-56).

Illustration: Ohio No. 4 McKinney, SW SW SE, 18-3N-2E.



Ulrich (1930), U. S. Nat. Mus. Proc., vol. 76, p. 73.

Named for McLish Ranch, 1N-7E, Johnston Co.

Consists of "birdseye" limestone, local dolomite, basal sandstone member, grading laterally into three sandstone beds with dolomite between to the north and northeast. See illustration of Simpson group.

McWhirter sand

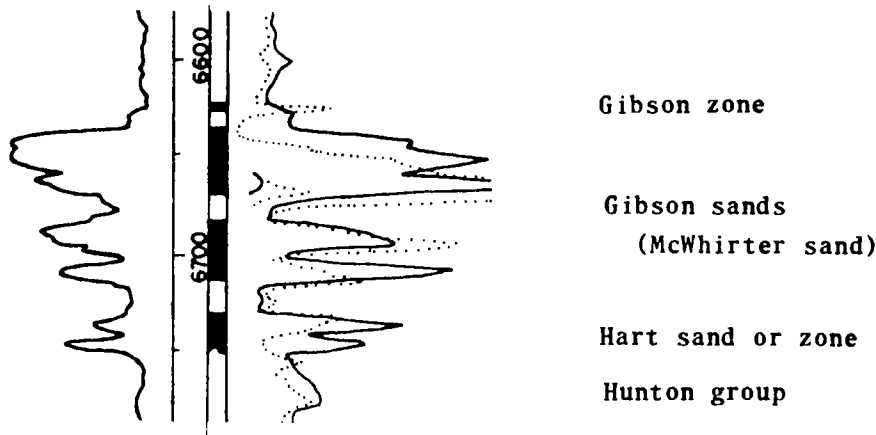
Desmoinesian

Pennsylvanian

Name from McWhirter lease of Sinclair Prairie. Discovery at 6,685-6,715 feet in No. 1, NW SW NE 12-3N-3W, SW Antioch field, Garvin Co.

Productive sandstone now included in Gibson sand zone, above Hart sand. Name was used for a time for the lower sand of Gibson sands in illustrated well.

Illustration: Sinclair Prairie No. 1 McWhirter.



M. A. Bateman sand

Virgilian

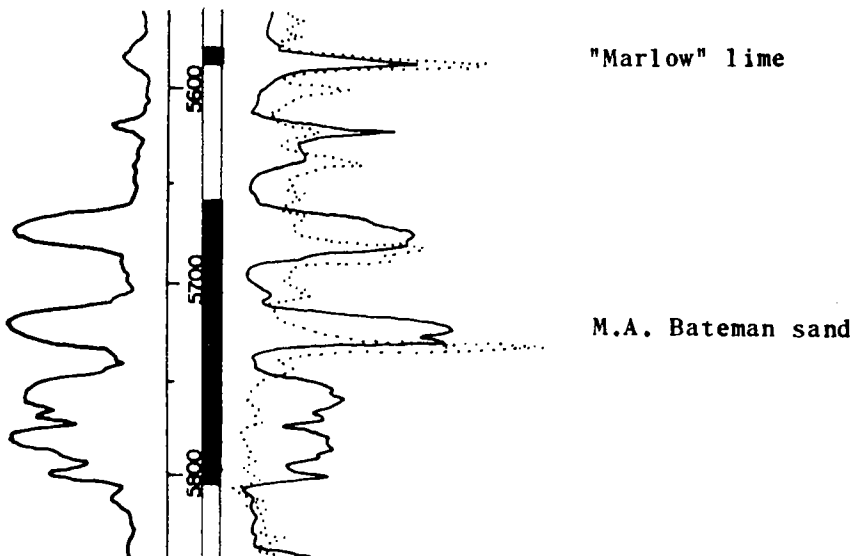
Pennsylvanian

First ref. - Hayes (1952), OCGS, vol. 3, no. 2, p. 7; (1955), p. 101.

Named for M. A. Bateman lease of Texas, SE NE 21-2N-8W, West Marlow field, Stephens Co.

Lies below Booth sands and "Marlow" lime ("Crinoidal" lime), and above Lower Gregory lime according to AGS (1956), Cross-section D-D', Well No. 1 where it is called "Bateman" sand. This sand should not be confused with J. N. Bateman sand which occurs above the Helms sand in this field. See also Marlow lime.

Illustration: Texas No. 1 M. A. Bateman, SW SE NE 21-2N-8W.



Madill sand

Desmoinesian

Pennsylvanian

First ref. - Dott (1944), NOSLA, vol. 14, p. 444.

Named for Madill city and field, Marshall Co.

Godfrey (1956, OCGS, vol. 6, no. 9, p. 10) considers the sand to be beneath the unconformity and to be Pennsylvanian, not Lower Cretaceous.

Magnolia sandPermian

Clapp (1921), AIME, vol. 65, p. 162.

Named for Magnolia Oil Co., discoverer in No. 1 Irwin, NW SE NW, 14-5N-8W, elev. 1,260 feet at 3,168 feet in Chickasha gas field, Grady Co. Could be the Noble-Olson sand. Name is not used today.

Main Oolitic lime

Missourian

Pennsylvanian

See under 5. Oolitic lime.

Maloney sand

Missourian

Pennsylvanian

Gouin (1926), OGS 40-E, p. 42.

Named for Maloney lease of Westheimer and Daube, NW NE NE NE 4-2S-8W, Empire field, Stephens Co.

Occurs at 2,600 feet, 300 feet below Kagay sand.

Manning zone

Chesterian

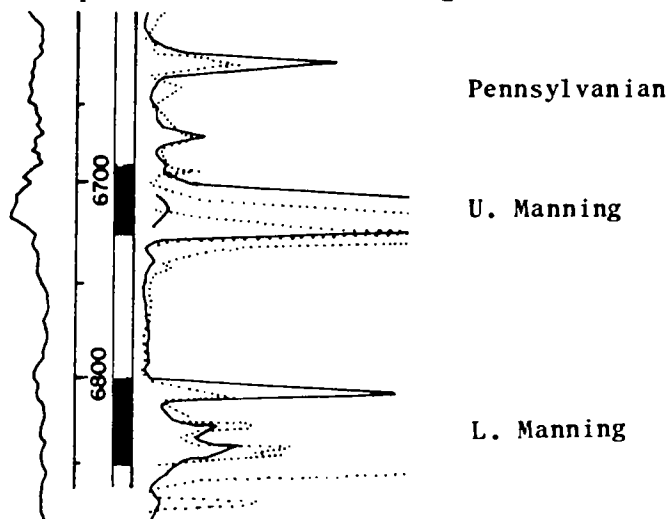
Mississippian

First ref. - Kornfeld (1951), OCGS, vol. 1, no. 9, p. 6; (1955) p. 6.

Named for Manning lease of Superior, discovery in 1945 in No. 41-27 Manning, NE NE NW 27-22N-10W, Ringwood district, Major Co.

Ranges up to more than 170 feet of limestone with shale breaks and siltstone. In illustrated well, Upper Manning is truncated; other wells to southwest show complete Manning zone with Chesterian shale on top of zone (W. J. Lee, 1956).

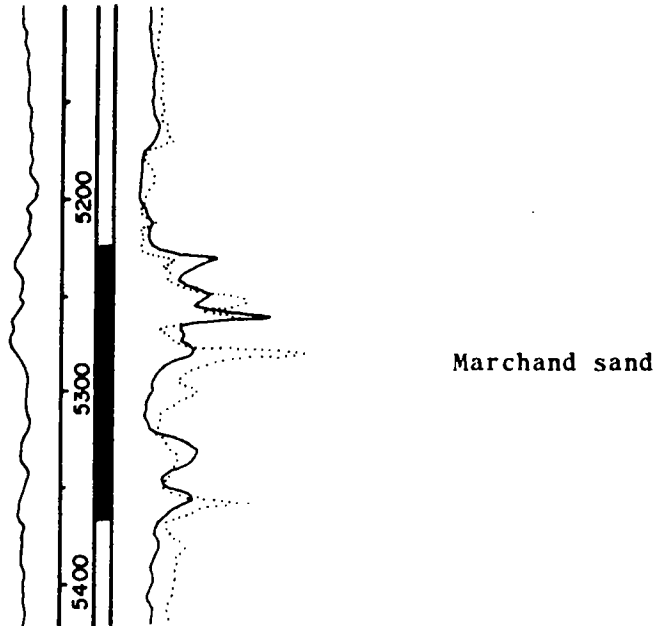
Illustration: Superior No. 41-27 Manning.



First ref. - Wheeler (1947), World Oil, vol. 127, no. 5, p. 46.

Named for Marchand lease of Gorton Trust, NW 2-5N-9W, Cement field, Caddo Co. In 1940, production discovered in Ohio No. 3 Marchand, SE SW NW 2-5N-9W. Sandstone, chert and limestone conglomerate up to 382 feet thick. Approximate level of Anadarche ls.; above Culp-Melton zone (Eisner, 1955, OCGS, vol. 6, no. 4, p. 23); below Medrano sand (AGS, 1956, Cross-section C-C').

Illustration: Peppers-Stanolind, No. 1 Culp, SW NW NE 6-5N-9W.



Name published by Ohern and Garrett (1912), OGS 16, p. 16.

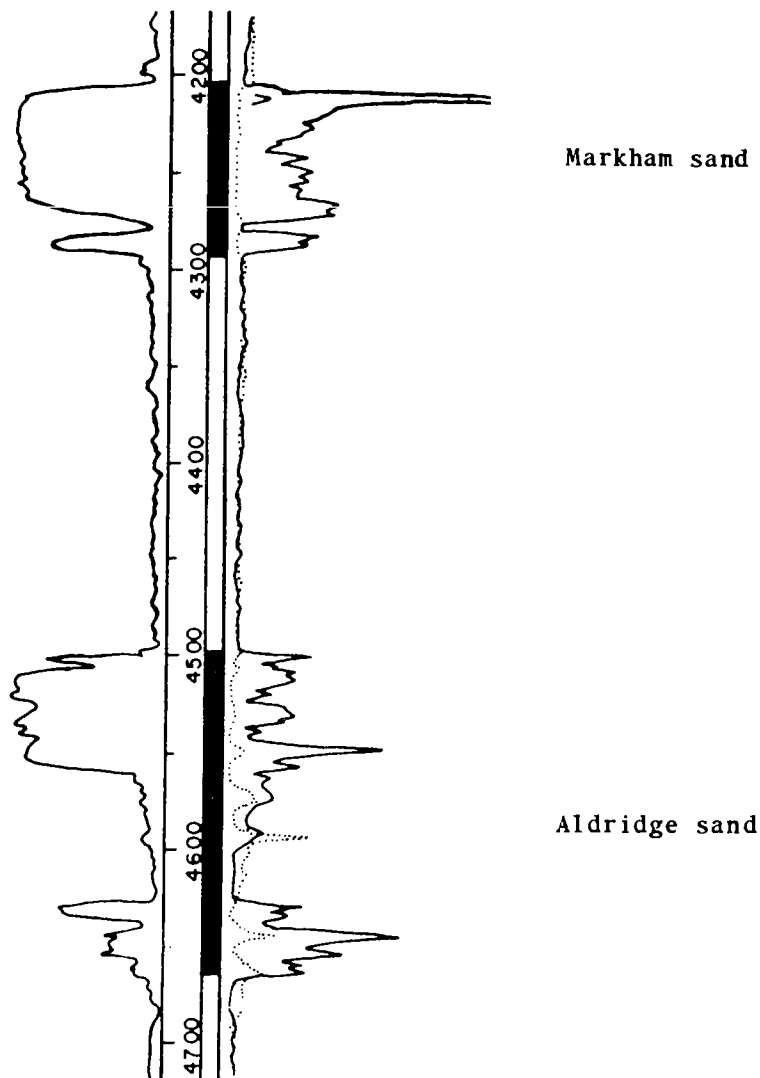
May have been named after H. W. Markham who obtained leases for discovery of Milroy field, during 1913-17 in north central Oklahoma. However, Ohern and Garrett were referring to sands which produce oil and gas in Craig, Nowata, Washington, Osage and other counties, and listed this sand below Bixler and above Barnett and Bartlesville. May be Skinner sand. Term is obsolete.

Name published in OCGS (1952), Cross-section 1-1; AGS (1956), Cross-section B-B', Well No. 16.

Named for Markham lease of Atlantic in NW 1-1S-4W, (1-16-48), a water sand. Production discovered in J. E. Jackson No. 1 Turner, SE NW SW 34-1N-4W, Sholom Alechem field, Stephens Co. (9-4-50).

First Springer sand, above Aldridge sand in Sholom Alechem field. Equal to Burr sand of Tussy field. Production in Ara, North Ara, Doyle, Sholom Alechem, Camp, Tatums and Tussy (notes from R. L. Fienning, 9-31-55).

Illustration: Atlantic No. 7 Markham, NE SE NW 1-1S-4W.



Marland sand

Mississippian?

First ref. - Aurin (1920), AAPG, vol. 4, p. 174.

Named for Marland Refining Co.

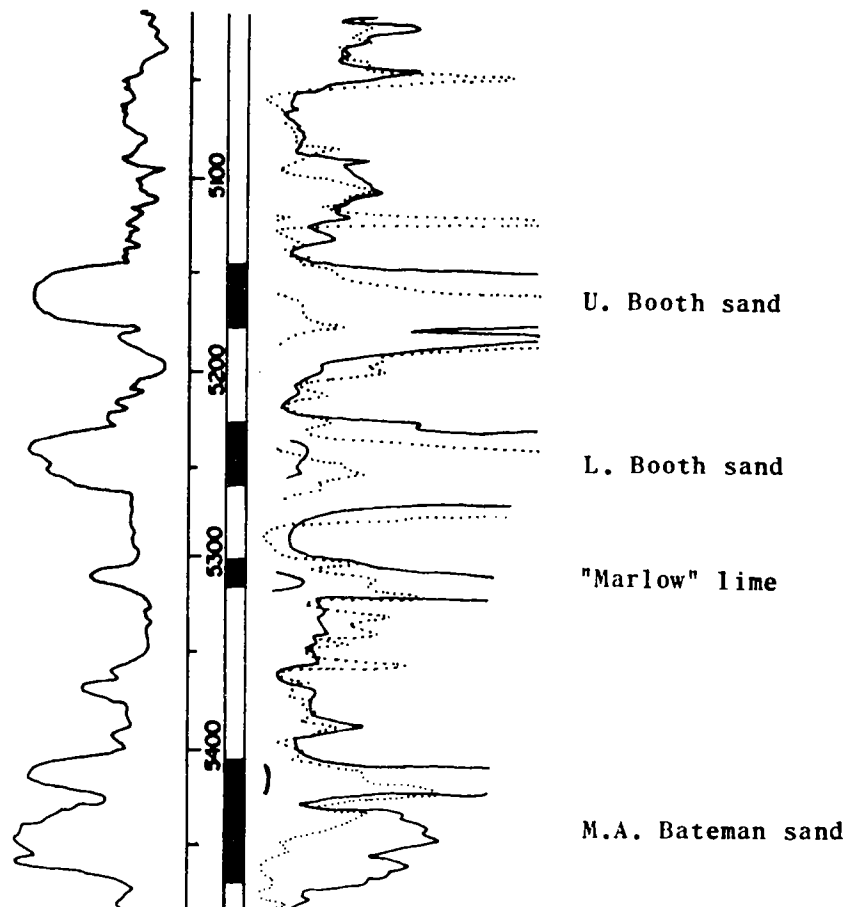
Lies above Tyner fm. may be Misener sand, once used in Ponca City field, Kay Co.

First ref. - Hayes (1952), OCGS, vol. 3, no. 2, p. 7; (1955), p. 101.

Named for Marlow town and field, 2N-8W, Stephens Co.

Equal to previously called "Crinoidal" lime. Below Booth sand, above M. A. Bateman sand. Approximately 400-500 feet above Lower Gregory lime (AGS, 1956, Cross-section C-C'). Name is objectionable as it conflicts with Marlow fm. (Guadalupean) of surface in same area. See also illustration of M. A. Bateman sand.

Illustration: Texas No. 1 Booth, SW NW NW 21-2N-8W.



First ref. - Keyes (1897), Iowa Acad. Sci., Proc., vol. 4, p. 23.

Named as formation, raised to group by Condra et al. (1932). Group contains (descending order) Holdenville sh., Lenepah ls., Nowata sh., Oolagah ls., Labette fm., and Fort Scott ls.

In Oklahoma Panhandle, production is called upper Marmaton, discovered in Carter No. 1 Hugh Dorman, NW NW 29-5N-22ECM, Beaver Co.; below 5,510 feet (9-11-52) in Floris field.

Basal Marmaton production discovered in Carter No. 1 Sid Sharp, C SE SE 31-6N-22 ECM, Beaver Co., at 5,830-49 feet (3-6-52) in Greenough field (notes by D. H. Swartz, 1955).

Maroon shale

Descriptive name for Pennsylvanian shale in Carter Co. (see Deese Maroon), an upper Virgilian shale in Grady Co., a member of the Jackfork in the Ouachita Mts.

Marshall zoneSimpson groupM. Ordovician

First ref. - Zavoico (1935), TGS, vol. 3, p. 59.

Named for town of Marshall, Logan Co.

Dolomite and sandstone, green shale, between Bromide Dense and First Bromide sand of Bromide formation, Simpson group. Equal to Bromide dolomite. Productive locally. See illustration of Simpson group.

Martin sandSpringeranPennsylvanian

Ref. - Parker (1956), PGSO, vol. 1, p. 174.

Named for Continental No. 1 Martin, SW NE NW 7-2S-3W, Camp field, Carter Co. at depth of 6,414-6,482 feet. Equal to First or Upper Sims sand of Sholom Alechem field and is generally now called First Sims (Parker, 1956, PGSO., vol. 1, p. 181). See illustration of Dotson sand.

Mauldin sandLeonardian-WolfcampianPermian

First ref. - Denison (1923), AAPG, vol. 7, p. 627.

Named for Magnolia Petroleum Company No. 1 Mauldin, NE SE 16-1N-3W, which came in for an estimated 40,000,000 cubic feet of gas from a total depth of 1,386 feet on June 20, 1920. Called Mauldin producing horizon, a series of lenticular gas sands, alternating with red and blue shales from 1,200 to 1,400 feet, lies below Garvin beds, and above Newberry sands.

Meadows sandDesmoinesian?Pennsylvanian

First ref. - Wood (1913), USGS, 531, p. 32.

Used in Cleveland field, Pawnee Co. Equal to Burgess (?) sand.

Meaner sandDesmoinesianPennsylvanian

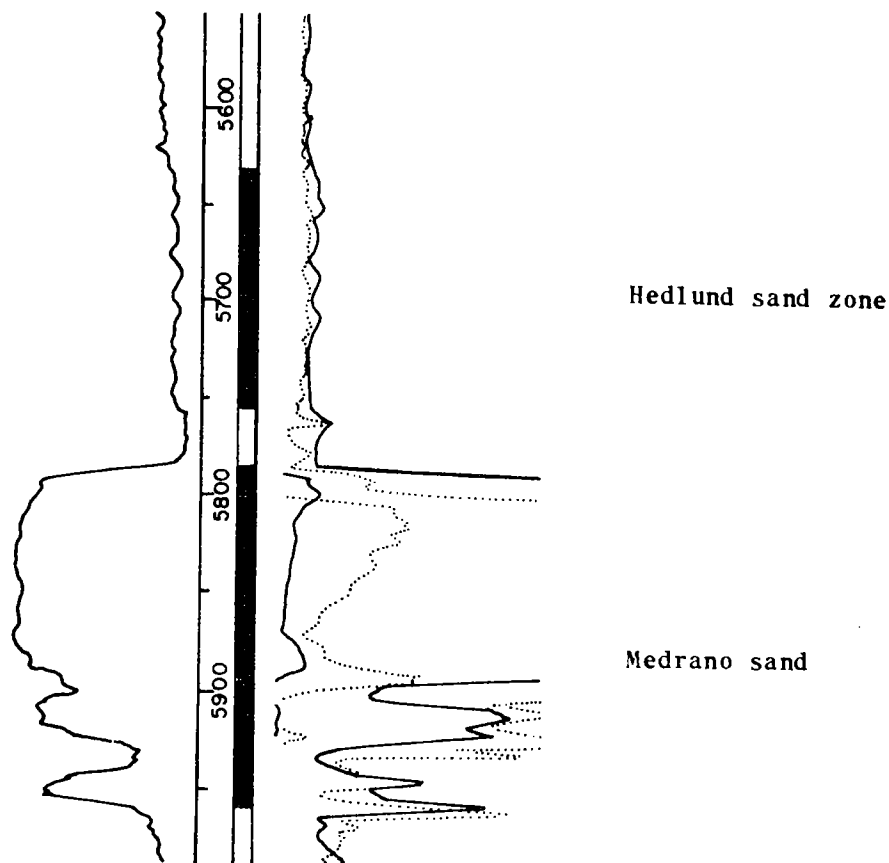
First ref. - Bullard (1928), OGS 40-Q, p. 46.

Davenport field, Lincoln Co. Equal to Oswego lime.

Ref. - Wheeler (1947), World Oil, vol. 127, no. 3, p. 46.

Named for B. A. Medrano lease of Magnolia, SW 36-6N-10W, Cement field, Caddo Co. Shown on AGS (1956), Cross-section C-C' as below Wade sand and above Marchand sand. In the Cement field, lies below the Wade sand and Hedlund sand zone, and above Marchand sand. Uppermost portion of Medrano sand usually contains a chert, sand and limestone conglomerate, 10-15 feet in illustrated well (H. R. Segnar, 3-15-57).

Illustration: Phillips No. 2 Hartshorne, NE NW NE 2-5N-10W.



Named for Megargel town and pool, Archer Co., Texas. Texas marker and pay used in Hollis Basin.

Equal to Rocky Mound limestone member of Graham formation, Cisco group. Equivalent to Lower Gregory lime of Cement field (Putman, 1956). See AGS (1956), Cross-section C-C' and illustration of Thomas sand of SW Randlett field.

Melton sand, Melton zone

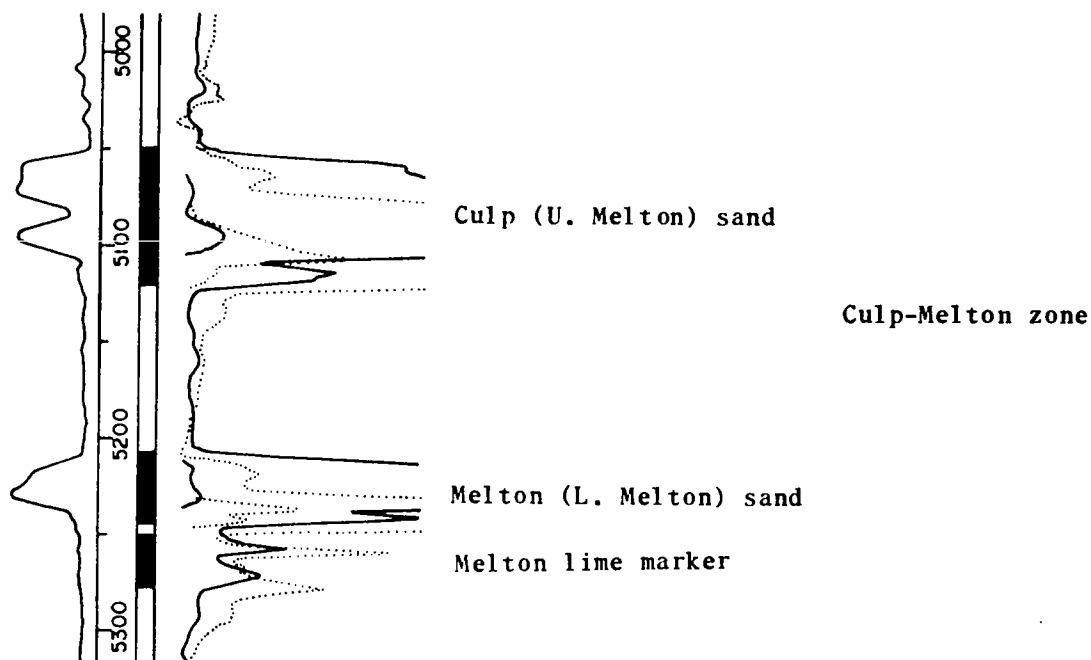
Missourian

Pennsylvanian

Ref. - Ingram (1941), OGJ, vol. 20, no. 9, July 10, p. 23.

Named for Melton lease of Ray Stephens, Inc., SE 26-6N-10W, Cement field, Caddo Co. Brown oolitic ls., shale, calcareous ss. up to 500 feet thick, below Marchand and Culp (= U. Melton) sands. Also called Culp-Melton zone, preferred name, including Culp or Upper Melton and Melton or Lower Melton. See also illustration of Culp sand.

Illustration: Magnolia No. 13 Niles, SW NW NW 36-6N-10W.



Mervine sand

Virgilian

Pennsylvanian

Clark and Cooper (1927), OGS 40-H, p. 25; also OGS 40, vol. II, p. 85.

Name from former town and Mervine anticline.

Also called "1,000-foot" and Newkirk sand in Mervine field, Kay Co. See Newkirk sand.

Miller sand

Virgilian

Pennsylvanian

Gouin (1926), OGS, 40-E, p. 28; also 40, vol. II, p. 42.

Named for Miller lease of Empire, NE 5-2S-8W, Empire field, Stephens Co., where a gas sand was discovered at 1,500 feet. Lies 100 feet above Nigh and 200 feet above Surber sand, in Empire field. One of the many lensing sands in the Pontotoc group named in North Duncan and Empire pools.

Misener sand

Kinderhookian

Devonian-Mississippian

First ref. - White and Green (1924), OGJ, vol. 23, no. 15, p. 42.

Named for Fred D. Misener of Tulsa.

Locally developed sand in basal part of Woodford or Chattanooga shale, equal to Sylamore sandstone of surface. Productive in central and northern Oklahoma. Misspelled Misner, Meisener.

Mississippi "Chat"

Mississippian

Porous and weathered zone at or near top of Mississippi lime. Term should not be used for detrital-conglomeratic zone at base of Desmoinesian to which name of Burgess should be applied. See Burgess sand discussion.

Mississippi lime

Mississippian

Term for thick Mississippian limestone. At places the unit is Keokuk, Reeds Spring and St. Joe of Osagean age. Elsewhere it includes Meramecian and Chesterian beds. Where porous and weathered at top, the zone is termed Mississippi "Chat".

Mississippian Caney

Chesterian

Mississippian

Term used in Seminole area for calcareous shales of Fayetteville shale, below fissile shales called Penn. Caney which are encountered below the Cromwell sands. Radioactive logs show a zone of high radioactivity at the top of this unit in the greater Seminole area.

Term as used in southern Oklahoma for beds below what is variously called "Goddard shale," "Springer shale," or "Pennsylvanian Caney." See Elias (1956), OGSO, vol. 1, p. 56.

Mocane sand

Morrowan?

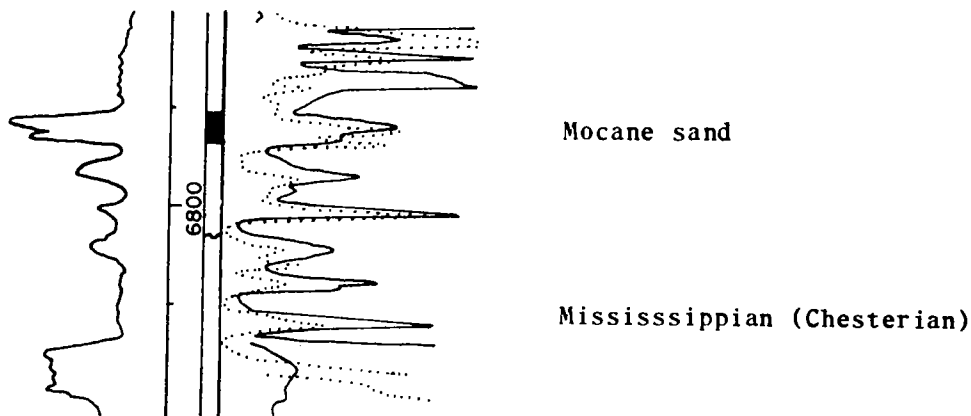
Pennsylvanian

First ref. - Barby (1956), OCGS, vol. 6, no. 10, p. 13.

Named for town of Mocane, Beaver Co.

Gas zone which at the present time is called Lower or Basal Morrow sand by most geologists. Discovered and named in Texas Co. No. 1 Barby "A", C NW NW 2-4N-25EMC, discovery well of SE Mocane field. Barby, *op. cit.* p. 32, considers that the Morrow sandstones can be subdivided into three zones called "Bowles", "Mocane", and basal sandstone and the "pinch out" of these zones can be traced in Beaver Co. Some geologists consider this sand a basal Morrowan sand equivalent to Keyes sand. Production from perforations, 6,722-6,764 feet, in illustrated well, top of Mississippian (Chesterian) at 6,804 or 6,816 feet (notes from W. P. Buckthal, A. J. Millikan).

Illustration: Texas No. 1 Barby "A".



Mollie Miller sand

Ordovician

Named for Mollie Miller lease of Marland, 9-25N-2E, Ponca City field, Kay Co. Discovery in No. 9 at 3,929-45 feet in 1919.
Misener or Wilcox sand equivalent.

Mollman sand

Simpson group

M. Ordovician

First ref. - McGee and Clawson (1932), AAPG, vol. 16, p. 973.

Named for B. T. Mollman lease of Mid-Kansas, SE 23-11N-3W, Oklahoma City field, Oklahoma Co.

Lower part of McLish fm. (lower part of School Land sand).

Mona sand

Desmoinesian

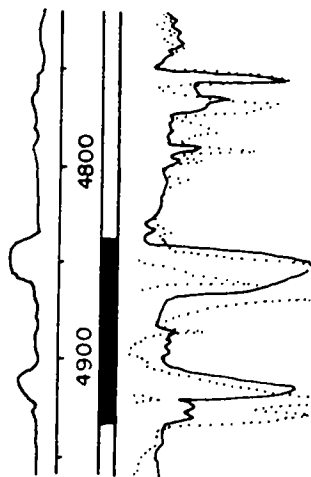
Pennsylvanian

First ref. - Hayes (1952), OCGS, vol. 3, no. 2, p. 10; (1955), p. 101.

Named for Mona lease of Phillips, SE 32-5N-8W, discovery in 1944, Chickasha field, Grady Co.

In lower part of Deese, below Pooler sand and above Second Carpenter = Basal Tussy according to AGS (1956), Cross-section C-C', Well No. 11.

Illustration: Sinclair Prairie No. 6 Pooler, C SW NE 22-5N-8W.



Mona sand

Montgomery sand

Desmoinesian

Pennsylvanian

Mentioned by Shaw (1954), OCGS, vol. 5, no. 3, p. 9.

Origin of name not determined. May be from Stanolind No. 1 Montgomery SW NW SW 28-2S-3W, Fox field, Carter Co., drilled in 1951.

Applied to a lower Deese sandstone by some geologists in T.2 S., R.3 W, Fox field, Carter Co. Name used only locally.

Named by Wheeler (1947), *World Oil*, vol. 127, no. 7, November 22, p. 156.

Named for Moore city and field, Oklahoma Co.
Atokan age in doubt. Not in use.

Morris sand (Morris field)

Atokan

Pennsylvanian

Name published by Fohs and Gardner (1914), *Fuel Oil Jour.*, Aug. Suppl.

Named for town of Morris and field. Discovered in 1907 by Tulsa Fuel and Mfg. well, SE SE SE 20-13N-14E, Morris field, Okmulgee Co. at 1,486-1,525 feet.

Equivalent to a Dutcher sand in upper part of Atoka, in the Gilcrease sand zone. Term still used in Okmulgee district above Glenn-of-Morris sand (called Glenn sand). See discussion under Fields sand.

Morris sand (Fox-Graham field)

Desmoinesian

Pennsylvanian

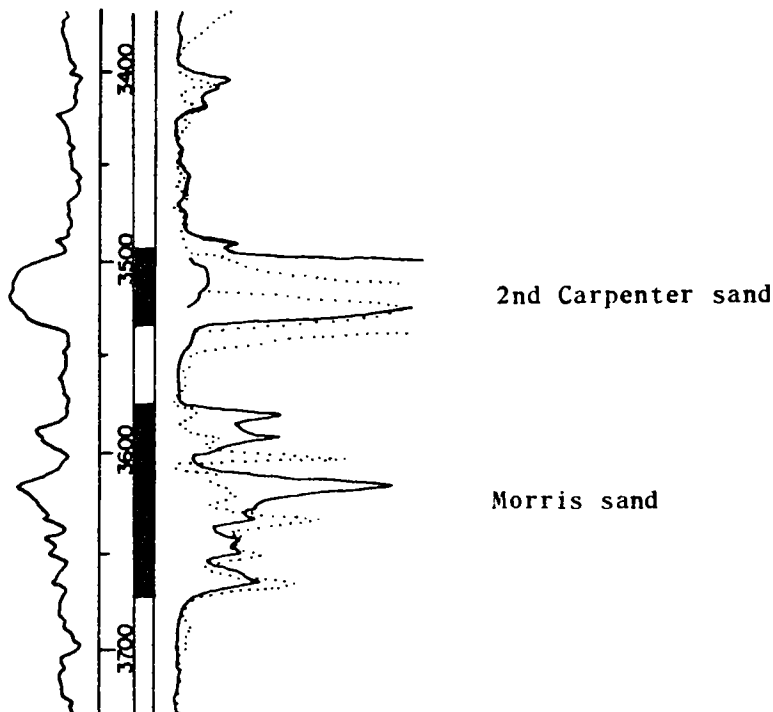
Name published by Shaw (1954), *OCGS*, vol. 5, no. 3, p. 9; (1955), p. 348.

Named for Mattie Morris lease of Gypsy, NE SE 29-2S-3W, Fox field, Carter Co. First used about 1950 by well sitters and scouts.

Near base of Deese group, below Second Carpenter. Equal to Hefner sand of Doyle field; Smith sand of Graham field; Lower Basal Tussy sand of Camp field (Parker, 1956, *PGSO*, vol. 1, p. 178); lower sandstone of Tussy-Five zone of Tussy field (Hoard, 1956, *op. cit.* p. 194); Pickens sand of N Alma (AGS, 1956, Cross-section B-B').

Occurs in Fox-Graham-Wheeler area, NW Healdton, Camp, Tatums-Tussy, N Alma, Sholom Alechem and other fields.

Illustration: Morgan and Pray No. 1 M. Morris, NW NE SE 29-2S-3W.



Morrow sand, Upper and Lower

See below.

*Morrow seriesMorrowanPennsylvanian

Adams and Ulrich (1904), USGS P. P. 24, p. 109, as formation, raised to group by Purdue (1907); to series by later writers.

Named for village of Morrow, Washington Co., Arkansas.

Divided into Hale fm. (sandy limestone) below, Bloyd formation (shale) above in NE Oklahoma. Contains Wapanucka fm. and Union Valley fm. (Cromwell sand) in E Oklahoma. Represented by Golf Course fm. (top of Otterville ls. to base of Primrose ss.) in Ardmore Basin. Absent in NC Oklahoma.

Productive in Panhandle where at present sands are considered Morrowan in age, divided into "Upper" and "Lower". Sandstones at similar stratigraphic position to "Upper Morrow" sand called Kelley sand in NW Eva field, Purdy and Sturgis sand in N Sturgis field. "Upper Morrow" sand called Atoka-Lips sand (Miller, 1955, Panhandle Geonews, vol. 2, no. 2, p. 13) in SW Light, Camp Creek, Camrick, Keyes and in Panhandle fields of Texas. Robert Roth (1957), World Oil, vol. 144, no. 2, p. 82, shows Bendian rocks as earliest Pennsylvanian in the Oklahoma and Texas Panhandles, with Morrowan rocks absent. "Basal" or "Lower Morrow" sand of Beaver and Texas Co. rests upon pre-Pennsylvanian rocks. Keyes sand of Keyes field, Mocane sand of Mocane field are called "Lower Morrow" (notes from A. J. Mullikin, F. D. Kozak). Since the term Morrow is being used in a time sense in the Anadarko basin, it is thought that the use of the same word for productive sandstones may very well lead to confusion in the future and that local terminology such as has been developed in the Ardmore area should be used until definite age is determined. See also Bowles sand.

Mose Carr sandSimpson groupM. Ordovician

First ref. - Clark and Bauer (1921), AAPG, vol. 5, p. 219.

Named for M. L. Carr of Okmulgee, discoverer in NE 34-15N-14E, drilled well in 1908, discovered oil at 1,612 feet. However Carr drilled in this area between 1908 and 1924, had oil at 750, 1,650 and 2,150 feet. Since Clark and Bauer in 1921 state that it was recently discovered, it would indicate that Mose Carr sand was at 2,150 feet, in the Simpson group.

Mounds sandSimpson groupM. Ordovician

Smith (1914), USGS, Bull. 541, pl. III.

Named for town of Mounds, Tulsa Co.

Discovery by Eastern Oil Company on J. Berryhill lease, SW SW NE, 29-17N-12E, Glennpool field, Creek Co., completed Dec. 9, 1908, in sand from 2,331-2,369 feet, producing 120 barrels a day. For many years this sand was called Mounds or Sapulpa. This was the first well in Oklahoma to produce oil from the Ordovician "Wilcox" (Powers, 1928, OGS 40, vol. 1, p. 10).

Name is older than "Wilcox" and its use is preferable in the Tulsa area.

Tomlinson and Storm (1924), AAPG, vol. 8, p. 603, fig. 6.

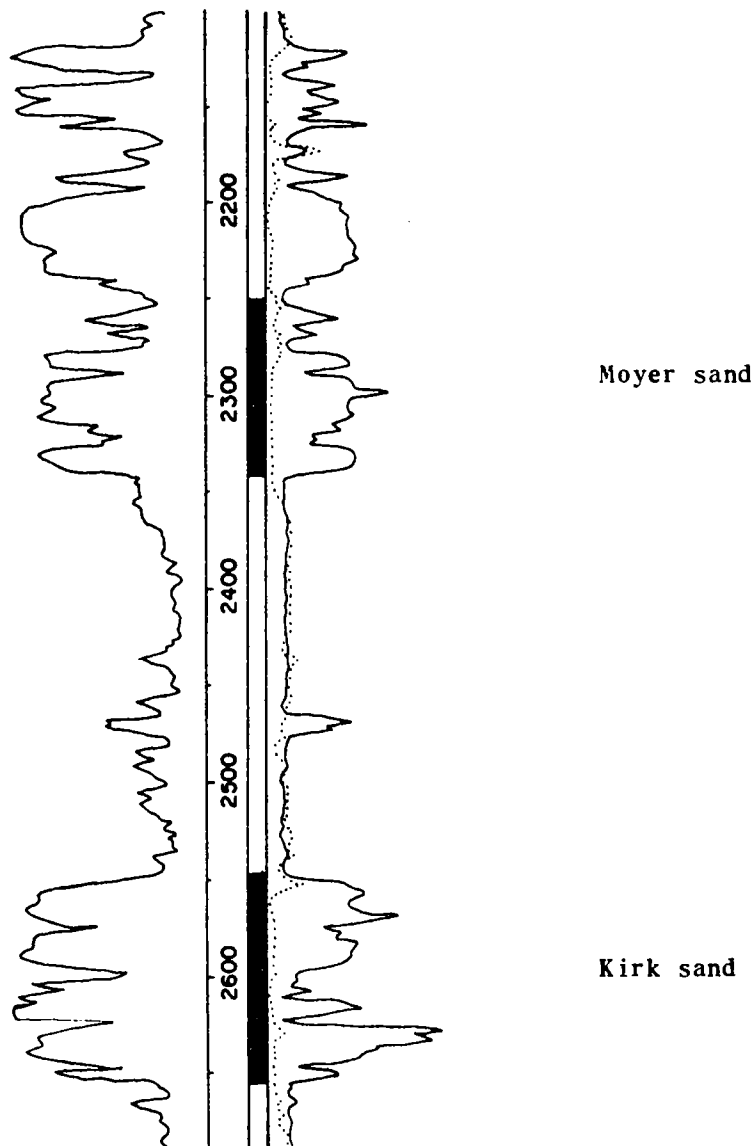
Named for Moyer lease of Gypsy Oil Co. in SW NE SE 6-3S-2W, gas sand at 964 feet, drilled in 1923, Graham field, Carter Co.

Equivalent to Culberson sand (Parker, 1956, PGS0, p. 176.), above Kirk sand or Upper Fusulina (U. Fusulinid).

The columnar section, fig. 6, represents strata encountered in 5 and 6-2S-2W. Records on Moyer leases in both sections and with columnar section identify this sand as a consistently developed sand body above the Kirk sand, in the upper part of the Deese section. It probably is identical with the lower portion of the sand zone which has become known to subsurface geologists as the Culberson sand. It is clearly identifiable with lower part of zone marker "Culberson ss." in cross section of Shaw (1952), OCGS, vol. 5, no. 3, pp. 20-21. It is consistently developed throughout the Graham field, although it produced in only a small portion of the field's area (letter from C. W. Tomlinson, 7-26-56).

This name appears to have been dropped and Culberson has taken its place in the literature.

Illustration: Patsy No. 1 McNaughton, C NW NE 6-3S-2W.



Muncrief sand

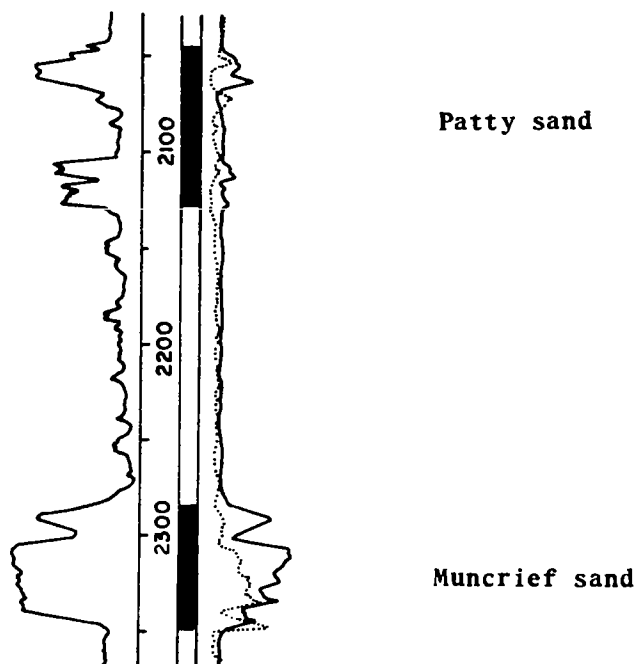
Missourian

Pennsylvanian

Atkinson (1952), OCGS vol. 3, no. 3, p. 10; (1955), p. 117.

Named for Muncrief lease of Seaboard, SE 21-2S-6W, S Palacine field, Stephens Co. Local sandstone below Patty sand and above Walker sand, medium-grained, well-sorted, up to 60 feet thick. In illustrated well, Walker sand is not developed, and sand below at 2,550 feet is Nichols sand (note from W. H. Atkinson, 3-1957).

Illustration: Atlantic No. 1 Varner, SE SW SE 21-2S-6W.

*Muskogee lime*

Atokan

Pennsylvanian

Named for Muskogee city and field.

Limestone marker in Muskogee Co. and vicinity. Equal in part to Webbers Falls member of Atoka fm. according to Wilson (1935), AAPG, vol. 19, p. 505.

Muskogee sand

Atokan

Pennsylvanian

First ref. - Fohs and Gardner (1914), Fuel Oil Jour., Aug. suppl.

Named for Muskogee field, (15N-18E), Muskogee Co., produced oil at 1,075 feet according to Fohs and Gardner. Wilson (1935) correlated it with Pope Chapel ss. of Atoka fm.

Mussellem sand

Missourian

Pennsylvanian

Named for M. S. or S. S. Mussellem lease in NE and SE 8-18N-7E, Cushing field, Creek Co. A gas sand at about 650 feet in SE of section 8.

Mussellem sand of Bass (1939, USGS, 900-C, p. 91) is Cottage Grove ss.

First ref. - Fohs and Gardner (1914), Fuel Oil Jour., Aug. suppl.

Seems to be misspelling of Mussellem. Used by Fohs and Gardner for sand at 800 feet in Cushing field and 1,710 feet in Ponca City field.

Named by Tomlinson (1937), AGS Field Trip, March 13, p. 3 to replace pre-empted name "Hollis" of Guthrey and Milner.

Type locality in N $\frac{1}{2}$ SW SE and S $\frac{1}{2}$ NW SW 27-5S-2E, Carter Co. Formation of Deese group.

Correlated by Westheimer and Schweers (1956, PGS0, vol. 1, p. 146, fig.2), from outcrop in Criner Hills into "Lower Oolitic" lime of SW Lone Grove field, below Chubbee sand and above Lone Grove sands.

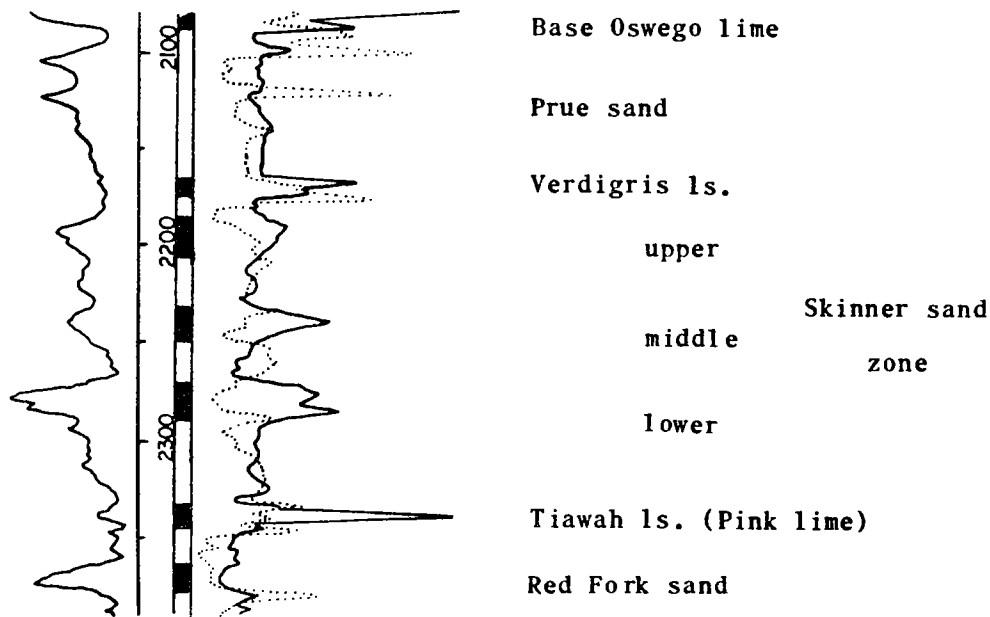
Bullard (1928), OGS 40-Q, p. 179 (as Nellis).

Named for village of Nellie. Nellie gas pool discovery at depth of 1,840 feet in Flowers and Frazier No. 1 Richardson, SE SW SW 26-2N-9W, in 1925, Stephens Co.

First ref. - Fohs and Gardner (1914), Fuel Oil Jour., Aug. suppl.

Origin of name not determined. Records (N.O.W. Index) show that in 1912 oil was obtained by Selby Oil and Gas in No. 1 Jas. Nemire, C SL SE NE 14-20N-8E, Pawnee Co., total depth 2,392 feet, which is in the area north of Mannford designated by Fohs and Gardner who reported oil at 2,239 feet. The name Nemire is not used on driller's logs in 1916, but producing sand on this lease occurs just below the Tiawah (Pink lime) ls. equivalent to Red Fork sand.

Illustration: Thompson No. 1 Lunsford, SW NE SE 14-20N-8E.



*Neva limestone

Wolfcampian

Permian

Beede (1902), Kansas Univ. Sci. Bull., vol. 1, p. 180.

Name from Neva Station, Chase Co., Kansas.

In present usage, Neva ls. is top limestone member of Grenola fm., which includes Neva ls., Burr ls., and Sallyards ls. In subsurface the term Neva normally refers to Neva and Burr limestones. The Grenola fm. is below the Cottonwood ls. and Eskridge shale and above Roca shale and Red Eagle ls. Hotson sand is in shale unit above Neva. See illustration of Hoxsey and Hoy sands.

Newberry sand

Virgilian?

Pennsylvanian?

Denison (1923), AAPG, vol. 7, p. 628.

Named for oil discovery well of field, Magnolia's No. 1 Hart Newberry, NW NW 14-1N-3W, Robberson field, Garvin Co. drilled to total depth of 1,399 feet, July 16, 1921.

Lies below Mauldin, around buried hills at depths from 1,375 to 1,877 feet. Wolfcampian or Virgilian.

Newkirk sand

Virgilian

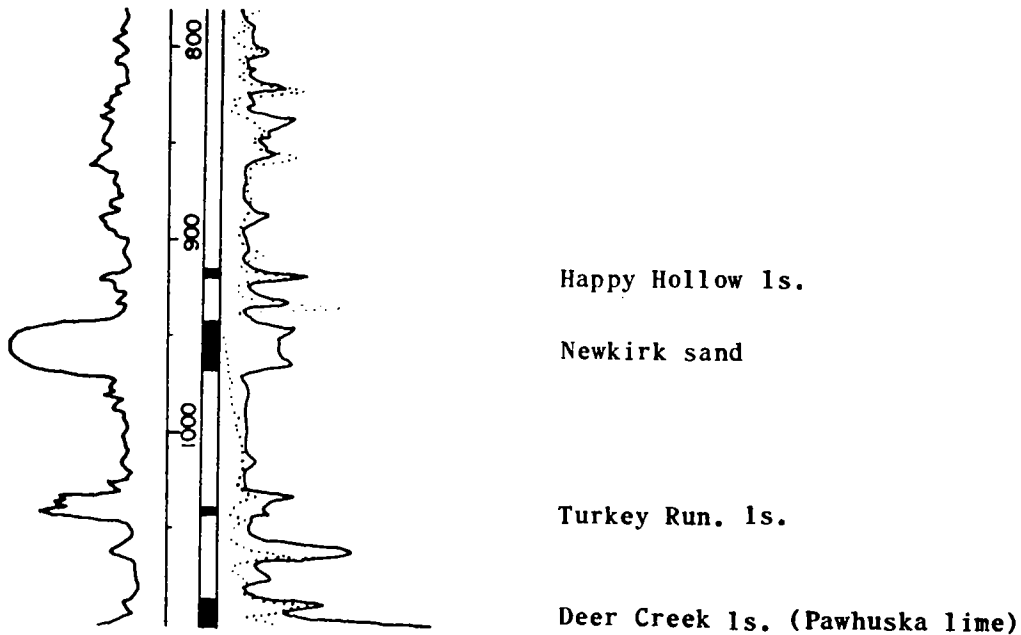
Pennsylvanian

First ref. - Fohs and Gardner (1914), Fuel Oil Jour., Aug. suppl.

Named for town of Newkirk, Kay Co. Named in Newkirk-Mervine, now Mervine field.

Also called "1,000-foot" or Mervine sand. Clark and Daniels (1929, STAOF, vol. 1, p. 162) show the top of sand approximately 100 feet above Pawhuska ls. group in the Mervine pool. E. W. Smith (1955, OCGS, vol. 5, no. 9, p. 6; 1955, p. 435), places the sand below Happy Hollow ls. and above Turkey Run (Topeka) ls., top limestone member of Pawhuska fm.

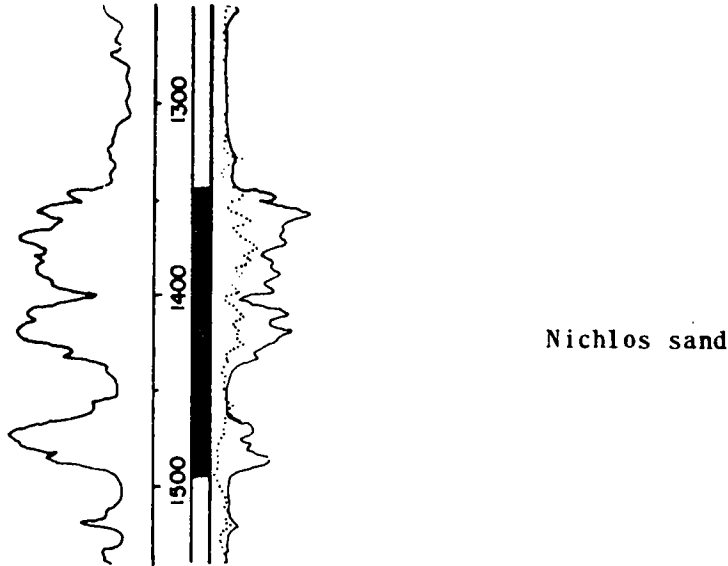
Illustration: Time Petr. Corp. 1 Hamlin, SW NE NE 2-27N-3E.



Kirwan and Swigart (1923), USBM Eng. Rep., Chickasha Gas Field, p. 3 and Table 1.

Named for John B. Nichlos, discoverer in No. 1 Farwell, C W $\frac{1}{2}$ W $\frac{1}{2}$ NE 26-5N-8W, elev. 1,174, from 1,224 to 1,281 feet, Chickasha field, Grady Co. Above Ramsey sand zone. Reported to be equivalent to Garber ss. of surface.

Illustration: Magnolia No. 8 Farwell, C SW SE 26-5N-8W.

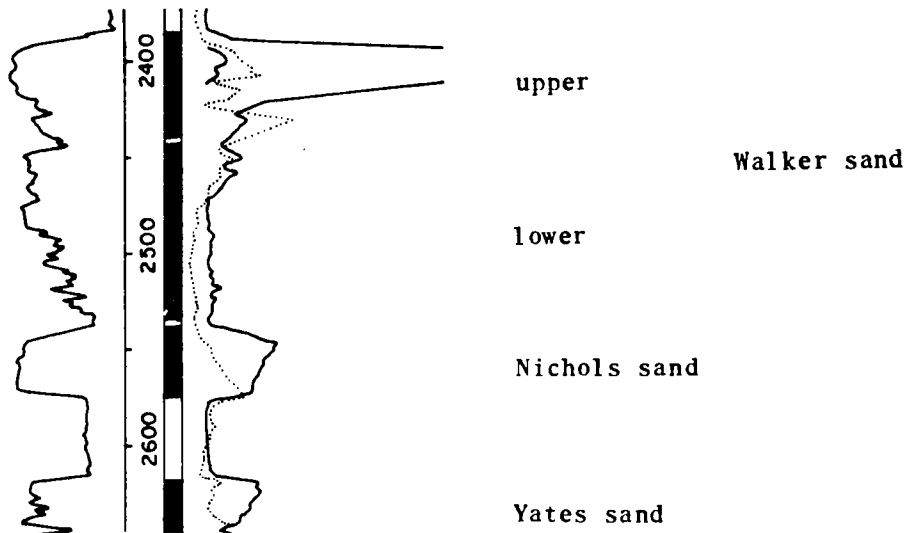


Atkinson (1952), OCGS, vol. 3, no. 3, p. 10; (1955), p. 117.

Named for Nichols lease of Sunray, NW 21-2S-6W, S Palacine field, Stephens Co.

Lies in lower part of Hoxbar, above Yates sand, below Walker sand. Laminated well-sorted sandstone up to 200 feet in thickness, in several beds. See also illustration of Yates sand.

Illustration: Amerada No. 2 Yates, SW SW SE 16-2S-6W.



Nigh sand

Virgilian

Pennsylvanian

Gouin (1926), OGS 40-E, p. 42.

Named for Elmer Nigh lease of N. Amer. O. & G. Corp., NW SW 34-1S-8W, at average depth of 1,600 feet, Empire field, Stephens Co.

One of the many lensing sands in Pontotoc group, 100 feet below Miller sand, 100 feet above Surber sand.

Niles lime

Virgilian or Missourian

Pennsylvanian

Hayes (1952), OCGS, vol. 3, No. 2, p. 9; (1955), p. 101.

Named for associated sandstone which lies below, Cement field, Caddo Co.

Niles sand

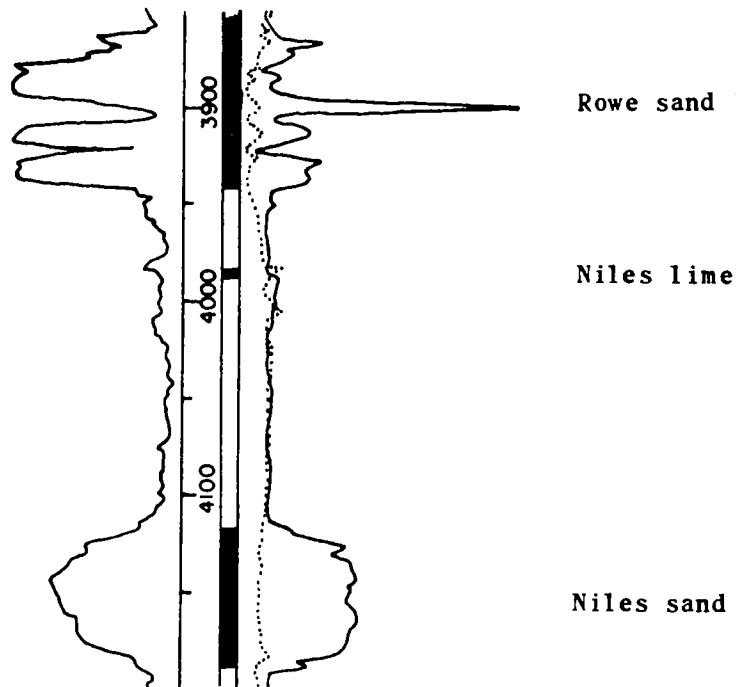
Virgilian or Missourian

Pennsylvanian

Ingram (1941), OGJ, vol. 40, no. 9, July 10, p. 23.

Named for F. A. Niles lease of Magnolia, NW 36-6N-10W, Cement field, Caddo Co. Sandstone 100 to 200 feet thick, below Rowe sands, above First or Upper Oolitic lime and Yule-Funk sand.

Illustration: Magnolia No. 11 Medrano, SW SW SW 36-6N-10W.

*Ninety-sixth Meridian sand*

Atokan

Pennsylvanian

First ref. - Fohs and Gardner (1914), Fuel Oil Jour., Aug. suppl.

Named for 96th Meridian, probably refers to Glennpool field, Creek Co. where Fohs and Gardner shows oil at average depth of 2,000 feet.

Equal to Atokan Dutcher sand, Gilcrease sand.

Noble-Olson sand

Leonardian

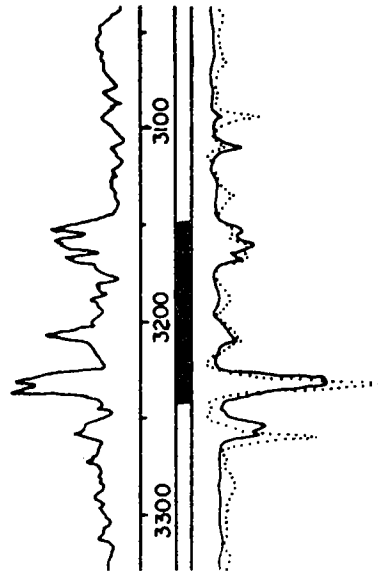
Permian

First ref. - Becker, Wells and Fulton (1932), OGJ, vol. 31, no. 16, p. 14.

Named for Noble-Olson Drilling Co., discoverer in 1929 of sand at 3,300 feet in NW SE SE 36-6N-10W, Cement field, Grady Co.

Lower sands in Wallace zone, which is below Fortuna sands of Cement field and Ramsey sands of Chickasha field. See Wallace zone.

Illustration: Magnolia No. 12 Niles, SW SE NW 36-6N-10W.



Noble-Olson sand zone

Norris sand

Missourian or Desmoinesian

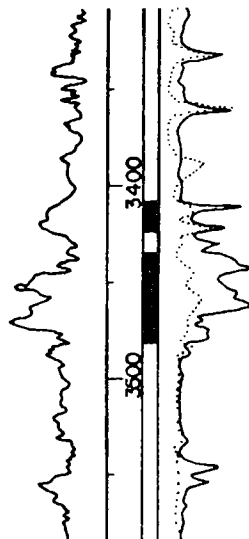
Pennsylvanian

First ref. - Williams (1954), OCGS, vol. 4, no. 9, p. 10; (1955), p. 285.

Name from L. C. Norris lease of Rock Hill, N $\frac{1}{2}$ 35-4S-2W, Bayou field, Carter Co.

Buff to brown lignitic sandstone with interbedded shale. Below Chubbee sand and Lower Oolitic lime possibly equivalent to Natsy ls. and above Lone Grove sands. Second Hewitt of Hewitt field is equivalent to Norris sand in part (notes from Westheimer, Mullen 1956).

Illustration: Rock Hill No. 2 Norris SE SW NE 35-4S-2W.



L. Oolitic lime

Norris sand

Oil City lime

Missourian

Pennsylvanian

Green (1918), AAPG, vol. 2, p. 121.

Named for community of Oil City, SE SE 17-23N-12E, Osage Co.
Equal to Avant limestone of surface.

**Oil Creek formation*

Simpson group

M. Ordovician

Ulrich (1930), U. S. Nat. Mus. Proc., vol. 76, art. 21, p. 73.

Named for exposures on Oil Creek, W Johnston Co. and SE Murray Co.
Consists of dolomite, limestone, shale and sandstone. Underlies McLish fm., overlies Joins fm. In subsurface contains several productive zones, which may be termed Oil Creek sand, or any of the numerous local names for pays in the Simpson group. See Simpson group.

Oklahoma City Checkerboard lime

Missourian

Pennsylvanian

See "Checkerboard" lime, Oklahoma City.

Okmulgee Wilcox sand

Simpson group

M. Ordovician

First ref. - Lockwood (1925), OGJ, April 16, p. 16.

Wilcox sand of Okmulgee district, type area of Wilcox. See Wilcox sand, Mounds sand, and Simpson group.

Olds sand

Simpson group

M. Ordovician

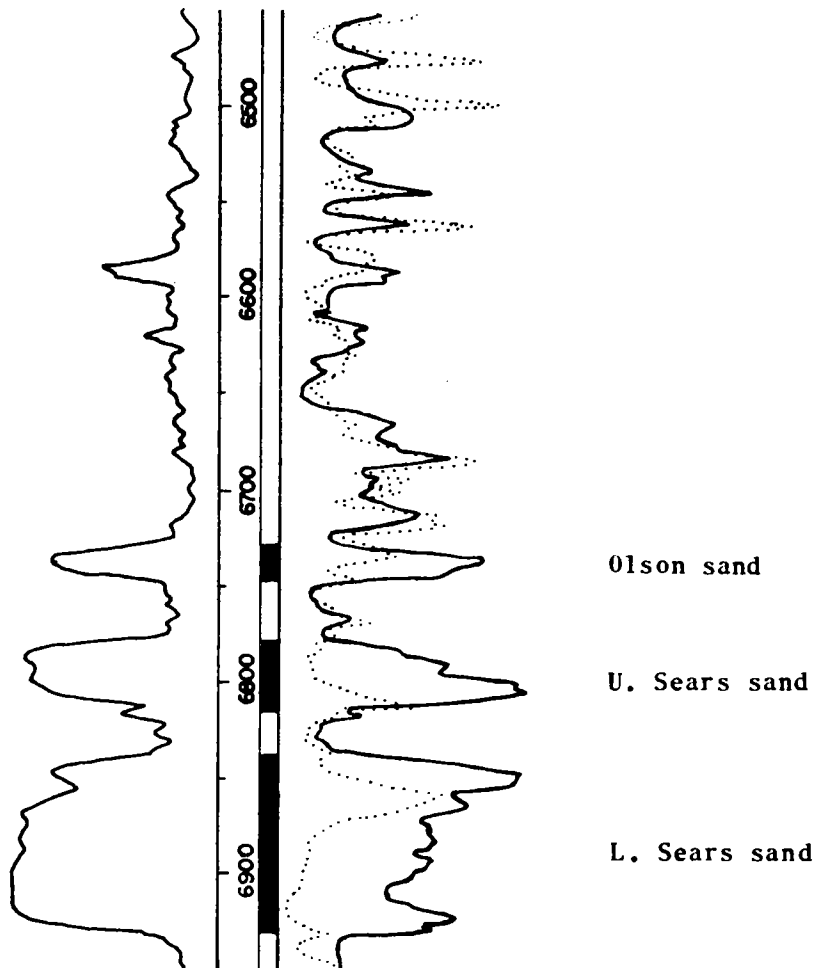
First ref. - McGee and Clawson (1932), AAPG, vol. 16, p. 974.

Named for Olds lease of Coline Oil Co., NW 24-11N-3W, Oklahoma City field, Oklahoma Co.
This is sandstone of Oil Creek fm. and should be so-called.

Name from Olson lease of Texas, discovered in No. 1, SW NE SW 21-2N-8W, West Marlow field, Stephens Co.

Productive sand locally developed about 30 feet above Upper Sears sand, considered equivalent to some of Rowe sands of Cement field; below Rowe lime and above Hervey or Niles sand as shown on AGS (1956) Cross-section D-D', Well No. 1.

Illustration: Texas No. 3 Olson, NE SE SW 21-2N-8W.



Tillotson (1938), AAPG, vol. 22, p. 1579.

Named for Olympic Oil Company, discoverer of Olympic field, Hughes and Okfuskee Cos., in Cromwell sand at a total depth of 3,474 feet in No. 1 McCaslin, SE NW NW 12-9N-8E, completed in July, 1934. Discovery of Olympic sand in Manahan No. 1 Dixon "A", NE SW NW 12-9N-8E, 1,685-1,737 feet, elevation, 835 feet.

In Senora formation, below Henryetta coal, above Senora lime, equal to Allen sand. Called Senora sand (Stiles, 1957, Journ. Petr. Tech., vol. 9, no. 2, p. 29).

Oolitic lime

This term has been applied to various horizons:

1 Oolitic lime	Hunton group	L. Silurian
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Reeds (1911), Amer. Jour. Sci., vol. 182, p. 259; informal description of basal member of Chimneyhill fm. of Hunton group on surface.

Name in use in subsurface since about 1935, descriptive of dense light gray oolitic limestone. Below Cochrane member ("Glaucopitic lime"), it rests on Sylvan shale; 0-10 feet thick and cherty at places. Because of many other uses of the general term, the unit should be called Chimneyhill oolitic lime, or Keel member, surface name.

2 Oolitic lime	Missourian or Desmoinesian	Pennsylvanian
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An oolitic limestone which is considered a basal limestone of the Hoxbar group by some, or the first marker zone in the Deese group above the Culberson sand by others. Often termed Hoxbar Oolitic. See PGSO (1956), vol. 1, pp. 176, 265, 284, 292. Called in Camp, Velma, N Alma, Tatums-Tussy, pp. 8-11, Tables VII, VIII.

3 Oolitic lime	Desmoinesian	Pennsylvanian
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Marker zone below Deese sand considered base of Deese and productive in N Wildcat Jim pool. See PGSO (1956), vol. 1, p. 212, fig. 3.

4 Upper Oolitic lime	Missourian	Pennsylvanian
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Ref. - Hayes (1952), OCGS, vol. 3, no. 2, p. 9; AGS (1956), Cross-section C-C'.

Above Yule-Funk sand, below Niles sand as placed on cross-section. Originally called in Cement field, and there also called "First Oolitic lime". See illustration of Yule-Funk sand.

5 Main Oolitic lime	Missourian	Pennsylvanian
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First ref. - Hayes (1952), OCGS, vol. 3, no. 2, p. 9; (1955), p. 101.

Name descriptive of lithology and thickness, brownish oolite, 15-20 feet thick, in upper part of Missourian above Wade sand, below Black Ostracod or Ostracod lime. Originally called Second or Lower Oolitic lime in Cement field. Zone was divided into First Lower Oolitic and Second Lower Oolitic by some. See illustrations of Black Ostracod lime and Wade sand. This is not the "Lower Oolitic" lime of Westheimer and Schweers described below.

6 Lower Oolitic lime

Desmoinesian

Pennsylvanian

First ref. - Westheimer and Schweers in Selk (1951), AAPG, vol. 35, p. 598, fig. 12; also (1956), PGSO, vol. 1, p. 146.

A 10-foot bed thought to be equivalent to Natsy ls., about 400 feet below Chubbee sand and 250 feet above Lone Grove sand zone in SW Lone Grove field, Carter Co. See illustration of Norris sand.

7 First and Second Oolitic lime

Missourian

Pennsylvanian

Two oolitic limestones below the "Checkerboard" of Oklahoma City field. Equivalent to true Checkerboard ls. and Cleveland sand below, respectively. See illustration of "Checkerboard" of Oklahoma City field.

*Oologah limestone

Desmoinesian

Pennsylvanian

Drake (1898), Amer. Phil. Soc., Proc., vol. 36, p. 377.

Named for town of Oologah, Tulsa Co.

In type area the formation consists of a three-foot crystalline ls., 4 feet of black fissile sh., 21 feet of cherty silty ls. Northward the Oologah divides into Altamont ls., Bandera shale, Pawnee ls. Equal to Big Lime of subsurface. The name Oologah could be effectively substituted for Big Lime in eastern half of Oklahoma without change of concept.

Sandstone in Bandera shale is called Weiser sand in Kansas, and Wiser sand in Osage Co., Okla. but not Wiser sand of Kansas which is in upper Cherokee. Wayside sand is in Nowata shale above the Altamont ls.

*Oread limestone

Virgilian

Pennsylvanian

Haworth (1894), Kan. Univ. Quart., vol. 2, pp. 123-4.

Named for fact it caps Mount Oread at Lawrence, Kansas. Raised to formation rank and includes in descending order: Kereford ls., Heumader sh., Plattsmouth ls., Heebner sh., Leavenworth ls., Snyderville sh., and Toronto ls. As used in subsurface in Oklahoma, "Oread lime" refers at many places but not everywhere to Plattsmouth ls., "Lovell lime" refers to Toronto ls. in most cases.

Osage-Layton

Missourian

Pennsylvanian

Layton sand as misidentified in Osage Co.

Equal to Cottage Grove ss. of surface and is now being called this in subsurface. Not the true Layton sand of Creek Co., which is Dodds Creek sandstone.

Osborne sand

Desmoinesian

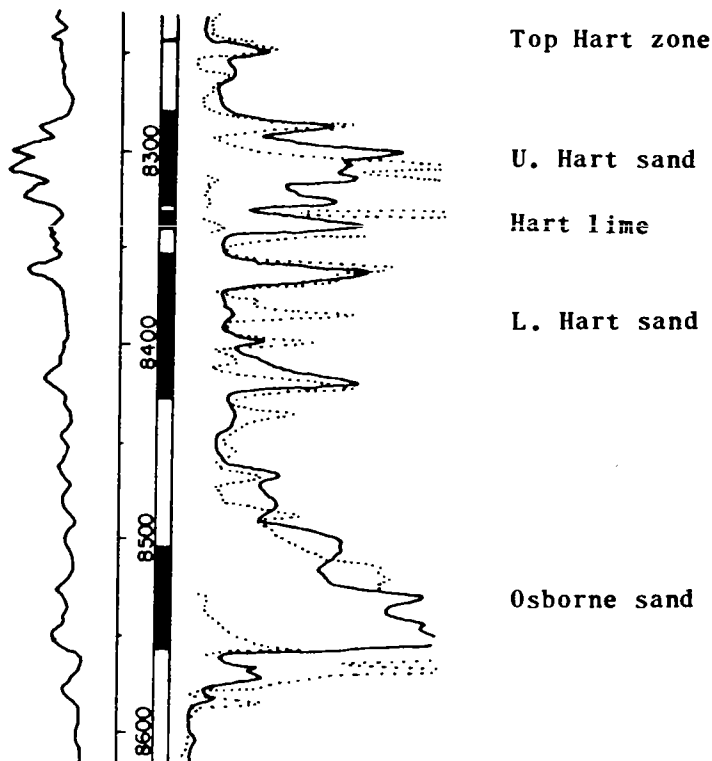
Pennsylvanian

Ref. - Wallace (1954), OCGS, vol. 4, no. 7, p. 6; (1955), p. 245.

Name from Fleet Osborne lease of Max Pray, discovery in No. 1, C SE SE 23-5N-4W, N Lindsay field, McClain Co.

Lies below Hart sand zone; distinguished by asphaltic stain. Equal to Fifth Deese of Golden Trend area. See also Hart lime.

Illustration: Max Pray No. 1 Donnell, C SE SW 23-5N-4W.



Oscar sand

Missourian

Pennsylvanian

First ref. - Wright et al. (1957), USBM Rept. Invest. 5326.

Name from town and field of Oscar, Jefferson Co.

Listed as oil-productive formation at 1,473-1,534, no elevation, in 33-6S-5W, Oscar field, Jefferson Co. This appears to be the "Crinoidal" lime of McBee and Vaughan (1956), PGSO, vol. 1, p. 367. This bioclastic limestone has high porosities and permeabilities and for at least the first six years was logged as 'sand' and 'limy sand'.

Not to be confused with surface Oscar (Permian) ss. named and mapped by Bunn (1930, OGS 40-pp, p. 11) in Jefferson Co.

Ostracod lime

Missourian

Pennsylvanian

See Black Ostracod lime.

Oswego lime

Desmoinesian

Pennsylvanian

Proposed as surface fm. by Haworth and Kirk (1894), Kans. Univ. Quart., vol. 2, p. 105.

Named for town of Oswego, Labette Co., Kan.

Name preoccupied by an Ordovician unit of New York. Replaced by Fort Scott ls.

Subsurface unit consists of Upper Ft. Scott ls. (Higginsville ls.), Little Osage sh., Lower Ft. Scott ls. (Blackjack Creek ls.), Excello sh., and Breezy Hill ls. in north central and eastern Oklahoma. South of Nowata Co., Higginsville ls. member is absent on surface.

Palacine shale

Missourian

Pennsylvanian

Listed by Mullen (1956), PGSO, vol. 1, p. 159.

Shale unit from 1,850 to 2,160 feet, below Hewitt lignite and above 1st Hewitt sand (Chubbee sand) in Texas Company No. 9 Nolen, NE NE NE 28-4S-2W in Hewitt field, Carter Co.

Panhandle Big Lime

Leonardian-Wolfcampian

Permian

Name published by Greene (1926), OGS 40-D, p. 9.

Named for Texas Panhandle.

First thick carbonate sequence encountered. Consists of dolomite of Leonard and Wolfcamp series. Top used as marker. Porous zones such as "Brown dolomite" are gas producers.

Panhandle dolomite

Wolfcampian

Permian

Named for Texas Panhandle and Panhandle gas field.

Same as Brown dolomite, top is correlative with Herington ls. of Chase group. Used in Beckham Co. (notes from L. W. Curtis, 8-26-55).

Papoose sand

Morrowan

Pennsylvanian

First ref. - Roark (1926), OGS 36, p. 18.

1923 Named for Papoose Oil Co., discoverer in No. 1 Simon, SE SE SW 4-9N-9E, August at 3,300 feet, Papoose field, Hughes Co.
Equal to Cromwell sand, the older and better name.

Parks sand

Springeran

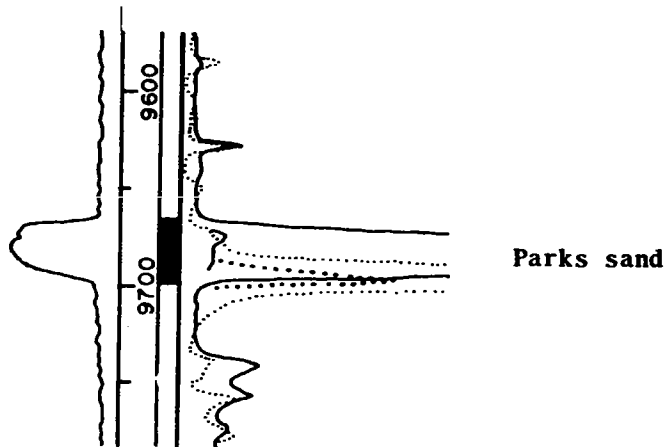
Pennsylvanian

Name used on OCGS (1952), Stratigraphic Cross-section 2-2 in 2N-3W, Garvin Co.

Name from Vickers Petroleum Co. No. 1 Parks, SE NW NE 6-2N-3W, drilled in 1951, SE Purdy field, Garvin Co.

This was the first well in this area that penetrated a good development of the sandstone. It is the same sandstone which produces to the north, being the main producing sand of the Springer in this area, and is known as the Cunningham sand in the area north and west of the town of Purdy. The name Cunningham is more widely known and is the term used by most operators (note from R. L. Beasley, 12-28-56).

Illustration: Vickers Petroleum No. 1 Parks.



Patchell sand

Desmoinesian

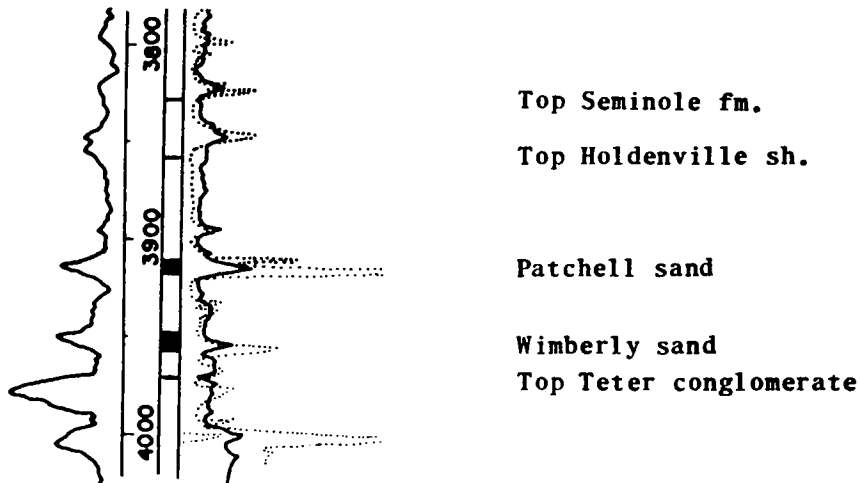
Pennsylvanian

Hicks (1956), PGS0, vol. 1, p. 342.

Name from Patchell lease of Kubat, in No. 1, C NW SW 30-4N-1E, discoverer of oil in 1943, Pauls Valley field, Garvin Co.

Crinoidal calcareous medium grained sandstone, 2-12 feet thick, 70 feet below top of Holdenville fm., lowest Pennsylvanian bed to be continuous over the eroded structure. See also Cashion and Wimberly sands, and Teter conglomerate.

Illustration: Kubat No. 1 Patchell, C NW SW 30-4N-1E.

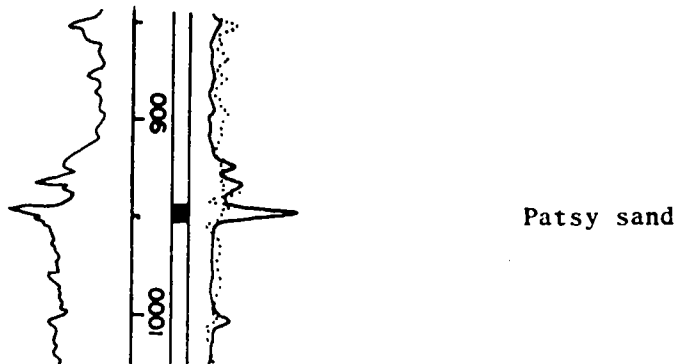


George and Bunn (1924), USBM, Petrol. Eng. Fox and Graham field, p. 13.

Named for Patsy Oil and Gas Co., discoverer in No. 3 Palmer near center, prob. SW SW NE of 6-3S-2W, Graham field, Carter Co. at 985 feet.

This sand is in basal portion of the Pontotoc (presumably Vanoss) red beds. Patsy Oil and Gas Co. also produced gas from a shallower horizon in their No. 1 McNaughton at 445-55 feet and a few other wells in the NW NE sec. 6 between 400-500 feet in depth (letter from C. W. Tomlinson, 7-26-56).

Illustration: Patsy No. 1 McNaughton, C NW NE 6-3S-2W.

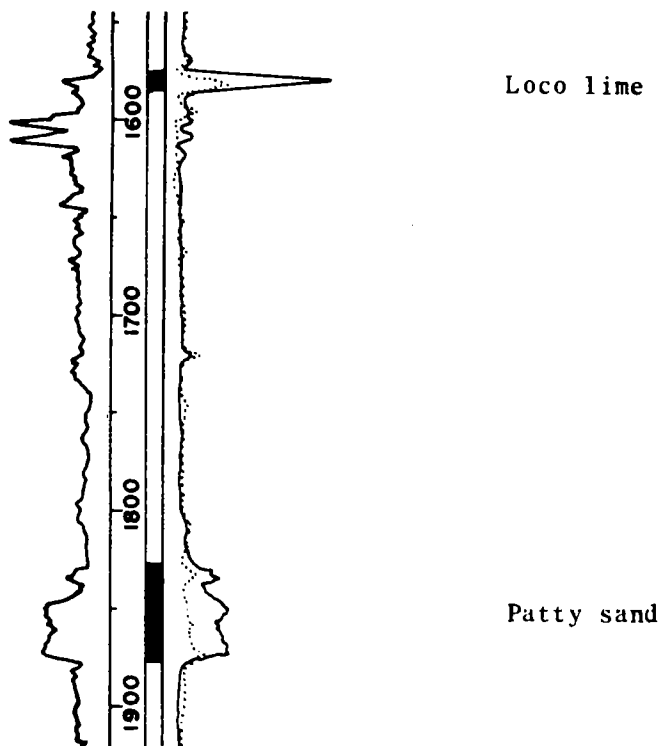


Atkinson (1952), OCGS, vol. 3, no. 3, p. 6; (1955), p. 116.

Named for Patty lease of W. H. Atkinson, SE 27-2S-6W, S Palacine field, Stephens Co.

Laminated sandstone, two beds separated by shale at places, approximately 300 feet below Loco lime. See also illustration of Muncrief sand.

Illustration: Atkinson and Harbour No. 2 Patty, NE SW SE 27-2S-6W.



*Pawhuska fm.

Virgilian

Pennsylvanian

Smith (1894), Jour. Geol., vol. 2, p. 199. Credited to H. E. Hoover's notes (as Pawhuski ls.).

Named for city of Pawhuska, Osage Co. Consisting of the following members in Oklahoma in descending order: Turkey Run ls. (called Topeka ls. in Kansas), Calhoun sh., Deer Creek ls., Tecumseh sh., and Lecompton ls. Shale names from Kansas. See Oklahoma Geology Notes (1956), vol. 16, p. 124.

Used in subsurface established by Green and Davis (1925, OGJ, vol. 24, no. 21, Oct. 15, cross-section following page 80), as Lecompton ls. member. In NW Oklahoma in use at present for limestones that range from Emporia ls. (Elmont and Reading ls.) to and including Lecompton ls.

Pawhuska sand

Pennsylvanian

Reported by Wilmarth (1938), USGS bull. 896, p. 1613 in central northern Oklahoma as "correlated with upper part of Cherokee sh."

Was used in Osage Co., equal to Prue sand (?). Also used in Oklahoma City field, reported in well from 2,950-3,034 feet, elevation 1,257 feet, 19-11N-2W.

Peach Orchard sand

Desmoinesian

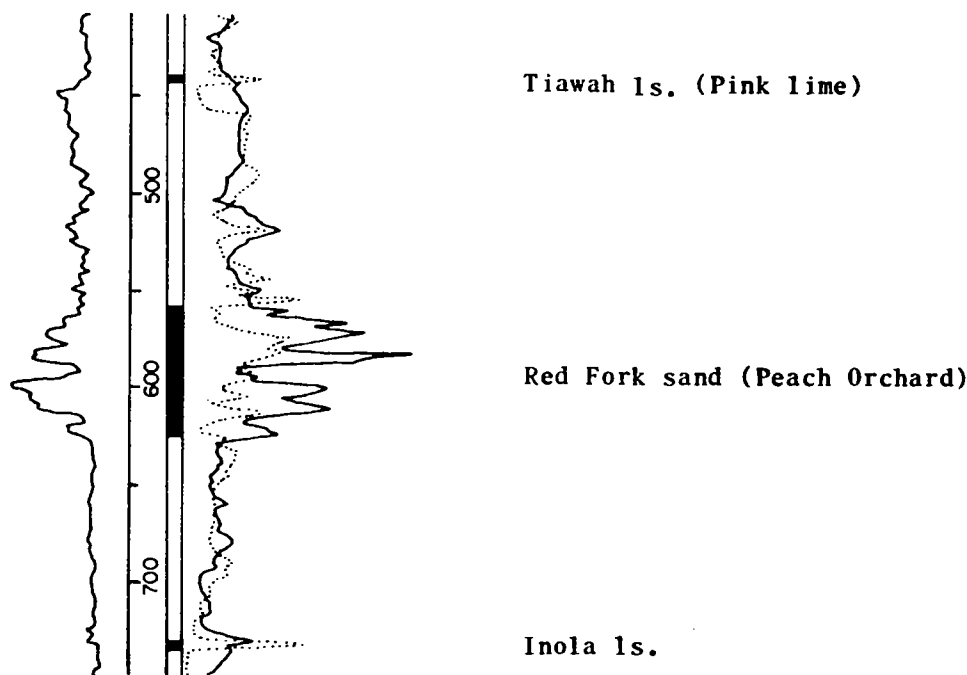
Pennsylvanian

Ref. - Logan (1957), Geol. of Okmulgee District, p. 4.

A shallow sand, which occurs from 500 to 600 feet, in the Morris and Bald Hill area, at one time called the "400 feet sand" but now being called Peach Orchard sand. Equivalent to lower Red Fork sand, below the Tiawah (Pink lime) ls. and above the Inola ls.

Logan reports that Peach Orchard sand is incorrectly placed on Plate 8. Name not needed.

Illustration: Pedco No. 1 Taft, SE SW SE 3-14N-14E.



Term used in Seminole area to distinguish black fissile shales below Cromwell sands, which flake in acid, from the underlying calcareous shale of Fayetteville fm. called Mississippi Caney (M. Hoover, 11-20-56). Considered by some to be Springeran in age, but could also be equivalent to Goddard sh. of Mississippian age. See illustration of Jefferson sand (2).

In southern Oklahoma, there is also a lithologic break between what is called Mississippian Caney (Elias, 1956, PGSO, vol. 1, p. 71) and the younger shale above, which is variously called "Goddard sh.", "Springeran sh.", or "Pennsylvanian Caney". Elias reports evidence that the younger shale (Goddard) is also Mississippian, and that the systemic boundary belongs at or near the base of the overlying Rod Club ss.

Peoples sand

Missourian

Pennsylvanian

First ref. - Fohs and Gardner (1914), Fuel Oil Jour., Aug. suppl.

Reported to be named for Peoples lease of Prairie, SW 10-25N-2W, Kay Co. This must be incorrect as it is in the area of the Thomas field, which was discovered in 1924. Fohs and Gardner refer to it as "Peoples sand of Cleveland", equal to Layton sand of Cleveland field.

Equal to Cottage Grove ss. (Osage-Layton).

Perry sand

Missourian

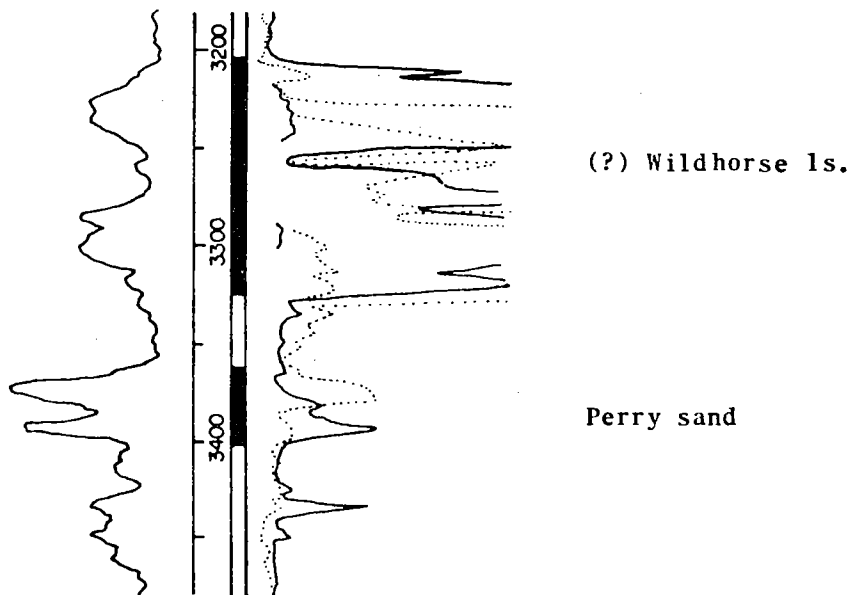
Pennsylvanian

First ref. - Lukert (1949), AAPG, vol. 33, p. 147.

Named for Perry town and field, Noble Co.

Gas-bearing sandstone in 20N and 21N-1W. Lies below some beds of highly erratic limestones which vary greatly in thickness. Some geologists believe that these limestones are equivalent to the Wildhorse ls., however, they may be a limestone development within the Wann formation. These limestones have been called erroneously "Avant" or "Avant-Dewey" by many geologists (notes from G. C. Maddox, 10-23-56).

Illustration: Summitt Drilling No. 1 Dauman, SE NW NE 32-21N-1W.



Perryman sand

Desmoinesian

Pennsylvanian

First ref. - White and Greene (1921), AAPG, vol. 5, p. 402.

Named for E. Perryman farm, N $\frac{1}{2}$ SW 14-13N-12E, Okmulgee district, Okmulgee Co.
Equal to Prue sand?

Peru sand

Desmoinesian

Pennsylvanian

First ref. - Fohs and Gardner (1914), Fuel Oil Jour., Aug. Suppl.

Named for Peru pool, Montgomery Co., Kansas.

Equal to Englevale ss. in Labette sh., below Oologah ls. and above Fort Scott.
Wayside sand of Nowata sh. called Peru in Osage Co.

Pharaoh sand

Missourian

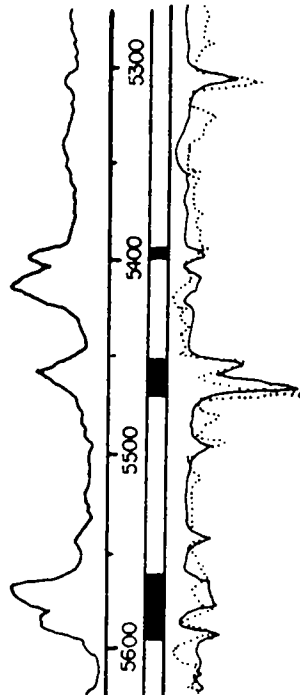
Pennsylvanian

First ref. - Swesnik (1950), AAPG, vol. 34, p. 392.

Named for Laura Pharaoh lease of Biffle et al., discovery in 1947 from 5,563-5,571 feet in No. 1 Pharaoh, NW NW NW 15-3N-2W, N Antioch field, Garvin Co.

Local sandstone in upper part of Deese group below Abernathy line, above 2nd Deese. Swesnik calls it 1st Deese. W. M. Decker reports that it is 1st Deese of the Golden Trend. Wallace correlates Pharaoh lime with 2nd Deese of Chitwood area, and Abernathy lime above with 1st Deese of Chitwood. See Abernathy lime.

Illustration: B & B Drilling No. 1 Pharaoh, NW NW NW 15-3N-2W.



Checkerboard ls.

Abernathy lime or
"2nd Checkerboard lime"

Pharaoh sand

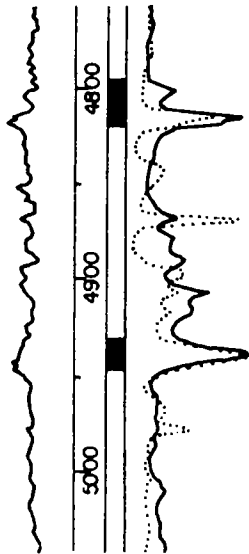
Name published by Maravich (1954), AAPG, vol. 38, p. 1124; see Norville (1956), PGSO, vol. 1, pp. 282-93.

Name from Pickens lease of Cox and Hamon, 60 acres in N $\frac{1}{2}$ 9-1S-4W, N Alma field, Stephens Co.

Lowest productive sandstone in the Deese in N Alma field, below Williams sand, produces mainly on N and E flanks of N Alma structure. Equivalent to Hefner sand of Doyle and Velma according to L. W. Curtis, (8-1955); to Lower Basal Tussy sand according to AGS (1956), Cross-section B-B'; to Morris sand of Fox-Graham area.

Productive in N Alma, Ara, Sholom Alechem and other fields.

Illustration: Crosbie, Inc. No. 1 Pickens, NW SE NE 9-1S-4W.



Carpenter (Williams, Bay) sand

Morris (Pickens, Hefner) sand

*Pinetop chert

M. Devonian

First ref. - Miser (1934), AAPG, vol. 18, p. 974.

Named for Pinetop school, 5-2N-15E, Pittsburg Co., about 20 miles due south of McAlester, Oklahoma, where approximately 50 feet of fossiliferous chert and limestone of Onondagan age are exposed. Replaced pre-empted Brushy Creek chert of Ulrich. Underlies Woodford chert in Ti-Valley-Choctaw belt in Ouachita Mts., Oklahoma.

Recognized in subsurface by Harlton (1953), AAPG, vol. 37, p. 788. Lithologic unit as encountered in Amerada No. 1 Rowland, NE NE NW 30-1S-5W, from 7,865 to 8,050 feet in W Velma field, Stephens Co., considered equivalent to lower division of Arkansas novaculite. Incorrectly spelled and placed in Upper Devonian by Harlton (1956), PGSO, vol. 1, p. 135.

Pink Crinoidal limc

Hunton group

M. ? Silurian

Reeds (1911), Amer. Jour. Sci., vol. 182, p. 260. Informal term for upper member of Chimneyhill fm. of Hunton group on surface.

Probably used first in subsurface in Oklahoma City area about 1930. Descriptive of crystalline limestone with salmon-pink crinoid stem ossicles. Marker zone in southern and central Oklahoma (notes from J. G. Newell, 12-1955).

Now named Clarita member, it underlies Henryhouse marlstone, overlies Cochrane member (formal term for "Glauconic lime").

Name has also been applied to St. Joe ls. and Viola ls.

Pink limeDesmoinesianPennsylvanian

First ref. - Fohs and Gardner (1914), Fuel Oil Jour., Aug. suppl.

Descriptive of contained pink calcite crystals. Equal to Tiawah ls., lies below Skinner sand and above Red Fork sand. Two beds at places. See illustrations of Red Fork and Skinner sands.

Name has been used for Pawnee ls. in Nowata Co. and in S Kansas.

Ponca sandVirgilianPennsylvanian

First ref. - Fohs and Gardner (1914), Fuel Oil Jour., Aug. suppl.

Named for Ponca City field, Kay Co., recorded by Fohs and Gardner at 1,550 feet. Equal to Hoover sand, or "Upper Hoover" of some.

*Pontotoc groupVirgilian-WolfcampianPennsylvanian-Permian

Morgan (1922), OGS Circ. 11, p. 4.

Named for Pontotoc Co.

Clastics derived from Arbuckle Mountains during Arbuckle orogeny. Includes locally called Stratford fm. with Hart ls. at base, and Vanoss fm. Top of varying age at different places.

Productive in structurally high positions in SC Oklahoma.

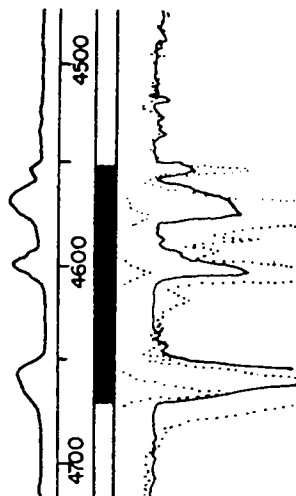
Pooler sandDesmoinesianPennsylvanian

First ref. - Hayes (1952), OCGS, vol. 3, no. 2, p. 10; (1955), p. 101.

Named for Pooler lease of Sinclair Prairie, NE 22-5N-8W, Chickasha field, Grady Co.

Upper, middle, lower Pooler at places. Lies in Deese group below Charlson sand, and above Mona sand. Shown as equivalent to Hart sand on AGS (1956), Cross-section C-C'; and Hart is shown as equivalent to Upper Tussy and Fourth Deese on Cross-section B-B'.

Illustration: Sinclair Prairie No. 6 Pooler, C SW NE 22-5N-8W.



Pooler sand

Term of oil geologists mapping surface in Lincoln Co., where bed is a good mapping horizon.

Named for city of Prague.

Sandy dolomitic ls. Is the Brownville ls. of standard terminology.

Preston sand

Atokan-Morrowan

Pennsylvanian

First ref. - Clark and Bauer (1921), AAPG, vol. 5, p. 290.

Named for Alex Preston, discoverer in Hamilton Switch field, 11-14N-12E, Okmulgee Co., in August 1909.

First and Second Preston sands at places, also called Hamilton Switch sands. Equal to Dutcher sands, in the Gilcrease sand zone. Second Preston may in some cases be equivalent to Cromwell sand.

Priddy sand

Virgilian

Pennsylvanian

Swigart (1920), USBM Rept. on Walters field, p. 2.

Named for B. F. Priddy lease of McMan Oil and Gas Co., SE 4-2S-10W, Walters field, Cotton Co.

Sandstone approximately 100 feet above Keys sand. Shown by Page (1948, World Oil, vol. 128, no. 6, p. 126) as above Megargel lime and Thomas sand. See illustration of Keys sand.

Preston-Arbuckle

Trinity

L. Cretaceous

Ref. - AIME, Statistics of Oil and Gas Dev. and Prod., 1945 (1946), p. 233.

Named after Preston anticline? Used in Enos pool, 7S-6E, Marshall Co. at 515 feet. Same as Arbuckle sand of this area. See Arbuckle sand.

**Primrose sandstone*

Morrowan

Pennsylvanian

First ref. - Roth (1928), Ec. Geol. vol. 23, p. 45, (subsurface usage).

Described by C. W. Tomlinson (1929, OGS 46, p. 19). Named for Primrose Ridge, 7-4S-2E, as a section of calcareous hard semi-crystalline thin-bedded sandstone, interrupted by numerous shale partings, 150 to 250 feet thick, from 250 to 500 feet above Lake Ardmore ss. Placed as uppermost named member in Springer fm.

Elias (1956, PGSO, vol. 1, pp. 70, 95-99) considers fossil evidence that "makes correlation of the Primrose ss. with Union Valley ss. almost certain, the possible difference in their ages being negligible."

In subsurface placed as lowermost member of Golf Course fm. of Dornick Hills group by Harlton (1956, PGSO, vol. 1 pp. 10, 138). Placed in basal Morrowan in Tatums-Tussy, N Wildcat Jim, W Velma fields, uppermost Springeran in Carter-Knox field, (1956, PGSO, pp. 10, 11, 13).

Prosperity sand

Leonardian

Permian

Named by Reeves (1922), USGS Bull. 726, p. 72.

Named for Prosperity Oil Co., No. 1 Cutshall, SE 5-5N-9W, Cement field, Caddo Co., at 2,345 feet in 1918.
100 feet below Fortuna sand.

Prue sand

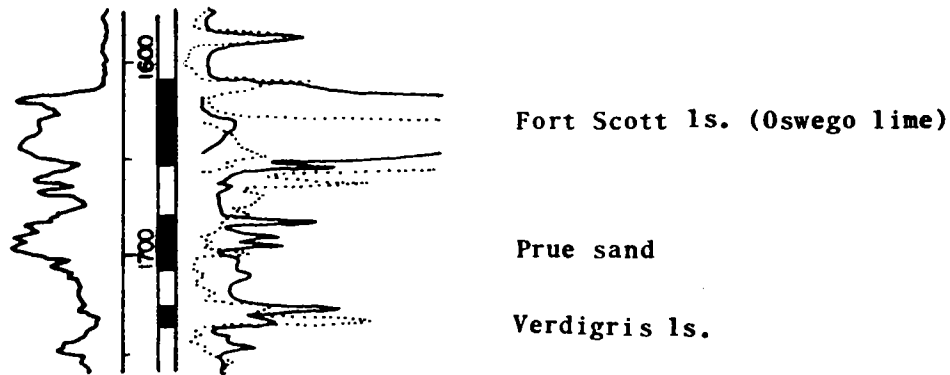
Desmoinesian

Pennsylvanian

First ref. - White and Green (1921), AAPG, vol. 5, p. 402.

Named for Prue field, 21N-10E, Osage Co.
Equal to Lagonda ss. of surface. Has been called Squirrel, Perryman, Bixler.
Lies below Fort Scott ls. (Oswego lime) above Verdigris ls.

Illustration: Devonian No. 6 Osage 30-21-10, SE SE SW 30-21N-10E.

*Pruitt sand*

Desmoinesian

Pennsylvanian

Local name for Second Tussy sand immediately below Tussy lime of N Alma field, Stephens Co. See illustration of Edwards sand (N Alma).

Pugh sand

Pennsylvanian

First ref. Snider (1920), Oil and Gas in Mid-Continent Fields, p. 237.

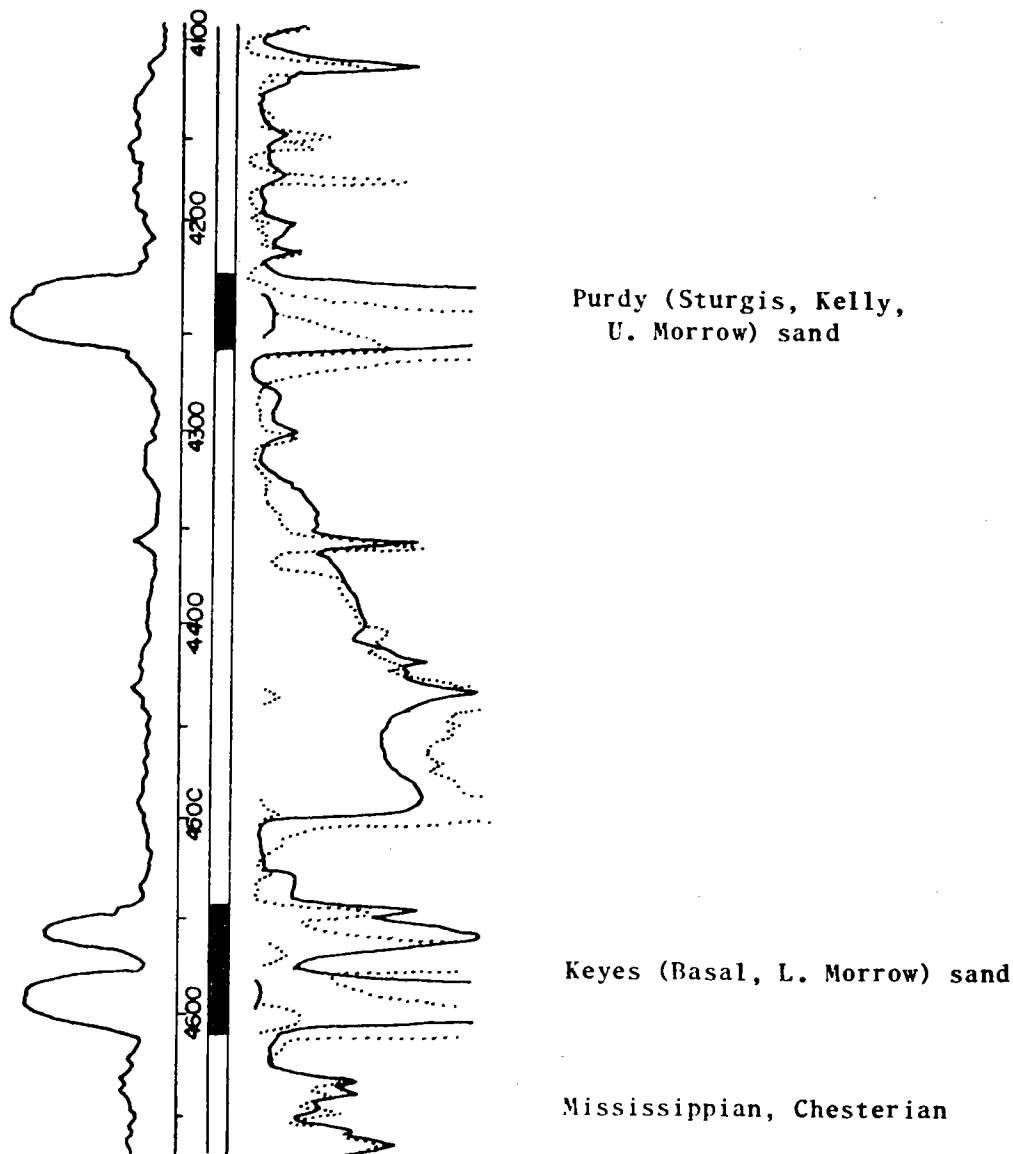
Origin of name not determined. Used in Healdton and Robberson fields.

Roth (1957), World Oil, vol. 144, no. 4, March, p. 94.

Named for Purdy lease of Coltexo Corp., 20-6N-9ECM, Keyes gas area, Cimarron Co. Same as Sturgis and Kelly sand, productive in north and east flanks of Keyes field, in E and N Sturgis area now in Keyes gas area, and NW Eva. Considered equivalent to Lips sand in Lips field, Roberts Co. Texas.

Called Upper Morrow sand by many, who consider it Morrowan in age. Roth on basis of paleontologic evidence and lithologic similarity considers it a basal Desmoinesian sand (Strawn). Purdy sand is preferred name, since the use of a time term for a pay sand should be discouraged.

Illustration: Coltexo No. 1-A Purdy, C NW SE 20-6N-9ECM.



Quinn sand

Morrowan

Pennsylvanian

Name published by Lockwood (1923), OGJ, April 16, map insert p. 16.

Named for Jeff Quinn of Haskell, discoverer of production in 13-11N-11E, about 1921, Quinn pool, Okfuskee Co.

Equal to Cromwell sand (note by D. M. Logan, 2-6-55). See Lyons and Lyons-Quinn sand.

Ragan sand

Virgilian

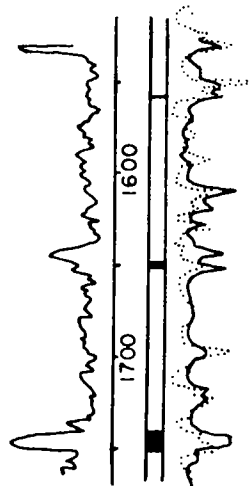
Pennsylvanian

Bullard (1928), OGS 40-Q, p. 121.

Named for Ragan lease of Twin States, discovery in SW NE NW 29-21N-1W at 1,803 to 1,811 feet, 1923, Perry district, Noble Co.

Producing horizon in Perry (shallow) approximately 90 feet below Brownville ls. Appears to be at same stratigraphic horizon as Sams sand; in basal portion of Campbell sand zone, above Crews sand zone of Garber field. See illustrations of Sams and Campbell sands.

Illustration: Allied Materials Corp. No. 2 Gillaspy, NW NW SE 29-21N-1W, extension discovery well, depth 1,740-49 feet, perforated 1,741-48, flowed 160 bbls. per day (W. M. Stirtz, 12-5-56).



Base Foraker ls.

Brownville ls.

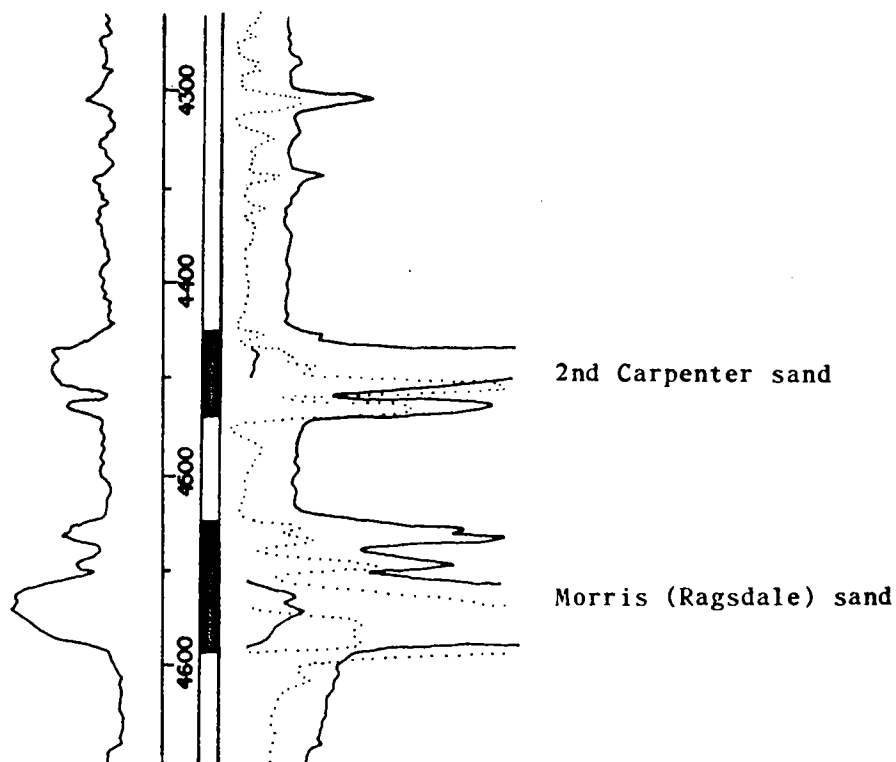
Ragan sand

Name mentioned by Shaw (1954), OCGS, vol. 5, no. 3, p. 9; (1955), p. 348.

Name from Ragsdale lease of Sohio, discovery in No. 1, NE NE NW 17-2S-3W, Camp field, Carter Co.

Below Second Carpenter or Basal Tussy sand of Parker, equal to Lower Basal Tussy sand of Parker (1956), PGSO, vol. 1, p. 179, and to Morris sand in other fields. See Morris sand of Fox-Graham field for other equivalent sand names. Also called Third Carpenter sand by some operators in Camp field.

Illustration: Sohio No. 1 Ragsdale.



Williams (1921), AAPG, vol. 5, p. 296.

Named for Ramsey pool, Washington Co.
Equal to Wayside sand.

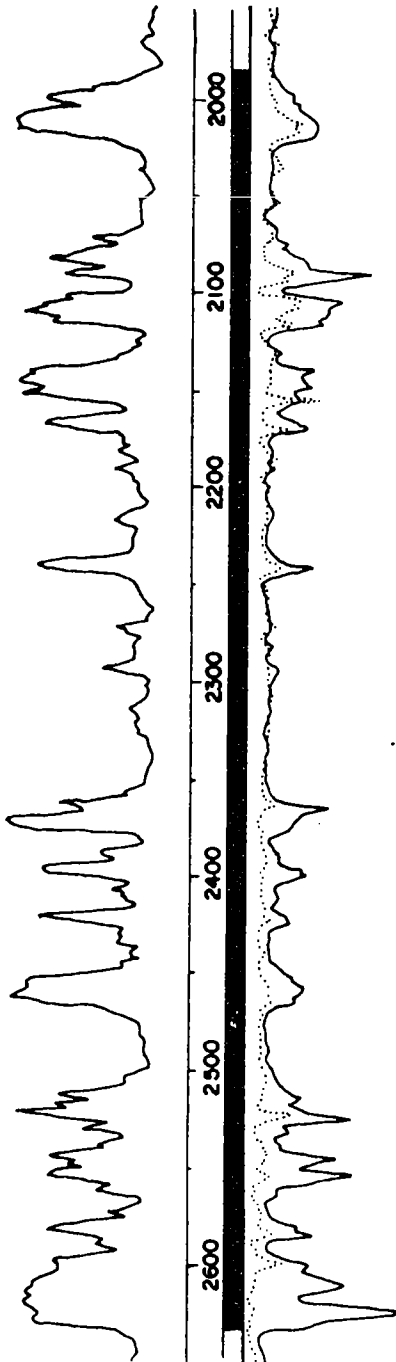
First ref. - Kirwan and Swigart (1923), USBM Eng. Rept. Chickasha gas field, p. 5.

Named for W. R. Ramsey, discoverer in 1923 in No. 1 Sanford, SE NW SE 23-5N-8W, elev. 1,163 feet, from 2,029 to 2,501 feet, Chickasha field, Grady Co.

Equal to Fortuna sand of Cement field. Below Nichlos zone, above Noble-Olson or Wallace zone in Chickasha field.

Illustrated well was claimed to be the largest gas well in the United States up to that time (1940) with calculated open flow of 300-375,000,000 cubic feet of gas from Charlson sand at 4,106-4,292 feet (note from L. V. Davis).

Illustration: Okla. Nat. Gas No. 1-B Sanford, C WL NW SW 23-5N-8W.



Ramsey sand zone

First ref. - Westheimer and Schweers (1956), PGSO, vol. 1, p. 146, fig. 2.

Sand zone below "Lower Oolitic lime", above Lone Grove sands. This "Lower Oolitic lime" is thought to be equivalent to the Natsy ls. of the surface.

Randolph sand zone

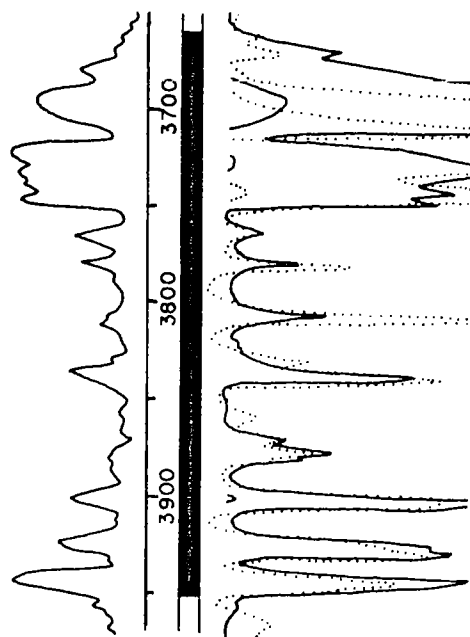
Missourian

Pennsylvanian

Named for Randolph lease of Delaney, 11-1N-1W, N Hoover field, Garvin Co.

The Randolph sand zone, directly below the Huber sands, in the No. 9 Tuley from 3,660 to 3,950 feet, was first found productive, named and classified as a common source of supply in the Delaney No. 2 Randolph, NE SE SW 11-1N-1W from 3,480 to 3,885 feet. The various sands in this interval have at times been given numbers; however, their development is so erratic laterally that this designation becomes ambiguous and therefore has not been generally accepted. The sandy zone below the Randolph has not been given any names in this local area. At the base of the Hoxbar is the "Second Checkerboard lime", 4,263 to 4,310 feet on illustrated log (note from L. D. Ford 10-4-56).

Illustration: White Eagle No. 9 Tuley, C N $\frac{1}{2}$ NE 13-1N-1W.



Randolph sand zone

*Reagan sandstone

U. Cambrian

Taff (1902), USGS, Geol. Atlas, Folio 79, p. 3.

Named for village of Reagan, Johnston Co.

Reddish to buff sandstone and quartzitic sandstone resting upon Precambrian rocks, overlain by Honey Creek fm. With Honey Creek fm. constitutes Timbered Hills group below Arbuckle group. On surface in Arbuckle and Wichita Mts., locally absent.

In subsurface used for sandstone below "Arbuckle" lime in most of Oklahoma.

*Red Eagle ls.

Wolfcampian

Permian

Heald (1916), USGS, Bull. 641, p. 24.

Named for Red Eagle School, Osage Co.

Gray to bluish silty limestone, which lies below Grenola (Neva-Burr-Sallyards) ls. and above Foraker ls. Called Cushing lime by surface parties in early mapping.

Red Fork sand

Desmoinesian

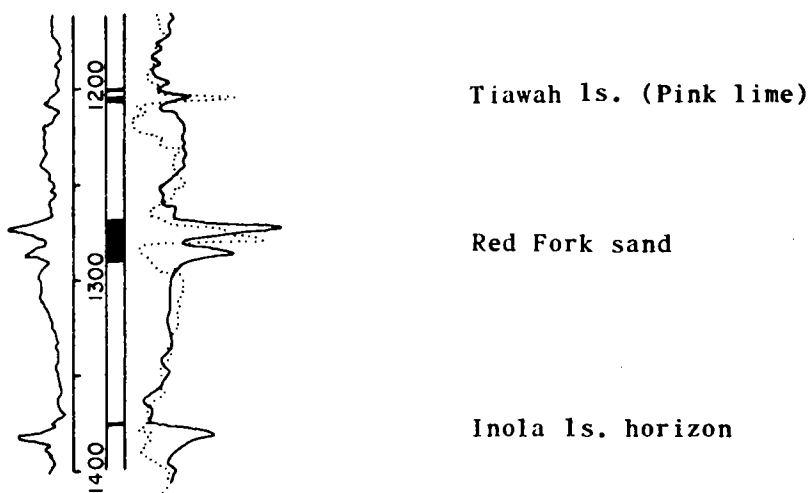
Pennsylvanian

First ref. - Hutchison (1911), OGS 2, p. 220.

Named for Red Fork field, Creek and Tulsa Cos.

Equal to Taft ss., lies in upper part of Boggy fm., below Tiawah ls. (Pink lime), above Inola ls.

Illustration: Carter No. 1 M. Big Pond, C W $\frac{1}{2}$ NW SW, 6-18N-12E, Creek Co.



Revelle sand

Pennsylvanian

Reported as producing zone in 2S-11W. National Oil obtained oil in No. 1 Revelle, SE SW 11-2S-11W, in 1920, total depth 2,023 feet, Cotton Co. This is probable source of name.

Reynolds zone

Desmoinesian

Pennsylvanian

First ref. - Krumbein (1956), AAPG, vol. 40, p. 2167.

Referred to as zone of lower Deese in West Brock area, Carter Co., "Lies unconformably on pre-Pennsylvanian rocks and is conformably overlain by higher sand units of the Lone Grove".

Rhodes sand

Atokan?

Pennsylvanian

First ref. - Smith (1914), USGS, Bull. 541, plate III.

Named for Lena D. Rhodes farm, SE NW 29-17N-12E, Glennpool field, Tulsa Co.
Equal to Dutcher sand.

Richter sand

Missourian

Pennsylvanian

Hosterman (1924), AAPG, vol. 8, p. 290.

Named for Richter lease of Amerada, discovery in No. 3, SE SE NE 35-25N-1W, between 2,811-2,860 feet, Tonkawa field, Kay Co.

Below Tonkawa sand at 2,568 feet, above Cottage Grove ss. (Osage-Layton) at 3,206 feet.

Rickets sand

Desmoinesian

Pennsylvanian

Tomlinson and Storm (1924), AAPG, vol. 8, p. 607.

Named for Rickets farm, S $\frac{1}{2}$ SW NW, 30-2S-2W, Graham field, Carter Co.

Lies above Graham sand and below Atlantic sand within "Tussy ss. zone" of Shaw (1954 OCGS, vol. 5, no. 3, p. 20). George and Bunn (1924) considered Rickets and Graham sands as identical.

The chief area of noteworthy oil production from the Rickets sand lay in sec. 30 and parts of 31-2S-2W, where it clearly developed above the main body of the Graham sand. The intervening shale section ordinarily exceeds 50 feet and the zone is readily recognizable in electric logs from end to end of Graham field in spite of relatively meager content of clean sand in most parts of the field (letter from C. W. Tomlinson, 7-26-56). See illustration of Bennett and Graham sands.

Roll sand

Leonardian

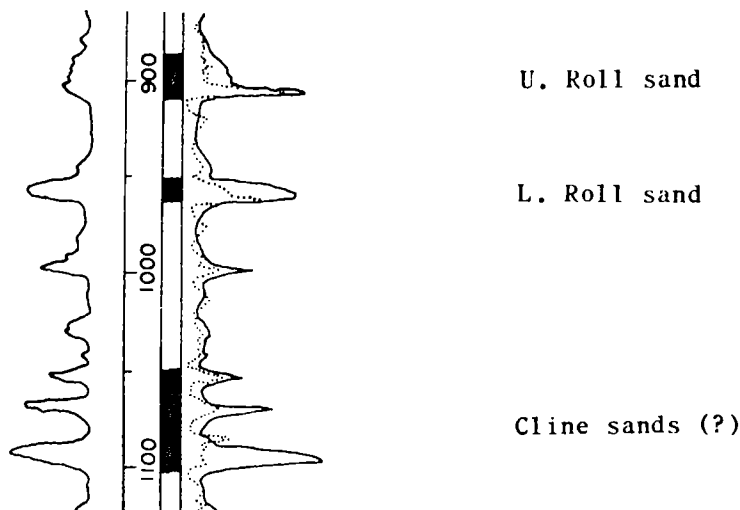
Permian

Listed by Hayes (1952), OCGS, vol. 3, no. 2, p. 7; (1955), p. 101.

Named for E. R. Roll lease of Texas, discovery in No. 1, C SE SW 5-3N-10W, Comanche Co.

Lies below Spencer sand, above Cline sand in Wellington fm. See illustrations of Spencer and Cline sands.

Illustration: Texas Co. No. 1 Roll.



Rose sand

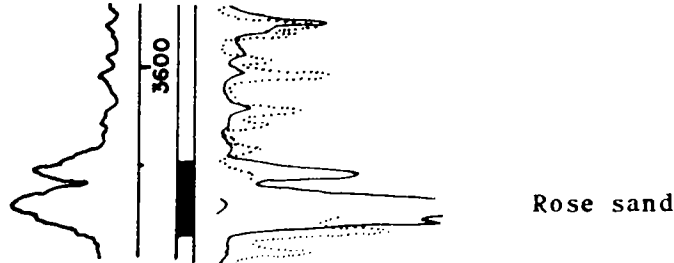
Pennsylvanian or Permian

First ref. - Maravich (1953), AAPG, vol. 37, p. 1344.

Name from G. L. Rose lease of Shell, discovery in No. 1, SE NE SW 6-1N-3W, Royal field, Garvin Co.

May be equivalent to Newberry sands of Roth (OGS 40, vol. 2, p. 150). Above detrital material which rests upon Arbuckle occurring at 3,770 feet in illustrated well.

Illustration: Shell No. 1 Rose.



Rowe lime

Virgilian

Pennsylvanian

Named for associated sand in Cement field. Equivalent to Gunsight ls., Armstrong lime (AGS, 1956, Cross-section C-C'). Brown, finely crystalline limestone marker bed above Rowe sand.

Rowe sand

Virgilian

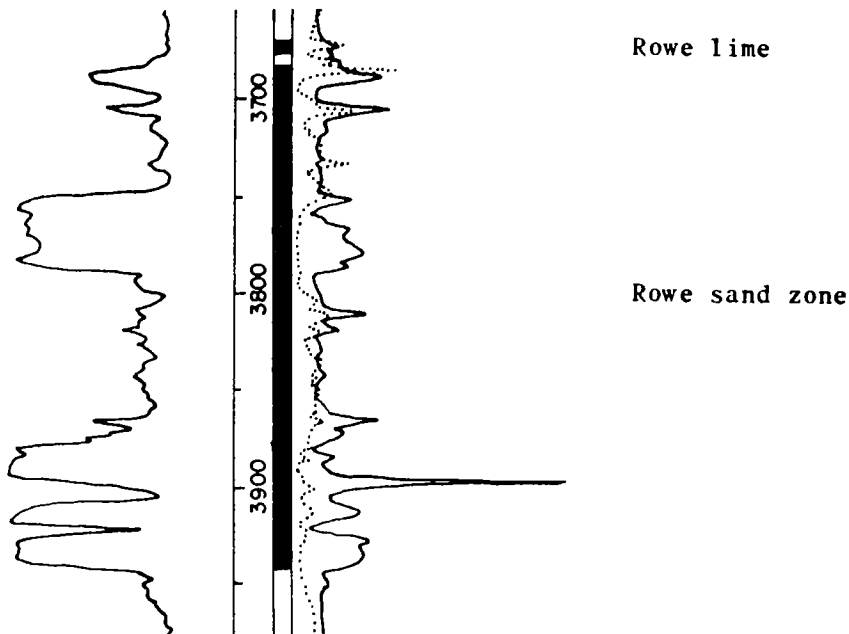
Pennsylvanian

Ingram (1941), OGJ, vol. 40, no. 9, July 10, p. 23.

Named for Ed Rowe lease of Caddo Petroleum Co., SW NE 36-6N-10W, Cement field, Caddo Co.

Zone of interbedded sandstone and shale up to 200 feet thick in Cement field. Above Niles lime, below Lower Gregory lime and Griffin sands (AGS, 1956, Cross-section C-C'). Possibly equivalent to Gunsight or Swastika sands of N Texas, Armstrong sand of N Duncan field (Putman, 1956, PGS0, vol. 1, p. 321).

Illustration: Magnolia No. 11 Medrano, SW SW SW 36-6N-10W.

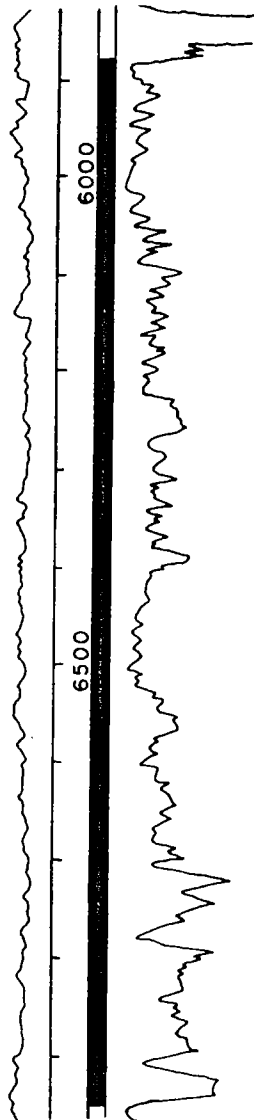


Harlton (1956), PGS0, vol. 1, p. 137, 232.

Name from Amerada No. 1 Rowland, NE NE NW 30-1S-5W, W Velma field, Stephens Co. Type locality in this well between depths of 5,878 to 6,942 feet, elev. 1,079 feet (Harlton letter, 6-25-56).

Lowest member of Golf Course fm. Described on p. 138 "in Harrisburg trough ranges from 1,030 to over 1,600 feet thick, and consists chiefly of coarsely crystalline limestone, silty, very fine sandy limestone and dark-gray to splintery shale...Though definite evidence is lacking, the Rowland is considered to be equivalent of the Primrose". In type well, the limestones are "in the main very argillaceous and commonly indistinguishable from Caney (Mississippian) sediments".

Illustration: Amerada No. 1 Rowland.



Rowland member of Golf Course fm.

Rue sand

Desmoinesian

Pennsylvanian

First ref. - Wright et al. (1957), USBM, Rept. Invest. 5326, p. 6.

Name from Rue lease of Davon, SW NE 22-1S-4W, Sho-Vel-Tum district, Stephens Co. Same as Kirk sand (U. Fusulina or U. Fusulinid sand). Below Culberson sand and above Johnson-Atlantic (Fusulina, L. Fusulina or L. Fusulinid).

Ruel Blake sand

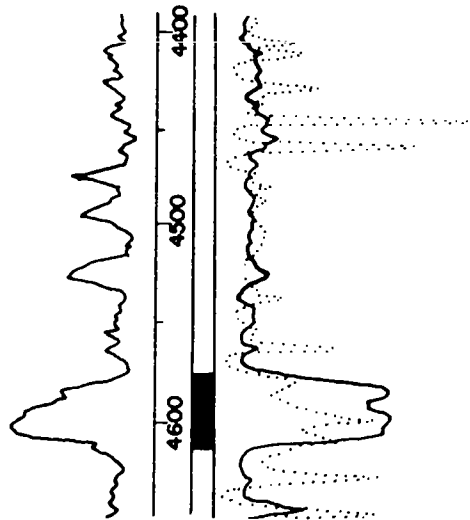
Virgilian

Pennsylvanian

First ref. - Hayes (1952), OCGS, vol. 3, no. 2, p. 7; (1955), p. 101.

Named for Ruel Blake lease of Texas, NW SE 21-2N-8W, W Marlow field, Stephens Co. Above J. N. Bateman sand.

Illustration: Texas No. 1 Ruel Blake, SW NW SE 21-2N-8W.



Ruel Blake sand

Saguyalon lime

Reported in Rogers Co., 22N-10E, 400 feet below Bartlesville sand.

Salt sand

Desmoinesian

Pennsylvanian

Term is Pennsylvanian drillers' name for brine-bearing sands in Pottsville. Used in Oklahoma since 1905.

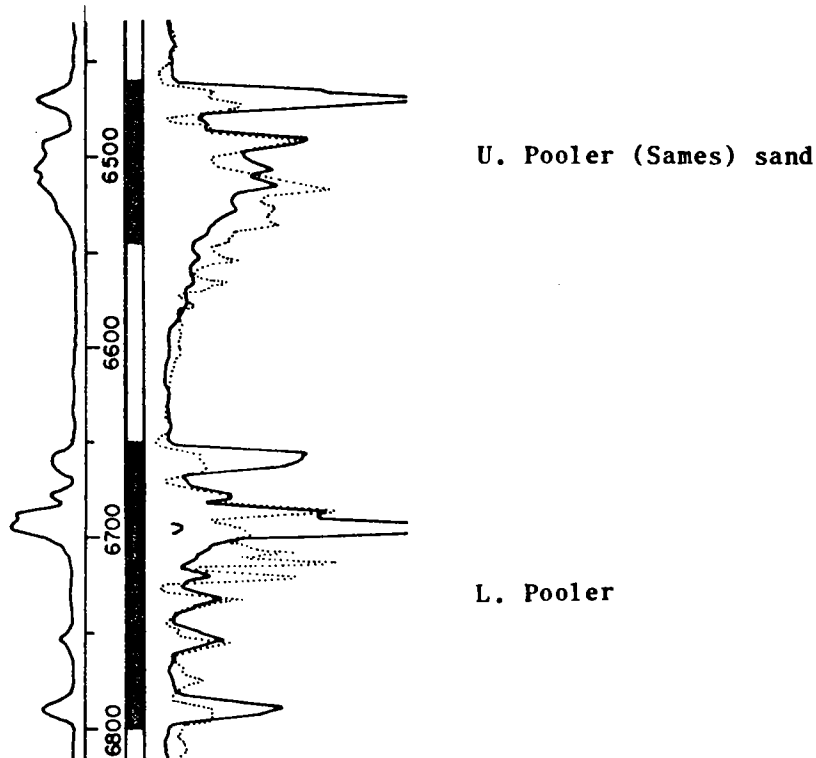
In the Okmulgee area, the term is ordinarily applied to the Bartlesville sand, especially where the term Glenn (Glen-of-Morris) sand is applied to a Gilcrease sand. In the most eastern part of the area, the term Salt sand is applied to Booch sand.

Ref. - NOSLA (1954), vol. 24, p. 523.

Named for Sames lease of Magnolia, discovery in NE 35-6N-10W, Cement field, Caddo Co. Called Sames sand on Magnolia No. 4 Sames, SW NE NE from 6,145-6,260 feet on scout ticket.

Below Charlson sand (also called Kistler), equal to upper sand of Pooler zone, preferred name (H. R. Segnar, 3-15-57).

Illustration: Magnolia No. 13 Niles, SW NW NW 36-6N-10W.

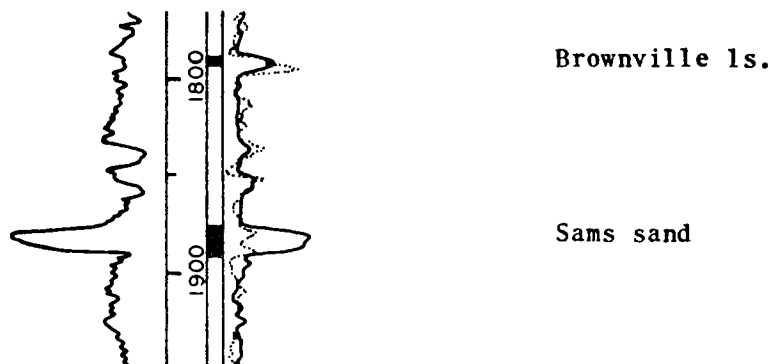


Ref. - Page (1955), OCGS, vol. 5, no. 9, p. 7; (1955), p. 450.

Named for Sams lease of Bu-Vi-Bar, discovery in SW SW SW 15-21N-2W at 1,930-1,934 feet in 1925, Sams field, Noble Co.

White, calcareous sandstone approximately 90 feet below Brownville ls., equal to Ragan sand (21N-1W), in lower part of same stratigraphic interval as Campbell sand zone of Garber field. Ragan is earlier and preferred name.

Illustration: Clark and Cowden No. B-1 Sams, NW SE SW 15-21N-2W.



Santa Fe sand

Permian?

First ref. - Wright, et al. (1957), USBM, Rept. Invest. 5326, p. 36.

Reference is made to productive formation in well at 652-705 feet, elev. 1,135, 27-1S-5W, Velma field, Stephens Co.

Sapulpa sand

Simpson group

M. Ordovician

First ref. - Snider (1913), Petr. and Nat. Gas in Okla., p. 108.

Named for city of Sapulpa.

Name used interchangeably with Mounds from 1908 until the name Wilcox superseded it.

School Land sand (Cement field)

Missourian

Pennsylvanian

Listed by Hayes (1952), OCGS, vol. 3, no. 2, p. 10; (1955), p. 101, 104.

Named for School Land lease of W. R. Ramsey, Cement field, Caddo Co.

Equal to Hedlund sand according to Hayes. See discussion of Hedlund, could be equivalent of Hedlund or Medrano (Frank Worrell, 3-27-57).

School Land sand (Fort Sill field)

Leonardian

Permian

Listed by Hayes (1952), OCGS, vol. 3, no. 2, p. 710; (1955), p. 101.

Hayes listed School Land "C" and School Land "D" or Spencer sand in Wichita fm. apparently in Fort Sill field. One of many lensing sands.

School Land sand (Chickasha field)

Leonardian

Permian

Named for School Land lease of Ohio Fuel Co., SW SW NW 36-5N-8W, Chickasha field, Grady Co., completed in 1923, total depth of 1,484 feet.

Probably equivalent of Nichlos sand of Chickasha field.

School Land sand (Oklahoma City field)

Simpson group

M. Ordovician

First ref. - McGee and Clawson (1923), AAPG, vol. 16, p. 973.

Named for School Land lease of Sinclair, 36-11N-3W, Oklahoma City field, Oklahoma Co.

Above Hammer-Haindl sand; sandstone in McLish fm.

Scott sand

Atokan?

Pennsylvanian

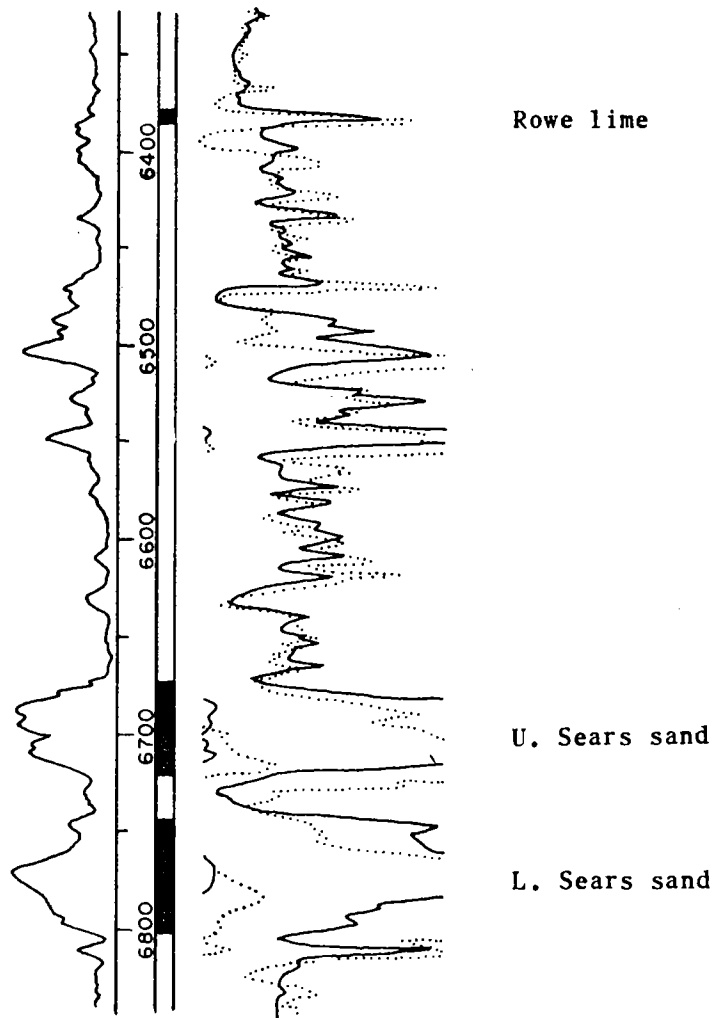
Named for Scott pool, near Kellyville, Creek Co.
Considered to be equivalent of Dutcher sand.

First ref. - Hayes (1952), OCGS, vol. 3, no. 2, p. 7; (1955), p. 101.

Named for Rosa Sears lease of Texas, discovery in No. 1, SW NE NE 20-2N-8W, W Marlow field, Stephens Co.

According to Hayes the Sears sands lie below "Canyon" lime in upper part of Hoxbar group. This was an early interpretation which is now considered incorrect. Present correlation shown on AGS (1956), Cross-section D-D', places the Sears sands equivalent to part of the Rowe sands of Virgilian age, below the Rowe lime and above what is considered Niles sand. Olson sand locally developed just above U. Sears sand.

Illustration: Texas No. 2 Sears, NE NW NE 20-2N-8W.

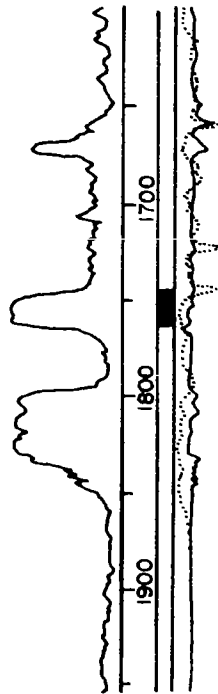


Seay sandMissourianPennsylvanian

First ref. - Maravich (1952), AAPG, vol. 36, p. 1109.

Named for W. D. Seay "B" lease of Dudley et al., SE SE SW 20-6S-5W, 1951 discovery of Woodrow field, Jefferson Co. Top of oil pay at 1,746 feet, total depth 1,747 feet.

Illustration: Gorman No. 1-D Seay, NW NW SE 20-6S-5W, dry test.



Seay sand

Second Oolitic lime

See Oolitic lime under 5 and 6.

Second Wilcox sand

See Bromide fm., Simpson group, and Seminole sand.

Section Two sand

Whiteside (1936), TGS, p. 2.

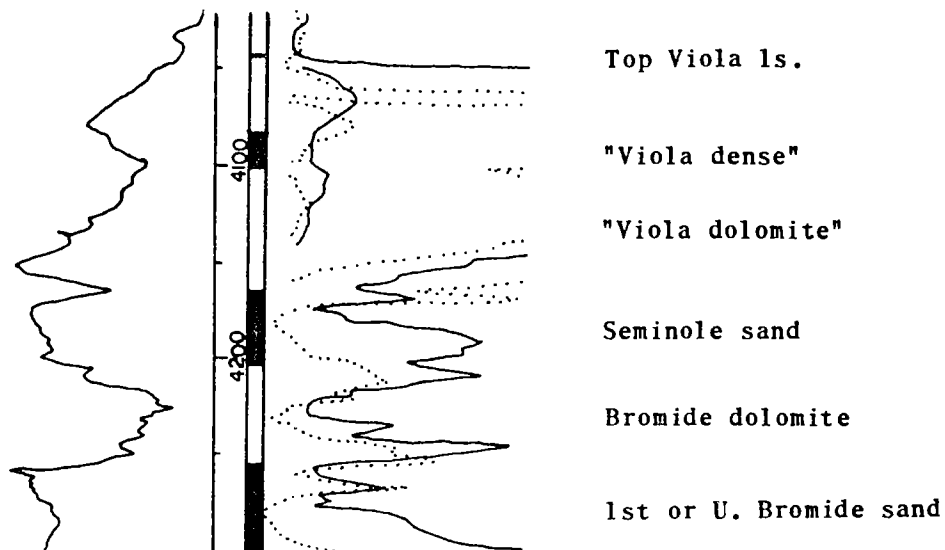
First ref. - Levorsen (1928), OGS 40-BB, p. 25; OGS 40, vol. III, 307.

Named for Seminole oil field and city. First production discovered in Seminole sand in Amerada No. 1 James NW NE SE 24-9N-6E, Seminole field, Seminole Co.

Consists of up to 55 feet of sandstone in the Viola. Equal to "Seminole Wilcox" or "First Wilcox" of Seminole area, not "First Wilcox" of Bromide fm.

Name conflicts with Seminole ss., early Missourian of E Oklahoma, but term is preferable to "First Wilcox". First or upper Bromide sand, called "First Wilcox" in C Oklahoma, is called Second Wilcox in this area. See discussion under Wilcox and Simpson.

Illustration: Atmar Drlg. No. 1 Robinson, NE SW SW 6-8N-6E.



First ref. - Dott (1944), NOSLA, vol. 14, p. 446.

Mayes fm. as identified in Seminole area.
Equal to Sycamore ls. See Ada Mayes.

A ferruginous unnamed limestone in middle part of Senora fm. below the Allen sand and above the Skinner sand in Hughes Co., mapped on surface in NE Hughes Co. May be McNabb ls. of surface in Wagoner and Rogers Cos. See Allen sand illustration.

Used in Okmulgee and other areas. Means any sand development in the Senora fm.

Gouin (1926), OGS 40-E, p. 28.

Named for Shelton lease, W $\frac{1}{2}$ SE 32-1S-8W, Empire field, Stephens Co.

Pay at average depth of 1,900 feet. Lies 100 feet below Cantrell sand, 100 feet above Smith sand of Empire. One of the many lensing sands below Pontotoc group in rocks of Virgilian (U. Cisco) age (D. M. Putman, 7-1956).

Sholom Alechem lime

Missourian

Pennsylvanian

Cloud (1930), OGS 40-MM, p. 8; 40, vol. II, p. 326-7, used in discussion of Cotton Co. subsurface.

Name from Sholom Alechem field, Stephens-Carter Cos.
Equal to County Line lime as used in Sholom Alechem field.

Sholom Alechem sand zone

Desmoinesian

Pennsylvanian

Billingsley (1956), PGSO, vol. 1, p. 305.

Name from Sholom Alechem field, Stephens-Carter Cos.
Sholom Alechem sand zone was the term used in the field for all the sands which produced through some 1,500 feet of perforated liner which was set below casing. This interval included at least the Kirk (U. Fusulina) and Johnson-Atlantic (Fusulina, L. Fusulina) sands and probably some lower sands (A. M. Meyers, 11-28-56). See illustrations of sands mentioned above.

Sikes sand

Morrowan

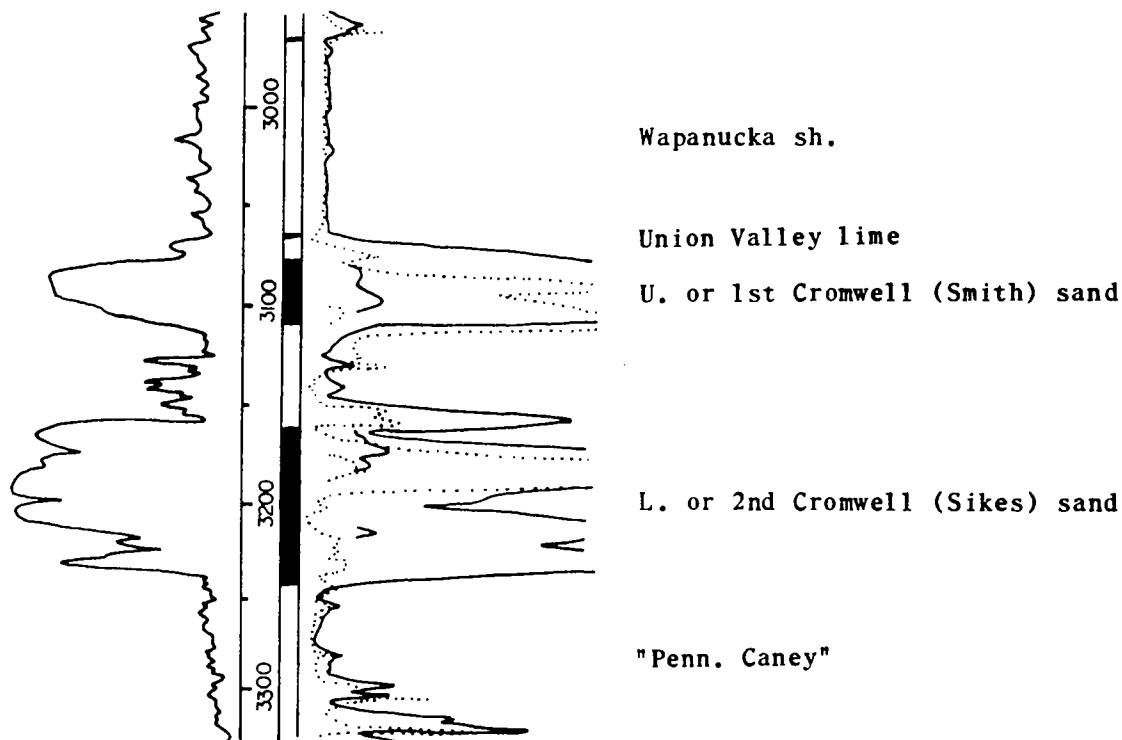
Pennsylvanian

Lockwood (1925), OGI, April 10, map insert p. 16, also p. 85 and 90, as Sykes sand.

Named for Louis Sikes, operator, who discovered production in Sikes and Boggs No. 1 Casey, NE SE NE 31-8N-8E, at 3,183 feet, Wewoka field, Seminole Co.

Sandstone below First Cromwell (Smith) sand, equal to Lower or Second Cromwell sand (notes from L. M. Wilshire, 1955).

Illustration: Nye No. 1 Jones, C S $\frac{1}{2}$ SE NW 32-8N-8E.



Siliceous lime

Canadian

Ordovician

First ref. - Aurin (1920), AAPG, vol. 4, p. 177.

Descriptive of cherty limestone.

Name used in Kansas and N Oklahoma for eroded upper part of Arbuckle group equal to W Spring Creek fm. Productive in scattered areas.

Simons sand

See Black and Simons sand.

Simpson Dense

Ordovician

Descriptive of dense limestone. Same as Bromide Dense, a better term.

Simpson Dolomite

Ordovician

Descriptive of dolomitic limestone. Same as Bromide Dolomite, a better term. Equivalent to Marshall zone.

Taff (1902), USGS, Geol. Atlas, Folio 70, p. 3 as Simpson fm.

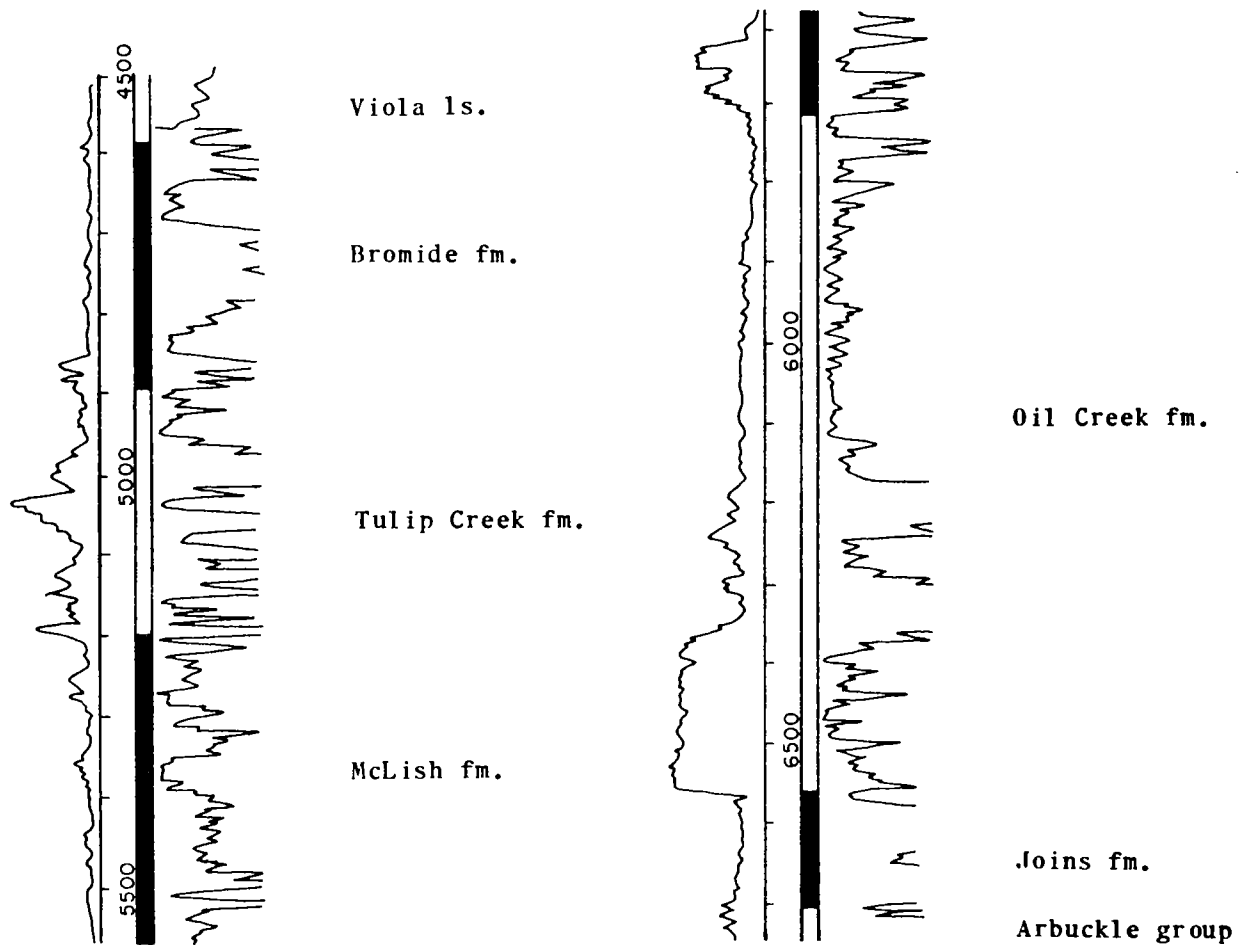
Named for the former hamlet of Simpson, 12-1S-7E, Pontotoc Co.

Consists of following formations in descending order: Bromide, Tulip Creek, McLish, Oil Creek and Joins.

Names used in subsurface. See illustration of Bromide sands and Cronenwett (1956), OCGS, vol. 7, no. 2, p. 8. Also contains subsurface names termed Wilcox sand, Lowery sand, Johnson sand, Golf Ball zone. Formational names can be used effectually at most places; for instance McLish sand in place of Mollman sand.

Harris (1957, OGS 75, p. 94) has recently established the Corbin Ranch fm. (equivalent to Bromide Dense of the subsurface), separating this unit from the Bromide fm. on the basis of Ostracods, disconformable relationship, and significant erosional hiatus with underlying Bromide Pooleville and overlying Viola ls. See illustration of Bromide sands or zones.

Illustration: Pure No. 3 Stewart-103, NW SE NE 28-5S-7E.



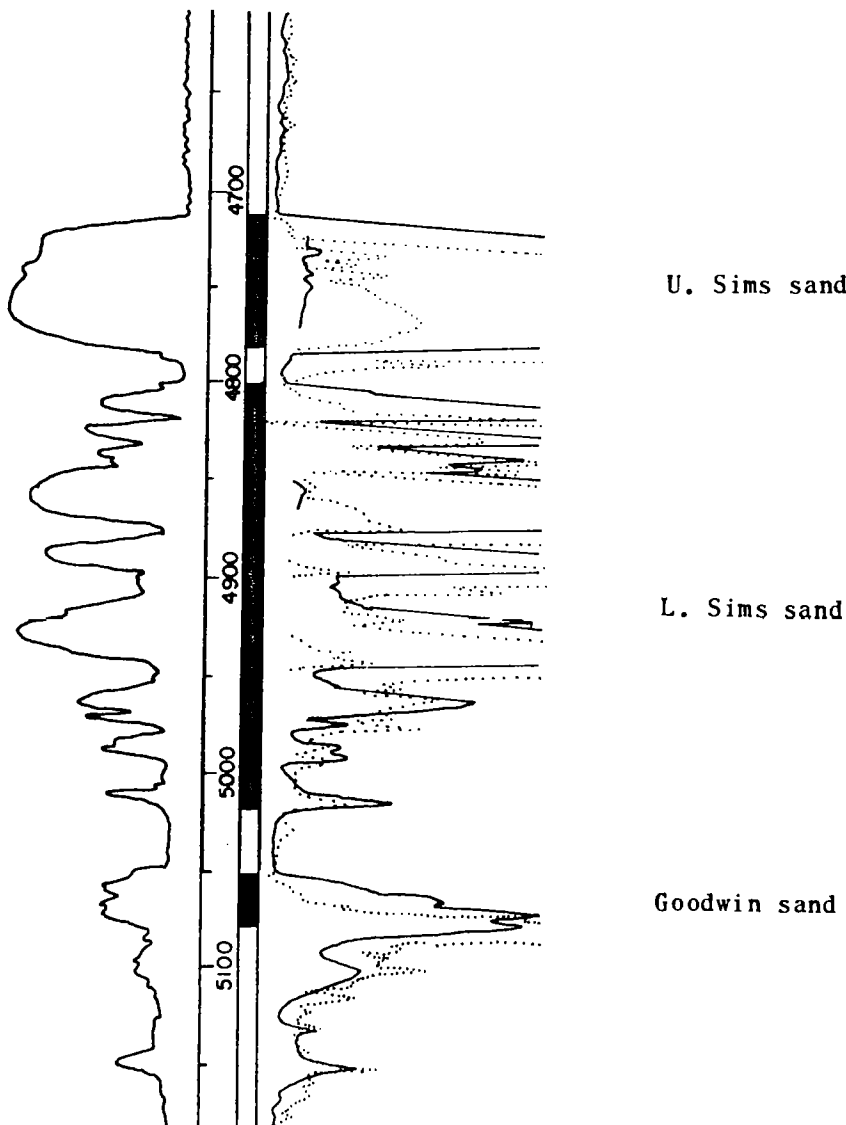
Ref. - Billingsley in Selk (1951), AAPG, vol. 35, p. 594, fig. 9, as Simms. Name published on OCGS (1952), stratigraphic Cross-section 1-1 showing Atlantic No. 7 Markham, NE SE NW 1-1S-4W, Stephens Co., near type locality; Rutledge (1953), Petrol. Eng., vol. 25, no. 13, p. B-41.

Named for Sims lease of Stanolind, discovery in No. 1, NE NE SE 2-1S-4W, Sholom Alechem field, Stephens Co. Misspelled Simms, Symmes.

Sandstone zone below Humphreys sand, above Goodwin sand, also called Fourth Springer sand in Sholom Alechem field. Many geologists separate zone into Upper or First Sims, 4,710-4,790 feet, development of which is erratic in some areas; Lower or Second Sims, 4,800-5,020 feet, more continuous and present over a larger area. Top of Lower Sims is good mappable unit in Springer. An identifiable feature of the Sims in samples is the presence of oolites, typical being small, dark-colored, many poorly developed, normally found in thin limestone beds within the Lower Sims zone (note from R. L. Beasley, 11-1956). May be equal to Rod Club ss. member of Springer fm. (1956, PGSO, vol. 1, p. 180). A. P. Benison made a tentative correlation of the Rod Club ss. with Velma, Sims and Cunningham sands. Westheimer (*op. cit.*, p. 396) suggests that Sims sands may correlate with upper part of Goddard fm.

Productive in Camp, Velma, N Alma, Sholom Alechem, Tatums, Tussy, Fox, Doyle and other fields.

Illustration: Stanolind No. 1 Sims.



Skinner sand

Desmoinesian

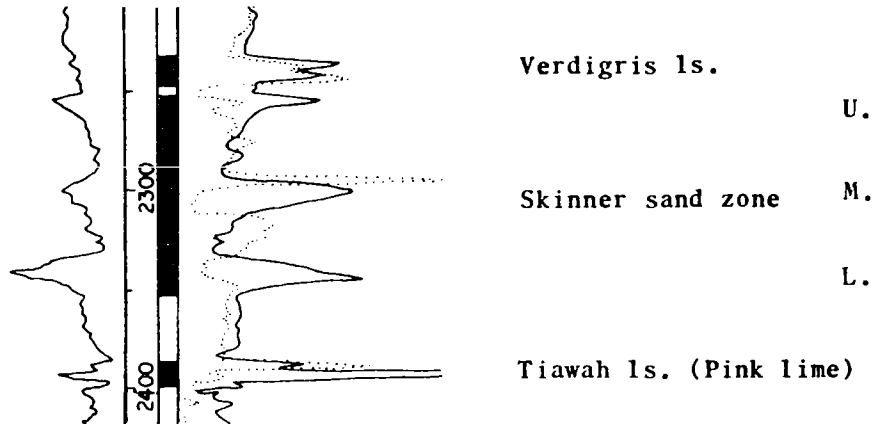
Pennsylvanian

Wood (1913), USGS Bull. 531, p. 43.

Name from Skinner lease of Prairie, SW 10-20N-8E, Lauderdale field, Pawnee Co. (E. Bloesch, 1-1956); sand at 2,290 to 2,309 feet in No. 4, N $\frac{1}{2}$ NE SW (J. Newby, 1955).

The type Skinner is considered equal to Chelsea ss. of surface and is called L. Skinner by some. Skinner sand zone in this area occupies the interval between the Verdigris ls., and the Tiawah ls. (Pink lime), and is divided into U., M. and L. Skinner sands as illustrated. The L. Skinner or Skinner sand is most commonly developed member in this area.

Illustration: Johnson-Clark No. 1-A McArthur NE NW SW 10-20N-8E.

**Sledge conglomerate**

Desmoinesian

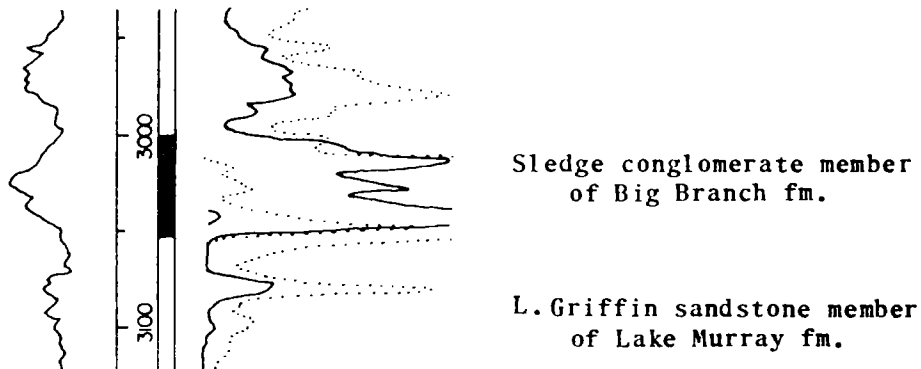
Pennsylvanian

First ref. - Harlton (1956), PGSO, vol. 1, p. 142, 224.

Named by Harlton from Amerada No. 11 Sledge, NE NE SE 19-1S-5W, type locality, from 3,000 to 3,053 feet, elev. 1,033 feet, W Velma field, Stephens Co. (note from Harlton, (6-25-56), as a member of Big Branch fm. in Dornick Hills group.

Basal Desmoinesian sediment composed of pebbles ranging in age from upper Arbuckle (Ordovician) through basal Mississippian, thickness 10 to 50 feet in W Velma field. Type locality illustrated on p. 229, fig. 6 showing Sledge conglomerate unconformably resting upon Griffin ss. (middle member) of Lake Murray fm. In Deep Rock No. 1 Massie, NW NW NW 31-1S-5W, "1,100 feet of pre-Tussy deposits were penetrated, consisting almost entirely of massive cherty dolomite and limestone conglomerate. These beds are designated Sledge conglomerate at the W Velma field where they attain a thickness of only 10 to 50 feet. Above the Big Branch fm. in the Deep Rock test are 1,700 feet of younger pre-Tussy sediments. These probably are assignable to the Deese and consist of cherty dolomite conglomerate, limestone conglomerate, shales and fine arkosic sediments. These deposits are absent at the W Velma field."

Illustration: Amerada No. 11 Sledge, type locality.



Gouin (1926), OGS 40-E, p. 28; 40, vol. II, p. 42.

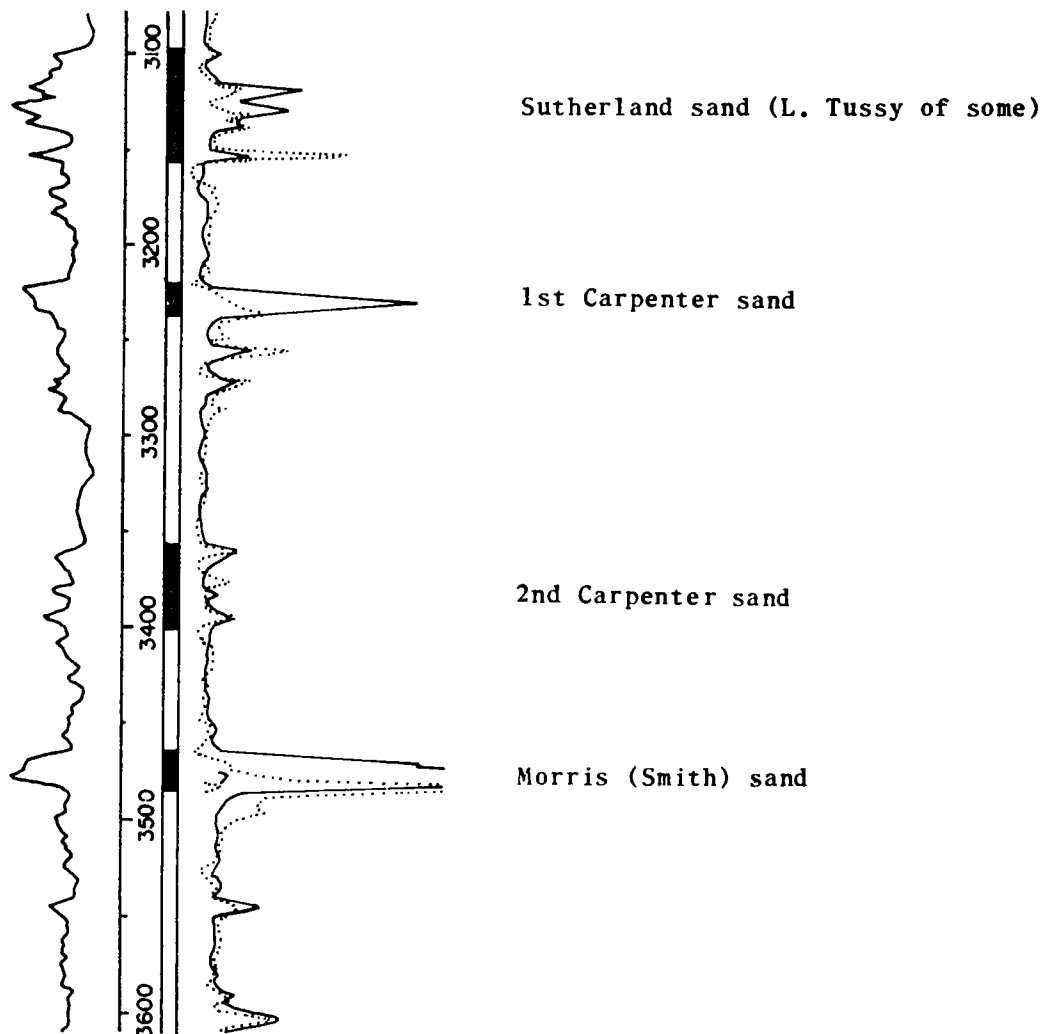
Named for Smith lease of Crump et al., SW NE 32-1S-8W, Empire field, Stephens Co. Top of pay at average depth of 2,000 feet, 100 feet below Shelton sand and 100 feet above Brown sand. One of lensing sands below Pontotoc group in rocks of Virgilian age (D. M. Putman, 7-56).

Tomlinson and Storm (1924), AAPG, vol. 8, p. 610.

Named for C. R. Smith, discoverer in Healdton Petroleum Co. and C. R. Smith No. 3 Moyer, NW NW SE 31-2S-2W, Graham field, Carter Co.

This sand is most certainly the sand now termed Morris (L. Basal Tussy of Parker) as shown by electric log of a later twin well, Continental No. 1 Moyer (C. W. Tomlinson, 7-26-56). Name should remain unused. See Morris sand.

Illustration: Continental No. 1 Moyer, NW NW SE 31-2S-2W.



Smith sand (Wewoka field)MorrowanPennsylvanian

First ref. - Lockwood (1925), OGJ, April 16, map insert p. 161, also p. 85 and 90.

Named for R. H. Smith, discoverer in NW SW NW 33-8N-8E, Wewoka field, Seminole Co., at 3,132 feet, March 1923.

Equal to First Cromwell, first sand below Union Valley lime in Wewoka field. See illustration of Sikes sand.

Soldier Creek sandVirgilianPennsylvanian

Name used in Soldier Creek field, Cotton Co.
Apparently same pay horizon as Cache Creek sand zone.

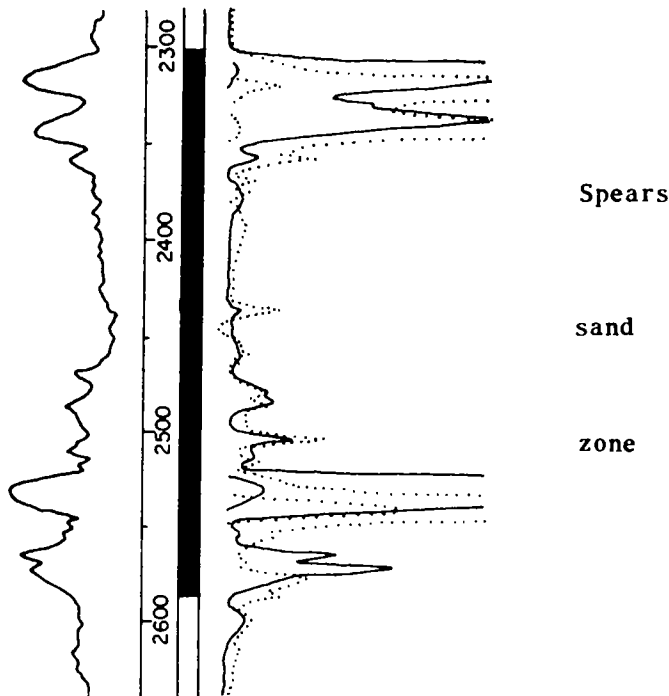
Spears sandMissourianPennsylvanian

First ref. - Rutledge (1956), PGSO, vol. 1, p. 11.

Named for Spears ranch in 1S-5W, Velma field, Stephens Co.

In Hoxbar group about 500 feet above County Line lime, a sandstone zone with three or four pays depending on structure and lenticular sandstone development (note from Rutledge, 7-1956). Suggest that this name be used locally only as it will be confused with similarly pronounced Spiers sand.

Illustration: Texas Co. No. 7 Spears, NE SE SE 3-1S-5W.

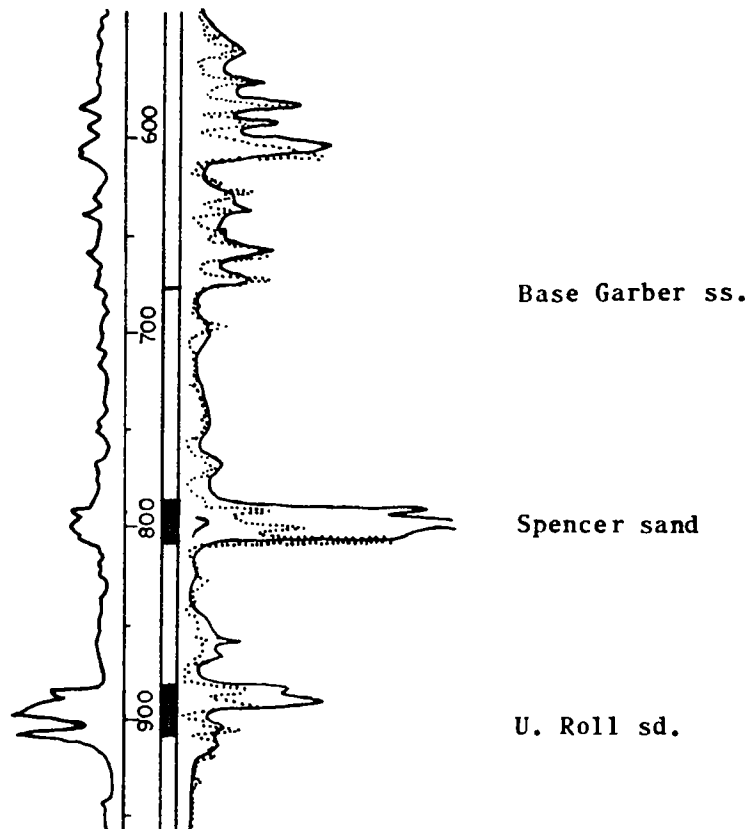


First ref. - Hayes (1952), OCGS, vol. 3, no. 2, p. 7; (1955), p. 101.

Named for Mary E. Spencer lease of Texas, discovery in No. 1, C NW NW 8-3N-10W, Fort Sill field, Comanche Co.

Lenticular sandstone in Wellington fm. above Roll sand, below Fort Sill sand, same as School Land "D" sand. Fort Sill sand in illustrated well is from 470-515 feet and was called Lawton sand by Hayes.

Illustration: Texas No. 1 Spencer, NW NW 8-3N-10W.



Named by Hicks (1956), PGS0, vol. 1, p. 343.

Designated limestone 10 feet below Teter conglomerate in Wewoka fm., Pauls Valley field, Garvin Co. Dark argillaceous sandy limestone with white siliceous spicules, approximately 20 feet thick. See illustration of Wimberly sand.

Spiers sand

Springeran

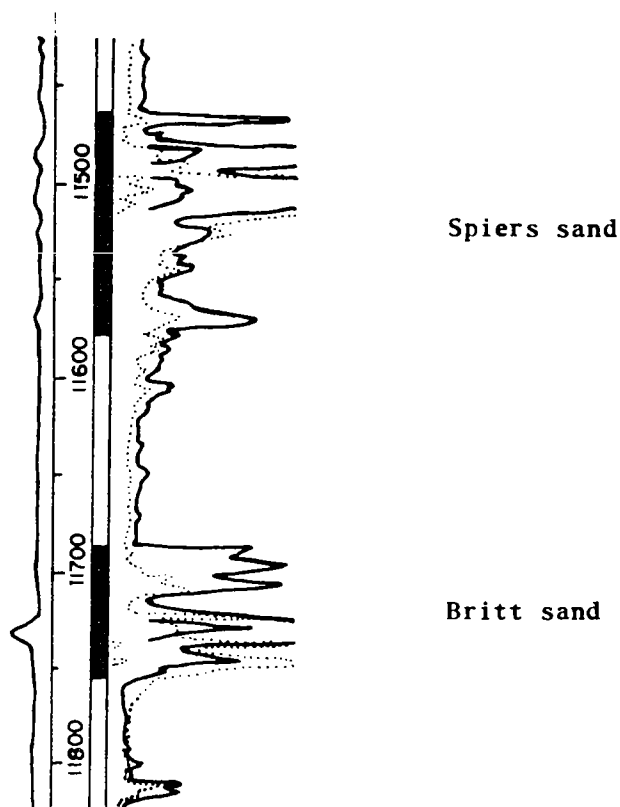
Pennsylvanian

Wallace (1954), OCGS, vol. 4, no. 7, p. 10; (1955), p. 245.

Named for Spiers lease of Magnolia, discovery in No. 1, C SW SW 28-5N-6W, productive from 11,722 to 11,735 feet, Chitwood field, Grady Co.

Equal to Third Springer sand in Chitwood area, below Britt sand and above Boatwright sand.

Illustration: Magnolia No. 1 Spiers, C SW SW 28-5N-6W.

***Spiro sandstone**

Desmoinesian

Pennsylvanian

Wilson (1935), AAPG, vol. 19, p. 503-520.

Defined as a member of the Savanna fm. Lies approximately 50 feet above Keota ss. mem. of Savanna fm. and 60 feet below Cavanal coal in Muskogee-Porum area. Caps ridge in secs. 13 and 14, 9N-25E, just north and northeast of Spiro, LeFlore Co.

This surface name has been dropped by Oklahoma Geological Survey. Type locality is in Lequire ss.

Spiro sand

Atokan

Pennsylvanian

Maravich (1955), AAPG, vol. 39, p. 899.

Named after town of Spiro, LeFlore Co.

Name has been in use for many years for gas-producing sandstone at or near the base of the Atoka, above Morrowan rocks. Some geologists use this name for any basal Atokan ss. in eastern and southeastern Oklahoma.

Goldston (1922), AAPG, vol. 6, p. 7.

Named for town of Springer, Carter Co. Considered basal member of Glenn fm., 4,000-6,000 feet thick resting unconformably upon Caney sh. and underlying Otterville ls. member.

Redefined in 1929 by Tomlinson (OGS 46), underlying Joliff member of Dornick Hills fm. and overlying Caney sh., 3,000 to 3,500 feet thick, its basal member named as Rod Club ss.

The Editorial Committee of "Petroleum Geology of Southern Oklahoma", AAPG, vol. 1, p. 4, raised the Springer to group rank, redefined it as including rocks below the Primrose ss., and above Caney sh. (restricted), dividing the group into an unnamed upper formation including Lake Ardmore ss., Overbrook ss. and Club ss. members, and a lower Goddard fm.

Squaw sandAtokan?Pennsylvanian

First ref. - Snider (1913), Petr. and Nat. Gas in Okla. p. 108.

Equal to Dutcher sand.

Squirrel sandDesmoinesianPennsylvanian

First ref. - Shannon and Trout (1915), OGS 19, p. 84.

Named for Linnie Squirrel farm, NW 7-26N-14E, Bartlesville field, Washington Co.

Equal to Lagonda ss. (Prue sand of subsurface). Incorrectly applied in other area to different sands. Now being incorrectly applied in Creek Co. to sand just above Glenn-Bartlesville sand, considered to be equivalent of a lower Red Fork sand.

Stalnaker sandVirgilianPennsylvanian

First ref. - Greene and Aurin (1925), OGJ, Oct. 16.

Named for Stalnaker farm, gas discovery in NW NW SE 11-35S-2E, at 2,380-97 feet, April 20, 1914, State Line field, Sumner Co., Kansas

Equal to Tonkawa sand, N Oklahoma.

Stamper zoneOrdovician

McGee and Clawson (1932), AAPG, vol. 16, p. 975.

Named for Stamper lease of Sinclair, S $\frac{1}{2}$ NW 30-11N-2W, Oklahoma City field, Oklahoma Co.

In Joins fm., below Kinter sand.

Still sand

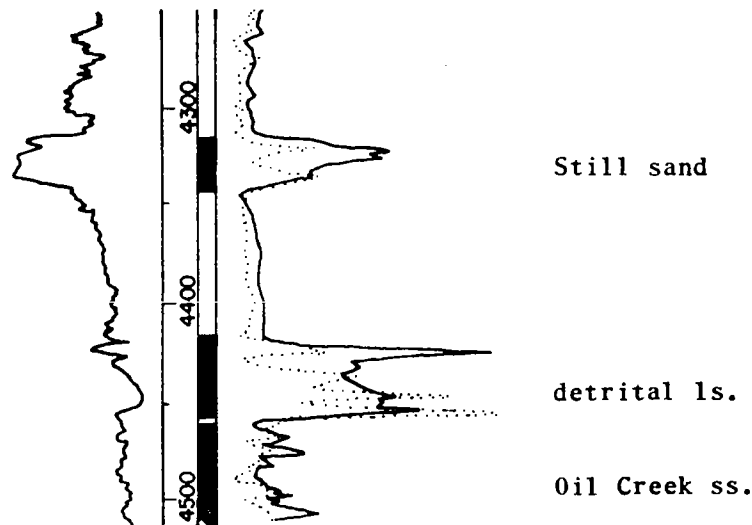
Desmoinesian

Pennsylvanian

Westheimer and Schweers (1956), PGSO, vol. 1, p. 148, fig. 3.

Named for A. H. Still lease of Stanolind, No. 1 in NW NE SW 14-5S-1W, SW Lone Grove (Hewitt) field, Carter Co.
In Deese group below Lone Grove sands.

Illustration: Stanolind No. 1 Still.



Sturgis sand

Morrowan?

Pennsylvanian

Reported to be same sand as that called Purdy or U. Morrow in Keyes and Sturgis field area of Cimarron Co. See illustration of Purdy sand, earlier name.

Surber sand

Virgilian

Pennsylvanian

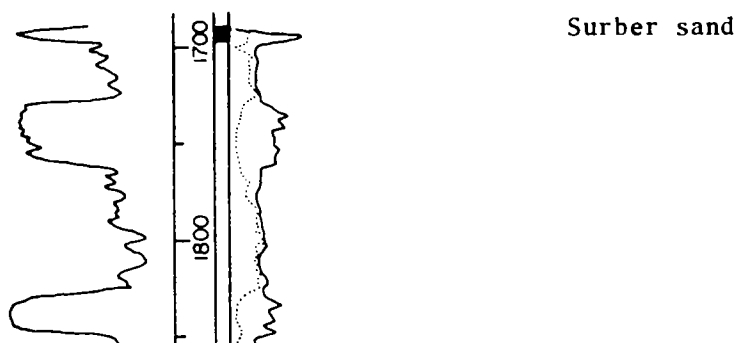
First ref. - Gouin (1926), OGS 40-E, p. 40; OGS 40, vol. 2, p. 40.

Named for O. B. Surber lease of Empire, discovery in No. 1, SW SW SW 33-1S-8W, March 1920, Empire field, Stephens Co.

Below Nigh sand, above Cantrell sand, both of which are lensing and may or may not be present. Conglomeratic sand at base of Pontotoc (D. M. Putman, 7-1956).

Illustration shows Surber sand, casing set at 1,691 feet in original discovery well, drilled deeper in 1941.

Illustration: Cities Service No. 1 Surber, SW SW SW 33-1S-8W.

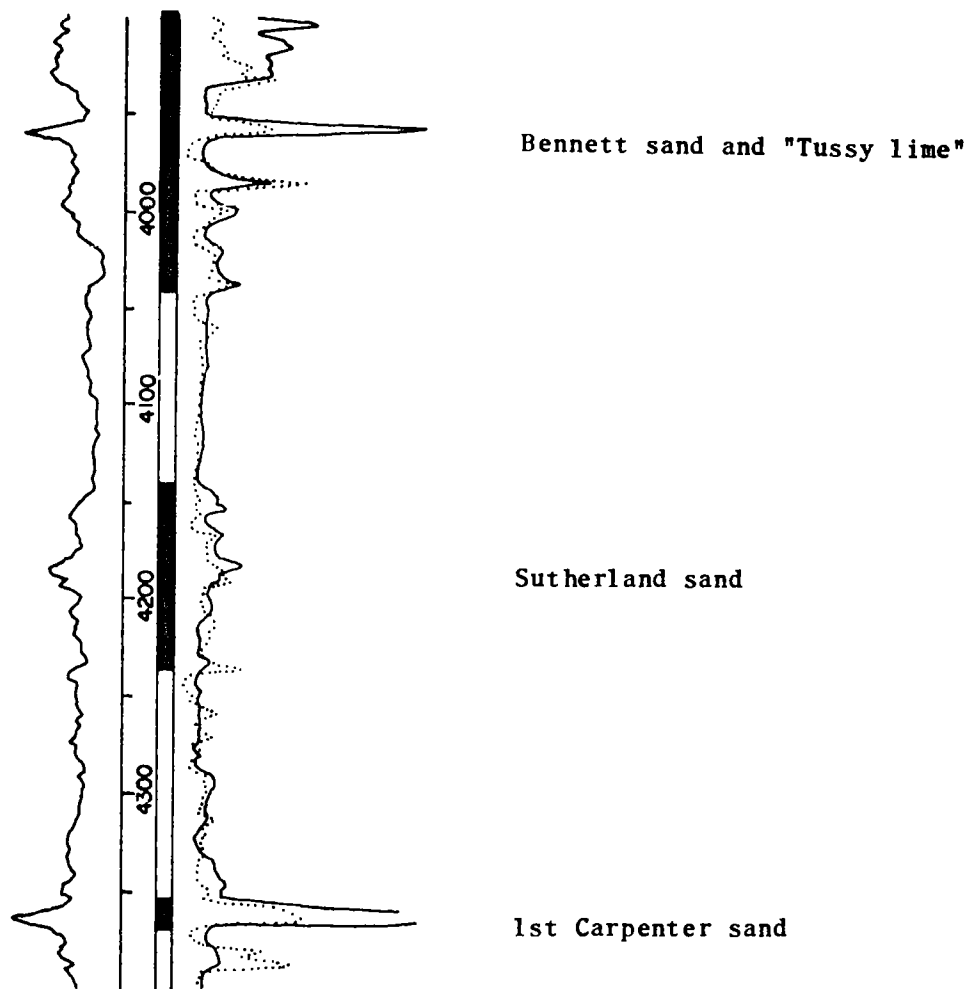


Tomlinson and Storm (1924), AAPG, vol. 8, p. 609.

Named for Sutherland Petroleum Co., discoverer on Poland et al. farm NW 5-3S-2W, Graham field, Carter Co.

George and Bunn included this sand in their "Lower Graham", and most subsurface geologists now probably include it in the lower part of the "Tussy zone". Nevertheless, it is readily distinguishable throughout most of the Graham field, and is separated from the Bennett sand above by a shale section from 50 to 100 feet in thickness. Like the Bennett zone, it normally comprises several thin sands, each 5 feet or less in thickness, scattered through 50 to 75 feet of section. It is absent in a considerable area around the northwest corner of 25-2S-3W, but reappears throughout the central and southeastern portions of the field (letter from C. W. Tomlinson, 7-26-56). See also illustrations of Bennett and Smith sands.

Illustration: Seaboard No. 1 Roberts, NE SE NW 5-3S-2W.



First ref. - Lockwood (1925), OGJ, April 16, map insert p. 16.

Named for Swaggert lease of Western States, SE SE 15-27N-3W, Deer Creek field, Grant Co.

Equal to Tonkawa sand.

Swenson sand

First ref. - Aurin (1917), OGS 19, pt. 2, p. 268.

Named for Gus Swenson well drilled by Jones and Buell in NE NE 32-29N-1E, Blackwell area of Aurin, Kay Co. Oil discovery reported with initial production of 600 bbls. per day from a sand at depth of 3,365-85 feet, gas from 3,355-65 feet according to driller's log.

Equal to Misener or Wilcox sand.

*Sycamore limestone

Meramecian

Mississippian

Taff (1903), USGS Tishomingo folio, no. 98.

Named for Sycamore Creek, 3S-4E, Johnston Co.

Described as "dense, even-textured bluish limestone, which weathers to yellowish hues and is hard and tough". Cooper (1926, OGS, Circ. 9, p. 16) reports that the limestone, appearing quite pure on casual examination, contains almost forty-five per cent quartz and clay.

Overlies Woodford sh. and underlies Caney sh.

Sykes sand

Morrowan

Pennsylvanian

Misspelling of Sikes sand.

Taneha sand

Desmoinesian

Pennsylvanian

First ref. - Snider (1913), Petr. and Nat. Gas in Okla., p. 108.

Named for village of Taneha, Tulsa Co.

Equal to Booch sand (Warner ss.).

Tatums sand

Desmoinesian

Pennsylvanian

Grimes (1935), AAPG, vol. 19, p. 407.

Named for village of Tatums and Tatums field, Carter Co.

Discovery in 1927 by Magnolia Petr. in 14-1S-3W, at 2,400 feet, Carter Co.
A local Deese sand.

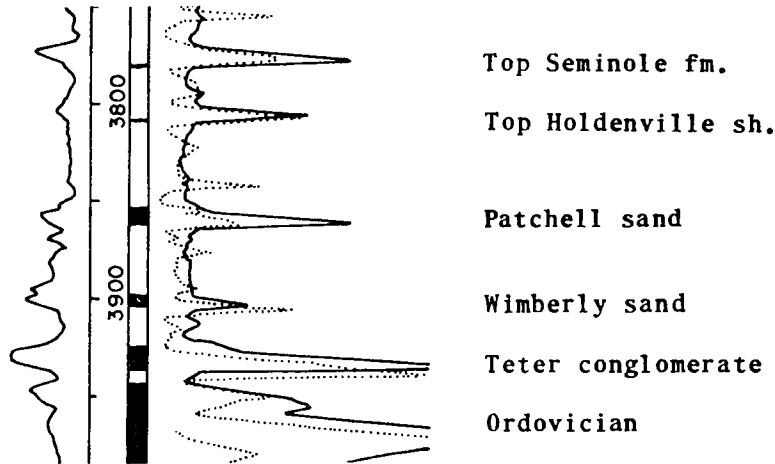
Taylor sand

Reported, but no data.

Hicks (1956), PGSO, vol. 1, p. 343.

Named for Teter lease of Pure, 31-4N-1E, Pauls Valley field, Garvin Co. Uppermost bed of Wewoka fm., 0-70 feet thick, an erratic zone of green shales, cherty conglomerate, rounded limestone pebbles, and rounded frosted quartz grains. Teter conglomerate rests upon 10 feet of dark gray micaceous shale which overlies the "Spicular ls." "Spicular ls." absent in illustrated well. See Cashion, Patchell and Wimberly sands.

Illustration: Pure No. 8 Teter, SE NE NW 31-4N-1E.

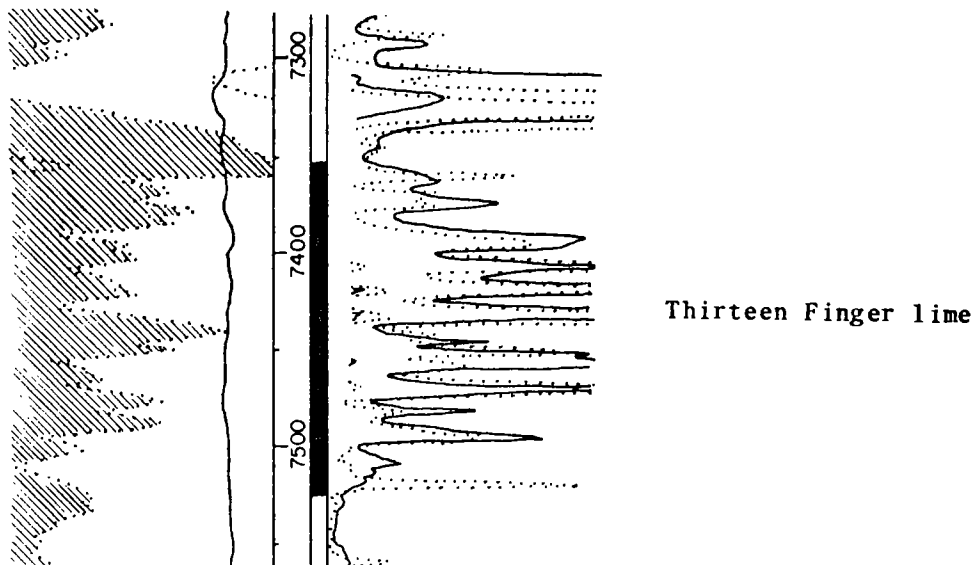


Name descriptive of appearance of electric log curves.

Name credited to G. L. Meholin, Amarillo, and so-named because it has 13 fingers of resistivity on electric log.

Commonly used in Texas and Oklahoma Panhandle portions of Anadarko basin. Considered by most to be in Atoka fm. although others (Meholin, Hollingsworth, Roth) place it in Cherokee group, Desmoinesian in age. It is reported that Desmoinesian fusulinids have been found in the Thirteen Finger lime.

Illustration: Gulf No. 1 Stump, Sec. 12, Blk. 4T-T. & N. O. Survey, Ochiltree Co., Texas, designated as type locality by Meholin.



Thomas sand (North Duncan field)

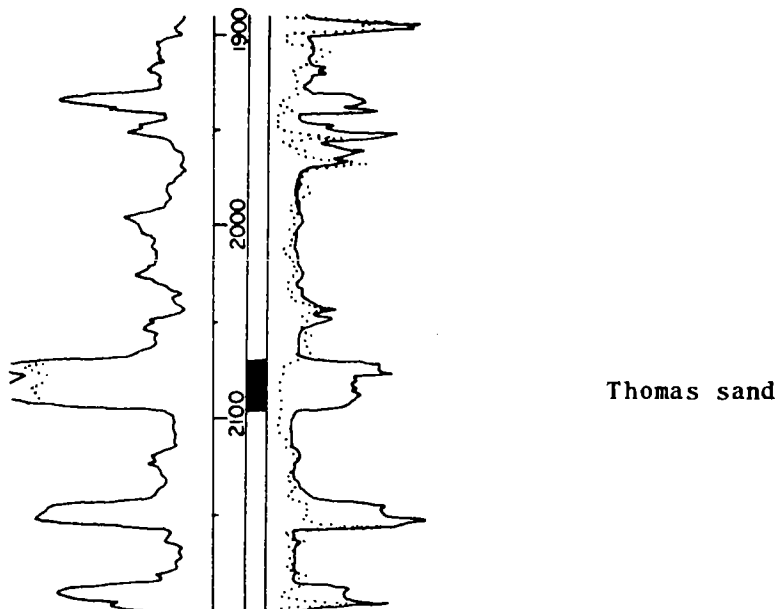
Virgilian

Pennsylvanian

Gouin (1956), OGS 40-E, p. 36; 40, vol. 2, p. 50.

Named for Thomas lease of Magnolia, SE SE 25-1N-9W, N Duncan field, Cotton Co. According to Gouin, first main producing sand, probably stratigraphic equivalent to Brown sand of Empire field. This correlation is questionable due to the lensing character of the sands. It is quite doubtful that this is the same sand named "Thomas" in SW Randlett field (D. M. Putman, 1956).

Illustration: Pat Drilling Co. No. 1 Thomas, SW NW SE 25-1N-9W.



Thomas sand (SW Randlett field)

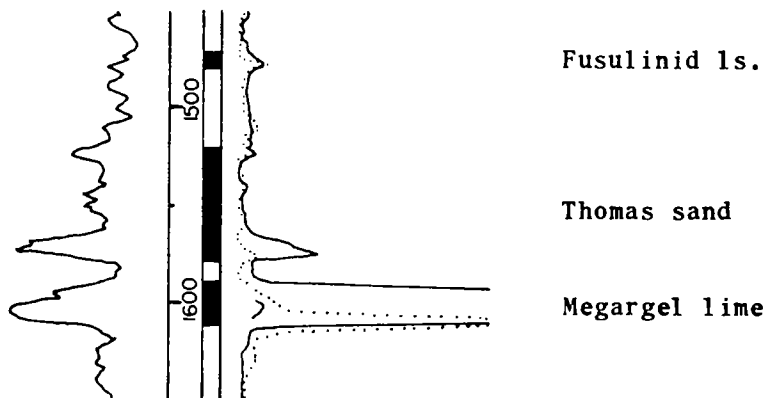
Virgilian

Pennsylvanian

First ref. - Pate (1948), World Oil, vol. 128, no. 6, p. 126; Cipriani (1956), PGSO, vol. 1, p. 312.

Main pay horizon in SW Randlett field, Cotton Co. One to two lenticular sandstones about 50 feet below a "Fusulinid ls." (Triticites spp. cf. L. Deer Creek fauna) and above Megargel lime.

Illustration: Broday, Wiley and Norwood No. 1 Moore, SW NW NW 6-5S-12W.

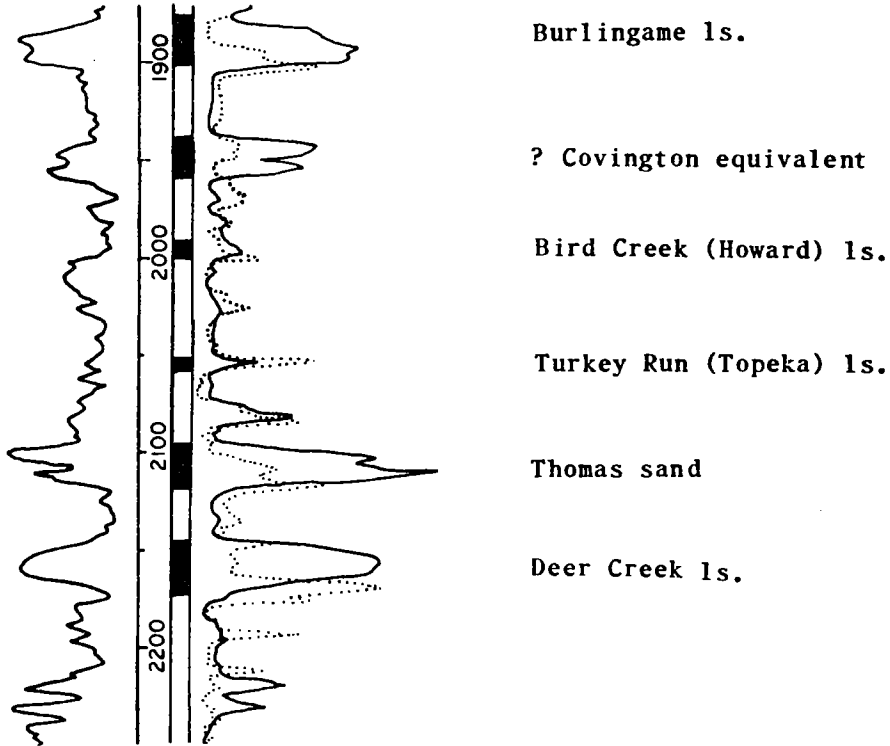


First ref. - Clark (1926), AAPG, vol. 10, p. 644.

Named for A. M. Thomas lease of Marland, W $\frac{1}{2}$ SW 15-25N-2W, discovery of Thomas field in 1924, Kay Co.

Below Bird Creek (Howard) ls., and above "Pawhuska" lime of Clark equivalent to Deer Creek ls.

Illustration: Central Oil No. 1-C Turk, SE NW NE 21-25N-2W.



First ref. - Wright et al. (1957), USBM Rept. Invest. 5,326, p. 36.

Reference is made to pay sand in W Rabbit Creek and SW Randlett fields, Cotton Co. It is virtually certain that this is the Thomas sand, and has been miscalled.

Timber Ridge sand

Atokan

Pennsylvanian

Bullard (1928), OGS 40-Q, p. 159.

Named for Timber Ridge pool, sec. 11-13, 14N-17E, Muskogee Co.

Reported by Bullard as below Muskogee sand, at average depth of 1,540-60 feet. Equivalent to Atokan Dutcher sands, in Gilcrease sand zone.

Equal to Coody (Coata) ss. mem. of Atoka fm. according to Wilson (1935), AAPG, vol. 19, p. 504.

Todd sand

Missourian

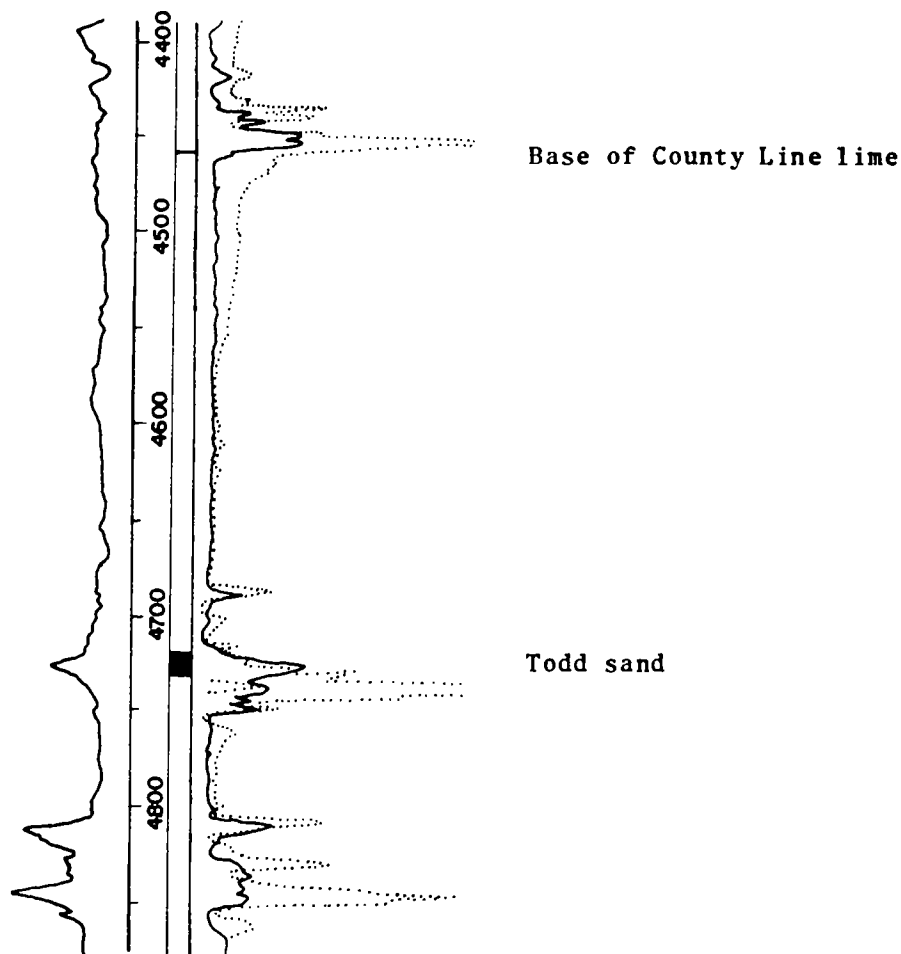
Pennsylvanian

Pate (1953), OCGS, vol. 4, no. 3, p. 10; (1955), p. 217.

Named for Todd lease of Dick Wegener, SE 1-3N-6W, Carter-Knox field, Grady Co.

In the basal part of Hoxbar group in the area, calcareous sandstone which attains a maximum thickness of 180 feet in Texas No. 1 Chapman, NE SE SE 26-4N-6W. It is possible that the entire interval from 4,720 to 4,850 feet is called the Todd sand in illustrated well.

Illustration: Wegener No. 1 Todd, SW SE SE 1-3N-6W.



First ref. - Charles (1930), AAPG, vol. 14, p. 1520.

The name "Tonkawa limes" was used and has been shown to be misapplied to the Oread ls. below the Tonkawa sands in the Oklahoma City field in the above reference. The term was originally applied in the Tonkawa field in Kay Co.

Name used for Haskell ls. in Kay Co. subsurface, a limestone just above the Tonkawa sand.

Tonkawa sand

Virgilian

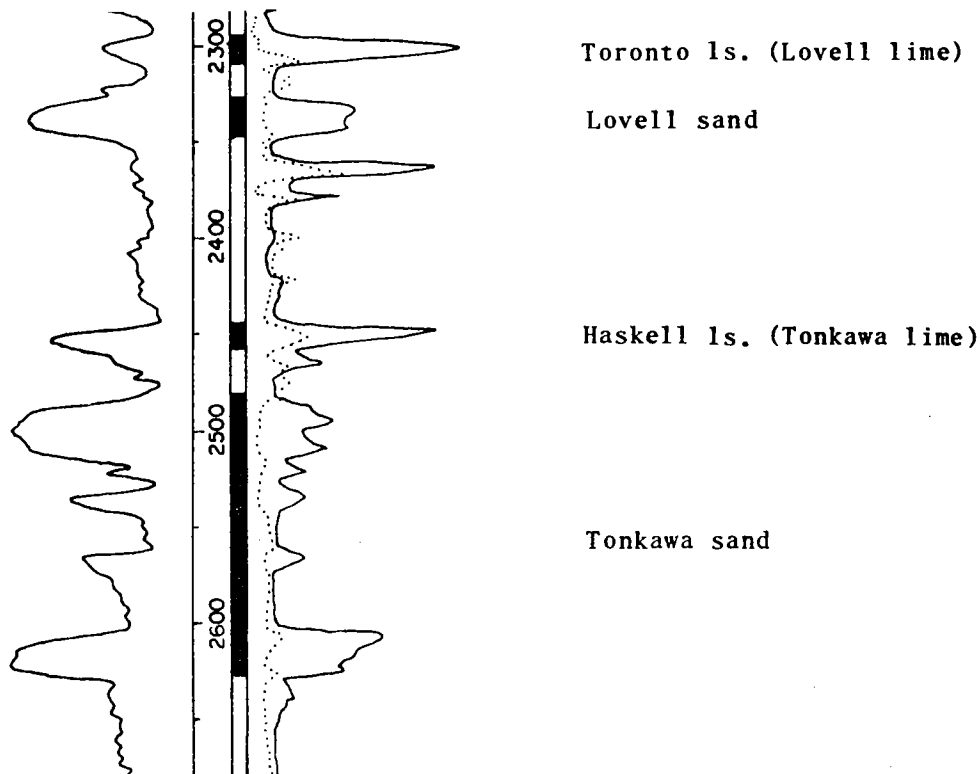
Pennsylvanian

Ross (1923), USBM, Prel. Rept. Tonkawa Oil Field, p. 3.

Named for Tonkawa pool, 24 and 25N-1W, Kay Co.

In Douglas group, below Haskell ls., reported to be equal to Cheshewalla and other early Virgilian ss. Same as Stalnaker sand of Kansas. Some geologists apply the name Tonkawa to both the Lovell and Tonkawa sands as illustrated above, dividing them into Upper and Lower Tonkawa (notes from G. C. Maddox, J. B. Lewis, 1956). The use of Lovell and Tonkawa is preferred.

Illustration: Wood Oil No. 1 McKee, C E½ NE SW 34-25N-1W.



Touley sand

Misspelling of Tuley.

Trenton Viola

Trentonian

Ordovician

Informal origin, to distinguish from "Fernvale" ls.
For Viola ls. of Trenton age. Name not needed as Viola is Trenton in age.

Trosper sand

Desmoinesian

Pennsylvanian

Edinger and Elliott (1949), AIME, Petr. Stat., p. 254.

Named for Trosper Park, Oklahoma City area. Used in Oklahoma City and Nikoma Park fields. Equal to Red Fork sand.

Tucker sand

First ref. - Woods (1913), USGS 531, Pt. II, p. 32.

The source of the name, Tucker, is not known. It has been reported to have been named for Dan Tucker farm, SE 3-17N-7E, Cushing field, Creek Co., where the name was applied to sandstone in the Simpson group at 2,524 feet in Prairie No. 12 Tucker, NE NW SE 3-17N-7E, by Buttram (1914, OGS 18, table of well records). However, Woods and also Snider (1913, Petr. and Nat. Gas in Okla., p. 123) were writing their articles before the discovery of oil in and below the Bartlesville sand in the Cushing field. Woods lists Bartlesville sand in the Cleveland field at depths from 2,400-2,500 feet and a deeper oil-bearing sand, the Tucker or Meadows, from 2,600-2,800 feet. This sand he described as "in a thick mass of hard limestone (the "Mississippi lime" of the drillers)", which in his opinion was referable to basal Pennsylvanian or uppermost Mississippian. The depths indicate both Burgess and Wilcox sand in this area. Powers (1926, OGS 40-G, p. 10) states that the Tucker sand was found in the Cleveland field by Gypsy Oil Co. No. 1 Brown, SE SE SE 27-21N-8E, on April 15, 1912 and that "it is now known to be of Ordovician age, probably representing in part the Wilcox sand and in part the top of the underlying 'Siliceous lime'". In the Oklahoma City files of the Gulf Oil Corporation a log of this well commenced February 14, 1912 gives the following data: Layton sand, 1,260-1,300, Cleveland sand, 1,660-1,795, Bartlesville sand, 2,361-2,449, and Tucker sand, 2,560-2,570 feet total depth. The sand listed as Tucker in this well is equivalent to the Burgess sand, a basal Desmoinesian sand resting upon Mississippian ls. (data from John T. Bado, 5-1957).

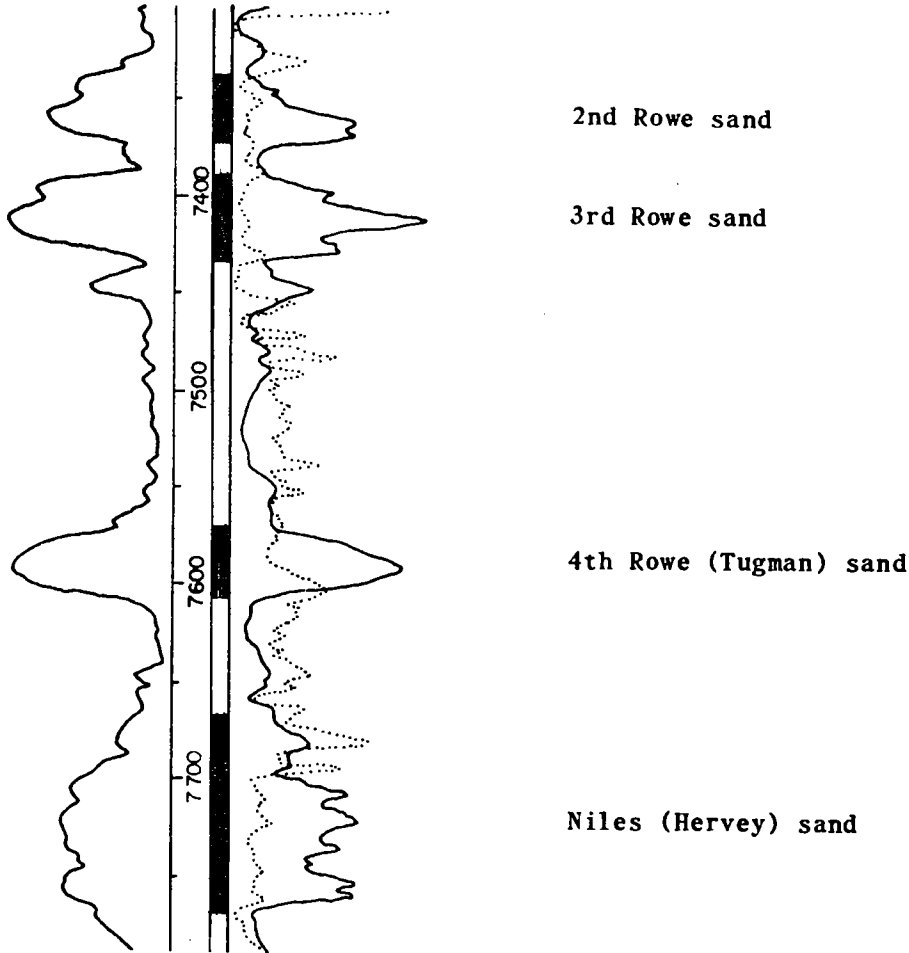
In the Cushing field alone, the term Tucker has been applied to Red Fork, Bartlesville, Misener and Wilcox sands. In other areas, it has also been used for Burgess, Skinner and Booch-Taneha and porosity at the top of the Arbuckle. In eastern Kansas, the name Tucker is used interchangeably with the name Burgess for a sandstone that occurs in the lower part of the Cherokee sh. In the vicinity of 24N and 25N-12E, it is now being applied to a sandstone below the Brown lime and above the Burgess sand and is probably about equivalent to Taneha-Booch.

This name should definitely be dropped from use at least in publications because it has become hopelessly confused in application. Geologists would be well served if the use of the term could be eliminated in all areas of Oklahoma.

First ref. - Maravich (1952), AAPG, vol. 36, p. 1109, 1114.

Named for E. Tugman lease of Shell, NE 11-2N-8W, SE Beaver field, Stephens Co. Called Fourth Rowe sand; above Hervey sand, which is considered equivalent of Niles sand, below Third Rowe sand. In illustrated well, top of Rowe line is placed at 6,970 feet (notes from W. W. Solter, 10-4-56).

Illustration: Shell No. 1 Tugman, NE SW NE 11-2N-8W.



Named for Tuley lease of Helmerich and Payne, discovery in No. 1, SW NE NE, N Hoover field, 13-1N-1W Garvin Co. at 3,264-90, and 3,332-60 feet.

The Tuley is a group of sands which are classified as a common source of supply. These sands are encountered in the No. 9 Tuley from 3,155 to 3,470 feet and are defined as follows:

A. The Stray Tuley sand, which is not developed in the No. 9 Tuley, but is stratigraphically represented by rocks from 3,155 to 3,200 feet.

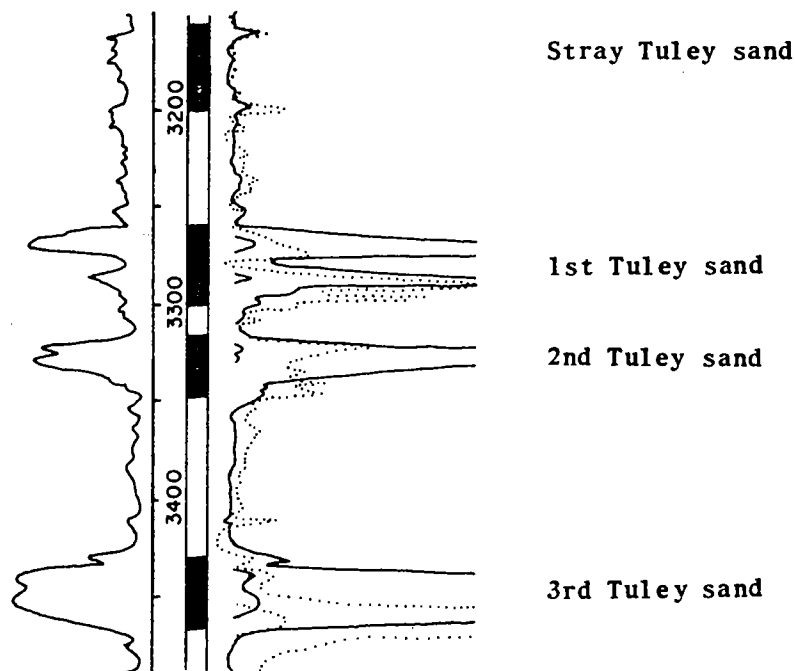
B. First Tuley sand from 3,260-3,300 feet.

C. Second Tuley from 3,320-3,350 feet.

D. Third Tuley sand from 3,427-3,470 feet.

These sands vary in thickness and shale separation but generally retain their stratigraphic position and development throughout the pool (L. D. Ford, 10-29-56).

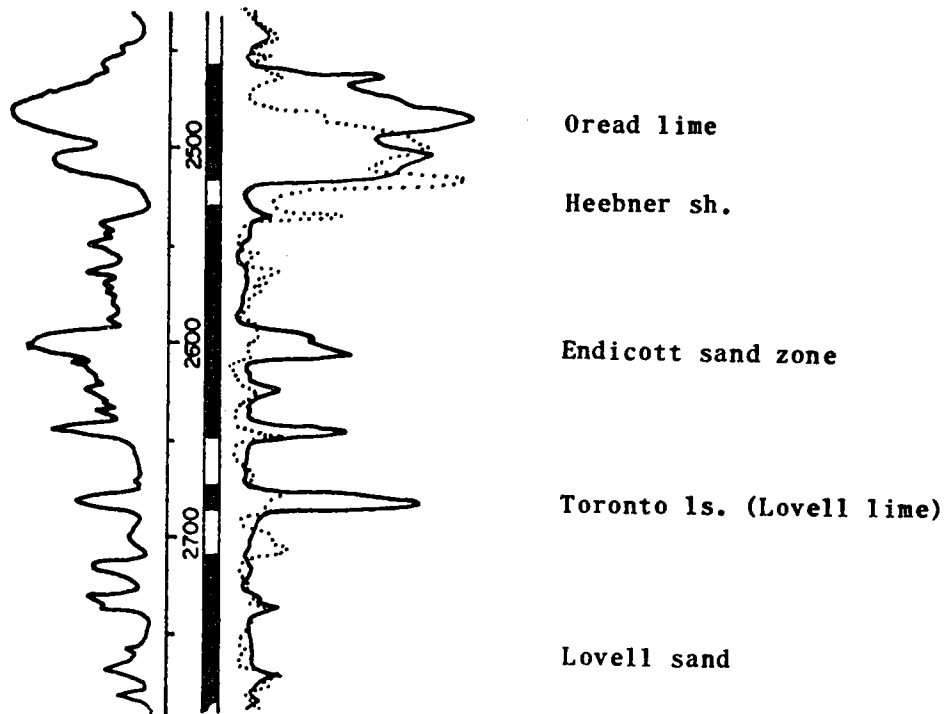
Illustration: White Eagle No. 9 Tuley, C N $\frac{1}{2}$ NE 13-1N-1W.



Clark (1926), AAPG, vol. 10, p. 645.

Named for Turk lease of Marland, NE 21-25N-2W, Thomas field, Kay Co.
Equal to sandstone from 2,590-2,610 feet in Endicott sand zone below Heebner sh.,
above Toronto ls.

Illustration: Central Oil No. 1-C Turk, SE NW NE 21-25N-2W.



First ref. - White and Greene (1924), OGJ, vol. 25, no. 15, p. 42, called Turkey Mountain sand.

Named for Turkey Mountain field, 18N-12E, Tulsa Co.
Eroded top of W Spring Creek fm. of Arbuckle group. Chiefly porous oolitic dolomite with oolitic chert. Same as Siliceous lime of N Oklahoma.

Named for Turman Oil Co.
Obsolete name for Simpson sand of Beggs area.

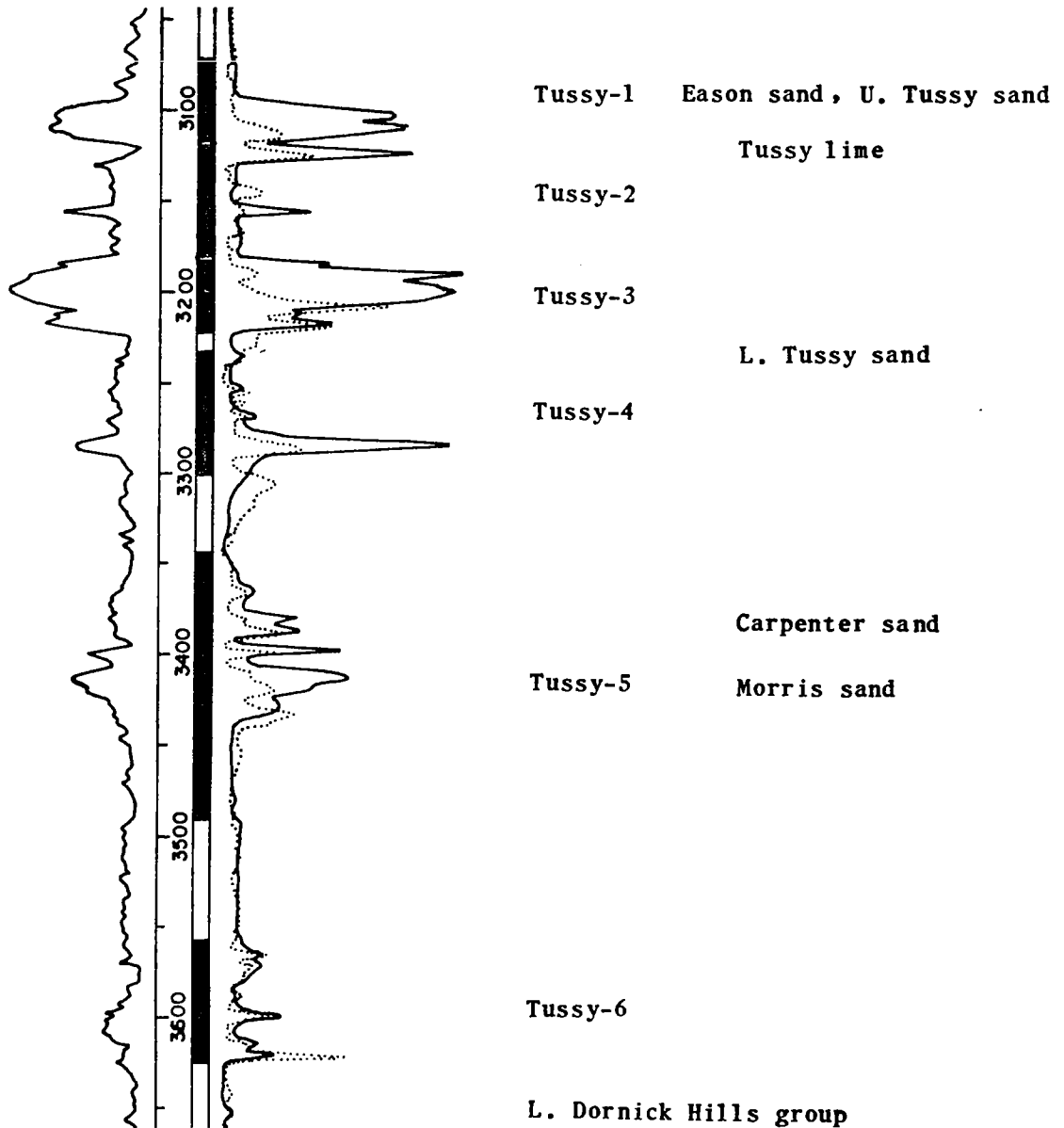
First ref. - Billingsley in Selk (1951), AAPG, vol. 35, p. 595.

Named for Tussy town and field, Carter Co.

Type locality for Tussy lime is in Tussy field, SE SE NW 32-1N-3W, in Tussy zone, a marker limestone bed lying immediately below Tussy-One zone and included in Tussy-Two zone of Hoard (1956, PGSO, vol. 1, p. 194). Tussy lime in Camp field is 30 to 40 feet below type Tussy lime of Tussy field (Parker, 1956, *op. cit.*, p. 178).

In Graham field, the name "Tussy lime" is most commonly applied to a thin (1 to 10-foot) limestone in the Bennett sand zone, locally absent in 3S-2W. Farther north in 2S-3W, it is applied to a higher limestone, type Tussy lime, between Graham and Bennett sands, which there is the thicker of the two limestones (note from C. W. Tomlinson, 8-1-56). See illustrations of Bennett, Graham, Eason and Tussy sands.

Illustration: Eason No. 1 Ledbetter, SE NW NE 6-1S-3W.



See discussion of Tussy sand or zone on following page.

First ref. - Mallory (1948), AAPG, vol. 32, p. 1958.

Applied in Velma field, type section from Mudge's Swanson No. 15, SE NW NE 23-1S-5W from 2,300-2,445 feet, recognized as equivalent to producing zone of Tussy field.

Named for Tussy town and field. The town of Tussy was named in 1889 in Chickasha Nation after H. B. Tussy who migrated there from Kentucky. Discovery of field in 1927 by Magnolia on Tussy lease, NE NE SW 31-1N-3W, Garvin Co. with small production at 3,432-3,437 feet.

In Tussy field, the Tussy zone is approximately 120 feet below the Fusulina sand (Johnson-Atlantic, L. Fusulina or L. Fusulinid) and is divided into the following zones (Hoard, 1956, PGS0, vol. 1, p. 193):

Tussy-One, 50-foot sand zone, also called Eason or U. Tussy sand.

Tussy-Two, includes Tussy ls. at top and underlying 70 feet of dark gray shale and one to two thin lenticular sands.

Tussy-Three, sandstone at 5-60 feet thick, has been called L. Tussy sand.

Tussy-Four, about 45 feet below Tussy-Three, a thin limestone marking top of 60-foot shaly sandstone with erratic zones of porosity, ranging from 0-25 feet.

Tussy-Five, 100 feet below Tussy-Four, separated by dark gray shale, a 130-foot section of dark shale with two sandstones. No local names have been applied in Tussy field, but the upper sandstone may be correlated with Carpenter sand, and lower with Morris sand of Fox-Graham area, and are called Basal Tussy sand and Lower Basal Tussy sand respectively in Camp field (Parker, *op. cit.*, p. 178).

Tussy-Six, base of Deese fm., is a 50-foot section of dark gray shale, white sandstone and two dense limestones separated by 70 feet of dark gray shale from the overlying Tussy-Five.

Graham sands of George and Bunn (Rickets through Sutherland of Tomlinson and Storm) are equivalent to Tussy-One through Tussy-Four zones of Hoard.

Productive in Tussy-Tatums, Camp, N Alma, Santa Fe, Fox-Graham, Sholom Alechem, etc.

"Twin lime" zone

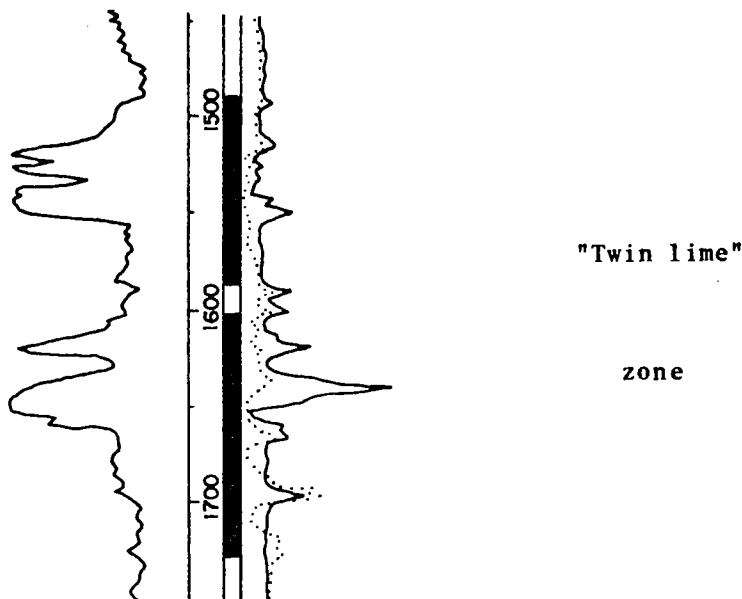
Missourian

Pennsylvanian

First ref. - McBee and Vaughan (1956), PGS0, vol. 1, p. 358.

Name derived from two thin limestones which occur within a sand and shale zone. Used in Jefferson Co. area since 1947 or 1948. "Twin lime" is shown as equivalent of Daube ls. on AGS (1956), Cross-section A-A' in 7S-3W.

Illustration: Pasotex (California Co.) No. 1 Going, NE SW NW 20-6S-5W.



Unconformity sand

General name for pay zone of detritus on an unconformity. Commonly used in Oklahoma for basal Cherokee sand, a transgressing zone.
At this horizon, should be called Burgess sand.

*Union Valley formationMorrowanPennsylvanian

Hollingsworth (1934), GSA Proc. 1933, p. 264.

Named for Union Valley schoolhouse, Pontotoc Co., consisting of a maximum of 242 feet of sandstone with 4-6 feet of arenaceous limestone at top, member of the Wapanucka fm. Hyatt (1936, AAPG, vol. 20, p. 935) raised the Union Valley member to rank of formation, separating it from the Wapanucka fm. In subsurface, the term Union Valley lime is applied to the limestone above the Cromwell sand, which sand is equivalent to the lower sandstone member of the Union Valley fm.

Upper Oolitic lime

See Oolitic lime, item 4.

Upper Skinner sandDesmoinesianPennsylvanian

Locally productive sandstone above Skinner sand (L. Skinner) equivalent to Chelsea ss. Lies below Verdigris ls. and above Henryetta coal zone. Name used also for a sand below Henryetta zone at places. See illustration of Skinner sand.

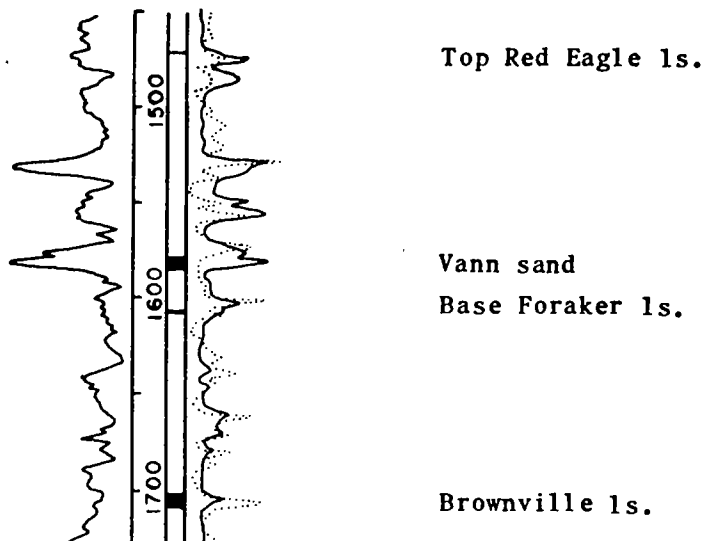
Vann sandWolfcampianPermian

First ref. - Bullard (1928), OGS 40-Q, p. 121.

Named for Vann lease of Twin States, discovery in No. 1, NE NW NE 29-21N-1W, Perry field, Noble Co., in 1921 at depth of 1,587-95 feet.

Lenticular gas sand about 100 feet below top of Red Eagle ls. and base of sand 20-25 feet above the base of Foraker ls. in Perry field. This unit is apparently within the Foraker. Top of Foraker ls. is difficult to place in this area, may be as high as 1,527 feet (notes by N. Bullard, G. C. Maddox, 12-1956).

Illustration: Summit Drlg. Corp. No. 2 Ragan, SE SW NW, 29-21N-1W.



Term used in Velma field in reference to main producing sand.

Applied to sand now known to be in Sims sand zone. Where Sims sand is best developed in 1S-5W, Velma field, it is divided into four recognizable members (Rutledge, 1956, PGSO, vol. 1, p. 274).

**Verdigris limestone*

Desmoinesian

Pennsylvanian

Smith (1928), OGS 40-U, map.

Named for Verdigris River, Rogers Co.

Siliceous, ferruginous limestone, 4-12 feet thick in Senora fm. above Croweburg (Henryetta) coal, below Prue sand.

Called Little Oswego ls. by some geologists; First Verdigris and Second Verdigris lime called at places. Misapplied to Oswego lime at places.

Verdigris sand

Desmoinesian

Pennsylvanian

Reported by Wilmarth (1938), USGS, Bull. 896, p. 2240.

Below Prue sand and above Skinner sand, 28 feet thick. Probably equal to U. Skinner sand just below Verdigris ls.

Vertz sand

Virgilian

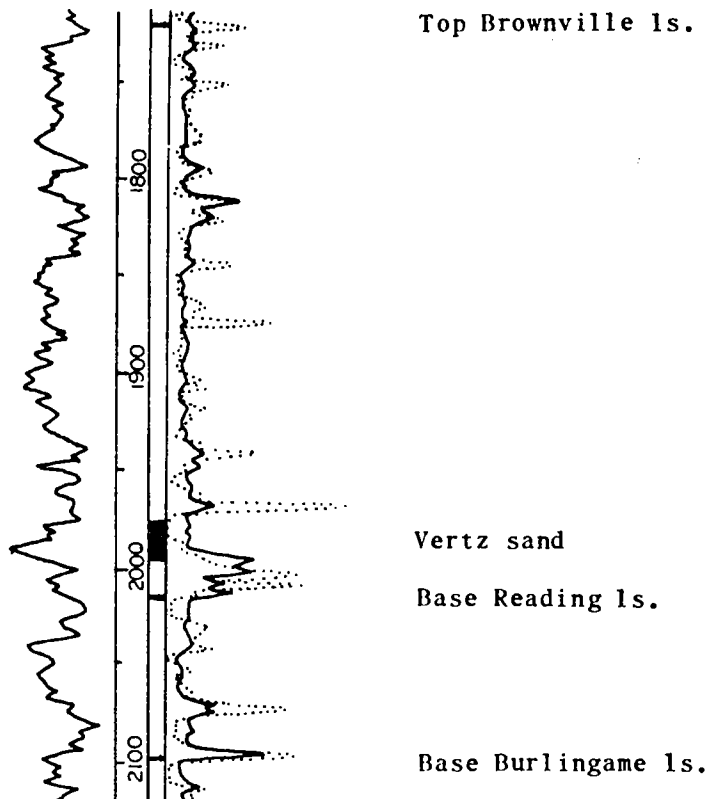
Pennsylvanian

First ref. - Page (1955), OCGS, vol. 5, no. 10, p. 7; (1955), p. 450.

Named for Vertz lease of Phillips, 7-21N-1W, NW Perry field, Noble Co.

Thin, lenticular, fine-grained sandstone below Emporia (Stonebreaker) ls. and above Wakarusa (Cryptozoon) ls. according to Page. G. C. Maddox (10-1956) suggests that it is immediately above Reading ls.

Illustration: Phillips No. 1 Vertz, SE NE SE 7-21N-1W.



*Viola limestone (formation)

Trentonian

Ordovician

Taff (1902), USGS, Folio 79, p. 3.

Named for village of Viola, 13-2S-7E, Johnston Co.

As originally defined the Viola included the "Fernvale" ls., now classified as a separate unit. Viola consists of fine-grained limestone up to 800 feet thick. Sandstone facies in Seminole area is Seminole sand (First Wilcox of Seminole). Viola called Trenton or Trenton Viola in subsurface.

Viola Dense is zone of compact ls. near top of Viola ls.

*Virgil series

Virgilian

Pennsylvanian

Moore (1931), Kan. Geol. Soc., Guidebook 5.

Named for town of Virgil, Greenwood Co., Kansas.

Time-rock stratigraphic term which includes strata from top of Brownville ls. to base of Vamoosa fm. or base of Cheshewalla ss. Contains in descending order the limestones with the following names used in subsurface: Brownville, Grayhorse, Dover, Tarkio, Emporia (formerly termed Stonebreaker, including Elmont and Reading), Wakarusa, Burlingame, Rulo, Happy Hollow, Bird Creek (Howard in Kan.), Pawhuska fm. [Turkey Run (Topeka in Kan.), Deer Creek, and Lecompton], Oread, Amazonia and Haskell.

Some of the producing sands are Hoover, Endicott, Tonkawa, Campbell, Crews, Covington, Sams, Garber, Vann, and Vertz in northern Oklahoma.

In SC Oklahoma, subsurface rocks of Virgilian age are included in the Pontotoc group (red arkosic sandstone and shales) and Cisco group (partly marine and essentially devoid of arkosic material). Some of the producing sands are Adkins, Armstrong, Booth, Cooper, M. A. Bateman, J. N. Bateman, Helm, Ruel Blake, Rowe, Tugman.

Vowell sand

Atokan

Pennsylvanian

Named for No. 1 Jesse Vowell, SE NE SE 6-16N-12E, Creek Co., completed in September 1908 at 2,040 feet. Tested 16,368 MCF gas rich in gasoline and the first or one of the first casing-head gasoline plants was built here.

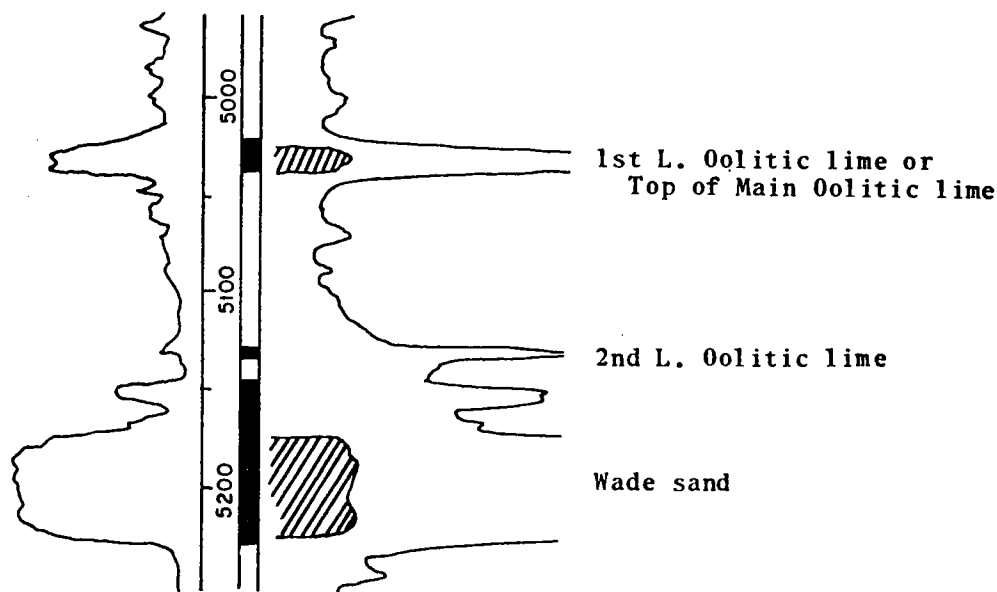
Equal to Atokan Dutcher sand (note from J. K. Leard, transmitted by R. A. Brant, 2-7-56).

Ingram (1941), OGJ, vol. 40, no. 9, July 10, p. 23.

Named for Wade lease of Gordon Trust, discovery in Mid-Kansas No. 9 Wade, SW 2-5N-9W, Cement field, Caddo Co.

Light brown calcareous sandstone up to 350 feet thick. Lies in Hoxbar group below Main Oolitic (or Lower Oolitic lime), above Hedlund sand, if developed, and Medrano sand (H. R. Segnar, 3-1957).

Illustration: Ohio No. 10 Wade, NW NE SW 2-5N-9W.



Wainwright sand

Atokan?

Pennsylvanian

First ref. - Clark and Bauer (1921), AAPG, vol. 5, p. 290.

Named for Wainwright town and pool, Muskogee Co. Probably a Gilcrease sand.

Walker sand (Garber field)

Wolfcampian

Permian

First ref. - Vanderpool (1925), OAS, vol. 6, p. 288.

Named for C. K. Walker lease of Exchange Oil Co., SE 24-22N-4W, Garber field, Garfield Co.

Vanderpool shows the Walker sand immediately below the Foraker ls., 250 feet below the Hotson sand, and 75 feet above the top of the Belveal. From a study of old records compared with new information the term Walker sand in most cases was applied to a pay just above the Red Eagle ls. or to porosity developed in the limestone itself. It is suggested that this term should not be used outside of Garber field. Since a 45° fault plane dipping east cuts many of the wells drilled before electric logs were available, the position of some sands named early in the development of the Garber field is obscure (notes from C. A. McAlister, 1957). See discussion of Belveal and Hoxsey sands.

Walker sand (S. Palacine field)

Missourian

Pennsylvanian

Atkinson (1952), OCGS, vol. 3, no. 3, p. 10; (1955), p. 117.

Named for J. L. Walker lease of Seaboard, SE 16-2S-6W, S Palacine field, Stephens Co.

In lower part of Hoxbar below Muncrief sand and above Nichols sand, a locally developed well-sorted sandstone which may be divided into upper and lower sands as shown in illustration of Nichols sand (W. H. Atkinson, 3-1957).

See illustration of Nichols sand, Muncrief sand not developed in illustrated well.

Wallace sand zone

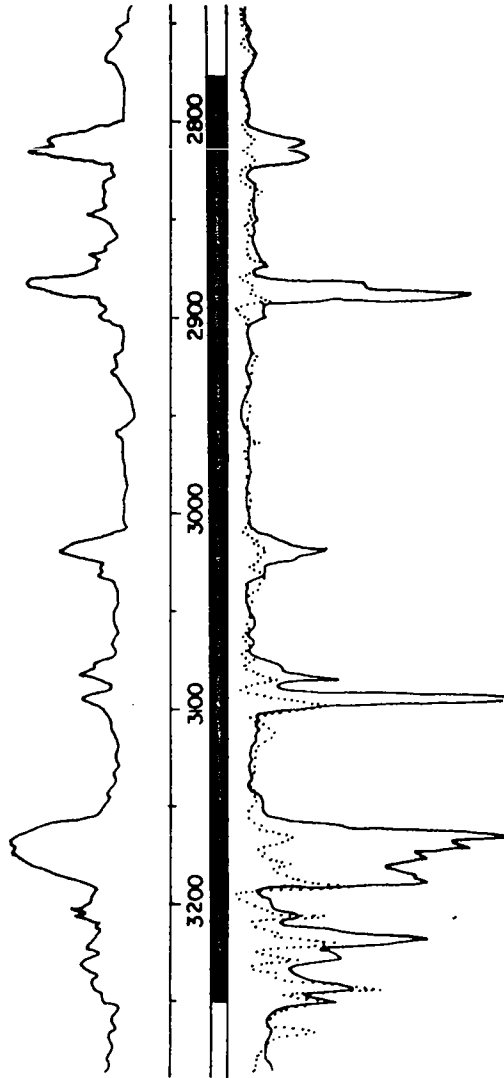
Leonardian

Permian

Named for P. A. Wallace, consulting geologist, by a group of operators in the Chickasha-Cement area. The illustrated well was in a cross-section which was presented before the Corporation Commission who defined it as a producing zone from 2,775 to 3,250 feet.

Includes the original Noble-Olson sand near the base, and the zone now also called Noble-Olson zone. Below the Fortuna sand zone of Cement, which is equal to the Ramsey sand zone of Chickasha.

Illustration: Skelly No. 5 Edmundson, C NL NW NW 23-5N-8W.



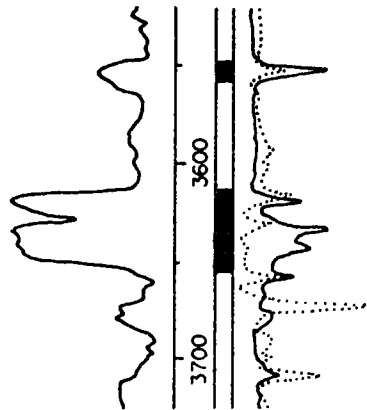
Wallace sand zone

Named by R. C. Quiett of I.T.I.O. in 1929.

First recognized in Bullock Oil Co. No. 1 Bullock, SE SE NE 22-6N-3E, discovery well of W Asher (Wanette) field, Pottawatomie Co.

Equal to Calvin ss. of surface, to a lower Calvin sand of subsurface (notes from F. J. Smith, 12-1955).

Illustration: Phillips No. 1 McPher, NW SW SW 22-6N-3E.



U. Calvin ss.

L. Calvin ss. (Wanette sand)

Taff (1901), USGS, Colgate Folio 74.

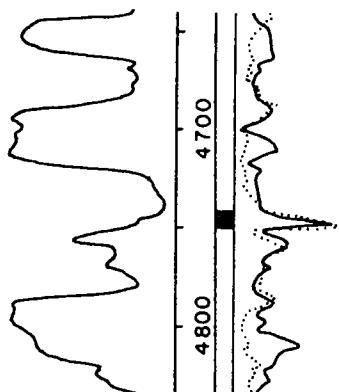
Named for town of Wapanucka, Johnston Co., located along north border of outcrop.

Underlies Atoka fm., overlies Springer fm. as originally defined. Hollingsworth (1934, GSA Proc. 1933, p. 364), and Hyatt (1936, AAPG, vol. 20, p. 954, 959) divided it into a restricted Wapanucka fm. above and Union Valley fm. below in EC Oklahoma. Terms Wapanucka lime and Wapanucka sh. are used in subsurface depending on lithology.

First ref. - AGS (1956), Cross-section C-C'.

Name from Texas Co. No. 1 Warden, SE 17-8N-10W, Caddo Co. at 4,740-4,750 feet. Texas Company geologists place Warden in Pontotoc group. Abundant "Triticites ventricosus" were found at this horizon in well (note from W. B. O'Hearn, 8-24-56). Used as a horizon marker in wells No. 11 (5N-7W), 12 (6N-9W), and 12 (8N-10W) on Cross-section.

Illustration: Texas No. 1 Warden.



Warden lime

Watchorn sand

Missourian

Pennsylvanian

Named for Robert Watchorn of Watchorn Oil and Gas Co., discoverer of oil in Miller Bros. No. 3 well, SW NW SW 33-23N-3E from 2,747-2,752 feet, gas from 2,724-2,747 feet Watchorn (Morrison) field, Pawnee Co.

Probably Cottage Grove ss., "Osage Layton".

Wayside sand

Desmoinesian

Pennsylvanian

First ref. - Shannon and Trout (1915), OGS 19, p. 87.

Named for Wayside pool, 34S-14E, Montgomery Co., Kansas.

Equal to Walter Johnson ss. member of Nowata sh., above Oologah ls. (Big lime), below Lenapah ls. In the Wayside pool area, the Wayside sand occurs at an average depth of 575 feet and the Weiser sand about 120 feet below.

Weiser sand

Desmoinesian

Pennsylvanian

Boughton (1920), Kan. Geol. Surv., Bull. 5, p. 9.

Named for Mr. Weiser, who first encountered it in Montgomery Co., Kansas.

Subsurface name in Kansas for Bandera Quarry ss. in Bandera sh., below Altamont ls. and above Pawnee ls., within the Oologah ls. (Big lime) fm.

Used by Bass in Osage Co. in this sense. Wilmarth (1938, p. 2296) states that it is equivalent to Wiser sand in Osage Co.

Wellington anhydrite

Leonardian

Permian

Anhydrite marker in Wellington fm.

Used in Oklahoma Panhandle and NW Oklahoma.

Wheeler lime

Desmoinesian

Pennsylvanian

Buttram (1914), OGS 18, p. 38.

Named from associated Wheeler pay. Used for non-porous parts of Fort Scott ls. (Oswego lime, also called Wheeler fm.), Cushing field, Creek Co.

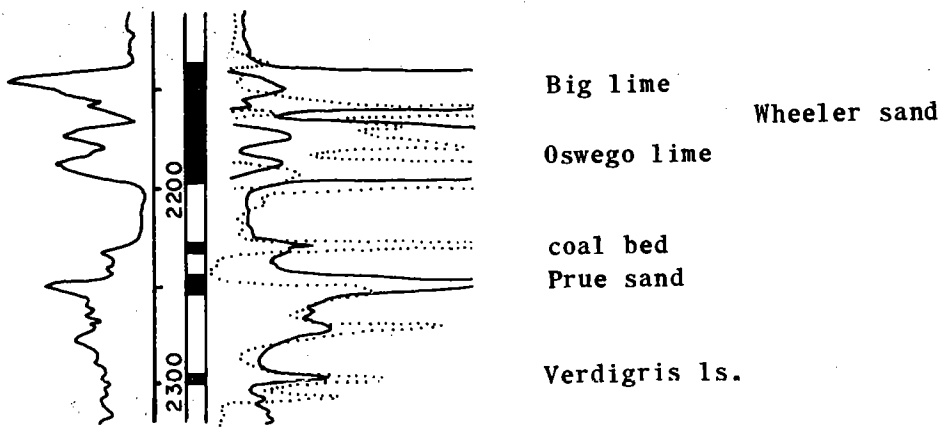
Buttram (1914), OGS 18, p. 41.

Name from discovery well of Cushing field, Shaffer No. 1 F. M. Wheeler, SW NW NW 32-18N-7E, Creek Co. completed in 1912.

General American Oil Co. recently deepened this well to 2,586 feet and obtained production in Red Fork sand, as well as good oil shows in Prue, U. and L. Skinner sands.

The Wheeler sand is porosity developed in Fort Scott ls. (Oswego lime) and in the field is about 75 feet thick, with a shale break from 5 to 20 feet in thickness between two limestones, which ordinarily produced oil or gas or both. At places Wheeler sand is reported to be oolitic limestone. It is possible that the upper limestone member of the Wheeler as shown above is a local limestone development above the Fort Scott ls. (sensu stricto) = Oswego lime, and equivalent to the lower part of the "Big Lime" of the subsurface, which may or may not be Oologah in the area (notes by G. C. Maddox, J. E. Orr, 1956).

Illustration: Gen. Amer. Oil Co. of Texas, No. 16 Wheeler, NW NE NW 32-18N-7E.



Wheeler zone

Leonardian

Permian

Name probably from Wheeler Co., Texas.

Name used in Beckham Co. for anhydrite bed in Wellington fm. Illustration of usage from Phillips No. B-1 Oren, SW SW NE 28-8N-26W: 1st anhydrite, 1,465, Wheeler zone, 1,558, 2nd anhydrite, 1,635, and Brown dolomite, 1,902 feet.

White lime

Ordovician

First ref. - Aurin, Clark and Trager (1921), AAPG, vol. 5, p. 127.

Descriptive name, probably Viola ls. See Buttermilk lime.

Whiting sand

Desmoinesian

Pennsylvanian

First ref. - Snider (1920), Oil and Gas Mid-Continent fields, p. 212.

Named for Whiting field, 11 and 14-27N-10E, Osage Co. Equal to Wayside sand.

Whitney sand

Wolfcampian

Permian

First ref. - Bullard (1928), OGS 40-Q, p. 62.

Named for J. R. Whitney lease of Exchange Oil Co., NE 18-22N-3W, Garber field, Garfield Co.

Lenticular sandstone approximately 150 feet below Hoy sand. Below Wreford ls. and above Cottonwood ls. See illustration of Hoy sand.

Wigton sand

Desmoinesian

Pennsylvanian

Reed (1923), AAPG, vol. 7, fig. 2 on p. 53 (as Wigdon).

Named for Bert Wigton, operator in 23-13N-12E, Okmulgee Co. in 1923 (note by D. M. Logan, 1955). Probably equal to Peru sand.

"Wilcox" sand

Simpson group

M. Ordovician

Name published by Aurin, Clark and Trager (1921), AAPG, vol. 5, p. 118.

Named for H. F. Wilcox or Wilcox Oil and Gas Co., who developed production in No. 1 Gracie Call, 3-16N-13E, Bixby field, Tulsa Co. on April 29, 1914.

Name is younger than Mounds sand which was used as early as 1908, and is preoccupied by Wilcox group (Eocene) of Alabama, a widely-known producing group in Gulf Coast.

Name Mounds should be used for uncorrelated Simpson sands of Tulsa area. "First Wilcox" sand of Seminole area should be called Seminole sand. "First Wilcox" of C Oklahoma should be called U. or First Bromide sand, Second Wilcox should be called L. or Second Bromide sand. The term "First Wilcox" is being loosely applied to a sandy facies of the Viola, to the U. Bromide and in eastern Oklahoma to the first sand encountered below the Trenton, which may actually belong to McLish or older strata (Cronenwett, OCGS, vol. 7, no. 2, p. 34).

Wildcat Jim sand

Pennsylvanian

Bullard (1928), OGS 40-Q, p. 179.

Named for Wildcat Jim Oil Co., discoverer in SW 18-2S-2W at 1,646-1,652 feet in 1916, Wildcat Jim pool, Carter Co.

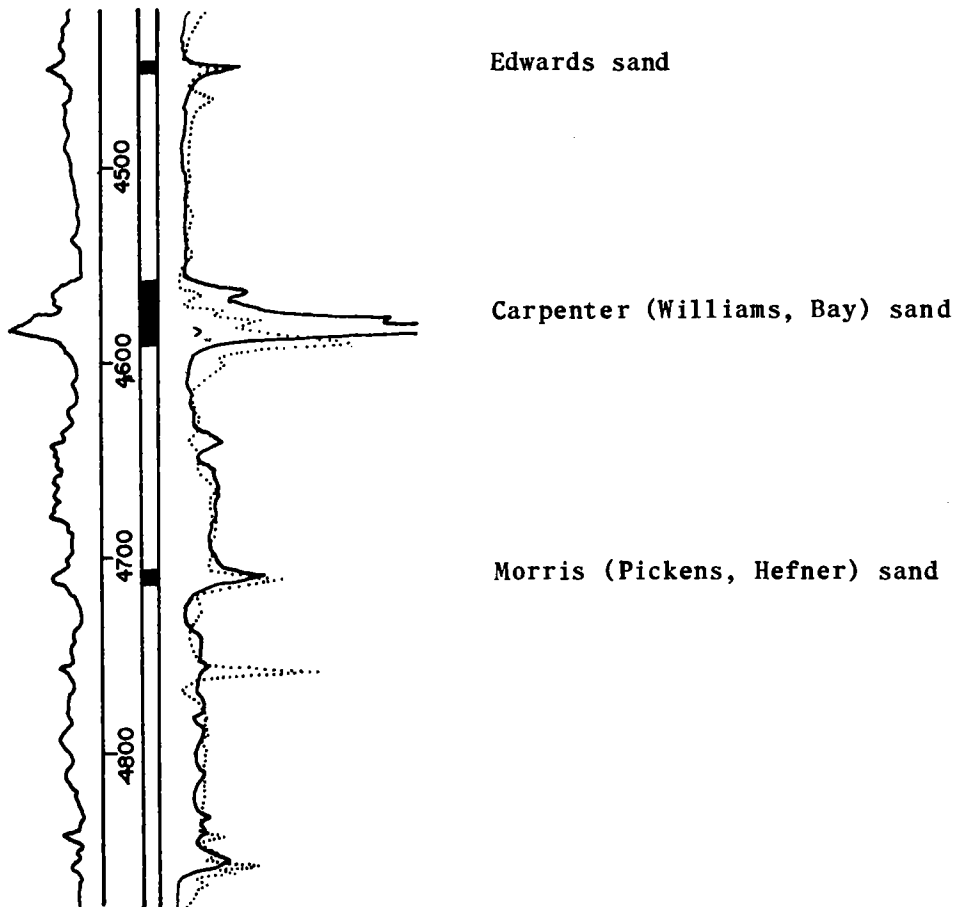
Norville (1956), PGSO, vol. 1, p. 11, 285, fig. 2.

Name from L. G. Williams lease of Skelly in No. 1, SE SW NE 16-1S-4W, discovery of N Alma field, Stephens Co. in which drilling was completed 12-11-45, production from Sims sand at 5,400 feet, oil show in Williams sand.

In lower part of Deese group, approximately 100 feet below Edwards and 100 feet above Pickens sand in N Alma structure. Equal to Carpenter and Bay sands (R. L. Beasley, 1956), to Woodmansee sand (Rutledge, 1957).

Name is unfortunate as it conflicts with Williams ls. mem. of Deese, surface member in Ardmore basin area named by C. W. Tomlinson (1937, AGS Field Trip Guide, March 13, p. 3). Name should not be used regionally, Carpenter preferred.

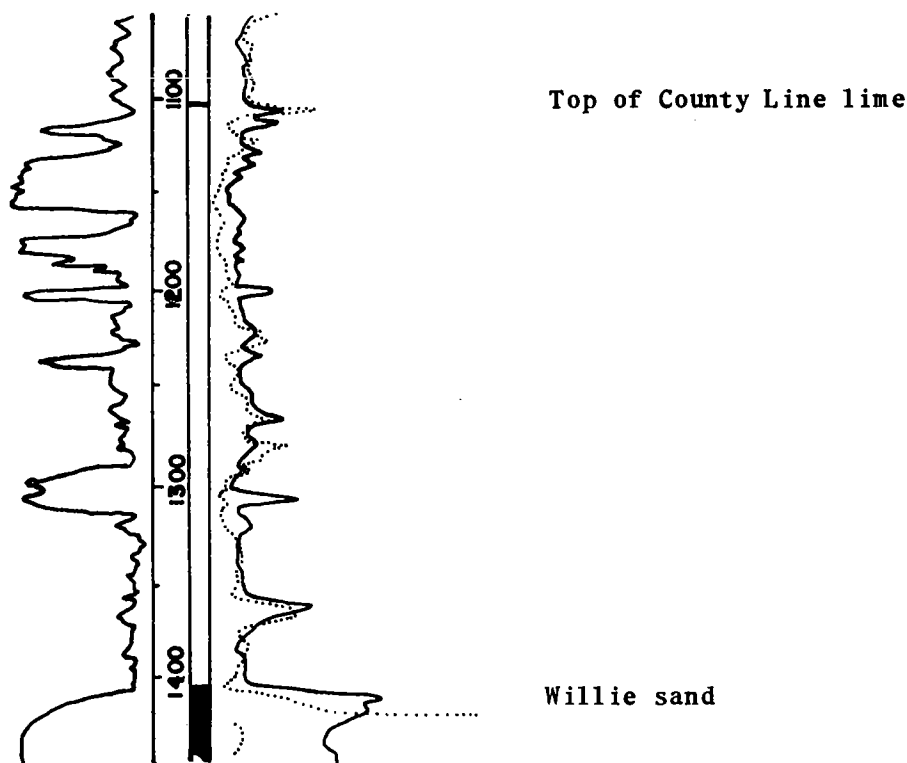
Illustration: Skelly No. 1 Williams, SE SW NE 16-1S-4W.



Mallory (1948), AAPG, vol. 32, p. 1957.

Name from Phillips No. 1 Willie, SW SE NE 23-1S-5W, Velma field, Stephens Co. Below County Line line in Hoxbar group. Possibly equal to Wade sand of Cement field (G. D. Reavis, 6-28-55). Illustration used is for the type locality, but is not typical in that it is in one of the few areas where the Willie sand is productive of oil. This sand is widely known as a water-bearing sand and is often called Willie water sand or Hoxbar water sand. A more typical example is shown on AGS (1956), Cross-section B-B' in Vickers No. 1 Burkhart, SW NE SE 27-1N-5W, top of sand at 4,465 feet (notes from R. L. Beasley, 1956).

Illustration: Phillips No. 1 Willie, type locality.



Swigart (1919), USBM, Rept. on Comanche field, p. 9.

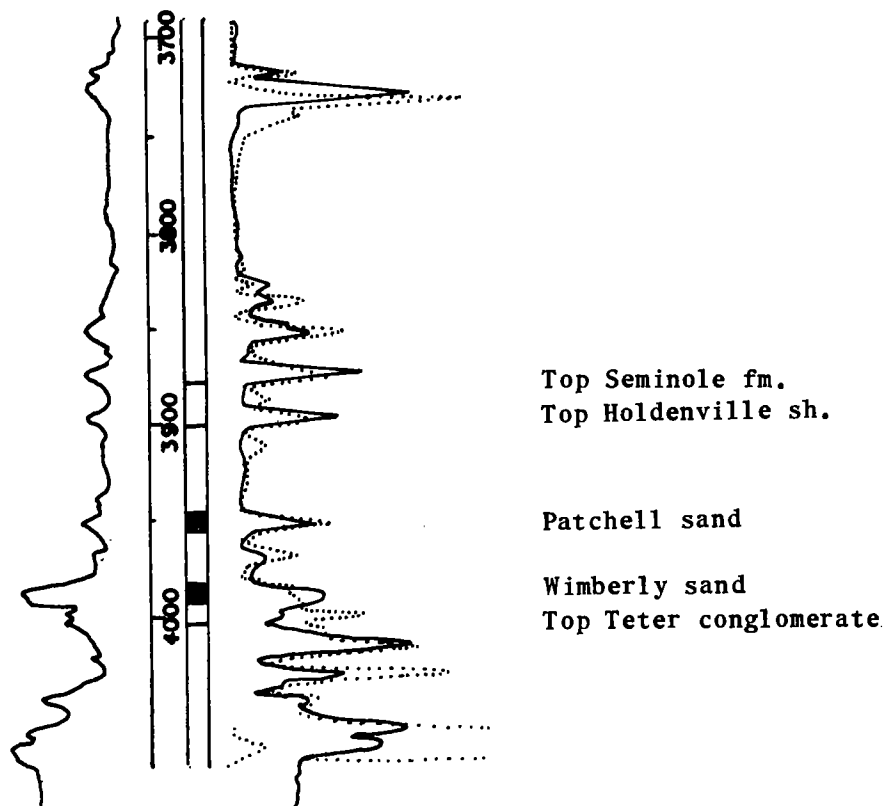
Named for Clara Wilson lease of Comanche Petroleum Co., discovery of field in August 1918 in No. 1 well, NW NW NW 20-2S-7W, of gas at 1,286-1,324 feet, Comanche field, Stephens Co. Well later deepened to 1,700 feet for oil. Called Wilson fm. by Swigart.

Hicks (1956), PGS0, vol. 1, p. 342.

Named for Wimberly "A" lease of Cities Service, in No. 1, SE SW NW 25-4N-1W, Pauls Valley field, Garvin Co.

A fine-grained sandstone with abundant fusulinids in basal 20 feet of Holdenville. See also Cashion, Patchell, and Teter.

Illustration: Cities Service No. 1 Wimberly.



Prosser (1897), Kan. Geol. Survey, vol. 2, p. 64.

Named for City of Winfield, Cowley Co., Kan.

Massive limestone with chert nodules. Subsurface marker in NW Oklahoma.

Used in Wiser pool, 27N-12E, discontinued name for Dewey field, Osage Co. According to Wilmarth, a subsurface sand, 0-60 feet thick correlated with part of the Oologah ls. in central northern Oklahoma.

Apparently confused with Weiser sand of Kansas, equivalent to Weiser sand of Osage Co. as used by Bass, or to Big Lime (Oologah), and not equivalent to Wiser sand of Kansas which is in upper Cherokee section. This name should not be used.

Wolfe sand

Wolfcampian

Permian

Named after John Wolfe or Wolfe Drilling Co. Discovery in Wolfe Drlg. No. 9 Huds-peth, NW NE SE 23-22N-4W, completed 7-3-55, elev. 1,096 feet, productive sandstone from 1,098-1,105 feet, Garber field, Garfield Co.

Below Winfield ls., above Fort Riley-Florence ls.

*Woodford shale

Mississippian-Devonian

Taff (1902), USGS Atoka folio, no. 79.

Named for exposures 1/4 mile N. of Woodford, 2S-1W, Carter Co. Underlies Caney sh., overlies Hunton group.

Woodmansee sand

Desmoinesian?

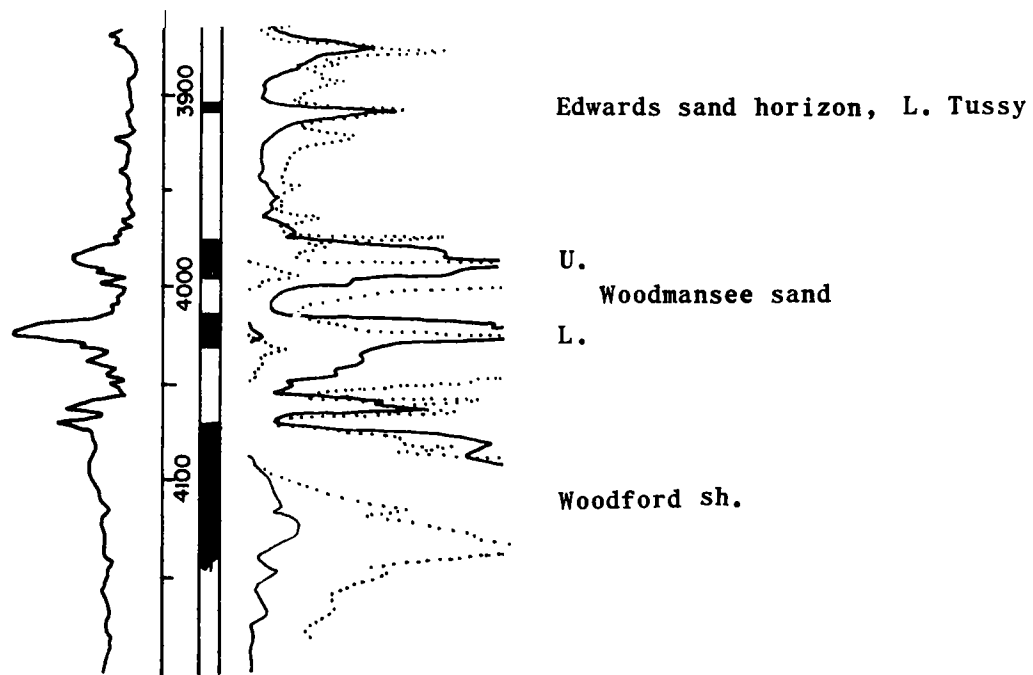
Pennsylvanian

Ref. - Maravich (1952), AAPG, vol. 36, p. 1109.

Named for M. J. Woodmansee lease of Skelly et. al., discovery in No. 1, NW NW NW 14-2S-4W, NW Milroy field, Stephens Co.

Sandstones from 3,980 to 3,990 and from 4,018 to 4,030 feet produce oil. The upper of these two sandstones and possibly the lower one are roughly equivalent to the Williams sand of N Alma field, which is oil bearing from 4,576-4,592 feet in Skelly No. 1 Williams, SE SW SE 16-1S-4W. In illustrated log, conglomeratic sandstone from 4,060 to 4,068 feet, which is oil bearing, and the sandy shale and erosional material from 4,070 to 4,075 is basal portion of U. Dornick Hills of some geologists. Woodmansee and Williams sands considered uppermost sandy zone of Upper Dornick Hills by some, Deese by others (notes from R. B. Rutledge, J. A. McGinley, 3-1957). Pickens sand of N Alma field, which is below Williams sand, is not present in illustrated log due to non-deposition or removal by erosion (Norville, 3-1957).

Illustration: Skelly No. 1 Woodmansee.

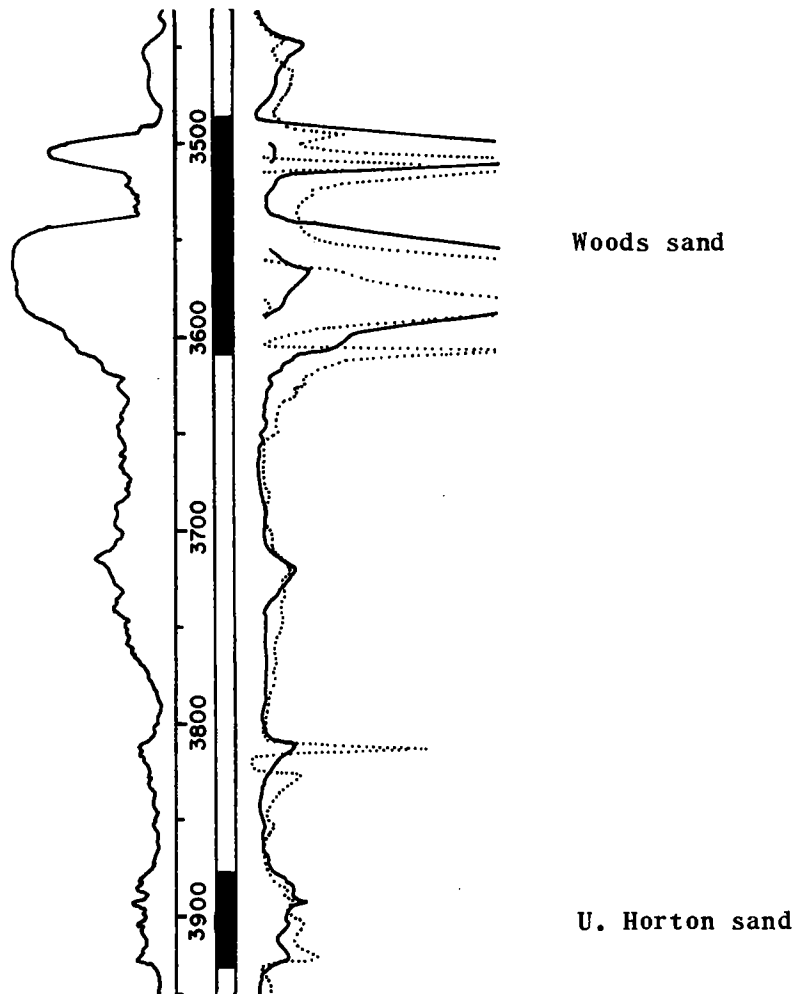


Name published by Pate (1953), OCGS, vol. 4, no. 3, p. 11; (1955), p. 218.

Named for Woods "B" lease of T. H. McCasland, discoverer of gas production from 2,810-65 feet in No. 1, NW SE NE 17-3N-5W, Carter-Knox field, Grady Co.

Uppermost Springeran sand in Carter-Knox field, above Horton sands. May be equal to Cunningham sand of Chitwood field, to Sims sand of Sholom Alechem (Pate). AGS (1956), Cross-section C-C' shows Woods sand above Cunningham sand in Phillips No. 1 Nichlos, C NE NE 3-4N-8W (notes from R. B. Harrington, 3-1-57).

Illustration: Ohio No. 1 Carl Woods, NE SW NE 17-3N-5W.



*Wreford limestone

Wolfcampian

Permian

Hay (1893), Kan. Board Agric., 8th Ann. Rept., p. 104.

Named for town of Wreford, Geary Co., Kansas,
Light gray cherty ls. Lies below Ft. Riley and Florence ls., above Funston ls.
Used as marker in NW Oklahoma. See illustration of Hoy sand.

Wynn lime

Missourian

Pennsylvanian

Calcareous sandstone about 90 feet thick, below Anadarche ls. Locally developed in Healdton area.

Yates sand

Missourian

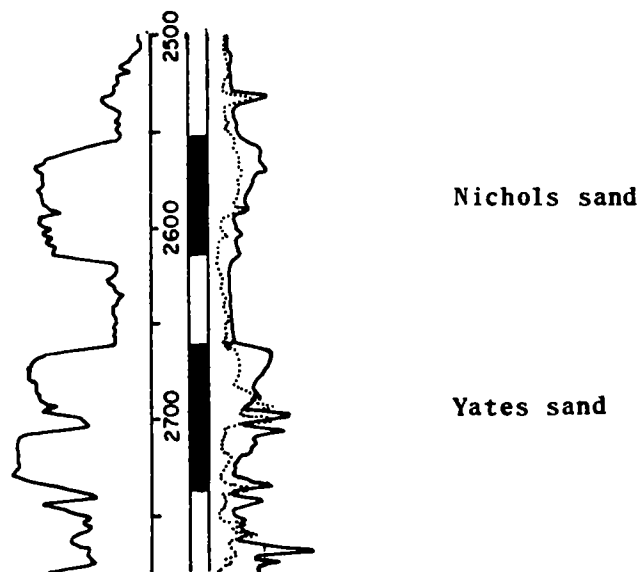
Pennsylvanian

Atkinson (1952), OCGS, vol. 3, no. 3, p. 10; (1955), p. 117.

Named for Jay Yates lease of Amerada, W $\frac{1}{2}$ SE 16-2S-6W, S Palacine field, Stephens Co. Discovery of production in J. E. Jackson et al. No. 1 Hughes, SW SE SE 16-2S-6W. Locally developed sandstone zone up to 120 feet thick, conglomeratic at base, lies below Nichols sand. Muncrief sand from 2,348-2,367 feet. Walker sand not developed in illustrated well. See also illustration of Nichols sand.

Not to be confused with widely known Yates sand (Capitanian) of W Texas and New Mexico.

Illustration: Atlantic No. 3 Varner, SW SW SE 21-2S-6W.



Youngstown sand

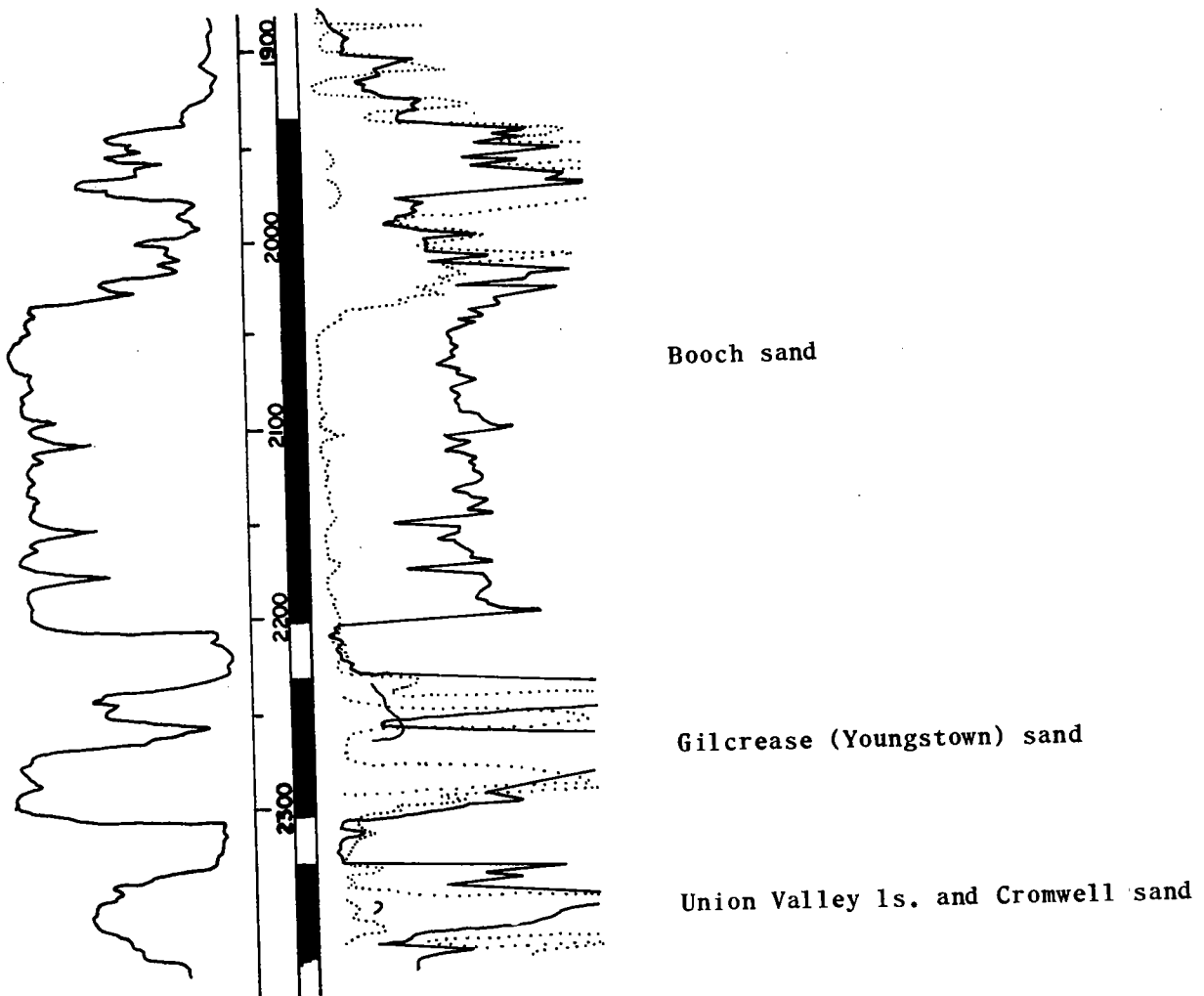
Atokan

Shannon and Rockwell (1920), AAPG, vol. 4, p. 277.

Named for Youngstown village in 36-14N-11E, Okmulgee Co. Production discovered in 1918.

Equal to an Atokan Dutcher sand, Gilcrease sand. Were called First and Second Youngstown sands. Bullard (1928, OGS 40-Q, p. 178) listed Youngstown sand at 2,250 feet and Dutcher sand at 2,400, which indicates that upper sand was Atokan, and lower sand called Dutcher was Morrowan (notes from L. M. Wilshire). This well in area where Booch sand shows channel fill.

Illustration: Hamilton No. 1 Prophet, NE NW 36-14N-11E.



Yule-Funk sand

Missourian

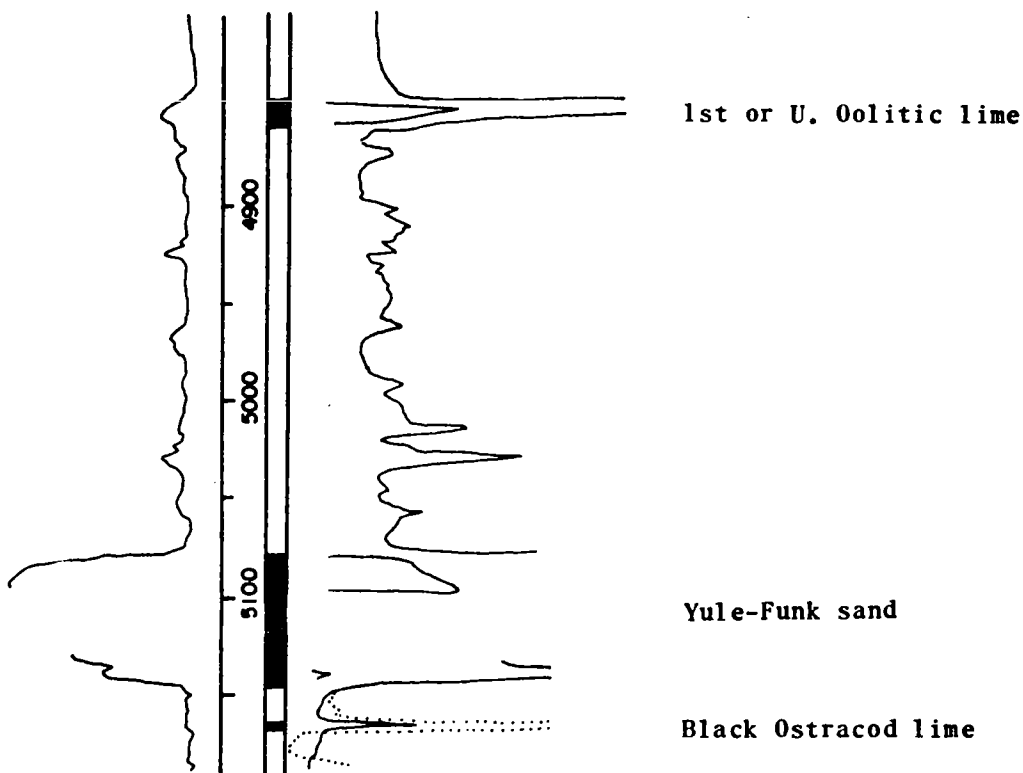
Pennsylvanian

Ref. - Ingram (1941), OGJ, vol. 40, no. 9, July 10, p. 23.

Named for Johnson Yule lease (SW) and Funk lease (SE) of Ray Stephens, Inc., 1-5N-9W, Cement field, Caddo Co.

Zone of off-white sandstones with shale and coal beds according to Hayes (1952, OCGS, vol. 3, no. 2, p. 9). Lies in Hoxbar group just above "Black Ostracod" or "Ostracod" lime, and below first or Upper Oolitic lime.

Illustration: Stephens Petr. No. 1 Funk, SW SW SE 1-5N-9W.

**Zypsie sand**

Virgilian

Pennsylvanian

First ref. - Swigart (1920), USBM Rept. on Walters field, p. 3.

Named for Zypsie lease of Pure, SE 29-1S-10W, Walters field, Cotton Co. Lies below Keys sand. See illustration of Keys sand.

KEY TO AGE AND TYPE LOCATION OF NAMES USED IN SUBSURFACE OF OKLAHOMA

Explanation: Terms arranged in descending stratigraphic sequence in locality separated by commas. Where sequence is interrupted, separated by semicolon. Except for terms named on surface, terms considered equivalent or terms not named in locality are in parentheses. (?) Correlation is questioned. (*) Age is questioned. The word 'sand' is omitted after name of pay.

SOUTHERN OKLAHOMA

	LOWER CRETACEOUS		
5S-5E	Bilbo; *Madill	1S-9W	Armstrong lime (Rowe lime=?Gunsight ls.), Armstrong
5S-6E	"Arbuckle"	1S-10W	Priddy, Keys, Zypsyie
7S-6E	Preston-Arbuckle	2S-11W	McDonald; Revelle
		3S-2W	Patsy
		3S-11W	Cache Creek=Soldier Creek
		3S-17W	(Gunsight), (?Swastika lime), Henderson (?Swastika)
	PERMIAN	5S-12W	Fusulinid ls., Thomas=Thompson, (Megargel lime=?L. Gregory lime)
		5S-14W	"Fusulinid ls.", (Thomas), (Megargel lime), (Gunsight), (Henderson)
	UNDIFFERENTIATED		
1N-3W	Garvin, Mauldin, *Newberry; *Rose		
2N-8W	House		
1S-5W	Santa Fe		
		MISSOURIAN	
	LEONARDIAN	1N-1W	Tuley, Huber, Randolph, (2nd Checkerboard lime)
2,3N-5W	Knox; Burkes	1N-4W	Doyle lime, (Willie)
2,3N-10,11W	Fort Sill (?Lawton), School Land "C", Spencer=School Land "D", Roll, Cline	2N-7,8W	Briscoe, (Main Oolitic lime), (Wade), Dyer
5N-8W	Nichlos=School Land, Ramsey, Wallace zone (includes Noble-Olson=?Magnolia)	3N-2W	Checkerboard ls., Abernathy lime (2nd Checkerboard lime), Pharaoh (1st Deese)
5,6N-9,10W	Caddo (Nichlos), Fortuna (Ramsey), Prosperity, Wallace zone (includes Noble-Olson zone)	3N-6W	(County Line lime), Todd
8N-26W	1st Wellington anhydrite, (Wheeler zone), 2nd anhydrite.	5,6N-9,10W	U. Oolitic lime, Yule-Funk, Black Ostracod lime, L. Oolitic lime (Main Oolitic lime), Wade, Hedlund, Medrano=?School Land, Marchand, Lackey, Culp=Melton or Melton zone
		11N-25W	Garrett zone="C" zone
	WOLFCAMPIAN	3N-2E	Hogshooter ls., McKinney, Burns, Brundidge
1N-20W	Hensley, Cole, Kelly, McDaniels	3N-3E	Lael, Belle City ls.
8N-10W	Warden lime	1S-4,5W	Spears, County Line lime=Sholom Alechem lime, "Hoxbar-water"=Willie (?Wade)
8N-26W	Brown dolomite, also used in Oklahoma Panhandle	1S-6W	Jacob (lower part of Hoxbar)
		2S-3W	*Oolitic lime=Hoxbar Oolitic (considered base of Hoxbar group)
	PENNSYLVANIAN	2S-6W	(Loco lime), Patty, Muncrief, Walker, Nichols, Yates
		2S-8W	*Maloney
	VIRGILIAN	3S-3W	Anadarche ls., Wynn lime, Healdton (?U. or L. Bayou); *Pugh; *Jackson
1N-3W	*Newberry; *Rose	3S-5W	Loco lime, Loco
1N-9W	Thomas	4S-2W	Hewitt lignite (within U. Bayou), Palacine sh., *1st Hewitt (Chubbee), *2nd Hewitt including Norris *3rd Hewitt (*Lone Grove 1 through 6)
2N-8W	Cooper, Ruel Blake, J. N. Bateman, Helm, U. Booth, L. Booth, Marlow lime, M. A. Bateman=Bateman, (L. Gregory lime), U. Coline, L. Coline, (Rowe lime), Adkins (1st Rowe), Tugman (4th Rowe), Hervey (Niles); (Rowe lime), Olson (Rowe), U. and L. Sears (Rowe), (Niles)	4S-4W	Edwards (in lower Bayou)
		5S-1W	Zuckermann ls., Daube ls., Anadarche ls., Dolman fm., Lansford zone, U. Bayou, Hewitt lignite, (Palacine sh.), *Chubbee sand, *L. Oolitic=?Natsy ls., *Ramsey zone, *Lone Grove 1 through 6 of Westheimer and Schweers=U. Lone Grove of Williams
2N-9W	Nellie		"Twin lime" zone=?Daube ls. includes Seay; Oscar=?Crinoidal lime
6N-9,10W	U. Gregory lime, Garner, L. Gregory lime, Griffin, Rowe lime, Rowe, Niles lime, *Niles	6S-5W	
1,2S-8W	Miller, Nigh, Surber, Cantrell, Shelton, Smith, Brown, Blaydes, Kagay, *Maloney		

DESMOINESIAN

- 1N-3W *Oolitic lime 2, (Culberson), (Kirk=U. Fusulinid), (Johnson-Atlantic=Fusulina=L. Fusulinid), Tussy zone 1 through 4, Tussy-5 (Carpenter and Morris), Tussy-6
- 1N-4W Culberson, (Kirk), (Johnson-Atlantic=Fusulina)
- 1N-5W Ashshalintubbi (2nd Carpenter), Hefner (Morris)
- 1N-19W Boucher
- 3N-2,3W Gibson zone, U. Gibson, L. Gibson=McWhirter, Hart (Pooler, Eason), (Osborne)
- 4N-1W (Patchell), Wimberly, (Teter), (Cashion)
- 5N-4W (Hart zone), (U. Hart), (Hart lime), (L. Hart), Osborne
- 5N-8W Glover (U, Kistler), Charlson (L. Kistler), Pooler (Hart=U. Tussy=Eason=Graham of Tomlinson and Storm), Mona
- 5N-9W U. Kistler (Glover), Kistler or L. Kistler (Charlson)
- 6N-10W Sames (U. Pooler)
- 2N-9E Harryman (upper sandstone of Hartshorne fm.)
- 4N-1E Patchell, (Wimberly), Teter, "Spicular lime", Cashion
- 1S-3W Tatums, Oolitic lime 3=base of Deese
- 1S-4W *Oolitic lime 2, Rue (Kirk=U. Fusulinid), (Johnson-Atlantic=Fusulina=L. Fusulinid), Edwards (Tussy-4=L. Tussy), Williams (Carpenter), Pickens (Hefner, Morris, Smith); Sholom Alechem (Kirk=U. Fusulina) and (Johnson-Atlantic=Fusulina) and (probably part of Tussy zone)
- 1S-5W (Tussy zone), Sledge conglomerate
- 2,3S-2,3W Moyer (lower part of Culberson), Kirk, Johnson-Atlantic, Rickets-Graham-Bennett-Sutherland (Tussy zone 1 through 4), 1st Carpenter, 2nd Carpenter (Williams=Bay), Morris=Ragsdale-Smith (Hefner=Pickens=3rd Carpenter), *Brooks (Edwards), Woodmansee(Williams=Carpenter=Bay)
- 2S-4W *Chubbee, *L. Oolitic=?Natsy,
- 5S-1W *Ramsey zone, *Lone Grove 1 through 6, Lone Grove 7 through 11, Still. Reynolds zone apparently in Lone Grove
- 5S-2W (Lone Grove), Fulton
- 5S-5E *Madill
- 8S-2E (Cox), (Bruhlmeier), (Hudspeth). All named in Texas

DESMOINESIAN-ATOKAN-MORROWAN

Dornick Hills group: (descending order) Big Branch fm. with Pumpkin Creek ls. mem. is Des Moinesian in age; Lake Murray fm. with Frensley ls., Lester ls. and Bostwick congl. members considered Atokan in age; Golf Course fm. with Otterville ls., Jolliff ls. and Primrose ss. members is Morrowan in age. The terms U. and L. Dornick Hills are used in subsurface.

ATOKAN

- 1S-5W Lake Murray fm. (divided into Frensley mem., U. and L. Griffin sandstone=Lester, Bostwick mem.)

MORROWAN

- 1S-5W Golf Course fm. (divided into Otterville mem., Limestone Gap mem., and Rowland mem.=?Primrose)
- 2S-8E Wapanucka fm.
- 4S-2E Primrose ss.

ATOKAN-MORROWAN

- 6S-2E Hendon

SPRINGERAN

- 1N-3W Burr (Markham)
- 2N-3W Parks (Cunningham)
- 3,4N-5W Woods, Horton, Hutson, (Anderson)
- 4N-6W (Cunningham), Britt, (Spiers), Anderson
- 5N-6W (Cunningham), Britt, Spiers, Boatwright (?Anderson)
- 1S-4,5W Markham, Aldridge, Humphreys, 1st Sims, 2nd Sims, Inscore=1st Goodwin; Sims=Velma
- 2S-3W Martin (1st Sims), Dotson (2nd Sims), Cross=Flattop, (Goodwin)
- 3S-4E *Goddard sh., placed in Springeran in subsurface by most, considered to be Mississippian in age on surface.

MISSISSIPPIAN

Goddard sh., Caney sh., Sycamore ls., Woodford sh., Misener-Sylamore ss.

SILURIAN-DEVONIAN

Hunton group: Frisco fm., Bois d'Arc fm., Haragan fm., Henryhouse fm., Chimneyhill fm. divided into Clarita (Pink Crinoidal), Cochrane (Glauconic), Keel and Ideal Quarry (Oolitic) members.

UPPER ORDOVICIAN

Sylvan sh., *Fernvale" ls.

MIDDLE ORDOVICIAN

Viola ls., Simpson group: Corbin Ranch fm. (Simpson Dense, Bromide Dense), Bromide fm. (Bromide dolomite=Marshall zone, and 1st and 2nd Bromide), Tulip Creek fm. (3rd Bromide), McLish fm., Oil Creek fm., Joins fm.

LOWER ORDOVICIAN AND UPPER CAMBRIAN

Arbuckle group: West Spring Creek fm., Kindblade fm., Cool Creek fm., McKenzie Hill fm., Butterfly dolomite, Signal Mountain ls., Royer dolomite, Fort Sill ls.

Timbered Hills group: Honey Creek fm., Reagan ss.

PRECAMBRIAN

Tishomingo granite; Colbert porphyry in Timbered Hills; complex of granites, extrusive rhyolites, basic igneous rocks, and metasedimentary rocks in the Wichita Mts.

CENTRAL AND NORTHERN OKLAHOMA

	PERMIAN	20,21N-1W	(Tonkawa), ?Wildhorse ls., Perry (?in Wann-Okesa), Iola ls. (Avant ls., Muncie Creek sh., Paola ls. members), Cottage Grove ss. (Mussellem of Bass=Osage Layton=Peoples=Broyles Layton="Layton" (not True Layton) Richter (?Perry) Swaggert (Tonkawa) Hogshooter ls., Checkerboard sand (in base of Coffeyville), Checkerboard ls. "Tucker" (=Red Fork, Bartlesville, Taneha, Misener or Wilcox) Broyles-Layton (Cottage Grove ss.) Mussellem. (Mussellem of Bass=Osage Layton=Peoples="Layton"=Cottage Grove ss. member of Chanute shale Hogshooter ls., Layton (Dodds Creek ss.), Checkerboard ls. Kelso (?Okesa ss. in Barnsdall fm.), Checkerboard ls., Cleveland=Lowery; U. Cleveland (Jones), L. Cleveland (Dillard) Watchhorn (?Cottage Grove ss.) Buzzard (upper part of Barnsdall fm.) Oil City lime (Avant ls., upper member of Iola ls.) "Checkerboard"=Hodges zone
GUADALUPEAN	Jester at base of Flowerpot		
LEONARDIAN	Panhandle Big lime	25N-1W 27N-3W 14N-2E	
WOLFCAMPIAN	Brown dolomite (Herington ls.) used in Oklahoma Panhandle	17N-7E	
21N-1,2W	Grenola (Neva-Burr) ls., Hoxsey="Belveal" of L. W. Cary, Red Eagle ls., Vann, Foraker ls. or Vann in Foraker ls.	18N-4E 18N-7E	
22N-3,4W	Herington ls.=?Kisner, Winfield ls., Wolfe, Fort Riley ls., Florence ls., Hoy, Wreford ls., Whitney=Hodges, Cottonwood ls., Hotson, Grenola (Neva-Burr) ls., ?Walker of Garber field, Red Eagle ls.=?Walker of Garber field, Foraker, Belveal of Garber field	20N-8E 21N-7,8E	
28N-1W	Blackwell (Neva ls.)	23N-3E 23N-9E 23N-12E 5N-24ECM	
	PENNSYLVANIAN		
VIRGILIAN		DESMOINESIAN	
18N-1W	(Endicott), Toronto ls.=Lovell lime, Lovell, Haskell ls.=(Tonkawa lime), (Tonkawa)	12N-2W 18N-9W 5N-8E 6N-3E 7N-6E 9N-5E 9N-8E 10N-8E 13N-12E	Chicken Farm (Red Fork) Inola (Inola ls. horizon) Henryetta coal, Allen, Senora lime Wanette (lower Calvin ss.) Dora (Red Fork) Earlsboro (Red Fork) Olympic (Allen=Senora) Brunner (Booch=Taneha) Wigton (Wewoka or Calvin); Perryman (?Prue) "Salt" (Bartlesville=Glenn), Savanna Brown lime, Booch (Warner ss. mem. of McAlester fm.) Meaner (Oswego lime=Fort Scott ls.) Peach Orchard (lower Red Fork) Glenn (Bartlesville) Wheeler (?Big lime and Oswego lime) Tiawah ls. (Pink lime), Red Fork (Taft ss. in upper part of Boggy fm.), Inola ls. Taneha (Booch) Hallett (?Cleveland or ?Wayside) Nemire (?Red Fork) Verdigris ls., Skinner or L. Skinner, Tiawah ls. (Pink lime), Meadows and "Tucker"=(?Burgess) Fort Scott ls. (Oswego lime), Prue (Lagonda ss.), Verdigris ls. (Bartlesville), Savanna Brown lime, (Taneha=Booch), Burgess (basal Desmoinesian sandstone normally in McAlester or Hartshorne fm.) "Tucker" (Taneha=Booch) Holland (Peru); Hogshooter (Burgess) Inola ls., Bartlesville (Bluejacket ss.=Glenn="Salt"), Savanna Brown lime Squirrel (Prue), in some areas applied to lower Red Fork Burbank (Red Fork)
21N-1W	Brownville ls., Ragan (Campbell), undesignated limestone, (Crews zone), Emporia (Elmont-Reading) ls., Vertz, Wakarusa ls. or Vertz, Reading ls.	14N-5E 14N-14E 17N-12E 18N-7E 18N-12E	
21N-2W	Brownville ls., Sams (Ragan=Campbell zone)	13N-14E	
22N-3,4W	Brownville ls., Campbell zone, undesignated limestone, Crews zone, Emporia (Elmont-Reading) ls., "Garber"=Ebert, Wakarusa ls., Burlingame ls., Happy Hollow ls., Covington, Bird Creek (Howard) ls. Deer Creek ls., Hoover, Elgin, "Oread lime"	19N-12E 20N-7E 20N-8E 21N-8E	
23N-2W	Undesignated limestone, Barnes (Crews zone), Emporia ls.	21N-10E	
23N-3W	Turkey Run (Topeka) ls., Thomas, Deer Creek ls., Lecompton ls., (Hoover, Elgin), ?Carmichael, Kereford ls., Plattsmouth ls., Heebner sh., Leavenworth ls., Endicott=Turk, Toronto ls. (Lovell lime), (Lovell), Haskell ls.=Tonkawa lime, Tonkawa (Stalnaker) Prague ls.=Brownville ls.	21N-13E	
13N-6E	Ponca (Hoover)		
25N-2E	Happy Hollow ls., Newkirk=Mervine,	24,25N-12E 25N-13E 26N-12E	
27N-3E	Turkey Run ls. (uppermost member of Pawhuska fm.)		
MISSOURIAN			
11,12N-3W	Checkerboard lime (Oklahoma City)=Hogshooter ls. and Layton zone, 1st Oolitic (Checkerboard ls.), 2nd Oolitic (Cleveland zone)	26N-14E 27N-5E	

DESMOINESIAN (Continued)

27N-10E Whiting (Wayside)
 27N-12E Wiser of Oklahoma (Weiser)
 29N-12E Ramsey (Wayside)
 6N-9ECM *Purdy (Kelly=Sturgis)

Names once used in Oklahoma, equivalencies unknown but thought to be Desmoinesian: Hickman, Markham, McEwin, Independence

Pays named in Kansas, term used in Oklahoma:

Peru=Englevale ss. member in Labette fm., below Oologah ls., above Fort Scott ls.
 Wayside=Walter Johnson ss. member of Nowata sh., below Lenapah ls., above Oologah ls.
 Weiser=Bandera Quarry ss. in Bandera sh. member of Oologah ls., below Altamont ls. member, above Pawnee ls. member

Named in Texas: *Thirteen Finger lime, *Lips

ATOKAN

9N-9E Gilcrease zone
 9N-24E Spiro
 10N-8E Harjo (Gilcrease)
 11N-11E Deaner, Doggett (Gilcrease)
 13N-14E Morris (Gilcrease)
 13N-16E Wainwright (?Gilcrease)
 14N-16E Leidecker (Gilcrease)
 14N-17E Bad Hole (Gilcrease), Timber Ridge (Gilcrease)
 15N-14E Glenn-of-Morris (Gilcrease)
 15N-18E Muskogee lime, Muskogee (Gilcrease)
 16N-12E Vowell (Gilcrease)
 6N-9ECM *Purdy (Kelly=Sturgis)

Named in Texas: *Thirteen Finger lime, *Lips

ATOKAN AND OR MORROWAN

13N-14E Fields (Gilcrease and or Cromwell)
 14N-11E Youngstown (Gilcrease and or Cromwell)
 14N-12E Hamilton Switch or Preston (Gilcrease and or Cromwell)
 17N-11E Dutcher (Gilcrease and or Cromwell)
 17N-12E Rhodes (Gilcrease and or Cromwell)

Names once used and considered equivalent to Dutcher: Colbert, Ninety-Six Meridian, Scott, Squaw

Named in Texas, used in NW Oklahoma and Panhandle: *Thirteen Finger lime, *Lips

MORROWAN

6N-6E Konawa (?Cromwell)
 8N-8E Smith (1st Cromwell), Sikes (2nd Cromwell)
 9N-9E Papoose (Cromwell)
 10N-8E Wapanucka sh., Union Valley ls., Cromwell (Union Valley ss.)
 11N-11E Kingwood (Union Valley ls.), Lyons=Lyons-Quinn=Quinn (1st Cromwell), Jefferson (2nd Cromwell), Ingram (3rd Cromwell)
 14N-11E Black and Simons (Cromwell)

*MORROWAN

1N-20ECM
 4N-10ECM
 4N-25ECM

5N-8ECM
 5N-9ECM
 6N-9ECM

Named in Texas: *Lips ("U. Morrow"=Purdy=Sturgis=Kelly)

PRE-MORROWAN

9N-12E

*Bowles ("U. Morrow")
 *Kelly (Purdy)
 *Mocane (? "M. Morrow" or "L. Morrow"=?Keyes)
 *Keyes ("L. Morrow")
 *Sturgis (Purdy)
 *Purdy ("U. Morrow"=Sturgis=Kelly)

*Lips ("U. Morrow"=Purdy=Sturgis=Kelly)

Union Valley ls., Cromwell zone, "Jefferson" in *Pennsylvanian Caney

MISSISSIPPIAN

Central Oklahoma: *Pennsylvanian Caney, Mississippian Caney, False Mayes, Mayes=Ada Mayes=Sycamore ls., Chattanooga sh.=Woodford sh.

Northern Oklahoma: Manning zone (Chesterian), Mississippi Chat (Osagean), Mississippi lime (Meramecian and or Osagean), Kinderhookian beds, Woodford sh.=Chattanooga, Misener=Sylamore ss.

SILURIAN-DEVONIAN

Hunton group (see under Southern Oklahoma)

UPPER ORDOVICIAN

Sylvan sh., "Fernvale" ls.,

MIDDLE ORDOVICIAN

11N-2,3W Viola ls., "Wilcox", "Green Shale zone", "Green Shale" sand, McLish fm. (pays named in descending order: School Land=Mollman, Hammer-Haindl), Oil Creek fm. (Kinter=Hoopes=Lowery=Olds=Johnson), Joins fm. (Stamper zone)
 19N-4W "1st Wilcox", Bromide dense, Marshall zone (Bromide dolomite), "2nd Wilcox" (1st Bromide)
 9N-6E Viola ls., Seminole="1st Wilcox" of Seminole, Bromide fm.
 15N-12E Turman ("Wilcox")
 15N-14E Mose Carr ("Wilcox")
 16N-13E "Wilcox", type area="2nd Wilcox" of Seminole area
 17N-12E Mounds (1st Simpson pay below Chattanooga sh.)
 18N-11E Sapulpa (Mounds)
 19N-13E Irish (pay in Tyner fm. below "Wilcox"=Mounds)
 22N-8E Hominy (Burgen ss.) rests on "Siliceous lime"

Fite ls.=?Corbin Ranch fm. (Bromide dense), Trentonian, after Harris (1957), OGS 75, p. 101. Tyner fm. and Burgen ss.=?Tulip Creek (or McLish) after Harris, p. 76.

LOWER ORDOVICIAN

Canadian stage: West Spring Creek fm., Kindblade fm., Cool Creek fm., and McKenzie Hill fm. of Arbuckle group of southern Oklahoma equivalent to Powell fm., Cotter dolomite, Jefferson City group, Roubidoux fm., and Gasconade dolomite in subsurface of NE Oklahoma.

18N-12E Turkey Mountain="Siliceous" lime
 (eroded top of Powell fm. or
 Cotter dolomite equivalent to
 West Spring Creek fm.)

UPPER CAMBRIAN

Trempealeauian stage: Butterly dolomite and Signal Mountain fm. of Arbuckle group of southern Oklahoma equivalent to Eminence dolomite and Potosi dolomite (not identified in subsurface of NE Oklahoma).

Franconian stage: Royer dolomite, Fort Sill ls. and Honey Creek fm. of southern Oklahoma equivalent to Elvins group (not identified in subsurface of NE Oklahoma). Reagan ss. of southern Oklahoma is probably younger than the Dresbachian Bonneterre dolomite and Lamotte ss. of the surface.

PRECAMBRIAN

22N-21E Spavinaw granite