SUBSURFACE GEOLOGIC CROSS SECTION OF PALEOZOIC ROCKS FROM BUTLER COUNTY TO STAFFORD COUNTY, KANSAS

By

W. L. ADKISON

Investigation conducted under cooperative agreement between the State Geological Survey of Kansas and the United States Geological Survey.

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ABSTRACT

The cross section extends across south-central Kansas from the Zenith-Peace Creek oil field on the southeastern flank of the Central Kansas Uplift in Stafford County eastward across the north-central part of the Sedgwick Basin to the Augusta oil field on the Nemaha Anticline in Butler County. Lithologic composition and general structural attitude of the Paleozoic rocks are shown by sample logs of 19 wells on sea level datum at a vertical scale of 1 inch equals 200 feet and a horizontal scale of 1 inch equals 3 miles. Detailed descriptions of the samples of each well are given in the appendix.

The Paleozoic rocks range in thickness from about 3,000 feet to at least 4,714 feet and represent all systems except the Silurian. Strata of Permian age, as much as 2,440 feet thick, consist mainly of shale in the upper part, anhydrite and salt in the middle part, and limestone, dolo-

mite, and shale in the lower part. Rocks of Pennsylvanian age, 1,319 to 2,061 feet thick, are mostly limestone and shale but include some sandstone. In the eastern part of the cross section the Pennsylvanian rocks are subdivided in part into formations composed mainly of limestone or shale, but many of the stratigraphic contacts become obscure to the west because of a considerable increase in the percentage of limestone. Rocks of Mississippian age, 0 to 408 feet thick, are characterized by limestone and dolomite that is cherty in large part. The Chattanooga Shale of Devonian and Mississippian age is 0 to 226 feet thick and is chiefly shale. Strata of Ordovician age, about 570 to 615 feet thick, are mostly cherty dolomite but include some sandstone, shale, and limestone, mainly in the uppermost part. Rocks of Cambrian age, about 300 feet thick, are chiefly dolomite but include a basal sandstone as much as 60 feet thick. Precambrian rocks, penetrated in two wells, are mostly granite and quartzite.

Major structural features along the cross section include the Augusta Anticline, which is a part of the Nemaha Anticline, the southern end of the Voshell Anticline, and the southeastern flank of the Central Kansas Uplift. These structures developed mainly after rocks of Mississippian age were deposited and before rocks of Des Moines age (Middle Pennsylvanian) were laid down. Strata of Des Moines age unconformably overlie rocks of Late Mississippian age in the central part of the cross section, the Chattanooga Shale at the western end, and rocks of Middle Ordovician age at the eastern end.

In the area adjacent to the cross section, oil and gas in commercial quantity was first discovered on the Augusta Anticline in 1914, and many other oil and gas fields have subsequently been found in this area. Within 2 miles of the line of the cross section, oil or gas is produced from rocks of Ordovician, Devonian, Mississippian, and Pennsylvanian ages, but the largest production has been from rocks of Ordovician age.

INTRODUCTION

This report is the initial publication of a subsurface study of the stratigraphy, structural development, and occurrence of oil and gas in the Sedgwick Basin in south-central Kansas. Additional cross sections and more comprehensive reports are planned. The work was done under the cooperative agreement between the U.S. Geological Survey and the State Geological Survey of Kansas. All well samples and electrical and radioactivity logs were supplied by the State Survey.

The geologic cross section (Pl. 1) extends from the Stanolind Oil and Gas Co. No. 1 M. Hartnett well in sec. 23, T. 24 S., R. 11 W., Stafford County, to the Bennett and Roberts Drilling Co. No. 1 Collins well in sec. 2, T. 28 S., R. 4 E., Butler County, Kansas. The Hartnett well is in the Zenith-Peace Creek oil field located on the southeastern flank of the Central Kansas Uplift, and the Collins well is in the Augusta oil field on the Nemaha Anticline. The location of the cross section in relation to the major structural features in south-central Kansas is shown on the index map on Plate 1. The cross section includes 19 wells numbered from west to east.

METHODS OF INVESTIGATION

The subsurface stratigraphy of the central Kansas oil fields has been well established through years of work by many geologists who have examined samples from thousands of wells and outcrops. Most of the major subdivisions of Cambrian, Ordovician, Silurian, Devonian, and Mississippian rocks that crop out in Oklahoma, Missouri, and Iowa, and many of the rock units of Pennsylvanian and Permian age that crop out in eastern and central Kansas were identified in the subsurface of south-central Kansas by Lee (1949) on a cross section from Barber County to Saline County, Kansas. Lukert (1949) published an electrical-log cross section from Marion County, Kansas, to Garfield County, Oklahoma, that passes within a mile of well 16 of the present report.

The nomenclature and stratigraphic classification of the U.S. Geological Survey are used in this report except that the Queen Hill Shale Member of Lecompton Limestone is not official nomenclature of the Federal Survey. The nomenclature and classification of the State Geological Survey of Kansas are generally in accord with that of the Federal Survey, but there are some differences, mainly in rank or age. The classification used in this report and the classification of the State Survey are compared in Table 1.

The interpretive method (Maher, 1959) of

logging well cuttings was used in this study. Four of the wells in this report (wells 5, 9, 13, and 16) were drilled with cable tools, and with one exception (well 16), the logs of these wells best represent the lithologic sequence studied; some samples from well 16 are not representative of the interval recorded on the sample bags. The other 15 wells were drilled with rotary tools. The logging of eight of these rotary-drilled wells was greatly aided by the concurrent study of electrical or radioactivity logs for these wells. The logging of the other seven was aided by the concurrent study of electrical, radioactivity, or sample logs from nearby wells. Interpretive logs prepared from rotary samples by different geologists are likely to vary somewhat, so that complete agreement regarding details cannot be expected.

Most of the samples were examined under 6.3X magnification, but magnifications of 18X and 27X were used for study of minute features. The color, hardness, mineral composition, texture, and cementing material of the rock fragments were described, and the descriptions include the type and characteristics of accessory particles, such as chert, oolites, microfossils, glauconite, pyrite, calcite, and siderite. The "Rock Color Chart" of the National Research Council (Goddard and others, 1948) was used to determine the rock color, and the Wentworth grade scale was used to describe the mean grain size of the clastic rocks composed chiefly of silicate minerals. This scale was also used as a guide to describe the crystallinity and granularity of the carbonate rocks.

The term *shale* is used in this report for clastic rocks composed mostly of clay and fine to medium silt-size particles of silicate minerals, regardless of bedding characteristics. The term *siltstone* designates clastic rocks composed mainly of coarse silt-size particles of silicate minerals. The carbonate rocks were described as silty if an appreciable amount of coarse silt-size or smaller residue remained after treatment with hydrochloric acid. Much of the residue probably is composed of clay-size particles, but this was not determined. The term *dense* describes carbonates and chert that are composed of particles too small to be seen under 6.3X magnification. The dense rocks commonly break with a smooth conchoidal fracture. Chert is described as *spicular* if it contains very fine distinct short white lines that probably are fossil spicules. Chert is described as *figured* if it shows a pattern of fine white to light-gray indistinct and irregular lines in a darker matrix.

The sample logs in this cross section are shown at a vertical scale of 1 inch equals 200 feet. This scale permits the representation of most stratigraphic units, but some of the finer details are not shown. Many of the very thin beds are either exaggerated in thickness or are combined with adjacent beds. The logs are alined on sea level datum, and the horizontal scale is 1 inch equals 3 miles except where noted on the cross section. Well 2 is located so close to well 1 that in the description of the stratigraphy the two wells are treated as one. The electrical or radioactivity logs for eight of the wells, plotted adjacent to the well columns, show the electrical or radioactive character of the geologic formations identified from the samples. The spontaneous-potential curve or the gamma-ray curve is plotted on the left side of the well column, and the short normal resistivity curve or the neutron curve is plotted on the right side. The resistivity curve for well 11 is a laterolog. The type of curve is indicated at the top of each log.

STRATIGRAPHY

In the vicinity of the wells of this report the outcropping rocks are Quaternary and Early Permian in age (Latta, 1950, pl. 1; Bayne, 1956, pl. 1; Williams and Lohman, 1949, pl. 1; and Moore and Landes, 1937). Nearly all the wells west of well 14 were started in deposits of Quaternary age, but the base of these deposits could not be determined, because samples were missing for the upper part of these wells. About 58 feet of loose, fine to very coarse feldspathic sand of Quaternary age was penetrated in well 14 above Permian rocks. Permian strata are exposed east of well 14. These rocks are underlain by Pennsylvanian, Mississippian, Devonian, Ordovician, and Cambrian

sedimentary rocks and Precambrian igneous and metamorphic rocks. The sequence of sedimentary rocks is 4,714 feet thick in well 2 on the southeastern flank of the Central Kansas Uplift, 4,370 feet thick in well 13 about 24 miles west of the Nemaha Anticline, and about 3,000 feet thick in the vicinity of well 19 on the Nemaha Anticline. The following descriptions of the Paleozoic and Precambrian rocks are generalized from the detailed sample logs, which are included in the appendix.

ROCKS OF PERMIAN AGE

The rocks of Permian age of this report are part of the Lower Permian Series of the U.S. Geological Survey and are, in descending order, the Nippewalla, Sumner, Chase, Council Grove, and Admire Groups. In a study of the outcropping rocks in Elk County, Verville (1958, p. 13-17) described the Permian formations below the upper part of the Barneston Limestone of the Chase Group. Many of these formations were extended westward from Elk County to well 19 by correlation of electrical logs for several intervening wells. The approximate thickness of these rocks ranges from 605 feet in well 19 to 2,440 feet in well 1, in which the drillers log was used to determine the top of the Permian rocks. A major unconformity is at the top of the Permian rocks. The lowermost Permian rocks are very similar to the uppermost Pennsylvanian rocks; therefore the contact between the two is difficult to determine.

Lower Permian Series

Nippewalla Group

Rocks of the Nippewalla Group were penetrated in wells 1 to 5 and possibly in well 6, but samples were available only for the lower 150 feet of the group in well 3. The position of the base of the group was interpreted from the drillers log of well 1. The lower part of the Nippewalla Group in well 3 consists chiefly of moderate-reddish-brown siltstone and shale. These rocks are assigned to the Harper Siltstone, which was formerly called the Harper Sandstone.

Sumner Group

The Sumner Group in central Kansas includes, in descending order, the Stone Corral Formation, the Ninnescah Shale, and the Wellington Formation. The group has an average thickness of about 1,120 feet in the western part of the cross section.

The Stone Corral Formation, previously called the Stone Corral Dolomite, consists of light-gray fine-grained silty dolomite about 3 feet thick in well 3. Samples were missing in the other wells, but the drillers log for well 1 includes an 18-foot "sand" at a depth of 510 feet, which is believed to be the Stone Corral. The "sand" probably is mainly anhydrite or gypsum, which is common in the formation in this area.

The Ninnescah Shale is 220 to 260 feet thick in the western part of the cross section where it is composed mainly of moderate-reddish-brown, greenish-gray, and medium-gray shale. The formation also includes beds of light-gray siltstone, white gypsum and anhydrite, and light-gray very finely crystalline dolomite. The amount of gypsum and anhydrite logged in the wells probably is exaggerated. The base of the Ninnescah is difficult to determine, but in this report it is placed at the bottom of the predominantly reddish-brown shale sequence.

The Wellington Formation is present in wells 1 to 17, but to the east of well 9 part of it has been removed by post-Permian erosion. The maximum thickness is 882 feet in well 1. The upper 250 to 300 feet of the Wellington consists mainly of gray, greenish-gray, and moderate-reddish-brown shale and white gypsum and anhydrite, but includes some light-gray dolomite and siltstone. The middle part of the Wellington, which is slightly more than 400 feet thick in well 3, includes much salt and lesser amounts of light-gray anhydrite and gray shale. The lower 150 to 210 feet of the formation is mainly light-gray anhydrite and gray shale but includes one or more beds of light-olive-gray to medium-gray silty dolomite. The salt in the lower part in well 10 and the silty limestone and dolomite shown in the upper 85 feet of well 16 probably are not representative of the strata drilled.

Chase Group

The Chase Group is 340 to 395 feet thick and includes, in descending order, the Nolans Limestone, Odell Shale, Winfield Limestone, Doyle Shale, Barneston Limestone, Matfield Shale, and Wreford Limestone. Because of incomplete samples and because of lithologic changes, the formations above the Barneston were not differentiated west of well 6. The Chase is composed mainly of limestone and dolomite, which is commonly very fine to fine grained or very finely to finely crystalline.

The Nolans Limestone, 20 to 58 feet thick, is mainly medium-gray silty dolomite and gray shale that is dolomitic in part. Some of the dolomite contains white to dark-gray chert.

The Odell Shale is 11 to 28 feet thick and consists chiefly of medium-light-gray silty dolomite and gray dolomitic or limy shale. Some medium-gray limestone is present in wells 9 and 10, and in a few wells the Odell contains small amounts of light-gray dolomitic siltstone, greenish-gray and grayish-red shale, and light-gray anhydrite. In well 7 the upper half of the Odell is anhydrite.

The Winfield Limestone, 20 to 60 feet thick, consists of medium-light-gray partly granular limestone and dolomite and some gray shale. Much of the limestone and dolomite is silty or anhydritic, and light-gray to dark-gray dense mottled or figured chert is present in the Winfield in most wells. The most common fossils in the limestone are crinoids, bryozoans, and ostracodes.

The Doyle Shale is 95 feet thick near the eastern end of the cross section (well 16), but is only about 60 to 75 feet thick in the western half of the cross section. Most of the Doyle is light-gray to medium-gray dolomite and limestone that is silty or anhydritic in part. The rest is gray, grayish-red, and greenish-gray limy or dolomitic shale and light-gray anhydrite. Because the carbonates in the Doyle are very similar to those in the adjacent formations, the upper and lower formational boundaries are located only approximately.

The Barneston Limestone, 85 to 110 feet thick, consists mainly of light-gray to pale-yellowish-brown limestone, medium-gray silty limestone, and light-gray dolomite. Part of the limestone is dolomitic in some wells, and finely oolitic and oolicastic limestone is fairly common in the upper part of the formation. The lower 25 to 40 feet of the Barneston includes much light-gray to medium-gray mottled dense to granular spicular fossiliferous chert. Fossil fragments generally are abundant in the Barneston, especially the lower part. The most common fossils are crinoids, bryozoans, fusulinids, brachiopods, and ostracodes.

The Matfield Shale is 38 to 63 feet thick and is composed of light-gray to medium-gray and pale-yellowish-brown partly silty limestone and gray, grayish-red, and greenish-gray generally limy shale. Limestone makes up a large percentage of the formation, especially in well 1 and wells 6 to 10. The base of the Matfield is difficult to determine in several wells because the basal limestone beds are similar to those at the top of the underlying Wreford Limestone.

The Wreford Limestone, 35 to 60 feet thick, consists chiefly of light-gray to pale-yellowish-brown fossiliferous limestone and some medium-gray limy shale and silty limestone. The limestone contains much light-gray to medium-dark-gray dense to granular spicular fossiliferous chert. Fossils identified in the Wreford include crinoids, fusulinids, brachiopods, bryozoans, and ostracodes.

Council Grove Group

The Council Grove Group is 305 to 386 feet thick along this cross section. These rocks crop out about 25 miles east of the cross section in northwestern Elk County, where they are divided into 14 formations. Several of the formations in the middle and lower parts of the group were traced westward and identified in well 19. These formations, in descending order, the Beattie Limestone, Eskridge Shale, Grenola Limestone, Roca Shale, and the Red Eagle Limestone, Johnson Shale, and Foraker Limestone undivided, are tentatively recognized as far west as well 14. Samples are not available for the Council Grove in wells 11, 12, and 13 and for part of the group in well 14. Only the Eskridge Shale is tentatively identified in wells 1 to 10. The rocks that compose the group are chiefly very fine to fine-

grained or very finely to finely crystalline limestone and shale, but include some finely crystalline dolomite.

That part of the Council Grove Group above the Beattie Limestone in wells 14 to 19 averages about 95 feet thick and consists almost entirely of interbedded limestone and shale. The limestone is mainly medium light gray to pale yellowish brown and is silty in part. In a few wells some limestone contains medium-gray dense spicular chert. Most of the shale is gray and limy, but grayish-red shale is at or near the top of the group in most wells on the cross section.

The Beattie Limestone, 33 to 52 feet thick, is composed mainly of light-gray to pale-yellowish-brown fossiliferous limestone that is locally cherty, silty, or finely oolitic or oolicastic. The rest of the Beattie is gray and greenish-gray mostly limy shale. Fossils commonly present in the formation include fusulinids, crinoids, bryozoans, ostracodes, and brachiopods.

The Eskridge Shale is 4 to 20 feet thick and is composed of gray, greenish-gray, and grayish-red shale. The upper part of the Eskridge contains a small amount of medium-gray silty limestone in well 19, but this limestone may be the basal bed of the overlying Beattie Limestone.

The Grenola Limestone, 41 to 50 feet thick, consists mainly of medium-gray to pale-yellowish-brown fossiliferous limestone and some gray limy shale. The most common fossils are fusulinids and crinoids.

The Roca Shale, 13 to 27 feet thick, includes about equal amounts of medium-gray to greenish-gray shale and medium-gray silty limestone. In well 19 the Roca includes pale-yellowish-brown limestone.

In wells 14 to 19 the lower part of the Council Grove Group, consisting of the Red Eagle Limestone, Johnson Shale, and Foraker Limestone, was not subdivided, because of the great similarity of these rocks. The undivided sequence is 84 to 129 feet thick and the rocks are mostly limestone but include some shale. The limestone is light gray to medium gray and pale yellowish brown, silty in part, and contains fusulinids, crinoids, and brachiopods, especially in the lower part. Most of the shale is gray and limy, but some greenish-gray and grayish-red shale is present in well 15.

The Council Grove Group west of well 14 is composed chiefly of limestone but includes minor amounts of shale and dolomite. The limestone is very similar to that in the eastern part of the cross section. The shale in wells 1 to 10 is gray, black, greenish gray, and grayish red. Beds, 3 to 30 feet thick, of pale-yellowish-brown finely crystalline dolomite are present locally. The base of the Council Grove Group is a reasonably distinct horizon except in several wells where limestone in the uppermost part of the underlying Admire Group is similar to that in the lowermost part of the Council Grove.

Admire Group

The Admire Group is 83 to 135 feet thick, but the thicknesses are only approximate because the base of the group, which marks the base of the Permian rocks, is obscure in most wells. The contact between the Admire Group and underlying Pennsylvanian rocks was extended westward from surface exposures in northwestern Elk County to well 19 by comparison of electrical logs of several wells located in the intervening area. The position of this contact is believed to be reasonably accurate in wells 19 to 17, but west of well 17 it is less accurate because of lithologic changes in Lower Permian and Upper Pennsylvanian strata and because of incomplete sample coverage in several of the wells. In a southwest-trending cross section through well 9, Lee (1949) placed the base of the Admire Group about 140 feet lower than the position shown in the present report.

The rocks of the Admire Group are mainly gray shale, medium-gray micaceous siltstone, light-gray very fine grained micaceous sandstone, and medium-gray to pale-yellowish-brown fine-grained limestone. Fusulinids and crinoids are present in some of the limestone and shale. Some grayish-red or greenish-gray shale is present in most wells. Small amounts of glauconite are in several of the limestone beds. Limestone is more common in the upper part of the Admire, and

sandstone and siltstone are more common in the middle and lower parts.

ROCKS OF PENNSYLVANIAN AGE

The rocks of Pennsylvanian age on the cross section are divided, in downward order, into the Virgil, Missouri, and Des Moines Series. The total thickness ranges from 1,319 feet in well 1 on the southeastern flank of the Central Kansas Uplift to 2,061 feet in well 12, but these thicknesses are only approximate because the upper contact is difficult to recognize, and because samples were missing for the uppermost Pennsylvanian and the Lower Permian rocks in well 12. The lower contact is marked by a major unconformity, and on this cross section rocks of Des Moines age overlie strata as young as Late Mississippian and as old as Middle Ordovician.

Virgil Series

The Virgil Series comprises, from youngest to oldest, the Wabaunsee, Shawnee, and Douglas Groups. Many of the formations in these groups were extended westward from outcrops in Elk County, described by Verville (1958, p. 17-27), to well 19 by comparison of electrical logs for wells in the intervening area. The approximate thickness of the Virgil Series ranges from 920 feet in well 1 to 1,185 feet in well 13. The series is characterized by much shale, siltstone, and sandstone in the upper and lower parts and much limestone in the middle part. The limestone is generally very fine to fine grained or very finely to finely crystalline and is similar to limestone in rocks of Permian age.

Wabaunsee Group

The Wabaunsee Group, 450 to 543 feet thick, includes 12 formations in the area of outcrop in eastern Kansas, but several of these formations could not be identified in the wells of this cross section. Along much of the cross section the Wabaunsee Group can be informally divided into three parts: an upper part consisting mainly of shale, siltstone, and sandstone; a middle part mainly of limestone and shale; and a lower part of shale, siltstone, and limestone.

The upper 95 to 165 feet of the Wabaunsee Group consist mainly of gray shale, medium-light-gray micaceous siltstone, and light-gray very fine to fine-grained micaceous sandstone, but includes some medium-gray to pale-yellowish-brown limestone. The limestone beds are generally about 2 to 6 feet thick, and several are silty or dolomitic. Fossils are fairly scarce and include chiefly crinoids and ostracodes. In some wells the upper part of the Wabaunsee also contains some greenish-gray, brownish-gray, and grayish-red shale. A thin bed of coal is present in wells 5 and 15.

The middle part of the Wabaunsee Group, 140 to 185 feet thick, is divided in most wells into, in descending order, the Zeandale Limestone, Willard Shale, Emporia Limestone, Auburn Shale, and Bern Limestone, but the formational contacts generally are obscure because of the lithologic similarity of the formations. These rocks are chiefly interbedded gray shale and medium-light-gray to brownish-gray limestone. Part of the Bern Limestone contains glauconite and some grayish-red silty limestone or oolitic limestone in several wells. Many of the limestone beds are silty, several are dolomitic, and most are locally fossiliferous. Fusulinids and crinoids are fairly common, and other fossils include ostracodes, brachiopods, bryozoans, and pelecypods. The middle part of the Wabaunsee Group also contains some medium-gray micaceous siltstone and medium-light-gray very fine to fine-grained micaceous sandstone.

The lower part of the Wabaunsee Group is 165 to 245 feet thick. It is composed of, in downward order, the Scranton Shale, Howard Limestone, and Severy Shale. The upper part of the Scranton Shale, 40 to 130 feet thick, consists of gray silty shale, micaceous siltstone, and some light-gray very fine grained sandstone and medium-light-gray to brownish-gray limestone. The lower part of the Scranton Shale, consisting of the Happy Hollow Limestone and White Cloud Shale Members, and the Howard Limestone form a dominantly limestone sequence 53 to 92 feet thick. The limestone is chiefly medium light gray to pale yellowish brown and silty, oolitic, fossilifer-

ous, or dolomitic in part. The most common fossils are fusulinids and crinoids; other forms include bryozoans, brachiopods, gastropods, and ostracodes. Interbedded with the limestone are gray and greenish-gray shale and medium-light-gray siltstone. The lowermost part of the Howard in wells 9 to 11 is black shale about 5 feet thick and, in well 10, includes a thin coal bed that may be equivalent to the Nodaway coal bed of eastern Kansas. The Severy Shale, 38 to 70 feet thick, consists chiefly of gray shale, much of which is silty and micaceous, and light-gray micaceous siltstone and very fine grained sandstone.

Shawnee Group

The Shawnee Group ranges in thickness from 323 feet in well 1 to 462 feet in well 13 and comprises, in descending order, the Topeka Limestone, Calhoun Shale, Deer Creek Limestone, Tecumseh Shale, Lecompton Limestone, Kanwaka Shale, and Oread Limestone, some of which were tentatively identified in the eastern part of the cross section.

The formations in the upper part of the Shawnee, consisting of the Topeka Limestone, Calhoun Shale, and Deer Creek Limestone, could not be differentiated. Rocks in this part of the group in wells 13 to 19 are 127 to 160 feet thick and are mainly light-gray to pale-yellowish-brown fossiliferous limestone and gray locally fossiliferous shale. The fossils include fusulinids, crinoids, ostracodes, and brachiopods. Some of the limestone in wells 15 and 16 contains light-gray to medium-dark-gray dense chert that is fossiliferous in part. The upper part of the Shawnee in wells 15 to 19 also contains beds of black and greenish-gray shale, light-gray siltstone, and light-gray very fine grained sandstone.

The middle part of the Shawnee Group in wells 16 to 19 is 113 to 184 feet thick and consists of the Tecumseh Shale and Lecompton Limestone. The Tecumseh seems to be 2 and 10 feet thick in wells 18 and 19 respectively, where it is gray and greenish-gray shale. West of well 18, the thickness increases to 62 feet in well 14, and the formation is gray shale and medium-light-gray siltstone and silty very fine grained sandstone. Some greenish-gray and yellowish-brown shale is in well 14. Except for well 9 the Tecumseh Shale is not identified west of well 13 where, according to the drillers log, it is composed of shale and limestone about 80 feet thick. The Tecumseh in well 9 of this report was identified by Lee (1949) in a cross section from Barber County to Saline County. In this well it is composed of 27 feet of light-gray very fine grained limy sandstone and gray and black shale.

The Lecompton Limestone is 105 to 150 feet thick in wells 16 to 19; it could not be identified west of well 16. The formation is mainly pale-yellowish-brown to medium-gray partly silty fossiliferous limestone and gray shale, but includes a small amount of black, greenish-gray, and grayish-red shale. The most common fossils are fusulinids, crinoids, and brachiopods. The black shale probably is equivalent to part of the Queen Hill Shale Member of the Lecompton. The upper part of the Lecompton in well 19 and the lower part in well 16 contain medium-light-gray dense chert. A thin coal bed is in the upper part in well 16.

The Kanwaka Shale is 63 feet thick in well 19 and it thins to the west; it was not identified west of well 16. Part of the thinning may be a result of lateral gradation of the upper and lower parts of the shale into limestone that is included in the Lecompton and Oread Limestones respectively. The Kanwaka is chiefly medium-gray and greenish gray shale that is limy in part. A coal bed is near the base of the formation in well 18.

The lowermost formation in the Shawnee Group, the Oread Limestone, is 70 to 100 feet thick in wells 16 to 19, but the upper part of the formation in wells 16 and 17 may be laterally equivalent to part of the overlying Kanwaka Shale of wells 18 and 19. The Oread consists chiefly of very pale orange to pale-yellowish-brown fossiliferous partly silty limestone, but it includes some gray, greenish-gray, and black shale. Crinoids and fusulinids are the most abundant fossils in the limestone. Light-gray dense chert is present in part of the limestone in wells 16 and 19. The black shale in the lower part of the formation in wells 17 to 19 is equivalent to

part of the Heebner Shale Member. To the west the identification of the Heebner is locally questionable because more than one bed of black shale is recorded near the base of the Shawnee Group in some wells, but this record may be the result of mixed or mislabeled samples.

The Shawnee Group in wells 1 to 12 is composed almost entirely of limestone, and except for the Tecumseh Shale in well 9, the group is not divided into formations. The limestone is mainly light gray to pale yellowish brown, fossiliferous, and cherty in part. The most common fossils are crinoids, fusulinids, and ostracodes, but brachiopods and bryozoans are also present. A few beds of limestone are locally silty, dolomitic, or oolitic. The chert is light gray to medium gray, dense, and locally figured or fossiliferous. The Shawnee Group on the west half of the cross section includes several beds of gray, black, and olive-gray shale that are commonly less than 5 feet thick; a few beds are as much as 22 feet thick.

Douglas Group

The Douglas Group is 147 feet thick in well 1 on the southeastern flank of the Central Kansas Uplift, 227 feet thick in well 7, and 177 feet thick in well 19 on the Nemaha Anticline. The group is not divided into formations on the cross section. The Douglas consists mainly of medium-gray to dark-gray shale and light-gray micaceous siltstone and very fine to fine-grained sandstone. Much of the sandstone is silty, limy, or dolomitic, and in general the largest percentage of sandstone is in wells 1 to 9. The Douglas also contains some greenish-gray, pale-brown, and grayish-red shale and some pale-yellowish-brown to brownish-gray limestone and dolomite. The limestone and dolomite are most common in the upper and lower parts of the group. Tentative correlation with outcrops of the Douglas Group in Elk County indicates that a 5- to 12-foot bed of limestone, present near the base of the group throughout most of the cross section, probably is the Haskell Limestone Member of the Stranger Formation. This member generally contains crinoids, fusulinids, brachiopods, and bryozoans. The Douglas Group is disconformable on strata of the Missouri Series.

Missouri Series

The Missouri Series ranges in thickness from 306 feet in well 1 to 650 feet in well 19, and in descending order consists of the Lansing, Kansas City, and Pleasanton Groups. The Pedee Group, normally the upper unit of the Missouri Series, is not identified on the cross section. It probably was removed by erosion before rocks of the Douglas Group were deposited. Lee (1949) did not identify rocks of Pedee age in the cross section from Barber County to Saline County. The Missouri Series is composed chiefly of very fine to fine-grained or very finely to finely crystalline limestone that is generally more cherty and oolitic than the rocks of Virgil age.

Lansing Group

The Lansing Group is 102 feet thick in well 1 and thickens to 232 feet in well 18. It was not divided into formations on the cross section. Except in wells 14 to 17, the group is principally pale-yellowish-brown fossiliferous limestone that locally contains fine to medium oolites and oolicasts. Fossils in the Lansing include crinoids, fusulinids, brachiopods, bryozoans, and ostracodes. Much of the limestone west of well 13 includes chert that is light gray to grayish black, dense, fossiliferous, spicular, and mottled in part. The rest of the Lansing is mainly gray shale, which in wells 14 to 17 constitutes more than half of the group. The base of the Lansing is readily identified in the eastern part of the cross section, but to the west of well 12 it is obscure, because the upper part of the Kansas City Group is mainly limestone that is lithologically very similar to limestone in the Lansing.

Kansas City Group

The Kansas City Group is 186 feet thick in well 1 and thickens to 385 feet in well 16; it is mainly limestone. East of well 6 the upper part of the group, 68 to 185 feet thick, was divided in some wells into the Bonner Springs Shale, Wyandotte Limestone, and Lane Shale. Only the base of the Lane Shale was tentatively identified in wells 7 to 11, and the Wyandotte was tentatively

differentiated only in wells 14 to 17. East of well 12 the upper part of the group consists chiefly of gray partly limy shale but contains small amounts of pale-yellowish-brown to medium-dark-gray generally silty limestone and greenish-gray to brownish-gray shale. Some of the limestone and shale contains glauconite in wells 14 to 16. A thin coal bed is present in well 19 about 40 feet below the top of the group. In well 12 the Wyandotte Limestone and Lane Shale, undivided, are chiefly light-gray to pale-yellowish-brown fossiliferous limestone. To the west of well 12 the upper part of the Kansas City is almost entirely very pale orange to brownish-gray partly cherty and fossiliferous limestone. The chert is mostly medium gray to dark gray, dense, and fossiliferous in part.

Limestone is the principal rock in the Kansas City Group in wells 1 to 6 and below the Lane Shale in wells 7 to 19. The limestone is mostly very pale orange to brownish gray, and much of it is oolitic or oolicastic, cherty, fossiliferous, or silty. Most of the chert is light gray to medium gray and pale yellowish brown, spicular, and dense, but some is dark gray to black. The group includes numerous beds of gray shale and a few beds of black, greenish-gray, and moderate-brown shale. Most of these beds are less than 5 feet thick, but some are as much as 15 feet thick. The middle and lower parts of the group are characterized by beds of finely to coarsely oolitic and oolicastic limestone and black shale. The most common fossils in the rocks of the Kansas City Group are crinoids, fusulinids, ostracodes, and brachiopods; some are enclosed in chert. The upper part of the group in wells 15 and 16 also contains bryozoans, pelecypods, and gastropods.

Pleasanton Group

The Pleasanton Group ranges in thickness from 18 feet in well 1 to 107 feet in well 15; the drillers log was used to determine the thickness in the latter well. The greatest thickness according to sample logs is 93 feet in well 13. The group is mainly gray, greenish-gray, and grayish-red partly limy and silty shale, but the group commonly includes one bed, and locally two or three beds, of pale-yellowish-brown to medium-dark-gray partly silty limestone. Some light-gray to greenish-gray siltstone generally occurs east of well 7, and a small amount of very fine grained silty sandstone is in wells 14 and 18.

Des Moines Series

The Des Moines Series is 85 to 315 feet thick, and except in well 1 it is divided into the Marmaton Group and the underlying Cherokee Group. These rocks include much limestone in the upper part and much shale in the lower part. The limestone is mostly very fine to fine grained or very finely to finely crystalline.

Marmaton Group

The Marmaton Group, described in detail from exposures in eastern Kansas by Jewett (1945), ranges in thickness from 46 feet in well 3 to 126 feet in wells 11 and 12. Most of the rocks of this group were traced westward from exposures in Neosho and Crawford Counties to well 19 by correlation of electrical and radioactivity logs for wells in the intervening area. The three formations in the upper part of the Marmaton Group, in descending order, the Holdenville Shale, Lenapah Limestone, and Nowata Shale, seemingly are absent along the cross section, probably because of pre-Pleasanton erosion. If any of these rocks are present, they could not be differentiated from rocks of the Pleasanton Group. Other rocks of the Marmaton Group are present in wells 3 to 19, but the only formation identified was the Altamont Limestone in wells 16 to 19.

The Marmaton Group consists of interbedded limestone and shale but includes a small amount of siltstone in several wells. The limestone is pale yellowish brown to brownish gray, dense in part, silty in part, and locally oolitic or oolicastic. Fossils are chiefly crinoids but there are some fusulinids. The shale is mostly gray, black, and greenish gray, but some is grayish red in several wells in the western part of the cross section. A thin bed of coal underlies the Altamont Limestone in well 19.

Cherokee Group

The Cherokee Group ranges in thickness from 39 feet in well 3 to 189 feet in well 12. It consists

predominantly of gray, black, greenish-gray, moderate-brown, and grayish-red shale. The Cherokee generally contains one or more beds of medium-light-gray to brownish-gray partly silty limestone, which can be correlated locally east of well 6. A small part of the Cherokee is light-gray to olive-gray siltstone and light-gray, greenish-gray, and grayish-red very fine to medium-grained sandstone. A thin coal bed is in the upper part in a few wells.

A conglomerate composed mainly of chert fragments in a greenish-gray clayey or silty matrix is in the lower part of the Cherokee Group in many of the wells. In some wells the conglomerate contains medium to very coarse grains of quartz, feldspar, and igneous or metamorphic rock. Chert fragments are very light gray to dark gray, pale yellowish brown, greenish gray, pale red to reddish brown, granular to dense, and spicular, glauconitic, or tripolitic in part. It closely resembles the chert in the underlying rocks of Mississippian age. Where the conglomerate is entirely chert fragments lying directly on weathered cherty rocks of Mississippian age, the lower Pennsylvanian contact is obscure and is located only approximately. Drillers commonly include the conglomerate with the weathered very cherty limestone of Mississippian age and call it "Mississippi chat". Other names that have been applied to the conglomerate include "Pennsylvanian basal conglomerate" and "Sooy conglomerate".

ROCKS OF MISSISSIPPIAN AGE

Rocks of Mississippian age in Kansas are divided into the Upper and Lower Mississippian Series. The Upper Mississippian Series is equivalent to the Chester and Meramec Series of the Mississippi Valley region, and the Lower Mississippian Series is equivalent to the Osage and Kinderhook Series. Along this cross section, only rocks of Meramec and Osage age were recognized. Rocks of Mississippian age are absent at both ends of the cross section (wells 1 and 19) because of pre-Cherokee uplift and erosion; the maximum thickness of these rocks is 408 feet in well 12.

Upper Mississippian Series

Rocks of Meramec age were identified in well 9 by Lee (1949). These rocks are recognized only in wells 9 to 12 where they are 50 to 78 feet thick. Here they consist almost entirely of limestone which is light gray to pale yellowish brown, finely to medium crystalline, cherty, and partly glauconitic. The chert is white to light gray, dense to granular, and spicular or tripolitic in part. A small amount of light-olive-gray and pale-yellowish-brown finely crystalline dolomite also is present. The contact between the Upper and Lower Mississippian Series is difficult to determine and is located only approximately.

Lower Mississippian Series

The Lower Mississippian Series along this cross section is represented by rocks of Osage age. These rocks, which attain a maximum thickness of 335 feet in well 12, are composed of limestone, dolomite, and some shale. Most of the limestone is light gray to pale yellowish brown, finely to medium crystalline, fossiliferous, and cherty, but some is medium gray to brownish gray and silty. Crinoids are the most common fossils. A bed of finely to coarsely oolitic limestone is about 43 to 55 feet below the top of the Lower Mississippian Series in wells 7 to 9, and medium to coarsely oolitic limestone is the basal bed in well 18. Some grayish-red and greenish-gray fine-grained silty limestone is present about 30 to 90 feet above the base in wells 11 to 14. The dolomite is light gray to pale yellowish brown, very fine grained to finely crystalline, and commonly cherty. Glauconite is locally present in very small amounts in a few beds of limestone and dolomite in the upper part of the rocks of Osage age. The lower part of the rocks of Osage age in well 3 and wells 11 to 18 include some gray, greenish-gray, brownish-gray, and grayish-red shale in beds as much as 23 feet thick. Except in the lower part, chert is abundant in most wells. Generally the chert is white to medium light gray, dense to granular, opaque to semitranslucent, and spicular or tripolitic in part. In many wells chert fragments are all that remain of the samples from

TABLE 1.—*Correlation chart showing the stratigraphic units differentiated along the cross section as classified by the U.S. Geological Survey and the classification of the State Geological Survey of Kansas.*

THIS REPORT				STATE GEOLOGICAL SURVEY OF KANSAS (MODIFIED FROM JEWETT, 1959)					
SYSTEM	SERIES	GROUP		SYSTEM	SERIES	STAGE	GROUP	SUBGROUP	
PERMIAN	LOWER	NIPPEWALLA	Absent	PERMIAN	MIDDLE	GUADALUPIAN	NIPPEWALLA		Dog Creek Formation
									Blaine Gypsum
									Flowerpot Shale
									Cedar Hills Sandstone
									Salt Plain Siltstone
			Harper Siltstone			LEONARDIAN			Harper Siltstone
		SUMNER	Stone Corral Formation				SUMNER		Stone Corral Formation
			Ninnescah Shale						Ninnescah Shale
			Wellington Formation						Wellington Formation
		CHASE	Nolans Limestone		LOWER	WOLFCAMPIAN	CHASE		Nolans Limestone
			Odell Shale						Odell Shale
			Winfield Limestone						Winfield Limestone
			Doyle Shale						Doyle Shale
			Barneston Limestone						Barneston Limestone
			Matfield Shale						Matfield Shale
			Wreford Limestone						Wreford Limestone
		COUNCIL GROVE	Undifferentiated				COUNCIL GROVE		Speiser Shale
									Funston Limestone
									Blue Rapids Shale
									Crouse Limestone
									Easly Creek Shale
									Bader Limestone
									Stearns Shale
			Beattie Limestone						Beattie Limestone
			Eskridge Shale						Eskridge Shale
			Grenola Limestone						Grenola Limestone
			Roca Shale						Roca Shale
			Red Eagle Limestone Johnson Shale, and Foraker Limestone, undifferentiated						Red Eagle Limestone
									Johnson Shale
									Foraker Limestone
		ADMIRE	Undifferentiated				ADMIRE		Janesville Shale
									Falls City Limestone
									Onaga Shale
								WREFORDSON	Wood Siding Formation
									Root Shale
			Undifferentiated						

PENNSYLVANIAN		MISSOURI	PLEASANTON		Undifferentiated
	DES MOINES				Included in Pleasanton Group if present
		MARMATON			Altamont Limestone
					Undifferentiated
		CHEROKEE			Undifferentiated
					Absent
MISSISSIPPIAN		UPPER			Absent
					? ?
					Undifferentiated
		LOWER			Undifferentiated
					Absent
DEV. AND MISS.					Chattanooga Shale

PENNSYLVANIAN		UPPER			
	MIDDLE		MISSOURIAN	PLEASANTON	Checkerboard Limestone
					Hepler Sandstone
		DESMOINESIAN			Holdenville Shale
					Lenapah Limestone
					Nowata Shale
					Altamont Limestone
					Bandera Shale
					Pawnee Limestone
					Labette Shale
		MARMATON			Fort Scott Limestone
		CHEROKEE			Cabaniss Formation
					Krebs Formation
		ATOKAN (BENDIAN)			
	LOWER	MORROWAN			Kearny Formation
MISSISSIPPIAN		UPPER	CHESTERAN		
			MERAMECIAN		Ste. Genevieve Limestone
					St. Louis Limestone
					Salem Limestone
					Warsaw Limestone
					Cowley Formation
	LOWER	OSAGIAN			Keokuk Limestone
					Burlington Limestone
					Reeds Spring Limestone
		KINDERHOOKIAN			St. Joe Limestone
					Gilmore City Limestone
					Sedalia Dolomite
					Chouteau Limestone
					Boice Shale
DEV. OR MISS.					Chattanooga Shale

PENNSYLVANIAN	VIRGIL	ADMIRE	Undifferentiated
		WABAUNSEE	Undifferentiated
			Zeandale Limestone
			Willard Shale
			Emporia Limestone
			Auburn Shale
			Bern Limestone
			Upper part of Scranton Shale
			Happy Hollow Limestone and White Cloud Shale Members of Scranton Shale and Howard Limestone
			Severy Shale
		SHAWNEE	Topeka Limestone, Calhoun Shale, and Deer Creek Limestone, undifferentiated
			Tecumseh Shale
			Lecompton Limestone
			Kanwaka Shale
			Oread Limestone
		DOUGLAS	Undifferentiated
	MISSOURI		Absent
		LANSING	Undifferentiated
		KANSAS CITY	Bonner Springs Shale
			Wyandotte Limestone
			Lane Shale
			Undifferentiated

PENNSYLVANIAN	UPPER	VIRGILIAN	ADMIRE		Janesville Shale
					Falls City Limestone
					Onaga Shale
			WABAUNSEE	RICHARDSON	Wood Siding Formation
					Root Shale
					Stotler Limestone
					Pillsbury Shale
					Zeandale Limestone
				NEMAHA	Willard Shale
					Emporia Limestone
					Auburn Shale
					Bern Limestone
				SACFOX	Scranton Shale
					Howard Limestone
					Severy Shale
			SHAWNEE		Topeka Limestone
					Calhoun Shale
					Deer Creek Limestone
					Tecumseh Shale
					Lecompton Limestone
					Kanwaka Shale
					Oread Limestone
			DOUGLAS		Lawrence Shale
					Stranger Formation
		MISSOURIAN	PEDEE		Iatan Limestone
					Weston Shale
			LANSING		Stanton Limestone
					Vilas Shale
					Plattsburg Limestone
			KANSAS CITY	ZARAH	Bonner Springs Shale
					Wyandotte Limestone
					Lane Shale
				LINN	Iola Limestone
					Chanute Shale
					Drum Limestone
					Cherryvale Shale
				BRONSON	Dennis Limestone
					Galesburg Shale
					Swope Limestone
					Ladore Shale
					Hertha Limestone

DEV. AND MISS.			Chattanooga Shale
DEVONIAN		HUNTON	Absent
SILURIAN			
ORDOVICIAN	UPPER		Sylvan Shale
	MIDDLE AND UPPER		Viola Limestone
	MIDDLE	SIMPSON	Undifferentiated
	LOWER	ARBUCKLE	Cotter and Jefferson City Dolomites, undifferentiated
			Roubidoux Dolomite
			Absent
CAMBRIAN	UPPER		Bonneterre Dolomite
			Reagan Sandstone
PRECAMBRIAN			

		KIND		Chouteau Limestone
				Boice Shale
DEV. OR MISS.				Chattanooga Shale
DEVONIAN	MIDDLE		"HUNTON"	
SILURIAN	LOWER			
				Chimneyhill Dolomite
ORDOVICIAN	UPPER			Maquoketa (Sylvan) Shale
	MIDDLE			Viola (Kimmswick) Limestone
			SIMPSON	Platteville Formation
				St. Peter Sandstone
	LOWER		ARBUCKLE	Cotter and Jefferson City Dolomites
				Roubidoux Formation
				Gasconade Dolomite and Van Buren Formation
CAMBRIAN	UPPER			Eminence Dolomite
				Bonneterre Dolomite
				Lamotte (Reagan) Sandstone
PRECAMBRIAN				

parts of the rocks of Osage age. In these wells any limestone or dolomite that was associated with the chert was drilled to very small particles and lost when the samples were washed.

ROCKS OF MISSISSIPPIAN AND DEVONIAN AGE

The Chattanooga Shale of Devonian and Mississippian age is in wells 1 to 18 but is absent in well 19 because of removal by pre-Cherokee erosion. Except for well 1, the thickness of the formation is considerably greater in the western half of the cross section, attaining a maximum of 226 feet in well 4. The Chattanooga is composed mainly of medium-dark-gray to dark-gray shale that is locally silty or dolomitic in part. In most wells it contains a thin basal sandstone. Some medium-gray to dark-brownish-gray limy or dolomitic siltstone is locally present in the lower half of the formation. A bed of pale-yellowish-brown to brownish-gray partly silty very finely crystalline limestone 15 feet thick is near the middle of the Chattanooga in well 4, and this bed is probably equivalent to a bed of medium-gray granular very silty limestone 5 feet thick in the lower part in well 3. Dark-brown spore cases and pyrite are fairly common in the Chattanooga Shale, especially in the lower part.

The basal sandstone of the Chattanooga, locally called the Misener sand, is as much as 7 feet thick but is absent in wells 3, 4, and 11. The sandstone is white to medium gray, very fine to medium grained, quartzose, and commonly pyritic and glassy; porosity in most wells seems to be low. Scattered coarse sand grains are locally present, and some sand grains show secondary enlargement. The Misener sand unconformably overlies rocks of Ordovician age.

ROCKS OF ORDOVICIAN AGE

Rocks of Ordovician age, present in wells 2 to 19, were completely penetrated in wells 2 and 13 where they are about 615 and 570 feet thick, respectively. These rocks are divided, in downward order, into the Sylvan Shale, Viola Limestone, Simpson Group, and the upper part of the Arbuckle Group. The Arbuckle is tentatively divided into the Cotter and Jefferson City Dolomites, undifferentiated, and the Roubidoux Dolomite.

Sylvan Shale

The Sylvan Shale of Late Ordovician age is in wells 6 to 9 and well 11 and may be in well 10. The formation ranges from 15 to 63 feet in thickness and consists principally of gray partly dolomitic shale that locally has a slight greenish tint. In well 9 the upper 32 feet is light-gray to pale-yellowish-brown cherty fine-grained dolomite. Although this dolomite is included in the Sylvan in accordance with Lee (1949), it may be a part of the Hunton Group of Silurian and Devonian age. The Sylvan in well 11 is medium-dark-gray very silty fine-grained dolomite and very dolomitic shale.

Viola Limestone

The Viola Limestone of Middle and Late Ordovician age is in wells 2 to 16 and is mostly limestone and dolomite. The formation is about 140 feet thick in well 2 (top determined from drillers log), only 44 feet thick 13 miles to the east in well 4, and about 2 feet thick in well 16 near the east end of the cross section. The limestone is chiefly light gray to very pale orange, finely to medium crystalline, and partly cherty in wells 2 to 4. The dolomite is light gray to medium gray and pale yellowish brown, finely to medium crystalline, and partly cherty in several wells. The chert in the Viola is white to medium gray and brownish gray, commonly dense, and spicular in part; some has very small black specks.

Simpson Group

The Simpson Group of Middle Ordovician age is in wells 2 to 19, where it consists mainly of sandstone and gray and greenish-gray shale. The group ranges in thickness from 32 feet in well 18 to 99 feet in well 11. Most of the sandstone is white to medium light gray, very fine to medium grained, subrounded, and dolomitic or glauconitic in part. Some of the grains are rounded and frosted. Light-gray to medium-dark-gray sandy

chert is locally present in the upper sandstone beds. In several wells the Simpson contains a small amount of light-gray to pale-yellowish-brown silty or sandy finely crystalline dolomite and pale-yellowish-brown locally sandy finely crystalline limestone.

Arbuckle Group

The Arbuckle Group is in all wells except 1, 15, and 19, but was completely penetrated only in wells 2 and 13 where it is 409 and 467 feet thick, respectively. The group is chiefly dolomite and includes, in descending order, the Cotter and Jefferson City Dolomites, undifferentiated, and the Roubidoux Dolomite, all of Early Ordovician age. The lower part of the Arbuckle Group, consisting of the Gasconade Dolomite and Van Buren Formation of Early Ordovician age and the Eminence Dolomite of Late Cambrian age, was not recognized along the cross section. The subdivision of the pre-Simpson rocks follows that of Lee (1956, table 1) in the Salina Basin except that the Bonneterre Dolomite of Late Cambrian age is not included in the Arbuckle Group.

The Cotter and Jefferson City Dolomites are about 285 feet thick in well 2 and 333 feet thick in well 13; elsewhere on the cross section only the upper part of these rocks was penetrated. These formations are composed mostly of dolomite that is light gray to pale yellowish brown, finely to medium crystalline, and cherty. Most of the chert is white to medium light gray, dense, and translucent to opaque, and some is oolitic. Some of the dolomite contains scattered rounded fine to medium quartz grains and masses of small quartz crystals. In well 14 a 7-foot bed of oolicastic dolomite occurs about 32 feet below the top. A bed of white glassy fine- to medium-grained sandstone, about 10 feet thick, is present in well 13. Many of the sand grains are angular and seem to show secondary enlargement. A very small part of the Cotter and Jefferson City Dolomites is gray and greenish-gray locally sandy shale.

The Roubidoux Dolomite is about 124 feet thick in well 2 and 134 feet thick in well 13. It is mainly light-gray to very pale orange finely to medium-crystalline dolomite that is cherty and sandy in part. The uppermost bed of the formation in well 13 is white glassy angular fine- to medium-grained sandstone about 8 feet thick. The chert in the Roubidoux is white to light gray, dense, commonly translucent, and oolitic in a small part. Most of the Roubidoux Dolomite in wells 13 and 2 was included with the Cotter and Jefferson City Dolomites by Keroher and Kirby (1948, p. 114, fig. 9). The Roubidoux rests unconformably on the Bonneterre Dolomite.

ROCKS OF CAMBRIAN AGE

Bonneterre Dolomite

The Bonneterre Dolomite of Late Cambrian age, tentatively identified on the cross section, is 259 feet thick in well 2 and 240 feet thick in well 13, and is mostly dolomite. In well 13 most of the dolomite is light gray to very pale orange, medium crystalline, and cherty in part. Fine to medium grains of quartz sand are scattered in some beds and abundant in others of the formation. The chert, which is most abundant in the uppermost and lower parts, is light gray and commonly dense. Fragments of glassy quartz and small quartz crystals are fairly common. Several thin beds of gray shale are present in the Bonneterre in well 13, and one of these is sandy and glauconitic. Samples from the Bonneterre in well 2 are composed of very small fragments and thus are difficult to study. The dolomite seems to be very light gray to very pale orange, very finely to medium crystalline, and slightly sandy in the lower part. Although the Bonneterre characteristically contains glauconite in and adjacent to the Salina Basin (Lee, 1956, p. 27), glauconite seems to be absent in wells 2 and 13. Rocks included in the Bonneterre Dolomite of well 13 were assigned to the Roubidoux Dolomite, Gasconade Dolomite, and the upper part of the Van Buren Formation by Keroher and Kirby (1948, p. 114). In eastern Stafford County (well 2) Keroher and Kirby (1948, fig. 4 to 8) restricted the Bonneterre to only the lower part of the Bonneterre of this report and included the upper part in the Roubidoux Dolomite. The Bonneterre Dolomite is conformable on the Reagan Sandstone.

Reagan Sandstone

The Reagan Sandstone of Late Cambrian age is 31 feet thick in well 2 and 60 feet thick in well 13, and is mainly light-gray subangular to subrounded fine- to medium-grained sandstone. The sandstone becomes coarser downward; in well 13 the lower part is medium to very coarse grained and contains fragments of metamorphic? rocks. Some of the quartz grains show secondary enlargement. The Reagan in well 13 includes two thin beds of gray shale and a thin bed of medium-gray medium-crystalline dolomite. Keroher and Kirby (1948, p. 115) questionably identified the sandstone in well 13 as the Gunter Sandstone Member of the Van Buren Formation (Lower Ordovician). The Reagan Sandstone rests unconformably on Precambrian rocks.

ROCKS OF PRECAMBRIAN AGE

Rocks of Precambrian age were penetrated for 9 feet in well 2 and 333 feet in well 13. In well 2 the rocks are pink and red granite, and in well 13 they are light-gray quartzite and light-gray and pink granite.

MAJOR STRUCTURAL FEATURES

The cross section in this report is in the north-central part of the Sedgwick Basin (index map, Pl. 1), which structurally is a northward extension of the northern platform of the Anadarko Basin of Oklahoma. The Sedgwick Basin is bounded on the east by the Nemaha Anticline and on the west by the southern part of the Central Kansas Uplift and by the Pratt Anticline. The northern boundary is a low southeast-trending arch, the Wilson-Burns Element of Koester (1935, p. 1419), that extends through central McPherson County. Maximum structural relief on the top of the Precambrian rocks in the Sedgwick Basin, measured from a high point on the Nemaha Anticline in western Chase County to the structurally lowest point in the basin at the Oklahoma line, is more than 4,500 feet (Farquhar, 1957, pl. 1). The structural development of the Salina Basin and adjacent areas, including the northern part of the Sedgwick Basin, has been described by Lee (1956). Only a brief description of the major structural features is given in this report.

At the east end of the cross section well 19 is located on the Augusta Anticline, which is a part of the Nemaha Anticline. The principal uplift that formed the Augusta Anticline occurred after the rocks of Mississippian age were deposited and before the Cherokee Group of Des Moines age was laid down. The thinning of rocks of Mississippian age between wells 17 and 19 on the cross section and the absence of rocks of Mississippian age and the Chattanooga Shale in well 19 are a result of erosion after that structural movement. In that well the Cherokee Group overlies the Simpson Group of Ordovician age. Elsewhere on the Augusta Anticline, pre-Cherokee erosion removed the Simpson Group and at least 400 feet of the Arbuckle Group (Berry and Harper, 1948, p. 216).

Well 8 of the cross section is located on the south end of the Voshell Anticline, a prominent subsurface structural feature in the northern part of the Sedgwick Basin that is subparallel to the Nemaha Anticline. According to Bunte and Fortier (1941, p. 110, 112), the Voshell Anticline probably was formed contemporaneously with the Nemaha Anticline, and pre-Cherokee erosion has removed most and locally all the limestone of Mississippian age from parts of the anticline. Thinning of rocks of Mississippian age does occur between wells 9 and 8, but in well 7 these rocks are almost the same thickness as in well 8.

The west end of the cross section is located on the southeastern flank of the Central Kansas Uplift, a large structural feature that has been described by Koester (1935). According to Lee (1953, p. 20), the Central Kansas Uplift was in existence before Mississippian time, had its major development at the end of the Mississippian, and continued to rise, but more slowly, during Middle and Late Pennsylvanian and Early Permian time. In the area around well 1, rocks of Mississippian age and most of the Chattanooga Shale (Devon-

ian and Mississippian) were removed by erosion before rocks of Des Moines age were deposited. Continued elevation of the Central Kansas Uplift during Pennsylvanian time is indicated on the cross section by westward thinning of rocks of Des Moines age and, to a lesser extent, rocks of Missouri and Virgil age. Rocks of Permian age below the Wellington Formation are relatively uniform in thickness and composition on the western part of the cross section, which probably indicates that the uplift was inactive during pre-Wellington post-Virgil time.

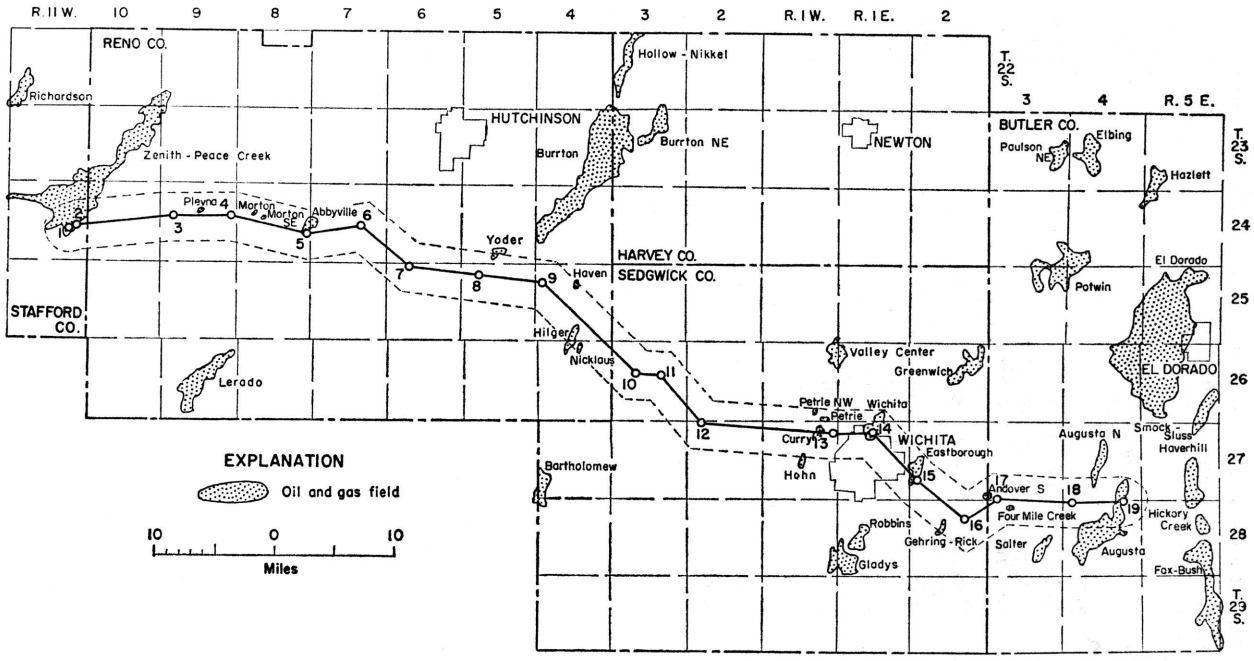

FIG. 1.—Map showing oil and gas fields within 2 miles of the cross section and selected fields in adjacent areas. (Modified from Goebel and others, 1960, pl. 1 and 2.)

OIL AND GAS

Exploration for oil and gas in the area adjacent to this cross section began about 1904, and discovery of oil and gas in commercial quantities was first made in the Augusta field in 1914 (Berry and Harper, 1948, p. 213, 215). Many additional fields have been discovered since 1914, and the location of these fields along the cross section and in adjacent areas is shown on Figure 1. Data on the oil and gas production from the fields located either entirely or partly within 2 miles of the cross section are summarized in Table 2.

Oil or gas is produced from rocks of Pennsylvanian, Mississippian, Devonian, and Ordovician ages in the fields listed in Table 2. The largest production, however, has been from the rocks of Ordovician age. Rocks of Permian age below the Sumner Group include much limestone and some sandstone in the lower part, but production of oil or gas from these beds has been very small in the area adjacent to the cross section. Berry and Harper (1948, p. 220) report small amounts of helium- and nitrogen-bearing gas in the Augusta field at depths of 450 to 550 feet. This gas is probably from rocks of the lower part of the Council Grove Group and the Admire Group. In the El Dorado oil and gas field, located on the Nemaha Anticline several miles north of the Augusta fields, Fath (1921, p. 76) recorded a small amount of oil production and a show of gas from rocks that seem to be in the Admire Group.

TABLE 2.—*Oil and gas production within 2 miles of cross section as of December 31, 1959*

(Data from Goebel and others, 1960)

Field and year of discovery	Location of discovery well			Cumulative oil production to Dec. 31, 1959, thous. bbl.	Producing rocks and age	Approximate depth to producing zones, ft.	Principal production
	Sec.	T.	R.				
					BUTLER COUNTY		
Andover South (?)	31	27S.	3E.	——	Stalnaker sand of local usage, Pennsylvanian	2,006	Gas
Augusta (1914)	21	28S.	4E.	39,784	Shawnee and Douglas Groups, Pennsylvanian[a]	1,400	Gas
					Lansing Group, Pennsylvanian	1,700	Oil, Gas
					Kansas City Group, Pennsylvanian	2,000	Oil
					Marmaton Group, Pennsylvanian	2,200	Oil
					Simpson Group, Ordovician	2,445	Oil
					Arbuckle Group, Cambrian and Ordovician	2,600	Oil
Augusta North (1914)	28	27S.	4E.	15,306	Lansing Group, Pennsylvanian	1,650	Oil
					Kansas City Group, Pennsylvanian	1,950	Oil
					Simpson Group, Ordovician	2,380	Oil
					Arbuckle Group, Cambrian and Ordovician	2,410	Oil
Four Mile Creek (1951)	5	28S.	3E.	254	Simpson Group, Ordovician	3,069	Oil
					RENO COUNTY		
Abbyville (1927)	24	24S.	8W.	1,072	Kansas City Group, Pennsylvanian[b]	3,540	Oil
Haven (1951)	9	25S.	4W.	29	Simpson Group, Ordovician	3,977	Oil
Hilger (1934)	16	26S.	4W.	4,855	Viola Limestone, Ordovician	4,062	Oil
Morton (1942)	17	24S.	8W.	54	Lansing and Kansas City Groups, Pennsylvanian	3,180	Oil
Morton Southeast (1951)	16	24S.	8W.	18	do	3,423	Oil
Nicklaus (1952)	3	26S.	4W.	181	do	3,249	Oil
Plevna (1959)	15	24S.	9W.	——	Rocks of Mississippian age	3,765	Gas
Yoder (1935)	34	24S.	5W.	——	"chat", Mississippian	3,402	Gas
				93	do	3,450	Oil
					SEDGWICK COUNTY		
Curry (1947)	11	27S.	1W.	716	Lansing and Kansas City Groups, Pennsylvanian	2,715	Oil
Eastborough (1929)	19	27S.	2E.	9,186	"chat", Mississippian	2,956	Oil
					Viola Limestone, Ordovician	3,238	Oil
Gehring-Rick (1952)	16	28S.	2E.	23	Rocks of Mississippian age	2,950	Oil
Hohn (1945)	22	27S.	1W.	149	Lansing and Kansas City Groups, Pennsylvanian	2,779	Oil
Petrie (1945)	36	26S.	1W.	157	Viola Limestone, Ordovician	3,387	Oil
Petrie Northwest (1951)	35	26S.	1W.	42	do	3,445	Oil
Wichita (1957)	4	27S.	1E.	871	do	3,325	Oil
					Simpson Group, Ordovician	3,345	Oil
					STAFFORD AND RENO COUNTIES		
Zenith-Peace Creek (1937)	23	24S.	11W.	40,345	Lansing and Kansas City Groups, Pennsylvanian	3,481	Oil
					Misener sand, Devonian and Mississippian	3,800	Oil
					Sylvan Shale (Maquoketa Shale of eastern Kansas), Ordovician[c]	3,830	Oil
					Viola Limestone, Ordovician	3,860	Oil, Gas

[a] Production is listed by Berry and Harper (1948, p. 220) from Douglas Group but is in part from the Oread Limestone of the Shawnee Group.

[b] Kansas Geological Society, 1956.

[c] Imbt, 1941.

Oil that has been produced in large amounts from rocks of Pennsylvanian age in fields on or near the cross section is primarily from porous, locally oolitic limestones in the Lansing and Kansas City Groups. Gas has been produced in the Augusta fields from the Oread Limestone of the Shawnee Group of this report and from sandstone in the Douglas Group, and shows of gas have been found in the rest of the Shawnee Group (Berry and Harper, 1948, p. 220). In the El Dorado field, oil or gas has been produced from beds of sandstone and limestone currently placed in the Wabaunsee, Shawnee, and Douglas Groups (Fath, 1921, p. 77-81; Reeves, 1929, p. 166). The Marmaton Group has yielded some oil in the Augusta fields (Berry and Harper, 1948, p. 222), and lenses of sandstone in the Cherokee Group have been the reservoir of much oil in areas east of the cross section (Bass, 1936). Oil or gas production from the chert conglomerate at the base of the Cherokee Group is locally included with production from rocks of Mississippian age because of the difficulty in separating the conglomerate from underlying weathered chert of Mississippian age.

The rocks of Mississippian age yield oil or gas in four fields along the cross section and in numerous other fields in the north-central part of the Sedgwick Basin. The producing zone in many of the fields, commonly called the "Mississippi chat" by drillers, is weathered chert that is porous and tripolitic in part. Oil shows or staining was reported in drillers logs or was seen by the author in the samples from the "chat" in wells 3, 4, 8, 15, and 16.

The Misener sand, which lies at the base of the Chattanooga Shale of Devonian and Mississippian age, has yielded oil in the southern part of the Zenith-Peace Creek field on the southeastern flank of the Central Kansas Uplift. This field, which was discovered by the drilling of well 1 of the cross section, is a stratigraphic trap that is productive from the Misener sand, the Sylvan Shale, and the Viola Limestone (Imbt, 1941; Kornfeld, 1943). Well 2, also located in the Zenith-Peace Creek field, probably produced oil from the Misener. No oil shows or stains were seen or reported in the Misener in the other wells on the cross section.

The Hunton Group of Silurian and Devonian age was not identified on the cross section, but petroleum production from these rocks has been reported from several fields in the northern part of the Sedgwick Basin, especially along the Voshell Anticline.

Rocks of Ordovician age that yield oil or gas in fields near the cross section include the Sylvan Shale, Viola Limestone, Simpson Group, and Arbuckle Group. Oil has been produced from porous dolomite and dolomitic limestone in the lower part of the Sylvan Shale in the southern part of the Zenith-Peace Creek field (Imbt, 1941, p. 147). One of the most prolific oil reservoirs is the Viola Limestone, which has been found productive in six fields along the cross section. The Simpson Group yields oil in five fields, the larger of which are the Augusta and Augusta North fields. A large amount of oil has been produced from the Arbuckle Group in the Augusta and Augusta North fields, but this group has yielded little or no oil in the other fields along the cross section. Part of the oil production assigned to the Arbuckle Group may be derived from strata tentatively correlated with the Bonneterre Dolomite of Cambrian age, which is included in the Arbuckle Group by many geologists.

A large part of the Paleozoic rocks beneath the Wellington Formation of Early Permian age consists of limestone, dolomite, and sandstone, and these rocks are potential reservoirs for oil and gas where conditions of porosity, permeability, and structure are suitable. Future petroleum production is likely to be controlled in great part by variations in porosity and permeability, and structural closure probably will be of secondary importance.

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APPENDIX

Detailed sample logs for the 19 wells on the cross section are included so that lithologic data not shown on the cross section will be available to the reader who wishes to know more about the lithology of the rocks or to make different stratigraphic correlations. Data concerning reported oil or gas shows, oil stains, and oil production are from drillers logs or completion reports in the files of the State Geological Survey of Kansas. The lithologic descriptions are abbreviated as shown in Table 3. The sample logs are numbered and listed in the west-to-east numerical order shown on the cross section. The tops of stratigraphic units are indicated in the logs, and the depths to the bases of named units are given if the units are directly underlain by unnamed units of equal stratigraphic rank.

TABLE 3.—*Abbreviations used in lithologic descriptions of well samples*
(Mitchell and Maher, 1957)

About	abt.	Gastropod	Gast.	Probable, probably	prob.
Above	abv.	Glassy	gl.	Pseudo-	psdo.
Abundant	abnt.	Glauconite, glauconitic	glau.	Pyrite, pyritized	pyr.
Amount	amt.	Good	g.	Quartz	qtz.
Angular	ang.	Grain, grained	gr.	Quartzite	qtzt.
Anhydrite, anhydritic	anhy.	Granite	grnt.	Quartzose	qtzs.
Argillaceous	arg.	Granular	gran.	Rhomb, rhombic	rhmb.
Asphalt, asphaltic	asph.	Gray	gy.	Round, rounded	rd.
Bedded	bdd.	Green	gn.	Sample	spl.
Bedding	bdg.	Gypsum, gypsiferous	gyp.	Sand	sd.
Black	blk.	Hard	hd.	Sandstone	ss.
Blue, bluish	bl.	Included, inclusion	incl.	Sandy	sdy.
Brachiopod	Brac.	Ironstone	Fe-st.	Scattered	scat.
Brown	brn.	Irregular	ireg.	Schist	sch.
Bryozoa	Bry.	Large, larger	lrg.	Secondary	sec.
Calcite, calcareous	calc.	Light, lighter	lt.	Shale	sh.
Carbonaceous	carb.	Limestone	ls.	Shaly	shy.
Cement, cemented	cmt.	Limy	lmy.	Silica, siliceous	sil.
Cephalopod	Ceph.	Lithographic	lith.	Siltstone	sltst.
Chert	cht.	Little	ltl.	Silty	slty.
Clay, clayey	cly.	Long	lg.	Slight, slightly	sl.
Claystone	clyst.	Loose	lse.	Small	s.
Clean	cln.	Material, matter	mat.	Smooth	sm.
Clear	clr.	Matrix	mtx.	Soft	sft.
Coarse, coarsely	c.	Medium	m.	Speck, speckled	spec.
Color, colored	col.	Metamorphic	meta.	Sphalerite	sphal.
Conglomerate	cgl.	Mica, micaceous	mica.	Spicule, spicular	spic.
Crinoid, crinoidal	Crin.	Moderate	mod.	Splintery	splty.
Crystal, crystalline	xl.	Mottled, mottling	mot.	Spore	Spr.
Dark	dk.	Oil	o.	Spot, spotted, spotty	sp.
Dense	dns.	Oil stain	o. stn.	Stain, stained, staining	stn.
Detrital, detritus	dtrl.	Olive	olv.	Streak	str.
Dolomite. dolomitic	dol.	Oolicast, oolicastic	ooc.	Stringer	strg.
Earthy	rthy.	Oolite, oolitic	ool.	Subangular	sbang.
Faint	fnt.	Opaque	op.	Subrounded	sbrd.
Feldspar, feldspathic	fld.	Orange	orng.	Tight, tightly	tt.
Figured	fig.	Ostracode	Ost.	Trace	tr.
Fine, finely	f.	Part, partly	pt.	Translucent	trnsl.
Fissile	fis.	Pebble	pbl.	Tripoli, tripolitic	trip.
Flaky	flky.	Pelecypod	Plcy.	Vein	vn.
Foraminifera	Foram.	Pellet	pel.	Very	v.
Fossil, fossiliferous	fos.	Phosphate, phosphatic	phos.	Vug, vuggy, vugular	vug.
Fragment, fragmental	frag.	Pink	pk.	White	wh.
Friable	fri.	Pin-point	p.-p.	With	/
Frosted	fros.	Pisolite, pisolitic	piso.	Yellow	yel.
Fusulinid	Fus.	Porosity, porous	por.		

WELL 1
STANOLIND OIL AND GAS CO. No. 1 M. HARTNETT
NW¼ NW¼ SE¼ SEC. 23, T. 24 S., R. 11 W.
STAFFORD COUNTY

Altitude: 1805 feet Total depth: 3812 feet
Completion date: September 2, 1937
Initial production: 974 barrels
Electrical log: None
Sample intervals: 5-foot; 600-1620 feet
10-foot; 1620-3200 feet
5-foot; 3200-3812 feet
Cored intervals: 3450-3464 No core chips
3480-3497 do
3498-3506? do
3716-3733 do
3735-3752 do
3753-3770 do
3772-3808 do

Depth, feet	*Sample description*
0- 600	No samples
Permian—Lower Permian Series	
Nippewalla Group	
Harper Siltstone	
Sumner Group 510?	
Stone Corral Formation	
Ninnescah Shale 528?	
600- 608	Sltst., lt. gy. and pale red; much wh. gyp. and some red, gy., and gn. sh.
608- 624	Sh., mod. red. brn.
624- 630	Sltst., lt. gy.
630- 637	Sh., m. gy. to gn. gy.
637- 640	Sh., mod. red. brn.
640- 646	Sh., lt. olv. gy.
646- 650	Sh., mod. red. brn.
650- 655	Sh., m. gy.
655- 663	Sh., olv. gy.
663- 670	Sh., mod. red. brn.
670- 673	Sh., lt. olv. gy.
673- 676	Gyp., wh.
676- 680	Sltst., m. lt. gy.
680- 683	Gyp., wh.
683- 690	Sh., m. gy.
690- 696	Sh., gy. red
696- 700	Gyp., wh.; satin spar
700- 703	Sh., gy. red
703- 708	Sh., gy.
708- 710	Dol., m. lt. gy., v. f. gr., arg.
710- 717	Sltst., lt. gy., dol.
717- 720	Sh., m. gy.
720- 730	Satin spar; gyp.
730- 733	Sh., gy.
733- 736	Sh., gy. red
736- 740	Gyp., wh.
740- 750	Sh., gy. red
Wellington Formation	
750- 751	Gyp., wh.
751- 756	Sh., gy.
756- 760	Sh., gy. red
760- 770	Sltst., pale red to lt. gy., dol. in pt.
770- 773	Sh., gy.
773- 776	Sh., gy. red
776- 780	Sh., mod. red. brn.
780- 785	Sh., gy. red
785- 788	Sh., gy.
788- 793	Gyp., wh.; clr. f. xl. anhy.
793- 797	Sh., gy.
797- 800	Gyp., wh.; clr. f. xl. anhy.
800- 805	Sh., mod. red. brn.
805- 807	Sh., gy.
807- 812	Gyp., wh.; f. xl. anhy.
812- 816	Sh., mod. red. brn.
816- 820	Sh., gy.
820- 825	Sh., lt. olv. gy.
825- 830	Sh., mod. red. brn.
830- 834	Sh., gy.
834- 835	Dol., lt. olv. gy., f. gr., arg.
835- 840	Sh., olv. gy.
840- 843	Sh., mod. red. brn.
843- 846	Anhy., wh., f. xl.
846- 850	Sh., mod. red. brn.
850- 853	Sltst., lt. gy.
853- 858	Sltst., pale red
858- 862	Sltst., pale red, v. f. sdy.
862- 864	Sh., gy.
864- 865	Sh., blk.
865- 868	Sh., gy.
868- 872	Sltst., lt. gy.
872- 876	Anhy., lt. gy., f. xl.
876- 878	Dol., lt. gy., v. f. gr.
878- 883	Sltst., lt. gy.
883- 886	Anhy., lt. gy.
886- 890	Sh., gy.
890- 892	Dol., m. gy., f. gr., arg.
892- 895	Sh., gy.
895- 898	Anhy., lt. gy.
898- 900	Sh., gy.
900- 902	Dol., as abv.
902- 916	Sh., m. to dk. gy.
916- 918	Dol., pale yel. brn., v. f. gr.
918- 925	Sh., gn. gy.
925- 930	Anhy., m. to lt. gy., f. xl.
930- 933	Sh., gy.
933- 937	Sltst., m. lt. gy.
937- 943	Sh., gy. red, slty.; gy.-red sltst.
943- 948	Sh., gy.
948- 950	Dol., lt. gy., v. f. gr., pyr.
950- 953	Sh., gy.
953- 960	Sltst., m. lt. gy.
960- 964	Sh., gy.
964- 970	Anhy., m. to lt. gy., f. xl.
970- 974	Sh., gy.
974- 978	Anhy., as abv.
978- 980	Sh., gy.
980- 982	Anhy., as abv.
982- 990	Sh., gn. gy.
990- 996	Sh., gy.
996-1000	Anhy., m. lt. gy., f. xl.
1000-1010	Sltst., m. lt. gy.
1010-1014	Sh., gy.
1014-1018	Anhy., m. lt. gy., f. xl.
1018-1024	Sltst., m. lt. gy.
1024-1045	Sh., gy.
1045-1050	Anhy., gy., f. gr., shaly
1050-1065	Anhy., m. to lt. gy., f. xl.
1065-1070	Anhy., lt. gy. to wh., f. xl.
1070-1080	Anhy., m. to lt. gy., f. xl.; salt
1080-1090	Anhy., m. to lt. gy., f. xl.; wh. dns. cht. / qtz. xls.
1090-1095	Sh., gy.
1095-1100	Anhy., m. to lt. gy., f. xl.
1100-1103	Sh., gy.
1103-1107	Anhy., as abv.
1107-1110	Sh., olv. gy.
1110-1117	Anhy., v. lt. gy., f. xl.
1117-1121	Sh., gy.
1121-1128	Prob. salt
1128-1130	Sh., gy.
1130-1138	Prob. salt
1138-1141	Anhy., lt. gy., f. xl.
1141-1150	Sh., gy.

1150-1155 Prob. salt
1155-1158 Anhy., as abv.
1158-1160 Sh., gy.
1160-1165 Prob. salt
1165-1170 Anhy., lt. gy., f. xl.
1170-1177 Sh., gy.
1177-1180 Anhy., lt. gy., f. xl.
1180-1187 Prob. salt
1187-1190 Anhy., lt. gy., f. xl.
1190-1193 Sh., gy.
1193-1200 Anhy., as abv.
1200-1207 Sh., gy.
1207-1220 Prob. salt
1220-1225 Sh., gy.
1225-1230 Prob. salt
1230-1235 Anhy., lt. gy., f. xl.
1235-1238 Sh., gy.
1238-1246 Prob. salt
1246-1254 Anhy., lt. gy., f. xl.
1254-1256 Sh., gy.
1256-1302 Prob. salt
1302-1306 Anhy., lt. gy. f. xl.
1306-1312 Prob. salt
1312-1314 Anhy., as abv.
1314-1324 Prob. salt
1324-1327 Anhy., as abv.
1327-1335 Sh., gy.
1335-1340 Anhy., lt. gy., f. xl.
1340-1343 Sh., gy.
1343-1346 Anhy., as abv.
1346-1349 Sh., gy.
1349-1351 Anhy., as abv.
1351-1357 Sh., gy.
1357-1361 Anhy., as abv.
1361-1370 Sh., gy.
1370-1374 Anhy., as abv.
1374-1377 Sh., gy.
1377-1380 Anhy., as abv.
1380-1390 Sh., gy.
1390-1394 Anhy., lt. gy., f. xl.
1394-1400 Prob. salt
1400-1403 Sh., gy.
1403-1407 Anhy., as abv.
1407-1413 Prob. salt
1413-1417 Anhy., lt. gy. to wh., f. xl.
1417-1420 Sh., gy.
1420-1422 Anhy., as abv.
1422-1427 Sh., gy.
1427-1430 Anhy., as abv.
1430-1435 Sh., gy.
1435-1437 Anhy., as abv.
1437-1440 Sh., gy.
1440-1446 Anhy., as abv.
1446-1450 Sh., gy.
1450-1452 Anhy., as abv.
1452-1454 Sh., gy.
1454-1457 Anhy., as abv.
1457-1460 Sh., gy.
1460-1462 Anhy., as abv.
1462-1467 Sh., gy.
1467-1470 Anhy., as abv.
1470-1472 Sh., gy.
1472-1478 Anhy., as abv.
1478-1480 Sh., gy.
1480-1484 Anhy., as abv.
1484-1486 Sh., gy.
1486-1491 Anhy., lt. gy. to wh., f. xl.
1491-1494 Sh., gy.
1494-1500 Anhy., as abv.
1500-1503 Sh., gy.
1503-1507 Anhy., as abv.
1507-1510 Sh., gy.
1510-1513 Anhy., as abv.
1513-1516 Sh., gy.
1516-1522 Anhy., as abv.
1522-1525 Sh., gy.
1525-1530 Anhy., as abv.
1530-1532 Sh., gy.
1532-1535 Anhy., lt. gy. to wh., f. xl.
1535-1537 Sh., gy.
1537-1544 Anhy., as abv.
1544-1546 Sh., gy.
1546-1550 Anhy., as abv.
1550-1554 Sh., gy.
1554-1566 Anhy., lt. gy. to wh., f. xl.
1566-1569 Sh., gy.
1569-1571 Anhy., as abv.
1571-1573 Sh., gy.
1573-1580 Anhy., as abv.
1580-1582 Sh., gy.
1582-1584 Anhy., as abv.
1584-1588 Sh., gy.
1588-1594 Anhy., as abv.
1594-1597 Sh., gy.
1597-1602 Anhy., lt. gy. to wh., f. xl.
1602-1604 Sh., gy.
1604-1606 Anhy., as abv.
1606-1610 Sh., gy.
1610-1613 Anhy., as abv.
1613-1615 Sh., gy.
1615-1628 Anhy., lt. gy. to wh., f. xl.
1628-1632 Sh., gy.

Chase Group

1632-1640 Dol., lt. olv. gy. to pale yel. brn., v. f. gr., arg.
1640-1643 Dol., m. dk. gy., v. f. gr., arg.
1643-1648 Sh., gy.
1648-1654 Dol., olv. gy., v. f. gr., arg., mot. / m. dk. gy.
1654-1660 Dol., pale yel. brn., v. f. gr.
1660-1663 Dol., m. gy., v. f. gr., arg.
1663-1672 Sltst., lt. gy., dol.
1672-1678 Dol., m. lt. gy., f. gr., arg.; wh. dns. semi-trnsl. cht.
1678-1690 Sh., m. gy., v. dol.
1690-1693 Dol., lt. gy., f. gran., por.
1693-1694 Sh., gy.
1694-1696 Dol., as abv.
1696-1701 Sh., gy., dol.
1701-1710 Dol., m. lt. gy. to pale orng., f. gr., anhy. xls.
1710-1717 Dol., lt. gy. to v. pale orng., v. f. gr.
1717-1720 Sh., gy.
1720-1732 Dol., m. gy., v. f. to f. gr., arg.; m.-lt.-gy. to m.-dk.-gy. and yel.-brn. dns. cht.
1732-1735 Sh., m. dk. gy., dol.
1735-1740 Dol., m. lt. gy. to lt. olv. gy., f. xl. to gran., arg. in pt., por.
1740-1747 Dol., as abv., anhy. xls.
1747-1750 Dol., m. to m. lt. gy., f. xl. to gran., arg.
1750-1752 Sh., gy.
1752-1760 Dol., m. to m. lt. gy., f. xl. to gran., arg.
1760-1765 Sh., gy.
1765-1778 Dol., m. lt. gy., f. gr., sl. arg.
1778-1783 Anhy., lt. gy. to wh., f. xl.
1783-1785 Sh., gy.
1785-1790 Dol., m. to m. lt. gy., f. gr., arg.
1790-1792 Sh., gy.
1792-1800 Dol., m. gy. to pale yel. brn., v. f. gr., tt.; m.-gy. to m.-dk.-gy. dns. cht. and sl. dol. cht.
1800-1803 Sh., gy.
1803-1807 Dol., lt. olv. gy., v. f. to f. xl., f. vugs, dk.-gy. sps.
1807-1809 Sh., gy.

1809-1818 Dol., as abv.
1818-1822 Sh., gy.

Barneston Limestone

1822-1830 Dol., lt. gy. to v. pale orng., f. xl.
1830-1832 Sh., gy.
1832-1840 Dol., v. pale orng., v. f. gr.
1840-1842 Sh., gy.
1842-1848 Dol., m. lt. to lt. gy., v. f. gr.
1848-1850 Sh., gy.
1850-1855 Dol., pale yel. brn., v. f. xl.
1855-1865 Ls., pale yel. brn. to v. pale orng., v. f. to f. xl., dol., s. Plcy.
1865-1876 Dol., as abv., Crin.
1876-1890 Ls., pale yel. brn. to v. pale orng., f. gr.
1890-1900 Ls., lt. gy. to v. pale orng., f. gr., Crin., fos. frags.; lt.-gy. to wh. rough mot. cht.
1900-1915 Ls., as abv., many Fus.; m.-gy to lt.-gy. mot. spic. fos. cht.; Fus. cht.

Matfield Shale

1915-1918 Sh., gn. gy.
1918-1926 Sh., gy.
1926-1932 Ls., pale yel. brn., f. xl., dol., por.
1932-1940 Sh., gy.
1940-1957 Ls., lt. to m. lt. gy., v. f. gr.
1957-1960 Sh., gy.

Wreford Limestone

1960-1967 Ls., lt. gy., mot. / dk. gy., f. gr.
1967-1970 Sh., gy.
1970-1980 Ls., m. lt. gy., f. gr., fos. frags.
1980-1990 Ls., v. pale orng., v. f. gr., dol.; m.-gy. to lt.-gy. mot. spic. cht.
1990-2000 Ls., pale yel. brn. to m. gy., f. gr.; m.-gy. to m.-dk.-gy. dns. spic. cht.
2000-2006 Sh., gy.
2006-2008 Ls., m. gy., f. gr., arg.
2008-2015 Ls., m. gy., f. gr.

Council Grove Group

2015-2018 Sh., m. gy.
2018-2023 Sh., gy. red
2023-2026 Sh., gy.
2026-2038 Ls., pale yel. brn., f. gr.
2038-2042 Sh., gn. gy., cave ?
2042-2050 Ls., v. pale orng. to v. lt. gy., f. gr.
2050-2057 Sh., m. gy., v. lmy.
2057-2060 Ls., lt. gy. sp. / dk. gy., f. gr.
2060-2065 Ls., pale yel. brn., v. f. gr.
2065-2070 Ls., brn. gy., v. f. gr.
2070-2075 Sh., gy.
2075-2081 Ls., m. gy., v. f. gr.
2081-2090 Sh., m. dk. gy., v. lmy.
2090-2092 Sh., blk.
2092-2095 Ls., m. gy., v. f. gr.
2095-2105 Ls., pale to mod. yel. brn., v. f. xl. to dns.
2105-2108 Sh., gy.
2108-2111 Ls., m. gy., v. arg.
2111-2113 Sh., gy.
2113-2120 Ls., m. gy., v. f. gr.
2120-2123 Sh., gy.
2123-2127 Ls., m. lt. gy. and pale yel. brn., f. gr., dk.-gy. sps.
2127-2131 Sh., gy.
2131-2140 Ls., m. gy., f. gr., sl. arg.
2140-2142 Sh., gy.
2142-2145 Dol., v. pale. orng., v. f. gr.
2145-2150 Ls., v. pale orng. to pale yel. brn., f. gr., dol.
2150-2152 Sh., gy.
2152-2154 Sh., blk.
2154-2160 Ls., pale to mod. yel. brn., f. gr.
2160-2164 Ls., v. pale orng. to lt. gy., f. gr., Fus., Ost.
2164-2166 Sh., gy.
2166-2168 Ls., as abv.
2168-2170 Sh., gy.
2170-2184 Ls., pale yel. brn. to v. pale orng., f. gr.

Eskridge Shale 2184-2188

2184-2188 Sh., gy.
2188-2194 Ls., pale red, v. f. gr.
2194-2200 Ls., pale yel. brn., f. ool. and ooc.
2200-2203 Ls., pale yel. brn., f. gr.
2203-2205 Sh., gy.
2205-2210 Ls., mod. yel. brn. to brn. gy., v. f. xl.
2210-2215 Ls., m. gy., f. gr.
2215-2224 Ls., pale yel. brn., f. gr.
2224-2228 Ls., m. dk. gy., v. arg.
2228-2232 Sh., gy.
2232-2238 Ls., m. gy., v. f. xl.
2238-2241 Sh., gy.
2241-2245 Ls., m. dk. gy., f. gr., sl. arg.
2245-2247 Sh., gy.
2247-2250 Ls., as abv.
2250-2252 Sltst., lt. gy., lmy.
2252-2257 Ls., m. to m. lt. gy., v. f. gr.
2257-2260 Sh., blk.
2260-2280 Ls., pale yel. brn. to lt. gy., f. gr.
2280-2291 Ls., v. pale orng. to lt. gy., f. xl.
2291-2295 Sh., gy.
2295-2300 Ls., pale yel. brn., f. gr., Crin.
2300-2302 Sh., gy.
2302-2307 Ls., lt. gy. to v. pale orng., f. gr., p.-p. por., calc.-filled vugs
2307-2310 Sh., gy.
2310-2314 Ls., m. gy., v. f. gr.
2314-2315 Sh., gy.
2315-2320 Ls., as abv.
2320-2322 Sh., gy.
2322-2330 Ls., pale yel. brn. to v. pale orng., v. f. gr.
2330-2334 Ls., m. to m. lt. gy., v. f. gr.; Fus.; some f. gran. ls. / fos. frags.
2334-2335 Sh., gy.
2335-2339 Ls., m. gy., arg.
2339-2340 Sh., gy.
2340-2350 Ls., m. lt. to m. dk. gy., f. gr., many Fus.
2350-2356 Ls., m. gy., f. gr., arg., Fus.
2356-2357 Sh., gy.
2357-2360 Ls., m. gy., f. gr., arg.
2360-2363 Sh., gy.
2363-2367 Ls., pale yel. brn., f. gr.
2367-2380 Ls., m. lt. gy., v. f. gr.
2380-2385 Ls., lt. gy. to pale yel. brn., v. f. gr.

Admire Group

2385-2390 Sh., gy.
2390-2394 Ls., m. gy., f. xl., sl. arg. and glau.
2394-2403 Ls., m. lt. gy., v. f. xl., sl. arg. in pt.
2403-2407 Sh., dk. gy.
2407-2410 Ls., m. gy., arg.
2410-2414 Sltst., m. gy., lmy.
2414-2418 Ls., v. pale orng. to lt. gy., v. f. gr.
2418-2422 Sh., gy.
2422-2430 Sltst., lt. gy., lmy., mica.
2430-2432 Sh., gy. red
2432-2435 Sh., gn. gy.
2435-2444 Sltst., m. to lt. gy., lmy., mica.
2444-2447 Sh., blk.
2447-2453 Ls., m. dk. gy., f. gr., arg., sl. brn. in pt., fos. frags.
2453-2460 Ls., m. to m. lt. gy., v. f. gr.
2460-2475 Ls., m. to m. dk. gy., f. gr., arg.
2475-2480 Sh., gy.

Pennsylvanian—Virgil Series
Wabaunsee Group

2480-2487 Ls., m. gy., f. gr., sl. arg.
2487-2490 Sh., gy.
2490-2495 Ls., brn. gy. and m. gy., f. gr., arg., glau.
2495-2503 Sh., gy.
2503-2510 Ss., m. to lt. gy., v. f. gr., slty., lmy., sl. mica.
2510-2516 Ss., as abv., carb. mat.
2516-2524 Sltst., m. lt. gy., v. f. sdy., lmy., mica.
2524-2532 Sh., gy.
2532-2540 Ss., lt. gy., f. gr., dol., por., sl. mica.
2540-2545 Sh., gy.
2545-2550 Sltst., m. gy., mica.
2550-2560 Ss., lt. gy., f. gr., dol., por., sl. mica.
2560-2567 Sh., m. to dk. gy.
2567-2570 Sh., gy. red
2570-2574 Sh., gy.
2574-2577 Sh., gy. red
2577-2580 Sh., gy.

Zeandale Limestone

2580-2585 Ls., v. pale orng., f. xl.
2585-2590 Ls., brn. gy. to m. gy., f. xl., Fus.
2590-2594 Ls., v. pale orng., f. xl.
2594-2597 Sh., gy.
2597-2600 Ls., v. pale orng., f. gr., dol.
2600-2604 Dol., v. pale orng., f. gr.

Willard Shale

2604-2610 Sh., gy.
2610-2613 Sltst., lt. gy., mica.
2613-2617 Ss., lt. gy., v. f. gr., slty., mica.
2617-2627 Sltst., lt. gy., v. f. sdy., mica., carb. mat.
2627-2632 Sh., gy.
2632-2640 Sltst., m. lt. gy., v. f. sdy., lmy., mica., carb.
2640-2642 Sh., blk.
2642-2648 Ls., brn. gy. to m. dk. gy., f. gr., sl. arg., Crin.
2648-2653 Sh., olv. gy., lmy.

Emporia Limestone

2653-2658 Ls., brn. gy. to m. dk. gy., f. gr., arg.
2658-2663 Ls., v. pale orng., v. f. gr.
2663-2666 Sh., gy.
2666-2671 Ls., pale yel. brn., v. f. gr., dol.
2671-2675 Sh., gy.
2675-2677 Ls., m. dk. gy., f. gr., arg.
2677-2684 Ls., m. lt. to m. gy., f. gr., sl. arg.
2684-2687 Sh., gy.
2687-2692 Ls., as abv.

Auburn Shale

2692-2695 Sh., gy.
2695-2700 Ls., m. lt. gy., v. f. gr.
2700-2702 Sh., gy.
2702-2707 Ls., m. gy., v. f. gr.
2707-2710 Sh., dk. gy.
2710-2716 Ls., pale yel. brn., v. f. xl.
2716-2723 Sh., gy.

Bern Limestone

2723-2732 Ls., v. pale orng. to lt. gy., v. f. xl.
2732-2735 Ls., gy. red, v. f. gr., arg.
2735-2738 Sh., gy. red, v. lmy., mica.
2738-2743 Sh., m. dk. to dk gy.
2743-2750 Ls., pale yel. brn. to v. pale orng., f. xl., Fus.; tr. yel.-brn. dns. cht.
2750-2758 Sh., gy.
2758-2764 Ls., pale yel. brn., f. ool., some f. to m. ool.

Scranton Shale

2764-2770 Sh., gy.
2770-2772 Sh., blk.
2772-2775 Sh., gy.
2775-2778 Sltst., lt. gy.
2778-2780 Sh., gy.
2780-2784 Sltst., lt. gy.
2784-2789 Sh., gy.
2789-2790 Sh., blk.
2790-2805 Sh., gy.

Happy Hollow Limestone and White Cloud Shale Members of Scranton Shale, and Howard Limestone

2805-2808 Ls., pale yel. brn. to v. pale orng., f. gr.
2808-2810 Sh., gy.
2810-2970 No samples

Severy Shale 2864?
Shawnee Group 2930?

2970-2978 Ls., pale yel. brn. to v. pale orng., f. xl.; m.-gy. to lt.-gy. spic. cht.
2978-2985 Ls., m. lt. gy., v. f. gr., Fus.
2985-2990 Ls., m. gy., v. f. gr.
2990-3014 Ls., pale yel. brn. to v. pale orng., f. xl.
3014-3017 Sh., gy.
3017-3020 Ls., m. lt. gy., f. gr., arg., Fus.
3020-3022 Sh., gy.
3022-3025 Ls., as abv.
3025-3028 Sh., gy.
3028-3039 Ls., pale yel. brn. to m. lt. gy., f. gr.
3039-3041 Sh., gy.
3041-3050 Ls., as abv.
3050-3065 Ls., pale yel. brn. to v. pale orng., f. gr.; m.-gy. to lt.-gy. dns. mot. cht.
3065-3070 Ls., as abv., Fus.
3070-3080 Ls., pale yel. brn. to m. lt. gy., f. xl.
3080-3082 Sh., gy.
3082-3087 Ls., as abv.
3087-3090 Sh., gy.
3090-3100 Ls., m. lt. to lt. gy., v. f. xl.
3100-3115 Ls., pale yel. brn., v. f. xl.
3115-3130 Ls., lt. gy. to v. pale orng., f. xl.
3130-3150 Ls., pale yel. brn. to v. pale orng., f. gr.
3150-3160 Ls., pale yel. brn., f. xl., dol.
3160-3168 Ls., lt. gy., f. xl.
3168-3172 Sh., gy.
3172-3190 Ls., pale yel. brn. to v. pale orng., f. xl.
3190-3194 Ls., m. gy., v. f. xl.
3194-3197 Sh., m. dk. gy.
3197-3220 Ls., pale yel. brn. to v. pale orng., f. xl.
3220-3223 Sh., dk. gy.
3223-3226 Sh., blk.
3226-3229 Ls., pale to mod. yel. brn., v. f. xl.
3229-3232 Sh., gy.
3232-3237 Ls., brn. gy. to m. dk. gy., v. f. xl.
3237-3245 Ls., v. pale orng., f. xl.
3245-3253 Ls., lt to v. lt. gy., v. f. xl.

Douglas Group

3253-3263 Sh., m. dk. gy.
3263-3268 Sh., olv. gy.
3268-3270 Sltst., m. lt. gy., v. f. sdy.
3270-3280 Sh., mod. brn. to dk. yel. brn.
3280-3282 Sltst., pale brn., mica.
3282-3287 Ls., lt. gy., v. f. xl., dol. in pt.
3287-3292 Sh., pale to mod. brn.
3292-3295 Dol., pale brn., f. xl., lmy., sl. slty.
3295-3305 Sltst., lt. brn., v. f. sdy., sl. mica.
3305-3320 Ss., lt. brn. to mod. yel. brn., v. f. gr., mica., dol. in pt.
3320-3325 Sh., pale to mod. brn.
3325-3328 Sh., m. dk. to dk. gy.
3328-3335 Ss., v. lt. gy., v. f. gr., mica., sl. dol.
3335-3378 Sh., m. dk. to dk. gy.
3378-3384 Ls., brn. gy., v. f. gr., arg. in pt., Crin., Ost.
3384-3395 Sh., m. dk. to dk. gy.
3395-3400 Sh., dk. gn. gy.; gy.-red sh., prob. cave.

Pennsylvanian—Missouri Series
Lansing Group

3400-3405 Ls., pale yel. brn., f. xl., many v. s. fos. frags.
3405-3410 Ls., pale to mod. yel. brn., f. xl., s. fos. frags.
3410-3413 Sh., gy.
3413-3425 Ls., brn. gy., v. f. xl., fos. frags.
3425-3435 Ls., pale yel. brn. to m. lt. gy., f. xl., fos. frags., some p.-p. por.
3435-3440 Ls., m. lt. to lt. gy., v. f. xl.
3440-3444 Ls., brn. gy., f. gr., arg.
3444-3446 Sh., gy.
3446-3450 Ls., brn. gy., v. f. gr., sl. arg.
3450-3455 Ls., as abv., Fus.
3455-3460 Ls., pale yel. brn. to brn. gy., gran., ool. ?; m.-lt.-gy. to m.-dk.-gy. spec. cht.
3460-3464 Ls., pale yel. brn., f. gr.
3464-3466 Sh., olv. gy.
3466-3469 Ls., as abv.
3469-3470 Sh., m. dk. gy.
3470-3480 Ls., pale yel. brn., v. f. xl.
3480-3482 Ls., brn. gy., v. f. gr., sl. arg., s. fos. frags.; gy.-blk. dns. spic. cht.
3482-3485 Ls., pale yel. brn., f. gr.; m.-lt.-gy. cht.
3485-3488 Sh., gy.
3488-3490 Ls., pale yel. brn., f. gr., por., much o. stn.
3490-3494 Ls., pale yel. brn. to brn. gy., f. gr.; m.-gy. spic. fos. cht.
3494-3496 Sh., gy. red
3496-3502 Ls., pale to mod. yel. brn., f. gr.; m.-gy. to lt.-gy. mot. spec. cht.

Kansas City Group

3502-3504 Sh., gy.
3504-3506 Sh., gy. red
3506-3514 Ls., pale yel. brn., f. xl.
3514-3516 Sh., gy.
3516-3520 Ls., as abv.; m.-gy. to lt.-gy. dns. fos. cht. and Fus. cht.
3520-3525 Ls., pale to mod. yel. brn., f. xl.; m.-gy. to m.-lt.-gy dns. cht. and mot. cht.
3525-3535 Ls., v. pale orng., f. gr.; lt.-gy. dns. cht.
3535-3540 Ls., pale to mod. yel. brn., f. xl.
3540-3544 Ls., brn. gy., v. f. xl.
3544-3547 Sh., m. dk. gy.; much gy.-red and gn.-gy. sh., prob. cave
3547-3552 Ls., pale yel. brn., f. to m. ooc.
3552-3555 Sh., olv. gy.
3555-3560 Ls., m. gy., v. f. xl.; lt.-gy. v. f. xl. ls.
3560-3566 Ls., pale yel. brn., v. f. xl., Fus.
3566-3568 Dol., pale yel. brn., dns.
3568-3572 Sh., m. dk. gy.
3572-3580 Ls., pale yel. brn., f. xl.
3580-3585 Ls., pale yel. brn., m. ool.
3585-3590 Ls., v. pale orng., v. f. xl.
3590-3598 Ls., v. pale orng., f. gr.
3598-3602 Ls., pale yel. brn. to v. pale orng., f. to m. ool and ooc.
3602-3608 Ls., pale yel. brn., v. f. xl.
3608-3620 Ls., m. lt. gy., v. f. xl., m. ooc. in pt.
3620-3630 Ls., pale yel. brn., v. f. xl.
3630-3633 Ls., m. lt. gy., v. f. xl.
3633-3638 Ls., m. gy., v. f. xl.
3638-3642 Sh., m. dk. gy.
3642-3650 Ls., pale yel. brn., v. f. xl.
3650-3660 Ls., lt. gy., v. f. xl.; brn.-gy. f.-gr. ls.; brn.-gy. dns. semi-trnsl. cht.
3660-3662 Sh., m. dk. gy.
3662-3667 Ls., v. lt. gy., v. f. xl.
3667-3671 Ls., pale yel. brn., v. f. xl.
3671-3675 Sh., m. dk. to dk. gy.
3675-3678 Ls., as abv.
3678-3680 Ls., brn. gy., gran., v. arg.; many pel. of rd. ls.
3680-3684 Ls., brn. gy., v. f. gr.
3684-3686 Ls., mod. yel. brn., f. gr., v. arg.
3686-3688 Ls., pale yel. brn. to gy. red, v. f. xl.

Pleasanton Group

3688-3689 Sh., mod. red brn.
3689-3691 Sh., olv. gy.
3691-3692 Sh., mod. brn.
3692-3694 Sh., olv. gy.
3694-3696 Ls., mod. yel. brn., v. f. xl.
3696-3698 Sh., m. dk. gy.
3698-3700 Ls., pale yel. brn. to brn. gy., v. f. xl.
3700-3702 Sh., gy. red
3702-3706 Sh., m. dk. gy.

Pennsylvanian—Des Moines Series
Marmaton and Cherokee Groups

3706-3710 Ls., brn. gy., v. f. xl.
3710-3717 Ls., pale to mod. yel. brn., v. f. xl.
3717-3719 Sh., gn. gy.
3719-3721 Sh., m. dk. to dk. gy.
3721-3722 Ls., brn. gy., f. gr.
3722-3727 Sh., m. dk. gy.
3727-3729 Sh., gy. red
3729-3731 Sh., olv. gy.
3731-3733 Sh., gy. red
3733-3738 Sh., olv. gy.
3738-3740 Sh., gy. red
3740-3743 Sh., olv. gy.
3743-3745 Sh., mod. red. brn.
3745-3750 No samples
3750-3752 Sh., m. dk. gy., mica.
3752-3757 Sh., gn. gy. and gy. red, mot.
3757-3760 Sh., gy.
3760-3762 Sh., olv. gy.
3762-3764 Sh., gy. red
3764-3770 No samples
3770-3772 Sh., gn. gy.
3772-3774 Sh., gy. red
3774-3776 Sh., m. dk. gy.
3776-3778 Sh., gn. gy.
3778-3780 Sh., gy. red
3780-3782 Sh., gn. gy.
3782-3784 Sh., gy. red
3784-3790 No samples
3790-3792 Sh., gy. red
3792-3795 Sh., gn. gy.
3795-3799 Sh., gy. red

Devonian and Mississippian
Chattanooga Shale

3799-3805 Sh., m. dk. gy., slty.

Misener sand

3805-3812 Ss., wh., f. to m. gr., scat. c. grs., sbrd., pyr., lmy. in pt., tt.
3812 Total depth

WELL 2

SINCLAIR PRAIRIE OIL CO. No. 5 MCCOMB
SW¼ NW¼ NW¼ SEC. 24, T. 24 S., R. 11 W.
STAFFORD COUNTY

Altitude: 1799 feet — Total depth: 4723 feet
Completion date: April 12, 1942
Initial production: 3575 barrels
Electrical log: None
Sample intervals: Irregular
Cored intervals: 3785-3803 feet
3813-3843 feet

Depth, feet *Sample description*
0-3848 No samples

Ordovician—Middle and Upper Ordovician Series
Viola Limestone

3848-3885 Dol., v. lt. gy., f. to m. xl.; lt.-gy. to wh. trnsl. and op. cht.
3885-3905 Ls., v. lt. gy., f. to m. xl.; v. lt. gy. cht.
3905-3916 Ls., lt. gy., f. xl.; m.-gy. cht.
3916-3924 Dol., pale yel. brn. to m. lt. gy., f. gr.
3924-3947 Ls., lt. gy., f. to m. xl.

Ordovician—Middle Ordovician Series
Simpson Group

3947-3950 Sh., dk. gy. to blk., f. dol. xls.
3950-3952 Ls., yel. brn. to lt. gy., m. sdy., dol.
3952-3956 Sh., dk. gn. gy.
3956-3960 Sh., dk. gy.
3960-3966 Sh., dk. gy. to gy. blk.
3966-3970 Ls., lt. gy. to v. pale orng., f. gr.
3970-3973 Sh., olv. gy.
3973-3978 Ss., lt. gy., f. to m. gr.; lt.-gy. dns. mot. cht. / blk. specs. and strs.
3978-3983 No samples
3983-3988 Sh., olv. gy., v. f. to f. sdy.
3988-3990 Sh., dk. gy., v. f. to f. sdy.
3990-3994 Ss., m. lt. to m. dk. gy., v. f. to f. gr., dol., arg.
3994-3999 Sh., dk. gy., splty.
3999-4002 Sh., dk. gn. gy., sm.
4002-4013 Sh., dk. gy.
4013-4015 Ss., wh., f. gr., tt.

Ordovician—Lower Ordovician Series
Arbuckle Group
Cotter and Jefferson City Dolomites

4015-4020 Dol., lt. gy. to pale yel. brn., v. f. to f. xl.
4020-4024 Dol., lt. gy. to v. pale orng., f. xl.
4024-4030 No samples
4030-4035 Dol., lt. gy., f. to m. xl.; wh. to v. pale orng. dns. fig. cht.
4035-4040 Dol., v. pale orng., f. to m. xl.; wh. dns. cht.
4040-4049 Dol., as abv.; wh. dns. trnsl. cht.
4049-4050 Sh., dk. gn. gy.
4050-4057 Dol., v. pale orng., m. xl.; m.-dk.-gy. to v. lt. gy. semi-trnsl. dns. cht., sl. bl.
4057-4059 Dol., v. pale orng., f. to m. xl.
4059-4064 Dol., v. pale orng. to pale yel. brn., f. xl.; v. pale orng. to wh. dns. m.-ool. cht.
4064-4080 Dol., v. pale orng. to pale yel. brn., f. to m. xl.
4080-4085 Sh., m. dk. gy., v. f. to f. sdy., ss. strgs. ?
4085-4088 Sh., dk. gn. gy., sm.
4088-4092 Sh., dk. gy.
4092-4096 Dol., v. pale orng., m. xl., por.; ltl. wh. dns. trnsl. cht.
4096-4110 Dol., v. pale orng. to pale yel. brn., f. to m. xl.
4110-4117 Dol., v. lt. gy., v. f. xl., clr. qtz.
4117-4158 Dol., v. lt. gy. to v. pale orng., f. to m. xl.
4158-4165 No samples
4165-4175 Dol., v. pale orng., f. to m. xl.
4175-4181 No samples
4181-4195 Dol., v. lt. gy., f. to m. xl.; wh. dns. trnsl. cht.
4195-4200 No samples
4200-4206 Dol., v. lt. gy., f. to m. xl.
4206-4213 Dol., as abv.; wh. dns. trnsl. to op. cht.
4213-4340 No samples

Roubidoux Dolomite 4300?

4340-4350 Dol., brn., powdered
4350-4385 No samples
4385-4395 Dol., v. pale orng., v. f. to f. xl., prob. f. to m. sdy.
4395-4414 Dol., as abv.; wh. semi-trnsl. dns. cht.
4414-4424 Dol., v. lt. gy., f. xl., prob. f. to m. sdy.

Cambrian—Upper Cambrian Series
Bonneterre Dolomite

4424-4440 Dol., v. lt. gy., f. xl.
4440-4505 Dol., v. lt. gy., f. to m. xl.
4505-4509 No samples
4509-4525 Dol., as abv.
4525-4535 Dol., v. pale orng., f. to m. xl.
4535-4575 Dol., v. lt. gy., v. f. to f. xl.
4575-4600 Dol., gy. wh., f. xl.
4600-4657 Dol., gy. wh., v. f. to f. xl.
4657-4677 Dol., as abv., ltl. f. sd. and scat. c. sd. grs.
4677-4683 Dol., as abv., more sdy.

Reagan Sandstone

4683-4700 Ss., gy. wh., v. f. to f. gr., scat. m. grs.
4700-4708 Ss., gy. wh., f. to m. gr.
4708-4712 Dol., gy. wh., f. xl., cave ?
4712-4714 Ss., gy. wh., f. to m. gr.

Precambrian

4714-4723 Grnt., pk. to red
4723 Total depth

WELL 3

MANHART, MILLISON, AND BEEBE No. 1 HINSHAW
NW COR. SW¼ SEC. 17, T. 24 S., R. 9 W.
RENO COUNTY

Altitude: 1663 feet Total depth: 4160 feet
Completion date: September 5, 1955
Initial production: Dry
Radioactivity log: 100-4149 feet
Sample intervals: 30-foot; 190-3000 feet
10-foot; 3000-3250 feet
5-foot; 3250-4160 feet
Cored intervals: None

Depth, feet *Sample description*

0- 190 No samples

Permian—Lower Permian Series
Nippewalla Group
Harper Siltstone

190- 200 Sltst., mod. red. brn.
200- 208 Sltst., pale red and lt. gy., v. f. sdy.
208- 262 Sltst., mod. red. brn.
262- 270 Sltst., mod. red. orng., v. f. sdy.
270- 280 Sh., mod. red. brn.
280- 285 Sltst., mod. red. brn.
285- 290 Sltst., mod. red. brn., v. f. sdy.
290- 310 Sltst., mod. red. brn.
310- 324 Sh., mod. to pale red. brn.
324- 330 Sh., lt. gy. to lt. bl. gy.
330- 340 Sltst., lt. gy.

Sumner Group
Stone Corral Formation

340- 343 Dol., lt. gy., f. gr., arg.; wh. anhy.

Ninnescah Shale

343- 350 Sltst., mod, red. brn.
350- 380 Sh., mod. red. brn.
380- 390 Gyp., wh.
390- 406 Sh., gy.
406- 415 Sltst., lt. gy.
415- 420 Gyp., wh.
420- 435 Sh., mod. red. brn.
435- 440 Gyp., wh.; anhy. xls.
440- 443 Dol., v. lt. gy., f. xl.
443- 480 Sh., m. gy. and gn. gy., sl. dol.
480- 500 Sh., mod. red. brn.
500- 510 Sh., gy., sl. dol.
510- 514 Sh., mod. red. brn.

514- 518 Sh., gy.
518- 527 Sh., mod. red. brn.
527- 536 Sh., m. gy., dol.
536- 543 Gyp., wh.; f. xl. anhy.
543- 554 Sh., mod. red. brn.
554- 560 Sh., gy., sl. dol.
560- 565 Sh., mod. red. brn.
565- 570 Sltst., m. lt. gy., sl. dol.
570- 575 Sh., gy.
575- 585 Sh., mod. red. brn.

Wellington Formation

585- 595 Sh., gy. and gn. gy., sl. dol.
595- 600 Sh., mod. red. brn.; much wh. gyp. in spl.
600- 615 Sh., gy., sl. dol.
615- 620 Gyp., wh.
620- 627 Sh., mod. red. brn.
627- 635 Sh., gy., sl. dol.
635- 640 Sh., mod. red. brn.
640- 645 Gyp., wh.
645- 650 Sh., mod. red. brn.
650- 663 Sh., gy., sl. dol.
663- 666 Gyp., wh.
666- 674 Sh., gy.
674- 680 Sh., mod. red. brn.
680- 683 Gyp., wh.; f. xl. anhy.
683- 690 Sh., mod. red. brn.
690- 693 Sh., gy.
693- 704 Sh., mod. red. brn.
704- 716 Sh., gy.
716- 718 Anhy., m. lt. gy., f. xl.
718- 722 Sh., gy.
722- 724 Anhy., as abv.
724- 735 Sh., gy.
735- 738 Anhy., as abv.
738- 740 Sh., gy.
740- 742 Dol., m. gy., f. gr., arg.
742- 747 Sh., gy.
747- 750 Sh., gn. gy.
750- 755 Anhy., m. dk. gy., v. f. xl.
755- 758 Sh., gn. gy.
758- 760 Anhy., as abv.
760- 764 Sh., gy.
764- 767 Anhy., lt. gy., f. xl.
767- 772 Sltst., m. lt. gy.
772- 778 Sh., m. dk. to dk. gy.
778- 782 Dol., lt. gy. to pale yel. brn., v. f. gr.
782- 790 Sh., gn. gy.
790- 795 Sh., gy.
795- 800 Sh., gn. gy.
800- 805 Sh., gy.
805- 807 Anhy., lt. gy., f. xl.
807- 820 Sh., gn. gy.
820- 825 Anhy., v. lt. to m. gy., f. xl.
825- 830 Sh., gy.
830- 835 Sh., gn. gy.
835- 840 Sh., gy.
840- 845 Anhy., as abv.
845- 850 Sh., gy.
850- 855 Anhy., as abv.
855- 862 Sh., gy.
862- 867 Anhy., as abv.
867- 887 Sh., gy.
887- 905 Anhy., gy., shy.
905- 914 Anhy., lt. to m. gy., f. xl.
914- 936 Sh., gy.
936- 940 Prob. salt, much anhy. in spl.
940- 943 Sh., gy.
943- 952 Prob. salt
952- 957 Sh., gy.
957- 962 Prob. salt
962- 968 Anhy., m. to. lt. gy., v. f. xl.
968- 980 Sh., gy.
980- 984 Anhy., as abv.
984- 990 Sh., gy.
990- 993 Anhy., as abv.
993- 998 Sh., gy.
998-1010 Anhy., as abv.
1010-1020 Sh., gy.
1020-1027 Anhy., lt. gy., f. xl.
1027-1030 Sh., gy.
1030-1036 Prob. salt, much anhy. in spl.
1036-1043 Sh., gy.
1043-1057 Prob. salt
1057-1060 Sh., gy.
1060-1080 Prob. salt
1080-1087 Sh., gy.
1087-1090 Prob. salt
1090-1093 Sh., gy.
1093-1120 Prob. salt
1120-1125 Sh., gy.
1125-1140 Prob. salt
1140-1145 Sh., gy.
1145-1156 Prob. salt
1156-1163 Sh., gy.
1163-1200 Prob. salt
1200-1203 Sh., gy.
1203-1208 Prob. salt
1208-1210 Anhy., v. lt. gy., v. f. to f. xl.
1210-1216 Prob. salt
1216-1220 Anhy., as abv.
1220-1230 Prob. salt
1230-1240 Anhy., as abv.
1240-1242 Sh., gy.
1242-1245 Anhy., as abv.
1245-1248 Sh., gy.
1248-1267 Prob. salt
1267-1270 Sh., gy.
1270-1273 Anhy., as abv.
1273-1278 Sh., gy.
1278-1282 Anhy., as abv.
1282-1287 Sh., gy.
1287-1290 Prob. salt
1290-1293 Sh., gy.
1293-1297 Prob. salt
1297-1306 Anhy., v. lt. gy., f. xl.
1306-1308 Sh., gy.
1308-1317 Anhy., as abv.
1317-1324 Sh., gy.
1324-1335 Anhy., as abv.
1335-1338 Sh., gy.
1338-1340 Anhy., as abv.
1340-1343 Sh., gy.
1343-1346 Anhy., as abv.
1346-1348 Sh., gy.
1348-1352 Anhy., as abv.
1352-1355 Sh., gy.
1355-1358 Anhy., as abv.
1358-1364 Sh., gy.
1364-1372 Anhy., as abv.
1372-1374 Sh., gy.
1374-1380 Anhy., as abv.
1380-1382 Sh., gy.
1382-1387 Anhy., as abv.
1387-1390 Sh., gy.
1390-1394 Anhy., as abv.
1394-1397 Sh., gy.
1397-1403 Anhy., as abv.
1403-1405 Sh., gy.
1405-1407 Anhy., as abv.
1407-1409 Sh., gy.
1409-1415 Anhy., as abv.

1415-1418 Sh., gy.
1418-1420 Anhy., as abv.
1420-1425 Sh., gy.
1425-1428 Dol., m. lt. gy. to lt. olv. gy., v. f. gr.
1428-1434 Sh., gy.
1434-1438 Anhy., v. lt. gy., f. xl.
1438-1440 Sh., gy.
1440-1450 Anhy., as abv.
1450-1455 Sh., gy.

Chase Group

1455-1460 Dol., m. gy., f. gr., arg.
1460-1462 Sh., gy.
1462-1464 Dol., lt. olv. gy., f. gr., arg.
1464-1470 Sh., gy.
1470-1474 Dol., as abv., anhy. xls.
1474-1479 Sh., gy.
1479-1483 Sh., mod. red. brn., cave ?
1483-1486 Sh., gn. gy.
1486-1494 Dol., lt. gy. and v. pale orng., v. f. gr., arg.
1494-1504 Sltst., lt. to m. lt. gy., dol.
1504-1507 Dol., lt. gy., slty.
1507-1513 Sltst., m. lt. gy., dol.
1513-1516 Sh., gy.
1516-1518 Sltst., as abv.
1518-1519 Sh., gy.
1519-1520 Sltst., as abv.
1520-1525 Sh., gy.
1525-1530 Sltst., as abv.
1530-1534 Anhy., v. lt. gy., f. xl.
1534-1540 Ls., m. gy., v. f. gr.
1540-1542 Sh., gy.
1542-1553 Ls., lt. gy. to v. pale orng., slty., Crin., spines; m.-lt.-gy. to lt.-gy. dns. cht.
1553-1558 Sh., olv. gy.
1558-1563 Sh., gy.
1563-1565 Sh., gy. blk.
1565-1568 Sh., gy.
1568-1575 Ls., m. lt. gy., f. gr., mot. / dk. gy., arg., Crin.
1575-1580 Sh., gy.
1580-1585 Sh., mod. red. brn., cave ?
1585-1590 Sh., gy.
1590-1598 Sh., gn. gy.
1598-1601 Sltst., lt. gy., dol.
1601-1603 Dol., v. pale orng., v. f. gr.
1603-1610 Anhy., v. lt. gy., f. xl.
1610-1615 Ls., m. lt. gy., f. gr., v. slty.
1615-1631 Ls., lt. gy., f. gr.
1631-1637 Sh., m. dk. gy., lmy.

Barneston Limestone

1637-1645 Ls., m. lt. gy., gran.
1645-1654 Dol., lt. gy., v. f. gr.
1654-1662 Ls., lt. gy. to v. pale orng., f. ooc.
1662-1677 Ls., m. lt. to lt. gy., f. gr.
1677-1684 Ls., m. gy., f. gr., arg.
1684-1695 Ls., m. lt. to lt. gy. and pale yel. brn., f. gr.
1695-1715 Ls., as abv., Crin., Bry., Ost.; m.-gy. to lt.-gy dns. fos. cht., spic. cht., and Fus. cht.
1715-1730 Ls., as abv., Fus.; cht. as abv.

Matfield Shale

1730-1740 Sh., gn. gy.
1740-1745 Sh., gy. red
1745-1750 Sh., m. dk. gy.
1750-1760 Ls., m. lt. gy., f. gr.
1760-1763 Sh., dk. gy.
1763-1774 Sh., gy.
1774-1778 Ls., m. gy., gran., arg.
1778-1780 Sh., gy.
1780-1786 Ls., as abv.
1786-1793 Sh., gy.

Wreford Limestone

1793-1799 Ls., v. pale orng., f. gr., p.-p. por.
1799-1800 Sh., gy.
1800-1804 Ls., as abv.
1804-1806 Sh., gy.
1806-1818 Ls., m. lt. gy., f. gr.; m.-gy. to lt.-gy. dns. mot. cht.; yel.-brn. spic. cht.
1818-1825 Sh., gy.
1825-1837 Ls., pale yel. brn. to v. pale orng., f. gr.; lt.-gy. and wh. mot. cht.

Council Grove Group

1837-1844 Sh., gy.
1844-1850 Sh., gy. red
1850-1860 Ls., m. lt. to m. gy., f. gr.
1860-1866 Sh., gy.
1866-1870 Ls., pale yel. brn., v. f. gr. to dns.
1870-1874 Ls., lt. gy., f. gr.
1874-1880 Sh., gy.
1880-1892 Ls., v. pale orng. to pale yel. brn., f. gr.
1892-1900 Sh., gy.
1905-1935 No samples
1900-1925 Interpreted from radioactivity log
1900-1902 Sh.
1902-1907 Ls.
1907-1914 Sh.
1914-1920 Ls.
1920-1925 Sh.
1925-1927 Sh., gy. blk.
1927-1938 Ls., pale yel. brn., f. gr.
1938-1942 Sh., gy. blk.
1942-1950 Ls., brn. gy. to pale yel. brn., v. f. gr.
1950-1955 Sh., gy.
1955-1963 Ls., m. lt. gy. to pale yel. brn., f. gr.
1963-1970 Sh., gy.
1970-1980 Ls., as abv.
1980-1982 Sh., gy.
1982-1986 Ls., as abv.
1986-1992 Sh., gy.
1992-2008 Ls., m. gy., f. gr., arg.

Eskridge Shale 2008-2017

2008-2012 Sh., gy.
2012-2017 Sh., gy. red
2017-2020 Ls., pale red to mod. red. orng., f. gr.
2020-2027 Ls., pale yel. brn., f. gr.
2027-2032 Sh., dk. gy.
2032-2035 Ls., pale yel. brn., f. gr.
2035-2037 Sh., gy.
2037-2043 Dol., v. lt. gy., v. f. xl.
2043-2045 Sh., gy.
2045-2050 Sh., gy. red
2050-2055 Ls., pale yel. brn., f. gr.
2055-2060 Sh., gy.
2060-2065 Ls., m. gy., v. f. gr.
2065-2070 Sh., gy.
2070-2076 Ls., m. dk. gy., f. gr., arg.
2076-2086 Sh., gy.
2086-2094 Ls., pale yel. brn. to m. lt. gy., f. gr.
2094-2098 Sh., gy.
2098-2115 Ls., lt. gy. to v. pale orng., f. gr.
2115-2120 Ls., v. pale orng., gran., por.
2120-2125 Sh., gy.
2125-2132 Ls., v. lt. gy. to v. pale orng., f. gr.
2132-2137 Sh., gy.
2137-2141 Ls., as abv., dk. o. stn. ?
2141-2144 Sh., gy.
2144-2148 Ls., as abv.
2148-2150 Sh., gy.
2150-2155 Ls., as abv.
2155-2157 Sh., gy.
2157-2165 Ls., as abv.

2165-2168 Sh., gy.
2168-2180 Ls., pale yel. brn., f. gr., Fus.
2180-2182 Sh., gy.
2182-2186 Ls., m. gy., arg.
2186-2190 Sh., gy.
2190-2193 Ls., pale yel. brn. to lt. gy., f. gr.
2193-2197 Sh., gy.
2197-2210 Ls., pale yel. brn. to lt. gy., f. gr., Fus.

Admire Group

2210-2217 Sh., gy.
2217-2227 Ls., m. gy., f. gr., arg.
2227-2236 Sh., gy.
2236-2243 Sltst., m. to m. lt. gy., lmy.
2243-2250 Ls., pale yel. brn., f. gr.
2250-2258 Sh., gy.
2258-2270 Sh., gy. red
2270-2280 Sh., gy.
2280-2287 Sltst., lt. to m. lt. gy., lmy.
2287-2300 Sltst., lt. gy., v. f. sdy., lmy.
2300-2306 Sltst., m. lt. gy.
2306-2312 Sh., gy.
2312-2320 Sltst., lt. gy., v. f. sdy., lmy.

Pennsylvanian—Virgil Series

Wabaunsee Group

2320-2340 Sh., gy.
2340-2345 Sltst., lt. gy., v. f. sdy., lmy.
2345-2360 Sltst., lt. gy.
2360-2370 Sh., gy.
2370-2374 Sh., gy. red
2374-2390 Sh., gy.
2390-2397 Sh., gy. red
2397-2403 Sltst., lt. gy., lmy., mica.
2403-2417 Sh., gy.

Zeandale Limestone

2417-2426 Ls., m. lt. gy. to pale yel. brn., f. gr.
2426-2428 Sh., gy.
2428-2433 Ls., as abv.
2433-2440 Sh., gy.
2440-2447 Ls., as abv.

Willard Shale

2447-2475 Sh., gy.
2475-2480 Ls., m. gy., arg.
2480-2484 Sh., gy.

Emporia Limestone

2484-2488 Ls., pale yel. brn., f. gr.
2488-2490 Sh., gy.
2490-2493 Ls., brn. gy., f. gr.
2493-2498 Sh., gy.
2498-2502 Ls., pale yel. brn., f. gr.
2502-2506 Sh., gy.
2506-2515 Ls., m. to m. dk. gy., arg.
2515-2518 Sh., gy.
2518-2526 Ls., as abv.

Auburn Shale

2526-2528 Sh., gy.
2528-2533 Ls., pale yel. brn., f. gr.
2533-2536 Sh., gy.
2536-2540 Ls., m. gy., v. f. gr.
2540-2542 Sh., gy.
2542-2548 Sltst., m. lt. gy., lmy.
2548-2553 Sh., olv. gy.
2553-2557 Sh., gy.

Bern Limestone

2557-2562 Ls., pale yel. brn., f. gr.
2562-2566 Sh., gy.
2566-2568 Ls., gy., arg.
2568-2575 Sh., gy.
2575-2580 Ls., brn. gy., f. gr.
2580-2586 Sh., gy.
2586-2592 Ls., m. to m. lt. gy., f. gr.

Scranton Shale

2592-2632 Sh., m. to dk. gy.

Happy Hollow Limestone and White Cloud Shale Members of Scranton Shale, and Howard Limestone

2632-2637 Ls., m. dk. gy., f. gr., sl. arg.
2637-2641 Ls., brn. gy., f. gr.
2641-2643 Sh., gy.
2643-2650 Ls., lt. gy. to v. pale orng., v. f. gr., dol.
2650-2652 Sh., gy.
2652-2658 Ls., pale yel. brn. to m. lt. gy., f. gr.
2658-2660 Sh., gy.
2660-2665 Ls., as abv.
2665-2672 Sh., gy.
2672-2678 Ls., as abv.
2678-2683 Ls., pale yel. brn., f. to m. ooc.
2683-2686 Sh., gy.
2686-2695 Ls., brn. gy. to m. gy., f. gr.
2695-2703 Ls., pale yel. brn., f. gr.

Severy Shale

2703-2727 Sh., gy.
2727-2731 Sltst., m. gy., sl. lmy.
2731-2734 Sh., gy.
2734-2737 Ss., m. lt. to lt. gy., v. f. gr., lmy.
2737-2738 Sh., gy.
2738-2745 Sltst., lt. gy., v. f. sdy., lmy.
2745-2748 Sh., gy.
2748-2753 Sh., gy. red, cave ?
2753-2767 Ss., v. lt. gy., v. f. gr., por., lmy. in pt.; some v. f. to f.-gr. ss.
2767-2770 Sh., gy.

Shawnee Group

2770-2777 Ls., m. gy., f. gr.
2777-2780 Ls., pale yel. brn., f. ool. and ooc.
2780-2800 Ls., pale yel. brn. to lt. gy., f. gr., 1 coiled Foram. or v. s. Gast.
2800-2810 Ls., m. lt. gy. to pale yel. brn., f. gr.; m.-lt.-gy. to m.-gy. dns. cht.
2810-2814 Ls., as abv.
2814-2816 Sh., gy.
2816-2850 Ls., as abv.
2850-2857 Ls., pale yel. brn., f. gr.; m.-gy. to lt.-gy. dns. cht.
2857-2860 Sh., gy.
2860-2863 Ls., m. gy., f. gr., arg.
2863-2865 Sh., gy.
2865-2878 Ls., lt. gy. to pale yel. brn., f. gr.
2878-2880 Sh., gy.
2880-2910 Ls., as abv., tr. o. stn. reported 2885-2900
2910-2933 Ls., v. lt. gy. to v. pale orng., v. f. gr.
2933-2936 Sh., dk. gy.
2936-2941 Ls., pale yel. brn., v. f. gr.
2941-2944 Ls., m. gy., f. gr., arg.
2944-2970 Ls., pale yel. brn. to v. pale orng., f. gr.
2970-2972 Sh., gy.
2972-2986 Ls., as abv.
2986-2988 Sh., gy.
2988-3004 Ls., pale yel. brn., f. gr.
3004-3007 Sh., gy.
3007-3015 Ls., as abv.
3015-3054 Ls., lt. gy. to v. pale orng., f. gr.
3054-3057 Sh., gy.
3057-3074 Ls., pale yel. brn. to v. pale orng., f. gr.
3074-3083 Sh., blk.
3083-3086 Ls., pale yel. brn., f. gr.
3086-3092 Sh., m. dk. to dk. gy.
3092-3102 Ls., pale yel. brn. to v. pale orng., v. f. to f. gr.

Douglas Group

3102-3110 Sh., gy.
3110-3115 Sh., blk.
3115-3120 Sh., gy.
3120-3124 Ss., lt. gy., v. f. gr., lmy., sl. mica.
3124-3128 Sltst., m. lt. gy., v. f. sdy., mica.
3128-3134 Ss., lt. gy., v. f. gr., lmy., sl. mica.
3134-3145 Sh., gy.
3145-3150 Sltst., gy., mica.
3150-3153 Sh., gy.
3153-3156 Sltst., as abv.
3156-3160 Sh., gy.
3160-3175 Sltst., lt. gy., v. f. sdy., mica.
3175-3182 Sh., gy.
3182-3185 Sltst., as abv.
3185-3246 Sh., m. dk. to dk. gy.
3246-3250 Ls., brn. gy., v. f. gr.
3250-3267 Sh., gy.

Pennsylvanian—Missouri Series
Lansing Group

3267-3270 Ls., pale yel. brn., f. xl.
3270-3283 Ls., lt. gy. to v. pale orng., f. xl.
3283-3286 Sh., gy.
3286-3297 Ls., pale yel. brn., f. xl., some p.-p. por. and s. vugs.
3297-3298 Sh., gy.
3298-3300 Ls., as abv.
3300-3302 Sh., gy.
3302-3306 Ls., m. gy., v. f. gr., sl. arg.
3306-3310 Sh., gy.
3310-3314 Ls., pale yel. brn., f. xl.
3314-3316 Sh., gy.
3316-3324 Ls., lt. gy., f. gr.
3324-3327 Sh., gy.
3327-3332 Ls., gy. brn., f. gr., Fus.; lt.-gy. to m.-gy. dns. cht.
3332-3334 Sh., gy.
3334-3340 Ls., brn. gy., f. xl.; m.-gy. to m.-dk.-gy. dns. cht. and spec. cht.
3340-3342 Sh., gy.
3342-3350 Ls., m. gy., v. f. xl., possible tr. of lt. o. stn. reported 3346-3351
3350-3352 Sh., gy.
3352-3360 Ls., pale yel. brn. to v. pale orng., f. gr.; m.-gy. dns. cht. and Fus. cht.
3360-3362 Sh., gy.
3362-3368 Ls., pale yel. brn., f. gr., v. sl. show o. reported 3364-3370
3368-3370 Sh., gy.
3370-3371 Ls., as abv.
3371-3372 Sh., gy.
3372-3380 Ls., pale yel. brn. to brn. gy., f. gr.; m.-dk.-gy. to gy.-blk. dns. spic. cht.
3380-3382 Ls., brn. gy., gran., arg.
3382-3383 Sh., olv. gy.
3383-3385 Sh., gy. red, cave ?
3385-3390 Ls., pale yel. brn. to m. gy., f. gr., much p.-p. por.
3390-3395 Ls., brn. gy., f. ool. and ooc.
3395-3400 Ls., pale yel. brn., f. gr.; m.-gy. dns. mot. spic. cht.

Kansas City Group

3400-3402 Sh., gn. gy.
3402-3405 Ls., pale yel. brn., v. f. gr.
3405-3408 Sh., dk. gn. gy.
3408-3420 Ls., pale yel. brn., f. gr.; lt.-gy. to pale-yel.-brn. dns. cht.
3420-3425 Ls., lt. gy. to v. pale orng., f. gr.; lt.-gy. to m.-lt.-gy. dns. cht. and spic. cht.
3425-3430 Ls., brn. gy., v. f. xl.
3430-3435 Ls., pale yel. brn., f. gr.; m.-gy. dns. cht.
3435-3440 Ls., brn. gy., v. f. gr.
3440-3442 Ls., m. gy., v. f. gr.
3442-3447 Sh., gy.
3447-3450 Ls., m. dk. gy., v. f. gr., sl. arg., Crin.
3450-3458 Ls., pale yel. brn., f. gr.
3458-3460 Sh., gy.
3460-3461 Ls., as abv.
3461-3462 Sh., gy.
3462-3465 Ls., brn. gy. to pale yel. brn., v. f. xl.
3465-3470 Ls., pale yel. brn., v. f. to f. xl., Fus.
3470-3475 Ls., pale yel. brn., f. ool.
3475-3480 Ls., pale yel. brn., f. gr.
3480-3483 Sh., gy.
3483-3486 Ls., m. gy., v. f. xl.; m.-gy. to gy.-blk. dns. cht.
3486-3488 Sh., gy.
3488-3492 Ls., m. gy., v. arg.
3492-3496 Sh., m. dk. to dk. gy.
3496-3500 Sh., blk.
3500-3505 Ls., pale yel. brn. to m. gy., f. gr.; gy-blk. dns. cht. and spic. cht.
3505-3509 Ls., m. lt. gy. to pale yel. brn., v. f. xl.
3509-3511 Sh., gy.
3511-3515 Ls., m. gy., v. f. xl.
3515-3525 Ls., pale yel. brn. to brn. gy., v. f. xl.
3525-3530 Ls., as abv.; m.-gy. dns. cht.
3530-3535 Ls., as abv.
3535-3537 Sh., blk.
3537-3542 Sh., dk. gy.
3542-3546 Ls., m. gy., v. arg.
3546-3552 Ls., pale yel. brn., f. gr., tr. o. show reported 3545-3548
3552-3554 Sh., gy.
3554-3560 Ls., v. pale orng. to lt. gy., f. gr.
3560-3562 Sh., gy.
3562-3570 Ls., pale yel. brn. to brn. gy., f. gr.
3570-3572 Sh., blk.
3572-3576 Ls., m. gy., f. gr., sl. arg.
3576-3578 Sh., gy.
3578-3582 Ls., brn. gy., f. gr., sl. arg.
3582-3590 Ls., pale yel. brn., f. gr.
3590-3598 Ls., v. pale orng., f. gr., dol., arg. in pt., tr. o. stn. reported 3592-3600
3598-3600 Ls., brn. gy., f. gr.
3600-3603 Sh., gy.
3603-3610 Ls., pale yel. brn., f. xl., red stn. in pt.; pale-yel.-brn. dns. cht.; mot. v. lt. gy to mod.-red-orng. cht.
3610-3613 Sh., gy.
3613-3617 Ls., pale yel. brn., v. slty.
3617-3621 Ls., pale yel. brn., f. gr.

Pleasanton Group

3621-3624 Sh., m. dk. gy.
3624-3626 Sh., gy. red
3626-3629 Dol., lt. olv. gy. and gy. red, mot., v. arg.
3629-3632 Ls., pale yel. brn., sp. / gy. red, f. gr.
3632-3634 Ls., pale yel. brn., v. f. xl.; brn.-gy. v. f. gr. m.-ool. ls.
3634-3637 Ls., m. lt. gy., f. gr., dol., v. slty.
3637-3642 Ls., m. gy., f. gr., v. arg.
3642-3646 Sh., olv. gy.
3646-3650 Sh., gy. red; prob. contains dtrl. ls. and cht. pbls.
3650-3654 Sh., m. dk. gy.
3654-3657 Sh., gy. red
3657-3660 Sh., gy.

Pennsylvanian—Des Moines Series
Marmaton Group

3660-3662 Ls., m. gy., arg.
3662-3664 Sh., gy.

3664-3670 Ls., pale yel. brn., v. f. xl.
3670-3672 Sh., gy.
3672-3676 Ls., brn. gy., gran., arg.
3676-3678 Sh., gn. gy.
3678-3680 Sh., dk. gy.
3680-3685 Ls., pale yel. brn., v. f. xl.
3685-3688 Ls., pale yel. brn. to lt. olv. gy., f. gr., v. arg.
3688-3690 Sh., gy.
3690-3697 Ls., pale yel. brn., v. f. gr.
3697-3700 Ls., m. to m. lt. gy., f. gr., arg.
3700-3702 Sh., gy.
3702-3706 Ls., lt. olv. gy., f. gr., arg.

Cherokee Group

3706-3709 Sltst., lt. gy. to pale yel. brn., lmy.
3709-3710 Sh., m. dk. gy.
3710-3712 Sltst., as abv.
3712-3716 Sh., m. dk. gy.
3716-3720 Ls., pale yel. brn., f. gr.
3720-3724 Sltst., m. lt. gy., prob. arg., tt.; pale-yel.-brn. dns. cht., prob. dtrl.
3724-3728 Sltst., gn. gy., tt.; m.-lt.-gy. dns. cht., prob. dtrl.
3728-3730 Sh., gy.
3730-3735 Cht., prob. dtrl., gy. wh., v. pale orng., and yel. brn., dns. and gran., scat. p.-p. por., dk. o. stn. ?, sl. to fr. show o. reported 3731-3750
3735-3745 Cht., prob. dtrl., pale red to red orng., dns. and spic.

Mississippian—Lower Mississippian Series
Rocks of Osage age

3745-3765 Cht., gy. wh. to lt. gy. and pale yel. brn., dns., op., some o. stn., g. show o. reported 3750-3785
3765-3774 Ls., pale yel. brn., v. f. to f. xl.; cht. as abv., some o. stn.
3774-3779 Ls., pale yel. brn., v. f. to f. xl.; m.-gy. f. xl. ls.
3779-3782 Ls., m. gy., f. gr., arg.
3782-3786 Sh., olv. gy.
3786-3790 Sh., lt. gn. gy., flky.
3790-3803 Ls., lt. gy to v. pale orng., f. to m. xl., ltl. o. stn. ?

Devonian and Mississippian
Chattanooga Shale

3803-3825 Sh., m. dk. to dk. gy., pyr.
3825-3900 Sh., m. dk. to dk. gy.
3900-3924 Sh., as abv., pyr., 2 v. s. Ceph. and 1 s. Gast. in 3900-3905 spl.
3924-3927 Sltst., m. to m. dk. gy., v. lmy., dk.-brn. Spr. cases, 2 s. Ceph. in 3925-3930 spl.
3927-3932 Ls., m. gy., f. gran., v. slty.
3932-3936 Sh., m. dk. gy.
3936-3945 Sltst., m. to m. dk. gy., v. lmy., sl. brn. in pt., Spr. cases
3945-3960 Sh., m. gy., sl. dol., sl. gn.
3960-3967 Sh., m. dk. gy.

Ordovician—Middle and Upper Ordovician Series
Viola Limestone

3967-3970 Ls., m. dk. gy., v. f. xl.; brn.-gy. v. f. xl. ls.
3970-3978 Ls., brn. gy., v. f. xl.; pale-yel.-brn. v. f. xl. ls.
3978-3985 Sh., m. to m. dk. gy.
3985-3995 Dol., m. to lt. gy., f. xl., por.; m.-gy. to lt.-gy. dns. to gran. cht. and spic. cht. / blk. spec.; some m. to c. rhmb. dol.
3995-4000 Dol., v. pale orng., f. xl.; m.-lt.-gy. dns. cht.
4000-4005 Ls., m. lt. gy., f. xl.
4005-4010 Ls., m. to m. lt. gy., f. gr.; m. gy. dns. spic. cht.
4010-4013 Ls., v. pale orng., f. xl.
4013-4014 Sh., gn. gy. mot. / dk. gy.
4014-4025 Ls., lt. gy., f. xl., dol.
4025-4035 Ls., lt. gy., f. gr.; v. lt. gy. gran. cht.
4035-4043 Dol., lt. gy. to v. pale orng., f. xl.
4043-4050 Ls., v. pale orng., f. to m. xl., Crin.
4050-4062 Ls., as abv.

Ordovician—Middle Ordovician Series
Simpson Group

4062-4065 Sh., dk. gn. gy., dol. xl.
4065-4067 Sh., blk., fos. frag., Brac. ?
4067-4070 Sh., dk. gy.
4070-4075 Ls., brn. gy. and m. to m. dk. gy., f. to m. sdy.
4075-4080 Ss., lt. gy to wh., f. to m. gr., sbrd., dol., pyr., blk. grs., o. stn.
4080-4085 Ss., lt. gy to wh., v. f. to f. gr., dol., scat. m. gr., many blk. grs., o. stn.
4085-4090 Ss., lt. gy., m. gr., dol.
4090-4102 Sh., m. dk. to dk. gy.
4102-4112 Sh., dk. gn. gy.
4112-4140 Sh., m. dk. to dk. gy.
4140-4142 Ss., v. lt. gy., m. to c. gr., sbrd., dol.

Ordovician—Lower Ordovician Series
Arbuckle Group
Cotter and Jefferson City Dolomites

4142-4150 Dol., m. lt. gy. to pale yel. brn., f. xl., tt.
4150-4160 Dol., pale yel. brn. to v. pale orng., m. xl., s. vugs. and p.-p. por.
4160 Total depth

WELL 4
LION OIL CO. No. 1 BUGBEY
C W½ SW¼ NE¼ SEC. 13, T. 24 S., R. 9 W.
RENO COUNTY

Altitude: 1665 feet Total depth: 4277 feet
Completion date: August 11, 1942
Initial production: Dry
Electrical log: 310-4275 feet
Sample intervals: 10-foot; 2000-3930 feet
5-foot; 3930-4277 feet
Cored intervals: None

Depth, feet *Sample description*

0-2000 No samples

Permian—Lower Permian Series
Chase Group 1400
Barneston Limestone 1598
Matfield Shale 1690
Wreford Limestone 1743
Council Grove Group 1790
Eskridge Shale 1984-1990

2000-2005 Ls., pale yel. brn. to v. pale orng., f. xl.
2005-2008 Sh., gy.
2008-2020 Ls., as abv.
2020-2024 Sh., gy.
2024-2030 Ls., m. gy., f. gr., arg.
2030-2035 Sh., gy.
2035-2040 Ls., m. lt. gy. mot. / dk. gy., f. gr.
2040-2045 Sh., gy.
2045-2054 Ls., pale yel. brn., v. f. gr.
2054-2057 Sh., gy.
2057-2070 Ls., v. pale orng. to lt. gy., v. f. gr.
2070-2078 Ls., m. lt. gy., f. gr., Crin. ?, Ost.
2078-2085 Sh., gy.
2085-2090 Ls., m. gy., f. gr., arg.
2090-2094 Sh., gy.
2094-2100 Ls., lt. gy., f. xl.
2100-2103 Sh., gy.
2103-2108 Ls., pale yel. brn., v. f. xl.
2108-2110 Sh., gy.
2110-2118 Ls., v. pale orng., v. f. xl.

2118-2126 Ls., m. lt. gy., f. gr., sl. arg., dk. v. s. fos. frag.
2126-2130 Sh., gy.
2130-2140 Ls., as abv., Fus.
2140-2144 Ls., m. gy., f. gr., arg.
2144-2149 Sh., gy.
2149-2155 Ls., as abv.
2155-2157 Sh., gy.
2157-2170 Ls., lt. gy. to v. pale orng., v. f. xl.
2170-2173 Sh., gy.
2173-2177 Ls., m. gy., v. f. gr., sl. arg.

Admire Group

2177-2190 Sh., gy.
2190-2200 Ls., lt. gy., v. f. gr.
2200-2206 Sh., m. dk. gy.
2206-2210 Ls., m. lt. gy., f. gr., sl. arg.
2210-2215 Sh., gn. gy.
2215-2220 Sh., gy.
2220-2230 Sltst., m. lt. gy., lmy.
2230-2238 Sltst., lt. gy., v. f. sdy., lmy.
2238-2242 Sh., gy.
2242-2245 Sltst., as abv.
2245-2252 Sh., gy.
2252-2255 Ls., m. lt. to m. dk. gy., f. gr., spine
2255-2260 Sh., gy.
2260-2263 Sltst., lt. gy., v. f. sdy.
2263-2267 Sh., gy.

Pennsylvanian—Virgil Series

Wabaunsee Group

2267-2271 Ls., m. gy., v. f. xl.
2271-2278 Sh., gy.
2278-2283 Ls., v. pale orng., v. f. xl., dol.
2283-2286 Ls., m. gy., v. f. gr., sl. arg.
2286-2300 Sh., gy.
2300-2307 Ss., lt. gy., v. f. gr., slty., lmy., mica.
2307-2313 Sltst., m. lt. gy., v. f. sdy., lmy., mica.
2313-2320 Sh., gy.
2320-2322 Ls., pale red to gy. red, v. f. gr., dol., arg.
2322-2327 Sltst., m. lt. gy., v. f. sdy., lmy., mica.
2327-2350 Sh., m. gy., lmy., slty.
2350-2356 Sltst., lt. gy., v. f. sdy., lmy., mica.
2356-2362 Ss., lt. gy., v. f. gr., slty., lmy., mica.
2362-2367 Sltst., as abv.
2367-2372 Sh., gy.
2372-2377 Ls., m. gy., f. gr., arg.
2377-2386 Sh., gy.

Zeandale Limestone

2386-2395 Ls., m. lt. gy., v. f. xl.
2395-2400 Ls., pale yel. brn., v. f. to f. xl.
2400-2402 Ls., brn. gy., v. f. gr., arg.
2402-2410 Sh., gy.
2410-2413 Ls., pale yel. brn. to v. pale orng., f. xl.
2413-2418 Dol., pale yel. brn., v. f. xl.

Willard Shale

2418-2432 Sh., gy.
2432-2436 Ls., m. gy., v. f. gr., sl. arg.
2436-2450 Sh., gy.

Emporia Limestone

2450-2458 Ls., pale yel. brn., v. f. xl.
2458-2463 Ls., brn. gy., v. f. gr., sl. arg.
2463-2468 Sh., gy.
2468-2475 Ls., m. to m. dk. gy., f. gr., arg.
2475-2479 Sh., gy.
2479-2484 Ls., m. lt. to m. gy., v. f. gr; m.-lt.-gy. to m.-dk.-gy. cht. and spic. cht.

Auburn Shale

2484-2488 Sh., gy.
2488-2493 Ls., m. lt. to m. gy., v. f. gr.
2493-2496 Sh., gy.
2496-2500 Ls., as abv.
2500-2506 Sltst., m. lt. gy., lmy.
2506-2510 Sh., gy.

Bern Limestone

2510-2513 Ls., pale yel. brn., v. f. xl.
2513-2516 Sh., gy.
2516-2520 Ls., as abv.
2520-2527 Sh., gy.
2527-2533 Ls., m. lt. to m. gy., v. f. gr.
2533-2540 Sh., gy.
2540-2544 Ls., as abv.

Scranton Shale

2544-2550 Sh., gy.
2550-2554 Ls., pale yel. brn., v. f. xl., Fus.
2554-2557 Sh., gy.
2557-2560 Ls., m. lt. to m. gy., f. gr., sp. and mot. / dk. gy.
2560-2567 Sh., gy.
2567-2570 Sltst., lt. gy., sl. mica.
2570-2582 Sltst., lt. olv. gy., v. f. sdy. in pt., sl. mica.
2582-2610 Sh., gy.

Happy Hollow Limestone and White Cloud Shale Members of Scranton Shale, and Howard Limestone

2610-2616 Ls., m. gy., v. f. gr., sl. arg.
2616-2620 Sh., gy.
2620-2625 Ls., v. pale orng., v. f. xl.
2625-2632 Ls., lt. gy., v. f. gr., dol.
2632-2635 Sh., gy.
2635-2644 Ls., pale yel. brn., v. f. to f. xl.; lt.-gy. dns. cht.
2644-2648 Sh., gy.
2648-2655 Ls., brn. gy. to pale yel. brn., v. f. gr.
2655-2666 Ls., lt. to m. lt. gy., v. f. to f. xl., Fus., dk.-gy. sp. in pt.

Severy Shale

2666-2672 Sh., gy.
2672-2678 Sltst., lt. to m. lt. gy.
2678-2685 Ss., lt. gy., v. f. gr., por., scat. dk. gr.
2685-2703 Ss., lt. gy. to pale yel. brn., v. f. gr., slty., sl. mica.
2703-2716 Sh., gy.
2716-2720 Ss., lt. to m. lt. gy., v. f. gr., slty., mica.
2720-2727 Ss., lt. gy., v. f. gr., por., lmy. in pt.
2727-2730 Sh., gy.

Shawnee Group

2730-2740 Ls., m. lt. to m. gy., v. f. gr., sl. arg.
2740-2750 Ls., pale yel. brn., v. f. xl.
2750-2770 Ls., lt. gy. to v. pale orng., v. f. to f. xl.
2770-2780 Ls., pale yel. brn., v. f. xl.
2780-2783 Sh., gy.
2783-2793 Ls., m. lt. gy., v. f. xl.
2793-2805 Ls., pale yel. brn. to lt. gy., v. f. xl.; lt.-gy. to m.-gy. dns. cht.
2805-2822 Ls., lt. gy. to v. pale orng., f. xl.
2822-2827 Sh., m. dk. gy.
2827-2835 Ls., m. lt. to m. gy., v. f. xl.
2835-2850 Ls., v. pale orng., f. xl.
2850-2875 Ls., lt. gy., v. f. to f. xl.
2875-2888 Ls., v. pale orng., v. f. to f. xl.
2888-2893 Sh., dk. gy.
2893-2915 Ls., lt. gy., v. f. xl.
2915-2935 Ls., pale yel. brn. to v. pale orng., f. gr.
2935-2945 Ls., m. lt. to m. gy., v. f. xl.
2945-2970 Ls., lt. gy. to v. pale orng., f. xl.
2970-2973 Ls., lt. gy., v. f. xl., f. ooc.
2973-2990 Ls., lt. gy. to v. pale orng., v. f. xl.
2990-3005 Ls., v. lt. gy., f. xl.
3005-3030 Ls., v. pale orng., f. xl.
3030-3040 Ls., lt. gy. to v. pale orng., v. f. xl., dol.
3040-3042 Sh., dk. gy.

3042-3045 Sh., blk.
3045-3053 Ls., lt. gy. to v. pale orng., v. f. to f. xl.
3053-3057 Ls., m. lt. gy., v. f. xl.
3057-3060 Sh., gy.
3060-3066 Ls., lt. gy. to v. pale orng., v. f. xl., dol.

Douglas Group

3066-3076 Sh., gy.
3076-3086 Ls., as abv.
3086-3092 Dol., pale yel. brn. to v. pale orng., v. f. xl.
3092-3100 Sltst., lt. to m. lt. gy., mica.
3100-3108 Ss., lt. gy. to yel. gy., v. f. gr., slty., mica. in pt.
3108-3112 Ss., lt. gy., v. f. gr., por.
3112-3117 Ss., lt. gy., v. f. gr., slty.
3117-3126 Sltst., lt. gy.
3126-3132 Ss., lt. gy., v. f. gr., slty.
3132-3140 Ss., lt. gy., v. f. gr., por.
3140-3160 Ss., lt. gy., v. f. gr., slty., scat. mica.
3160-3168 Sltst., lt. to m. lt. gy., v. f. sdy., mica.
3168-3180 Ss., pale yel. brn. to lt. gy., v. f. gr., sl. dol.
3180-3215 Sh., m. to dk. gy.
3215-3225 Sh., brn. gy.
3225-3248 Sh., gy.
3248-3254 Ls., brn. gy., v. f. gr., sl. arg.; m.-gy. sl. arg. v. f. gr. ls.
3254-3267 Sh., gy.

Pennsylvanian—Missouri Series
Lansing Group

3267-3275 Ls., brn. gy. to pale yel. brn., v. f. gr.
3275-3280 Ls., m. gy., v. f. gr.
3280-3287 Ls., m. lt. gy., v. f. xl.
3287-3291 Sh., gy.
3291-3296 Ls., m. dk. gy., f. gr., arg.
3296-3305 Ls., pale yel. brn. to m. lt. gy., v. f. to f. xl.
3305-3310 Ls., lt. gy., f. to m. gran., psdo.-ool.
3310-3312 Sh., gy.
3312-3317 Ls., brn. gy., v. f. gr., v. s. fos. frags.
3317-3320 Ls., m. lt. gy., v. f. to f. xl.
3320-3324 Sh., m. dk. gy.
3324-3335 Ls., pale yel. brn., v. f. to f. xl.; lt.-gy. and m.-dk.-gy. dns. cht.
3335-3337 Sh., gy.
3337-3347 Ls., m. lt. gy. to v. pale orng., f. xl.
3347-3350 Sh., gy.
3350-3355 Ls., brn. gy., v. f. gr.
3355-3365 Ls., lt. gy., v. f. xl.; m.-gy. to m.-dk.-gy. dns. mot. cht.
3365-3375 Ls., pale yel. brn., v. f. xl.
3375-3385 Ls., v. pale orng. to lt. gy., f. gran., por.
3385-3395 Ls., lt. gy., v. f. gr., sft.; m.-lt.-gy. and wh. mot. gran. cht.
3395-3400 Ls., pale yel. brn., v. f. to f. gr.; m.-lt.-gy. mot. spic. cht.

Kansas City Group

3400-3406 Sh., gy.
3406-3415 Ls., m. lt. gy., v. f. gr.; m.-gy. mot. cht., spic. ?
3415-3425 Ls., pale yel. brn., v. f. gr.
3425-3433 Ls., as abv.; m.-lt.-gy. to m.-gy. dns. cht.
3433-3440 Sh., gy.
3440-3450 Ls., pale yel. brn. to lt. gy., m. ool. and ooc.
3450-3453 Ls., m. lt. gy., v. f. xl.
3453-3458 Sh., gy.
3458-3470 Ls., pale yel. brn., v. f. xl.
3470-3474 Ls., lt. gy., f. xl., Fus.
3474-3477 Sh., gy.
3477-3495 Ls., pale to mod. yel. brn., v. f. xl.
3495-3510 Ls., m. lt. gy. to v. pale orng., v. f. xl.
3510-3515 Ls., pale to mod. yel. brn., v. f. xl.; m.-dk.-gy. dns. cht.
3515-3533 Ls., brn. gy., v. f. xl.
3533-3535 Sh., dk. gy.
3535-3538 Sh., blk.
3538-3540 Sh., dk. gy.
3540-3552 Ls., v. pale orng., f. to m. ooc., o. stn. in pt., show o. reported 3542-3557
3552-3562 Ls., lt. gy. to v. pale orng., v. f. xl.
3562-3565 Sh., gy.
3565-3570 Ls., as abv.; lt.-gy dns. cht.
3570-3574 Ls., pale yel. brn., v. f. xl.
3574-3578 Sh., dk. gy.
3578-3586 Ls., m. dk. gy., v. f. gr., arg.
3586-3590 Ls., m. gy., v. f. gr.
3590-3603 Ls., pale yel. brn. to m. lt. gy., v. f. xl.
3603-3606 Sh., gy.
3606-3610 Ls., lt. gy., v. f. gr.
3610-3615 Ls., pale yel. brn., v. f. xl.
3615-3622 Sh., gy.
3622-3632 Ls., as abv.

Pleasanton Group

3632-3640 Sh., lt. olv. gy. to m. gy., v. slty.
3640-3646 Sh., pale to mod. brn.
3646-3653 Ls., m. gy., v. f. gr., v. arg.
3653-3657 Sh., m. dk. gy.
3657-3660 Sh., gy. red
3660-3665 Sh., olv. gy. and gn. gy.
3665-3670 Sh., gy. red

Pennsylvanian—Des Moines Series
Marmaton Group

3670-3680 Ls., m. lt. gy., v. f. gr., sl. arg.
3680-3683 Ls., lt. olv. gy., v. f. xl., dol., arg.
3683-3694 Ls., pale yel. brn., v. f. xl.
3694-3699 Ls., gy. red and olv. gy., v. f. xl., arg.
3699-3702 Sh., gy. red
3702-3706 Sh., gn. gy.
3706-3713 Ls., m. lt. gy., v. f. gr.
3713-3720 Ls., pale yel. brn., v. f. xl.
3720-3724 Sh., gy.
3724-3730 Ls., lt. gy. to v. pale orng., f. gr., slty.
3730-3740 Ls., as abv.; lt.-gy. to pale-orng. cht. and lmy. cht.

Cherokee Group

3740-3746 Sltst., pale yel. brn., sl. lmy.
3746-3750 Sh., gy. red
3750-3755 Sh., olv. gy.
3755-3760 Sh., gy. red
3760-3765 Sh., gy.
3765-3770 Sh., olv. gy.
3770-3773 Sh., gy. red
3773-3778 Sh., olv. gy.
3778-3800 Cht., prob. dtrl., v. pale orng. to lt. gy. and wh., dns. and gran., por. in pt., o. stn. in pt.
3800-3807 Cht., prob. dtrl., m. gy. mot. / gy. red, dns. to gran.

Mississippian—Lower Mississippian Series
Rocks of Osage age

3807-3810 Ls., sil., pale yel. brn., m. ool.
3810-3840 Cht., v. lt. to m. lt. gy., dns., spic., fos., Bry., Crin.
3840-3847 Ls., lt. gy., v. f. to f. xl.
3847-3860 Ls., lt. to m. lt. gy., f. to m. xl., Crin. ?

Devonian and Mississippian
Chattanooga Shale

3860-3920 Sh., m. dk. to dk. gy.
3920-3950 Sh., m. dk. to dk. gy., sl. dol.
3950-3977 Sh., m. dk. to dk. gy.
3977-3990 Sltst., m. to m. dk. gy., v. lmy.
3990-3994 Ls., brn. gy., v. f. xl., arg.
3994-4005 Ls., pale to mod. yel. brn., v. f. xl.
4005-4086 Sh., m. dk. to dk. gy., prob. lmy. in pt.

Ordovician—Middle and Upper Ordovician Series
Viola Limestone

4086-4100 Dol., pale yel. brn. to lt. gy., f. to m. xl.; lt.-gy. to m.-lt.-gy. dns. cht.
4100-4112 Ls., lt. gy. to v. pale orng., f. to m. xl.; m.-lt.-gy. to m.-gy. dns. cht.
4112-4123 Ls., as abv.
4123-4130 Dol., m. to lt. gy. and pale yel. brn., f. xl.

Ordovician—Middle Ordovician Series
Simpson Group

4130-4132 Sh., dk. gn. gy., scat. v. f. sand and dol. xls.
4132-4135 Ls., m. lt. gy. to pale yel. brn., f. xl., dol.; pale-yel.-brn. f. to m.-sdy. ls.
4135-4145 Ss., lt. gy., v. f. to f. gr., dol.
4145-4150 Ss., v. lt. to m. lt. gy., v. f. to f. gr., dol.; tr. of m.-lt.-gy. f. sdy. cht.
4150-4160 Ss., as abv.
4160-4180 Ss., v. lt. gy., v. f. to f. gr.
4180-4197 No spl., prob. ss.

Ordovician—Lower Ordovician Series
Arbuckle Group
Cotter and Jefferson City Dolomites

4197-4225 No spl., prob. dol.
4225-4230 Dol., v. pale orng. to lt. gy., f. to m. xl., some / sl. pk. tint
4230-4235 Dol., m. lt. gy., v. f. to f. xl.
4235-4240 Dol., v. pale orng., m. xl., por. in pt.; v. lt. gy. dns. trnsl. cht.
4240-4250 Dol., as abv., some / sl. pk. tint
4250-4255 Dol., as abv.; v. lt. gy. dns. cht.
4255-4270 Dol., as abv.
4270-4277 No spl., prob. dol.
4277 Total depth

WELL 5

DUWE AND DUSTIN CO. No. 1 MILBURN
C SW¼ SE ¼ SEC. 24, T. 24 S., R. 8 W.
RENO COUNTY

Altitude: 1634 feet Total depth: 4231 feet
Completion date: June 26, 1936
Initial production: Potential 107 barrels
Electrical log: None
Sample intervals: Irregular
Cored intervals: None

Depth, feet *Sample description*

0-1400 No samples

Permian—Lower Permian Series
Chase Group 1270?

1400-1416 Sh., gn. gy. and gy. red, dol.
1416-1423 Sltst., m. lt. gy. and lt. gn. gy., dol.
1423-1426 Dol., v. pale orng., v. f. gr.; m.-gy. dns. cht.
1426-1430 Anhy., wh., f. xl.
1430-1443 Dol., m. gy. to m. dk. gy., f. gr., sl. arg., scat. anhy. xls., much p.-p. por.
1443-1447 Ls., lt. gy., f. gr., many dk.-gy. strs. and sps., Forams. ?
1447-1456 Ls., m. lt. gy., v. f. gr.
1456-1464 Sh., gy., lmy.

Barneston Limestone

1464-1474 Ls., lt. gy., v. f. gr., Crin.
1474-1485 Ls., v. pale orng., f. ooc., Crin.
1485-1495 Ls., lt. gy., v. f. gr.
1495-1500 Ls., m. lt. gy., f. gr., sl. arg., Crin.
1500-1506 Ls., m. gy., arg., Crin.
1506-1510 Ls., lt. gy., v. f. gr., Crin., Ost.
1510-1517 Ls., m. lt. gy., f. gr., some p.-p. por.
1517-1525 Ls., m. lt. gy., f. gr., Crin., Ost.; m.-gy. to lt.-gy. dns. and gran. spic. fos. cht.
1525-1532 Ls., v. pale orng., f. gr., Bry.; m.-lt.-gy. dns. and gran. spic. fos. cht.
1532-1540 Ls., as abv., Fus.; much cht. as abv.
1540-1554 Ls., as abv.; cht. as abv.; some m.-gy. dns. spic. cht.
1554-1558 Ls., lt. gy., v. f. gr.

Matfield Shale

1558-1568 Sh., gn. gy. to olv. gy., lmy.
1568-1572 Sh., gy. red, lmy.
1572-1576 Sh., gn. gy., lmy.
1576-1580 Ls., v. pale orng. to lt. gy., f. gr.
1580-1584 Ls., as abv., dol.
1584-1590 Sh., m. dk. gy., lmy., Brac.
1590-1600 Sh., as abv., Bry.
1600-1605 Sh., as abv.
1605-1612 Ls., m. dk. gy., v. arg., Brac.
1612-1614 Sh., gy., lmy., Bry.
1614-1617 Ls., m. gy. to m. lt. gy., arg., f. gr.
1617-1621 Sh., gy., lmy.

Wreford Limestone

1621-1623 Ls., m. lt. to m. gy., arg., fos.
1623-1628 Ls., lt. gy. to v. pale orng., f. gr.; m.-lt.-gy. to lt.-gy. spic. fos. cht.
1628-1634 Ls., m. lt. gy., f. gr., dol.; m.-dk.-gy. lmy. gran. cht.
1634-1640 Ls., v. pale orng., f. gr.; m.-gy. to m.-lt.-gy. v. spic. cht.
1640-1643 Ls., m. gy., f. gr.; m.-gy. spic. cht.
1643-1647 Ls., m. gy., arg.; m.-dk.-gy. spic. lmy. cht.
1647-1649 Sh., dk. gy., lmy.
1649-1653 Ls., pale yel. brn., f. gr., fos.; m.-gy. arg. ls., Bry. Brac.; yel.-brn. dns. spic. fos. cht.
1653-1656 Sh., gy.
1656-1660 Ls., pale yel.-brn. to v. pale orng., f. gr., Fus., Crin.; m.-gy. to v. lt. gy. dns. spic. cht.
1660-1662 Ls., lt. olv. gy., f. gr., arg., dol.

Council Grove Group

1662-1664 Sh., gn. gy., lmy.
1664-1666 Sh., m. dk. gy., lmy.
1666-1677 Sh., gy. red. lmy., chunky
1677-1680 Sh., gn. gy.
1680-1683 Ls., pale brn., v. f. xl., dol.
1683-1688 Ls., pale yel. brn. to lt. gy., f. gr., fos.
1688-1692 Sh., m. dk. gy., lmy.
1692-1696 Ls., m. dk. gy., f. gr., sl. arg.; gy.-red chunky lmy. sh.
1696-1698 Sh., gn. gy., sl. lmy., flky.
1698-1700 Ls., pale yel. brn., slty.
1700-1703 Ls., lt. olv. gy., f. gr., slty.
1703-1707 Sh., dk. gy. to gy. blk., lmy.
1707-1708 Sh., olv. gy., lmy.
1708-1712 Ls., m. lt. gy., f. gr., arg.; m.-gy. f. to c. gran. arg. ls.
1712-1716 Sh., gy. red, lmy.
1716-1723 Ls., v. pale orng. to pale yel. brn., v. f. gr.
1723-1727 Ls., pale yel. brn., f. gr., Crin., spine
1727-1731 Sh., gn. gy. and m. dk. gy., lmy.
1731-1734 Sh., gy. red, lmy.
1734-1740 Ls., m. gy., f. gr., sl. arg., spines, Brac. ?
1740-1743 Sh., gy., lmy.
1743-1746 Ls., m. gy., arg.
1746-1748 Ls., pale yel. brn., v. f. gr., sl. arg.
1748-1750 Sh., gn. gy., lmy.
1750-1752 Sh., gy. red, lmy.
1752-1756 Sh., m. gy., lmy.
1756-1758 Ls., pale yel. brn., v. f. xl.
1758-1761 Sh., gy., lmy.

1761-1767 Ls., m. gy., f. gr., arg., Ost.
1767-1770 Ls., m. gy., to brn. gy., f. gr.
1770-1773 Sh., gn. gy. to m. dk. gy., lmy., fis.
1773-1780 Ls., pale yel. brn., f. gr.
1780-1783 Sh., gy., lmy.
1783-1790 Ls., m. gy., arg., Brac., Bry., Crin.; m.-lt.-gy. dns. cht. / dk. sp.
1790-1794 Sh., gn. gy. to m. dk. gy., lmy.
1794-1798 Ls., brn. gy. to olv. gy., gran., dol., sl. arg.
1798-1804 Dol., pale yel. brn., f. xl.
1804-1808 Sh., gy., lmy.
1808-1816 Ls., m. gy., v. arg., Brac.
1816-1821 Sh., gy., lmy., lg. Fus.
1821-1825 Ls., pale yel. brn., sft., f. gr., arg., wh. spec., Fus., Crin.
1825-1830 Sh., gy. and olv. gy., lmy.
1830-1833 Sh., gy. red, lmy.
1833-1838 Ls., pale yel. brn., f. gr.; pale-red v. f. xl. sl. arg. ls.
1838-1842 Sh., gy. red., not lmy.
1842-1847 Ls., pale red, lt. gy., and v. pale orng., v. f. xl., sl. arg., red.-brn. str.

Eskridge Shale 1847-1855

1847-1850 Sh., m. dk. gy., lmy.
1850-1853 Sh., olv. gy., lmy.
1853-1855 Sh., gy. red, lmy.
1855-1858 Ls., pale red, v. f. gr., sl. arg.
1858-1868 Ls., lt. gy. to v. pale orng., v. f. gr., dol.
1868-1873 Sh., gy. red, v. lmy.
1873-1878 Ls., lt. olv. gy to v. pale orng., v. f. gr.
1878-1883 Ls., pale yel. brn., f. xl., some m.-xl. calc.
1883-1887 Sh., m. dk. gy., lmy., flky.
1887-1893 Ls., pale yel. brn., f. gr., Crin.
1893-1896 Sh., gn. gy., lmy.
1896-1899 Sh., gy., lmy.
1899-1913 Ls., m. to m. dk. gy., f. gr., arg. in pt., Bry., Crin., Brac., spine
1913-1917 Sh., m. dk. gy., v. lmy.
1917-1925 Ls., as abv., Ost., Brac., Crin.
1925-1933 Sh., m. dk. gy., v. lmy.
1933-1940 Ls., m. lt. to m. gy., f. gr., arg., Bry., Crin., spine, other dk. fos.
1940-1949 Ls., pale brn., m. lt. gy., and pale yel. brn., f. xl., dol., spine, Crin.
1949-1951 Sh., gy.
1951-1955 Ls., lt. gy. to lt. olv. gy., f. gr., many f. to m. dk. ool., fos.
1955-1957 Sh., gy.
1957-1959 Ls., lt. gy., v. f. gr., dol.
1959-1963 Sh., olv. gy., v. lmy.
1963-1967 Sh., gn. gy.
1967-1973 Ls., m. gy., f. gr., arg.
1973-1984 Ls., m. lt. to m. dk. gy., f. gr., arg., spine, Crin., pyr.
1984-1986 Sh., gy.
1986-1993 Ls., m. lt. gy., f. gr., abnt. Fus.
1993-1999 Sh., gy., lmy., Fus.
1999-2002 Ls., m. gy., mot., arg., Fus.
2002-2010 No samples
2010-2012 Sh., gy., lmy., Fus.
2012-2017 Ls., m. lt. to m. gy., f. gr., arg., abnt. Fus., eroded Fus.
2017-2020 Ls., lt. gy., f. gr., sl. glau., sl. arg., Fus.

Admire Group

2020-2024 Sh., m. dk. gy., lmy.
2024-2026 Ls., m. lt. to dk. gy., arg., pyr., glau., Crin.
2026-2032 Sltst., m. gy., lmy.
2032-2036 Ls., m. lt. gy., v. f. gr., dol., sl. arg.
2036-2038 Sltst., m. lt. gy.
2038-2042 Ls., m. lt. gy., v. f. gr., sl. arg.
2042-2044 Sh., m. dk. gy., lmy.
2044-2049 Sltst., m. lt. gy., lmy.
2049-2052 Ls., m. lt. to m. gy., v. f. gr., arg.
2052-2055 Sh., m. to dk. gy.
2055-2058 Sh., gn. gy.
2058-2060 Sh., gy. red
2060-2062 Sh., olv. brn.
2062-2065 Sh., gn. gy.
2065-2067 Sh., m. gy.
2067-2070 Sh., gn. gy.
2070-2072 Sh., gy. red
2072-2076 Ls., pale red, v. arg.
2076-2080 Sh., gn. gy.
2080-2082 Ls., pale yel. brn., f. gr., Fus.
2082-2084 Sh., gy.
2084-2088 Sltst., m. lt. gy., lmy., mica.
2088-2092 Sh., gn. gy.
2092-2104 Sh., m. gy., carb. plant imprint
2104-2118 Sltst., m. lt. gy., mica., v. f. sdy. in pt., pyr., carb. mat.
2118-2123 Ss., lt. gy., v. f. gr., slty., mica., carb., pyr.
2123-2130 No samples
2130-2135 Ss., lt. gy., v. f. gr., sl. lmy., sl. mica.
2135-2146 Sh., dk. gy., v. s. fos.

Pennsylvanian—Virgil Series
Wabaunsee Group

2146-2148 Ls., lt. gy. to v. pale orng., v. f. gr., dol.
2148-2150 Ls., pale yel. brn., f. xl., Crin., spines
2150-2157 Sh., gy., lmy.
2157-2160 Ls., m. gy., f. gr., arg., Crin., Brac.
2160-2168 Sh., m. gy. to olv. gy., lmy.
2168-2170 Sh., gy. red, sl. lmy.
2170-2174 Sh., gy., lmy.
2174-2180 Sltst., lt. gy., mica., sl. lmy., v. f. sdy. in pt., v. carb. strgs.
2180-2182 Ss., lt. gy., v. f. gr., slty., mica., sl. lmy.
2182-2188 Sh., gy., lmy.
2188-2190 Ls., m. gy., f. gr., arg., dol., pyr., spines, sl. brn. tint
2190-2193 Sltst., m. gy., mica., v. lmy.
2193-2199 Sh., gy., lmy.
2199-2206 Ls., m. gy., f. gr., v. arg., dol.
2206-2212 Sltst., m. gy., v. lmy., mica.
2212-2217 Sh., gy., lmy.
2217-2220 Sltst., lt. olv. gy., v. lmy., many fos. frags.
2220-2227 Sltst., m. lt. gy., mica., carb., v. f. sdy. and lmy. in pt.
2227-2230 Sltst., gy. red to brn. gy., lmy.
2230-2235 No samples
2235-2237 Sh., gy.
2237-2240 Sltst., m. lt. gy., lmy., mica., some v. f. carb. mat.
2240-2249 Sh., gy., lmy., slty., mica.
2249-2250 Coal
2250-2260 Sh., gy.
2260-2266 Sh., m. gy., lmy., slty., mica.
2266-2273 Sltst., m. lt. gy., lmy., mica.
2273-2278 Sh., m. dk., gy.

Zeandale Limestone

2278-2283 Ls., brn. gy., v. f. gr., sl. arg., Fus.
2283-2284 Sh., m. dk. gy.
2284-2290 Ls., pale yel. brn. to brn. gy., v. f. gr., Fus.; m.-gy. v. f. gr. ls.
2290-2295 Ls., pale yel. brn. to v. pale orng., v. f. gr., Fus.
2295-2300 Ls., m. gy., f. gr., v. arg.
2300-2309 Sh., m. gy., lmy.
2309-2314 Ls., m. lt. gy. to pale yel. brn., f. gr., fos. frags.; rd. pel. of yel.-brn. v. f. gr. ls.
2314-2320 Ls., m. lt. gy. and m. dk. gy., f. gran., arg.

Willard Shale

2320-2327 Sh., gy., lmy.
2327-2334 Ls., m. dk. gy. to brn. gy., f. gran., arg.
2334-2342 Sh., m. dk. gy.

Emporia Limestone

2342-2346 Ls., m. gy. to brn. gy., f. gr., arg., spines
2346-2348 Sh., gy.
2348-2350 Ls., pale yel. brn. to m. lt. gy., f. gr.
2350-2352 Sh., gy.
2352-2354 Ls., pale yel. brn., v. f. gr., dol.
2354-2357 Ls., v. lt. gy., v. f. gr., Fus.
2357-2362 Sh., m. dk. gy.
2362-2365 Ls., m. lt. to m. gy., f. gr., dol., arg., Crin.
2365-2368 Sh., gy.
2368-2370 Ls., brn. gy., f. gr.; m.-gy. to m.-dk.-gy. mot. dns. fos. spic. cht.

Auburn Shale

2370-2375 Sh., gy.
2375-2378 Ls., m. to m. dk. gy., f. gr., arg., many dk. ls. algal? pel.
2378-2387 Sh., m. dk. gy.
2387-2390 Sh., gn. gy., lmy.

Bern Limestone

2390-2396 No samples
2396-2400 Ls., v. pale orng., v. f. gr., dol.; brn.-gy. f.-gr. ls.
2400-2408 Ls., m. lt. gy., v. f. gr.
2408-2410 Sh., gy. red, lmy.
2410-2416 Ls., gy. red, f. gr., arg.
2416-2418 Sh., m. gy., mica.
2418-2420 Ls., m. lt. gy., v. f. xl.
2420-2424 Ls., pale to dk. yel. brn., f. xl., glau.
2424-2428 Ls., lt. gy., f. gr., abnt. Fus.

Scranton Shale

2428-2436 Sh., gy., lmy.
2436-2440 Ls., v. pale orng. to pale yel. brn., f. gr., dol., arg.
2440-2447 Sltst., m. to m. lt. gy., lmy., mica.
2447-2453 Sltst., m. dk. gy., lmy., mica.
2453-2458 Ls., m. to m. dk. gy. and brn. gy., mot., f. gr., sl. arg., Crin., Bry.
2458-2490 Sh., m. lt. to m. gy., mica., slty., v. f. carb. mat.
2490-2497 Sh., m. dk. gy.
2497-2500 Sh., m. lt. gy., mica., slty.
2500-2515 Sh., m. dk. gy.

Happy Hollow Limestone and White Cloud Shale Members of Scranton Shale, and Howard Limestone

2515-2520 Ls., m. dk. gy., arg., Crin., spines
2520-2525 Sh., gy., lmy., gn. gy. in pt.
2525-2535 Ls., v. pale orng., v. f. gr., dol.
2535-2538 Ls., pale yel. brn. to v. pale orng., v. f. xl.
2538-2540 Sh., gy.
2540-2545 Ls., lt. gy., f. gr., many fos. frags.
2545-2547 Sh., gy.
2547-2553 Ls., pale yel. brn., f. gr.
2553-2555 Ls., m. lt. gy., f. gr., sl. arg., many dk.-gy. grs.
2555-2557 Sh., gy.
2557-2563 Ls., lt. gy., v. f. gr., dol. in pt., Fus. in pt.
2563-2570 Ls., pale yel. brn., f. xl., Fus.; m.-gy. f. xl. ls.
2570-2573 Sh., gy.
2573-2580 Ls., m. gy., f. gr., sl. arg., Crin.
2580-2583 Ls., pale yel. brn. to m. lt. gy., f. gr., Crin., Bry.

Severy Shale

2583-2596 Sh., m. dk. gy., slty., mica., v. f. carb. frags.
2596-2599 Ss., lt. gy., v. f. gr., slty., lmy.
2599-2606 Sltst., m. lt. gy., mica., v. f. sdy. in pt., carb. mat.
2606-2610 Sh., m. dk. gy., mica., slty., carb. mat.
2610-2616 Sltst., m. to m. lt. gy., mica., carb., v. f. sdy. in pt.
2616-2624 Sh., m. dk. gy., mica., slty., carb.
2624-2642 Sh., m. dk. gy.

Shawnee Group

2642-2649 Ls., m. lt. gy. to pale yel. brn., f. gr., sl. arg., Fus., Crin., fos. frags., many dk. frags.
2649-2650 Sh., gy.
2650-2670 Ls., pale yel. brn., f. gr., Crin.; m.-lt.-gy. dns. fos. spic. cht.
2670-2676 Ls., brn. gy. to m. gy., v. f. gr., sl. arg.
2676-2680 Sh., dk. gy. to gy. blk.
2680-2688 Ls., m. lt. gy. to pale yel. brn., f. xl.
2688-2690 Sh., m. dk. gy.
2690-2700 Ls., v. lt. gy. to v. pale orng., f. xl.
2700-2715 Ls., pale yel. brn. to v. lt. gy., f. xl., spines, Crin., Brac., Ost.
2715-2718 Sh., gy.
2718-2723 Ls., brn. gy., f. xl.
2723-2725 Sh., gy.
2725-2730 Ls., m. gy., f. gr.
2730-2740 Ls., pale yel. brn. to v. pale orng., f. xl.; m.-lt.-gy. to m.-gy. dns. cht.
2740-2742 Sh., gy.
2742-2753 Ls., m. to m. lt. gy., f. gr., Fus.
2753-2756 Ls., m. gy., f. gr., arg.
2756-2766 Ls., m. lt. gy., f. gr.
2766-2770 Sh., m. dk. gy., v. lmy.
2770-2785 Ls., lt. gy. to v. pale orng., f. gr., Fus., Crin., vugs, por.
2785-2800 Ls., lt. gy. to v. pale orng., f. gr., Fus., Crin.
2800-2810 Ls., lt. gy to v. pale orng., f. xl., spines.
2810-2817 Ls., v. lt. gy., f. xl., spines
2817-2819 Sh., blk.
2819-2822 Ls., pale yel. brn., f. xl., Ost.
2822-2830 Ls., pale yel. brn., v. f. gr., pyr.
2830-2834 Ls., pale yel. brn. to m. gy., f. xl.; m.-gy. to wh. dns. fig. cht.
2834-2840 Ls., m. gy., f. gr., arg., Crin.
2840-2850 Ls., as abv., few Fus., Crin.
2850-2858 Ls., m. gy., v. f. xl.
2858-2861 No samples
2861-2865 Ls., as abv., Crin.
2865-2873 Ls., pale yel. brn., f. gr., sl. arg., Crin.
2873-2880 Sh., gy., pyr.
2880-2888 Sh., as abv., much pyr.
2888-2894 Ls., pale yel. brn. to v. pale orng., f. gr., dol., spines; lt.-gy. mot. fos. cht.
2894-2896 Sh., gy.
2896-2900 Ls., pale yel. brn., f. gr.; m.-lt.-gy. dns. mot. cht.
2900-2905 Sh., m. dk. gy., pyr.
2905-2912 Ls., pale yel. brn., f. gr.
2912-2915 Sh., blk.
2915-2918 Ls., pale yel. brn., f. gr.
2918-2921 Sh., blk.
2921-1923 Sh., gy.
2923-2927 Ls., pale yel. brn., v. f. to f. xl.
2927-2932 Sh., blk.
2932-2937 Ls., v. pale orng., f. to m. xl.
2937-2940 Ls., pale yel. brn., f. xl., dol.
2940-2944 Ls., m. to m. lt. gy., f. gr., sl. arg.
2944-2947 Sh., blk.
2947-2950 Sh., gy., lmy.
2950-2954 Ls., pale yel. brn., f. gr.
2954-2965 Sh., blk.
2965-2970 Ls., lt. gy. to v. pale orng., f. xl., Crin., Brac., Bry.; m.-gy. to lt.-gy. dns. mot. cht.
2970-2974 Ls., pale yel. brn., f. xl.
2974-2980 Sh., m. dk. to dk. gy.
2980-2984 Sh., blk.

2984-2990 Ls., brn. gy., v. f. gr.; pale-yel.-brn. f. xl. ls.
2990-2994 Ls., brn. gy. to m. dk. gy., v. f. gr., sl. arg.

Douglas Group

2994-2996 Sh., blk.
2996-3004 Sh., gy., lmy.
3004-3006 Ls., m. dk. to m. gy., f. gr., arg.
3006-3013 Sh., gy., lmy.
3013-3015 Ls., v. pale orng., f. xl.
3015-3023 Dol., pale yel. brn., f. xl.
3023-3028 Sh., gy.
3028-3037 Ls., v. pale orng. to lt. gy., v. f. gr.
3037-3039 Sh., gy.
3039-3044 Ss., lt. gy., v. f. gr., lmy., sl. mica., por.
3044-3046 Sh., blk.
3046-3060 Ss., lt. gy., v. f. gr., sl. mica., sl. lmy. in pt., por., pyr.
3060-3062 Sh., gy.
3062-3065 Sltst., lt. gy.
3065-3070 No samples
3070-3077 Sltst., lt. gy.
3077-3084 Sh., m. gy.
3084-3088 Sltst., lt. gy.
3088-3090 Sh., gy.
3090-3100 Ss., lt. gy., v. f. gr., slty., sl. dol., mica. in pt., por.
3100-3133 Ss., lt. gy., v. f. gr., dol., por., sl. mica.
3133-3150 Ss., lt. gy., v. f. gr., sl. dol., por.
3150-3160 Ss., lt. gy., v. f. to f. gr., dol., por.
3160-3167 Sh., m. dk. gy.
3167-3170 Ls., brn. gy., v. f. xl., Brac., Bry., Crin.
3170-3175 Sltst., m. lt. to lt. gy., sl. dol.
3175-3186 Sh., m. dk. gy.
3186-3190 No samples

Pennsylvanian—Missouri Series

Lansing Group

3190-3193 Ls., brn. gy. to pale yel. brn., f. xl.
3193-3200 Ls., brn. gy. to m. gy., v. f. xl.
3200-3201 Sh., gy.
3201-3207 Ls., as abv.; m.-gy. f.-gr. ls., mot. / lt. gy., fos., Crin., Bry. ?
3207-3212 Ls., brn. gy. to pale yel. brn., v. f. gr.
3212-3216 Sh., gy.
3216-3222 Ls., brn. gy. to m. gy., v. f. gr., Fus., Crin.
3222-3225 Sh., gn. gy.
3225-3227 Sh., gy.
3227-3235 Ls., pale yel. brn., v. f. xl.
3235-3240 Ls., as abv.; pale-yel.-brn. dns. cht.
3240-3244 No samples
3244-3246 Sh., gy.
3246-3249 Ls., brn. gy., f. xl., arg.
3249-3256 Ls., pale yel. brn., v. f. xl.; m.-gy. to m.-lt.-gy. dns. spec. cht.
3256-3258 Sh., gy.
3258-3270 Ls., as abv.; m.-gy. dns. cht.
3270-3275 Ls., pale yel. brn., f. gr.; m.-lt.-gy. dns. cht.
3275-3280 Ls., brn. gy., v. f. xl.; m.-dk.-gy. to m.-lt.-gy. dns. cht.
3280-3287 Ls., pale yel. brn., f. gr.
3287-3289 Sh., dk. gy.
3289-3297 Ls., pale yel. brn., f. gr.
3297-3299 Sh., gy.
3299-3305 Ls., as abv.
3305-3307 Sh., gy.
3307-3310 Ls., as abv.
3310-3311 Sh., gy.
3311-3320 Ls., pale yel. brn., f. gr., Ost., spine
3320-3326 Ls., as abv.; m.-gy. to m.-lt.-gy. dns. cht.

Kansas City Group

3326-3330 Sh., gy.
3330-3338 Ls., pale yel. brn., f. gr.
3338-3340 Sh., gy.
3340-3342 Ls., brn. gy., v. f. gr.; yel.-brn. dns. cht.
3342-3345 Ls., pale yel. brn., f. gr.
3345-3350 Ls., m. lt. gy., f. gr.
3350-3355 Ls., pale yel. brn. to brn. gy., v. f. gr.; m.-gy. to m.-lt.-gy. dns. cht.
3355-3363 Ls., pale yel. brn., f. xl.; m.-lt.-gy. to lt.-gy. dns. cht.
3363-3368 Ls., as abv.; ltl. cht. as abv.
3368-3370 Sh., gy.
3370-3378 Ls., pale yel. brn., v. f. xl.
3378-3380 Sh., gy.
3380-3384 Ls., pale yel. brn. to v. pale orng., v. f. gr., f. to m. ooc.
3384-3390 Ls., v. pale orng. to pale yel. brn., f. gr.
3390-3398 Ls., v. lt. gy. to v. pale orng., f. gr., Fus., Crin.
3398-3400 Sh., gy., lmy.
3400-3407 Ls., v. lt. gy., f. gr., fos. frags.
3407-3411 Ls., v. pale orng., f. gr., Fus., Crin.; m.-lt.-gy. dns. semi-trnsl. cht.
3411-3415 Ls., brn. gy. to m. dk. gy., v. f. gr., arg.; m.-dk.-gy. to blk. cht.
3415-3419 Ls., brn. gy., v. f. gr.; cht. as abv.; show o. reported 3415-3424
3419-3421 Ls., m. gy., f. gr., arg.
3421-3423 Sh., gy.
3423-3430 Ls., pale yel. brn., v. f. gr., f. to m. ooc. in pt.
3430-3433 Ls., lt. gy., v. f. gr., dol.; v. lt. gy. dns. cht.
3433-3435 Sh., gy.
3435-3440 Ls., v. pale orng., f. gr., dol., Crin.; lt.-gy. dns. Fus. cht.
3440-3444 Ls., v. lt. gy., f. gr., Fus.; lt.-gy. dns. cht.
3444-3449 Ls., pale yel. brn., f. gr.; m.-lt.-gy. to lt.-gy. dns. cht.
3449-3453 Ls., brn. gy., v. f. xl.; ltl. m.-gy. dns. cht.
3453-3458 No samples
3458-3461 Ls., pale yel. brn., v. f. xl.; m.-lt.-gy. dns. cht.
3461-3466 Ls., brn. gy., v. f. xl.; brn.-gy. dns. cht.
3466-3470 Ls., pale yel. brn., f. xl.; m.-gy. to lt.-gy. dns. cht.
3470-3475 Ls., m. to m. lt. gy., f. gr., dk.-gy. sps.
3475-3480 Sh., dk. gy. to gy. blk.
3480-3488 Sh., gy., lmy.
3488-3495 Ls., pale yel. brn., v. f. xl. to dns.
3495-3500 Ls., pale yel. brn. to v. pale orng., v. f. xl.
3500-3510 Ls., v. pale orng., v. f. to f. gr.
3510-3514 Sh., m. dk. gy., lmy.
3514-3520 Ls., pale yel. brn. to brn. gy., v. f. xl.
3520-3523 Sh., m. dk. gy., lmy.
3523-3528 Sh., dk. gy. to gy. blk.
3528-3550 No samples, o. production reported 3528-3536
3550-3554 Ls., pale yel. brn., f. gr. to v. f. xl.; brn.-gy. v. f. xl. ls., Crin.
3554-3556 Ls., brn. gy., f. gr., arg.
3556-3562 Sh., gy., sl. lmy.
3562-3566 Ls., m. dk. gy. to brn. gy., f. gr., sl. arg.
3566-3574 Sh., dk. gy. to blk.
3574-3578 Ls., m. gy. to pale yel. brn., f. xl.; pale-yel.-brn. v. f. xl. ls.

Pleasanton Group

3578-3580 Sh., gy. red
3580-3585 Sh., gn. gy. and gy.
3585-3587 Ls., pale yel. brn., v. f. xl.
3587-3593 Sh., gy. and gn. gy., mot. / gy. red
3593-3595 Ls., pale yel. brn., f. gr.
3595-3599 Sh., gy. and gn. gy.
3599-3603 Sh., gy. red
3603-3606 Sh., gy.
3606-3609 Sh., gy. red
3609-3613 Sh., gy.

Pennsylvanian—Des Moines Series
Marmaton Group
3613-3616 Ls., pale yel. brn. to m. gy., v. f. xl.
3616-3620 Sh., gy.
3620-3623 Sh., gy. red
3623-3627 Sh., gn. gy.
3627-3630 Sh., gy.
3630-3633 Ls., brn. gy., v. f. gr., arg.
3633-3636 Sh., gy.
3636-3640 Sh., gy. red, lmy.
3640-3643 Sh., gn. gy., sl. lmy.
3643-3645 Sh., gy. red
3645-3648 Sh., gy.
3648-3655 No samples
3655-3658 Sh., gn. gy.
3658-3661 Sh., gy.
3661-3662 Ls., brn. gy., v. f. gr.
3662-3666 Sh., gn. gy.
3666-3670 Sh., gy., Fus.
3670-3672 Ls., m. gy. and pale yel. brn., v. f. xl., arg.
3672-3673 Sh., gy.
3673-3675 Sh., gn. gy., lmy.
3675-3681 Sh., gy., lmy.
3681-3683 Ls., pale yel. brn., v. f. xl., arg.
3683-3685 Sh., gy.
3685-3687 Sh., blk.
3687-3690 Ls., pale yel. brn. to m. gy., f. gr., arg.

Cherokee Group
3690-3693 Sh., m. dk. gy.
3693-3695 Sh., gy. blk.
3695-3703 Sh., m. dk. gy.
3703-3705 Coal
3705-3709 Sh., gy., Gast.; gn.-gy. sh.
3709-3711 Ls., pale yel. brn., v. f. xl.
3711-3714 Sh., gy. red
3714-3720 Sh., gy.
3720-2723 Sltst., m. lt. gy., lmy.
3723-3727 Sh., gy.
3727-3730 Sltst., m. lt. gy. to lt. olv. gy., lmy.
3730-3735 Sh., gy.
3735-3739 Sh., gy. red; gn.-gy. sh.
3739-3740 Ls., pale yel. brn. to gn. gy., v. f. xl., sl. arg.
3740-3744 Sh., gy., Gast.
3744-3747 Sh., gy. red, 500,000 cu. ft. gas reported 3745
3747-3750 Sh., gy.
3750-3754 Clyst., v. lt. gy. and mot. / gy. red and dusky red, scat. v. f. to m. sd. grs.
3754-3757 Clyst., as abv.; some v. f. to m. sdy. clyst .

Mississippian—Lower Mississippian Series
Rocks of Osage age
3757-3760 Cht., v. pale orng., dns. to gran.
3760-3770 Cht., lt. olv. gy. and wh., mot., dns.; cht. as abv.; some yel.-brn. gran. por. cht.
3770-3775 Cht., v. lt. gy. to wh., gran. to dns.
3775-3782 Cht., wh. and lt. gy., sft., por., trip.
3782-3805 No samples
3805-3815 Cht., wh. to v. lt. gy., dns., spec. in pt.
3815-3840 Cht., wh. to v. lt. gy., dns. to gran.
3840-3845 No samples
3845-3852 Cht., as abv.
3852-3860 Ls., lt. gy., f. xl.; cht. as abv.
3860-3865 Ls., lt. gy., f. to m. xl.; v. lt. gy. dns. cht., trnsl. in pt.
3865-3870 Ls., lt. gy., f. gr., v. pale orng. in pt.
3870-3875 Ls., lt. gy. to lt. olv. gy., f. gr., Crin.
3875-3885 Ls., m. gy., f. gr., arg., Crin.
3885-3895 Ls., pale yel. brn., f. xl., Crin.

Devonian and Mississippian
Chattanooga Shale
3895-3975 Sh., m. dk. gy.
3975-4000 Sh., m. dk. gy., sl. dol.
4000-4085 Sh., m. dk. gy.
4085-4096 Sh., as abv., few Spr. cases

Misener sand
4096-4097 Ss., m. gy., f. to m. gr., pyr., tt.

Ordovician—Middle and Upper Ordovician Series
Viola Limestone
4097-4099 Dol., v. lt. gy., f. xl., pyr.
4099-4100 Ls., v. lt. gy., m. xl.
4100-4110 No samples
4110-4135 Ls., v. pale orng. to v. lt. gy., m. xl., Crin.

Ordovician—Middle Ordovician Series
Simpson Group
4135-4144 Sh., gn. gy., abnt. f. dol. xls. in pt., f. to m. sdy. in pt.
4144-4148 Ss., wh., f. to m. gr., sbrd. to sbang., por., scat. c. rd. and fros. grs.
4148-4157 Ss., wh., f. gr., sbang., scat. m. grs., drills loose
4157-4160 Sh., gy.
4160-4170 Ss., v. lt. gy., f. to m. gr., sbrd., fros. in pt., drills loose, much yel.-brn. stn.
4170-4176 Ss., wh., f. gr., por.
4176-4181 Sh., m. dk. gy.
4181-4185 Ss., v. lt. gy., f. to m. gr., sbrd., drills loose
4185-4187 Sh., gy.
4187-4196 Ss., as abv.
4196-4198 Sh., gy.
4198-4200 Ss., v. lt. gy., v. f. to m. gr., drills loose
4200-4208 Sh., m. dk. gy. to dk. gn. gy., sm.
4208-4214 Sh., as abv.; strg. of lt.-gy. v. f. to m.-gr. glau. dol. ss.
4214-4218 Ss., m. gy., v. f. to m. gr., v. glau., tt., slty.
4218-4222 Sh., m. dk. gy. and dk. gn. gy.

Ordovician—Lower Ordovician Series
Arbuckle Group
Cotter and Jefferson City Dolomites
4222-4226 Dol., lt. gy. to v. pale orng., f. xl.
4226-4227 Sh., gn. gy., sm.
4227-4231 Dol., v. pale orng., f. to m. xl.
4231 Total depth

WELL 6
KINGWOOD OIL CO., ET AL. No. 1 KUHNS
NE¼ NE¼ NE¼ SEC. 22, T. 24 S., R. 7 W.
RENO COUNTY

Altitude: 1530 feet Total depth: 4251 feet
Completion date: December 7, 1943
Initial production: Dry
Electrical log: 218-4225 feet
Sample intervals: 10-foot; 1000-3600 feet
5-foot; 3600-4251 feet
Cored intervals: None

Depth, feet *Sample description*
0-1000 No samples

Permian—Lower Permian Series
Sumner Group
Wellington Formation
1000-1020 Anhy., v. lt. gy., f. xl.
1020-1023 Dol., lt. olv., gy., v. f. gr., sl. arg.; cave ?
1023-1038 Anhy., v. lt. gy., f. xl.
1038-1040 Sh., m. dk. gy.
1040-1055 Anhy., m. gy. to wh., f. xl.

1055-1075 Anhy., lt. gy. to wh., f. xl.
1075-1080 Sh., gy.
1080-1100 Anhy., as abv.
1100-1105 Sh., gy. and olv. gy., dol.
1105-1118 Anhy., as abv.
1118-1123 Sh., gy.
1123-1137 Anhy., v. lt. gy. to wh., f. xl.
1137-1142 Sh., gy.
1142-1156 Anhy., as abv.
1156-1160 Sh., olv. gy.
1160-1167 Anhy., as abv.
1167-1170 Sh., gy.
1170-1173 Dol., lt. olv. gy. to m. gy., v. f. gr., arg.
1173-1180 Anhy., as abv.
1180-1184 Sh., gy.
1184-1188 Anhy., as abv.

Chase Group

Nolans Limestone

1188-1190 Dol., olv. gy., v. f. gr., arg., anhy. xls.
1190-1197 Sh., gy.
1197-1207 Dol., m. gy., v. f. gr., arg.
1207-1210 Sh., blk.
1210-1220 Dol., m. lt. gy., f. xl., mot. / dk. gy., some p.-p. por.
1220-1225 Dol., as abv., sl. arg.
1225-1236 Sh., olv. gy. and gn. gy., dol.
1236-1245 Dol., lt. olv. gy., f. gr., arg.; ltl. wh. milky cht.

Odell Shale

1245-1250 Sh., gy., dol.
1250-1257 Dol., m. lt. gy., f. gr., sl. arg.
1257-1263 Sh., gy.

Winfield Limestone

1263-1280 Dol., as abv.; lt.-gy. to dk.-gy. cht., fig. cht.
1280-1286 Dol., m. gy., f. xl., sl. arg.

Doyle Shale

1286-1290 Sh., gy.
1290-1300 Dol., m. gy. to m. lt. gy., f. xl., sl. arg.
1300-1320 Dol., as abv., anhy. xls.
1320-1330 Dol., m. lt. gy., f. xl.
1330-1334 Dol., olv. gy. to m. gy., f. xl.
1334-1337 Sh., gy.
1337-1350 Ls., m. lt. gy., f. gr., mot. / dk. gy.
1350-1358 Ls., as abv., Crin. Ost.?
1358-1360 Sh., gy.

Barneston Limestone

1360-1380 Dol., lt. to v. lt. gy., v. f. gr.
1380-1390 Ls., v. pale orng. to pale yel. brn., f. ooc.
1390-1420 Ls., lt. gy., v. f. gr.
1420-1430 Ls., as abv., Crin., 1 Fus.
1430-1440 Ls., as abv.
1440-1450 Ls., lt. gy. to pale yel. brn., f. gr.; lt.-gy. fig. cht. and spic. cht.
1450-1468 Ls., as abv.; cht. as abv.; much gran. cht.

Matfield Shale

1468-1472 Sh., gy.
1472-1480 Ls., pale yel. brn., f. gr.
1480-1484 Sh., gy.
1484-1498 Ls., m. lt. to m. gy., f. gr., sl. arg.
1498-1505 Sh., gy., lmy.

Wreford Limestone

1505-1516 Ls., m. lt. gy. to pale yel. brn., f. gr.
1516-1520 Sh., gy.
1520-1525 Ls., lt. gy. to v. pale orng., v. f. gr.
1525-1527 Sh., gy.
1527-1530 Ls., m. lt. gy., f. gr.; brn.-gy. to lt.-gy. dns., fig., and spic. cht.
1530-1534 Ls., as abv.; cht. as abv.; m.-dk.-gy. dns. cht.
1534-1538 Sh., gy.
1538-1541 Ls., m. gy., f. gr., sl. arg.
1541-1545 Sh., gy.
1545-1553 Ls., pale yel. brn., f. gr.; m.-gy. to m.-dk.-gy. and brn.-gy. dns. spic. cht.

Council Grove Group

1553-1557 Sh., olv. gy., lmy.
1557-1561 Sh., gy. red, lmy.
1561-1570 Ls., pale yel. brn., f. gr.
1570-1580 Sh., gy., lmy.
1580-1585 Ls., pale yel. brn., f. gr.
1585-1588 Sh., gy.
1588-1590 Sh., blk.
1590-1594 Sh., gy.
1594-1600 Ls., m. gy., f. gr., sl. brn. in pt.
1600-1607 Ls., pale yel. brn., f. gr.
1607-1612 Sh., gy., lmy.
1612-1617 Ls., m. gy., v. arg.
1617-1627 Sh., gy., lmy.
1627-1634 Ls., m. gy., v. f. gr., sl. arg.
1634-1640 Sh., gy., lmy.
1640-1647 Ls., pale yel. brn., f. gr.
1647-1652 Sh., gy., lmy.
1652-1658 Ls., brn. gy., f. gr., sl. arg.
1658-1660 Sh., gy.
1660-1667 Ls., pale yel. brn., f. gr.
1667-1670 Sh., gy.
1670-1675 Ls., as abv.
1675-1683 Ls., brn. gy., f. gr.
1683-1690 Sh., gy., lmy.
1690-1710 Ls., pale yel. brn., v. f. gr.
1710-1715 Sh., gy., lmy.
1715-1720 Ls., lt. gy., f. gr., sl. arg.; lt.-gy. dns. fig. and spic. cht.
1720-1727 Sh., gy., lmy.
1727-1734 Ls., v. pale orng. to pale yel. brn., f. gr.
1734-1736 Sh., gy.
1736-1742 Ls., m. gy., f. gr., sl. arg.

Eskridge Shale 1742-1748

1742-1745 Sh., gy., lmy.
1745-1748 Sh., gy. red
1748-1752 Ls., pale red to gy. red, f. gr., arg.
1752-1772 Ls., pale yel. brn., f. gr.
1772-1787 Sh., gy., lmy.
1787-1795 Ls., m. gy., f. gr., arg.
1795-1799 Sh., gy., lmy.
1799-1808 Ls., m. gy., f. gr., sl. arg.
1808-1810 Sh., gy.
1810-1820 Ls., pale yel. brn., f. gr.
1820-1827 Ls., as abv., por., Fus.
1827-1835 Ls., lt. gy., f. gr., por.
1835-1837 Sh., gy.
1837-1844 Ls., m. gy., f. gr., sl. arg.
1844-1846 Sh., gy.
1846-1850 Dol., brn. gy. to pale yel. brn., f. xl.
1850-1856 Sh., gy.
1856-1865 Ls., lt. gy. to v. pale orng., f. gr., por.
1865-1872 Ls., lt. gy., f. gr.
1872-1874 Sh., gy.
1874-1877 Dol., brn. gy., f. xl.; cave ?
1877-1883 Sh., gy.
1883-1893 Ls., lt. gy. to v. pale orng., f. gr., Fus.

Admire Group

1893-1900 Sh., gy.
1900-1906 Ls., m. gy., f. gr., arg.
1906-1910 Sh., gy.
1910-1917 Ls., as abv.
1917-1924 Ls., lt. gy., f. gr.
1924-1928 Sh., gy.
1928-1935 Sltst., olv. gy., sl. lmy. in pt.
1935-1946 Sh., gy.

1946-1950 Ls., m. gy., arg.
1950-1954 Sh., gy.
1954-1960 Ls., as abv.
1960-1962 Sh., gy.
1962-1965 Ls., m. lt. gy., f. gr.
1965-1975 Sltst., olv. gy., lmy.
1975-1977 Sh., gy.
1977-1980 Sltst., as abv.
1980-1983 Sh., gy.
1983-1993 Sltst., olv. gy., sl. lmy.
1993-2000 Ss., lt. olv. gy., v. f. gr., slty., sl. lmy.
2000-2006 Sltst., lt. gy., v. f. sdy., sl. lmy.
2006-2013 Sh., gy.
2013-2015 Ls., m. lt. gy., f. gr., dk.-gy. oolitoid pel., 1 Foram.
2015-2018 Sh., gy.
2018-2022 Sltst., pale yel. brn., v. f. sdy., sl. mica.
2022-2028 Ss., pale yel. brn., v. f. gr., slty., sl. mica., por.

Pennsylvanian—Virgil Series
Wabaunsee Group

2028-2033 Ls., m. gy. to brn. gy., v. f. gr.
2033-2038 Sh., olv. gy., slty.
2038-2043 Sh., gy.
2043-2047 Ls., lt. olv. gy., v. f. gr., arg.
2047-2054 Ss., lt. olv. gy., v. f. gr., slty., sl. lmy., mica.
2054-2061 Sh., gy.
2061-2066 Sltst., olv. gy., sl. mica.
2066-2070 Ls., m. gy., v. f. gr., sl. arg.
2070-2072 Sh., gy.
2072-2078 Ss., lt. gy., v. f. gr., slty., mica., sl. lmy.
2078-2083 Ls., m. gy., f. gr., sl. arg.; some gy.-red ls.
2083-2090 Sh., olv. gy., slty.
2090-2092 Dol., olv. gy., f. gr., arg.
2092-2097 Sh., gy.
2097-2102 Ls., brn. gy. to m. gy., f. gr., arg., glau. in pt.
2102-2117 Sh., gy.
2117-2120 Sltst., m. lt. gy., mica., lmy. in pt.
2120-2128 Sh., gy.
2128-2142 Ss., lt. gy., v. f. gr., slty., mica., sl. lmy.
2142-2150 Sh., gy.
2150-2152 Sh., gy. red
2152-2162 Sh., gy.

Zeandale Limestone

2162-2170 Ls., brn. gy. to m. gy., f. gr., sl. arg.
2170-2173 Ls., pale yel. brn., f. gr.
2173-2177 Ls., brn. gy., f. gr., sl. arg., Fus.
2177-2189 Sh., gy.
2189-2193 Sltst., lt. gy., mica., carb., lmy.
2193-2196 Ls., brn. gy., f. gr., Fus.

Willard Shale

2196-2199 Sh., gy.
2199-2203 Sltst., lt. gy., lmy., sl. mica.
2203-2207 Ls., m. gy. to pale yel. brn., f. gr.
2207-2222 Sh., gy.

Emporia Limestone

2222-2226 Ls., m. dk. gy., gran., sl. arg.
2226-2230 Ls., m. gy., f. gr.
2230-2235 Ls., brn. gy., f. gr.
2235-2242 Sh., gy.
2242-2246 Ls., pale yel. brn., f. gr.
2246-2250 Ls., lt. gy. to v. pale orng., f. gr., dol.

Auburn Shale

2250-2252 Sh., gy.
2252-2256 Ls., m. gy., f. gr., sl. arg.
2256-2262 Sh., gy.
2262-2266 Ls., m. gy., arg.
2266-2268 Sh., gy.

Bern Limestone

2268-2272 Ls., brn. gy., f. gr.
2272-2276 Sh., gy.
2276-2287 Ls., pale yel. brn. to m. gy., f. gr.
2287-2300 Sh., gy.
2300-2304 Ls., pale yel. brn., f. gr., m. dk. gy. m. ool. in pt.
2304-2308 Ls., pale yel. brn., f. xl., glau., Fus.
2308-2312 Ls., gy. red, arg.

Scranton Shale

2312-2315 Sh., gy. red
2315-2320 Sh., gy.
2320-2326 Ls., brn. gy., f. gr., dk.-gy. sp.
2326-2334 Sh., gy.
2334-2338 Ls., pale yel. brn., f. gr.
2338-2344 Sh., gy.
2344-2352 Sltst., m. lt. to lt. gy., v. f. sdy., lmy., mica.
2352-2357 Ss., lt. gy., v. f. gr., slty., lmy.
2357-2360 Sh., gy.
2360-2364 Sltst., lt. gy., v. f. sdy., lmy., mica.
2364-2400 Sh., gy.

Happy Hollow Limestone and White Cloud Shale Members of Scranton Shale, and Howard Limestone

2400-2407 Ls., m. to m. dk. gy., f. gr., sl. arg.
2407-2412 Sh., gy.
2412-2425 Ls., m. dk. to dk. gy., f. gr., arg.
2425-2430 Sh., gy.
2430-2438 Ls., v. pale orng. to pale yel. brn., f. gr., dol.
2438-2445 Ls., pale yel. brn., f. xl.
2445-2455 Ls., m. gy., f. gr., sl. arg.
2455-2460 Ls., m. dk. gy., f. gr., sl. arg., f. ool. ?
2460-2463 Ls., pale yel. brn., f. gr., Fus.
2463-2470 Ls., brn. gy., f. gr., slty., Forams. ?
2470-2472 Sh., gy.
2472-2480 Ls., pale yel. brn., f. gr.
2480-2488 Ls., as abv., Fus.
2488-2492 Ls., as abv., arg.

Severy Shale

2492-2512 Sh., gy.
2512-2522 Ss., lt. gy., v. f. gr., slty., mica., lmy. in pt.
2522-2526 Sh., gy.
2526-2532 Ss., as abv.

Shawnee Group

2532-2540 Ls., m. gy., f. gr., sl. arg.
2540-2542 Sh., gy.
2542-2560 Ls., m. gy. to brn. gy., f. gr.
2560-2570 Ls., m. lt. gy. to pale yel. brn., f. gr.
2570-2580 Ls., pale yel. brn. to v. pale orng., f. gr., dol. in pt.; m.-lt.-gy. to pale-yel.-brn. dns. fos. cht.
2580-2601 Ls., pale yel. brn. to v. pale orng., f. gr.
2601-2603 Sh., gy.
2603-2610 Ls., pale yel. brn., f. gr.
2610-2620 Ls., m. lt. gy., f. gr.; m.-lt.-gy. to lt.-gy. dns. fos. cht.
2620-2622 Sh., gy.
2622-2630 Ls., m. gy. and pale yel. brn., f. gr.
2630-2657 Ls., pale yel. brn., f. gr.
2657-2665 Ls., m. gy., f. gr.
2665-2668 Sh., gy.
2668-2680 Ls., pale yel. brn., f. gr.
2680-2690 Ls., v. pale orng. to lt. gy., f. gr.
2690-2712 Sh., olv. gy.
2712-2720 Ls., m. lt. gy., f. gr., sl. brn.
2720-2730 Ls., pale yel. brn., f. gr.
2730-2732 Sh., gy.
2732-2748 Ls., as abv.
2748-2750 Sh., gy.
2750-2760 Ls., m. to m. lt. gy., f. gr., sl. arg.
2760-2765 Sh., olv. gy.

2765-2770 Sh., gy.
2770-2780 Sh., olv. brn. to mod. brn.
2780-2782 Sh., blk., chunky; cave ?
2782-2786 Sh., gy.
2786-2794 Ls., m. gy., f. xl.
2794-2797 Sh., gy.
2797-2804 Ls., m. lt. gy. to pale yel. brn., f. xl.; m.-lt.-gy. dns. cht.
2804-2807 Sh., gy.
2807-2817 Ls., pale yel. brn. to v. pale orng., f. gr.
2817-2819 Sh., gy.
2819-2830 Ls., m. lt. to lt. gy., f. gr.
2830-2840 Ls., as abv.; m.-lt.-gy. dns. fos. spic. cht.
2840-2847 Ls., as abv.
2847-2854 Sh., gy. blk.
2854-2858 Sh., dk. gy.
2858-2863 Ls., m. gy., f. gr., sl. arg.
2863-2876 Ls., lt. gy. to v. pale orng., f. xl.
2876-2880 Sh., m. dk. to dk. gy.
2880-2890 Ls., m. lt. gy., f. gr.
2890-2896 Sh., gy.
2896-2906 Ls., brn. gy. to m. dk. gy., v. f. xl., sl. arg. in pt.

Douglas Group

2906-2910 Sh., dk. gy.
2910-2920 Sh., gy. blk.
2920-2973 Sh., gy.
2973-2977 Sltst., lt. gy., v. f. sdy., mica.
2977-2990 Sh., gy.
2990-2996 Sltst., pale yel. brn., v. f. sdy., mica.
2996-3000 Sh., gy.
3000-3006 Sh., olv. gy.
3006-3010 Ss., pale yel. brn., v. f. gr., slty.
3010-3050 Ss., lt. gy. to pale yel. brn., v. f. to f. gr., por., sl. dol. and mica.
3050-3080 Ss., lt. to v. lt. gy., f. gr., dol., sl. mica., por. in pt., much pyr. in 3050-3060 spl.; some f.- to m.-gr. ss.
3080-3090 Ss., lt. gy. to pale yel. brn., v. f. gr., sl. dol. and mica.

Pennsylvanian—Missouri Series

Lansing Group

3090-3098 Ls., m. to m. lt. gy., f. gr., Crin.
3098-3100 Sh., gy.
3100-3115 Ls., pale yel. brn., f. xl.
3115-3119 Sh., gy.
3119-3124 Ls., brn. gy., v. f. xl.
3124-3128 Sh., gy.
3128-3140 Ls., m. lt. gy. to pale yel. brn., f. gr.; m.-gy. to m.-lt.-gy. dns. cht.
3140-3145 Ls., as abv.
3145-3148 Sh., gy.
3148-3160 Ls., pale yel. brn., f. gr., p.-p. por.
3160-3177 Ls., pale yel. brn., f. xl.
3177-3179 Sh., gy.
3179-3188 Ls., pale yel. brn. to brn. gy., f. xl.; m.-gy. sp. and mot. / brn.-gy. and lt.-gy dns. cht.
3188-3190 Sh., gn. gy., flky.
3190-3200 Ls., pale yel. brn., f. xl.
3200-3205 Ls., brn. gy., v. f. xl.
3205-3220 Ls., pale yel. brn. to brn. gy., gran., Crin., p.-p. por.
3220-3230 Ls., as abv.; m.-gy. dns. cht.
3230-3237 Ls., pale yel. brn., f. xl.; m.-lt.-gy. dns. mot. fos. cht.

Kansas City Group

3237-3240 Sh., gy.
3240-3250 Ls., brn. gy. to m. dk. gy., f. xl.; m.-dk.-gy. dns. cht.
3250-3260 Ls., pale yel. brn. to brn. gy., f. gr., much p.-p. por.
3260-3275 Ls., pale yel. brn., f. gr.
3275-3282 Sh., gy.
3282-3287 Ls., m. gy., f. gr., arg.
3287-3295 Ls., pale yel. brn., f. xl.
3295-3298 Sh., gy.
3298-3305 Ls., v. pale orng. to v. lt. gy., f. gr.
3305-3310 Ls., pale yel. brn., v. f. xl.
3310-3325 Ls., pale yel. brn. to brn. gy., f. xl.
3325-3330 Ls., pale yel. brn., gran., Fus., por.
3330-3340 Ls., v. pale orng. to v. lt. gy., f. gr., por.
3340-3350 Ls., pale yel. brn., f. xl.; v. lt. gy. dns. spic. cht.
3350-3370 Ls., pale yel. brn., f. xl.; m.-lt.-gy. to pale-yel.-brn. dns. cht.
3370-3375 Ls., brn. gy. to m. dk. gy., v. f. xl.
3375-3380 Sh., gy.
3380-3384 Sh., blk.
3384-3400 Ls., pale yel. brn. to brn. gy., f. xl., f. to m. ooc.
3400-3410 Ls., brn. gy., v. f. gr.
3410-3430 Ls., pale yel. brn., v. f. gr.
3430-3438 Ls., brn. gy., v. f. xl.
3438-3442 Sh., gy.
3442-3444 Sh., blk.
3444-3450 Sh., gy.
3450-3455 Ls., pale yel. brn., f. to m. ool.
3455-3459 Ls., m. gy., f. to m. ool., s. show of o. reported 3455-3457
3459-3461 Sh., gy.
3461-3470 Ls., pale yel. brn., f. gr.
3470-3484 Ls., v. pale orng., f. gr.
3484-3487 Sh., gy.
3487-3495 Ls., brn. gy. to m. gy., f. xl.

Pleasanton Group

3495-3500 Sh., gn. gy.
3500-3510 Sh., gy.
3510-3518 Ls., m. gy., f. xl.
3518-3523 Sh., olv. gy.
3523-3527 Sh., gy. red
3527-3530 Sh., gy.

Pennsylvanian—Des Moines Series

Marmaton Group

3530-3533 Ls., olv. gy. and gy. red, mot., f. gr., arg.
3533-3536 Sh., olv. gy.
3536-3540 Ls., brn. gy., v. f. gr., arg.
3540-3546 Ls., pale yel. brn. to v. pale orng., f. gr.
3546-3552 Ls., olv. gy., f. gr., arg.
3552-3560 Sh., gy.
3560-3566 Sh., olv. gy.
3566-3580 Ls., pale. yel. brn. to v. pale orng., v. f. xl.
3580-3584 Ls., pale yel. brn., f. gr., slty.
3584-3590 Sh., gy.
3590-3593 Sh., blk.
3593-3600 Ls., m. dk. gy., f. gr., arg.
3600-3610 Ls., pale yel. brn. to brn. gy., f. gr., arg.

Cherokee Group

3610-3616 Sh., gy.
3616-3622 Sh., blk.
3622-3626 Sh., olv. brn. to mod. brn.
3626-3630 Sh., gn. gy.
3630-3640 Sh., gy.
3640-3644 Sh., mod. brn. to olv. brn.
3644-3650 Sh., gy.
3650-3654 Sh., gy. red
3654-3675 Sh., dk. gy.
3675-3678 Sh., blk.
3678-3687 Sh., olv. gy.
3687-3690 Sh., gn. gy.
3690-3698 Sh., gy.
3698-3702 Sh., blk.
3702-3707 Sh., olv. gy.
3707-3712 Sh., gy. red

3712-3725 Cht., prob. dtrl., gy. red, pale red, gy. orng., and lt. gy., dns., fos.
3725-3730 Cht., prob. dtrl., v. lt. gy. mot. / gy. orng. and gy. red, spic.
3730-3735 Cht., as abv., less red col.

Mississippian—Lower Mississippian Series
Rocks of Osage age

3735-3740 Cht., gy. wh. to v. pale orng., gran., por.
3740-3755 Cht., gy. wh. and v. pale orng., mot., dns., spic.
3755-3795 Cht., gy. wh. to lt. gy., dns.
3795-3825 Cht., gy. wh., dns., fos. in pt.
3825-3835 Ls., lt. olv. gy., f. xl.
3835-3840 Ls., pale yel. brn. to lt. olv. gy., v. f. xl.
3840-3850 Ls., pale yel. brn., f. xl.
3850-3856 Ls., lt. olv. gy., f. gr., dol., arg.

Devonian and Mississippian
Chattanooga Shale

3856-4040 Sh., m. dk. gy.
4040-4052 Sh., dk. gy., scat. v. f. to f. sd. grs.

Misener sand

4052-4055 Ss., lt. gy., f. to m. gr., v. pyr., tt.

Ordovician—Upper Ordovician Series
Sylvan Shale

4055-4072 Sh., gy., sl. dol.

Ordovician—Middle and Upper Ordovician Series
Viola Limestone

4072-4076 Ls., v. lt. gy., m. xl., dol., some blk. sp. (prob. pyr.)
4076-4090 Ls., v. lt. gy., m. xl.
4090-4100 Ls., v. lt. gy. to v. pale orng., m. xl., sl. pk. to pale red in pt.
4100-4107 Dol., v. lt. gy., f. xl.

Ordovician—Middle Ordovician Series
Simpson Group

4107-4110 Dol., m. lt. gy., v. f. sdy., slty., f. xl.
4110-4115 Dol., m. lt. to lt. gy., f. xl., slty.
4115-4120 Dol., as abv.; lt.-gy. gran. cht.; blk. o. sp. ?
4120-4130 Dol., as abv.; m.-lt.-gy. cht. / v. f. to f. dol. rhmbs.
4130-4135 Ss., m. lt. gy., f. to m. gr., dol.
4135-4140 Ss., m. dk. gy. to red. brn., f. to m. gr., c. rd. Fe-st. and gn. sh. pel.
4140-4147 Ss., m. lt. to v. lt. gy., f. gr., dol., pyr. in pt.; pale-yel.-brn. f.-gr. dol. ss.
4147-4155 Ss., v. lt. gy., v. f. to f. gr., gl.
4155-4160 Ss., v. lt. gy. to yel. gy., f. gr., gl., scat. m. gr.
4160-4167 Dol., m. lt. gy., f. xl., slty.
4167-4170 Sh., m. dk. gy.
4170-4175 Sh., gn. gy.
4175-4184 Sh., m. dk. gy.
4184-4187 Ss., v. lt. gy., v. f. to f. gr., gl., scat. blk. gr., much pyr.
4187-4190 Ss., v. lt. gy., f. to m. gr., scat. c. gr.
4190-4194 Sh., gn. gy.

Ordovician—Lower Ordovician Series
Arbuckle Group
Cotter and Jefferson City Dolomites

4194-4200 Dol., lt. gy., m. xl.
4200-4210 Dol., v. pale orng., f. to m. xl., some vugs and por.; lt.-gy. to v. pale orng. dns. cht.
4210-4215 Dol., pale yel. brn., m. xl., some vugs.
4215-4220 Dol., pale yel. brn. to v. pale orng., f. xl.; v. lt. gy. dns. trnsl. cht.
4220-4230 Dol., pale yel. brn. to v. pale orng., m. xl., some por.
4230-4235 Dol., mod. orng. pk. to pale red, m. xl.
4235-4251 Dol., v. pale orng., m. xl.
4251 Total depth

WELL 7

BELL OIL AND GAS CO. AND SHELL OIL CO. No. 1 BENSON

NE¼ NE¼ SEC. 5, T. 25 S., R. 6 W.

RENO COUNTY

Altitude: 1539 feet **Total depth: 4223 feet**
Completion date: March 4, 1937
Initial production: Dry
Electrical log: None
Sample intervals: 10-foot; 130-2990 feet
5-foot; 2990-3160 feet
10-foot; 3160-4050 feet
5-foot; 4050-4223 feet
Cored intervals: 4192-4194 ? feet No core chips

Depth, feet *Sample description*

0- 130 No samples

Permian—Lower Permian Series
Sumner Group
Ninnescah Shale

130- 135 Sh., mod. red. brn.
135- 137 Gyp., wh.
137- 145 Sh., m. gy. to gn. gy.
145- 150 Sh., mod. red. brn.
150- 152 Gyp., wh.
152- 158 Sh., as abv.
158- 163 Sltst., pale red
163- 170 Sh., mod. red. brn.
170- 172 Gyp., wh.
172- 175 Sh., gy.
175- 180 Sh., mod. red. brn.
180- 183 Gyp., wh.
183- 186 Sh., gn. gy.
186- 192 Sh., mod. red. brn.
192- 198 Sh., gy.
198- 200 Gyp., wh.
200- 208 Sh., gy.
208- 210 Dol., lt. gy., v. f. to f. xl., cave ?
210- 213 Sh., gy.
213- 216 Sh., gn. gy.
216- 225 Sh., mod. red. brn.
225- 230 Sh., gy.
230- 233 Gyp., wh.
233- 243 Sh., mod. red. brn.
243- 246 Sh., gn. gy.
246- 250 Sh., gy.
250- 253 Gyp., wh.
253- 260 Sh., mod. red. brn.

Wellington Formation

260- 263 Gyp., wh.
263- 265 Dol., lt. gy., v. f. gr., gyp.
265- 270 Sh., gy.
270- 274 Gyp., wh.
274- 287 Sh., m. to m. dk. gy.
287- 293 Gyp., wh.; f. xl. anhy.
293- 300 Sh., m. dk. gy.
300- 303 Gyp., as abv.
303- 310 Sh., gy.
310- 312 Dol., m. lt. gy., v. f. gr., arg.
312- 320 Sh., m. gy.
320- 325 Sh., gn. gy.
325- 327 Anhy., lt. gy., f. xl.
327- 330 Sh., gy.
330- 335 Sh., gn. gy.
335- 340 Sh., gy.
340- 343 Anhy., wh. to pale red, f. xl., qtz. xls.
343- 347 Sh., gy. red, slty.
347- 353 Sh., gy.
353- 360 Sh., gy. red

360- 363 Anhy., m. lt. gy., f. xl.
363- 368 Sh., m. gy., v. dol.
368- 373 Sh., gy.
373- 375 Anhy., m. dk. gy., f. xl.
375- 380 Sh., gy.
380- 385 Dol., m. lt. gy., f. gr., arg.
385- 390 Sh., gy.
390- 396 Sh., gn. gy.
396- 398 Anhy., v. lt. gy., f. xl.
398- 405 Sh., gy.
405- 407 Anhy., m. lt. to m. gy., f. xl.
407- 415 Sh., gy.
415- 417 Anhy., as abv.
417- 426 Sh., gy.
426- 430 Anhy, as abv.
430- 438 Sh., gy.
438- 440 Dol., lt. gy., v. f. gr.
440- 443 Sh., gy.
443- 447 Anhy., m. to m. dk. gy., f. xl.
447- 454 Sh., gy.
454- 458 Dol., m. gy., v. f. gr., arg.
458- 460 Sh., gy.
460- 465 Anhy., m. dk. gy., f. xl.
465- 470 Sh., gy.
470- 475 Anhy., as abv.
475- 480 Sh., gy.
480- 487 Anhy., as abv.
487- 494 Sh., gy.
494- 500 Anhy., m. gy., f. xl.; salt
500- 503 Sh., gy.
503- 510 Anhy., m. to m. lt. gy., f. xl.
510- 513 Sh., gy.
513- 520 Anhy., as abv.
520- 523 Sh., gy.
523- 530 Anhy., as abv.; salt
530- 534 Sh., gy.
534- 540 Anhy., as abv.
540- 546 Sh., gy.
546- 555 Anhy., as abv.
555- 560 Sh., gy.
560- 566 Anhy., m. to lt. gy., f. xl.; salt
566- 576 Sh., gy.
576- 584 Anhy., as abv.
584- 590 Sh., gy.
590- 595 Anhy., as abv.; salt
595- 600 Sh., gy.
600- 607 Anhy., as abv.
607- 610 Sh., gy.
610- 616 Anhy., as abv.
616- 623 Sh., gy.
623- 630 Anhy., lt. to v. lt. gy., f. xl.
630- 635 Sh., gy.
635- 640 Anhy., as abv.
640- 644 Sh., gy.
644- 653 Anhy., as abv.
653- 658 Sh., gy.
658- 670 Anhy., as abv.
670- 672 Sh., gy.
672- 680 Anhy., as abv.
680- 684 Sh., gy.
684- 696 Anhy., as abv.
696- 700 Sh., gy.
700- 755 Anhy., as abv.; salt
755- 770 Anhy., lt. to v. lt. gy., f. xl.
770- 785 Anhy., as abv.; salt
785- 790 Prob. salt
790- 795 Anhy., as abv.
795- 803 Prob. salt
803- 806 Anhy., as abv.
806- 810 Prob. salt
810- 820 Anhy., lt. gy., f. xl.
820- 830 Prob. salt
830- 835 Anhy., as abv.
835- 840 Prob. salt
840- 844 Anhy., as abv.
844- 850 Prob. salt
850- 852 Sh., gy.
852- 860 Prob. salt
860- 863 Sh., gy.
863- 870 Prob. salt
870- 875 Anhy., as abv.
875- 885 Prob. salt
885- 890 Anhy., as abv.
890- 895 Prob. salt
895- 910 Anhy., v. lt. gy., f. xl.
910- 913 Prob. salt
913- 920 Anhy., as abv.
920- 923 Sh., gy.
923- 934 Anhy., as abv.
934- 937 Sh., gy.
937- 950 Anhy., as abv.
950- 952 Sh., gy.
952- 960 Anhy., as abv.
960- 962 Sh., gy.
962- 970 Anhy., as abv.
970- 972 Sh., gy.
972- 983 Anhy., v. lt. gy., f. xl.
983- 985 Sh., gy.
985- 992 Anhy., as abv.
992- 994 Sh., gy.
994-1000 Anhy., as abv.
1000-1002 Sh., gy.
1002-1013 Anhy., as abv.
1013-1017 Sh., gy.
1017-1020 Dol., m. lt. gy. to lt. olv. gy., f. gr., sl. arg., anhy. xl. in pt.
1020-1022 Sh., gy.
1022-1035 Anhy., v. lt. gy., f. xl.
1035-1038 Sh., gy.
1038-1040 Dol., m. gy., v. f. gr., arg., p.-p. por.
1040-1042 Sh., gy.
1042-1054 Anhy., v. lt. to lt. gy., f. xl.
1054-1057 Sh., gy.
1057-1068 Anhy., as abv.
1068-1072 Sh.. gy.

Chase Group

Nolans Limestone

1072-1080 Dol., m. gy. to lt. olv. gy., v. f. gr., arg., mot. / dk. gy., p.-p. por.; wh. qtzs. cht.; tr. of dk.-gy. cht.
1080-1082 Sh., gy.
1082-1090 Dol., m. gy. to lt. olv. gy., v. f. gr.; cht. as abv.
1090-1092 Sh., gy.
1092-1099 Dol., m. gy. to lt. olv. gy., v. f. gr., arg., mot. / dk. gy.
1099-1100 Sh., gy.
1100-1110 Dol., as abv.

Odell Shale

1110-1120 Anhy., lt. gy., f. xl.
1120-1130 Sltst., m. to lt. gy., dol.; m.-lt.-gy. to m.-dk.-gy. gran. dol. spec. cht.

Winfield Limestone

1130-1140 Dol., m. lt. gy., gran., arg.; m.-gy. to m.-dk.-gy. dns. mot. cht.
1140-1142 Sh., gy.
1142-1150 Ls., m. lt. gy., gran., Crin., scat. anhy. xls., p.-p. por.
1150-1155 Ls., m. lt. gy. to pale yel. brn., v. f. gr., sl. arg.
1155-1158 Ls., m. lt. gy., v. f. gr., dol.
1158-1160 Dol., v. pale orng., v. f. gr.

Doyle Shale

1160-1162 Sh., gy.
1162-1177 Sltst., lt. gy., pale red to pale red. brn., dol.
1177-1180 Ls., m. gy., v. f. gr.
1180-1187 Ls., m. lt. gy., v. f. gr., dol., sl. arg.
1187-1193 Anhy., v. lt. gy., v. f. xl.
1193-1200 Dol., lt. olv. gy. to pale yel. brn., v. f. gr., anhy.
1200-1210 Ls., m. lt. to lt. gy., v. f. gr., sl. dol., Crin.
1210-1222 Ls., pale yel. brn., mot. / dk. gy., f. gr., dol., s. fos. frags.
1222-1225 Sh., dk. gn. gy.

Barneston Limestone

1225-1230 Ls., m. lt. gy., f. gr.
1230-1240 Ls., lt. gy., v. f. gr., dol.
1240-1250 Ls., pale yel. brn., f. ooc., Crin., spine
1250-1260 Ls., m. lt. gy., v. f. gr., sl. dol.
1260-1270 Ls., lt. gy., v. f. gr., Crin.
1270-1280 Ls., as abv., Crin.; m.-lt.-gy. to lt.-gy. dns. spic. cht.
1280-1290 Ls., as abv., Crin., Ost.; cht. as abv.; m.-gy. cht.
1290-1300 Ls., m. lt. gy., v. f. gr.; m.-gy. to lt.-gy. dns. mot. spic. cht.
1300-1307 Ls., lt. gy., v. f. gr., Crin.
1307-1315 Ls., m. dk. gy., v. arg.
1315-1320 Ls., m. lt. to m. gy., v. f. gr., arg., s. fos. frags.
1320-1338 Ls., lt. gy., v. f. gr., Fus., Crin., Bry.; m.-gy. to v. lt. gy. dns. and gran. spic. and mot. cht.

Matfield Shale

1338-1341 Sh., gy.
1341-1343 Sh., gy. red
1343-1345 Sh., gy.
1345-1353 Ls., pale yel. brn., gran., v. s. fos. frags.
1353-1357 Sh., gy.
1357-1365 Ls., m. lt. to m. gy., f. gr., sl. arg.
1365-1373 Ls., m. gy., gran., many dk.-gy. sps., sl. arg.
1373-1378 Sh., m. dk. gy., v. lmy.

Wreford Limestone

1378-1380 Ls., v. lt. gy., v. f. gr., Ost. ?, ltl. p.-p. por.
1380-1384 Ls., m. lt. gy., f. gr.
1384-1386 Sh., dk. gy.
1386-1400 Ls., m. gy., f. gr., arg., fos. frags.; m.-lt.-gy. to m.-dk.-gy. spic. cht.
1400-1402 Sh., gy.
1402-1410 Ls., lt. gy. to v. pale orng., v. f. to f. gr.; m.-gy. and olv.-gy. spic. cht.
1410-1413 Ls., v. pale orng., v. f. gr.

Council Grove Group

1413-1420 Sh., gn. gy., v. lmy.
1420-1428 Sh., gy. red, v. lmy.
1428-1430 Ls., pale red, v. f. gr., arg.
1430-1440 Ls., pale yel. brn., gran., v. s. fos. frags., Gast., much p.-p. por.
1440-1457 Ls., lt. gy. to v. pale orng., gran., many v. s. fos. frags., Gast., much p.-p. por.
1457-1460 Ls., lt. gy., slty.
1460-1468 Sltst., lt. gy., v. lmy.
1468-1470 Sh., gy.
1470-1475 Ls., pale yel. brn. to v. pale orng., f. gr.
1475-1480 Sh., dk. gy.
1480-1485 Ls., m. gy., arg.
1485-1490 Sh., m. gy. to olv. gy., lmy.
1490-1493 Ls., m. gy., arg.
1493-1498 Ls., m. to m. lt. gy., v. f. gr.
1498-1503 Sh., gy., lmy.
1503-1510 Ls., m. gy., v. f. gr., sl. arg.
1510-1513 Ls., m. lt. gy., v. f. gr.
1513-1517 Sh., gy., lmy.
1517-1520 Ls., m. dk. gy., v. f. gr., arg.
1520-1522 Ls., pale yel. brn., v. f. xl.
1522-1527 Sh., gy., lmy.
1527-1530 Ls., m. gy., v. arg.
1530-1532 Ls., pale yel. brn., f. xl., some pk. mot.
1532-1537 Sh., gy., lmy.
1537-1540 Ls., m. gy., arg.
1540-1545 Ls., m. to m. lt. gy., v. f. gr., sl. arg.
1545-1550 Ls., pale yel. brn., f. gr.
1550-1554 Sh., gy., lmy.
1554-1564 Dol., v. pale orng., v. f. xl.
1564-1567 Sh., gy.
1567-1578 Ls., pale yel. brn., v. f. to f. xl.
1578-1582 Sh., gy., lmy.
1582-1586 Ls., m. gy., v. f. gr., arg.
1586-1590 Ls., m. gy., v. f. xl.
1590-1606 Ls., pale to mod. yel. brn., f. xl.

Eskridge Shale 1606-1612

1606-1610 Sh., gy., lmy.
1610-1612 Sh., gy. red, lmy.
1612-1620 Ls., pale yel. brn. to lt. gy., f. gr., some gy.-red mot.; tr. of pale-red v. f. gr. ls.
1620-1626 Ls., m. lt. gy., v. f. gr.
1626-1628 Ls., m. lt. gy., v. f. gr., arg.
1628-1632 Sh., gn. gy.
1632-1640 Ls., pale yel. brn., v. f. gr.
1640-1656 Sh., m. dk. to dk. gy., lmy.
1656-1664 Ls., m. gy., f. gr., sl. arg.
1664-1667 Sh., gy.
1667-1675 Ls., m. lt. gy., f. gr., sl. arg. in pt.
1675-1680 Ls., pale yel. brn., f. xl.
1680-1710 Dol., pale to mod. yel. brn., f. xl.
1710-1712 Sh., gy.
1712-1724 Ls., pale to dk. yel. brn., f. xl.
1724-1727 Sh., gy.
1727-1735 Ls., m. lt. gy., v. f. xl.
1735-1740 Ls., pale yel. brn., v. f. xl.
1740-1743 Sh., gy.
1743-1770 Ls., m. to m. lt. gy., f. gr., Fus., sil. Fus.

Admire Group

1770-1774 Sh., gy.
1774-1780 Ls., m. lt. gy., f. xl., tr. of glau.
1780-1786 Sltst., m. lt. gy., lmy.
1786-1793 Ls., m. gy., v. f. gr., arg.
1793-1806 Sh., m. dk. gy.
1806-1810 Ls., m. gy., v. f. gr., sl. arg.
1810-1816 Sh., gy.
1816-1820 Ls., v. lt. gy., v. f. gr., dol.
1820-1823 Ls., pale yel. brn., f. xl.
1823-1826 Sh., gy.
1826-1828 Sh., gy. red
1828-1830 Ls., pale red, v. f. gr., sl. arg.
1830-1834 Sh., gy.
1834-1836 Ls., m. to m. dk. gy., f. gr., sl. arg., mot. / dk. gy.
1836-1840 Sh., gy.
1840-1842 Ls., pale yel. brn., f. xl., Fus.
1842-1846 Ls., v. pale orng., slty., v. glau.
1846-1850 Sltst., lt. gy., mica.
1850-1854 Sh., gy.
1854-1856 Ls., pale yel. brn., f. xl., glau.
1856-1860 Sh., gy.
1860-1862 Ls., m. gy., arg.
1862-1870 Sh., gy.
1870-1873 Sltst., lt. gy., lmy., mica.
1873-1883 Ss., m. lt. to v. lt. gy., v. f. gr., mica., lmy. in pt., por. in pt.
1883-1887 Sltst., lt. to m. lt. gy., lmy., mica.
1887-1890 Ss., lt. gy., v. f. gr., lmy., mica.
1890-1896 Ss., lt. gy., v. f. gr., slty., por.
1896-1905 Sh., gy.

Pennsylvanian—Virgil Series

Wabaunsee Group

1905-1910 Ls., m. to m. lt. gy., v. f. gr.
1910-1914 Ls., pale yel. brn. to v. pale orng., f. gr.
1914-1932 Sh., gy.
1932-1935 Ls., m. gy., arg.
1935-1940 Sh., gy.
1940-1950 Sltst., m. lt. to m. gy., lmy., sl. mica.
1950-1958 Sh., gy.
1958-1962 Sltst., m. gy., lmy., mica.
1962-1973 Sh., gy.
1973-1975 Ss., m. gy., v. f. gr., slty.
1975-1982 Sh., m. gy. to dusky brn., mica.
1982-1985 Sh., mod. red. brn.
1985-1990 Ss., lt. brn. to mod. yel. brn., v. f. to f. gr., ang. to sbang., dol.
1990-1994 Sh., gy.
1994-2032 Ss., m .lt. to lt. gy., v. f. to f. gr., dol., sl. mica.
2032-2036 Sh., gy.

Zeandale Limestone

2036-2046 Ls., brn. gy., v. f. gr., sl. arg., Fus.
2046-2050 Sh., gy.
2050-2054 Ls., pale yel. brn. to v. pale orng., f. xl.
2054-2057 Sh., gy.
2057-2063 Ls., m. lt. gy., v. f. gr.
2063-2066 Sh., gy.
2066-2070 Ls., brn. gy., v. f. gr., arg., Fus.

Willard Shale

2070-2073 Sh., gy.
2073-2076 Ls., v. lt. gy., v. f. gr., dol.
2076-2080 Ls., pale yel. brn., f. xl.
2080-2083 Sh., gy.
2083-2088 Ls., m. gy., v. f. gr., arg.
2088-2100 Sh., gy.

Emporia Limestone

2100-2105 Ls., brn. gy., f. gr., arg.
2105-2110 Sh., gy.
2110-2120 Ls., v. pale orng. to v. lt. gy., v. f. xl.
2120-2122 Sh., gy.
2122-2127 Ls., pale yel. brn., v. f. xl.
2127-2130 Ls., brn. gy., v. f. xl., dol.

Auburn Shale

2130-2134 Sh., gy.
2134-2138 Ls., m. gy., v. f. gr., arg.
2138-2140 Sh., gy.
2140-2142 Ls., as abv.
2142-2147 Sh., gy.

Bern Limestone

2147-2154 Ls., pale yel. brn., f. xl.
2154-2157 Sh., gy.
2157-2163 Ls., m. gy., v. f. gr.
2163-2167 Sh., gy.
2167-2174 Ls., pale yel. brn., f. gr.
2174-2180 Sh., gy.
2180-2190 Ls., pale yel. brn., f. gr., tr. of glau. in pt., Fus.
2190-2198 Sh., gy.
2198-2200 Ls., pale yel. brn., f. gr.

Scranton Shale

2200-2208 Sh., gy.
2208-2210 Ls., pale yel. brn., f. gr.
2210-2217 Sh., gy.
2217-2223 Ls., m. gy., f. gr., arg.
2223-2230 Sh., gy.
2230-2240 Sltst., lt. gy., v. f. sdy., mica., scat. v. f. carb. mat.
2240-2245 Sh., m. gy., slty., mica., scat. v. f. carb. mat .
2245-2255 Sltst., m. lt. gy., mica., scat. v. f. carb. mat.
2255-2260 Sh., m. dk. to dk. gy.
2260-2263 Ss., lt. gy., v. f. gr., slty., sl. lmy., mica.
2263-2270 Sh., gy.

Happy Hollow Limestone and White Cloud Shale Members of Scranton Shale, and Howard Limestone

2270-2278 Ls., m. dk. gy., f. gr., sl. arg., Fus. ?, Bry. ?, Crin.
2278-2282 Sh., gy.
2282-2288 Ls., m. lt. to m. gy., v. f. gr., arg.
2288-2292 Sh., gy.
2292-2306 Ls., v. pale orng., v. f. gr., dol.
2306-2310 L.s, pale yel. brn., f. gr.
2310-2312 Sh., gy.
2312-2320 Ls., m. gy., f. gr., Fus.
2320-2326 Ls., m. gy., f. gr., sl. arg.
2326-2328 Sh., gy.
2328-2340 Ls., lt. gy. to v. pale orng., f. gr., Fus.
2340-2355 Ls., m. gy., f. gr., arg.

Severy Shale

2355-2366 Sh., gy.
2366-2375 Sltst., m. lt. gy., v. f. sdy., mica., lmy. in pt. ?
2375-2385 Sh., gy.
2385-2390 Sltst., lt. gy., v. f. sdy., sl. mica.
2390-2395 Sltst., lt. gy., sl. mica.

Shawnee Group

2395-2400 Ls., m. gy., v. f. gr., sl. arg.
2400-2404 Sh., gy.
2404-2410 Ls., brn. gy., v. f. gr.
2410-2413 Sh., gy.
2413-2420 Ls., m. lt. gy., f. gr., Fus.
2420-2422 Sh., gn. gy., cave ?
2422-2430 Ls., m. gy., f. gr.
2430-2440 Ls., pale yel. brn., gran., fos. frags., Crin.; tr. m.-lt.-gy. dns. cht.
2440-2450 Ls., as abv.
2450-2460 Ls., lt. gy., f. xl.
2460-2462 Sh., gy.
2462-2470 Ls., pale yel. brn. to m. lt. gy., f. gr.
2470-2480 Ls., pale yel. brn., f. gr.; ltl. lt.-gy. to m.-gy. dns. fig. cht.
2480-2482 Sh., gy.
2482-2490 Ls., v. pale orng., v. f. gr.
2490-2500 Ls., pale yel. brn., f. gr.
2500-2502 Sh., gy.
2502-2520 Ls., lt. gy. to v. pale orng., f. gr.
2520-2540 Ls., pale yel. brn., f. gr.
2540-2542 Sh., gy.
2542-2560 Ls., as abv.
2560-2565 Sh., gy.
2565-2580 Ls., pale yel. brn. to lt. gy., f. gr.
2580-2587 Ls., as abv., Crin.; lt.-gy. to v. lt. gy. dns. fig. cht.
2587-2590 Sh., gy.
2590-2600 Ls., v. pale orng. to lt. gy., f. xl., Crin., Brac.
2600-2608 Ls., as abv., Fus., Crin.
2608-2610 Sh., gy.
2610-2620 Ls., as abv.
2620-2623 Ls., brn. gy., f. gr.
2623-2625 Sh., gy.
2625-2640 Ls., lt. gy., f. xl.
2640-2643 Sh., dk. gy.
2643-2650 Ls., lt. gy., f. xl.
2650-2654 Sh., gy.
2654-2666 Ls., m. lt. to m. gy., f. xl.; lt.-gy. to m.-gy. dns. cht.
2666-2674 Ls., pale yel. brn., f. xl.; some m.-xl. ls.
2674-2676 Sh., gn. gy.
2676-2688 Ls., pale yel. brn. to lt. gy., f. xl.
2688-2690 Sh., gy.
2690-2700 Ls., as abv.

2700-2702 Sh., gy.
2702-2710 Ls., v. pale orng., f. xl.
2710-2713 Sh., dk. gy.
2713-2720 Ls., m. lt. to m. gy., f. xl.
2720-2730 Ls., v. pale orng., f. xl.
2730-2732 Sh., gn. gy.
2732-2734 Sh., gy.
2734-2747 Ls., pale yel. brn., f. xl.
2747-2750 Sh., gy.
2750-2760 Ls., lt. gy., f. xl.
2760-2763 Sh., gy.
2763-2770 Ls., as abv.
2770-2773 Sh., gy.
2773-2777 Sh., blk.
2777-2780 Ls., brn. gy., v. f. xl.
2780-2785 Ls., pale yel. brn., f. xl.

Douglas Group

2785-2850 Sh., m. to dk. gy.
2850-2868 Sh., m. dk. to dk. gy., lmy.
2868-2872 Ls., dk. gy., v. f. gr., v. arg., dol.
2872-2890 Sh., m. dk. to dk. gy., lmy.
2890-2891 Ls., brn. gy., f. gr., arg., fos. frags.
2891-2895 Sltst., m. lt. gy., mica., v. f. sdy. in pt.
2895-2900 Ss., m. lt. to lt. gy., v. f. gr., sl. lmy. and mica.
2900-2908 Ss., m. lt. gy., v. f. gr., slty., sl. lmy. in pt., sl. mica.
2908-2920 Sh., gy.
2920-2930 Sltst., m. lt. gy. to lt. olv. gy., v. f. sdy., mica., sl. lmy. in pt.
2930-2941 Sh., m. dk. to dk. gy., slty.
2941-2947 Ss., lt. gy., v. f. gr., slty., lmy. in pt.
2947-2956 Sh., gy.
2956-2960 Ss., lt. brn., v. f. gr., slty.
2960-2963 Ss., lt. gy., v. f. gr., slty., sl. lmy.
2963-2967 Sh., gy.
2967-2970 Ls., m. gy., v. f. to f. gr.
2970-2973 Sh., gy.
2973-2975 Ls., brn. gy., v. f. gr., sl. slty.
2975-2978 Sh., gy.
2978-2987 Ls., pale yel. brn., f. gr.
2987-2990 Ss., lt. gy., v. f. gr., sl. mica., por.
2990-2996 Ss., lt. gy., v. f. gr., slty., lmy. in pt.
2996-2998 Dol., v. pale orng., v. f. gr.
2998-3000 Ls., pale yel. brn., f. ooc.
3000-3012 Sh., gy.

Pennsylvanian—Missouri Series

Lansing Group

3012-3020 Ls., pale yel. brn. to lt. gy., f. xl.
3020-3024 Ls., as abv., Brac.
3024-3026 Sh., gy.
3026-3030 Ls., pale yel. brn. to brn. gy., v. f. to f. xl., Ost., Crin.
3030-3038 Ls., brn. gy., v. f. xl.
3038-3040 Sh., gy.
3040-3050 Ls., m. lt. to lt. gy., v. f. xl.
3050-3055 Ls., pale yel. brn., f. xl.; tr. of lt.-gy. dns. cht.
3055-3059 Ls., brn. gy., v. f. xl.; m.-gy. dns. cht.
3059-3060 Ls., brn. gy., f. gr., arg.
3060-3064 Ls., pale yel. brn., f. gr.; brn.-gy. dns. cht.
3064-3067 Sh., gy.
3067-3075 Ls., as abv.
3075-3080 Ls., m. lt. gy., f. gr.
3080-3083 Sh., gy.
3083-3086 Ls., pale yel. brn., f. gr.; m.-gy. to pale-yel.-brn. dns. cht.; brn.-gy. f.-gr. ls.
3086-3090 Ss., m. lt. gy., v. f. gr., slty., sl. dol.
3090-3092 Sh., yel. brn. to mod. brn.
3092-3097 Ls., m. lt. gy., f. gr.; m.-lt.-gy. to m.-gy. dns. cht., spic. in pt.
3097-3100 Ls., brn. gy., f. gr.
3100-3107 Ls., pale yel. brn., f. gr.
3107-3110 Sh., gy.
3110-3115 Ls., pale yel. brn. to brn. gy., f. xl.; m.-lt.-gy. to m.-dk.-gy. dns. cht., mot. in pt.
3115-3120 Ls., m. lt. to m. gy., f. xl.; cht. as abv.
3120-3124 Ls., brn. gy., f. xl.; brn.-gy. to dk.-gy. dns. mot. cht. and fos. cht.
3124-3128 Sh., gy.
3128-3136 Ls., pale yel. brn., f. xl.; brn.-gy. f. xl. ls.
3136-3141 Ls., pale yel. brn., f. to m. ooc.
3141-3143 Ls., pale yel. brn., f. xl.
3143-3145 Sh., gy.
3145-3148 Ls., pale to mod. yel. brn., f. gr.; m.-lt.-gy. to m.-gy. mot. cht.

Kansas City Group

3148-3150 Sh., gy.
3150-3160 Ls., pale to mod. yel. brn., f. gr.
3160-3170 Ls., as abv.; m.-gy. dns. cht., mot. / lt. gy.
3170-3175 Ls., as abv.; cht. as abv.; Fus. cht.
3175-3180 Ls., brn. gy., f. gr.
3180-3184 Sh., gy.
3184-3190 Ls., brn. gy., v. f. to f. xl.; m.-gy. to dk.-gy. dns. cht.
3190-3200 Ls., pale yel. brn., f. xl.
3200-3203 Sh., gy.
3203-3210 Ls., brn. gy., v. f. xl., Fus.
3210-3213 Sh., brn. gy.

Base of Lane Shale

3213-3230 Ls., pale yel. brn., f. xl.
3230-3234 Sh., gy.
3234-3239 Ls., m. lt. to m. gy., f. xl.; lt.-gy. to m.-dk.-gy. cht.
3239-3240 Ls., m. dk. gy., v. f. gr., arg.
3240-3243 Sh., gy.
3243-3255 Ls., pale yel. brn., v. f. xl.
3255-3260 Ls., brn. gy., v. f. xl., fos. frags.
3260-3270 No samples
3270-3272 Sh., gy.
3272-3280 Ls., m. lt. gy. to pale yel. brn., f. gr.; m.-lt.-gy. to m.-gy. dns. cht. and spic. cht.
3280-3286 Ls., brn. gy., v. f. xl.
3286-3290 Ls., m. dk. gy., v. f. xl., arg.
3290-3296 Ls., m. lt. gy., f. gr.
3296-3300 Sh., m. dk. gy.
3300-3304 Ls., brn. gy. to m. gy., f. xl.
3304-3310 Sh., olv. gy. to mod. brn.
3310-3313 Sh., m. dk. gy.
3313-3317 Sh., blk.
3317-3320 Ls., m. dk. gy. to brn. gy., f. gr., arg.
3320-3324 Sh., gy.
3324-3330 Ls., brn. gy., f. xl.
3330-3333 Sh., gy.
3333-3340 Ls., pale yel. brn., f. xl.; m.-gy. f. xl. ls.
3340-3354 Ls., brn. gy. to pale yel. brn., v. f. xl.
3354-3356 Sh., gy.
3356-3360 Ls., m. gy., f. xl.
3360-3364 Ls., brn. gy., f. xl.
3364-3368 Sh., m. dk. to dk. gy.
3368-3370 Sh., blk.
3370-3373 Sh., m. dk. gy.
3373-3383 Ls., pale yel. brn., m. ooc.
3383-3386 Sh., gy.
3386-3393 Ls., pale yel. brn., f. xl.
3393-3395 Sh., gy.
3395-3406 Ls., m. dk. gy., f. xl., sl. arg., Crin.
3406-3410 Sh., gy.
3410-3415 Ls., brn. gy., f. xl.
3415-3420 Ls., m. dk. gy., v. f. gr., v. arg.
3420-3424 Ls., m. dk. gy., v. f. xl., arg.

Pleasanton Group
3424-3430 Sh., gy.
3430-3440 Ls., pale yel. brn., f. xl.
3440-3443 Sh., gy.
3443-3447 Sh., gy. red, lmy. in pt.
3447-3452 Sh., gn. gy.

Pennsylvanian—Des Moines Series
Marmaton Group
3452-3456 Ls., m. lt. gy., f. to m. ooc.
3456-3460 Ls., brn. gy. to m. gy., v. f. xl.
3460-3465 Ls., pale yel. brn., v. f. xl. to dns.
3465-3468 Sh., gy.
3468-3470 Ls., gy. red, f. xl., arg.
3470-3474 Sh., gy. red
3474-3480 Ls., pale yel. brn., f. xl.
3480-3488 Sh., m. to dk. gy.
3488-3490 Sh., gn. gy.
3490-3493 Ls., brn. gy. mot. / dk. gy., f. xl., arg.
3493-3503 Ls., pale yel. brn., f. xl.
3503-3506 Ls., m. gy. to brn. gy., f. xl., sl. arg.
3506-3512 Sh., dk. gy. to blk.
3512-3516 Ls., m. gy. to olv. gy., f. gr., arg.
3516-3520 Ls., pale yel. brn., f. xl., Fus.
3520-3523 Ls., m. dk. gy., f. gr., sl. arg.
3523-3530 Ls., olv. gy., f. gr., v. arg.
3530-3535 Ls., pale yel. brn., f. xl., arg.
3535-3538 Ls., pale yel. brn., f. xl., sl. arg.
3538-3547 Sh., gy.
3547-3552 Ls., pale yel. brn., m. ooc. and f. ool.

Cherokee Group
3552-3558 Sh., dk. gy.
3558-3560 Sh., blk., tr. fusain ?, pyr.
3560-3578 Sh., lt. olv. gy. and mod. brn.
3578-3580 Sh., gy. red, cave ?
3580-3588 Sh., gy.
3588-3590 Ls., m. dk. gy., v. f. gr., arg.
3590-3600 Sh., gy.
3600-3603 Sh., olv. gy.
3603-3606 Sh., mod. brn.
3606-3610 Sh., gy. red
3610-3614 Sh., yel. orng. to lt. olv. gy., pel. ? of olv.-gy. and gy.-red v. f. gr. arg. ls.
3614-3617 Sh., gy.
3617-3620 Ls., m. gy., v. f. xl., arg.
3620-3628 Sh., gy.
3628-3631 Sltst., m. lt. gy., sl. lmy., mica.
3631-3636 Sh., gy. red
3636-3640 Sh., gn. gy.
3640-3641 Ls., m. gy. to gn. gy., v. f. xl.
3641-3646 Sh., gy.
3646-3652 Sh., gn. gy.
3652-3656 Sh., gy. red
3656-3664 Ss., lt. gy., gn. gy., and gy. red, v. f. to f. gr., slty., tt., gl. in pt., scat. m. grs.
3664-3670 Cht., prob. dtrl., lt. gy., yel. brn., yel. orng., and pale red, mostly trip. and por.

Mississippian—Lower Mississippian Series
Rocks of Osage age
3670-3680 Cht., lt. gy. to wh., trip., por.
3680-3685 Cht., as abv.; some lt.-gn.-gy. trip. cht.
3685-3705 Cht., wh., v. lmy., trip.
3705-3710 Ls., lt. gy., f. to m. xl.; lt.-gy. dns. spic. cht., f. qtz. xls.
3710-3718 Ls., v. pale orng., f. to m. xl., Crin.
3718-3727 Ls., lt. gy. to v. pale orng., f. to m. xl., Crin., sl. glau.
3727-3730 Ls., lt. gy. to v. pale orng., f. to m. ool.
3730-3760 Ls., lt. gy., f. to m. xl.; lt.-gy. cht.
3760-3770 Ls., lt. gy. to v. pale orng., f. to m. xl.; wh. dns. trnsl. spic. cht.
3770-3790 Ls., v. pale orng., f. xl.; v. lt. gy. dns. op. cht.
3790-3800 No samples
3800-3810 Ls., lt. gy., f. xl., sl. dol.; v. lt. gy. dns. op. cht.
3810-3820 Ls., v. pale orng. to pale yel. brn., f. xl.; m.-lt.-gy. dns. op. cht.
3820-3850 Ls., as abv.; lt.-gy. dns. op. cht.
3850-3855 Ls., m. to m. lt. gy., f. xl., dol., arg.
3855-3865 Ls., as abv., brn. in pt.

Devonian and Mississippian
Chattanooga Shale
3865-3900 Sh., m. dk. to dk. gy.
3900-3910 Sh., as abv., pyr.
3910-4040 Sh., as abv.
4040-4048 Sltst., m. to dk. gy., sl. dol.
4048-4050 Sltst., m. lt. gy., v. f. sdy., dol.
4050-4068 Sh., m. dk. gy., slty., sl. dol.

Misener sand
4068-4070 Ss., v. lt. gy., v. f. to f. gr.
4070-4072 Ss., m. lt. to v. lt. gy., v. f. gr., slty., dol., pyr. in pt.

Ordovician—Upper Ordovician Series
Sylvan Shale
4072-4087 Sh., gy., some gn. mot.

Ordovician—Middle and Upper Ordovician Series
Viola Limestone
4087-4090 Ls., lt. gy. to v. pale orng., m. xl., dol., scat. dk. xls.
4090-4100 Ls., lt. gy. to v. pale orng., m. to c. xl., scat. dk. xls.
4100-4185 No samples

Ordovician—Middle Ordovician Series 4110
Simpson Group
Ordovician—Lower Ordovician Series 4183
Arbuckle Group
Cotter and Jefferson City Dolomites
4185-4190 Dol., lt. gy., v. pale orng., and pale yel. brn., m. xl.
4190-4210 Dol., as abv., few vugs, ltl. p.-p. por.
4210-4218 Dol., as abv., some c. xl. dol.
4218-4223 Dol., lt. gy. to v. pale orng., f. to m. xl.; v. lt. gy. to lt.-gy. dns. semi-trnsl. cht.; tr. of m.-ool. cht.
4223 Total depth

WELL 8
J. M. HUBER CORP., ET AL. No. 1 HAINES
SE¼ SE¼ SW¼ SEC. 5, T. 25 S., R. 5 W.
RENO COUNTY

Altitude: 1544 feet **Total depth: 3997 feet**
Completion date: May 1, 1949
Initial production: Dry
Electrical log: 250-4004 feet
Sample intervals: 10-foot; 2500-3300 feet
5-foot; 3300-3997 feet
Cored intervals: None

Depth, feet *Sample description*
0-2500 No samples

Permian—Lower Permian Series
Chase Group 830
Nolans Limestone
Odell Shale 878
Winfield Limestone 907
Doyle Shale 952
Barneston Limestone 1015
Matfield Shale 1112

Wreford Limestone 1160
Council Grove Group 1206
Eskridge Shale 1376-1390
Admire Group 1544
Pennsylvanian—Virgil Series 1657
Wabaunsee Group
Zeandale Limestone 1816
Willard Shale 1839
Emporia Limestone 1866
Auburn Shale 1896
Bern Limestone 1926
Scranton Shale 1961
Happy Hollow Limestone and White Cloud Shale Members of Scranton Shale, and Howard Limestone 2045
Severy Shale 2116
Shawnee Group 2177

2500-2505 Ls., pale yel. brn., f. xl., dol.
2505-2520 Ls., lt. gy. to pale yel. brn., f. xl.
2520-2522 Sh., m. to m. dk. gy.
2522-2529 Ls., pale yel. brn., f. xl.
2529-2535 Sh., blk.
2535-2537 Sh., gy.
2537-2540 Ls., brn. gy., f. xl.
2540-2544 Sh., gy.
2544-2550 Ls., m. dk. gy., v. f. xl.; pale-yel.-brn. f. xl. ls.

Douglas Group

2550-2554 Sh., gy.
2554-2562 Ss., v. lt. gy., f. gr., dol. in pt., por. in pt.
2562-2567 Sh., gn. gy.
2567-2576 Sh., gy.
2576-2580 Ss., v. lt. gy., v. f. gr., dol.
2580-2585 Sltst., m. gy.
2585-2590 Sh., gy.
2590-2600 Ss., lt. gy., v. f. gr., slty.
2600-2626 Ss., lt. gy., v. f. gr., sl. dol., sl. mica., por.
2626-2630 Sltst., lt. gy., v. f. sdy., sl. dol. and mica.
2630-2658 Sh., gy.
2658-2667 Ss., lt. gy., v. f. gr., dol., sl. mica., tt.
2667-2669 Sh., m. gy.
2669-2708 Ss., lt. gy. to pale yel. brn., v. f. to f. gr., sl. dol. and mica., por.
2708-2712 Sh., gy. red, cave ?
2712-2714 Sh., gn. gy., cave ?
2714-2750 Sh., m. to dk. gy.; cement in 2730-2740 spl.
2750-2755 Ls., brn. gy., v. f. gr., sl. arg., fos. frag.
2755-2760 Ss., m. dk. gy., v. f. to f. gr., slty., v. lmy.
2760-2763 Sh., gy.

Pennsylvanian—Missouri Series
Lansing Group

2763-2770 Ls., pale yel. brn. to m. lt. gy., f. gr., Crin.
2770-2772 Sh., m. gy.
2772-2789 Ls., pale to mod. yel. brn., f. gr.
2789-2791 Sh., m. gy.
2791-2798 Ls., brn. gy., v. f. xl.
2798-2800 Sh., m. gy.
2800-2814 Ls., pale yel. brn. to lt. gy., f. gr., Fus., Crin.; m.-gy. to lt.-gy. dns. cht.
2814-2817 Sh., m. gy.
2817-2831 Ls., m. lt. gy. to pale yel. brn., v. f. xl.
2831-2835 Sh., m. gy.
2835-2847 Ls., m. lt. gy., f. gr.; m.-gy. dns. cht.; ltl. spic. cht.
2847-2850 Ls., pale yel. brn., f. gr.
2850-2853 Sh., m. gy.
2853-2860 Ls., as abv.; yel.-brn. to m.-gy. mot. dns. cht.
2860-2870 Ls., as abv.; dk.-gy. dns. cht.
2870-2873 Sh., m. gy.
2873-2880 Ls., brn. gy., f. gr.
2880-2890 Ls., pale yel. brn., f. gran., f. ool. in pt.; brn.-gy. dns. cht.; m. gy. spic. mot. cht.
2890-2896 Ls., pale yel. brn., f. gr.

Kansas City Group

2896-2900 Sh., m. gy.
2900-2919 Ls., pale yel. brn., f. gr.
2919-2928 Ls., v .pale orng., f. xl.; m.-lt.-gy. mot. cht.
2928-2942 Ls., pale yel. brn., f. xl.; cht. as abv.
2942-2946 Sh., m. gy., Fus.
2946-2950 Ls., brn. gy. to m. dk. gy., f. xl., arg.; dk.-gy. dns. cht.
2950-2960 Ls., as abv.
2960-2971 Ls., pale yel. brn., v. f. to f. gr.
2971-2976 Sh., m. gy.

Base of **Lane Shale**

2976-2981 Ls., m. to m. dk. gy., v. arg.
2981-2990 Ls., pale to mod. yel. brn., v. f. xl.
2990-2998 Ls., lt. to m. lt. gy., v. f. xl.; v. lt. gy. dns. cht.
2998-3002 Sh., m. gy.
3002-3010 Ls., pale yel. brn., v. f. xl.
3010-3020 Ls., as abv.; pale-yel.-brn. to m.-lt.-gy. dns. cht.
3020-3022 Sh., m. gy.
3022-3025 Ls., pale yel. brn., v. f. xl.
3025-3034 Ls., m. dk. gy., v. f. gr., arg.
3034-3037 Sh., gn. gy.
3037-3038 Sh., gy. red, cave ?
3038-3046 Sh., m. gy.
3046-3050 Ls., m. dk. gy., f. gr., v. arg.
3050-3056 Ls., m. dk. gy., f. to m. ool.
3056-3060 Sh., m. gy.
3060-3065 Ls., brn. gy., v. f. gr., sl. arg.
3065-3068 Sh., m. gy.
3068-3080 Sltst., m. lt. to m. gy., v. lmy.
3080-3092 Ls., m. gy., v. f. gr., arg.
3092-3095 Sh., m. gy.
3095-3104 Ls., pale yel. brn. to m. lt. gy., m. to c. ooc. and ool.
3104-3106 Sh., m. gy.
3106-3130 Ls., pale yel. brn., v. f. xl.
3130-3134 Sh., m. gy.
3134-3141 Ls., brn. gy., v. f. xl.
3141-3142 Sh., dk. gy.
3142-3146 Sh., blk.
3146-3154 Ls., pale yel. brn. to brn. gy., v. f. xl.
3154-3158 Ls., pale to mod. yel. brn., f. to m. ool.
3158-3160 Sh., gn. gy.
3160-3171 Ls., brn. gy., f. gr., sl. arg.
3171-3177 Sh., m. gy.
3177-3188 Ls., m. dk. to dk. gy., v. f. gr., v. arg.

Pleasanton Group

3188-3190 Sh., gy.
3190-3192 Sh., gy. red
3192-3196 Sltst., m. lt. gy., lmy., mica.
3196-3200 Sh., gn. gy.
3200-3203 Sltst., gn. gy., lmy.
3203-3206 Sh., gn. gy.
3206-3209 Sh., gy. red
3209-3212 Sh., gn. gy.

Pennsylvanian—Des Moines Series
Marmaton Group

3212-3216 Ls., m. to m. lt. gy., slty.
3216-3218 Sh., m. gy.
3218-3230 Ls., pale yel. brn., gran., f. to m. ireg.-shaped ool. in pt., Osagia?
3230-3232 Sh., m. dk. gy.
3232-3236 Sh., gy. red
3236-3238 Ls., m. gy. mot. / dk. gy. red, f. gr., v. arg.
3238-3247 Sh., m. gy.

3247-3250 Ls., m. lt. gy., f. gr., slty.
3250-3260 Ls., pale yel. brn., f. xl.
3260-3263 Sh., blk.
3263-3266 Ls., m. lt. gy., v. f. gr., dol.
3266-3272 Sh., m. gy.
3272-3280 Ls., m. lt. to lt. gy., f. gr.
3280-3290 Ls., pale yel. brn., f. gr.
3290-3296 Ls., m. dk. gy., f. gr., v. arg.
3296-3298 Sh., m. gy.
3298-3300 Sh., blk.
3300-3302 Ls., m. dk. gy., f. gr., v. arg.
3302-3304 Sh., m. gy.
3304-3312 Ls., m. lt. gy. to pale yel. brn., f. gr., slty.
3312-3320 Sltst., lt. olv. gy. to m. lt. gy., lmy.
3320-3322 Ls., m. lt. gy., f. gr., slty.

Cherokee Group

3322-3328 Sh., m. dk. to dk. gy.
3328-3330 Sh., blk.
3330-3333 Sh., gn. gy.
3333-3338 Ls., gn. gy. to lt. olv. gy., f. gr., slty.
3338-3340 Sh., m. gy., Fus.
3340-3346 Ls., pale to mod. yel. brn., v. f. xl.
3346-3355 Sh., m. dk. gy.
3355-3360 Sh., gn. gy.
3360-3365 Sh., gy. red
3365-3370 Sh., gn. gy.
3370-3378 Sh., m. gy., tr. of coal
3378-3381 Sh., gn. gy. to olv. gy.
3381-3387 Sh., gy. red
3387-3398 Sh., dk. gy.
3398-3400 Sltst., m. lt. gy., pyr.
3400-3404 Sh., gn. gy.
3404-3413 Sh., m. gy.
3413-3415 Ls., brn. gy. to gn. gy., v. f. xl.; ltl. gy.-red v. f. xl. ls.
3415-3420 Sh., m. gy.
3420-3425 Sh., gy. red
3425-3435 Sh., m. gy.
3435-3438 Sh., gn. gy. to olv. gy.
3438-3445 Ss., v. lt. gy. to lt. gn. gy., v. f. gr., clay cmt. ?
3445-3452 Ss., v. lt. gy. to gn. gy., f. to m. gr.
3452-3454 Sh., dk. gy. red
3454-3460 Cht., prob. dtrl., lt. gy. to wh., gran., por., o. stn.

Mississippian—Lower Mississippian Series
Rocks of Osage age

3460-3470 Ls., v. pale orng., f. xl.; v. lt. gy. to wh. op. dns. cht.
3470-3490 Cht., v. lt. gy., gran., lmy.
3490-3496 Dol., v. pale orng., f. xl.; v. lt. gy. dns. and gran. cht.
3496-3510 Dol., lt. gy. to lt. olv. gy., f. xl.
3510-3514 Ls., lt. gy., f. xl.; lt.-gy. to wh. dns. spic. cht.
3514-3524 Ls., pale yel. brn., v. f. xl., m. ool.
3524-3530 Ls,, lt. gy., f. to m. xl.; v. lt. gy. dns. cht.
3530-3540 Ls., v. pale orng., f. xl.; lt.-gy. to wh. dns. op. cht.
3540-3545 Ls., v. pale orng., pale yel. orng., and mod. orng. pk., f. xl.; cht. as abv.
3545-3550 Ls., dusky yel., pale red and gy. orng., f. xl.; cht. as abv.
3550-3560 Ls., lt. gy. and gy. orng., m. xl.; v. lt. gy. to wh. dns. cht.
3560-3567 Dol., lt. gy., f. xl.; lt.-gy. to wh. dns. spic. cht.
3567-3580 Ls., v. lt. gy., f. xl.; v. lt. gy. to wh. dns. spic. cht.
3580-3586 Dol., v. pale orng., f. xl.; wh. dns. cht.
3586-3610 Ls., lt. gy. to v. pale orng., f. gr.; lt.-gy. dns. op. cht.
3610-3625 Ls., lt. gy., f. xl.; lt.-gy. dns. spic. cht.
3625-3640 Ls., as abv.; lt.-gy. dns. cht.
3640-3650 Ls., pale yel. brn., f. xl.; wh. trnsl. cht.
3650-3667 Ls., brn. gy. to m. gy., f. xl., arg., sl. rthy.

Devonian and Mississippian
Chattanooga Shale

3667-3710 Sh., m. dk. gy.
3710-3720 Sh., dk. gy., sl. dol., hd.
3720-3795 Sh., m. dk. to dk. gy.
3795-3806 Sh., dk. gy., slty.
3806-3827 Sltst., dk. brn. gy. to m. dk. gy., dol.

Misener sand

3827-3830 Ss., wh., gl., f. to m. gr., tt.
3830-3832 Ss., lt. gy. to v. pale orng., f. gr., lmy. in pt., fair por.

Ordovician—Upper Ordovician Series
Sylvan Shale

3832-3857 Sh., m. gy., sm., sl. gn.

Ordovician—Middle and Upper Ordovician Series
Viola Limestone

3857-3863 Ls., v. lt. gy., m. xl., dol.
3863-3875 Ls., v. lt. gy., m. xl.

Ordovician—Middle Ordovician Series
Simpson Group

3875-3878 Dol., m. lt. to lt. gy., f. xl., f. to m. sdy.
3878-3890 Ss., m. lt. to lt. gy., f. to m. gr., sbrd., dol., o. stn.
3890-3895 Ss., v. lt. gy., v. f. to f. gr., o. stn. in pt.
3895-3903 Ss., wh., v. f. to f. gr., gl.
3903-3914 Ls., pale to dk. yel. brn., v. f. xl.
3914-3930 Sh., m. to dk. gy.
3930-3940 Ss., v. lt. gy., f. gr., por., scat. m. grs.
3940-3942 Sh., gy.
3942-3944 Ss., lt. gy., v. f. to f. gr., glau., scat. blk. grs.
3944-3946 Sh., gy.
3946-3948 Ss., v. lt. gy., v. f. gr.
3948-3950 Sh., gy.
3950-3952 Ss., v. lt. gy., f. to m. gr., scat. c. rd. grs., scat. blk. grs.
3952-3955 Sh., gn. gy.
3955-3959 Ss., wh., f. gr., gl., por., scat., m. grs.
3959-3964 Sh., m. gy.

Ordovician—Lower Ordovician Series
Arbuckle Group
Cotter and Jefferson City Dolomites

3964-3970 Dol., lt. gy. to v. pale orng., f. to m. xl., scat. s. vugs
3970-3975 Dol., as abv.; m.-lt.-gy. dns. m.-ool. cht.
3975-3985 Dol., as abv.
3985-3990 Dol., v. pale orng. to pale yel. brn., f. xl.
3990-3995 Dol., as abv.; m.-gy. dns. cht.
3995-3997 Dol., v. pale orng., m. xl.
3997 Total depth

WELL 9

WESTGATE-GREENLAND OIL CO., ET AL. No. 1 POPP

SW COR. NE¼ SEC. 7, T. 25 S., R. 4 W.
RENO COUNTY

Altitude: 1537 feet — Total depth: 4095 feet
Completion date: Jan. 3, 1938 — (4108 drillers log)
Initial production: Dry
Electrical log: None
Sample intervals: 10- to 25-foot; 460- 590 feet
10-foot; 590-2990 feet
5-foot; 2990-3200 feet
10-foot; 3200-3450 feet
5-foot; 3450-4095 feet

Cored intervals: None

Depth, feet	*Sample description*
0- 425	No samples
425- 460	Cement
Permian—Lower Permian Series	
Sumner Group	
Wellington Formation	
460- 463	Sh., gy.
463- 500	Prob. salt; lt.-gy. to m.-gy. f. xl. anhy.
500- 575	No samples
575- 660	Prob. salt; m.-lt.-gy. f. xl. anhy.
660- 760	Anhy., v. lt. to lt. gy., f. xl.
760- 770	Sh., m. gy., dol.
770- 780	Anhy., as abv.
780- 790	Anhy., m. gy., f. xl.
790- 794	Dol., pale yel. brn., f. gr.
794- 800	Sh., olv. gy. to m. gy., sl. dol.
800- 810	Anhy., as abv.
810- 815	Dol., olv. gy. to m. gy., f. gr., anhy. xls.
815- 820	Dol., m. lt. gy., f. gr., arg.
820- 830	Anhy., as abv.
830- 835	Sh., gy., dol.
835- 840	Anhy., as abv.
Chase Group	
Nolans Limestone	
840- 845	Dol., m. gy., f. gr., arg.
845- 856	Sh., gy., dol.
856- 860	Dol., m. lt. to m. gy., f. gr., arg.; m.-dk.-gy. fig. cht.
860- 875	Dol., as abv.
875- 880	Dol., as abv., Crin. ?; tr. of m.-dk.-gy. fig. spic. cht.
880- 888	Dol., m. dk. gy., f. xl., sl. arg.
Odell Shale	
888- 890	Sh., gy., Bry.
890- 892	Sh., gy. red
892- 895	Sh., gn. gy.
895- 900	Dol., v. pale orng. to v. lt. gy., v. f. gr., lmy.
900- 910	Ls., m. gy., f. gr.
910- 916	Sh., m. dk. gy., lmy.
Winfield Limestone	
916- 920	Dol., v. lt. gy., v. f. gr.
920- 930	Ls., m. gy., v. arg., Crin.
930- 940	Ls., m. lt. gy., gran., Crin., anhy. xls., p.-p. por.
940- 950	Ls., as abv., Ost., Crin.
950- 957	Ls., as abv.
Doyle Shale	
957- 970	Ls., m. gy., v. arg.
970- 973	Dol., m. gy., v. f. gr., sl. arg.
973- 979	Anhy., v. lt. gy., f. xl.
979- 986	Ls., m. lt. gy., mot., gran., anhy. xls., psdo.-ool.
986- 990	Anhy., v. lt. gy., f. xl.
990-1002	Dol., m. lt. gy., f. gr., arg.; m.-dk.-gy. spic. cht.
1002-1008	Sh., m. dk. gy., v. dol.
1008-1014	Ls., m. gy., arg.
1014-1017	Dol., pale yel. brn., f. xl.
1017-1020	Sh., gn. gy.
Barneston Limestone	
1020-1027	Ls., m. to lt. gy., f. gr., sl. arg.; ltl. lt.-gy. dns. to spic. cht.
1027-1035	Ls., as abv.
1035-1040	Ls., pale yel. brn., f. ooc.
1040-1060	Ls., m. to m. lt. gy., f. gr., Ost., Bry., abnt. Crin.
1060-1070	Ls., as abv., Fus., Ost., abnt. Crin.
1070-1080	Ls., as abv., abnt. Crin.
1080-1090	Ls., m. lt. gy., f. gr., Crin., Fus., Ost.; lt.-gy. to yel.-brn. mot. cht.
1090-1114	Ls., as abv.; much cht.; Fus. and spic. cht.
Matfield Shale	
1114-1118	Sh., m. gy., lmy.
1118-1120	Sh., gy. red, lmy.
1120-1122	Sh., gy., lmy.
1122-1130	Ls., pale yel. brn., f. gr., v. s. fos. frags.
1130-1133	Sh., gy., lmy.
1133-1150	Ls., m. gy., arg., Crin., Ost.
1150-1158	Sh., gy., v. lmy.
1158-1160	Dol., gn. gy., f. gr., arg.
1160-1167	Ls., m. lt. gy., f. gr., sl. arg., mot. / dk. gy.
1167-1170	Sh., gy., lmy.
Wreford Limestone	
1170-1180	Ls., m. lt. to lt. gy., f. xl.; m.-gy. to lt.-gy. fig. and spic. cht.
1180-1190	Ls., as abv.; cht. as abv.; m.-dk.-gy. spic. cht.
1190-1200	Ls., lt. gy., f. gr.; lt.-gy. fig. cht.
1200-1208	Ls., lt. gy to v. pale orng., f. gr.
1208-1210	Sh., gy.
1210-1215	Ls., lt. gy., f. gr.
Council Grove Group	
1215-1220	Sh., gy., lmy.
1220-1226	Sh., gy. red, lmy.
1226-1230	Ls., pale yel. brn., v. f. xl.
1230-1231	Sh., gy.
1231-1233	Ls., m. gy., f. gr., arg.
1233-1245	Ls., m. lt. to lt. gy., f. gr., sl. arg.
1245-1260	Ls., pale yel. brn., v. f. xl.; pale-yel.-brn. dns. cht.
1260-1268	Ls., as abv.
1268-1274	Sh., gy., lmy.
1274-1280	Ls., m. gy., f. gr., sl. arg.
1280-1283	Ls., pale yel. brn., v. f. xl.
1283-1287	Sh., gy. red, lmy.
1287-1298	Ls., m. lt. gy., f. gr.
1298-1300	Ls., m. gy., f. gr., sl. arg.
1300-1304	Sh., gy., lmy.
1304-1320	Ls., as abv.
1320-1324	Sh., gy., lmy.
1324-1330	Ls., as abv.
1330-1336	Sh., gy., lmy.
1336-1344	Ls., m. lt. gy., f. xl., por.
1344-1350	Sh., gy., lmy.
1350-1355	Ls., as abv.
1355-1359	Sh., gy., lmy.
1359-1360	Ls., pale yel. brn. to m. lt. gy., f. xl.
1360-1362	Sh., gy.
1362-1374	Ls., as abv.
1374-1379	Sh., gy., lmy.
1379-1381	Ls., lt. gy., f. xl., dol.
1381-1387	Ls., lt. gy. to pale yel. brn., f. xl.
Eskridge Shale 1387-1392	
1387-1392	Sh., gy. red, lmy.
1392-1394	Ls., pale red, f. gr., sl. arg.
1394-1400	Ls., pale yel. brn., f. gr., Fus.
1400-1405	Ls., lt. gy., f. xl.; o. stn. reported 1400-1420
1405-1414	Ls., brn. gy., f. xl.
1414-1421	Sh., gy., lmy.
1421-1436	Ls., m. gy., f. gr., sl. arg.
1436-1443	Sh., gy., lmy., Fus.
1443-1450	Ls., as abv.
1450-1458	Ls., pale yel. brn., gran., por.
1458-1460	Sh., gy., lmy.
1460-1469	Ls., lt. gy. to pale yel. brn., f. gr.
1469-1473	Sh., gy., lmy.
1473-1485	Ls., pale yel. brn. to lt. gy., f. gr.
1485-1489	Sh., gy., lmy.
1489-1500	Ls., m. lt. to lt. gy., f. gr.
1500-1516	Ls., as abv., Fus.
1516-1518	Sh., gy.
1518-1538	Ls., m. to m. lt. gy., f. gr., many Fus.

1538-1540 Sh., gy.
1540-1553 Ls., as abv., many Fus.

Admire Group

1553-1555 Sh., gy.
1555-1564 Ls., pale yel. brn., f. gr., arg., dol.
1564-1570 Sltst., pale yel. brn.
1570-1574 Sh., gy., lmy.
1574-1576 Ls., m. gy., f. gr., Ost.
1576-1580 Sh., gy., lmy.
1580-1590 Sltst., m. lt. gy., lmy., mica.
1590-1597 Ls., m. lt. gy., f. xl., dol., sl. brn.
1597-1600 Sltst., m. gy., lmy., mica.
1600-1604 Ls., m. gy., f. xl., dol., sl. brn.
1604-1610 Sh., gy., lmy.
1610-1616 Ss., m. lt. gy., v. f. gr., mica., sl. lmy.
1616-1620 Sh., gy., lmy.
1620-1630 Ss., lt. gy., v. f. gr., lmy., sl. mica.
1630-1640 Ss., lt. gy., v. f. to f. gr., lmy., mica.
1640-1643 Sh., dk. gy.
1643-1646 Ls., m. gy., f. xl.
1646-1648 Sh., gy.
1648-1650 Ls., as abv.
1650-1655 Ss., lt. gy., v. f. to f. gr., lmy.
1655-1664 Sh., dk. gy.

Pennsylvanian—Virgil Series

Wabaunsee Group

1664-1667 Ls., m. gy., f. xl.
1667-1673 Ss., lt. gy., v. f. gr., lmy.
1673-1677 Sh., gy.
1677-1680 Ls., pale yel. brn., v. f. xl., cave ?
1680-1685 Ls., lt. gy., v. f. sdy.
1685-1688 Sh., gy.
1688-1690 Dol., lt. gy., slty.
1690-1700 Ss., m. to lt. gy., v. f. gr., slty., lmy.
1700-1704 Sh., gy.
1704-1709 Ls., m. lt. gy., v. f. sdy., slty.
1709-1725 Ss., m. to m. lt. gy., v. f. gr., lmy., slty., Crin. 1718-1725
1725-1730 Sltst., m. lt. gy., v. f. sdy., lmy.
1730-1735 Ls., m. lt. gy., v. f. sdy., slty.
1735-1738 Sh., gy.
1738-1740 Ls., as abv.
1740-1742 Sh., gy.
1742-1756 Sltst., m. to m. lt. gy., v. f. sdy., lmy.
1756-1770 Ss., m. lt. gy., v. f. gr., lmy., slty.
1770-1780 Ss., lt. gy., v. f. gr., por.
1780-1793 Ss., lt. gy., v. f. gr., sl. dol.
1793-1799 Sh., gy.
1799-1803 Sltst., m. gy., lmy., v. f. sdy.
1803-1807 Ss., lt. gy., v. f. gr.

Zeandale Limestone

1807-1810 Ls., m. gy. to brn. gy., arg., Fus.
1810-1812 Sh., gy.
1812-1815 Ls., m. gy., f. gr., sl. arg.
1815-1818 Sh., gy.
1818-1819 Ls., as abv.
1819-1820 Sh., gy.
1820-1823 Ls., as abv.

Willard Shale

1823-1830 Sh., gy.
1830-1834 Ls., lt. gy. to pale yel. brn., f. xl., sl. dol.
1834-1840 Sh., gy.
1840-1842 Ls., m. gy., f. gr., sl. arg.
1842-1844 Sh., gy.

Emporia Limestone

1844-1850 Ls., as abv.
1850-1855 Ls., pale yel. brn., v. f. gr., Ost.
1855-1858 Sh., gy.
1858-1870 Ls., v. pale orng. to lt. gy., v. f. xl.
1870-1878 Ls., brn. gy., v. f. xl.

Auburn Shale

1878-1880 Sh., gy.
1880-1887 Ls., m. gy., f. xl.
1887-1893 Sh., gy.
1893-1897 Ls., pale yel. brn., f. xl.
1897-1903 Ls., m. gy., f. gr., arg.
1903-1905 Sh., gy.

Bern Limestone

1905-1910 Ls., pale yel. brn., f. xl.; brn.-gy. dns. cht.
1910-1912 Sh., gy.
1912-1920 Ls., m. lt. gy., f. gr., Ost., Crin.
1920-1930 Ls., as abv.
1930-1935 Ls., pale yel. brn., f. xl., Fus., glau.
1935-1938 Sh., gy.
1938-1943 Ls., as abv., Fus., glau.
1943-1947 Sh., gy.
1947-1950 Ls., m. to m. lt. gy., f. gr.
1950-1953 Ls., m. gy., slty.

Scranton Shale

1953-1971 Sltst., m. gy., sl. lmy., sl. mica.
1971-1974 Sh., gy.
1974-1979 Sltst., lt. gy., v. f. sdy., lmy.
1979-1981 Ls., lt. gy., slty.
1981-1983 Ls., brn. gy. to m. gy., f. gr., fos., Fus.
1983-1988 Sh., gy.
1988-1993 Sh., gn. gy.
1993-2006 Sh., gy.
2006-2010 Ls., m. gy., v. f. gr.
2010-2020 Sltst., m. lt. gy., lmy.
2020-2024 Sh., gy. red
2024-2035 Sh., gy.

Happy Hollow Limestone and White Cloud Shale Members of Scranton Shale, and Howard Limestone

2035-2044 Ls., m. gy., f. gr., sl. arg., spines, Crin., Fus.
2044-2046 Sh., gy.
2046-2058 Ls., pale yel. brn. to m. lt. gy., f. gr.; yel.-brn. dns. cht.
2058-2060 Sh., gy.
2060-2070 Ls., as abv.
2070-2080 Ls., as abv., Fus.
2080-2090 Ls., m. gy., f. gr., slty.
2090-2106 Ls., m. lt. gy., f. gr., sl. arg.
2106-2113 Sh., blk., v. carb., coaly str.

Severy Shale

2113-2124 Sltst., m. lt. gy., sl. lmy., v. f. sdy., mica.
2124-2127 Ss., m. lt. gy., v. f. gr., slty., lmy.
2127-2132 Sh., gy.
2132-2134 Ls., m. gy., arg., Crin., cave ?
2134-2138 Sh., gy.
2138-2142 Sh., gy. red, lmy.
2142-2147 Sh., gy.
2147-2155 Sltst., m. lt. gy., sl. lmy.
2155-2162 Sh., gy.
2162-2175 Sltst., as abv.
2175-2180 Sh., gy.

Shawnee Group

2180-2190 Ls., brn. gy. to m. gy., f. gr., sl. arg., fos. frags.
2190-2192 Sh., gy.
2192-2200 Ls., m. lt. gy., f. gr., Fus.
2200-2201 Sh., gy.
2201-2212 Ls., pale yel. brn., f. gr.
2212-2214 Sh., gy.
2214-2220 Ls., lt. gy. to pale yel. brn., f. xl., Crin.
2220-2230 Ls., as abv., Fus.; ltl. lt.-gy. fig. cht.
2230-2255 Ls., pale yel. brn., f. xl.
2255-2258 Sh., gy.
2258-2270 Ls., lt. gy., f. xl.; m.-gy. to lt.-gy. fig. cht.
2270-2275 Sh., dk. gy.
2275-2280 Sh., gy. red and olv. gy.

2280-2293 Ls., pale yel. brn., f. xl.
2293-2295 Sh., gy.
2295-2313 Ls., as abv., Fus.

Tecumseh Shale 2313-2340

2313-2320 Ss., lt. gy., v. f. gr., lmy., por., mica.
2320-2322 Sh., gy.
2322-2328 Ss., lt. gy., v. f. gr., slty., lmy., mica.
2328-2331 Sh., blk.
2331-2340 Ss., lt. gy., v. f. gr., lmy., mica.
2340-2350 Ls., pale yel. brn., f. xl.; gy.-orng. m.-xl. ls.
2350-2376 Ls., pale yel. brn., f. xl.
2376-2378 Sh., gy.
2378-2395 Ls., m. lt. gy., f. gr.
2395-2399 Sh., gy.
2399-2408 Ls., pale yel. brn. to lt. gy., f. gr., Ost., Crin.
2408-2411 Sh., gy.
2411-2419 Ls., as abv.
2419-2421 Sh., gy.
2421-2428 Ls., lt. gy., f. gr., Ost., Fus.
2428-2430 Sh., gy.
2430-2440 Ls., lt. gy. to pale yel. brn., f. gr.
2440-2450 Ls., as abv.; ltl. lt.-gy. cht.
2450-2457 Ls., as abv.
2457-2460 Sh., gy.
2460-2468 Ls., lt. gy., f. gr., Ost., Crin.
2468-2470 Sh., gy.
2470-2486 Ls., as abv.
2486-2490 Sh., gy.
2490-2495 Ls., m. lt. gy., mot., f. gr., sl. arg.
2495-2528 Ls., pale yel. brn., f. xl., Crin.
2528-2530 Sh., gy.
2530-2536 Ls., brn. gy., f. xl.
2536-2545 Sh., blk.
2545-2554 Sltst., lt. olv. gy.
2554-2564 Ls., pale yel. brn., f. xl.

Douglas Group

2564-2570 Sltst., lt. olv. gy., v. f. sdy., sl. lmy. in pt .
2570-2573 Sh., gy. red
2573-2580 Ss., lt. olv. gy., v. f. gr., slty., sl. lmy., sl. mica.
2580-2583 Sh., gy.
2583-2594 Ss., m. lt. gy., v. f. gr., slty., sl. mica.
2594-2600 Sltst., lt. gy., v. f. sdy., sl. lmy., sl. mica.
2600-2604 Ss., lt. gy., v. f. gr., slty., sl. mica.
2604-2608 Sh., gy.
2608-2620 Ss., as abv.
2620-2630 Ss., as abv., few blk. carb. str.
2630-2641 Ss., lt. gy., v. f. gr., sl. mica. and dol.
2641-2643 Sh., gy.
2643-2650 Ss., as abv.
2650-2655 Sh., gy.
2655-2680 Ss., as abv.
2680-2695 Ss., lt. gy., v. f. gr., slty.
2695-2710 Sltst., lt. gy., v. f. sdy.
2710-2720 Sh., dk. gy.
2720-2723 Sh., blk.
2723-2730 Sh., dk. gy.
2730-2740 Ls., brn. gy., f. xl., Fus.
2740-2757 Sh., gy.
2757-2760 Ls., m. gy., arg.
2760-2770 Sh., gy.

Pennsylvanian—Missouri Series

Lansing Group

2770-2780 Ls., pale yel. brn., f. xl.
2780-2783 Sh., gy.
2783-2806 Ls., as abv.
2806-2814 Ls., pale yel. brn., m. to c. ooc.
2814-2818 Ls., pale yel. brn., f. xl.
2818-2820 Sh., gy.
2820-2828 Ls., brn. gy., f. xl., sl. arg.; ltl. m.-gy. cht.
2828-2832 Sh., gy.
2832-2840 Ls., pale yel. brn., f. xl.; m.-gy. cht.
2840-2848 Ls., as abv., Brac. ?, Bry.; cht. as abv.
2848-2850 Sh., gy.
2850-2857 Ls., pale yel. brn. to m. lt. gy., f. gr.; m.-lt.-gy. spic. cht.
2857-2860 Sh., gy.
2860-2867 Ls., pale yel. brn., f. xl.; m.-lt.-gy. cht.
2867-2870 Sh., gy.
2870-2876 Ls., as abv., Crin., Fus., Ost.
2876-2878 Sh., gy.
2878-2890 Ls., m. lt. gy. to v. pale orng., f. gr., Fus., por.; m.-gy. to lt.-gy. cht.; Fus. cht.
2890-2894 Dol., pale yel. brn., f. xl.
2894-2902 Ls., m. dk. brn. gy., f. xl., arg.; brn.-gy. spec. cht.
2902-2910 Ls., pale yel. brn., f. xl.
2910-2920 Ls., as abv.; lt.-gy. to m.-gy. fig. fos. cht.
2920-2930 Ls., pale yel. brn., f. gr., por.; m.-gy. dns. cht.

Kansas City Group

2930-2932 Sh., gy.
2932-2940 Ls., pale yel. brn., f. xl., Fus.; m.-gy. fos. spic. cht., Crin.
2940-2944 Ls., as abv.
2944-2950 Ls., m. gy., v. f. gr., dol., v. arg., Crin.
2950-2960 Ls., pale yel. brn., f. xl.
2960-2968 Ls., brn. gy. to pale yel. brn., f. xl.; ltl. lt.-gy. to yel.-brn. mot. lmy. cht.
2968-2970 Sh., gy.
2970-3000 Ls., brn. gy., f. xl.
3000-3003 Sh., gy.

Base of **Lane Shale**

3003-3005 Ls., m. gy., f. xl., sl. arg.
3005-3026 Ls., pale yel. brn., f. xl.
3026-3030 Ls., v. pale orng., f. gr., dol.; lt.-gy. spic. and Fus. cht.
3030-3033 Sh., gy.
3033-3045 Ls., pale yel. brn., f. xl.; m.-lt.-gy. dns. cht.; pale-yel.-brn. dns. cht.
3045-3050 Ls., m. gy., f. gr.
3050-3053 Sh., dk. gy., lmy.
3053-3062 Ls., m. gy. to brn. gy., f. gr., arg.
3062-3067 Ls., pale yel. brn., f. xl.
3067-3070 Ls., pale yel. brn. to lt. gy., f. ool. and ooc.
3070-3074 Ls., as abv.; lt.-gy. cht.
3074-3077 Sh., gy.
3077-3080 Sltst., m. to m. lt. gy., lmy.
3080-3090 Sltst., as abv., ltl. wh. milky cht.
3090-3094 Sh., dk. gy.
3094-3104 Sltst., m. gy., v. lmy.
3104-3110 Sh., olv. gy.
3110-3120 Ls., m. gy., arg.
3120-3135 Ls., m. gy., f. gr., sl. arg., sl. brn.
3135-3146 Ls., m. lt. gy., m. to c. ool. and ooc., pale yel. brn. in pt.
3146-3155 Ls., pale yel. brn., f. xl.
3155-3162 Ls., as abv.; m.-lt.-gy. dns. cht.; brn.-gy. f. xl. ls.
3162-3165 Sh., blk., carb.
3165-3170 Ls., brn. gy., f. xl.
3170-3175 Ls., pale yel. brn., f. ool., tr. o. reported 3170-3175
3175-3182 Ls., m. gy., f. xl., sl. brn.
3182-3185 Sh., gn. gy.
3185-3192 Ls., pale yel. brn., f. to m. xl., dk.-gy. sps.
3192-3195 Sh., gy.
3195-3200 Ls., m. gy., f. gr., sl. arg., spines
3200-3210 Ls., m. gy., v. f. gr., arg., Crin.; m.-dk.-gy. dns. cht.
3210-3214 Ls., as abv.
3214-3220 Sltst., dk. gy., v. lmy.

3220-3224 Sh., blk., lmy.
3224-3235 Ls., m. gy., f. gr., arg.

Pleasanton Group

3235-3240 Sh., gy. and gn. gy.
3240-3243 Sh., gy.
3243-3246 Sh., gy. red
3246-3248 Ls., gy. red, slty.
3248-3253 Ls., pale yel. brn., f. to m. xl.
3253-3257 Sh., gn. gy.
3257-3266 Sh., gy.

Pennsylvanian—Des Moines Series
Marmaton Group

3266-3270 Ls., olv. gy., slty.
3270-3273 Sh., gy.
3273-3276 Ls., pale yel. brn., f. xl.
3276-3284 Sh., gy.
3284-3290 Ls., pale yel. brn., f. gr., slty.
3290-3300 Ls., m. gy., f. xl., sl. arg.
3300-3306 Ls., pale yel. brn., f. xl.
3306-3310 Sh., blk.
3310-3323 Ls., pale yel. brn., f. gr., slty. in pt.
3323-3330 Ls., brn. gy., f. gr., slty.
3330-3335 Sh., gy.
3335-3340 Sh., blk.
3340-3342 Ls., as abv.
3342-3346 Sh., gy.
3346-3350 Ls., pale yel. brn., f. xl.
3350-3360 Ls., brn. gy. to m. gy., slty., Fus.

Cherokee Group

3360-3365 Sh., olv. gy.
3365-3368 Sh., blk.
3368-3370 Ls., brn. gy., slty.
3370-3375 Sltst., m. gy., mica., lmy.
3375-3380 Ls., brn. gy. to pale yel. brn., slty.
3380-3384 Sh., gy., lmy.
3384-3388 Ls., as abv.
3388-3398 Sh., gy.
3398-3400 Sh., blk.
3400-3407 Sh., gy.
3407-3410 Ls., lt. olv. gy., v. f. gr., arg.
3410-3423 Sh., dk. gy.
3423-3426 Sh., blk.
3426-3435 Sh., olv. gy., fis.
3435-3445 Sh., gy.
3445-3455 Sh., gn. gy., fis.
3455-3458 Ls., m. lt. gy., v. f. gr.
3458-3470 Sh., gy.
3470-3485 Sh., mod. red. brn. and red. orng.
3485-3488 Sh., gy.
3488-3490 Sltst., lt. olv. gy., v. f. sdy.
3490-3495 Sh., yel. orng. to yel. brn.
3495-3500 Sh., gy. red to v. dusky red

Mississippian—Upper Mississippian Series
Rocks of Meramec age

3500-3503 Ls., pale yel. brn., m. xl.; v. lt. gy. to pale-orng. dns. cht. and ool. ? cht.
3503-3510 Ls., v. lt. gy. to pale yel. brn., m. xl., tr. glau.
3510-3515 Ls., as abv., sl. pk. in pt., no glau.
3515-3520 Ls., lt. gy. mot. / gy. red, f. to m. xl., glau.
3520-3525 Dol., lt. gy. to lt. olv. gy., f. xl., arg.
3525-3532 Ls., pale yel. brn. mot. / gy. red and lt. gy., m. xl., glau.
3532-3550 Cht., v. lt. gy., v. f. gran.; lt.-brn. gran. por. cht.; ltl. lt.-gy. f. to m.-xl. ls.; ltl. sat. of o. reported 3540-3553

Rocks of Osage age

3550-3560 Ls., v. lt. gy., f. xl.; v. lt. gy. v. f. gran. cht.
3560-3585 Cht., v. lt. gy., f. gran.; tr. o. reported 3560-3591
3585-3593 Dol., lt. gy., f. xl.
3593-3606 Ls., lt. gy. to pale yel. brn., m. to c. ool., many oblong ool.
3606-3624 Ls., lt. gy., f. to m. xl.; v. lt. gy. cht.
3624-3650 Dol., lt. gy. to v. pale orng., f. xl.; v. lt. gy. cht.; wh. cht.
3650-3693 Cht., lt. gy. to wh.; clr. qtz.
3693-3700 Ls., v. lt. gy., f. xl.; v. lt. gy. cht.
3700-3715 Ls., lt. gy., f. xl.; v. lt. gy. cht.
3715-3735 Ls., lt. gy. to v. pale orng., f. xl.; lt.-gy. dns. cht.
3735-3745 Ls., pale yel. brn., f. xl.; lt.-gy. dns. cht.
3745-3755 Ls., brn. gy. to pale yel. brn., f. xl., rthy.
3755-3777 Ls., brn. gy., f. xl.
3777-3784 Ls., m. gy., f. gr., slty.
3784-3791 Dol., m. gy., f. gr., slty.

Devonian and Mississippian
Chattanooga Shale

3791-3825 Sh., m. dk. to dk. gy., sl. slty.
3825-3832 Sh., m. to m. dk. gy.
3832-3835 Sh., brn. gy.
3835-3850 Sh., m. dk. gy.
3850-3871 Sh., m. dk. gy.; some m.-gy. sh.
3871-3875 No samples
3875-3887 Sh., as abv.
3887-3900 Sh., as abv., pyr., show o. reported 3898

Misener sand

3900-3902 Ss., lt. gy., f. to m. gr., sbrd. in pt.

Ordovician—Upper Ordovician Series
Sylvan Shale

3902-3908 Dol., lt. gy. and pale yel. brn., f. xl.
3908-3934 Dol., m. lt. gy., f. gr.; m.-lt.-gy. to m.-gy. dns. cht. / dk. inclusions; show o. reported 3911
3934-3940 Sh., gy., sl. dol., scat. f. to c. sbrd. sd. grs. in pt.
3940-3965 Sh., gy., sl. dol.

Ordovician—Middle and Upper Ordovician Series
Viola Limestone

3965-3986 Ls., lt. gy., m. xl., few s. dk.-gy. Gast. prob. from Sylvan Shale; show o. reported 3985

Ordovician—Middle Ordovician Series
Simpson Group

3986-3990 Ss., v. lt. gy., m. gr., sbrd., scat. c. grs., drills loose
3990-3997 Ss., v. lt. gy., f. to m. gr., sbang., sec. xl. growth, drills loose
3997-4000 Ss., lt. gy., f. to m. gr., dol.
4000-4005 Ss., v. lt. gy., f. to m. gr., sec. xl. growth, drills loose
4005-4020 Ss., v. lt. gy., f. gr., some m. gr., drills loose
4020-4023 Sh., gn. gy.
4023-4026 Sh., m. dk. gy.
4026-4030 Sh., blk., f. sdy.
4030-4033 Sh., gy.
4033-4036 Sh., gn. gy.
4036-4040 Ss., lt. gy., f. to m. gr., drills loose
4040-4042 Ss., lt. gy., v. f. to f. gr., slty., sl. dol., glau.
4042-4046 Sh., gy.
4046-4048 Ss., m. lt. gy., v. f. gr., slty.
4048-4051 Sh., gy.
4051-4060 Ss., v. lt. gy., m. gr., sbang.
4060-4063 Sh., gn. gy.
4063-4067 Ss., as abv.
4067-4070 Sh., gn. gy.
4070-4074 Sh., gy.
4074-4082 Ss., v. lt. gy., f. to m. gr., drills loose

Ordovician—Lower Ordovician Series
Arbuckle Group
Cotter and Jefferson City Dolomites

4082-4087 Dol., m. lt. gy., m. xl., por. in pt.; lt.-gy. cht.

4087-4092 Dol., lt. gy. to v. pale orng., m. xl.; pale-yel.-brn. f. xl. dol.; lt.-gy. m.-ool. cht.
4092-4095 Dol., pale yel. brn., m. xl.
4095 Total depth

WELL 10
WESTERN KANSAS OIL AND REFINING CO.
No. 1 BETZEN
SE COR. NE¼ SEC. 17, T. 26 S., R. 3 W.
SEDGWICK COUNTY

Altitude: 1497 feet Total depth: 4270 feet
Completion date: May 23, 1935
Initial production: Dry
Electrical log: None
Sample intervals: 10-foot; 750 to 2300 feet
Cored intervals: None

Depth, feet *Sample description*

0- 750 No samples

Permian—Lower Permian Series
Sumner Group
Wellington Formation

750- 790 Anhy., m. lt. gy., f. xl.; salt
790- 793 Sh., gy.
793- 800 Prob. salt
800- 806 Anhy., lt. gy., f. xl.
806- 810 Sh., gy.
810- 817 Anhy., as abv.
817- 820 Sh., gy.
820- 830 Anhy., as abv.
830- 835 Sh., dk. gy.
835- 840 Dol., m. gy. to lt. olv. gy., f. gr., arg., some anhy. xls.
840- 843 Sh., gy.
843- 847 Anhy., lt. gy., f. xl.
847- 850 Sh., gy.
850- 857 Dol., lt. olv. gy., f. gr., arg.
857- 863 Anhy., as abv.
863- 865 Sh., gy.
865- 870 Dol., as abv.
870- 875 Anhy., lt. gy., f. xl.
875- 880 Sh., gn. gy.

Chase Group
Nolans Limestone

880- 887 Dol., pale yel. brn., f. gr.
887- 890 Sh., gy.
890- 900 Dol., olv. gy., f. xl.; m.-gy. matted cht.
900- 920 Dol., m. gy., f. gr., arg.

Odell Shale

920- 925 Sh., gy.
925- 930 Ls., m. gy., f. gr., arg., dol., fos. ?
930- 935 Sh., gn. gy.

Winfield Limestone

935- 940 Dol., v. pale orng., f. gr.
940- 950 Dol., m. lt. gy., f. gr., arg.; v. lt. gy. dns. cht.
950- 960 Ls., m. lt. to m. gy., f. gr., sl. arg.
960- 970 Ls., as abv.; dk.-gy. dns. cht.
970- 980 Ls., m. lt. gy. and lt. olv. gy., f. gr., Crin., Bry.
980- 996 Ls., m. lt. gy. to lt. olv. gy., f. gr., Crin., anhy. xls.

Doyle Shale

996-1000 Sltst., m. lt. to lt. gy., lmy.
1000-1004 Ls., gy. and gn. gy., v. arg.
1004-1007 Sh., gy., lmy.
1007-1010 Sh., gy. red, lmy.
1010-1014 Sh., gy., sl. lmy.
1014-1030 Anhy., lt. gy., f. xl.
1030-1045 Dol., lt. olv. gy., f. gr., anhy. xls. and gyp. in pt.
1045-1050 Ls., lt. gy., f. gr.; m.-gy. mot. spic. cht.
1050-1055 Sltst., lt. gy., lmy.

Barneston Limestone

1055-1070 Ls., m. gy., f. gr., sl. arg., Ost., Crin.
1070-1073 Ls., olv. gy., f. gr., dol., arg., fos. ?
1073-1080 Ls., m. lt. gy., f. xl.
1080-1090 Ls., as abv., prob. fos.; gy. mot. spic. cht., cave ?
1090-1093 Sh., gy.
1093-1106 Ls., m. lt. gy., f. gr., sl. arg., Crin.
1106-1110 Ls., m. gy., arg.
1110-1120 Ls., m. lt. gy., f. gr., sl. arg., Crin.
1120-1130 Ls., m. lt. gy., gran.; m.-lt.-gy. spic. and mot. cht.
1130-1140 Ls., v. pale orng., f. xl., Crin., Ost.; m.-lt.-gy. spic. cht.
1140-1160 Ls., as abv., Crin., Fus., Bry.; cht. as abv.

Matfield Shale

1160-1167 Sh., m. gy., v. lmy.
1167-1173 Sh., gy. red
1173-1176 Sh., gn. gy.
1176-1180 Ls., pale yel. brn., f. xl., Crin.
1180-1190 Ls., m. lt. to m. gy., f. gr., sl. arg., Ost., Crin.
1190-1200 Sh., m. gy., v. lmy.
1200-1208 Ls., m. lt. gy., gran., many dk.-gy. frags. (fos.?)
1208-1210 Sh., gy., lmy.

Wreford Limestone

1210-1230 Ls., pale yel. brn., f. gr.; lt.-gy. to m.-gy. spec. cht.; m.-dk.-gy. dns. cht. and spic. cht.
1230-1240 Ls., m. lt. gy., f. gr.; m.-dk.-gy. cht.
1240-1246 Ls., pale yel. brn., f. gr., Crin., Ost.
1246-1250 Ls., m. gy., f. gr., arg.
1250-1254 Ls., pale yel. brn., v. f. xl.

Council Grove Group

1254-1266 Sh., gy., lmy.
1266-1272 Ls., m. gy., f. gr.
1272-1276 Sh., gy.
1276-1285 Ls., m. gy., f. gr., sl. arg.
1285-1300 Ls., pale yel. brn. to lt. gy., v. f. xl.; gy. cht.
1300-1305 Ls., as abv.
1305-1316 Sh., m. dk. gy., lmy.
1316-1330 Ls., m. lt. gy., f. gr., slty.
1330-1334 Ls., m. gy., f. gr., arg.
1334-1345 Ls., pale yel. brn., v. f. xl.
1345-1347 Sh., gy.
1347-1350 Ls., m. gy., f. gr., sl. arg.
1350-1390 No samples
1390-1397 Sh., gy., lmy.
1397-1400 Sh., gn. gy.
1400-1405 Sh., gy., lmy.
1405-1410 Ls., m. to m. lt. gy., f. gr., Crin., spines
1410-1412 Sh., gy.
1412-1417 Ls., lt. gy., v. f. xl.
1417-1420 Ls., m. gy., f. gr., arg.

Eskridge Shale 1420-1430

1420-1430 Sh., gy. red, gn. gy., and gy., lmy.
1430-1437 Ls., pale yel. brn. to brn. gy., f. xl.
1437-1447 Sh., gn. gy., dol.
1447-1450 Ls., brn. gy., f. gr., arg.
1450-1456 Sh., gy., lmy.
1456-1460 Ls., pale yel. brn., f. gr.
1460-1463 Ls., m. gy., arg.
1463-1470 Ls., m. lt. gy., gran., dk.-gy. specs.
1470-1473 Sh., gy., lmy.
1473-1483 Ls., m. gy., f. gr.
1483-1487 Sh., gy., lmy.
1487-1490 Ls., as abv., sl. arg.

1490-1498 Ls., m. lt. gy., f. xl.; pale-yel.-brn. f. xl. ls.
1498-1500 Sh., gy.
1500-1508 Ls., pale yel. brn., f. gr.; lt.-gy. to v. pale orng. f. xl. ls.
1508-1510 Sh., gy., lmy.
1510-1520 Ls., pale yel. brn., f. gr., Crin.
1520-1524 Dol., pale yel. brn. to brn. gy., f. xl.
1524-1530 Ls., lt. gy., f. gran.
1530-1533 Dol., as abv.
1533-1535 Sh., gy.
1535-1540 Ls., gy., f. gr., sl. arg.
1540-1550 Ls., lt. gy. to pale yel. brn., f. xl.
1550-1552 Sh., gy.
1552-1556 Ls., m. lt. to lt. gy., f. gr., sl. arg. in pt.
1556-1557 Sh., gy.
1557-1570 Ls., m. lt. to m. gy., f. gr.
1570-1578 Ls., as abv., many Fus.
1578-1580 Sh., gy.
1580-1590 No samples

Admire Group

1590-1597 Sh., gy.
1597-1605 Ls., m. lt. to m. gy., f. xl.
1605-1607 Sh., gy.
1607-1610 Ls., pale yel. brn., f. xl., tr. of glau.
1610-1614 Sh., gy., lmy.
1614-1617 Sh., gy. red
1617-1621 Ls., m. gy., f. xl.
1621-1627 Sh., gy., lmy., Fus.
1627-1629 Ls., m. gy., f. xl., fos.
1629-1630 Sh., gy.
1630-1633 Sh., gn. gy.
1633-1636 Ls., m. lt. gy., f. gr., dol.
1636-1644 Sh., gy., lmy.
1644-1647 Ls., m. gy., arg.
1647-1649 Sh., gy.
1649-1653 Ls., pale yel. brn., f. xl., Crin., tr. of glau.
1653-1658 Sh., gn. gy., lmy., slty., mica.
1658-1665 Sh., gy., lmy.
1665-1674 Sltst., m. lt. gy., lmy., sl. mica.
1674-1680 Ss., lt. gy., v. f. gr., slty., lmy., sl. mica.
1680-1690 Sh., gy., lmy., Fus.
1690-1700 No samples

Pennsylvanian—Virgil Series 1697

Wabaunsee Group

1700-1704 Ls., m. gy., f. xl., sl. arg.
1704-1710 Ss., lt. gy., v. f. gr., slty., lmy., sl. mica.
1710-1715 Sh., dk. gy., coal frags. ?
1715-1722 Sh., gy., lmy.
1722-1725 Ls., m. gy., f. xl., sl. arg.
1725-1733 Sh., gy., lmy.
1733-1735 Ls., m. gy., f. xl.
1735-1740 Sh., gn. gy., lmy.
1740-1745 Sh., gy., sl. lmy.
1745-1748 Ls., gy., f. gr.
1748-1750 Ss., lt. gy., v. f. gr., slty., lmy.
1750-1755 Sh., gy.
1755-1764 Sltst., lt. gy., mica.
1764-1776 Ss., lt. gy., v. f. gr., slty., lmy., sl. mica.
1776-1780 Sh., gy., lmy.
1780-1785 Ss., as abv.
1785-1790 Ls., gy., v. arg.
1790-1810 Sh., gy., lmy.
1810-1812 Ls., brn. gy., f. gr., sl. arg.
1812-1830 Sh., m. dk. gy.
1830-1834 Ls., brn. gy., f. gr., many Fus.
1834-1846 Sh., gy., slty., lmy., mica.
1846-1848 Ls., gy., arg.
1848-1852 Sh., gy.
1852-1856 Ss., lt. gy., v. f. gr., slty., lmy., mica.
1856-1865 Ls., brn. gy., gran., fos.
1865-1867 Sh., gy.
1867-1873 Sltst., m. to m. lt. gy., mica., lmy. in pt.
1873-1876 Sh., gy.
1876-1880 Sltst., as abv.
1880-1884 Ss., lt. gy., v. f. gr., slty., lmy., mica.
1884-1890 Sh., gy., lmy.
1890-1895 Sh., gy.
1895-1897 Coal
1897-1900 Sh., gy.
1900-1904 Sh., blk.
1904-1908 Ls., m. gy., f. gr., sl. arg.
1908-1916 Sh., gy., sl. lmy.

Emporia Limestone

1916-1926 Ls., m. gy., f. gr., sl. arg.
1926-1934 Ls., pale yel. brn., f. xl.
1934-1937 Sh., gy.
1937-1940 Ls., m. gy., f. gr., sl. arg.
1940-1945 Ls., pale yel. brn., f. xl.
1945-1950 Ls., as abv., Fus.

Auburn Shale

1950-1957 Sh., gy.

Bern Limestone

1957-1963 Ls., brn. gy., v. f. xl.
1963-1970 Ls., m. gy., f. xl.
1970-1973 Sh., gy.
1973-1984 Ls., gy., mot., gran., fos. frags. ?
1984-1988 Sh., gn. gy.
1988-2000 Ls., pale yel. brn. to lt. gy., v. f. to f. xl., Fus.
2000-2004 Ls., yel. brn., f. gr., much glau.

Scranton Shale

2004-2007 Sh., gy.
2007-2020 Ss., lt. gy., v. f. gr., slty., v. lmy., sl. mica.
2020-2030 Sltst., m. gy., lmy., v. f. sdy., sl. mica.
2030-2035 Sh., gy., sl. lmy.
2035-2038 Ls., m. gy., arg., many Crin.
2038-2042 Sh., gy., lmy.
2042-2046 Ls., brn. gy., f. gr., Crin., Fus., glau.
2046-2048 Sh., gy.
2048-2050 Ls., gy., arg., Crin.
2050-2056 Sh., gy., lmy., slty.
2056-2060 Sltst., gy., lmy., v. f. sdy.
2060-2065 Sltst., gy., v. f. sdy., some carb. mat.
2065-2074 Ss., m. lt. gy., v. f. gr., slty., sl. mica.
2074-2080 Sltst., gy., some carb. mat.
2080-2085 Ss., as abv.
2085-2100 Sh., gy., slty.
2100-2103 Ls., gy., arg., Crin., Bry.
2103-2110 Sh., gy., slty.
2110-2113 Ls., brn. gy., f. gr.
2113-2120 Sh., gy.

Happy Hollow Limestone and White Cloud Shale Members of Scranton Shale, and Howard Limestone

2120-2125 Ls., m. dk. gy., f. gr., arg.
2125-2130 Ls., m. lt. gy., f. gr., arg.
2130-2142 Ls., lt. gy. to pale yel. brn., f. gr., Crin.
2142-2150 Ls., lt. gy., f. gr., dol.
2150-2160 No sample
2160-2165 Ls., pale yel. brn., f. xl.
2165-2170 Ls., m. gy., f. gr., sl. arg., Fus.
2170-2176 Sltst., m. lt. gy., mica., scat. carb. mat.
2176-2180 Sh., gy.
2180-2190 No sample
2190-2194 Sh., blk., v. carb.
2194-2196 Coal

Severy Shale

2196-2200 Sh., gy.
2200-2210 Sltst., m. lt. gy., sl. lmy., v. f. sdy., mica.
2210-2220 Sh., m. dk. gy., slty.

2220-2224 Ls., brn. gy., f. gr.; m.-dk.-gy. f.-gr. arg. ls., Crin.
2224-2240 Sh., gy.
Shawnee Group
2240-2250 Ls., lt. gy. to pale yel. brn., f. gr., Bry., Crin., Fus.
2250-2252 Sh., gy.
2252-2260 Ls., as abv., Crin., Fus.
2260-2270 Ls., as abv., Crin., Fus.; lt.-gy. Fus. cht.
2270-2283 Ls., as abv., Crin., Fus.
2283-2286 Sh., gy.
2286-2300 Ls., as abv., Crin., Fus.
2300-4270 No samples; stratigraphic contacts below 2300 interpreted from drillers log
Douglas Group 2648?
Pennsylvanian—Missouri Series 2793?
Lansing Group
Kansas City Group 3005?
Mississippian 3626?
Devonian and Mississippian 4068?
Chattanooga Shale
Ordovician—Middle and Upper Ordovician Series 4135?
Viola Limestone
Ordovician—Middle Ordovician Series 4150?
Simpson Group
Ordovician—Lower Ordovician Series 4239?
Arbuckle Group
4270 Total depth

WELL 11
CHAMPLIN REFINING CO. NO. 1 PELTZER
NE¼ NE¼ SE¼ SEC. 15, T. 26 S., R. 3 W.
SEDGWICK COUNTY

Altitude: 1447 feet Total depth: 4120 feet
Completion date: March 5, 1952
Initial production: Dry
Gamma-laterolog: 313-4124 feet
Sample intervals: 10-foot; 2020-2680 feet
5-foot; 2680-4120 feet
Cored intervals: None

Depth, feet *Sample description*
0-2020 No samples; stratigraphic contacts between 0 and 2020 feet interpreted from electrical log
Permian—Lower Permian Series
Sumner Group
Wellington Formation
Chase Group 755
Barneston Limestone 928
Matfield Shale 1035
Wreford Limestone 1090
Council Grove Group 1128
Admire Group 1463
Pennsylvanian—Virgil Series 1565
Wabaunsee Group
Emporia Limestone 1784
Auburn Shale 1810
Bern Limestone 1820
Scranton Shale 1862
Happy Hollow Limestone and White Cloud Shale Members of Scranton Shale, and
Howard Limestone 1985
2020-2027 Ls., pale yel. brn., f. xl.
2027-2029 Sh., gy.
2029-2038 Ls., as abv.
2038-2044 Sh., gy.
2044-2050 Ls., brn. gy., f. gr.
2050-2056 Sh., blk.
Severy Shale
2056-2060 Sltst., gy., lmy., sl. mica.
2060-2066 Sh., gy.
2066-2074 Sltst., as abv.
2074-2084 Sh., gy.
2084-2090 Sltst., m. lt. gy., sl. mica.
2090-2094 Sh., gn. gy.
2094-2100 Sltst., as abv.
2100-2108 Sh., gy., slty., mica.
Shawnee Group
2108-2116 Ls., m. gy., f. xl.
2116-2120 Sh., gy.
2120-2138 Ls., pale yel. brn., f. xl., Crin.
2138-2140 Sh., gy.
2140-2150 Ls., m. gy., f. gr., Crin.
2150-2153 Sh., gy.
2153-2160 Ls., pale yel. brn., f. xl., Fus., Crin.; m.-gy. to lt.-gy. spic. cht. and Fus. cht.
2160-2182 Ls., as abv., Crin., Fus.
2182-2184 Sh., gy. red
2184-2187 Sh., olv. gy.
2187-2213 Ls., pale yel. brn., f. xl.
2213-2215 Sh., gy.
2215-2218 Sh., gn. gy.
2218-2230 Ls., pale yel. brn., f. gr.
2230-2251 Ls., lt. gy. to v. pale orng., f. xl.
2251-2253 Sh., gy.
2253-2256 Ls., brn. gy., v. f. xl.
2256-2258 Sh., gy.
2258-2280 Ls., v. lt. gy., v. f. xl.
2280-2290 Ls., v. pale orng., f. xl.
2290-2295 Sh., gy.
2295-2306 Ls., pale yel. brn., f. xl., Crin.
2306-2308 Sh., gy.
2308-2312 Ls., as abv., Crin.
2312-2314 Sh., gy.
2314-2320 Ls., as abv., Crin.
2320-2326 Sh., olv. gy.
2326-2330 Dol., brn. gy., v. f. xl., sl. slty.
2330-2334 Ls., brn. gy., v. f. xl.
2334-2337 Sh., gy.
2337-2340 Ls., as abv.
2340-2342 Sh., gy.
2342-2350 Ls., as abv.
2350-2370 Ls., pale yel. brn. to v. pale orng., f. xl., p.-p. por.
2370-2390 Ls., pale yel. brn., f. xl.; lt.-gy. to yel.-brn. dns. cht.
2390-2410 Ls., pale yel. brn., f. xl.; lt.-gy. to m.-gy. mot. cht.
2410-2420 Ls., brn. gy., f. xl.
2420-2423 Sh., olv. gy.
2423-2427 Sh., gy.
2427-2430 Sh., blk.
2430-2435 Sltst., brn. gy., lmy.
2435-2445 Ls., brn. gy. to pale yel. brn., f. xl.
2445-2457 Ls., m. gy. to brn. gy., f. gr., sl. arg.
2457-2460 Sh., gy.
2460-2475 Ls., pale yel. brn., f. xl.
2475-2478 Sh., blk.
2478-2482 Ls., pale yel. brn., f. xl.
2482-2488 Sh., gn. gy. and olv. gy.
2488-2495 Ls., v. pale orng., f. xl.
2495-2507 Ls., pale yel. brn. and brn. gy., f. xl.
Douglas Group
2507-2515 Sh., gy.
2515-2520 Sltst., lt. gy., sl. lmy., mica.

2520-2523 Sh., gy.
2523-2527 Sltst., as abv.
2527-2530 Sh., gn. gy.
2530-2532 Sh., gy.
2532-2550 Ls., pale yel. brn., f. xl.
2550-2555 Sh., gy.
2555-2560 Sh., gn. gy.
2560-2564 Sh., gy. red
2564-2567 Sh., gy.
2567-2575 Sh., gn. gy.
2575-2578 Sh., gy.
2578-2585 Sltst., lt. gy., lmy., mica.
2585-2590 Sh., gy.
2590-2595 Sltst., as abv.
2595-2600 Sh., gy.
2600-2607 Sh., olv. gy.
2607-2613 Sh., gn. gy.
2613-2620 Sh., gy. red
2620-2627 Sh., gy.
2627-2630 Sh., blk.
2630-2687 Sh., m. to dk. gy.
2687-2693 Ls., brn. gy., f. xl., dol.
2693-2698 Ss., lt. gy., f. gr., v. lmy., Crin.
2698-2700 Sh., gy.
2700-2703 Ss., as abv., Crin.
2703-2707 Sh., gy.
2707-2710 Ss., as abv.

Pennsylvanian—Missouri Series
Lansing Group

2710-2730 Ls., pale yel. brn., f. gr., Crin.
2730-2740 Ls., m. gy., f. xl., sl. brn., sl. dol.
2740-2742 Sh., gy.
2742-2750 Ls., pale yel. brn., f. xl.
2750-2758 Ls., v. pale orng., f. xl., p.-p. por.
2758-2761 Sh., gn. gy.
2761-2770 Ls., m. lt. to lt. gy., f. xl.
2770-2775 Ls., as abv., Ost.
2775-2777 Sh., gy.
2777-2790 Ls., pale yel. brn., f. xl., Crin.
2790-2795 Ls., pale yel. brn., f. xl., dol.
2795-2800 Ls., pale yel. brn., f. xl.
2800-2802 Sh., gy.
2802-2806 Ls., pale yel. brn., v. f. xl.
2806-2808 Sh., gy.
2808-2820 Ls., pale yel. brn., f. xl., Brac., Crin.
2820-2825 Ls., m. gy., f. xl., sl. arg.
2825-2830 Ls., brn. gy., f. xl.
2830-2835 Ls., as abv.; m.-gy. str. cht.
2835-2840 Ls., pale yel. brn., f. xl., Fus.
2840-2845 Ls., as abv.; gy. cht.
2845-2850 Ls., m. gy., f. xl.
2850-2857 Ls., pale yel. brn., f. xl.; m.-gy. and yel.-brn. dns. cht.
2857-2860 Ls., brn. gy., f. gr., arg.
2860-2866 Sh., m. gy., v. lmy.
2866-2872 Ls., pale yel. brn. and m. lt. gy., f. gr., sl. arg.
2872-2874 Sh., gy.
2874-2880 Ls., pale yel. brn., f. xl.; lt.-gy. dns. cht.
2880-2885 Ls., v. pale orng. to lt. gy., f. xl.
2885-2890 Ls., pale yel. brn. to brn. gy., f. xl.; yel.-brn. dns. cht.
2890-2905 Ls., pale yel. brn., f. xl., wh. xl. calc.
2905-2918 Ls., m. gy., f. xl.
2918-2922 Ls., brn. gy., f. xl., sl. arg.

Kansas City Group

2922-2924 Sh., gy.
2924-2927 Ls., pale yel. brn., v. f. to f. xl.; m.-gy. dns. cht.
2927-2930 Sh., gy.
2930-2940 Ls., pale yel. brn., f. xl.; m.-gy. and yel.-brn. dns. cht.
2940-2943 Sh., gy.
2943-2948 Ls., m. lt. gy., f. gr.; lt.-gy. dns. spic. cht.
2948-2950 Sh., gy.
2950-2965 Ls., v. pale orng. to pale yel. brn., f. xl.
2965-2970 Ls., as abv., Ost.
2970-2983 Ls., m. to m. lt. gy., f. xl.
2983-2990 Sh., gy.

Base of **Lane Shale**

2990-2994 Ls., m. dk. gy., f. gr., arg.
2994-2998 Ls., pale yel. brn., f. xl.
2998-3000 Sh., gy.
3000-3008 Ls., as abv.
3008-3014 Sh., gy.
3014-3020 Ls., m. lt. gy., f. gr., arg.
3020-3023 Dol., pale yel. brn., f. xl.
3023-3030 Ls., pale yel. brn., f. xl.; some gran. por. ls.; lt.-gy. fos.? cht.
3030-3034 Ls., pale yel. brn., f. xl.
3034-3041 Ls., m. dk. gy., arg.
3041-3045 Sh., gy.
3045-3048 Ls., brn. gy., f. xl., Fus.
3048-3050 Sh., gy.
3050-3057 Ls., pale yel. brn., f. to m. ool., some p.-p. por.
3057-3060 Ls., pale yel. brn., f. xl.
3060-3065 Ls., brn. gy., f. xl., sl. arg.
3065-3068 Sh., gy.
3068-3072 Ls., m. dk. gy., f. gr., sl. arg.
3072-3074 Sh., gy.
3074-3090 Ls., pale yel. brn., f. xl.; m.-lt.-gy. to lt.-gy. dns. spic. cht.
3090-3095 Ls., m. dk. gy., f. gr., sl. arg.
3095-3100 Ls., as abv., sl. brn., Crin.
3100-3104 Sh., blk.
3104-3107 Ls., m. gy. to brn. gy., m. to c. ooc.
3107-3116 Ls., pale yel. brn., m. to c. ool. and ooc.
3116-3135 Ls., pale yel. brn. to brn. gy., v. f. to f. xl.
3135-3137 Sh., blk.
3137-3142 Ls., brn. gy., v. f. to f. xl.
3142-3145 Sh., gy.
3145-3150 Ls., pale yel. brn., v. f. xl.
3150-3157 Ls., pale yel. brn., f. to m. ooc.
3157-3159 Sh., gy.
3159-3161 Ls., pale yel. brn., f. xl.
3161-3162 Sh., gy.
3162-3170 Ls., as abv.
3170-3177 Ls., brn. gy. to m. dk. gy., f. gr., sl. arg.

Pleasanton Group

3177-3179 Sh., gy.
3179-3180 Ls., as abv.
3180-3190 Sh., gy.
3190-3195 Ls., m. dk. to dk. gy., arg.
3195-3200 Sh., gy., lmy.
3200-3207 Ls., m. dk. gy., f. gr., sl. arg., Crin.
3207-3210 Sh., gn. gy.
3210-3214 Sh., gy.
3214-3217 Sh., gy. red
3217-3222 Ls., olv. gy., slty.
3222-3228 Sh., olv. gy., lmy.
3228-3230 Sh., gy.
3230-3232 Sh., gy. red
3232-3237 Sh., gy.

Pennsylvanian—Des Moines Series
Marmaton Group

3237-3240 Ls., pale yel. brn., f. ool.
3240-3247 Ls., pale yel. brn., f. xl., dol.
3247-3250 Sh., gy.
3250-3257 Ls., pale yel. brn., f. xl.
3257-3262 Sh., blk.
3262-3268 Ls., as abv.
3268-3269 Sh., gy.

3269-3271 Ls., pale yel. brn., m. ool.
3271-3274 Ls., pale yel. brn., f. xl.
3274-3285 Ls., m. gy., f. gr., arg.
3285-3290 Ls., brn. gy. to pale yel. brn., f. xl.
3290-3300 Ls., m. dk. gy., f. gr., sl. arg.
3300-3308 Ls., brn. gy., f. xl.
3308-3310 Sh., gy.
3310-3313 Sh., blk.
3313-3327 Ls., m. lt. to m. gy., f. gr., arg.
3327-3332 Sh., gy.
3332-3342 Ls., brn. gy. to m. gy., f. xl., sl. arg.
3342-3345 Sh., gy.
3345-3348 Sh., blk.
3348-3350 Ls., as abv.
3350-3353 Sh., gy.
3353-3360 Ls., as abv.
3360-3363 Ls., pale yel. brn., f. xl.

Cherokee Group

3363-3366 Sh., gy.
3366-3368 Sh., blk.
3368-3375 Sltst., m. gy., lmy., sl. mica.
3375-3380 Sltst., olv. gy., lmy., mica.
3380-3388 Sh., gy.
3388-3395 Ls., pale yel. brn., f. gr., arg.
3395-3410 Sltst., gy. and olv. gy., lmy.
3410-3412 Sh., blk.
3412-3413 Coal, tr.
3413-3417 Sh., gy.
3417-3420 Sh., mod. brn.
3420-3422 Ls., gn. gy., v. arg.
3422-3427 Sh., gn. gy.
3427-3430 Ls., brn. gy., f. gr., v. arg.
3430-3440 Sh., olv. gy.
3440-3447 Sh., gy. red. and red orng., slty. in pt.
3447-3457 Sh., olv. gy., Brac. ?
3457-3460 Ls., gn. gy., f. xl., arg.
3460-3465 Sh., gy.
3465-3474 Sh., gn. gy. and olv. gy.
3474-3477 Sh., gy.
3477-3480 Sh., blk.
3480-3484 Sh., olv. gy.
3484-3488 Sh., gy.
3488-3490 Ls., pale yel. brn., f. xl.
3490-3493 Sh., gy.
3493-3500 Sh., blk.
3500-3504 Sh., gy.
3504-3508 Sh., blk.
3508-3511 Ls., olv. gy., f. gr., v. arg.
3511-3512 Sh., gy.
3512-3517 Ls., m. lt. gy., f. xl., arg.
3517-3520 Sh., gy.
3520-3525 Sh., gy. red
3525-3528 Sh., olv. gy.
3528-3532 Sh., gy. red

Mississippian—Upper Mississippian Series
Rocks of Meramec age

3532-3543 Ls., pale yel. brn., m. xl., glau.
3543-3550 Dol., pale yel. brn. to lt. olv. gy., f. xl.; lt.-gy. matted cht.
3550-3555 Ls., lt. gy., f. gr., glau.; lt.-gy. sl. glau. cht.; gy.-wh. gran. cht.
3555-3560 Ls., pale yel. brn., f. xl.; lt.-gy. matted cht.
3560-3565 Ls., as abv.; lt.-gy. to wh. dns. cht. and gran. cht.
3565-3575 Ls., v. pale orng., f. to m. xl.
3575-3610 Ls., lt. gy. to pale yel. brn., f. xl.; v. lt. gy. trip. cht.

Mississippian—Lower Mississippian Series
Rocks of Osage age

3610-3620 Ls., as abv.; m.-lt.-gy. to lt.-gy. spic. cht.
3620-3630 Dol., lt. gy., f. xl.; lt.-gy. spic. dns. cht.
3630-3640 Dol., v. pale orng., f. xl.; cht. as abv.; wh. milky qtz.
3640-3650 Ls., lt. gy. to pale yel. brn., f. gr.; lt.-gy. dns. spic. cht.
3650-3670 Dol., lt. gy., f. xl.; v. lt. gy. dns. spic. cht.; qtz. xls.
3670-3680 Dol., v. pale orng., f. xl.; lt.-gy. to v. lt. gy. dns. cht., fos. ?
3680-3695 Ls., lt. gy., f. xl.; cht. as abv.
3695-3700 Ls., as abv.; m.-lt.-gy. mot. spic. cht. / blk. incl.; qtz. xls.
3700-3710 Ls., lt. gy. to pale orng., f. xl., dol.; lt.-gy. and wh. dns. and trip. cht.
3710-3720 Dol., lt. gy., f. xl.; lt.-gy. matted cht.
3720-3730 Dol., v. pale orng., f. xl.; lt.-gy. matted cht.
3730-3745 Ls., lt. gy. to v. pale orng., m. xl.; m.-lt.-gy. to lt.-gy. dns. spic. and fos. cht.
3745-3770 Ls., lt. gy. to v. pale orng., f. xl.; m.-lt.-gy. to lt.-gy. dns. cht.
3770-3780 Ls., lt. gy., f. xl., dol.; v. lt. gy. to lt.-gy. dns. fos. cht.
3780-3795 Ls., lt. gy. and v. pale orng., f. to m. xl.
3795-3810 Ls., lt. olv. gy., f. xl., dol.; m.-lt.-gy. to m.-gy. dns. cht.
3810-3815 Ls., pale yel. brn. to v. pale orng., f. to m. xl.
3815-3820 Ls., brn. gy., v. f. xl.
3820-3823 Ls., gy. red, f. gr., arg.
3823-3834 Ls., pale yel. brn., f. xl.
3834-3837 Ls., gn. gy., f. xl., dol., v. arg., cave ?
3837-3850 Ls., pale yel. brn., f. xl.
3850-3854 Sh., gy.
3854-3863 Sh., gn. gy., dol. in pt.
3863-3897 Ls., pale yel. brn., f. xl.

Devonian and Mississippian
Chattanooga Shale

3897-3935 Sh., dk. gy.
3935-3959 Sh., m. dk. to dk. gy.

Ordovician—Upper Ordovician Series
Sylvan Shale

3959-3968 Dol., m. dk. gy., f. gr., v. arg.
3968-3972 Sh., m. dk. gy., v. dol.
3972-3979 Dol., as abv.
3979-3988 Sh., m. dk. gy., dol. in pt.

Ordovician—Middle and Upper Ordovician Series
Viola Limestone

3988-3995 Dol., m. lt. to m. gy. and pale yel .brn., m. to c. xl., por., ltl. blk. o. stn.
3995-4002 Dol., m. dk. gy., f. xl., brn.

Ordovician—Middle Ordovician Series
Simpson Group

4002-4005 Ss., v. lt. gy., f. to m. gr., sbrd., dol.
4005-4015 Ss., v. lt. gy., f. to m. gr., sbrd.
4015-4020 Ss., as abv., dol.
4020-4026 Ss., v. lt. gy., m. to c. gr., much sec. xl. growth
4026-4028 Sh., gy.
4028-4030 Sltst., wh., v. f. to m. sdy.
4030-4035 Ss., wh., v. f. to f. gr., gl.
4035-4037 Ss., v. lt. gy., v. f. gr., slty., v. glau.
4037-4038 Sltst., m. gy., glau.
4038-4046 Sh., gn. gy., sm.
4046-4053 Sh., m. dk. gy.
4053-4055 Ss., v. lt. gy., f. to m. gr., glau., pyr., dk. sh. grs.
4055-4057 Sh., gy.
4057-4065 Ss., as abv.
4065-4070 Sh., gy.
4070-4074 Ss., v. lt. gy., v. f. gr., slty., gl.
4074-4076 Sh., gn. gy.
4076-4080 Ss., as abv.
4080-4082 Sh., gn. gy.

4082-4097 Ss., lt. gy., m. gr., scat. c. grs.
4097-4101 Sh., gy.

Ordovician—Lower Ordovician Series
Arbuckle Group
Cotter and Jefferson City Dolomites
4101-4106 Dol., lt. gy. and v. pale orng., m. xl.
4106-4110 Dol., as abv.; m.-lt.-gy. cht., ool. ? in pt.
4110-4115 Dol., as abv.; m.-gy. ool. cht.
4115-4120 Dol., as abv.
4120 Total depth

WELL 12
E. H. ADAIR OIL CO. No. 1 STRUNK
NW¼ NW¼ NW¼ SEC. 5, T. 27 S., R. 2 W.
SEDGWICK COUNTY

Altitude: 1457 feet Total depth: 4220 feet
Completion date: January 23, 1955
Initial production: Dry
Radioactivity log: 190-4220 feet
Sample intervals: 10-foot; 2000-2680 feet
5-foot; 2680-4220 feet
Cored intervals: None

Depth, feet *Sample description*
0-2000 No samples; stratigraphic contacts between 0 and 2000 feet interpreted from radioactivity log

Permian—Lower Permian Series
Sumner Group
Wellington Formation
Chase Group 730
Barneston Limestone 916
Matfield Shale 1016
Wreford Limestone 1067
Council Grove Group 1103
Admire Group 1427
Pennsylvanian—Virgil Series 1524
Wabaunsee Group
Emporia Limestone 1736
Auburn Shale 1770
Bern Limestone 1780
Scranton Shale 1828
Happy Hollow Limestone and White Cloud Shale Members of Scranton Shale, and Howard Limestone 1935
2000-2003 Ls., m. gy. and yel. brn., f. gr.
Severy Shale
2003-2010 Sh., gy.
2010-2015 Sh., gn. gy.
2015-2020 Sh., gy., Fus., Crin. ?
2020-2023 Sltst., lt. gy., sl. lmy., sl. mica., ltl. carb. mat.
2023-2027 Ss., lt. gy., v. f. gr., slty., sl. lmy.
2027-2033 Sltst., as abv.
2033-2040 Sh., gy.
2040-2046 Ss., lt. gy., v. f. gr., slty.
2046-2050 Sh., gn. gy.
2050-2066 Sh., gy.
Shawnee Group
2066-2070 Ls., m. gy. and brn. gy., f. gr., Crin ?
2070-2080 Ls., m. lt. to m. gy., f. gr., Ost., Crin.; m.-gy. dns. spic. cht.
2080-2100 Ls., pale yel. brn., f. xl., Fus.
2100-2110 Ls., lt. gy., f. xl., Fus.
2110-2115 Ls., pale yel. brn. to v. pale orng., f. xl.
2115-2118 Sh., gy.
2118-2140 Ls., pale yel. brn. to m. lt. gy., f. xl.
2140-2145 Dol., pale yel. brn., f. xl.
2145-2150 Ls., pale yel. brn., f. xl.
2150-2160 Ls., as abv., Fus.
2160-2170 Ls., lt. gy., f. xl., Ost.
2170-2180 Ls., m. lt. gy., f. xl.; ltl. m.-lt.-gy. cht.
2180-2190 Ls., as abv.
2190-2200 Ls., pale yel. brn., f. xl.
2200-2203 Ls., pale yel. brn., m. ooc.
2203-2215 Ls., pale yel. brn. to v. pale orng., f. xl., Fus., Crin.
2215-2240 Ls., as abv., Crin.
2240-2260 Ls., lt. gy. to v. pale orng., f. xl.
2260-2270 Ls., v. pale orng. to pale yel. brn., f. xl., Crin.
2270-2280 Ls., as abv., Fus., Crin., Ost.
2280-2300 Ls., as abv.
2300-2310 Ls., m. lt. gy., f. xl., Crin.
2310-2320 Ls., m. gy., f. xl., Crin.
2320-2330 Ls., lt. gy. to pale yel. brn., f. xl.
2330-2340 Ls., m. gy., f. xl.
2340-2360 Ls., pale yel. brn., f. xl., Crin.
2360-2365 Ls., m. gy., f. xl.
2365-2375 Ls., pale yel. brn., f. xl.
2375-2380 Ls., v. pale orng., f. xl.; tr. of brn.-gy. dns. cht.
2380-2400 Ls., brn. gy., f. xl.
2400-2500 No samples; lithology interpreted from radioactivity log
2400-2402 Ls.
2402-2406 Sh.
2406-2412 Sh., blk.
2412-2435 Ls.
2435-2440 Sh.
2440-2452 Ls.
2452-2462 Sh., blk.
2462-2464 Ls.
2464-2468 Sh.
2468-2490 Ls.
Douglas Group
2490-2500 Sh.
2500-2503 Sh., gy.
2503-2510 Sltst., m. lt. gy., lmy., sl. mica.
2510-2514 Ls., m. gy., f. gr., arg.
2514-2520 Ls., pale yel. brn., f. xl.
2520-2525 Ls., pale yel. brn., f. xl., dol.
2525-2532 Ls., pale yel. brn., f. xl.
2532-2540 Sh., gy.
2540-2545 Sh., gn. gy.
2545-2550 Sh., gy. red
2550-2555 Sh., gn. gy.
2555-2564 Sh., gy.
2564-2575 Sltst., m. to lt. gy., lmy., mica.
2575-2580 Sh., gy.
2580-2585 Sltst., lt. gy., lmy., v. f. sdy., mica.
2585-2595 Sh., gy.
2595-2600 Sltst., as abv.
2600-2604 Sltst., lt. gy., lmy., sl. mica.
2604-2615 Sh., gy.
2615-2620 Sh., gy. red
2620-2628 Sh., gy.
2628-2640 Sltst., lt. gy., v. f. sdy., mica., lmy. in pt.
2640-2642 Sh., gy.
2642-2646 Ss., lt. gy., v. f. gr., slty., lmy.
2646-2670 Sh., gy.
2670-2675 Sh., gn. gy.
2675-2678 Ss., lt. gy., v. f. gr., slty.
2678-2680 Sh., gy.
2680-2685 Ls., brn. gy., f. gr., dol., sl. arg., Crin.
2685-2702 Sh., gy.

Pennsylvanian—Missouri Series
Lansing Group
2702-2707 Ls., pale yel. brn., f. xl., spines
2707-2709 Sh., gy.

2709-2720 Ls., pale yel. brn. to brn. gy., f. gr., Ost., v. s. fos. frags.
2720-2730 Ls., pale yel. brn. to lt. gy., f. xl.
2730-2736 Ls., pale yel. brn., f. xl.
2736-2738 Sh., gy.
2738-2752 Ls., brn. gy., f. xl.
2752-2754 Sh., gy.
2754-2760 Ls., pale yel. brn., f. ool. and ooc., some p.-p. por.
2760-2765 Ls., lt. gy. and v. pale orng., f. gr., p.-p. por.; lt.-gy. and wh. mot. spic. cht.
2765-2770 Ls., pale yel. brn., f. xl.
2770-2775 Ls., as abv.; lt.-gy. to yel.-brn. dns. and mot. spic. cht.
2775-2780 Ls., m. lt. to m. gy., f. xl., sl. arg.; tr. of gy.-blk. cht.
2780-2785 Ls., pale yel. brn., f. xl.; yel.-brn. dns. cht.
2785-2787 Sh., gy.
2787-2794 Ls., as abv.; lt.-gy. and yel.-brn. dns. cht.
2794-2802 Ls., pale yel. brn., f. ool., f. to m. ooc.
2802-2805 Ls., pale yel. brn., f. gr., por.
2805-2815 Ls., pale yel. brn., f. gr.
2815-2825 Ls., v. pale orng. to pale yel. brn., f. gr.; lt.-gy. dns. cht.
2825-2830 Ls., pale yel. brn., f. xl., Fus.
2830-2850 Ls., as abv.
2850-2870 Ls., m. lt. to m. gy., v. f. to f. xl.
2870-2875 Ls., pale yel. brn., f. xl.
2875-2880 Ls., m. gy., f. xl.
2880-2895 Ls., pale yel. brn., f. xl.
2895-2900 Ls., as abv., Crin. ?
2900-2907 Ls., as abv.
2907-2914 Ls., m. to dk. brn. gy., f. gr., arg.

Kansas City Group

Bonner Springs Shale

2914-2920 Sh., gy.
2920-2925 Sh., gn. gy.
2925-2928 Sh., gy. red
2928-2933 Sh., gy.
2933-2936 Sh., gn. gy.
2936-2946 Sh., gy.
2946-2950 Sltst., m. lt. gy., v. f. sdy.
2950-2958 Sh., gy.

Wyandotte Limestone and Lane Shale 2958-3005

2958-2965 Ls., m. dk. gy., f. gr., arg.
2965-2967 Sh., gy., Fus.
2967-2980 Ls., pale yel. brn., f. xl.
2980-2985 Ls., lt. gy., f. xl.
2985-2990 Ls., lt. gy., f. ool.
2990-2995 Ls., pale yel. brn., f. xl.
2995-3000 Ls., as abv., Fus.
3000-3002 Sh., gy.
3002-3005 Sh., gn. gy.
3005-3017 Ls., pale yel. brn., f. xl.
3017-3020 Sh., gy.
3020-3025 Ls., brn. gy. to pale yel. brn., f. xl.; pale-orng. dns. spic. cht.
3025-3035 Ls., v. pale orng., f. gr.; lt.-gy. dns. spic. cht.
3035-3040 Ls., pale yel. brn., f. xl.
3040-3045 Ls., as abv.; pale-yel.-brn. dns. cht.
3045-3051 Ls., as abv.
3051-3054 Sh., dk. gy.
3054-3060 Ls., brn. gy., v. f. to f. xl.
3060-3067 Ls., pale yel. brn., f. xl.
3067-3070 Ls., brn. gy., f. to m. ool.
3070-3085 Ls., pale yel. brn., f. xl.
3085-3095 Ls., lt. gy. to v. pale orng., f. gr.
3095-3106 Ls., pale yel. brn., f. xl.; p.-p. por., few s. vugs
3106-3110 Sh., blk.
3110-3111 Ls., brn. gy., f. xl.
3111-3115 Sh., gy.
3115-3120 Ls., pale yel. brn., f. xl., Brac., spine
3120-3128 Ls., pale yel. brn., m. to c. ooc.
3128-3130 Ls., m. gy., f. xl., sl. brn.
3130-3135 Ls., m. dk. gy., f. xl.
3135-3146 Ls., brn. gy., f. xl.
3146-3150 Sh., blk.
3150-3154 Ls., as abv.
3154-3157 Sh., gy.
3157-3160 Ls., pale yel. brn., f. xl.; lt.-gy. to pale-yel.-brn. dns. cht.
3160-3163 Ls., pale yel. brn. to brn. gy., f. ool.; lt.-gy. to yel.-brn. ool. cht.
3163-3170 Ls., pale yel. brn., f. ool.
3170-3172 Sh., gy.
3172-3177 Ls., pale yel. brn., f. gr., dol.
3177-3180 Ls., brn. gy., arg.
3180-3185 Ls., brn. gy. to gy. brn., m. ool.
3185-3200 Ls., brn. gy., f. xl.

Pleasanton Group

3200-3214 Sh., dk. gy.
3214-3220 Sh., gn. gy.
3220-3226 Sh., gy.
3226-3230 Sh., gn. gy.
3230-3236 Sh., dk. gy.
3236-3240 Ls., m. dk. gy., f. gr., sl. arg.
3240-3244 Ls., pale yel. brn., f. xl.
3244-3247 Sh., gn. gy.
3247-3254 Sltst., gn. gy., lmy.
3254-3258 Sh., gy.
3258-3267 Sh., gy. red
3267-3270 Sltst., m. lt. gy., v. f. sdy., lmy.

Pennsylvanian—Des Moines Series

Marmaton Group

3270-3273 Ls., pale yel. brn., f. gr.
3273-3280 Ls., pale yel. brn., f. ool.
3280-3283 Ls., brn. gy., f. gr.
3283-3287 Sh., dk. gy.
3287-3290 Ls., brn. gy., f. xl., sl. dol.
3290-3293 Ls., pale yel. brn., v. f. xl.
3293-3296 Sh., gy.
3296-3300 Ls., olv. gy., f. gr., arg.
3300-3305 Ls., brn. gy., f. xl.
3305-3310 Ls., pale yel. brn., f. xl.
3310-3320 Ls., m. gy., f. gr., arg.
3320-3323 Sh., gy.
3323-3330 Ls., m. dk. gy., f. gr., sl. arg.
3330-3340 Ls., brn. gy., f. xl.
3340-3343 Sh., blk.
3343-3367 Ls., m. gy., f. gr., arg.
3367-3368 Sh., gy.
3368-3375 Ls., m. dk. gy., v. arg.
3375-3378 Ls., brn. gy., f. xl.
3378-3380 Sh., blk.
3380-3385 Ls., m. dk. gy., f. gr., v. arg.
3385-3387 Sh., gy.
3387-3396 Ls., brn. gy., f. xl.

Cherokee Group

3396-3400 Sh., blk.
3400-3404 Sltst., m. lt. gy., lmy., sl. mica.
3404-3416 Sltst., m. gy., v. lmy.; m.-gy. v. arg. ls.
3416-3422 Sh., gy.
3422-3428 Ls., m. lt. gy. to pale yel. brn., f. xl.
3428-3430 Sh., gy.
3430-3433 Ls., brn. gy., f. xl., dol.
3433-3440 Ls., brn. gy., f. gr., arg.
3440-3442 Sh., blk.
3442-3446 Sh., gn. gy., cave ?
3446-3450 Sh., mod. brn.
3450-3454 Ls., olv. gy., f. gr., v. arg.

3454-3458 Sh., gn. gy.
3458-3465 Sh., gy. red
3465-3468 Sh., gn. gy.
3468-3473 Sh., gy.
3473-3478 Sh., gy. red
3478-3485 Sh., gy.
3485-3490 Sh., gn. gy.
3490-3493 Ls., brn. gy., f. xl., pyr.
3493-3494 Sh., gy.
3494-3498 Ls., as abv.
3498-3500 Sh., gy.
3500-3506 Sh., olv. gy., lmy.
3506-3510 Sh., gn. gy.
3510-3513 Sh., blk.
3513-3516 Sh., gn. gy.
3516-3523 Sh., gy.
3523-3527 Ls., m. lt. gy., f. xl.
3527-3530 Sh., blk.
3530-3537 Sh., gy.
3537-3540 Sh., blk.
3540-3544 Sh., gy.
3544-3547 Ls., m. dk. gy. and gy. brn., f. xl., arg.
3547-3550 Ls., m. dk. gy. and gy. brn., f. xl.
3550-3553 Sh., gn. gy.
3553-3560 Sh., gy. red
3560-3566 Sh., gn. gy.
3566-3570 Sh., gy. red
3570-3573 Sh., gy.
3573-3576 Sh., gn. gy.
3576-3580 Sltst., dk. gn. gy., v. f. to f. sdy., scat. m. to c. sbrd. grs.
3580-3585 Sh., gn. gy.

Mississippian—Upper Mississippian Series
Rocks of Meramec age

3585-3595 Ls., lt. gy., f. to m. xl.
3595-3605 Ls., as abv.; v. lt. gy. dns. cht.
3605-3610 Ls., pale yel. brn. to lt. gy., m. xl., tr. of glau.; v. lt. gy. spic. cht.
3610-3625 Ls., pale yel. brn. to lt. gy., m. xl., glau.
3625-3630 Ls., lt. gy., f. to m. xl.; lt.-gy. to m.-gy. spic. cht.
3630-3635 Ls., pale yel. brn., f. to m. xl.; lt.-gy. spic. dns. and lmy. cht.
3635-3640 Ls., pale yel. brn., f. xl., dol.
3640-3645 Ls., pale yel. brn., f. xl., glau.
3645-3650 Ls., pale yel. brn., f. xl.; v. lt. gy. v. lmy. trip. cht.
3650-3658 Ls., lt. gy. to pale yel. brn., gran., v. sil.

Mississippian—Lower Mississippian Series
Rocks of Osage age

3658-3670 Ls., as abv.; v. lt. gy. cht.
3670-3680 Dol., v. pale orng. to pale yel. brn., f. xl., v. f. sil. in pt.
3680-3695 Ls., lt. gy. to v. pale orng., f. gr., v. f. sil.
3695-3700 Ls., as abv.; v. lt. gy. lmy. v. f. gran. cht.
3700-3705 Dol., pale yel. brn., f. xl.
3705-3710 Ls., v. lt. gy. to v. pale orng., f. gr., sil.; v. lt. gy. dns. and v. f. gran. cht.
3710-3720 Dol., pale yel. brn., f. xl.; v. lt. gy. v. f. gran. cht.
3720-3730 Dol., v. lt. gy., f. gr., sil.; v. lt. gy. cht.
3730-3735 Dol., lt. gy., f. xl., tr. of glau.; lt.-gy. dns. spic. cht. / tr. glau.
3735-3745 Ls., pale yel. brn., f. xl.; v. lt. gy. dns. cht.
3745-3750 Ls., as abv.; spic. cht.
3750-3760 Dol., lt. gy., f. gr.; m.-lt.-gy. and yel.-brn. dns. spic. cht.
3760-3765 Dol., as abv.; tr. of wh. dns. cht. / clr. qtz. xls.
3765-3770 Ls., v. pale orng., f. xl.; v. lt. gy. to lt.-gy. dns. spic. cht.
3770-3780 Ls., lt. gy., f. gr.; cht. as abv.
3780-3785 Ls., as abv.; m.-lt.-gy. dns. spic. cht.
3785-3795 Ls., lt. gy., f. gr.; v. lt. gy. dns. cht. / spines ?
3795-3800 Ls., v. pale orng., f. xl.
3800-3810 Ls., v. pale orng., f. to m. xl.
3810-3820 Ls., as abv.; lt.-gy. dns. cht.
3820-3835 Ls., lt. gy., f. xl., dol.
3835-3840 Ls., lt. gy., f. xl.
3840-3844 Dol., lt. gy., f. xl.
3844-3858 Ls., lt. gy., f. xl.
3858-3860 Dol., lt. gy., f. xl.
3860-3865 Ls., lt. gy., f. xl.
3865-3890 Ls., lt. gy., f. to m. xl.
3890-3905 Ls., v. lt. gy. mot. / pale red, sft.
3905-3910 Ls., as abv., sl. arg.; some pale-red.-brn. ls.
3910-3913 Dol., gn. gy., f. xl.
3913-3923 Ls., lt. gy., f. to m. xl.
3923-3930 Ls., gn. gy. to olv. gy., f. gr., v. arg.
3930-3934 Ls., m. lt. gy. to gn. gy., f. gr., arg., Crin. ?
3934-3950 Ls., pale yel. brn., f. xl., Crin. ?
3950-3960 Ls., gn. gy. and gy. red, f. gr., arg.
3960-3963 Sh., dk. gy.
3963-3973 Sh., gn. gy., dol. and lmy. in pt.
3973-3993 Ls., pale yel. brn., f. xl.

Devonian and Mississippian
Chattanooga Shale

3993-4075 Sh., m. dk. to dk. gy.

Misener sand

4075-4078 Ss., m. gy., v. f. to f. gr., pyr., arg., scat. m. grs., tt.
4078-4080 Ss., v. lt. gy., f. to m. gr., pyr., scat. ls. grs.

Ordovician—Middle and Upper Ordovician Series
Viola Limestone

4080-4085 Dol., lt. to m. gy., pale yel. brn., and brn. gy., m. xl., vug.
4085-4090 Dol., as abv.; m.-gy. dns. cht.; brn.-gy. spec. and spic. cht.
4090-4092 Dol., brn. gy., f. xl.; cht. as abv.
4092-4095 Dol., m. dk. gy., f. xl., arg.

Ordovician—Middle Ordovician Series
Simpson Group

4095-4100 Ss., v. lt. gy., f. to m. gr.; dk.-gy. and pale-yel.-brn. v. f. to m.-sdy. cht.
4100-4105 Ss., as abv.
4105-4110 Ss., lt. gy., f. to m. gr., dol., sbrd., scat. c. grs.
4110-4115 Ss., v. lt. gy., v. f. gr.
4115-4118 Sh., gn. gy.
4118-4127 Sh., gy.
4127-5133 Sh., gn. gy.
4133-4135 Ss., v. lt. gy., f. gr.
4135-4138 Ss., as abv., v. glau.
4138-4148 Sh., gy.
4148-4157 Ss., v. lt. gy., f. gr., scat. m. grs.
4157-4160 Sltst., lt. gy., v. f. sdy., glau., pyr.
4160-4166 Ss., v. lt. gy., f. gr.
4166-4168 Sh., gy.
4168-4173 Ss., v. lt. gy., m. gr., scat. c. grs.
4173-4174 Sh., gy.
4174-4183 Ss., v. lt. gy., f. gr., scat. m. grs.
4183-4187 Sh., gy.

Ordovician—Lower Ordovician Series
Arbuckle Group
Cotter and Jefferson City Dolomites

4187-4190 Dol., v. pale orng. to lt. gy., m. xl.
4190-4195 Dol., v. pale orng., f. xl.; m.-lt.-gy. dns. cht., fig. cht., and ool. cht.
4195-4220 Dol., pale yel. brn., m. xl.
4220 Total depth

WELL 13
D. R. LAUCK No. 1 MCLEAN
SW COR. SE¼ SEC. 1, T. 27 S., R. 1 W.
SEDGWICK COUNTY

Altitude: 1315 feet (estimated) Total depth: 4703 feet
Completion date: December 9, 1936
Initial production: Dry
Electrical log: None
Sample intervals: Irregular
Cored intervals: None

Depth, feet *Sample description*

0-2596 No samples; stratigraphic contacts interpreted from drillers log

Quaternary
Permian—Lower Permian Series 50
Sumner Group
Wellington Formation
Chase Group 353?
Barneston Limestone 513?
Matfield Shale 606?
Wreford Limestone 665
Council Grove Group 724?
Admire Group 1055
Pennsylvanian—Virgil Series 1140?
Wabaunsee Group
Emporia Limestone 1365
Auburn Shale 1390
Bern Limestone 1395
Scranton Shale 1445
Happy Hollow Limestone and White Cloud Shale Members of Scranton Shale, and
Howard Limestone 1560
Severy Shale 1610
Shawnee Group 1673
Tecumseh Shale 1810?-1880?
Douglas Group 2135
Pennsylvanian—Missouri Series 2325
Lansing Group
Kansas City Group 2470?
Bonner Springs Shale
Wyandotte Limestone and Lane Shale 2470-2596

2596-2600 Ls., pale yel. brn., f. xl., Crin. ?; m.-lt.-gy. dns. cht.
2600-2610 Ls., pale yel. brn., v. f. to f. xl.
2610-2620 Sh., m. dk. to dk. gy.
2620-2630 Ls., pale yel. brn., f. xl., Fus.; lt.-gy. to m.-lt.-gy. cht., Fus. cht., and spic. cht.
2630-2650 Ls., pale yel. brn., f. xl.; lt.-gy. cht.
2650-2654 Ls., pale yel. brn., f. xl.
2654-2658 Sh., gy.
2658-2666 Ls., as abv., Ost., Crin. ?
2666-2670 Sh., gy.
2670-2673 Sh., gn. gy.
2673-2680 Ls., pale yel. brn., f. xl.
2680-2690 Ls., v. pale orng. to pale yel. brn., f. xl.; m.-lt.-gy. dns. spic. cht.
2690-2692 Sh., gy.
2692-2695 Ls., m. lt. gy., f. xl.
2695-2700 Ls., pale yel. brn. to brn. gy., f. xl.; lt.-gy. cht.
2700-2717 Ls., pale yel. brn., m. to c. ooc.
2717-2725 Sh., gy.
2725-2730 Ls., pale yel. brn., f. xl.
2730-2736 Ls., brn. gy., v. f. xl.; lt.-gy. to m.-dk.-gy. dns. cht.
2736-2743 Sh., blk.
2743-2747 Ls., m. gy., f. xl.
2747-2750 Sh., gy.
2750-2760 Ls., as abv.
2760-2767 Ls., m. lt. gy., m. ool.
2767-2770 Ls., m. gy., f. xl.

Pleasanton Group

2770-2774 Sh., gy.
2774-2777 Ls., m. dk. gy., f. gr., dol., arg.
2777-2791 No samples
2791-2804 Sh., dk. gy., lmy., spines, Crin.
2804-2833 Sh., m. dk. gy., mica.
2833-2836 Ls., m. dk. gy., arg.
2836-2840 Ls., olv. gy., v. f. xl.; pale-yel.-brn. f. xl. ls.
2840-2847 Sltst., lt. olv. gy., v. f. sdy., lmy., glau. in pt.
2847-2854 Sltst., m. lt. gy., lmy.
2854-2857 Sh., gn. gy.
2857-2860 Sh., gy. red
2860-2863 Sh., gn. gy.

Pennsylvanian—Des Moines Series
Marmaton Group

2863-2867 Ls., pale yel. brn., f. xl.
2867-2870 Ls., pale yel. brn., f. to m. ooc.
2870-2873 Ls., pale yel. brn., f. xl.
2873-2875 Sh., gn. gy.
2875-2878 Sh., gy.
2878-2883 Ls., m. gy., f. xl., sl. arg.
2883-2886 Sh., gy.
2886-2890 Sh., blk.
2890-2894 Sh., gn. gy.
2894-2898 Ls., pale yel. brn., f. gr.
2898-2900 Sh., gy.
2900-2904 Ls., lt. gn. gy., f. gr., dol., arg.
2904-2914 Ls., pale yel. brn., f. xl.
2914-2920 Sh., gn. gy.
2920-2923 Ls., pale yel. brn., f. gr., fnt. m. ool.
2923-2927 Ls., pale yel. brn., f. gr.
2927-2933 Ls., m. dk. gy., f. gr., arg.
2933-2938 Ls., brn. gy., f. xl.
2938-2943 Sh., blk.
2943-2950 Sh., dk. gy., lmy.
2950-2973 Ls., pale yel. brn. to m. gy., f. gr., arg.
2973-2980 Ls., brn. gy., f. xl.

Cherokee Group

2980-2983 Sh., blk.
2983-2986 Sh., gy.
2986-2990 Ls., m. dk. gy., v. arg.
2990-3000 Ls., brn. gy., f. gr., arg., Fus.
3000-3005 Sh., gy.
3005-3007 Sh., blk.
3007-3013 Sh., gn. gy., lmy., slty.
3013-3016 Sh., gy.
3016-3030 Ls., brn. gy., v. f. xl.
3030-3040 Sh., gy. and gn. gy., blk. phos. ? pel.
3040-3047 Ls., olv. gy. to gn. gy., f. xl., v. arg.
3047-3050 Sh., gy. red
3050-3052 Sltst., lt. olv. gy., v. f. sdy., sl. lmy.
3052-3057 No samples
3057-3060 Sh., olv. gy., flky.
3060-3062 Ls., gn. gy., v. f. xl.
3062-3067 Sh., dusky red, flky., Fus., eroded ? Fus.
3067-3070 Sh., olv. gy.
3070-3072 Ls., lt. olv. gy., v. f. xl.
3072-3075 Sh., v. dusky red
3075-3080 Sh., gy. red and dk. yel. orng.
3080-3086 Sh., gy. red, eroded ? Fus.; olv.-gy. arg. rough ls. pel.
3086-3088 Ls., lt. gy., v. f. xl.
3088-3090 Ss., lt. gy. v. f. to f. gr., scat. m. grs., sl. lmy.
3090-3092 Ls., lt. olv. gy., v. f. to f. sdy.
3092-3102 Sh., gy. red

3102-3104 Ss., gn. gy., v. f. to f. gr., slty., tt.
3104-3110 Ss., lt. gy., f. to m. gr., scat. c. grs., ang. to rd.
3110-3114 Sh., gy. red
3114-3118 Cht., dtrl., v. lt. gy. to m. dk. gy., fig. and spic.; gn.-gy. sh. mtx.
3118-3126 Cht., dtrl. as abv.; gn. frags. of Precambrian rock ?; c. fld. grs.; brn. ls. frags.

Mississippian—Lower Mississippian Series
Rocks of Osage age
3126-3135 Cht., v. lt. gy., semi-gran., por.
3135-3150 Cht., v. lt. gy., semi-gran.; ltl. v. lt. gy. dns. fig. cht.
3150-3170 Cht., as abv.; ltl. v. lt. gy. f. xl. ls.
3170-3178 Cht., v. lt. gy.; v. f. to f. xl. dol.
3178-3182 Cht, v. lt. gy., semi-gran.; ltl. fig. cht.
3182-3187 Cht., wh., trip., sft.; ltl. lt.-gy. f. xl. ls.
3187-3192 Cht., v. lt. gy. to wh., dns., sl. fig.; ltl. lt.-gy. f. xl. ls.
3192-3197 No samples
3197-3202 Cht., m. lt. to v. lt. gy., spic. in pt.; some qtz.
3202-3207 Cht., v. lt. to lt. gy., dns. and semi-gran., fig.; lt.-gy. f. xl. ls.
3207-3215 Cht., lt. to m. gy., dns., spic.; v. lt. gy. semi-gran. cht.
3215-3220 Cht., v. lt. gy., dns.; lt.-gy. f.-gr. ls.
3220-3230 Cht., m. lt. gy., dns., spic.; m.-lt.-gy. semi-gran. lmy. cht.; lt.-gy. f.-gr. ls.
3230-3240 Cht., lt. gy., dns., spic. in pt.; lt.-gy. f. xl. dol.
3240-3250 Cht., v. lt. to lt. gy., dns.
3250-3255 Cht., as abv.; lt.-gy. f.-gr. ls.
3255-3264 Cht., lt. gy., spic., dns.; v. pale orng. f. xl. ls.
3264-3269 No samples
3269-3275 Cht., as abv.
3275-3280 Ls., lt. gy., f. xl.; lt.-gy. dns. and spic. cht.
3280-3295 Cht., lt. gy., dns.; lt.-gy. f. xl. ls.
3295-3300 Cht., m. lt. to m. gy., dns.; lt.-gy. f.-gr. ls.
3300-3312 Ls., lt. gy., f. to m. xl.; lt.-gy. dns. cht.
3312-3316 Ls., m. lt. gy., f. xl.; lt.-gy. dns. cht.
3316-3322 Ls., lt. gy., f. to m. xl.; lt.-gy. dns. cht.
3322-3326 Ls., as abv.; v. lt. gy. dns. trnsl. cht.
3326-3334 Ls., as abv.; cht. as abv.; pale-red to gy.-pk. dns. sl. trnsl. cht.
3334-3338 Ls., lt. olv. gy., f. gr., dol., arg.; v. lt. gy. dns. trnsl. cht.; ltl. pale-red sl. arg. ls.
3338-3347 Ls., pale yel. brn., v. f. xl.
3347-3349 Ls., gy. red, arg.
3349-3353 Sh., gy. red, lmy.
3353-3360 Ls., lt. gy., f. to m. xl., fos. frags.
3360-3372 Ls., pale yel. brn., f. to m. xl.
3372-3378 Ls., pale yel. brn., v. f. xl.
3378-3382 Sh., gy. red, lmy.
3382-3402 Sh., m. dk. gy.
3402-3407 Ls., brn. gy., v. f. xl.; pale-yel.-brn. f. xl. ls.
3407-3411 No samples
3411-3420 Ls., pale yel. brn., f. xl.

Devonian and Mississippian
Chattanooga Shale
3420-3430 No samples
3430-3447 Sh., dk. gy.
3447-3460 Sh., m. dk. gy., pyr.; some brn.-gy. f. xl. ls.—prob. out of place
3460-3490 Sh., m. dk. gy.
3490-3498 Sh., dk. gy.

Misener sand
3498-3500 Ss., lt. gy., v. f. to m. gr., pyr.

Ordovician—Middle and Upper Ordovician Series
Viola Limestone
3500-3506 Dol., lt. gy. to v. pale orng., m. xl.
3506-3510 Dol., brn. gy., f. xl.; gy.-brn. dns. cht.

Ordovician—Middle Ordovician Series
Simpson Group
3510-3516 Dol., brn. gy. to yel. brn., f. xl., m. sdy.; rd. and fros. sd. grs.
3516-3520 Ss., lt. gy., m. gr.; lt.-gy. semi-gran. cht. / blk. specs. and dol. xls. (sil. sltst. ?); m.-gy. v. f. to f. sdy. cht.
3520-3524 No samples
3524-3530 Ss., as abv.; lt.-gy. f. to m.-sdy. cht.
3530-3534 Sh., gy.
3534-3540 Ss., lt. gy., f. to m. gr., sbang. to rd.; lt.-gy. to m.-gy. dns. cht. and f. to m.-sdy. cht.
3540-3543 Sh., gy.
3543-3545 Dol., lt. gy., f. xl., f. sdy.
3545-3550 Ss., v. lt. gy., f. to m. gr., sbrd.
3550-3552 Sh., gy.
3552-3555 Ss., as abv.
3555-3556 Sh., gy.
3556-3558 Ss., lt. gy., m. to c. grs., sbrd.
3558-3569 Ss., lt. gy., f. to m. gr., sbrd.
3569-3570 Ss., m. lt. gy., v. f. to f. gr., glau., scat. blk. grs.
3570-3573 Sh., m. gy., v. f. to f. sdy., glau.
3573-3575 Sh., m. dk. gy.
3575-3578 Ss., v. lt. gy., f. to m. gr., sbrd., scat. c. grs.
3578-3580 Sh., gy.
3580-3582 Ss., v. lt. gy., v. f. gr.
3582-3591 No samples
3591-3600 Ss., lt. gy., f. to m. gr., sbang. to rd., scat. c. grs.
3600-3603 Sh., gn. gy.

Ordovician—Lower Ordovician Series
Arbuckle Group
Cotter and Jefferson City Dolomites
3603-3607 Dol., m. lt. gy., m. xl.; lt.-gy. cht.; xl. qtz.
3607-3615 Dol., as abv.; lt.-gy. to m.-gy. cht.; xl. qtz.
3615-3623 Dol., lt. gy., f. to m. xl.; gy.-wh. dns. cht.
3623-3630 Dol., m. lt. gy., m. xl.
3630-3634 Sh., m. gy., sl. gn.
3634-3645 Dol., m. lt. gy., m. xl.; xl. qtz. at top
3645-3650 Dol., v. lt. gy., f. xl.
3650-3656 Dol., pale yel. brn., m. xl.; v. lt. gy. to lt.-gy. dns. cht. and ool. cht.
3656-3666 Dol., lt. gy., f. to m. xl.
3666-3672 Dol., as abv.; v. lt. gy. cht.
3672-3678 Dol., lt. gy., f. to m. xl.
3678-3697 No samples
3697-3705 Dol., m. lt. gy. to pale yel. brn., f. to m. xl.; v. lt. gy. m.-ool. cht.
3705-3715 Dol., as abv.
3715-3725 Dol., lt. gy. to v. pale orng., f. xl.
3725-3730 Dol., pale yel. brn., m. xl.
3730-3745 Dol., m. lt. gy., f. to m. xl.
3745-3750 Dol., v. pale orng., m. xl., por., scat. m. sd. grs. in pt.
3750-3755 Dol., lt. gy. to brn. gy., m. xl.
3755-3770 Dol., v. pale orng., m. xl.; v. lt. gy. trnsl. cht.
3770-3773 Dol., m. lt. gy., f. xl.
3773-3780 Dol., lt. gy., f. to m. xl.; v. lt. gy. dns. trnsl. cht.
3780-3783 Dol., pale yel. brn., m. xl.
3783-3790 Dol., as abv.; v. lt. gy. dns. trnsl. cht.
3790-3804 Dol., lt. gy., f. to m. xl.; gy.-wh. dns. cht.
3804-3814 Ss., gl., f. to m. gr., ang., much sec. qtz. ?
3814-3820 Dol., v. pale orng., m. xl.; v. lt. gy. dns. and trnsl. cht.
3820-3825 Dol., pale yel. brn., m. xl.; cht. as abv.
3825-3832 Dol., pale yel. brn., f. xl.
3832-3848 Dol., lt. gy., f. xl.; v. lt. gy. trnsl. cht. / some blk. specs.; wh. cht. / dol. xls.
3848-3851 Sh., gy.
3851-3855 Dol., as abv., cht. as abv.
3855-3860 Dol., lt. gy., f. xl., f. to m. sdy.

3860-3866 Dol., lt. gy., f. xl.; wh. dns. cht.; v. lt. gy. dns. trnsl. cht.
3866-3872 Dol., lt. gy., f. to m. xl.
3872-3885 Dol., as abv.; wh. and v. lt. gy. to m.-gy. dns. cht., trnsl. cht., and ool. cht.
3885-3900 Dol., lt. gy., f. xl.; v. lt. gy. dns. trnsl. cht.; wh. dns. cht.
3900-3907 Dol., lt. to m. lt. gy., f. xl.; v. lt. gy. to wh. dns. cht.
3907-3915 Dol., lt. gy., m. xl.
3915-3920 Dol., v. lt. gy., f. xl.
3920-3926 Dol., pale yel. brn., f. xl.
3926-3933 Dol., lt. gy., f. to m. xl.; wh. to lt.-gy. dns. cht. and trnsl. cht.
3933-3936 Dol., as abv.

Roubidoux Dolomite

3936-3944 Ss., gl., f. to m. gr., ang.
3944-3954 Dol., lt. to m. lt. gy., m. xl.
3954-3960 Dol., as abv.; v. lt. gy. to lt.-gy. dns. cht., ool. in pt.
3960-3965 Dol., lt. gy., f. to m. xl.; cht. as abv.
3965-3975 Dol., lt. gy., m. xl.; v. lt. gy. dns. cht.
3975-3985 Dol., as abv.
3985-3992 Dol., as abv.; wh. trnsl. dns. cht.
3992-4002 Dol., lt. gy., m. xl., f. to m. sdy.
4002-4012 Dol., pale yel. brn., f. to m. xl.
4012-4018 Dol., as abv.; wh. dns. trnsl. cht.
4018-4037 Dol., v. pale orng., f. to m. xl.
4037-4040 Dol., lt. gy., f. xl., f. to m. sdy.
4040-4049 Dol., lt. gy., f. xl.; v. lt. gy. dns. trnsl. cht.
4049-4056 Dol., lt. gy., f. xl., f. to m. sdy.
4056-4060 Dol., lt. gy., f. xl.
4060-4070 Dol., lt. gy., f. xl., f. to m. sdy., scat. c. sbrd. sd. grs.

Cambrian—Upper Cambrian Series
Bonneterre Dolomite

4070-4076 No samples
4076-4083 Dol., lt. gy., f. xl.; v. lt. gy. dns. cht.
4083-4098 Dol., pale yel. brn., m. xl.
4098-4104 Dol., v. lt. gy., m. xl., scat. f. to m. sd. grs.; clr. gl. qtz.
4104-4110 Dol., lt. gy., m. xl.; clr. gl. qtz. xls.
4110-4124 Dol., lt. gy. to v. pale orng., m. xl.
4124-4128 No samples
4128-4134 Dol., as abv.; ltl. lt.-gy. cht.; scat. f. to m. sd. grs.
4134-4142 Dol., lt. gy., f. to m. xl.
4142-4149 Dol., as abv., f. to m. sdy.
4149-4150 Sh., gy.
4150-4158 Dol., lt. gy., m. xl.
4158-4164 Dol., lt. gy., m. xl., m. sdy.
4164-4173 Dol., as abv.; lt.-gy. dns. cht.
4173-4176 Sh., gy., scat. f. sd. grs., glau. ?
4176-4186 Dol., lt. gy., m. xl.
4186-4190 Dol., lt. gy., f. to m. xl., scat. f. to m. sd. grs.
4190-4195 Dol., as abv.; clr. gl. qtz.
4195-4210 Dol., lt. gy., f. to m. xl.; scat. f. to m. sd. grs.
4210-4215 Dol., as abv.; lt.-gy. cht.; qtz.
4215-4222 Dol., as abv.
4222-4225 Sh., gy.
4225-4230 Dol., lt. gy., f. xl., f. to m. sdy.; lt.-gy. cht.
4230-4234 Dol., as abv.
4234-4235 Sh., gy.
4235-4249 Dol., v. lt. gy., m. xl., f. to m. sdy.
4249-4260 Dol., lt. gy., f. to m. xl., f. to m. sdy.; wh. cht.; clr. gl. qtz. xls.
4260-4270 Dol., as abv.; much clr. gl. qtz.; ltl. lt.-gy. cht.; scat. f. to m. sd. grs.
4270-4275 No samples
4275-4280 Dol., lt. gy., m. xl.
4280-4288 Dol., as abv., scat. f. to m. sd. grs.; ltl. lt.-gy. cht.
4288-4293 Dol., lt. gy., f. to m. xl.; v. lt. gy. cht.; clr. gl. qtz.
4293-4300 Dol., lt. gy., f. to v. xl., f. to m. sdy.; v. lt. gy. cht.
4300-4310 Dol., as abv.

Reagan Sandstone

4310-4318 Ss., lt. gy., m. gr., sbang. to sbrd.
4318-4322 Ss., as abv., dol.; some sec. enlargement of grs.
4322-4328 Ss., lt. gy., m. gr., sbang. to sbrd.
4328-4330 Sh., m. dk. gy.
4330-4332 Dol., m. gy., m. xl.
4332-4340 Ss., lt. gy., m. gr.
4340-4355 Ss., lt. gy., f. to m. gr., sbang. to sbrd., scat. c. grs.
4355-4360 Ss., lt. gy., m. to c. grs., scat. v. c. grs.
4360-4363 Sh., gy.
4363-4370 Ss., as abv.; frags. of meta. ? rocks; v. c. books of mica

Precambrian

4370-4380 Qtzt., lt. gy., f. to c. gr., mica.
4380-4397 Qtzt., lt. to m. lt. gy., f. to m. gr., many dk. grs., mica., tt.
4397-4400 Grnt., red
4400-4408 Qtzt., as abv.
4408-4416 Qtzt., lt. gy., f. to m. gr., mica., scat. c. to v. c. grs., gn. and dk-gy. grs.
4416-4442 Grnt.?, lt. gy.
4442-4462 No samples
4462-4467 Qtzt., lt. gy., f. to m. gr., mica., some c. grs.
4467-4490 Grnt., lt. gy. to pk.
4490-4507 Qtzt., lt. gy. as abv.
4507-4512 Grnt., lt. gy.
4512-4540 Qtz., lt. gy., mica.
4540-4550 Sch. ?
4550-4554 Qtzt., as abv.
4554-4570 Grnt., lt. gy.
4570-4580 Grnt., pk.
4580-4598 Grnt., gy. wh.
4598-4608 Qtzt., v. lt. gy., mica.
4608-4613 Grnt., gy. wh.
4613-4620 Qtzt., as abv.
4620-4623 Sh., m. dk. gy. (slate ?)
4623-4634 Qtzt., as abv.
4634-4638 Grnt., as abv.
4638-4650 Qtzt., as abv.
4650-4654 Grnt., gy. wh.
4654-4660 Qtzt., as abv.
4660-4685 Grnt., as abv.
4685-4690 Qtzt., as abv.
4690-4700 Grnt., as abv.
4700-4703 No samples
4703 Total depth

WELL 14
DERBY REFINING CO. NO. 1 DERBY REFINERY
C SE¼ SE¼ SEC. 4, T. 27 S., R. 1 E.
SEDGWICK COUNTY

Altitude: 1314 feet Total depth: 3482 feet
Completion date: December 7, 1956
Initial production: Salt water disposal well.
Electrical log: 75-3487 feet
Sample intervals: 10-foot; 0-2400 feet
5-foot; 2400-3482 feet
Cored intervals: None

Depth, feet *Sample description*

Quaternary

0- 58 Sand, f. to v. c. gr., loose, fld.; some gy. sh., gyp., and anhy.

Permian—Lower Permian Series

Sumner Group

Wellington Formation

58- 60 Sh., m. to m. dk. gy.
60- 64 Gyp., wh.; f. xl. anhy.
64- 66 Sh., m. gy.
66- 70 Gyp. and anhy., as abv.
70- 72 Sh., gy.
72- 74 Dol., m. lt. gy., v. f. gr., arg., rthy.
74- 80 Gyp., wh.
80- 82 Sh., m. gy.
82- 90 Gyp., wh.
90- 93 Sh., m. gy.
93- 98 Gyp., wh.
98- 100 Sh., m. to m. dk. gy.
100- 102 Sh., gn. gy.
102- 127 Gyp., wh.; v. lt. gy. f. xl. anhy.
127- 130 Sh., m. to m. dk. gy.
130- 133 Sh., gy. red
133- 136 Sh., m. gy.
136- 143 Anhy., lt. gy., f. xl.
143- 152 Sh., m. dk. gy.
152- 161 Gyp., wh.; lt.-gy. f. xl. anhy.
161- 163 Sh., m. gy.
163- 174 Anhy., m. to lt. gy., f. xl.
174- 176 Sh., m. dk. gy.
176- 180 Sh., m. lt. gy., v. dol.
180- 183 Sh., dk. gn. gy.
183- 191 Anhy., m. to lt. gy., f. xl.
191- 194 Sh., m. gy.
194- 205 Anhy., as abv.
205- 208 Sh., gn. gy.
208- 214 Sh., m. to m. dk. gy.
214- 224 Anhy., as abv.
224- 227 Sh., m. gy.
227- 230 Dol., lt. olv. gy., v. f. gr., mot. / dk. gy., sl. arg.
230- 232 Sh., m. gy.
232- 234 Dol., as abv., anhy. xls. and vns.
234- 237 Anhy., m. lt. gy., f. xl.
237- 240 Sh., m. dk. gy.
240- 246 Anhy., as abv.
246- 249 Sh., gn. gy.
249- 250 Dol., pale yel. brn., v. f. gr., sl. arg.
250- 255 Sh., m. gy.
255- 262 Anhy., m. lt. to lt. gy., f. xl.
262- 265 Sh., m. gy.
265- 275 Anhy., as abv.
275- 278 Sh., olv. gy.

Chase Group

Nolans Limestone

278- 280 Dol., pale yel. brn. to lt. olv. gy., v. f. gr., arg., anhy.
280- 283 Sh., m. gy.
283- 290 Dol., m. lt. gy. to v. pale orng., v. f. gr., arg.; v. lt. gy. dns. op. cht.
290- 294 Sh., m. gy., dol., v. f. carb. ? frags.
294- 296 Dol., m. gy., v. f. gr., arg.
296- 300 Sh., as abv.
300- 304 Dol., m. gy. to lt. olv. gy., f. gr., arg.

Odell Shale

304- 307 Sh., m. gy., v. dol.
307- 313 Dol., as abv.
313- 316 Sh., m. gy.

Winfield Limestone

316- 320 Dol., m. lt. gy., v. f. xl., arg.
320- 327 Dol., m. gy., f. gr., arg.; m.-gy. dns. cht.
327- 330 Sh., gy. red, dol.
330- 333 Sh., m. gy., dol.
333- 339 Dol., m. gy., f. gr., arg.
339- 343 Sh., m. gy., dol.
343- 354 Ls., m. to m. lt. gy., gran., anhy., sl. arg., s. fos. frags.

Doyle Shale

354- 360 Sh., m. dk. gy., lmy.
360- 367 Ls., m. gy., v. f. gr., dol., v. arg.
367- 370 Sh., gy., lmy.
370- 377 Ls., m. gy., v. f. gr., v. arg.
377- 382 Sh., gy. and gy. red, lmy.
382- 385 Anhy., pale red to pk., f. xl.
385- 390 Ls., m. to m. lt. gy., gran., anhy.
390- 398 Anhy., wh., f. xl.
398- 400 Dol., lt. olv. gy., f. gr., gyp.
400- 403 Sh., m. gy.
403- 408 Dol., pale yel. brn. to lt. olv. gy., f. gr., gyp.
408- 410 Anhy., lt. gy., f. xl.
410- 413 Dol., as abv.
413- 417 Sh., gy., dol.
417- 420 Sh., blk.
420- 423 Gyp., lt. gy.; f. xl. anhy.
423- 427 Sh., m. gy.
427- 430 Dol., m. gy., f. gr., v. arg.
430- 432 Sh., dk. gn. gy.

Barneston Limestone

432- 436 Ls., m. gy., v. arg.
436- 438 Sh., m. gy.
438- 444 Ls., m. lt. gy., gran., sl. arg., scat. s. vugs
444- 450 Ls., m. lt. gy., v. f. gr., arg., gyp., v. dol.
450- 465 Ls., m. lt. gy., v. f. gr., arg., dol.
465- 470 Ls., m. lt. to lt. gy., f. gr., sl. arg., v. s. fos. frags.
470- 483 Ls., m. lt. to m. gy., f. gr., arg., dol., Crin., spine
483- 490 Ls., m. lt. to m. gy., f. gran., sl. arg., Crin.
490- 500 Ls., m. lt. gy., gran., sl. arg., Crin., Bry., por.
500- 510 Ls., v. pale orng. to lt. gy., gran., por., Crin., Bry.; m.-lt.-gy. to m.-gy. dns. spic. fos. cht.
510- 550 Samples prob. out of place; lithology interpreted from electrical log
510- 530 Ls.

Matfield Shale

530- 550 Sh.
550- 559 Sh., m. dk. gy., lmy.
559- 562 Ls., m. lt. gy., gran., sl. arg.
562- 570 Ls., m. gy., f. gr., arg., Brac.
570- 580 Sh., m. dk. gy., v. lmy.
580- 586 Ls., m. gy., f. gr., arg.
586- 590 Sh., m. gy., lmy.

Wreford Limestone

590- 596 Ls., m. lt. gy., gran., arg., dk. fos. frags.
596- 603 Ls., m. lt. gy., gran., sl. arg., Brac., fos.; m.-lt.-gy. dns. mot. spic. cht.
603- 607 Sh., gy., lmy.
607- 610 Ls., m. lt. gy., gran., arg., Brac.
610- 614 Sh., m. gy., lmy.
614- 630 Ls., v. pale orng., gran., Ost., s. fos. frags.; m.-lt.-gy. to m.-dk.-gy. dns. spic. fos. cht.
630- 633 Sh., gn. gy., lmy.
633- 638 Sh., m. dk. gy., lmy.
638- 640 Ls., m. gy., f. gr., arg.
640- 650 Ls., v. pale orng., f. gr. to gran., fos. frags.; m.-lt.-gy. to m.-dk.-gy. dns. spic. cht.

Council Grove Group

650- 654 Sh., gn. gy., sl. lmy.
654- 656 Ls., v. pale orng. to m. lt. gy., f. gr., sl. arg.
656- 660 Sh., gn. gy., sl. lmy.
660- 663 Sh., gy. red, sl. lmy.

663- 666 Sh., m. gy., lmy.
666- 670 Ls., m. lt. gy., v. f. gr., sl. arg.
670- 677 Sh., m. gy., lmy.
677- 680 Ls., m. lt. to m. gy., f. gr., sl. arg.
680- 686 Ls., lt. gy., f. gr.
686- 697 Sh., m. gy., lmy.
697- 702 Ls., m. gy., f. gr., sl. arg.; m.-gy. mot. dns. spic. cht.
702- 708 Sh., gy., lmy.
708- 710 Ls., pale yel. brn. to brn. gy., v. f. xl.
710- 714 Sh., lt. olv. gy.
714- 717 Ls., m. lt. gy., f. gr., arg.
717- 720 Ls., v. pale orng. to pale yel. brn., v. f. xl.
720- 725 Ls., m. lt. gy., gran., por., v. s. fos. frags.
725- 730 Sh., gn. gy. to olv. gy.
730- 732 Sh., gy. red
732- 735 Sh., gy., lmy.

Beattie Limestone

735- 740 Dol., v. pale orng. to pale yel. brn., v. f. xl., por., sl. ooc.
740- 742 Sh., m. gy.
742- 745 Ls., m. lt. gy., v. f. gr., mot. / m. dk. gy.; v. lt. gy. and pale-red dns. op. to trnsl. cht.
745- 748 Sh., gy.
748- 757 Ls., m. lt. to m. gy., f. gr., sl. arg. in pt., Fus.
757- 766 Sh., gn. gy. and m. gy., lmy.
766- 776 Ls., v. pale orng. to lt. gy., f. gr., por., abnt. Fus.
776- 778 Ls., m. lt. to m. gy., v. f. gr., arg.

Eskridge Shale

778- 785 Sh., m. to m. dk. gy., lmy.
785- 790 Sh., gn. gy., lmy.
790- 793 Sh., gy., lmy.

Grenola Limestone

793- 800 Ls., v. pale orng., f. gr., por. in pt., Fus., cave ?
800-1100 No samples; lithology interpreted from electrical log
800- 809 Ls.
809- 814 Sh.
814- 830 Ls.
830- 840 Sh.
840- 843 Ls.

Roca Shale

843- 848 Sh.
848- 853 Ls.
853- 860 Sh.

Red Eagle Limestone, Johnson Shale, and Foraker Limestone

860- 872 Ls.
872- 880 Sh.
880- 890 Ls.
890- 892 Sh.
892- 898 Ls.
898- 902 Sh.
902- 910 Ls.
910- 912 Sh.
912- 918 Ls.
918- 920 Sh.
920- 925 Ls.
925- 928 Sh.
928- 934 Ls.
934- 938 Sh.
938- 943 Ls.
943- 950 Sh.
950- 957 Ls.
957- 962 Sh.
962- 968 Dol.
968- 978 Sh.
978- 983 Ls.

Admire Group

983- 988 Sh.
988- 990 Ls.
990- 994 Sh.
994- 996 Ls.
996- 999 Sh.
999-1001 Ls.
1001-1006 Sltst.
1006-1010 Ls.
1010-1013 Dol.
1013-1020 Sh.
1020-1027 Sltst., sdy.
1027-1040 Sltst.
1040-1050 Sltst., sdy.
1050-1053 Sltst.
1053-1063 Sh.

Pennsylvanian—Virgil Series

Wabaunsee Group

1063-1066 Ls.
1066-1073 Sltst.
1073-1077 Ls.
1077-1080 Sltst.
1080-1082 Sh.
1082-1087 Sltst.
1087-1090 Sh.
1090-1096 Sltst.
1096-1100 Ls.
1100-1112 Sh., m. dk. gy., v. pyr.
1112-1115 Sltst., lt. gy., v. f. sdy., mica.
1115-1128 Sltst., m. lt. gy., mica.
1128-1130 Sltst., lt. gy., v. f. sdy., mica.
1130-1132 Dol., pale yel. brn., v. f. gr., arg.
1132-1138 Sh., mod. yel. brn., dol.
1138-1146 Sh., m. lt. gy. to gn. gy., slty., lmy.
1146-1150 Ls., pale yel. brn. to m. gy., v. f. to f. xl., v. glau., sl. arg.
1150-1157 Sh., gy., slty. in pt.
1157-1160 Dol., brn. gy., v. f. xl., arg.
1160-1162 Ls., pale yel. brn., f. gr., sl. arg.
1162-1170 Sh., gy.
1170-1174 Ls., m. gy. to brn. gy., f. gr., v. f. sdy., arg., Fus.
1174-1180 Sh., gy.
1180-1184 Sltst., m. lt. to m. gy., lmy., mica.
1184-1188 Sh., gy.
1188-1193 Sltst., pale yel. brn., dol., v. f. sdy., sl. mica.
1193-1204 Sh., dk. gy., slty., mica.
1204-1206 Sltst., m. lt. gy., mica.
1206-1210 Ss., lt. gy., v. f. gr., slty., dol.
1210-1215 Ss., lt. gy., f. gr., por.
1215-1218 Sh., m. gy.
1218-1226 Ss., lt. gy., v. f. to f. gr., dol. in pt., sl. mica.
1226-1228 Sh., m. gy.
1228-1233 Sltst., lt. gy., v. f. sdy., dol.
1233-1238 Sh., m. gy.
1238-1247 Ss., lt. gy., v. f. gr., slty., dol., sl. mica.
1247-1265 Sh., m. gy.

Emporia Limestone

1265-1270 Ls., m. gy. to brn. gy., f. gr., arg., Fus.; m.-dk.-gy. v. f. gr. arg. ls.
1270-1273 Sh., gy.
1273-1276 Ss., v. pale orng., v. f. gr., slty., dol.
1276-1279 Ls., lt. gy., v. f. gr., Fus., Ost.
1279-1280 Sh., m. gy.
1280-1283 Ls., lt. gy., v. f. gr., dol.
1283-1287 Ls., v. pale orng. to pale yel. brn., v. f. xl., Fus.

Auburn Shale

1287-1290 Sh., m. gy.
1290-1292 Sltst., mod. yel. brn., lmy., sl. mica.
1292-1296 Sltst., lt. gy., sl. lmy., sl. mica.

1296-1302 Sh., pale brn. and lt. olv. gy., lmy.
1302-1313 Sh., gy.
1313-1315 Ls., m. gy., v. f. gr., arg.
1315-1317 Sh., gy.

Bern Limestone

1317-1323 Ls., lt. gy. to v. pale orng., v. f. gr.
1323-1326 Sh., gy.
1326-1328 Ss., lt. gy., v. f. gr., slty., lmy.
1328-1334 Sh., gy.
1334-1340 Ls., m. gy., f. gr., arg., Fus.; some sl. yel.-brn. ls.
1340-1342 Sh., gy., Fus.
1342-1348 Ls., m. lt. gy. to pale yel. brn., f. gr., sl. arg.

Scranton Shale

1348-1353 Sh., dk. gy.
1353-1357 Sh., blk.
1357-1364 Sh., gy.
1364-1372 Ls., lt. gy. to pale yel. brn., v. f. to f. gr., Ost., s. fos. frags.
1372-1386 Sh., gy.
1386-1390 Ls., m. to m. dk. gy., f. gr., v. arg., Crin.
1390-1392 Sh., gy.
1392-1396 Sltst., m. lt. gy., mica., sl. dol.
1396-1398 Sh., gy.
1398-1407 Sltst., lt. gy., v. f. sdy., lmy., mica., v. f. carb. mat.
1407-1417 Sltst., m. lt. gy., mica., v. f. carb.
1417-1435 Sh., m. gy., slty., mica.
1435-1446 Sh., m. dk. gy.
1446-1453 Sltst., lt. gy., v. f. sdy., mica.
1453-1456 Sh., gy.
1456-1460 Sltst., yel. brn., v. f. sdy., mica., lmy.
1460-1463 Sh., m. gy., mica., slty.

Happy Hollow Limestone and White Cloud Shale Members of Scranton Shale, and Howard Limestone

1463-1469 Ls., pale yel. brn. to brn. gy., v. f. to f. xl., wh. xl. calc.
1469-1472 Sh., gy.
1472-1477 Dol., v. pale orng., v. f. gr.
1477-1480 Sh., gy.
1480-1483 Ls., pale yel. brn., f. xl.
1483-1486 Ls., brn. gy., f. xl.
1486-1489 Ls., brn. gy., f. gr., arg.
1489-1491 Sh., gy.
1491-1495 Ls., m. lt. to m. gy., v. f. gr., sl. arg.
1495-1500 Sh., gn. gy. to olv. gy., lmy.
1500-1740 No samples; lithology interpreted from electrical log
1500-1504 Sh.
1504-1510 Ls.
1510-1513 Sh.
1513-1518 Ls.

Severy Shale

1518-1530 Sh.
1530-1553 Ss.
1553-1570 Sh.
1570-1574 Ls.
1574-1577 Sh.
1577-1579 Ls.
1579-1588 Sh.

Shawnee Group

Topeka Limestone, Calhoun Shale, and Deer Creek Limestone

1588-1592 Dol.
1592-1618 Ls.
1618-1620 Sh.
1620-1630 Ls.
1630-1634 Sh.
1634-1637 Ls.
1637-1644 Sh.
1644-1646 Ls.
1646-1667 Sh.
1667-1680 Ls.
1680-1687 Sh.
1687-1692 Ls.
1692-1698 Sh.
1698-1701 Ls.
1701-1710 Sh.
1710-1712 Dol.
1712-1714 Sh.
1714-1717 Dol.
1717-1722 Sh.
1722-1727 Ls.

Tecumseh Shale 1727-1789

1727-1732 Sltst.
1732-1735 Sh.
1735-1740 Sltst.
1740-1753 Sltst., m. lt. to m. gy., mica., v. f. carb. in pt.
1753-1760 Ss., m. lt. gy., v. f. gr., slty., mica., lmy.
1760-1770 Sh., m. dk. to dk. gy.
1770-1780 Sh., dk. gn. gy., sl. lmy.
1780-1783 Sh., mod. yel. brn.
1783-1785 Sh., gy. red
1785-1787 Sh., mod. yel. brn.
1787-1789 Sltst., m. lt. gy., mica.
1789-1792 Ls., m. lt. gy., v. f. gr., sl. arg., Fus.
1792-1795 Sh., gy.
1795-1800 Ls., brn. gy., v. f. xl., sl. arg., Fus., spine
1800-1803 Ls., m. gy., v. f. gr., sl. arg.
1803-1805 Sh., dk. gy.
1805-1808 Sh., blk.
1808-1812 Sh., dk. gy.
1812-1818 Ls., m. gy. to brn. gy., v. f. gr., arg., Fus., Crin.
1818-1820 Ls., m. lt. gy., v. f. gr., sl. arg.
1820-1827 Ls., pale yel. brn., v. f. xl.
1827-1832 Ss., m. lt. gy., v. f. gr., sl. lmy.
1832-1835 Sh., gy.
1835-1843 Ls., brn. gy. and m. gy., v. f. xl.
1843-1848 Sh., gn. gy.
1848-1857 Sh., m. dk. to dk. gy.
1857-1865 Ls., pale yel. brn., v. f. xl.
1865-1870 Ls., m. lt. gy., v. f. gr.
1870-1885 Ls., v. pale orng. to pale yel. brn., v. f. to f. xl.
1885-1897 Ls., v. lt. gy., v. f. xl., fairly sft.
1897-1900 Ls., pale yel. brn., v. f. xl., dol.
1900-1920 Ls., m. lt. to lt. gy., v. f. xl.
1920-1923 Sh., m. dk. to dk. gy.
1923-1926 Ls., m. gy., v. f. gr., arg.
1926-1940 Ls., brn. gy. to pale yel. brn., v. f. xl.
1940-1947 Ls., lt. gy. to v. pale orng., v. f. to f. xl.
1947-1949 Sh., gy.
1949-1955 Ls., pale yel. brn., f. xl., s. fos. frags.
1955-1957 Sh., dk. gy.
1957-1962 Sh., blk.
1962-1966 Ls., m. lt. gy., v. f. gr., arg.
1966-1970 Sh., dk. gy.
1970-1975 Sh., blk.
1975-1980 Sh., gy.
1980-1982 Ls., brn. gy., v. f. xl., dol., sl. arg.
1982-1986 Sh., gy.
1986-1994 Ls., brn. gy., v. f. xl., sl. arg., Fus.
1994-1996 Sh., gy.
1996-2000 Ls., v. lt. gy. to v. pale orng., v. f. gr.

Douglas Group

2000-2002 Sh., gy.
2002-2008 Sltst., lt. gy., mica., v. f. sdy. in pt.
2008-2020 Sh., m. dk. gy.
2020-2027 Dol., pale to mod. yel. brn., v. f. to f. xl.; lt.-gy. v. f. gr. dol.

2027-2029 Sh., gy.
2029-2035 Ls., lt. gy., v. f. gr., dol., sl. arg.
2035-2040 Sltst., m. to m. dk. gy., mica.
2040-2090 Sh., m. to m. dk. gy., slty., mica.
2090-2100 Sh., m. gy., sl. olv.-gy. tint
2100-2108 Sh., m. dk. gy.
2108-2124 Sltst., lt. to m. lt. gy., mica., carb. in pt., lmy. in pt.
2124-2127 Sltst., m. gy., v. f. sdy., mica., sl. lmy.
2127-2133 Sltst., m. lt. gy., mica.
2133-2180 Sh., m. to m. dk. gy.
2180-2188 Ls., pale yel. brn., f. xl., Crin.; lt.-gy. v. f. gr. ls.
2188-2193 Sltst., m. lt. gy.
2193-2197 Sh., gn. gy.
2197-2204 Sh., gy.

Pennsylvanian—Missouri Series
Lansing Group
2204-2207 Dol., brn. gy. to lt. olv. gy., v. f. gr. to dns., arg.
2207-2238 Ls., lt. to m. lt. gy., v. f. xl., Brac., fos. frags.
2238-2245 Sltst., m. to m. dk. gy., lmy.
2245-2255 Sh., m. to m. dk. gy., lmy., slty.
2255-2270 Sh., m. to m. dk. gy., lmy.
2270-2275 Sh., m. dk. gy.
2275-2280 Sh., gn. gy.
2280-2290 Sh., m. dk. gy., lmy.
2290-2295 Sh., olv. gy., sl. lmy., sl. brn.
2295-2310 Sh., m. dk. to dk. gy.
2310-2325 Sh., m. dk. gy. to brn. gy., slty., mica.
2325-2330 Sh., brn. gy.
2330-2333 Sh., gy.
2333-2336 Sh., m. gy., lmy., Fus., cave ?
2336-2340 Ls., pale yel. brn., v. f. xl.
2340-2345 Ls., m. gy., v. f. xl., sl. arg.

Kansas City Group
Bonner Springs Shale
2345-2350 Sh., m. dk. gy.
2350-2355 Sh., olv. gy.
2355-2370 Sh., m. dk. gy., sl. lmy.
2370-2400 Sh., m. dk. gy.
2400-2405 Sh., brn. gy.
2405-2422 Sh., m. dk. gy.

Wyandotte Limestone
2422-2427 Sh., m. dk. gy., v. lmy.
2427-2432 Ls., m. dk. gy., v. arg., sl. brn. in pt., glau. in lower pt.
2432-2440 Sh., m. dk. gy., lmy.
2440-2442 Sh., gy.
2442-2450 Ls., pale yel. brn. and m. lt. to m. gy., v. f. to f. xl., Crin., some m.-xl. calc.

Lane Shale 2450-2513
2450-2457 Sh., m. to m. dk. gy., lmy.
2457-2460 Sh., brn. gy., sl. lmy.
2460-2483 Sh., m. gy., lmy.
2483-2486 Sh., brn. gy., sl. lmy., brn. Fe-st.
2486-2492 Sh., m. gy., lmy.
2492-2495 Ls., m. gy., v. f. gr., v. arg.
2495-2513 Sh., m. gy., lmy.
2513-2518 Ls., pale yel. brn., f. xl., many s. fos. frags.
2518-2520 Sh., gy.
2520-2525 Ls., brn. gy. to pale yel. brn., v. f. xl., fos.
2525-2530 Ls., pale yel. brn., v. f. xl.
2530-2534 Ls., lt. gy., f. gr., fos.
2534-2538 Sh., m. dk. gy., lmy.
2538-2540 Sh., gn. gy.
2540-2542 Ls., m. gy., f. gr., dol., v. arg.
2542-2545 Ls., pale yel. brn., f. xl.
2545-2550 Ls., pale yel. brn., f. xl., Fus.; pale-yel.-brn. to m.-lt.-gy. dns. cht., spic. cht., and Fus. cht.
2550-2555 Ls., v. pale orng. to lt. gy., v. f. gr., sl. o. stn. ?; lt.-gy. dns. cht.
2555-2565 Ls., as abv., Ost., Crin.; cht. as abv.
2565-2570 Ls., as abv.; m.-lt.-gy. dns. spic. fos. cht.
2570-2573 Ls., m. gy., f. xl., sl. arg.
2573-2580 Ls., pale yel. brn. to brn. gy., f. xl.
2580-2590 Ls., pale yel. brn. to v. pale orng., f. gr., fairly sft.
2590-2595 Ls., as abv.; lt.-gy. dns. cht.
2595-2600 Ls., pale yel. brn., v. f. to f. xl., spine; m.-gy. to pale-yel.-brn. dns. spic. cht.
2600-2605 Ls., m. lt. gy., v. f. xl.; m.-gy. dns. spic. cht.
2605-2610 Ls., pale yel. brn., f. xl., p.-p. por.
2610-2615 Ls., as abv.; v. lt. gy. dns. cht.
2615-2617 Ls., m. gy., f. gr., v. arg., Crin.
2617-2622 Sh., blk.
2622-2624 Sh., dk. gy.
2624-2627 Ls., pale yel. brn., f. xl.
2627-2630 Ls., m. lt. gy. to pale yel. brn., v. f. xl.
2630-2635 Ls., pale yel. brn., v. f. xl.
2635-2640 Ls., as abv.; lt.-gy. dns. cht.
2640-2644 Ls., brn. gy., v. f. xl.; m.-lt.-gy. to v. lt. gy. dns. cht.
2644-2648 Ls., m. gy., f. gr., arg., Crin.
2648-2650 Sh., blk.
2650-2652 Ls., brn. gy., f. xl., sl. arg.
2652-2656 Ls., pale yel. brn., f. xl.
2656-2660 Sh., gy.
2660-2664 Ls., v. pale orng., f. xl., f. ool. and ooc. in pt., Crin.
2664-2668 Ls., lt. gy. to v. pale orng., f. to m. ooc.
2668-2670 Sh., m. dk. gy.
2670-2675 Ls., pale yel. brn. to v. pale orng., f. ool. and ooc.
2675-2679 Ls., as abv., some ool. / gy.-red centers

Pleasanton Group
2679-2685 Sltst., m. dk. gy., lmy., sl. mica.
2685-2692 Sh., m. dk. gy., lmy.
2692-2700 Sh., m. dk. gy., sl. olv. gy. in pt.
2700-2732 Sh., m. dk. gy., prob. lmy. in pt.
2732-2734 Sh., m. dk. gy., v. lmy., fos.
2734-2740 Ls., m. dk. gy., gran., v. arg., fos.
2740-2742 Ls., gn. gy., gran., v. arg.
2742-2746 Ls., pale yel. brn., v. f. xl. to dns.
2746-2750 Ss., m. lt. gy. to gn. gy., v. f. gr., slty., lmy., pk. fld.? grs., many gn. grs.
2750-2753 Ss., yel. brn., v. f. gr., slty., lmy.
2753-2758 Sh., olv. gy. and dk. gn. gy.
2758-2762 Ss., m. gy., v. f. gr., v. slty., sl. lmy., pk. fld.? grs.
2762-2768 Sh., m. gy., slty., sl. gn.

Pennsylvanian—Des Moines Series
Marmaton Group
2768-2776 Ls., lt. gy., f. gr., sl. arg., dol.
2776-2779 Ls., pale yel. brn., v. f. xl.
2779-2785 Ls., m. gy., v. f. gr., arg.
2785-2788 Sh., gn. gy.
2788-2790 Sh., m. dk. gy.
2790-2795 Ls., brn. gy., v. f. xl. to dns.
2795-2800 Sh., m. dk. to dk. gy.
2800-2802 Sh., gn. gy.
2802-2804 Ls., lt. gy. to pale yel. brn., f. gr., sl. arg. in pt.
2804-2808 Ls., pale yel. brn., v. f. to f. xl.
2808-2812 Ls., pale yel. brn., f. to m. ool.
2812-2813 Sh., dk. gy.
2813-2816 Sh., m. gy., v. lmy.
2816-2820 Ls., m. gy., v. f. to f. xl., arg.
2820-2824 Ls., brn. gy., v. f. gr., arg.
2824-2828 Sh., brn. gy., lmy.
2828-2830 Sh., blk., cave ?

2830-2834 Ls., brn. gy., v. f. gr., arg.
2834-2838 Sh., gy.
2838-2842 Ls., brn. gy., v. f. xl., arg.
2842-2844 Ls., m. dk. gy. to brn. gy., f. xl., arg.
2844-2848 Sh., dk. gy., lmy.
2848-2850 Sh., blk.
2850-2852 Sh., dk. gy.
2852-2857 Sltst., m. dk. gy., lmy., pyr.
2857-2873 Ls., brn. gy. to m. gy., v. f. to f. gr., v. arg.

Cherokee Group

2873-2880 Sh., m. gy., v. lmy.
2880-2884 Sh., blk.
2884-2894 Sh., gy., lmy.
2894-2897 Ls., m. to dk. gy., f. gr., arg.
2897-2900 Ls., pale to mod. yel. brn., v. f. xl.
2900-2906 Ls., m. gy. to brn. gy., f. gr., arg.
2906-2908 Sh., olv. gy.
2908-2913 Sltst., gn. gy., lmy.
2913-2918 Sh., gn. gy., lmy., slty.
2918-2922 Ls., pale yel. brn., v. f. to f. xl.; brn.-gy. v. f. xl. ls., arg. in pt.
2922-2926 Sh., gy.
2926-2933 Ls., brn. gy., v. f. xl., arg. in pt.
2933-2938 Sh., m. gy., lmy.
2938-2941 Sh., gn. gy.
2941-2943 Ls., m. lt. gy., v. f. gr., arg.
2943-2950 Sh., gy.
2950-2952 Sh., blk.
2952-2957 Ls., m. gy. to pale yel. brn., f. gr., arg., some gy.-red mot.
2957-2960 Sh., gn. gy.
2960-2968 Sh., gy. red
2968-2972 Sh., gn. gy.
2972-2977 Ss., lt. gy. to lt. gn. gy., v. f. to f. gr., many m. to v. c. subrd. grs.
2977-2982 Sh., v. dusky red
2982-2990 Cht., prob. dtrl., v. lt. gy. to gn. gy., gran., por. to dns., fos. and spic. in pt.; some red and yel.-brn. cht.; gn.-gy. sil. sh. mtx.
2990-2992 Sh., gn. gy.

Mississippian—Lower Mississippian Series
Rocks of Osage age

2992-3020 Cht., v. lt. gy. to v. pale orng., v. f. gran., por. to dns.
3020-3045 Cht., as abv.; much lt.-gn.-gy. v. por. cht., sl. trip., some gy.-red and yel.-orng. mot.
3045-3050 Cht., v. lt. gy., mot. / pale red, gy. red, and yel. orng., dns., fos., spic.; xl. qtz.
3050-3055 Cht., v. lt. gy., dns., spic., op.
3055-3060 Cht., as abv.; some v. lt. gy. dns. semi-trnsl. cht.
3060-3065 Ls., v. lt. gy., f. to m. xl., Crin.; v. lt. gy. dns. cht.
3065-3080 Dol., lt. gy., v. f. xl., Crin. ?; m.-gy. to wh. dns. op. spic. cht.
3080-3085 Ls., lt. gy., v. f. xl., sl. dol.; wh. dns. to v. f. gran. op. cht. and some sl. spic. cht.
3085-3090 Ls., m. lt. to lt. gy., v. f. xl.; cht. as abv.
3090-3095 Ls., v. pale orng., v. f. xl.; cht. as abv.
3095-3105 Ls., v. pale orng. to lt. gy., v. f. xl.; wh. dns. op. cht.
3105-3110 Ls., v. pale orng. to lt. gy., v. f. xl., dol.; cht. as abv.
3110-3115 Ls., as abv.; m.-lt.-gy. dns. op. spic. cht.
3115-3120 Ls., v. pale orng. to pale yel. brn., v. f. xl., Crin.; m.-lt.-gy. to m.-gy. dns. op. cht.
3120-3125 Ls., as abv.
3125-3130 Ls., lt. gy. to v. pale orng., f. xl.
3130-3135 Ls., as abv.; v. lt. gy. to lt.-gy. dns. fig. cht.
3135-3140 Ls., as abv., some v. pale orng. dns. fig. cht.
3140-3150 Ls., v. pale orng. to pale yel. brn., f. xl., Crin.
3150-3157 Ls., lt. gy. to v. pale orng., f. to m. xl., Crin.
3157-3160 Ls., lt. gy., v. f. to f. xl., dol.
3160-3170 Ls., gn. gy., f. gr., arg.; m.-lt.-gy. to gn.-gy. semi-trnsl. dns. cht.; v. lt. gy. to pale-red trnsl. cht.
3170-3175 Ls., brn. gy., v. f. xl., arg.
3175-3184 Ls., m. lt. gy., f. xl., sl. olv.-gy. tint, sl. arg.
3184-3188 Ls., pale red to gy. red, f. gr., arg.
3188-3195 Ls., m. lt. gy. to pale yel. brn., f. xl., sl. gn. in pt.
3195-3200 Ls., pale red, lt. gn. gy., and lt. gy., f. to m. xl.
3200-3205 Ls., pale yel. brn., v. f. xl. to dns.
3205-3210 Ls., lt. gy., v. f. xl.
3210-3216 Ls., m. lt. gy., f. xl., dol.
3216-3220 Sh., brn. gy. to mod. brn.
3220-3227 Sh., m. dk. to dk. gy., slty.
3227-3230 Sh., gn. gy.
3230-3232 Sh., m. dk. gy.
3232-3234 Ls., brn. gy., f. gr., arg.
3234-3238 Ls., brn. gy., v. f. xl.
3238-3240 Ls., pale yel. brn. to lt. gy., f. xl.
3240-3253 Ls., pale yel. brn., v. f. xl.

Devonian and Mississippian
Chattanooga Shale

3253-3260 Sh., m. dk. to dk. gy.
3260-3270 Sh., m. dk. gy., sl. dol.
3270-3277 Sh., m. dk. gy., dol.
3277-3322 Sh., m. dk. to dk. gy.

Misener sand

3322-3324 Ss., m. gy., f. to m. gr., v. pyr., v. tt.

Ordovician—Middle and Upper Ordovician Series
Viola Limestone

3324-3330 Dol., m. lt. gy. to m. gy., f. to m. xl., vuggy
3330-3344 Dol., m. lt. to m. dk. gy., f. to m. xl., vuggy
3344-3346 Dol., m. lt. to m. gy., f. xl., slty.

Ordovician—Middle Ordovician Series
Simpson Group

3346-3348 Dol., m. lt. gy., v. f. to m. sdy.
3348-3352 Ss., m. lt. gy. to wh., f. to m. gr.
3352-3357 Ss., wh. to lt. gy., f. gr., o. stn. in pt.
3357-3360 Ss., wh., v. f. gr.
3360-3362 Sh., gn. gy., mot. / gy. red
3362-3366 Ss., wh., f. gr., fri., por.
3366-3370 Ss., wh. to v. pale orng., v. f. gr., por.
3370-3377 Ss., wh. to lt. gy., v. f. gr., slty., glau., scat. f. to m. sbrd. grs.
3377-3382 Sh., m. dk. gy.
3382-3386 Sh., gn. gy.
3386-3389 Ss., v. pale orng., f. to m. gr., lmy. in pt., o. stn.
3389-3390 Ss., lt. gy., v. f. to f. gr., glau.
3390-3394 Ss., m. lt. gy., v. f. gr., slty., tt.
3394-3400 Sltst., m. lt. to m. gy., sl. dol.
3400-3404 Sltst., m. gy., v. f. to f. sdy., v. glau.
3404-3410 Ss., v. pale orng. to m. gy., v. f. gr., scat. f. to c. grs., o. stn.
3410-3412 Sh., gn. gy., scat. f. to c. sd. grs.
3412-3414 Ss., v. lt. gy., v. f. gr.
3414-3418 Sh., gn. gy. and m. dk. gy.
3418-3420 Ss., wh., f. to c. gr., sbrd., drills loose

Ordovician—Lower Ordovician Series
Arbuckle Group
Cotter and Jefferson City Dolomites

3420-3425 Dol., m. lt. to m. gy., f. xl., some v. f. xl.
3425-3430 Dol., pale yel. brn. to brn. gy., f. to m. xl., scat. f. to m. rd. sd. grs. in pt., scat. vugs and p.-p. por.
3430-3438 Dol., lt. gy. to v. pale orng., m. xl.

3438-3443 Dol., m. lt. gy. to pale yel. brn., m. xl., scat. vugs, qtz. xls.
3443-3450 Dol., m. lt. gy. to v. pale orng., f. xl.
3450-3452 Dol., lt. to m. lt. gy., v. f. xl.
3452-3459 Dol., v. pale orng. to lt. gy., v. f. xl., f. to m. ooc.
3459-3465 Dol., lt. gy., v. f. xl.
3465-3470 Dol., pale yel. brn., f. xl.
3470-3475 Dol., lt. gy., v. f. xl.
3475-3482 Dol., pale to mod. yel. brn., m. xl.; pale-yel.-brn. v. f. to f. xl. dol.
3482 Total depth

WELL 15

PRODUCERS AND REFINERS CORP. No. 1 TURNER
NW COR. SE¼ SEC. 30, T. 27 S., R. 2 E.
SEDGWICK COUNTY

Altitude: 1339 feet Total depth: 3342 feet
Completion date: October 22, 1930
Initial production: Dry
Electrical log: None
Sample intervals: Irregular, mostly 10-foot; 800 to 3327 feet
Cored intervals: None

Depth, feet *Sample description*

0- 800 No samples; stratigraphic contacts interpreted in part from drillers log

Permian—Lower Permian Series
Sumner Group
Wellington Formation
Chase Group 230?
Nolans Limestone
Odell Shale 260?
Winfield Limestone 270?
Doyle Shale 290?
Barneston Limestone 386?
Matfield Shale 480?
Wreford Limestone 540?
Council Grove Group 600?
Beattie Limestone 677?
Eskridge Shale 710?
Grenola Limestone 730?
Roca Shale 780?
Red Eagle Limestone, Johnson Shale, and Foraker Limestone 800?
800-810 Ls., m. gy., f. gr., sl. arg., some clr. xl. calc. vn. or fos. fillings
810- 816 Sh., gy., v. lmy.
816- 823 Ls., m. gy., f. gr., sl. arg.
823- 828 Sh., gy., v. lmy.
828- 835 Ls., pale yel. brn., f. xl.; m.-gy. f.-gr. sl. arg. ls.
835- 840 Sh., gy., v. lmy.
840- 850 Ls., lt. gy., f. gran., por.
850- 853 Sh., gn. gy.
853- 856 Ls., lt. olv. gy., f. xl., dol.
856- 860 Ls., m. lt. gy., f. xl.
860- 865 Ls., m. gy., f. gr., arg. in pt.
865- 867 Sh., gy., lmy., many Fus.
867- 874 Ls., pale yel. brn., f. gr., many Fus.
874- 880 Sh., as abv., Fus.
880- 883 Ls., m. gy., arg., Fus.
883- 885 Sh., gy.
885- 888 Sh., gn. gy.
888- 890 Sh., gy. red
890- 897 Sh., dk. gy.
897- 900 Ls., m. lt. gy., mot., arg., Fus.

Admire Group
900-1000 No samples
1000-1004 Ss., lt. gy., v. f. gr., slty., mica.

Pennsylvanian—Virgil Series
Wabaunsee Group
1004-1010 Ls., lt. gy. to v. pale orng., f. gr., Crin.
1010-1013 Sh., gy.
1013-1020 Ls., lt. olv. gy. to m. gy., f. gr., arg.
1020-1030 No samples
1030-1035 Sltst., lt. olv. gy., mica., lmy.
1035-1040 Sh., m. dk. gy., slty., lmy., mica.
1040-1044 Ls., m. gy., f. gr., fos. frags.; brn.-gy. f.-gr. ls.
1044-1049 Sh., gy.
1049-1050 Coal
1050-1053 Sltst., m. lt. gy., mica.
1053-1058 Ss., lt. gy., v. f. gr., slty., mica., lmy.
1058-1060 Sh., gn. gy., flky.
1060-1070 Sh., gy., lmy.
1070-1078 Sh., as abv., s. Plcy.
1078-1080 Ls., m. gy., f. gr., arg.
1080-1085 Ls., lt. olv. gy. to v. pale orng., v. f. gr., dol.
1085-1097 Sh., gy., mica., slty.
1097-1100 Sh., lt. gn. gy., sft., mica.
1100-1106 Ls., m. gy., v. arg., Bry., Fus., other fos. frags.
1106-1116 Sh., gy.
1116-1124 Ss., m. lt. gy., v. f. gr., slty., lmy., mica.
1124-1130 Sltst., m. lt. gy., lmy., mica.
1130-1138 Ls., m. gy., slty., Fus.
1138-1155 Sltst., m. lt. to m. gy., lmy., mica.
Zeandale Limestone and Willard Shale
1155-1160 Ls., gy. brn., v. arg., Fus.
1160-1165 Sh., m. dk. gy.
1165-1170 Sh., gy.
1170-1175 Sh., gn. gy.
1175-1180 Sh., gy.
1180-1185 Sltst., m. lt. gy., lmy.
1185-1190 Ls., brn. gy., f. gr., v. fos., Plcy., Bry.
1190-1200 Sh., gy.
1200-1220 Sltst., m. gy. to lt. olv. gy., mica., sl. lmy., v. f. sdy. in pt.
1220-1223 Ss., m. lt. gy., v. f. gr., slty., mica., sl. lmy.
1223-1226 Sltst., m. gy. to lt. olv. gy., mica.
1226-1235 Sh., gy., mica.
1235-1238 Ss., lt. gy., f. to m. gr., sl. lmy.
Emporia Limestone
1238-1243 Ls., pale yel. brn., f. gr., Fus.
1243-1245 Ls., m. gy., v. f. gr., sl. arg.
1245-1250 Sh., gy.
1250-1254 Ls., pale yel. brn., f. gr., Fus.
Auburn Shale
1254-1258 Sh., gy.
1258-1263 Ls., m. gy., f. gr., sl. arg.
1263-1270 Sh., gy.
Bern Limestone
1270-1276 Ls., lt. gy. to v. pale orng., f. gr.
1276-1285 Ls., lt. gy., f. gr., dol.
1285-1290 Ls., pale yel. brn., v. f. gr.
1290-1293 Sh., gy.
1293-1300 Ls., m. lt. to m. gy., f. gr., sl. arg., Crin.
1300-1404 No samples
Scranton Shale 1304
1404-1415 Ss., lt. to m. gy., v. f. to f. gr., lmy.
1415-1426 Ss., m. lt. gy., v. f. gr., lmy.
1426-1433 Sltst., m. lt. gy., mica.
Happy Hollow Limestone and White Cloud Shale Members of Scranton Shale, and Howard Limestone
1433-1435 Ls., pale yel. brn., f. gr., rthy.
1435-1440 Ls., m. gy., f. gr., Fus.
1440-1450 No samples

1450-1458 Ls., m. lt. gy., f. gr., sl. arg., Fus., Crin.
1458-1470 No samples
1470-1474 Ls., m. to m. dk. gy., f. gr., arg., Brac., Crin., Gast.
1474-1478 Sh., gy., Fus.
1478-1480 Sh., blk.
1480-1483 Ls., pale yel. brn. to m. lt. gy., v. f. ooc.
1483-1485 Ls., brn. gy., f. ool.
1485-1490 Ls., brn. gy., v. f. gr.

Severy Shale

1490-1495 Sltst., m. lt. gy., v. f. sdy., lmy., mica.
1495-1515 Sltst., m. lt. gy., mica.
1515-1528 Sltst., m. lt. gy., lmy., mica.
1528-1540 Sh., gy.

Shawnee Group
Topeka Limestone, Calhoun Shale, and Deer Creek Limestone

1540-1543 Ls., m. gy., f. gr., sl. arg., spines, other fos. frags.
1543-1544 Ls., lt. gy., f. gr., dk. f. ool. ?
1544-1550 Ls., pale yel. brn. to brn. gy., v. f. gr., sl. dol. and arg. in pt.
1550-1555 Ls., pale yel. brn., f. gr., many Fus.
1555-1565 Ls., lt. gy. to v. pale orng., f. gr., many. Fus.
1565-1575 Ls., pale yel. brn., f. xl., many Fus.
1575-1585 Ls., as abv., Fus., Crin.; m.-dk.-gy. dns. spic. cht. and Fus. cht.
1585-1590 No samples
1590-1595 Ss., m. lt. gy., f. gr., slty., lmy.
1595-1606 Sltst., m. lt. gy., mica., lmy.
1606-1610 Ss., m. lt. gy., v. f. gr., slty., lmy.
1610-1616 Sh., m. dk. to dk. gy., lmy.
1616-1623 Ls., m. dk. gy., arg., fos. frags.
1623-1630 Sh., m. dk. gy., lmy.
1630-1634 Ls., m. lt. to m. gy., arg., many Fus.
1634-1637 Sh., gy.
1637-1650 Ls., pale yel. brn., f. xl., Brac.; lt.-gy. to m.-gy. and yel.-brn. dns. cht.
1650-1657 Ls., m. gy., arg., many Fus.
1657-1662 Ls., m. gy., f. gr., dol., arg.
1662-1666 Sh., blk.
1666-1670 Sh., gn. gy., lmy.
1670-1673 Ls., v. pale orng., f. gr., dol.
1673-1675 Ls., pale yel. brn. to brn. gy., f. gr.
1675-1680 Ls., lt. gy., v. f. gr.
1680-1685 Ls., pale yel. brn., f. xl., Fus., spines
1685-1694 Ls., lt. gy., v. f. gr.

Tecumseh Shale 1694-1745

1694-1700 Sltst., m. lt. gy. to lt. olv. gy., lmy.
1700-1704 Sh., gy., mica., scat. carb. mat.
1704-1708 Sltst., lt. gy., v. f. sdy., lmy.
1708-1715 Sh., gy., slty.
1715-1726 Ss., m. lt. gy., v. f. gr., sl. lmy., slty., mica.
1726-1730 Sltst., m. lt. gy., mica., scat. carb. mat.
1730-1745 Sh., gy.
1745-1747 Ls., brn. gy., f. gr., arg. in pt., Crin.
1747-1750 Ls., brn. gy., f. gr.
1750-1756 Ls., brn. gy., v. f. gr.
1756-1763 Sh., gy., lmy., flky.
1763-1770 Ls., brn. gy., f. gr., sl. arg.
1770-1775 Ls., m. lt. gy. to pale yel. brn., f. gr.
1775-1780 Sh., gy.
1780-1790 Ls., as abv.
1790-1795 Sh., gy.
1795-1807 Ls., pale yel. brn. to lt. gy., f. xl.
1807-1813 Sh., gy.
1813-1827 Ls., as abv.
1827-1830 Sh., gy.
1830-1850 Ls., as abv., much xl. calc., Crin.
1850-1860 Ls., m. gy., v. f. gr.
1860-1875 Ls., m. lt. gy. to pale yel. brn., f. xl.
1875-1880 Ls., pale yel. brn. to brn. gy., f. xl., dol.
1880-1885 Ls., pale yel. brn., f. xl.
1885-1900 Ls., v. pale orng. to v. lt. gy., v. f. to f. xl.
1900-1905 Ls., m. gy., v. f. gr.
1905-1915 Ls., pale yel. brn., f. xl., fos.; m.-lt.-gy. dns. fig. cht.
1915-1920 Ls., brn. gy., v. f. xl.
1920-1930 Ls., pale yel. brn., f. xl., Crin.
1930-1940 Ls., m. lt. to m. gy., f. gr., sl. arg.
1940-1944 Ls., brn. gy., v. f. xl., sl. arg., few Fus.
1944-1947 Sh., dk. gy.
1947-1950 Sh., blk.
1950-1953 Sh., dk. gy.
1953-1958 Ls., m. gy., v. f. xl., sl. arg.
1958-1960 Ls., pale yel. brn., f. gr., dol., sl. arg.
1960-1963 Sh., gy.
1963-1970 Ls., m. lt. gy., f. xl.
1970-1973 Sh., gy.
1973-1985 Ls., pale yel. brn., f. xl.

Douglas Group

1985-1990 Sh., gy.
1990-1993 Sltst., m. lt. gy., pyr.
1993-2004 Sh., gy.
2004-2010 Ls., pale yel. brn. to brn. gy., v. f. to f. gr., dol., sl. arg., fos. frags. in pt.
2010-2013 Sh., mod. brn.
2013-2025 Sh., gy.
2025-2030 Sltst., lt. gy., v. f. sdy., mica., sl. lmy., scat. carb. mat.
2030-2040 Sltst., lt. gy., sl. lmy.
2040-2045 Sltst., lt. gy., v. f. sdy.
2045-2050 Sltst., lt. gy.
2050-2065 Ss., lt. gy., v. f. gr., slty., sl. lmy., mica., carb. in pt.
2065-2075 Sltst., lt. gy., sl. lmy., mica., carb. in pt.
2075-2085 Sh., gy.
2085-2090 Sltst., m. lt. gy., sl. lmy.
2090-2095 Sltst., m. lt. gy., mica., carb.
2095-2100 Sh., gy.
2100-2106 Sltst., lt. gy., v. f. sdy.
2106-2110 Ss., lt. gy., v. f. gr., slty., sl. lmy.
2110-2168 Sh., m. dk. gy.
2168-2170 Sltst., m. gy., lmy.
2170-2180 Sh., gy.

Pennsylvanian—Missouri Series
Lansing Group

2180-2204 Ls., m. lt. gy. to pale yel. brn., f. xl., Crin.
2204-2215 Sh., m. dk. gy.
2215-2223 Ls., m. lt. to lt. gy., f. gr., Bry.
2223-2226 Sh., gy.
2226-2230 Ls., brn. gy., f. gr.
2230-2235 Ls., brn. gy., f. gr., m. ool.
2235-2240 Ls., m. gy., v. arg.
2240-2246 Sltst., m. gy., v. lmy.
2246-2250 Ls., as abv.
2250-2257 Sltst., as abv.
2257-2260 Ls., m. gy., v. arg.
2260-2280 Sh., gy., slty., lmy.
2280-2283 Ls., m. gy., v. arg.
2283-2300 Sh., gy., slty., lmy.
2300-2340 Sh., m. gy.
2340-2345 Ls., m. dk. gy., v. arg., Bry., Crin., many fos. frags.
2345-2350 Ls., brn. gy. to m. gy., v. f. gr., sl. arg.

Kansas City Group
Bonner Springs Shale

2350-2375 Sh., gy., sl. lmy.
2375-2380 Sh., as abv., s. Gast., Plcy., Crin.

2380-2385 Sh., gy., sl. lmy.
2385-2400 Sh., gy., sl. lmy., Ost., s. Gast., brn. Fe-st.
2400-2415 Sh., gy.

Wyandotte Limestone

2415-2425 Sh., m. dk. gy., v. lmy., Crin., Bry., spines, glau. in pt.
2425-2435 Sh., gy.
2435-2440 Ls., dk. gy. to blk., v. arg.
2440-2444 Ls., m. dk. gy., f. gran., arg., Fus., Bry., Crin., glau. in pt.
2444-2457 Sh., gy.
2457-2463 Ls., m. dk. gy., v. arg., gran., Crin., Bry.

Lane Shale 2463-2505

2463-2505 Sh., gy., lmy.
2505-2957 No samples; stratigraphic contacts interpreted in part from drillers log

Pleasanton Group 2703?
Pennsylvanian—Des Moines Series 2810?
Marmaton Group
Cherokee Group 2920?

2957-2960 Sh., gy. red
2960-2963 Sltst., m. lt. gy., few scat. f. sbrd. sd. grs.
2963-2965 Sh., gy.
2965-2968 Sh., olv. brn.
2968-2970 Sh., gy. red
2970-2975 Cht., dtrl., lt. gy., pale yel. brn. and yel. orng., dns., spic., and gran.; m. to v. c. sd. grs., scat. fld. ?
2975-2977 Sh., dusky red, slty.
2977-2980 Sh., gn. gy., slty.
2980-2983 Sh., dusky red, slty.
2983-2988 No samples

Mississippian—Lower Mississippian Series 2985
Rocks of Osage age

2988-2993 Cht., wh. to yel. brn., dns., spic., and fig.; wh. to pale-yel.-brn. gran. por. glau. cht., some o. stn. ?
2993-3005 Cht., wh., op., gran.; wh. dns. semi-trnsl. cht., s. show o. reported 2994
3005-3010 Cht., as abv.; wh. trnsl. spic. cht., show o. reported 3006-3010
3010-3015 Cht., wh., op., gran.
3015-3025 Ls., v. lt. gy., f. to m. xl.; cht. as abv.; wh. trnsl. dns. cht., fig. in pt.
3025-3035 Cht., v. lt. gy. to wh., dns., op. to trnsl.; some ls. dust
3035-3043 Cht., as abv.; some fig. cht.; clr. xl. qtz.
3043-3050 Ls., gy. wh., m. xl.; wh. dns. op. to trnsl. cht.; red-orng. fig. cht.; some fig. ool. ? cht.
3050-3052 Sh. and Sltst., gn. gy.
3052-3055 Ls., lt. gy., f. xl.; wh. cht.
3055-3063 Ls., as abv.
3063-3068 Ls., v. lt. gy., f. to m. xl.; ltl. gy.-red ls.; wh. dns. and fig. cht.
3068-3070 Sh., gn. gy.
3070-3080 Ls., lt. gy., m. xl.; cht. as abv.
3080-3088 Ls., as abv., spines; lt.-gy. to m.-gy. dns. cht.
3088-3102 Ls., m. lt. gy., f. xl., Crin.; m.-lt.-gy. dns. semi-trnsl. cht. and fig. cht.
3102-3122 Ls., m. lt. gy., f. to m. xl.
3122-3125 Ls., lt. olv. gy. to m. gy., f. xl., arg., many Crin.
3125-3132 Ls., as abv., Crin.; ltl. m.-lt.-gy. trnsl. dns. cht.
3132-3137 Ls., as abv., Crin.
3137-3145 Ls., m. lt. gy. to pale yel. brn., f. xl., Crin., Bry.
3145-3150 Ls., m. gy., f. xl.
3150-3155 Ls., m. to m. dk. gy., f. gr., arg.
3155-3160 Ls., pale yel. brn., v. f. gr., lith.
3160-3165 Ls., pale yel. brn., v. f. to f. gr.
3165-3174 Sh., gy. and olv. gy.
3174-3185 Sh., gy.
3185-3188 Sh., brn. gy.
3188-3196 Ls., brn. gy. to pale yel. brn., f. gr.
3196-3198 Sh., gy.
3198-3210 Ls., pale yel. brn., v. f. to f. gr.
3210-3218 No samples
3218-3220 Ls., as abv.

Devonian and Mississippian
Chattanooga Shale

3220-3240 Sh., dk. gy.
3240-3254 No samples
3254-3260 Sh., m. dk. to dk. gy.
3260-3268 Sh., dk. gy., Spr. cases
3268-3270 Sltst., m. to dk. gy., v. f. to f. sdy.

Misener sand

3270-3272 Ss., lt. gy., f. gr., scat. m. to c. grs., pyr.
3272-3275 No samples

Ordovician—Middle and Upper Ordovician Series
Viola Limestone

3275-3282 Dol., pale yel. brn., m. xl.

Ordovician—Middle Ordovician Series
Simpson Group

3282-3285 Ss., lt. gy., m. gr., sbrd. to sbang., rd. and fros. in pt., drills loose
3285-3288 Ss., v. lt. gy., f. to m. gr., scat. c. grs., drills loose
3288-3290 Sh., gn. gy.
3290-3292 Sh., dk. gy.
3292-3296 Ss., as abv.
3296-3303 Ss., as abv.; lt.-gy. to m.-lt.-gy. v. f. to f. sdy. cht.; lt.-gy. v. f. to f.-gr. ss.
3303-3306 Sh., m. dk. gy.
3306-3308 Sh., gn. gy.
3308-3310 Dol., brn. gy., slty.; brn.-gy. dns. cht.
3310-3312 Dol., as abv., scat. f. sd. grs.
3312-3315 Ss., v. lt. gy., f. gr., scat. m. grs.
3315-3318 Sh., gy.
3318-3322 Ss., lt. gy., f. gr., scat. m. to c. grs.
3322-3326 Ss., v. lt. gy., m. gr., scat. c. grs.
3326-3328 Sh., gn. gy., s. show o. reported 3327
3328-3342 No samples
3342 Total depth

WELL 16

T. C. JOHNSON No. 1 LULA JANSEN
SW COR. NW¼ SEC. 11, T. 28 S., R. 2 E.
SEDGWICK COUNTY

Altitude: 1372 feet (estimated) Total depth: 3405 feet
Completion date: March 31, 1936
Initial production: Dry
Electrical log: None
Sample intervals: mostly 10-foot; 0-3405 feet
Cored intervals: None

Depth, feet *Sample description*

Permian—Lower Permian Series
Sumner Group
Wellington Formation

0- 85 Samples prob. out of place ?
0- 10 Ls., lt. gy. to pale red, f. to m. gran., arg.
10- 37 Ls., lt. gy. to pale yel. brn., f. to m. gran., arg.
37- 40 Ls., m. gy., f. gr.; m.-gy. to m.-dk.-gy. dns. cht. and spic. cht.
40- 50 Ls., gy. yel., gran., arg.; lt.-gy. f.-gr. ls.
50- 55 Ls., pale red to gy. red, gran., arg.
55- 60 Sh., m. lt. gy., slty.
60- 65 Dol., lt. gy., v. f. gr., arg.

65- 70 Ls., gy. yel. to lt. gy., gran., arg.
70- 75 Dol., lt. gy., v. f. gr., arg.
75- 80 Ls., m. lt. to m. gy., v. f. gr., arg.
80- 85 Ls., brn. gy., m. gy., and gy. red, f. gr., arg., v. vug.
85- 90 Sh., gy. red, slty.; m.-gy. slty. sh.
90- 100 Sh., m. gy., v. dol.
100- 103 Sh., m. gy., sl. dol.
103- 107 Gyp., wh., sft.
107- 110 Sh., m. dk. to dk. gy., sl. dol.
110- 114 Gyp., wh., sft.
114- 120 Sh., gy., dol.
120- 130 Anhy., lt. gy., f. xl.
130- 136 Anhy., m. gy., f. xl.
136- 140 Sh., gy., sl. dol.
140- 150 Anhy., m. gy., f. xl.
150- 154 Dol., lt. olv. gy., sp. and mot. / dk. gy., v. f. gr., arg.
154- 166 Anhy., m. lt. gy. to wh., f. xl.
166- 169 Dol., lt. olv. gy., v. f. gr., arg.
169- 175 Sh., gy. to lt. olv. gy., v. dol.
175- 185 Anhy., v. lt. gy., f. xl.; wh. gyp.
185- 188 Dol., m. gy., v. f. gr., arg., gyp.
188- 192 Sh., gy., sl. dol.
192- 196 Dol., m. gy., v. f. gr., v. arg.; wh. dns. op. cht.; m.-dk.-gy. dns. cht.
196- 205 Anhy., v. lt. gy., f. xl.
205- 210 Sh., gy., dol.
210- 212 Anhy., wh., f. xl.

Chase Group

Nolans Limestone

212- 214 Dol., m. gy. to lt. olv. gy., v. f. gr., arg.
214- 220 Sh., gy., dol.
220- 235 Dol., m. gy., v. f. gr., arg., dk.-gy. str.
235- 240 Dol., lt. gy. to v. pale orng., v. f. gr.

Odell Shale

240- 247 Sh., m. gy., dol.
247- 250 Gyp., wh. to v. pale orng.
250- 254 Sh., m. gy., v. lmy.

Winfield Limestone

254- 265 Ls., m. gy., v. f. gr., v. arg., Crin.
265- 273 Sh., gy., lmy.
273- 278 Ls., m. gy., v. f. gr., v. arg., Crin.

Doyle Shale

278- 290 Sh., m. lt. gy., v. dol.
290- 297 Dol., m. lt. gy., v. f. gr., arg.
297- 300 Ls., m. gy., v. f. gr., v. arg., Crin., v. s. fos. frags.
300- 303 Sh., gy. red, lmy.
303- 307 Sh., gn. gy., dol.
307- 310 Sh., gy. red, dol.
310- 314 Sh., gn. gy., lmy.
314- 320 Sh., gy. red to pale red, dol.
320- 324 Dol., pale yel. brn. to lt. olv. gy., f. xl.
324- 336 Anhy., wh., f. xl.
336- 340 Dol., pale yel. brn. to lt. olv. gy., v. f. xl.
340- 345 Dol., m. lt. gy., f. gr. to gran.
345- 350 Dol., m. gy., v. f. gr., arg.
350- 353 Sh., m. dk. gy., dol.
353- 360 Dol., m. lt. to m. gy., v. f. gr. to gran., arg.
360- 365 Sh., dk. gy., dol.
365- 370 Dol., m. gy. to m. lt. gy., gran., arg.
370- 373 Sh., gn. gy., lmy.

Barneston Limestone

373- 380 Ls., m. lt. gy., v. f. gr., sl. arg.
380- 390 Ls., m. lt. to m. gy., f. gr., arg., Crin.
390- 400 Ls., m. lt. to m. gy., f. gr., sl. arg., Crin.
400- 407 Ls., m. gy., f. gr., arg., Crin., Brac.
407- 413 Ls., m. lt. gy., f. to m. ooc.
413- 417 Ls., m. gy., f. gr., Crin.
417- 420 Sh., m. gy., lmy., Ost.
420- 430 Ls., m. lt. to m. gy., f. gr. to gran., arg., Crin., Bry.
430- 438 Ls., as abv., Crin., Ost., Brac.
438- 440 Sh., m. dk. gy., v. lmy.
440- 450 Ls., m. lt. gy., gran., Ost., Crin., Brac., Bry.; m.-lt.-gy. dns. to gran. spic. cht. and lmy. cht., scat. dk.-gy. sps.
450- 463 Ls., as abv., fos. as abv.; m.-gy. fos. cht.; cht. as abv.; some v. pale orng. gran. ls.

Matfield Shale

463- 474 Sh., m. gy., gn. gy., and gy. red, lmy.
474- 477 Sh., gn. gy., lmy.
477- 482 Sh., gy., lmy.
482- 490 Sh., gn. gy. and gy. red, lmy.
490- 495 Ls., lt. gy. to v. pale orng., f. gr., sl. arg.
495- 500 Ls., v. pale orng. to lt. gy., v. f. gr., sl. dol. in pt.
500- 505 Sh., gn. gy. and m. dk. gy.
505- 508 Sh., m. gy., v. lmy.
508- 523 Ls., m. gy., f. gr., arg., Brac., spines, Crin., Bry., Ost.
523- 526 Sh., gy., lmy.

Wreford Limestone

526- 545 Ls., v. pale orng., f. gr., sl. arg., Crin., spines, Brac., Bry., Ost.; m.-lt.-gy. to m.-dk.-gy. dns. spic. cht.
545- 555 Ls., v. pale orng., f. gr., Crin., spines; cht. as abv.
555- 563 Ls., lt. gy., f. gr., Crin., Brac.; cht. as abv.
563- 566 Sh., m. dk. gy., lmy., Crin., Brac.
566- 570 Ls., v. lt. gy., f. xl., no fos.
570- 573 Ls., lt. gy. to lt. gn. gy., v. f. gr., sl. arg., no fos.
573- 580 Ls., v. lt. gy., f. gr.; v. lt. gy. dns. to gran. cht.

Council Grove Group

580- 584 Sh., gn. gy., lmy.
584- 586 Sh., gy. red, sl. lmy.
586- 597 Ls., lt. gy. to lt. gn. gy., v. f. gr., arg.
597- 604 Ls., v. pale orng. to lt. gy., v. f. gr.
604- 620 Ls., m. gy., v. f. gr., arg., fos., Brac. ?, scat. rd. blk. grs.
620- 625 Sh., m. dk. gy., v. lmy.
625- 635 Ls., m. gy., f. gr., arg., Fus., spines; m.-gy. to m.-dk.-gy. dns. spic. cht.
635- 645 Ls., as abv., v. arg., Crin.; cht. as abv.
645- 650 Sh., gn. gy., v. lmy.
650- 653 Sh., gy. red, sl. lmy.
653- 660 Sh., gn. gy., lmy.

Beattie Limestone

660- 664 Ls., m. lt. gy., f. gr., arg.
664- 672 Ls., brn. gy., v. f. gr., f. ool. ?, many v. s. fos. frags.
672- 675 Sh., m. dk. gy., lmy.
675- 690 Ls., m. gy., f. gr., arg., Bry., Crin., spines, Ost.
690- 700 Sh., m. gy., v. lmy., Crin., Bry., Brac.
700- 705 Ls., m. gy., f. gr., arg., Crin., spines
705- 712 Ls., m. lt. gy., f. gr., sl. arg., abnt. slender Fus.

Eskridge Shale

712- 717 Sh., m. dk. gy., lmy., pyr., spines

Grenola Limestone

717- 724 Ls., v. pale orng. to pale yel. brn., v. f. gr., Fus.
724- 727 Ls., v. pale orng., v. f. gr.
727- 734 Sh., gy., lmy., sl. red in pt.
734- 737 Dol., pale red, v. f. gr., sl. arg., s. vugs in pt.
737- 740 Dol., pale yel. brn. to gn. gy., v. f. gr., sl. arg.
740- 747 Ls., v. lt. gy. to v. pale orng., f. gr.
747- 750 Sh., m. dk. gy., v. lmy., big Fus.
750- 753 Ls., m. gy., v. arg., big Fus.
753- 756 Sh., m. dk. gy., lmy.

756- 762 Ls., m. gy., f. gr., v. arg.
762- 764 Ls., pale yel. brn. to m. lt. gy., f. xl.

Roca Shale

764- 768 Sh., m. gy., v. lmy.
768- 774 Ls., m. gy., v. arg.
774- 778 Sh., m. gy., lmy.

Red Eagle Limestone, Johnson Shale, and Foraker Limestone

778- 790 Ls., m. gy., v. f. gr., sl. arg., scat. m. grs. of dk.-coated calc., psdo.-ool.
790- 793 Sh., gy., lmy.
793- 795 Ls., m. lt. gy., v. f. gr.
795- 800 Sh., gy., lmy.
800- 812 Ls., m. gy., v. f. gr., sl. arg.
812- 815 Sh., m. gy., lmy.
815- 822 Ls., m. gy., v. f. gr., sl. arg.
822- 826 Sh., gy., lmy.
826- 828 Ls., m. lt. gy., v. f. gr., rthy., sl. lt.-brn. tint, pyr., Crin., spines, ltl. p.-p. por.
828- 830 Ls., as abv., arg.
830- 843 Ls., v. pale orng., v. f. gr., Crin., spines, Brac.
843- 845 Sh., m. dk. gy., mica., sl. lmy., pyr.
845- 852 Ls., v. pale orng. to lt. gy., v. f. gr., Crin., spines, sl. rthy.
852- 858 Ls., v. lt. gy., v. f. xl.; v. pale orng. v. f. ooc. ? ls.
858- 863 Ls., m. lt. to m. gy., mot., f. gr., arg., Fus.
863- 867 Sh., m. dk. gy., lmy.
867- 872 Ls., v. pale orng. to pale yel. brn., gran.; v. lt. gy. v. f. xl. ls., cave ?
872- 875 Sh., gy., lmy.
875- 877 Ls., as abv.
877- 880 Sh., m. dk. gy., lmy., abnt. big Fus.
880- 883 Ls., m. lt. to m. gy., f. gr., sl. arg., abnt. Fus.
883- 890 Ls., m. gy., v. f. gr., arg., Brac., Bry., spines
890- 900 Sh., m. gy., v. lmy., Fus.
900- 905 Ls., m. gy., v. f. gr., arg., Fus.

Admire Group

905- 908 Sh., gy., lmy.
908- 910 Dol., brn. gy., v. f. xl., arg.
910- 916 Ls., m. lt. gy., v. f. gr., arg., dol.
916- 920 Ls., m. lt. gy., v. f. gr.
920- 923 Sltst., m. lt. gy., v. lmy.
923- 927 Sh., m. dk. gy., lmy.
927- 933 Ls., m. lt. gy., v. f. gr., arg.
933- 937 Sltst., m. lt. to m. gy.. sl. mica.
937- 944 Dol., m. lt. gy., v. f. gr., arg., yel.-brn. stn.
944- 986 Spls. v. similar; may be from one bailer
944- 975 Sltst., m. to m. dk. gy., v. lmy., many gn. grs. (glau. ?), mica., pyr.
975- 986 Sltst., m. gy., lmy., many gn. grs. (glau. ?), pyr.
986- 990 Ls., m. lt. gy., f. gr., arg.
990- 993 Ls., pale yel. brn., f. xl.
993- 996 Sh., m. dk. gy., lmy.
996-1000 Ls., mod. yel. brn., v. f. xl., dol.
1000-1004 Ls., pale yel. brn. to lt. gy., f. xl.
1004-1010 Sh., m. dk. gy., lmy.
1010-1014 Ls., m. gy., v. f. gr., sl. arg.
1014-1020 Ls., m. dk. gy., v. f. gr., arg.
1020-1024 Ls., pale yel. brn., v. f. xl., dol.
1024-1026 Sh., m. dk. gy., lmy.
1026-1036 Sltst., m. lt. to m. gy., v. lmy., mica.

Pennsylvanian—Virgil Series
Wabaunsee Group

1036-1038 Ls., brn. gy., v. f. gr., dol., sl. arg.
1038-1047 Sltst., m. lt. to m. gy., v. lmy., mica.
1047-1050 Sltst., m. lt. gy., v. f. sdy., mica., lmy.
1050-1055 Sh., m. gy., lmy., slty., pyr., mica.
1055-1060 Sltst., m. gy., mica., carb.
1060-1065 Sh., m. gy., carb. on bdg.
1065-1075 Sltst., m. lt. to m. gy., mica., lmy. in pt.
1075-1084 Sltst., m. lt. gy., mica.
1084-1086 Sh., dusky red to gy. red
1086-1104 Sltst., m. lt. gy., mica., lmy. in pt.
1104-1120 Ss., lt. gy., f. gr., dol., v. por., scat. mica. and carb. mat.
1120-1124 Ss., m. lt. gy., v. f. gr., slty.
1124-1128 Ss., lt. gy., f. gr., dol., por., sl. mica.
1128-1132 Sltst., m. lt. gy., mica., carb.
1132-1136 Sh., m. gy.
1136-1140 Sltst., lt. gy., v. f. sdy., mica., scat. carb. mat.
1140-1147 Ss., lt. gy., f. gr., dol., por.
1147-1156 Sltst., m. lt. gy., mica.
1156-1160 Sh., m. gy., slty.

Zeandale Limestone and Willard Shale

1160-1170 Ls., gy. red to brn. gy., f. gr., arg., abnt. Fus.
1170-1177 Sltst., m. gy., lmy., mica.
1177-1180 Ss., m. lt. gy., v. f. gr., slty., dol., mica.
1180-1182 Sh., gy.
1182-1185 Ls., m. gy., v. f. gr., arg., abnt. Fus.
1185-1190 Sltst., m. lt. gy., mica.
1190-1194 Ss., m. lt. gy., v. f. gr., slty., dol., mica.
1194-1200 Sltst., m. dk. gy., v. lmy., mica.
1200-1208 Ls., m. gy., lt. olv. gy., and brn. gy., f. gr., arg., Crin., Bry. Gast., Plcy., Brac., pyr.
1208-1210 Ls., brn. gy., f. gr., Crin., fos. frags.
1210-1213 Sh., m. dk. gy.
1213-1216 Sh., m. dk. gy., slty., mica.
1216-1220 Sh., m. to m. dk. gy.

Emporia Limestone

1220-1227 Ls., brn. gy., gran., sl. arg., tt., scat. Fus., abnt. fos. frags., Crin., Brac.
1227-1230 Sh., gy.
1230-1233 Ls., v. pale orng., m. lt. gy., and pale yel. brn., v. f. gr., tt., dol.
1233-1235 Ls., as abv., not dol.
1235-1238 Sh., gy.
1238-1244 Ls., brn. gy. to m. gy., gran., arg., Brac., abnt. fos. frags.
1244-1246 Ls., m. lt. gy., v. f. gr., Fus.
1246-1286 Spls. v. similar; may be from one bailer
1246-1252 Sltst., m. dk. gy., v. lmy., v. f. sdy., mica., f. fos. frags.
1252-1256 Sh., m. dk. gy.
1256-1258 Ls., m. lt. gy., v. f. gr., sl. arg., Fus.

Auburn Shale

1258-1280 Sltst., m. to m. dk. gy., v. lmy., sl. mica., fos., v. f. sdy. in pt.
1280-1286 Sh., m. gy., slty., mica., lmy.

Bern Limestone

1286-1290 Ls., m. lt. gy., f. gr., sl. arg.
1290-1293 Ls., pale yel. brn., f. xl.
1293-1296 Sh., m. dk. gy.
1296-1310 Ls., m. gy., v. f. gr., sl. arg., Crin., spines, Brac.

Scranton Shale

1310-1320 Sh., dk. gy. to blk.
1320-1323 Ls., m. lt. gy. to pale yel. brn., v. f. gr.
1323-1326 Sh., gy.
1326-1330 Sh., m. gy., lmy.
1330-1337 Ls., m. lt. gy., f. gr., arg., abnt. Fus., Crin., Ost.
1337-1339 Sh., gy.
1339-1342 Dol., m. dk. gy., v. f. gr., arg., v. hd.
1342-1345 Sh., m. gy.
1345-1350 Sh., dk. gy. to blk., dk.-gy. sphal. ?
1350-1375 Sltst., lt. to m. lt. gy., mica., v. f. carb. mat.
1375-1396 Sltst., lt. to m. lt. gy., lmy., mica.
1396-1408 Sh., m. gy., slty.

Happy Hollow Limestone and White Cloud Shale Members of Scranton Shale, and Howard Limestone

1408-1410 Ls., m. dk. gy., f. gr., arg., spines, Crin., Brac., scat. s. Fus.
1410-1416 Ls., brn. gy., f. gr., sl. arg., Crin., spines, Brac.
1415-1455 Spls. very similar; prob. from the same bailer
1416-1420 Dol., m. gy., v. f. gr., arg.
1420-1423 Ls., m. lt. gy., f. gr., v. por., ooc. ?
1423-1432 Ls., m. lt. gy. to v. pale orng., v. f. gr., dol.
1432-1435 Ls., pale yel. brn., f. xl.
1435-1442 Ls., m. lt. gy., v. f. gr., dol.
1442-1450 Dol., m. gy., v. f. gr., arg., pyr., spines
1450-1454 Ls., m. lt. gy., v. f. gr., dol.
1454-1456 Sh., gy.
1456-1475 Spls. from the same bailer ?
1456-1473 Ls., m. gy., gran., sl. arg., Crin., abnt. fos. frags., Gast., Brac. Fus., spines, scat. m. ool.
1473-1476 Sh., gy.
1476-1480 Ls., pale yel. brn., f. gr., v. f. ool. and ooc. ?
1480-1485 Ls., m. lt. to m. gy., f. gr., abnt. v. f. blk. grs., Ost., spine
1485-1492 Ls., as abv., fos. as abv., Brac.

Severy Shale

1492-1495 Sh., dk. gy.
1495-1516 Sh., m. gy., slty.
1516-1522 Sltst., m. gy., mica., lmy.
1522-1525 Sh., dk. gy.
1525-1538 Sltst., m. lt. to m. gy., mica., scat. v. f. carb. mat., lmy. in pt.
1538-1545 Sh., m. dk. to dk. gy., Plcy.

Shawnee Group

Topeka Limestone, Calhoun Shale, and Deer Creek Limestone

1545-1550 Ls., v. pale orng., v. f. gr., dol.
1550-1560 Ls., pale yel. brn., gran., Brac., Fus., fos. frags.; v. lt. gy. to lt.-gy. f.-gr. ls.
1560-1564 Ls., pale yel. brn., f. xl., spine
1564-1571 Ls., m. lt. to m. gy., v. f. gran., arg., Crin., Brac., abnt. Fus., sil. Fus.
1571-1573 Sh., dk. gn. gy., lmy.
1573-1575 Sh., m. dk. gy., lmy.
1575-1585 Ls., pale yel. brn. to v. pale orng., v. f. to f. xl., spine, Brac. Crin., Fus.
1585-1590 Ls., brn. gy. mot. / m. gy., gran., arg. in pt., abnt. Fus., spines, Crin., shell frags., Ost.
1590-1593 Ls., as abv., arg.
1593-1595 Sh., m. dk. gy.
1595-1600 Ls., as abv.
1600-1604 Sh., m. dk. gy.
1604-1626 Sh., m. dk. gy., v. lmy., Gast., Crin., Brac.
1626-1628 Sh., blk.
1628-1643 Ls., m. lt. gy. to pale yel. brn., f. xl., Fus., Crin., Ost.; ltl. v. lt. gy. cht.
1643-1645 Sh., gy.
1645-1653 Ls., pale yel. brn. to m. lt. gy., f. xl., Crin., Fus.
1653-1656 Sh., m. dk. gy.
1656-1660 Ls., m. gy., f. gr., arg., sl. yel.-brn. tint, abnt. fos. frags.
1660-1662 Sh., dk. gy.
1662-1665 Sh., blk., pyr., sphal. ?
1665-1668 Sh., gn. gy.
1668-1672 Ls., pale yel. brn., v. f. gr., dol., sl. arg.
1672-1680 Ls., m. lt. to m. gy., v. f. gr., dol., arg. in pt.
1680-1682 Ls., lt. gy., v. f. gr.
1682-1685 Sh., dk. gy.
1685-1687 Ls., pale yel. brn. to lt. gy., f. gr., Fus.
1687-1700 Ls., m. lt. to m. gy., f. gr., dol., v. arg.

Tecumseh Shale

1700-1705 Sh., m. dk. gy.
1705-1710 Sltst., m. lt. gy., mica., carb. mat.
1710-1720 Ss., m. lt. gy., v. f. gr., slty., dol., mica., scat. f. carb. mat.
1720-1724 Sltst., m. lt. gy., mica., carb. mat.
1724-1726 Sh., m. dk. gy.
1726-1730 Sltst., as abv.
1730-1733 Ss., m. lt. gy., v. f. gr., slty., dol., mica., carb. mat.
1733-1736 Sh., gy.
1736-1740 Sltst., m. lt. gy., mica., carb.

Lecompton Limestone

1740-1752 Ls., m. lt. gy. to pale yel. brn., v. f. gr., sl. arg. in pt., Crin., spines, scat. Fus.
1752-1755 Sh., gy.
1755-1765 Ls., brn. gy. to pale yel. brn., v. f. gr.
1765-1770 Ls., m. gy., v. f. gr., arg., Fus.
1770-1775 Sh., dk. gy., carb. plant imprints, coal frags.
1775-1780 Ls., m. gy., v. f. gr., arg., Fus., Crin.
1780-1784 Ls., m. gy., v. f. gr., Fus., Crin.
1784-1786 Sh., gy.
1786-1795 Ls., lt. gy. to pale yel. brn., v. f. gr., Crin.
1795-1800 Ls., as abv., Crin., Brac., spines, scat. Fus.
1800-1802 Sh., dk. gy.
1802-1805 Sh., blk.
1805-1810 Sh., dk. gy.
1810-1816 Ls., m. lt. gy., v. f. gran., sl. arg., Crin.
1816-1835 Sh., m. dk. gy., v. lmy.
1835-1840 Sh., m. dk. gy.
1840-1845 Ls., m. lt. gy., v. f. to f. xl.; tr. of lt.-gy. cht.
1845-1850 Ls., pale yel. brn., v. f. to f. xl.; tr. of m.-lt.-gy. fig. cht.
1850-1855 Ls., as abv.
1855-1858 Sh., gy.
1858-1867 Ls., pale yel. brn. to brn. gy., v. f. to f. xl.
1867-1870 Ls., m. lt. to m. gy., v. f. gran., sl. arg.
1870-1880 Ls., lt. gy., f. gr.; m.-lt.-gy. to m.-gy. dns. fig. and mot. cht.
1880-1884 Ls., v. pale orng., v. f. to f. xl., Brac.

Kanwaka Shale

1884-1892 Sh., m. dk. gy., lmy.

Oread Limestone

1892-1900 Ls., v. pale orng. to pale yel. brn., v. f. to f. xl.; v. lt. to lt.-gy. dns. cht.
1900-1920 Ls., v. pale orng., v. f. to f. xl., Crin., spines, calc.-filled vugs
1920-1924 Sh., m. dk. to dk. gy.
1924-1930 Ls., m. dk. gy., v. f. xl., arg., Crin., scat. Fus.
1930-1932 Sh., m. dk. gy., v. lmy.
1932-1934 Sh., m. dk. to dk. gy.
1934-1935 Sh., blk.
1935-1938 Sh., dk. gy.
1938-1944 Ls., m. dk. gy., v. f. xl., sl. arg., sl. brn. tint
1944-1947 Sh., m. dk. gy.
1947-1948 Sh., blk.
1948-1955 Ls., m. dk. gy., v. f. xl., sl. arg.
1955-1958 Sh., m. gy., lmy., sl. olv. tint
1958-1971 Ls., lt. gy. to v. pale orng., v. f. gr., Crin., Ost.
1971-1973 Sh., m. dk. gy.
1973-1978 Sh., olv. gy., lmy.
1978-1980 Sh., gy.
1980-1985 Ls., lt. gy. to v. pale orng., v. f. to f. xl., Crin.

Douglas Group

1985-1990 Sltst., m. lt. gy., v. dol., some red.-brn. stns., sl. mica.
1990-1995 Ls., dusky brn. to olv. gy., v. f. gr., arg., dol., hd., tt.
1995-2000 Ls., brn. gy. to m. gy., v. f. gr., dol., sl. arg.
2000-2005 Sh., m. lt. to m. gy., slty.
2005-2015 Sltst., m. lt. gy., mica., v. f. carb. mat., scat. carb. imprints

2015-2030 Sltst., as abv., some brn. sltst.
2030-2040 Sltst., m. lt. to lt. gy., v. f. sdy., mica., sl. dol.
2040-2046 Sh., m. gy., slty.
2046-2050 Sltst., m. lt. gy., mica., v. f. sdy.
2050-2055 Ss., m. lt. gy., v. f. gr., slty., mica., sl. dol.
2055-2070 Sltst., m. lt. gy., mica., carb.
2070-2072 Sh., m. gy., slty.
2072-2075 Sltst., m. lt. gy., v. f. sdy., lmy., mica.
2075-2080 Sh., m. gy., slty.
2080-2086 Sh., m. dk. gy.
2086-2090 Sltst., m. lt. gy., mica., carb.
2090-2100 Sh., m. gy., slty., sl. brn.
2100-2106 Sh., m. dk. gy.
2106-2110 Sltst., m. gy., sl. lmy., mica., scat. v. f. carb. mat.
2110-2117 Sh., m. to m. dk. gy., slty.
2117-2120 Sltst., m. gy., mica., carb., sl. lmy.
2120-2127 Sh., m. dk. gy.
2127-2140 Sh., as abv., dk.-gy.-red dns. Fe-st.
2140-2145 Ls., m. lt. to m. gy., f. gr., sl. arg., Crin., Brac.
2145-2150 Sh., m. gy.; m.-gy. v. f. sdy. lmy. sltst.
2150-2155 Ss., m. gy., v. f. gr., lmy., slty., tt.
2155-2158 Ss., as abv.; some v. f. to f.-gr. ss.
2158-2173 Sltst., m. gy., v. f. sdy., lmy.
2173-2175 Dol., m. gy., v. f. xl. to dns., some red.-brn. stn.
2175-2178 Sh., gy.

Pennsylvanian—Missouri Series

Lansing Group

2178-2190 Ls., lt. gy. to v. pale orng., f. gr., spine, calc. fillings of fos. ?, scat. s. vugs
2190-2200 Ls., as abv., Crin.
2200-2202 Sh., gn. gy.
2202-2205 Sh., m. gy.
2205-2220 Ls., lt. gy. to v. pale orng., f. to m. xl., Crin.
2220-2224 Ls., m. lt. to m. gy., f. xl., sl. arg., Brac., Crin., tr. of galena ?
2224-2230 Sh., m. gy., v. lmy., slty.
2230-2237 Ls., m. gy., v. f. sdy., v. slty., tt.
2237-2245 Sltst., m. gy., v. lmy.
2245-2249 Ls., m. lt. gy., v. slty.
2249-2255 Sh., m. to m. dk. gy., lmy.
2255-2256 Ls., dusky brn., v. slty.
2256-2295 Sh., m. to m. dk. gy., lmy.
2295-2310 Sh., m. dk. gy.
2310-2315 Ls., m. gy., gran., v. arg., abnt. Crin.
2315-2320 Ls., m. gy., f. gr., arg., spine, Brac. ?, abnt. Crin.
2320-2324 Ls., m. gy. to brn. gy., f. gr., Crin.
2324-2326 Sh., m. dk. gy.
2326-2330 Ls., as abv.

Kansas City Group

Bonner Springs Shale

2330-2340 Sh., m. dk. gy.
2340-2345 Sh., m. dk. gy., slty.
2345-2353 Sh., m. dk. gy.
2353-2355 Sh., mod. brn. to red. brn.
2355-2368 Sh., m. dk. gy.
2368-2370 Sh., mod. brn. to red. brn.
2370-2384 Sh., m. dk. gy.
2384-2387 Sh., mod. brn. to red. brn.
2387-2430 Sh., m. dk. gy.
2430-2435 Sh., as abv., Bry.

Wyandotte Limestone

2435-2445 Sh., m. dk. gy., lmy., Plcy., Ceph. ?, brn. Fe-st.
2445-2455 Sh., as abv., Bry.
2455-2457 Sh., blk., lmy.
2457-2463 Ls., m. dk. gy., gran., v. arg., glau., s. fos. frags.
2463-2468 Sh., m. dk. gy., lmy.
2468-2473 Ls., m. dk. to dk. gy., gran., arg., glau., Crin., fos. frags.
2473-2486 Sh., m. dk. gy., lmy.
2486-2490 Ls., m. dk. gy., gran., arg.

Lane Shale 2490-2516

2490-2500 Sh., m. dk. gy.
2500-2516 Sh., m. gy., lmy.
2516-2520 Ls., lt. olv. gy., f. gran., arg., dol., Crin.; m.-lt.-gy. to m.-gy. f.-gr. arg. ls., Crin.
2520-2526 Ls., m. gy. to pale yel. brn., v. f. gr.
2526-2530 Sh., m. dk. gy., sl. lmy.
2530-2537 Ls., m. lt. to m. gy., v. f. xl.
2537-2544 Ls., m. lt. gy., v. f. gr., dol., sl. arg.
2544-2546 Sh., gy.
2546-2550 Ls., m. lt. gy., v. f. xl.
2550-2555 Ls., pale yel. brn., v. f. to f. xl.
2555-2557 Sh., gy.
2557-2568 Ls., m. lt. to m. gy., v. f. xl.
2568-2570 Sh., gy.
2570-2580 Ls., pale to mod. yel. brn., v. f. xl., Crin.; m.-lt.-gy. dns. cht.
2580-2587 Ls., pale yel. brn., f. gr., Fus., Crin.; lt.-gy. to m.-gy. cht. and spic. cht.
2587-2590 Sh., m. dk. gy., spine, Crin.
2590-2597 Ls., v. pale orng. to pale yel. brn., f. gr.; lt.-gy. dns. cht. and spic. cht.
2597-2600 Sh., m. dk. gy.
2600-2606 Ls., v. pale orng., f. gr.; lt.-gy. dns. cht.
2606-2608 Sh., dk. gn. gy., sl. lmy.
2608-2613 Sh., m. dk. gy.
2613-2620 Ls., m. lt. gy. to v. pale orng., f. to c. ooc. and ool.
2620-2622 Sh., gy.
2622-2628 Ls., pale yel. brn. to m. gy., f. gr.; m.-gy. f.-gr. v. arg. ls. (sil. ?); m.-gy. cht. and spic. cht.
2628-2630 Sh., gy.
2630-2636 Ls., pale yel. brn., f. xl.; m.-lt.-gy. to m.-gy. cht.
2636-2639 Sh., gy.
2639-2641 Ls., m. gy., v. f. xl.
2641-2643 Sh., blk.
2643-2646 Sh., m. dk. gy.
2646-2650 Ls., pale yel. brn. to brn. gy., v. f. xl.
2650-2665 Ls., brn. gy., v. f. xl.
2665-2675 Ls., m. gy., v. f. xl., Crin.; v. lt. gy. to yel.-brn. dns. cht.
2675-2680 Ls., brn. gy., v. f. xl.
2680-2693 Ls., m. gy., v. f. xl., sl. arg.
2693-2699 Sh., m. dk. gy.
2699-2700 Ls., m. to m. dk. gy., f. gr., sl. arg.
2700-2705 Ls., brn. gy. to m. dk. gy., f. gr., arg.; m.-lt.-gy. to brn.-gy. dns. cht.; m.-dk.-gy. to blk. dns. cht.; spic. cht.
2705-2707 Sh., blk., sl. lmy.
2707-2715 Ls., m. dk. gy., f. xl., arg.

Pleasanton Group

2715-2725 Sh., m. dk. to dk. gy., v. lmy.
2725-2727 Ls., m. dk. gy., v. f. gr., v. arg.
2727-2740 Sh., m. dk. gy., v. lmy.
2740-2743 Ls., m. dk. gy., v. f. gr., v. arg.
2743-2748 Sh., m. dk. gy., v. lmy.
2748-2750 Sltst., m. lt. gy., lmy.
2750-2753 Ls., m. lt. gy., f. gr., arg.
2753-2756 Ls., pale yel. brn., f. gr.
2756-2765 Sh., m. gy., slty., sl. gn. in pt.
2765-2775 No samples
2775-2782 Sh., as abv.
2782-2784 Sltst., m. lt. gy.
2784-2787 Sltst., m. lt. gy., v. f. sdy., sl. lmy.

Pennsylvanian—Des Moines Series
Marmaton Group
Altamont Limestone 2787-2802

2787-2790 Ls., m. lt. gy., f. gr., arg.
2790-2802 Ls., pale yel. brn. to lt. gy., v. f. xl., sl. arg. in pt., Crin.
2802-2803 Sh., m. dk. gy.
2803-2805 Sltst., gn. gy., sl. lmy.
2805-2808 Sh., m. gy.
2808-2810 Sh., gn. gy., slty.
2810-2812 Ls., brn. gy., v. f. xl.
2812-2814 Sh., m. dk. gy.
2814-2816 Sh, gn. gy.
2816-2823 Sh., m. dk. gy.
2823-2830 Ls., pale yel. brn., v. f. xl., sl. arg. in pt.
2830-2833 Sh., m. dk. to dk. gy.; gn.-gy. mot. sh.
2833-2836 Sh., blk.
2836-2840 Ls., pale yel. brn., v. f. to f. xl.
2840-2849 Ls., brn. gy. to pale yel. brn., v. f. to f. xl.
2849-2850 Sh., blk.
2850-2854 Sh., dk. gy., sl. lmy.
2854-2856 Sh., dk. gy., v. lmy., hd., Crin., looks like ls.
2856-2860 Ls., m. dk. gy. to brn. gy., f. gr., arg.
2860-2862 Sh., dk. gy.
2862-2865 Sh., blk.
2865-2867 Sh., gy.
2867-2868 Ls., brn. gy., v. f. gr., sl. arg.
2868-2870 Sh., m. dk. gy.
2870-2872 Ls., pale yel. brn., v. f. xl.
2872-2874 Sh., gy.
2874-2880 Ls., m. lt. gy. to pale yel. brn., f. gr., v. arg., Crin.
2880-2883 Sh., gy.
2883-2886 Ls., m. gy. to pale yel. brn., v. f. xl., arg.

Cherokee Group

2886-2889 Sh., dk. gy.
2889-2892 Sh., blk.
2892-2900 Sh., m. gy., sl. lmy., abnt. carb. frags.
2900-2914 Sh., as abv., scat. s. Plcy.
2914-2917 Ls., m. lt. to m. gy., v. f. gr., dol., arg.
2917-2920 Sh., gy.
2920-2923 Ls., m. lt. to m. gy., v. f. gr., arg.
2923-2927 Sh., gy.
2927-2929 Ls., m. to m. dk. gy., f. gr., arg.
2929-2934 Sh., m. dk. to dk. gy., lmy.; gy. arg. ls. pel.
2934-2936 Sh., gn. gy., lmy.
2936-2940 Ls., brn. gy. to pale yel. brn., v. f. xl.
2940-2944 Ls., pale yel. brn., f. gran. to v. f. xl.; pale-yel.-brn. dns. lmy. cht.
2944-2947 Sh., blk.
2947-2950 Cht., dtrl. ?, m. gy., dns. to v. f. gran., sl. bl.; v. pale orng. to yel.-gy. v. f. gran. cht.
2950-2952 Sh., gn. gy.; gn.-gy. ls. pel.
2952-2955 Sh., gy. red
2955-2964 Sample out of place ?
2964-2966 Sh., gn. gy. and olv. gy.
2966-2970 Sh., gy. red
2970-2974 No samples
2974-2976 Sh., gy. red
2976-2977 Sltst., lt. olv. gy., tt., ltl. show o. and gas reported 2975-2980

Mississippian—Lower Mississippian Series
Rocks of Osage age

2977-2987 Cht., lt. gy. to v. pale orng., f. gran., lmy. in pt., tr. of glau.
2987-3000 Dol., lt. gy. to v. pale orng., v. f. gr., sil., tr. of glau.; v. lt. gy. dns. spic. cht.; v. lt. gy. mot. / m.-gy. v. fos. glau. cht., Bry. in cht.
3000-3002 Sh., gn. gy.
3002-3007 Ls., lt. gy. to v. pale orng., f. to m. xl.; v. lt. gy. to m.-gy. dns. op. spic. cht.
3007-3015 Ls., as abv., Crin.; cht. as abv.
3015-3021 Ls., lt. gy. to v. pale orng., f. gr., Crin.; v. lt. gy. to m.-gy. dns. fos. spic. cht.
3021-3040 Ls., m. lt. gy., v. f. gr., dol.; m.-lt.-gy. to m.-gy. dns. spic. cht., tr. o. reported 3021 to 3028, s. show o. reported 3035-3040
3040-3062 Ls., lt. gy. to v. pale orng., f. to m. xl., abnt. Crin.; cht. as abv.
3062-3074 Ls., lt. gy., v. f. gr., dol., Crin.
3074-3083 Ls., m. lt. gy., f. gr., dol., sl. arg., Crin.; m.-lt.-gy. to m.-gy. dns. spic. cht.
3083-3090 Ls., lt. gy. to v. pale orng., f. gr., Crin.; cht. as abv.
3090-3100 Ls., m. lt. gy. to pale yel. brn., f. xl.; cht. as abv.
3100-3110 Ls., as abv., Crin.; cht. as abv.
3110-3120 Ls., m. gy., f. xl., arg.
3120-3125 Ls., pale yel. brn., f. to m. xl., abnt. Crin.
3125-3134 Ls., brn. gy., v. f. gr., arg., abnt. Crin.; m.-lt.-gy. dns. trnsl. cht. / scat. v. s. blk. incls.
3134-3136 Sh., olv. gy., lmy.
3136-3144 Ls., as abv.; cht. as abv.
3144-3150 Sh., m. gy. to gn. gy., lmy., Crin.; m.-lt.-gy. dns. trnsl. cht.
3150-3155 Ls., m. gy., f. gr., v. arg., Crin.; m.-lt.-gy. dns. trnsl. cht.
3155-3168 Ls., m. lt. gy., f. gr., arg., Crin.
3168-3185 Ls., pale yel. brn., f. gr., Crin.
3185-3195 Sh., m. gy., sl. gn. in pt.
3195-3205 Sample out of place
3205-3208 Sh., gn. gy. and m. gy., sl. dol.
3208-3220 Ls., pale yel. brn., v. f. gr.
3220-3231 Ls., m. lt. to m. gy., v. f. to f. gr., arg., Crin.

Devonian and Mississippian
Chattanooga Shale

3231-3244 Sh., m. dk. to dk. gy.
3244-3248 Sh., blk.
3248-3255 Sh., m. dk. to dk. gy.
3255-3267 Sh., m. dk. gy., slty., sl. dol.
3267-3270 Sltst., m. gy., dol., pyr.
3270-3285 Sh., m. dk. gy., sl. slty.
3285-3287 Sh., blk.
3287-3290 Sh., dk. gy.

Misener sand

3290-3292 Ss., m. gy., v. f. to m. gr., v. pyr., tt.; wh. f.-gr. gl. ss., por., scat. m. to c. grs., much sec. qtz. growth

Ordovician—Middle and Upper Ordovician Series
Viola Limestone

3292-3294 Ls., m. lt. to lt. gy., m. xl.

Ordovician—Middle Ordovician Series
Simpson Group

3294-3298 Ss., m. lt. gy., v. f. to f. gr., v. dol.
3298-3299 Sh., dk. gn. gy., sm.
3299-3304 Sh., lt. gn. gy. to m. lt. gy., slty., v. glau.; wh. to m.-lt.-gy. fig. cht.
3304-3315 Ss., lt. gy., f. to m. gr., drills loose
3315-3317 Sh., dk. gn. gy.
3317-3327 Ss., lt. gy., f. to m. gr., scat. c. grs., drills loose
3327-3330 Sh., m. to m. dk. gy.
3330-3338 Ss., lt. gy., f. to m. gr., scat. c. grs., drills loose
3338-3340 Sh., m. gy., f. to m. sdy.
3340-3350 Ss., as abv.
3350-3353 Sh., m. lt. gy., slty.
3353-3357 Sh., dk. gn. gy.
3357-3360 Sh., m. dk. gy.; much loose sd. in spl.
3360-3362 Sh., gn. gy.

3362-3364 Sltst., v. lt. gy., v. f. sdy., scat. f. to m. sd. grs.
3364-3365 Ss., v. lt. gy., v. f. to f. gr., scat. m. to c. grs.
3365-3368 Sh., dk. gn. gy.
3368-3370 Ss., lt. gy., v. f. to m. gr., tt.

Ordovician—Lower Ordovician Series
Arbuckle Group
Cotter and Jefferson City Dolomites
3370-3375 Dol., lt. gy. to pale yel. brn., f. to m. xl.; v. lt. gy. dns. cht. and f. to m.-ool. cht.
3375-3385 Dol., as abv.; much v. lt. gy. dns. op. and trnsl. cht.
3385-3390 Dol., m. lt. gy. to v. pale orng., m. xl.
3390-3400 Dol., pale yel. brn. to m. lt. gy., f. to m. xl.
3400-3405 Dol., as abv.; wh. to lt.-gy. dns. cht. and m.-ool. cht.; xl. qtz.
3405 Total depth

WELL 17
LARIO OIL AND GAS CO. No. 1 STEPHENS
SE¼ SE¼ SE¼ SEC. 31, T. 27 S., R. 3 E.
BUTLER COUNTY

Altitude: 1317 feet Total depth: 3216 feet
Completion date: March 2, 1951
Initial production: Dry
Electrical log: None
Sample intervals: 10-foot; 500-1800 feet
5-foot; 1800-2530 feet
10-foot; 2530-2810 feet
5-foot; 2810-3216 feet
Cored intervals: None

Depth, feet *Sample description*
0- 500 No samples

Permian—Lower Permian Series
Sumner Group
Wellington Formation
Chase Group 100?
Barneston Limestone 276?
Matfield Shale 367?
Wreford Limestone 426?
Council Grove Group 481?
500- 510 Ls., pale yel. brn. to m. lt. gy., f. gr.
510- 517 Sh., m. dk. gy., lmy.
517- 520 Ls., m. gy., f. gr.
520- 527 Ls., m. gy., f. gr.; m.-gy. fig. cht.
527- 530 Sh., gy.
530- 540 Sh., gn. gy., v. lmy.
540- 544 Ls., pale yel. brn., gran., Ost., p.-p. por.
544- 550 Sh., gy., lmy.
550- 556 Ls., m. gy., arg.
556- 567 Sh., gn. gy., sl. lmy.
567- 570 Sh., gy.
570- 576 Sh., gy. red, lmy.
Beattie Limestone
576- 580 Ls., pale yel. brn., f. xl.; m.-gy. to lt.-gy. mot. and spic. cht., cave ?
580- 586 Ls., brn. gy., f. gr.
586- 590 Sh., gy.
590- 605 Ls., pale yel. brn., f. gr., Fus., pyr., p.-p. por.
605- 610 Ls., v. pale orng., f. gr.
Eskridge Shale
610- 612 Sh., gn. gy., lmy.
612- 623 Sh., gy. red, lmy.
623- 627 Sh., gy.
Grenola Limestone
627- 637 Ls., pale yel. brn., f. gr.
637- 643 Sh., gy., lmy.
643- 650 Ls., pale yel. brn., f. xl.
650- 654 Sh., gy.
654- 660 Ls., m. gy., f. gr., sl. arg.
660- 666 Sh., gy.
666- 670 Ls., lt. gy. to v. pale orng., f. gr.
Roca Shale
670- 675 Sh., gy.
675- 683 Ls., m. to m. dk. gy., arg.
683- 690 Sh., gy.
Red Eagle Limestone, Johnson Shale, and Foraker Limestone
690- 700 Ls., pale yel. brn. to m. lt. gy., f. xl.
700- 703 Sh., gy.
703- 710 Ls., pale yel. brn., gran., por., pyr., Ost., s. Gast.
710- 717 Sh., gy.
717- 720 Ls., pale yel. brn., f. gr.
720- 723 Sh., gy.
723- 730 Ls., brn. gy. to yel. brn., mot., f. gr.
730- 735 Sh., gy.
735- 750 Ls., pale yel. brn. to m. gy., v. f. xl.
750- 760 Sh., m. to m. dk. gy., lmy., sl. slty., abnt. Fus.
760- 765 Ls., m. gy., arg.
765- 770 Sh., gy.
770- 777 Ls., m. lt. gy., f. gr., Fus.
777- 780 Sh., gy., Fus.
780- 783 Ls., pale yel. brn., f. xl.
783- 790 Ls., m. to m. lt. gy., f. gr., arg.
790- 796 Sh., gy., lmy.
796- 800 Ls., as abv.
800- 807 Ls., pale yel. brn., v. f. xl.
Admire Group
807- 813 Sh., gy.
813- 820 Ls., m. gy., arg.
820- 824 Sh., gy., lmy.
824- 830 Sh., olv. gy., lmy.
830- 834 Ls., lt. gy., slty.
834- 840 Sltst., lt. gy., lmy., v. f. sdy. in pt.
840- 850 No samples
850- 855 Sltst., m. gy.
855- 860 Sltst., m. lt. gy., v. f. sdy., lmy.
860- 865 Ss., lt. gy., v. f. gr., lmy., scat. coal frags.
865- 870 Sltst., lt. gy., v. f. sdy., lmy.
870- 874 Sltst., m. to m. lt. gy.
874- 877 Sh., dk. gy.
877- 883 Sh., m. gy., slty., mica.
883- 887 Ls., brn. gy., f. gr., sl. slty.
887- 890 Sh., dk. gy.
890- 897 Sltst., m. to m. lt. gy., mica.
897- 910 Sh., gy., slty.
910- 913 Sh., gy. red
913- 917 Sh., gn. gy.
917- 920 Sh., dk. gy.
920- 930 Sh., gy., slty.
930- 936 Sh., dk. gy.
936- 940 Ss., lt. gy., v. f. gr., lmy., slty.

Pennsylvanian—Virgil Series
Wabaunsee Group
940- 942 Ls., pale yel. brn., v. f. xl.
942- 950 Sltst., m. lt. gy., lmy., Ost.
950- 952 Ls., brn. gy., f. gr., glau.
952- 960 Sh., gy., slty.
960- 967 Sh., dk. gy.
967- 970 Ls., m. gy. to brn. gy., f. gr., arg.
970- 976 Sh., gy.
976- 980 Sh., gn. gy., mica.
980-1000 Sh., gy.
1000-1010 Sh., yel. brn. to olv. gy., slty.
1010-1020 Sh., gy.
1020-1030 Sltst., gy., mica.
1030-1040 Sh., gy.

1040-1050 Sltst., m. lt. gy., v. f. sdy., mica.
1050-1053 Ss., lt. gy., v. f. gr., slty., mica.
1053-1060 Sltst., gy., mica.
1060-1065 Sltst., lt. gy., v. f. sdy., mica.
1065-1070 Sh., gy.
1070-1080 Sh., brn. gy. and olv. brn., slty.

Zeandale Limestone and Willard Shale

1080-1084 Ls., brn. gy., arg.
1084-1090 Sh., gy.
1090-1100 Sh., gy., mica.
1100-1106 Ls., pale yel. brn., f. gr.
1106-1108 Sh., gy.
1108-1110 Ls., as abv.
1110-1115 Sltst., gy., mica.
1115-1120 Ss., lt. gy., v. f. gr., slty., mica.
1120-1126 Ss., m. to m. lt. gy., v. f. to f. gr., lmy., sbang.
1126-1135 Sltst., m. lt. gy., lmy., mica.
1135-1140 Sh., dk. gy.
1140-1150 Sltst., m. gy., mica., sl. lmy.
1150-1153 Ss., lt. gy., v. f. to f. gr., lmy.

Emporia Limestone

1153-1157 Ls., pale yel. brn., f. gr.
1157-1163 Sh., gy.
1163-1167 Ls., m. gy., f. gr.

Auburn Shale

1167-1170 Sh., gy.
1170-1180 No samples
1180-1185 Sh., m. gy., lmy.
1185-1188 Sh., gy. red, lmy.
1188-1191 Sh., gn. gy.
1191-1197 Sh., gy. red, lmy.

Bern Limestone

1197-1203 Ls., pale yel. brn., f. gr., Ost.
1203-1207 Sh., gy.
1207-1213 Sh., gy. red, lmy.
1213-1217 Sh., gy.
1217-1220 Ls., pale yel. brn., f. gr.

Scranton Shale

1220-1226 Ss., lt. gy., v. f. gr., sl. lmy.
1226-1230 Sh., gy.
1230-1235 Ss., as abv.
1235-1240 Ls., pale yel. brn., f. gr.
1240-1246 Ss., lt. gy., v. f. gr., slty.
1246-1250 Sh., gn. gy.
1250-1253 Ls., brn. gy., arg.
1253-1260 Sh., gy.
1260-1265 Sh., gn. gy.
1265-1273 Sh., gy.
1273-1277 Ls., pale yel. brn., f. gr.
1277-1283 Sh., gy.
1283-1287 Sh., gy. red
1287-1290 Ss., lt. gy., v. f. gr., slty.

Happy Hollow Limestone and White Cloud Shale Members of Scranton Shale, and Howard Limestone

1290-1295 Ls., pale yel. brn., f. gr.
1295-1300 Ls., m. gy., f. gr.
1300-1304 Sh., gy.
1304-1310 Ls., pale yel. brn., f. gr.
1310-1316 Sh., olv. brn. and olv. gy.
1316-1320 Ls., brn. gy. and pale yel. brn., f. gr.
1320-1325 Ls., pale yel. brn. to v. pale orng., f. gr.
1325-1330 Sh., gy.
1330-1337 Ls., pale yel. brn., f. gr.
1337-1340 Ls., m. gy., f. gr., sl. arg.
1340-1348 Sh., gy.
1348-1352 Ls., pale yel. brn., f. gr.
1352-1357 Sh., gy.
1357-1366 Ls., pale yel. brn., f. to m. ool. and ooc.; lt.-gy. gran. and dns. fos. cht.
1366-1370 Ls., brn. gy., f. gr.

Severy Shale

1370-1375 Sh., olv. gy.
1375-1400 Sh., gy.
1400-1405 Sh., gn. gy.
1405-1417 Sh., gy.

Shawnee Group
Topeka Limestone, Calhoun Shale, and Deer Creek Limestone

1417-1424 Ls., m. gy., arg., mot. / dk. gy. in pt.
1424-1430 Sh., gy.
1430-1440 Ls., pale yel. brn., f. xl., Fus.
1440-1443 Sh., gy.
1443-1448 Ls., v. pale orng., f. gr., sl. dol.
1448-1455 Sh., gn. gy.
1455-1464 Ls., m. gy., f. gr., sl. slty., Fus.
1464-1467 Sh., gy.
1467-1473 Ls., v. pale orng. to pale yel. brn., f. gr. to gran.
1473-1476 Sh., gn. gy., splty.
1476-1480 Ss., lt. gy., v. f. gr., lmy., mica.
1480-1485 Sh., gn. gy.
1485-1500 Sh., gy.
1500-1503 Ls., brn. gy., f. gr., sl. arg.
1503-1513 Ls., pale yel. brn., f. xl.
1513-1517 Sh., gy.
1517-1520 Ls., brn. gy., v. f. xl.
1520-1523 Ls., m. gy., f. gr., arg., abnt. Fus.
1523-1536 Sh., gy., Fus.
1536-1540 Ls., brn. gy. and pale yel. brn., f. gr.
1540-1544 Ls., brn. gy., f. gr., sl. arg.
1544-1550 Sh., blk.
1550-1557 Ls., brn. gy., f. gr., Fus., Crin.

Tecumseh Shale

1557-1576 Sh., m. dk. to dk. gy.
1576-1580 Ss., m. lt. gy., v. f. gr., slty., lmy., mica.

Lecompton Limestone

1580-1586 Ls., brn. gy., f. gr., arg.
1586-1590 Sh., olv. gy., lmy.
1590-1600 Sh., brn. gy., slty.
1600-1607 Ls., brn. gy. to pale yel. brn., f. gr., sl. arg., Fus.
1607-1615 Ls., brn. gy., f. gr., arg.
1615-1620 Sh., gy.
1620-1624 Sh., olv. gy., sl. lmy.
1624-1630 Ls., brn. gy., f. gr., sl. arg.
1630-1633 Sh., gy.
1633-1640 Ls., m. gy., f. gr., sl. arg.
1640-1650 Ls., pale yel. brn., f. gr.
1650-1653 Sh., blk.
1653-1657 Sh., gy.
1657-1667 Ls., brn. gy. to m. gy., f. gr., arg., Fus.
1667-1670 Sh., gy.
1670-1677 Ls., pale yel. brn., f. xl.
1677-1696 Sh., gy., Fus.
1696-1720 Ls., pale yel. brn., f. xl.
1720-1726 Ls., brn. gy., f. gr., arg., cave ?
1726-1730 Ls., pale yel. brn., f. xl.

Kanwaka Shale

1730-1736 Sh., olv. gy.
1736-1747 Sh., gy., Fus.

Oread Limestone

1747-1755 Ls., brn. gy. to m. gy., f. gr., arg.
1755-1760 Ls., pale yel. brn., f. gr.
1760-1770 Ls., v. pale orng., f. xl.
1770-1774 Sh., olv. gy.
1774-1780 Sh., gy.
1780-1790 Ls., brn. gy., f. xl.

1790-1800 Sh., gy.
1800-1805 Ls., m. lt. gy., f. gr.
1805-1815 Ls., v. lt. gy. to v. pale orng., f. xl., Crin.
1815-1820 Ls., pale yel. brn., f. xl., Crin.
1820-1828 Sh., m. dk. to dk. gy.
1828-1830 Sh., blk.
1830-1833 Sh., m. dk. to dk. gy.
1833-1838 Ls., m. dk. gy., f. gr., sl. arg.
1838-1842 Ls., m. lt. gy., v. f. gr.
1842-1846 Ls., mod. yel. brn., f. gr., dol.

Douglas Group

1846-1850 Sh., gy.
1850-1853 Sh., olv. gy.
1853-1856 Ls., m. gy., arg.
1856-1858 Sh., gy.
1858-1860 Sltst., lt. gn. gy., lmy.
1860-1864 Sh., gy., Fus., cave ?
1864-1865 Coal
1865-1870 Ss., lt. gy., v. f. gr., slty., mica.
1870-1880 Ss., lt. gy., v. f. gr., lmy., sl. mica., scat. carb. and coaly frags.
1880-1884 Sh., gy.
1884-1890 Ss., lt. gy., v. f. gr., slty., sl. mica. and lmy.
1890-1895 Ss., lt. gy. to pale yel. brn., v. f. gr., mica., sl. lmy.
1895-1897 Sh., gy.
1897-1905 Ss., as abv., slty.
1905-1910 Sh., m. dk. gy., splty. in pt.
1910-1920 No samples
1920-1930 Sh., m. dk. gy.
1930-1932 Sh., gn. gy.
1932-1935 Sh., gy. red
1935-1940 Ss., lt. gy., v. f. gr., slty., mica.
1940-1944 Sltst., lt. gy., mica., carb.
1944-1956 Ss., lt. gy., v. f. gr., mica., sl. lmy.
1956-1965 Sltst., lt. gy., mica.
1965-1970 Sh., m. dk. gy.
1970-1975 Sh., gn. gy.
1975-1990 Sh., m. dk. gy.
1990-2000 Ls., pale yel. brn. to brn. gy., f. gr.
2000-2003 Ls., pale yel. brn. to m. lt. gy., v. f. gr.
2003-2007 Sh., gn. gy.
2007-2010 Sh., gy.
2010-2017 Ss., lt. gy., v. f. gr., lmy., mica.
2017-2023 Sh., gy. red
2023-2028 Sh., gy.
2028-2032 Ss., v. lt. gy., v. f. to f. gr., mica., por.
2032-2037 Ls., brn. gy. to m. gy. and lt. gy., mot., v. f. sdy., slty.
2037-2042 Ss., lt. gy., v. f. to f. gr., por., mica.
2042-2046 Ls., m. lt. gy. mot. / dk. gy., v. f. sdy., slty.

Pennsylvanian—Missouri Series

Lansing Group

2046-2067 Ls., lt. gy. to v. pale orng., f. gr., Crin.
2067-2070 Ls., pale yel. brn., f. gr., m. ool.
2070-2080 Sh., m. dk. gy.
2080-2090 Sh., olv. gy. to yel. brn.
2090-2100 Sh., gy.
2100-2102 Ls., brn. gy., v. f. gr.
2102-2104 Ls., pale yel. brn., f. gr.
2104-2120 Sh., gy.
2120-2128 Sh., olv. gy.
2128-2130 Sltst., yel. brn., v. f. sdy.
2130-2180 Sh., m. dk. gy.
2180-2183 Sh., gy. red
2183-2190 Sh., olv. gy.
2190-2195 Sh., gy.
2195-2198 Sh., gn. gy.
2198-2200 Ls., m. lt. gy., f. gr.
2200-2205 Ls., pale yel. brn. to brn. gy., f. xl.
2205-2210 Ls., m. gy., f. gr., faintly ool. ?
2210-2216 Ls., pale yel. brn., f. gr.

Kansas City Group

Bonner Springs Shale

2216-2280 Sh., m. dk. gy.
2280-2282 Sh., gy. red
2282-2287 Sh., brn. gy.
2287-2290 Sh., olv. brn.
2290-2295 Sh., brn. gy.
2295-2300 Sltst., pale yel. brn., v. f. sdy., lmy.

Wyandotte Limestone

2300-2304 Ls., gy. brn., f. gr., sl. arg.
2304-2307 Sh., m. dk. gy.
2307-2310 Sh., gy. red
2310-2315 Sh., m. dk. gy.
2315-2320 Sh., olv. gy. to olv. brn.
2320-2321 Dol., brn. gy., v. f. gr.
2321-2330 Sh., m. dk. gy.
2330-2335 Sh., brn. gy.
2335-2340 Ls., gy. brn., f. gr., sl. arg.
2340-2346 Ls., m. dk. gy., f. gr., arg., sl. brn.

Lane Shale 2346-2380

2346-2365 Sh., m. dk. gy.
2365-2380 Sh., m. gy., lmy.
2380-2385 Ls., m. lt. gy. to pale yel. brn., f. gr., Brac. ?
2385-2395 Ls., pale yel. brn. to v. pale orng., v. f. to f. xl.
2395-2403 Ls., as abv.; m.-lt.-gy. dns. fig. cht.
2403-2406 Sh., m. dk. gy.
2406-2408 Ls., brn. gy., m. ool.
2408-2415 Ls., pale yel. brn., f. gr., Fus.; m.-lt.-gy. dns. spic. and Fus. cht.
2415-2422 Ls., v. pale orng., f. gr., Fus.; cht. as abv.
2422-2425 Sh., m. dk. gy.
2425-2435 Ls., lt. gy. to pale yel. brn., f. gr.; lt.-gy. dns. spic. cht.
2435-2440 Ls., pale yel. brn. to brn. gy., f. gr.
2440-2446 Ls., pale yel. brn., f. gr.; m.-gy. dns. spic. cht.
2446-2450 Sh., m. dk. gy.
2450-2455 Ls., pale yel. brn., f. gr., Crin., Fus.
2455-2460 Ls., m. lt. gy., f. gr.; v. pale orng. f.-gr. ls.
2460-2466 Ls., pale yel. brn., f. gr.
2466-2468 Sh., m. dk. gy.; one coal frag., prob. cave
2468-2472 Ls., brn. gy., m. ool.
2472-2476 Ls., brn. gy. to m. gy., v. f. gr.
2476-2482 Ls., pale yel. brn., m. to c. ooc.
2482-2486 Sh., olv. gy. to olv. brn.
2486-2490 Ls., pale yel. brn., f. xl.
2490-2494 Ls., m. gy., f. gr.
2494-2497 Sh., olv. gy.
2497-2502 Sh., blk.
2502-2506 Ls., m. dk. gy., f. gr., arg.
2506-2510 Ls., pale yel. brn., f. xl.
2510-2515 Ls., v. pale orng., v. f. gr., sft.
2515-2520 Ls., pale yel. brn., f. xl.
2520-2522 Sh., m. dk. gy.
2522-2525 Ls., as abv.; v. lt. gy. to lt.-gy. dns. cht.
2525-2534 Ls., pale yel. brn., f. xl.
2534-2538 Sh., m. dk. gy.
2538-2550 Ls., brn. gy. and m. gy., f. gr.
2550-2556 Ls., m. dk. gy., v. arg.
2556-2560 Sh., m. dk. gy.
2560-2570 Ls., brn. gy. to gy. brn., f. gr., sl. arg.
2570-2577 Ls., m. dk. gy., v. arg.
2577-2580 Sh., m. dk. gy.
2580-2584 Ls., as abv.

Pleasanton Group

2584-2588 Sh., olv. gy.
2588-2600 Sh., m. dk. gy., sl. lmy.
2600-2608 Sh., m. dk. gy.
2608-2610 Sh., olv. gy.

2610-2612 Sh., gy. red
2612-2616 Sh., olv. gy.
2616-2625 Ls., pale yel. brn. to brn. gy., f. gr.
2625-2630 Ls., m. lt. gy., f. gr.
2630-2634 Sh., olv. gy.
2634-2637 Sh., gy. red
2637-2640 Sh., olv. brn.
2640-2644 Sh., olv. gy.
2644-2648 Sh., olv. brn.
2648-2652 Sltst., lt. gy., v. f. sdy., sl. lmy.

Pennsylvanian—Des Moines Series
Marmaton Group
Altamont Limestone 2652-2663

2652-2663 Ls., pale yel. brn. to m. lt. gy., v. f. gr.
2663-2667 Sh., m. dk. gy.
2667-2670 Ls., m. gy. to olv. gy., f. gr., arg.
2670-2676 Sltst., brn. gy., v. f. sdy., v. lmy.
2676-2680 Sh., m. dk. gy.
2680-2684 Ls., brn. gy., f. gr.
2684-2690 Sh., m. dk. gy.
2690-2693 Sh., olv. gy.
2693-2697 Sh., m. dk. gy.
2697-2710 Ls., pale yel. brn., v. f. gr.
2710-2714 Sh., m. dk. gy.
2714-2718 Ls., pale yel. brn. to brn. gy., f. gr., some f. ool.?
2718-2720 Ls., pale yel. brn., v. f. to f. ooc.
2720-2724 Sh., m. dk. gy.
2724-2730 Ls., pale yel. brn., f. gr.
2730-2735 Sh., m. dk. gy.
2735-2740 Ls., brn. gy., f. gr.
2740-2743 Sh., m. dk. gy.
2743-2750 Ls., pale yel. brn., f. gr.

Cherokee Group

2750-2753 Sh., m. dk. gy.
2753-2757 Sh., blk.
2757-2760 Ls., m. gy., arg.
2760-2767 Sh., m. dk. gy.
2767-2770 Ls., m. gy., arg.
2770-2774 Sh., m. dk. gy.
2774-2780 Ls., brn. gy., f. xl., sl. arg.
2780-2790 Sh., m. dk. gy.
2790-2795 Sh., gn. gy.
2795-2800 Sh., m. gy.
2800-2803 Sh., gy. red
2803-2810 Sh., m. dk. gy., lmy.
2810-2820 Ls., brn. gy., v. f. gr., sl. to v. arg.
2820-2825 Sh., m. dk. gy.
2825-2828 Sh., gy. red
2828-2832 Sh., gn. gy.
2832-2835 Sh., gy. red
2835-2842 Cht., dtrl., lt. to dk. gy., pale red, gy. red, and red. brn., dns., spic. and fig. in pt., some v. f. glau.; gn.-gy. sil. sltst. mtx.
2842-2846 Sh., gn. gy.
2846-2857 Sh., m. dk. gy.
2857-2860 Ss., lt. gy., v. f. gr., slty., lmy.

Mississippian—Lower Mississippian Series
Rocks of Osage age

2860-2885 Ls., v. lt. gy., f. xl.; abnt. m.-gy. to v. lt. gy. and v. pale orng. dns. fig. cht.
2885-2895 Ls., v. lt. gy. to v. pale orng., f. to m. xl.
2895-2905 Ls., as abv., Crin.
2905-2925 Ls., v. lt. gy., f. to m. xl., Crin.
2925-2930 Ls., pale yel. brn., v. f. xl.
2930-2940 Ls., m. lt. gy., f. xl., Crin.
2940-2960 Ls., as abv.; m.-gy. to m.-lt.-gy. dns. cht., pyr.
2960-2965 Ls., pale yel. brn., f. to m. xl., Crin.
2965-2970 Ls., as abv.; m.-gy. dns. cht.
2970-2985 Ls., as abv., wh. qtz.
2985-2990 Ls., lt. gy. to v. pale orng., f. to m. xl., Crin.
2990-3000 Ls., lt. gy. to lt. olv. gy., f. to m. xl., sl. arg., Crin.
3000-3005 Ls., pale yel. brn., f. xl.
3005-3015 Ls., pale yel. brn., v. f. xl.
3015-3047 Ls., m. lt. gy. to pale yel. brn., f. xl.
3047-3050 Ls., lt. olv. gy., f. xl., arg.
3050-3055 Ls., brn. gy., f. xl., arg.
3055-3060 Ls., m. gy., f. gr., arg.
3060-3063 Sh., gy.
3063-3068 Sh., gn. gy.
3068-3070 Sh., gy.
3070-3074 Ls., pale yel. brn., v. f. xl.
3074-3085 Sh., gy.
3085-3090 Ls., m. gy., v. f. gr., sl. slty.
3090-3096 Sltst., m. lt. gy., sl. dol., sl. mica.
3096-3100 Ls., pale yel. brn., f. gr.

Devonian and Mississippian
Chattanooga Shale

3100-3110 Sh., gy.
3110-3117 Sh., dk. gy. to gy. blk., Spr. cases ?

Misener sand

3117-3120 Ss., lt. gy., gl., f. to m. gr., scat. c. grs., some sec. enlargement, pyr.

Ordovician—Middle Ordovician Series
Simpson Group

3120-3130 Ss., m. lt. to v. lt. gy., v. f. to f. gr., scat. m. grs., sl. lmy., slty. in pt., some blk. o. stn.
3130-3134 Ss., m. lt. gy., v. f. gr., dol., slty.; some f.-gr. ss.
3134-3137 Sltst., wh., v. f. to f. sdy., glau., pyr.
3137-3145 Dol., pale yel. brn., v. f. to f. sdy., slty.
3145-3148 Sh., m. to m. dk. gy., splty. in pt.
3148-3150 Sh., gn. gy.
3150-3153 Sh., m. to m. dk. gy.
3153-3156 Sltst., lt. gy., v. f. sdy.
3156-3160 Ss., v. lt. gy., f. to m. gr., sbrd. to sbang.
3160-3163 Ss., lt. gy., v. f. gr., slty., glau.
3163-3166 Sltst., lt. gy., v. f. sdy., glau.
3166-3176 Sh., m. dk. gy.
3176-3180 Sh., gn. gy., slty.
3180-3185 Ss., wh., f. to m. gr., scat. c. grs., sbrd., drills loose
3185-3190 Ss., wh., m. to c. grs., sbrd., drills loose

Ordovician—Lower Ordovician Series
Arbuckle Group
Cotter and Jefferson City Dolomites

3190-3196 Dol., lt. gy. to v. pale orng., f. to m. xl.; m.-lt.-gy. to pale-yel.-brn. f. xl. dol.; m.-lt.-gy. dns. m.-ool. cht.
3196-3200 Dol., pale yel. brn., f. to m. xl.
3200-3206 Dol., as abv., por.
3206-3210 Dol., as abv.; v. lt. gy. dns. v. f. to f. sdy. cht.; drusy cht. / qtz. xls.
3210-3216 Dol., m. lt. gy. to v. pale orng., f. xl.
3216 Total depth

WELL 18

BIRMINGHAM AND BARTLETT DRILLING CO.
No. 1 RALSTON "A"
NW¼ NE¼ NE¼ SEC. 6, T. 28 S., R. 4 E.
BUTLER COUNTY

Altitude: 1286 feet — Total depth: 2987 feet
Completion date: August 13, 1950
Initial production: Dry
Electrical log: 163-2989 feet

Sample intervals: 10-foot; 170-1825 feet
5-foot; 1825-2987 feet
Cored intervals: None

Depth, feet *Sample description*

0- 170 No samples

Permian—Lower Permian Series

Chase Group

Barneston Limestone

170- 190 Ls., m. gy., f. gr., arg., spines; m.-lt.-gy. gran. lmy. fos. mot. cht.
190- 200 Ls., as abv.; cht. as abv.; spic. cht.

Matfield Shale

200- 214 Sh., gy., v. lmy.
214- 220 Ls., m. gy., v. arg.
220- 222 Sh., gy.
222- 225 Ls., pale yel. brn., f. gr., Crin.
225- 233 Sh., gy., v. lmy.
233- 236 Ls., m. lt. gy., f. gr., fos.; some yel.-brn. ls.
236- 240 Sh., gy., lmy.
240- 243 Sh., gy. red, lmy.
243- 247 Sh., gn. gy., lmy.

Wreford Limestone

247- 250 Ls., pale yel. brn. to lt. gy., f. gr., spines, Crin., Bry.
250- 258 Ls., m. lt. gy., f. gr., arg., dol.; m.-gy. to m.-dk.-gy. dns. spic. cht.
258- 259 Sh., gy.
259- 268 Ls., m. lt. gy., f. gr., sl. arg.; cht. as abv.
268- 272 Sh., gy., v. lmy.
272- 285 Ls., as abv.; cht. as abv.

Council Grove Group

285- 298 Sh., gy., lmy.
298- 307 Ls., m. lt. gy., f. gr.; m.-gy. to m.-dk.-gy. dns. spic. cht.
307- 309 Sh., gy.
309- 311 Ls., lt. gy., f. gr., dol.
311- 316 Sh., gy., lmy.
316- 318 Sh., gn. gy., lmy.
318- 321 Ls., m. lt. gy., f. gr., sl. arg.
321- 330 Sh., gy., lmy.
330- 337 Ls., lt. gy., f. gr., sl. arg.
337- 340 Ls., pale yel. brn., f. gr.
340- 344 Sh., gy., lmy.
344- 346 Sh., gy. red, lmy., cave ?
346- 349 Sh., gy., lmy.
349- 352 Ls., m. gy., arg.
352- 370 Clyst., gn. gy., sl. lmy., non-bdd. ?, pyr.
370- 373 Ls., pale yel. brn., f. gr., m. ool. ?
373- 382 Sh., gy., v. lmy.
382- 385 Ls., m. gy., arg.
385- 394 Sh., gy., lmy., Brac., Gast.

Beattie Limestone

394- 400 Ls., pale yel. brn., v. f. gr., v. f. ool. in pt.; lt.-olv.-gy. to m.-lt.-gy. v. f. to f. ooc. ls.
400- 404 Sh., gy., sl. lmy.
404- 406 Ls., m. gy. to brn. gy., v. f. ooc.
406- 409 Ls., brn. gy. to pale yel. brn., v. f. gr.
409- 410 Ls., m. to lt. gy., f. xl., dol.
410- 420 Sh., gy., lmy.
420- 430 Ls., m. lt. gy., f. gr., s. Fus.; lt.-gy. dns. spic. cht.
430- 438 Ls., pale yel. brn., v. f. xl.

Eskridge Shale

438- 449 Sh., m. gy., v. lmy., sl. gn.

Grenola Limestone

449- 454 Ls., m. lt. gy., f. gr., Crin.
454- 456 Ls., m. gy., f. gr., arg.
456- 468 Ls., m. lt. gy., f. gr.
468- 474 Sh., gy., sl. lmy.
474- 477 Ls., v. pale orng., f. gr., dol.
477- 480 Ls., m. to m. lt. gy., f. gr., sl. arg.
480- 483 Sh., gy.
483- 487 Ls., m. lt. gy., f. gr., dk.-gy. f. ool.-like grs. (cly. pel. ?)
487- 490 Ls., m. to m. lt. gy., f. gr., sl. arg.

Roca Shale

490- 495 Sh., dk. gy., sl. lmy.
495- 505 Sh., gn. gy. mot. / dk. gy., sl. lmy.
505 -512 Sh., gy., lmy.
512- 515 Ls., m. dk. gy., v. arg.
515- 517 Sh., gy.

Red Eagle Limestone, Johnson Shale, and Foraker Limestone

517- 520 Ls., pale yel. brn., m. ool.
520- 524 Ls., lt. gy. to pale yel. brn., f. gr.
524- 527 Ls., m. gy., arg.
527- 530 Sh., gy., sl. lmy.
530- 540 Ls., m. gy., f. xl., sl. arg.
540- 543 Sh., gy., sl. lmy.
543- 548 Ls., pale yel. brn. to lt. gy., v. f. to f. gr., sub-lith. in pt.
548- 554 Sh., gy., lmy.
554- 558 Ls., as abv.
558- 560 Sh., gy.
560- 569 Ls., as abv.
569- 570 Sh., gy.
570- 578 Ls., m. lt. gy., f. gr., sl. arg., Fus.
578- 587 Sh., gy., lmy., Fus., spines
587- 590 Ls., lt. gy., v. f. gr., sub-lith. in pt.
590- 592 Ls., m. gy., f. gr., sl. arg.
592- 600 Sh., gy., lmy.
600- 604 Ls., m. lt. gy., f. xl., Fus.; m.-lt.-gy. to m.-dk.-gy. dns. fig. cht. and spec. cht.
604- 609 Sh., gy., lmy.
609- 613 Ls., brn. gy., f. xl., Fus.

Admire Group

613- 615 Sh., gn. gy.
615- 623 Sh., red. brn. and gy. red, lmy.
623- 627 Sh., olv. gy.
627- 629 Ls., brn. gy. and m. gy., f. gr., Fus.
629- 631 Sh., gy.
631- 632 Ls., m. gy., arg.
632- 643 Sh., gy., lmy.
643- 647 Sltst., m. gy., lmy.
647- 653 Ls., m. gy., slty.
653- 663 Ss., lt. gy., v. f. gr., slty., mica., carb.
663- 667 Sh., gy., lmy.
667- 672 Sltst., m. lt. gy., mica., carb.
672- 678 Sh., olv. gy., v. lmy.
678- 683 Ss., lt. gy., v. f. gr., slty., mica., carb.
683- 689 Sh., gy., lmy.
689- 693 Ss., as abv.
693- 714 Sltst., m. lt. gy. to brn. gy., v. lmy.
714- 717 Ls., pale yel. brn., f. gr., sl. arg., slty., Fus.
717- 723 Sh., m. dk. gy.
723- 728 Sltst., m. lt. gy., v. lmy.
728- 730 Sh., m. dk. gy.

Pennsylvanian—Virgil Series

Wabaunsee Group

730- 733 Ls., m. dk. gy., v. arg.
733- 738 Sltst., lt. gy., lmy., mica.
738- 748 Sh., dk. gy.
748- 750 Sltst., lt. gy., lmy., mica.
750- 760 Sh., m. dk. to dk. gy.
760- 763 Ls., m. lt. gy., f. gr.
763- 780 Sh., gy., lmy.
780- 781 Ls., pale yel. brn. to brn. gy., v. f. to f. gr.
781- 785 Sh., gy., lmy.
785- 790 Ss., lt. gy. to olv. gy., v. f. gr., slty., lmy.

790- 797 Sltst., lt. olv. gy., sl. lmy.
797- 805 Sltst., lt. gy., lmy., mica.
805- 808 Sh., gy.
808- 812 Ls., m. lt. gy., f. gr., sl. arg.
812- 814 Sh., gn. gy.
814- 816 Sh., gy. red
816- 818 Sh., gy.
818- 823 Ss., lt. gy., v. f. gr., lmy.
823- 831 Ss., lt. gy., v. f. gr., slty., lmy.
831- 835 Sltst., lt. gy., lmy.
835- 843 Sh., gy.
843- 850 Ls., m. gy., f. gr., arg., s. Fus., other fos. frags.
850- 858 Sh., gy.
858- 860 Ls., m. gy., f. gr., arg., spines
860- 865 Ss., lt. gy., v. f. gr., sl. lmy.
865- 880 Sh., gy.
880- 910 No samples; lithology interpreted from electrical log

Zeandale Limestone and Willard Shale

880- 882 Ls.
882- 900 Sh.
900- 902 Ls.
902- 908 Ss.
908- 910 Sh.
910- 915 Sh., gy.
915- 920 Ss., lt. gy., f. gr., dol.
920- 930 Sh., gy.
930- 931 Ls., brn. gy., f. gr., sl. arg.
931- 937 Sh., gy.

Emporia Limestone

937- 945 Ls., as abv., Crin.
945- 948 Sh., gy.
948- 950 Sltst., lt. gy., v. lmy.
950- 953 Ls., pale yel. brn., f. gr., Crin., Trilobite
953- 958 Sltst., lt. gy., v. lmy.
958- 961 Ls., as abv.
961- 966 Sh., gy.
966- 970 Ls., lt. gy. to v. pale orng., v. f. gr., dol.

Auburn Shale

970- 973 Sh., gy.
973- 976 Ls., pale yel. brn., f. gr.
976- 988 Sh., gy.

Bern Limestone

988-1000 Ls., pale yel. brn., f. xl., Crin.
1000-1004 Ls., m. gy., f. gr., v. arg.
1004-1007 Sh., m. gy., lmy.
1007-1010 Sh., gn. gy., lmy.
1010-1018 Ls., pale yel. brn., f. xl., Crin., spine
1018-1020 Sh., gy.
1020-1022 Ls., v. pale orng., f. xl.
1022-1027 Ls., lt. gy., f. ool., f. sdy.
1027-1029 Ls., lt. olv. gy., f. gr., v. arg.

Scranton Shale

1029-1042 Sh., gy.
1042-1050 Ls., pale yel. brn., f. gr. to f. xl.
1050-1054 Sh., gy.
1054-1061 Ls., m. gy. to pale yel. brn., f. gr., f. to m. ool.
1061-1070 Sh., gy.
1070-1076 Sh., gy., slty., mica.
1076-1079 Ls., m. dk. gy., arg.
1079-1090 Sh., gy., slty., mica., scat. carb. mat.
1090-1095 Sltst., m. gy., v. f. sdy., lmy., mica.
1095-1104 Sltst., olv. gy., mica., scat. carb. mat.
1104-1132 Sh., gy., slty., mica., scat. carb. mat.
1132-1138 Sh., gn. gy., sl. dol.

Happy Hollow Limestone and White Cloud Shale Members of Scranton Shale, and Howard Limestone

1138-1146 Ls., pale yel. brn. to v. pale orng., v. f. to f. gr.; some psdo.-ool. ls.
1146-1150 Ls., as abv., sl. arg.
1150-1156 Sh., gy.
1156-1161 Sltst., m. lt. gy., v. f. sdy.
1161-1163 Sh., gy.
1163-1168 Sltst., as abv.
1168-1176 Sh., gy.
1176-1186 Ls., m. gy., f. gr., sl. arg.
1186-1190 Sh., gy.
1190-1195 Ls., brn. gy., f. gr.

Severy Shale

1195-1259 Sh., m. gy.

Shawnee Group
Topeka Limestone, Calhoun Shale, and Deer Creek Limestone

1259-1261 Ls., m. gy., f. gr., sl. arg.
1261-1267 Sh., gy.
1267-1270 Ls., lt. gy., v. f. gr.
1270-1273 Ls., pale yel. brn., v. f. gr.
1273-1274 Sh., gy.
1274-1282 Ls., pale yel. brn., f. xl., abnt. Fus.
1282-1285 Sh., gy.
1285-1290 Ls., m. lt. gy. to pale yel. brn., f. gr., sl. arg., abnt. Fus.
1290-1294 Ls., pale yel. brn., f. xl., Fus.
1294-1297 Ls., m. gy., Fus.
1297-1300 Sh., gy., slty.
1300-1307 Ss., lt. gy., v. f. gr., sl. lmy., mica.
1307-1320 Sh., gy.
1320-1323 Ls., brn. gy., f. gr., sl. arg.
1323-1334 Ls., pale yel. brn. to brn. gy., f. xl., xl. calc.
1334-1337 Sh., dk. gy.
1337-1347 Ls., m. gy., arg.
1347-1350 Sh., gn. gy.
1350-1360 Sh., m. gy., lmy., slty., mica., Fus.
1360-1365 Sh., gy.
1365-1369 Ls., pale yel. brn., f. gr., sl. arg., tr. of galena
1369-1371 Sh., blk., pyr.
1371-1376 Ls., brn. gy., f. gr.
1376-1382 Sh., gy.
1382-1390 Ls., pale yel. brn., f. gr., Fus.
1390-1393 Ls., pale yel. brn., f. gr., dol.
1393-1408 Ls., pale yel. brn. to lt. gy., f. gr.

Tecumseh Shale

1408-1410 Sh., gy.

Lecompton Limestone

1410-1418 Ls., m. lt. gy., f. gr., sl. arg., Fus.
1418-1425 Sh., gn. gy.
1425-1440 Sh., gy., mica.
1440-1448 Ls., brn. gy., f. xl.
1448-1460 Sh., gy., lmy., Fus.
1460-1467 Sh., gy. red
1467-1470 Ls., m. lt. gy., f. gr.
1470-1478 Ls., pale yel. brn., f. xl., Fus.
1478-1481 Sh., blk.
1481-1486 Ls., brn. gy. to m. gy., f. gr., arg., Fus.
1486-1490 Sh., gy.
1490-1500 Ls., m. lt. gy., f. gr., sl. arg., spec. / dk. gy., Fus.
1500-1520 Ls., pale yel. brn. to v. pale orng., gran., por., calc. xls.
1520-1530 Ls., v. pale orng., f. gr.
1530-1537 Ls., m. lt. gy., arg.

Kanwaka Shale

1537-1560 Sh., gy., lmy., mica., abnt. pyr. 1550-1560
1560-1565 Sh., gn. gy.
1565-1585 Sh., gy.
1585-1589 Sh., as abv., brn. Fe-st.
1589-1590 Coal
1590-1596 Sh., gy.

Oread Limestone

1596-1600 Ls., brn. gy., f. gr., arg. in pt., Crin., Bry. ?
1600-1616 Ls., lt. gy., f. gr.; pale-yel.-brn. f.-gr. ls.
1616-1620 Sh., gy.
1620-1630 Ls., v. pale orng. to pale yel. brn., f. gr., Crin., Brac.
1630-1633 Ls., m. lt. gy., f. gr., arg.
1633-1638 Sh., blk.
1638-1640 Ls., gy. brn., f. gr., sl. arg.
1640-1650 Sh., olv. gy. and m. gy., sl. lmy.
1650-1656 Ls., v. pale orng., v. f. to f. gr., Crin.
1656-1658 Sh., gn. gy.
1658-1664 Ls., as abv.

Douglas Group

1664-1668 Sltst., lt. gy., sl. lmy., v. f. sdy.
1668-1670 Sh., gy.
1670-1673 Sltst., m. gy., mica.
1673-1680 Sh., gy., plant imprints
1680-1687 Sltst., m. lt. gy., v. f. sdy., mica., carb. in pt.
1687-1690 Sh., gy.
1690-1693 Sltst., as abv.
1693-1700 Sltst., gy.
1700-1703 Ls., brn. gy., gran., Crin.
1703-1717 Sltst., m. gy., mica., carb. mat.
1717-1720 Ss., lt. gy., v. f. gr., slty.
1720-1726 Sltst., m. lt. gy.
1726-1740 Ss., lt. gy., v. f. gr., slty., mica. in pt.
1740-1760 Sh., gy., slty.
1760-1776 Sh., m. dk. gy.
1776-1784 Sltst., m. lt. gy., v. f. sdy., lmy. in pt., mica. in pt.
1784-1787 Sltst., brn. gy., v. f. sdy., mica.
1787-1832 Sh., m. dk. gy.
1832-1840 Ls., pale yel. brn. to brn. gy., f. gr., Fus.
1840-1853 Sh., m. dk. gy.

Pennsylvanian—Missouri Series

Lansing Group

1853-1860 Ls., pale yel. brn., gran., p.-p. por., Fus.
1860-1867 Ls., lt. gy., f. xl., p.-p. por.
1867-1870 Ls., pale yel. brn., f. xl., p.-p. por.
1870-1876 Ls., m. gy., f. xl.
1876-1880 Sh., gy. red
1880-1884 Sltst., m. gy., v. f. sdy., lmy.
1884-1892 Sh., m. dk. gy., lmy., slty.
1892-1898 Sh., m. dk. gy.
1898-1905 Ls., m. lt. gy. to pale yel. brn., f. gr., Fus.
1905-1910 Ls., lt. gy., f. gr.
1910-1920 Ls., pale yel. brn., f. xl.
1920-1925 Ls., as abv., Crin., p.-p. por.
1925-1930 Ls., pale yel. brn., f. xl., few Fus.
1930-1932 Ls., m. gy., f. xl.
1932-1936 Sh., olv. gy. and gn. gy.
1936-1940 Ls., brn. gy. and pale yel. brn., f. xl.
1940-1945 Ls., pale yel. brn. to lt. gy., f. xl.; m.-lt.-gy. dns. cht.
1945-1950 Ls., v. pale orng., f. gr.
1950-1955 Ls., pale yel. brn., f. gr., ltl. p.-p. por.
1955-1958 Sh., gy.
1958-1965 Ls., pale yel. brn. to lt. gy., f. gr.
1965-1970 Ls., brn. gy., f. xl.
1970-1973 Ls., pale yel. brn., f. gr., sl. ooc.
1973-1980 Ls., pale yel. brn., f. gr., gran.
1980-1990 Ls., as abv., por., ooc. ?
1990-1992 Ls., pale yel. brn. to m. lt. gy., f. gr., few Fus.
1992-1993 Sh., gy.
1993-2000 Ls., as abv., Brac., other fos. frags.
2000-2010 Ls., m. lt. to lt. gy., f. gr., Ost.
2010-2030 Ls., as abv.; some pale-yel.-brn. ls.
2030-2034 Ls., m. lt. gy., v. f. gr.
2034-2037 Ls., m. gy., v. f. gr.
2037-2043 Sh., gy.
2043-2050 Ls., brn. gy., v. f. to f. gr.
2050-2065 Ls., pale yel. brn., v. f. to f. gr.
2065-2070 Ls., m. gy., f. xl.
2070-2071 Sh., gy.
2071-2074 Sh., gn. gy.
2074-2085 Ls., pale yel. brn., f. gr.

Kansas City Group

Bonner Springs and Lane Shales 2085-2217

2085-2090 Sh., dk. gy.
2090-2113 Sh., m. gy., slty., lmy., Crin., spines
2113-2140 Sh., gy.
2140-2160 Sh., gy., lmy.
2160-2165 Sh., gn. gy.
2165-2170 Sh., gy. red
2170-2217 Sh., gy.
2217-2223 Ls., m. gy. to brn. gy., f. xl., Crin.
2223-2230 Ls., lt. gy. to pale yel. brn., f. gr.; lt.-gy. fos. ? dns. cht.
2230-2237 Ls., m. lt. gy., f. xl.
2237-2240 Sh., gy.
2240-2245 Ls., m. to m. lt. gy., v. f. gr., lt.-olv.-gy. m. to c. ool.
2245-2255 Ls., pale yel. brn., f. xl.; m.-lt.-gy. to lt.-gy. dns. spic. cht.
2255-2265 Ls., lt. gy., f. xl.; cht. as abv.
2265-2270 Ls., pale yel. brn., f. xl.
2270-2272 Sh., m. dk. gy.
2272-2275 Ls., brn. gy., f. xl.
2275-2284 Ls., pale yel. brn., f. gr.; m.-gy. dns. cht. and spic. cht.
2284-2290 Ls., pale yel. brn., f. gr., Fus., Crin.
2290-2300 Ls., v. pale orng., f. gr., some p.-p. por.
2300-2306 Ls., pale yel. brn., f. xl.
2306-2310 Ls., pale yel. brn., f. to m. ool. and ooc.
2310-2333 Ls., pale yel. brn., m. to c. ool. and ooc.
2333-2336 Ls., pale yel. brn., f. xl.
2336-2341 Ls., m. to m. dk. gy., f. gr., arg., Brac. ?
2341-2345 Sh., blk.
2345-2348 Sh., gy.
2348-2355 Ls., m. lt. gy. to pale yel. brn., f. xl.
2355-2360 Ls., pale yel. brn., f. xl.
2360-2365 Ls., as abv.; lt.-gy. dns. cht.
2365-2367 Ls., brn. gy., f. xl.
2367-2370 Sh., gy.
2370-2373 Ls., brn. gy., f. xl.
2373-2377 Ls., pale yel. brn., f. xl.
2377-2380 Sh., gy.
2380-2385 Ls., pale yel. brn., f. gr.
2385-2390 Ls., m. lt. gy., v. f. gr.
2390-2393 Ls., m. gy., f. gr., arg., Brac., Crin.
2393-2398 Ls., as abv., v. arg.
2398-2400 Sh., gy.
2400-2403 Sh., gy. brn.
2403-2406 Sh., gy.
2406-2410 Ls., m. dk. gy., f. gr., v. arg., Brac.
2410-2414 Ls., pale yel. brn., f. xl.; lt.-gy. and dk.-gy. dns. fos. cht.
2414-2420 Ls., brn. gy., v. f. to f. xl., spines
2420-2425 Ls., m. dk. gy., f. gr., arg.

Pleasanton Group

2425-2428 Sh., gy., sl. lmy.
2428-2430 Ls., dk. gy., v. arg.
2430-2450 Sh., dk. gy., lmy.
2450-2451 Ls., m. gy., f. gr., arg.
2451-2455 Sh., m. dk. gy.
2455-2460 Sh., gn. gy. and olv. gy.
2460-2463 Ls., pale yel. brn., f. xl.
2463-2467 Ls., lt. olv. gy., v. slty.
2467-2475 Sh., gy.

2475-2477 Sltst., lt. olv. gy., lmy.
2477-2480 Ss., lt. olv. gy., v. f. gr., slty., sl. lmy.
2480-2483 Sh., gy.
2483-2490 Sltst., lt. gy., v. f. sdy., lmy.
2490-2502 Sh., gy.

Pennsylvanian—Des Moines Series
Marmaton Group
Altamont Limestone 2502-2519
2502-2504 Ls., pale yel. brn., f. gr., sl. arg.
2504-2514 Ls., pale yel. brn., f. xl., f. ool. in pt.
2514-2519 Ls., pale yel. brn., v. f. xl.
2519-2522 Sh., blk.
2522-2525 Sltst., m. dk. gy., v. lmy., sl. brn.
2525-2530 Sh., olv. gy. and gn. gy.
2530-2539 Ls., m. dk. gy., f. gr., sl. arg., fos. hash
2539-2542 Sh., gy.
2542-2550 Ls., pale yel. brn., f. xl., f. to m. ool. in pt., Crin.
2550-2554 Sh., gn. gy.
2554-2560 Ls., pale yel. brn. to m. gy., v. f. gr., arg.
2560-2567 Sh., gy.
2567-2573 Ls., brn. gy., f. xl., Crin., pyr.
2573-2578 Sh., blk.
2578-2581 Ls., m. lt. gy. to pale yel. brn., v. f. xl., sl. arg.
2581-2587 Sh., gy.
2587-2593 Ls., pale yel. brn., v. f. to f. xl.
2593-2595 Ls., m. lt. gy., arg.
2595-2600 Sh., gy.
2600-2606 Ls., lt. gy., f. gr., dol., v. arg.

Cherokee Group
2606-2612 Sh., gy.
2612-2619 Sltst., lt. gy., v. f. sdy.
2619-2622 Sh., dk. gy.
2622-2627 Sh., gn. gy.
2627-2658 Sh., gy., large Fus. 2640-2650
2658-2663 Ls., pale yel. brn., f. gr., fos. hash, v. f. pyr. in pt.
2663-2670 Ls., m. dk. brn. gy., v. f. xl., sl. arg.
2670-2676 Ls., brn. gy., f. gr., arg.
2676-2683 Sltst., dk. gy. to blk., v. sil., v. s. qtz. xls.
2683-2690 Sh., gy.
2690-2694 Sltst., lt. gn. gy., glau., pyr.
2694-2705 Sh., lt. gn. gy., slty., glau.

Mississippian—Lower Mississippian Series
Rocks of Osage age
2705-2710 Ls., lt. gy., f. xl., v. glau., Crin.; pale-yel.-brn. f. xl. ls.; lt.-gy. fig. cht.
2710-2730 Ls., lt. gy. to v. pale orng., f. gr., sil.; m.-lt.-gy. to v. lt. gy. dns. op. spic. cht.
2730-2735 Ls., as abv.; m.-gy. dns. spic. cht.
2735-2740 Ls., as abv.
2740-2755 Ls., lt. gy., f. gr., sil.; m.-lt.-gy. to lt.-gy. dns. spic. cht.
2755-2765 Ls., as abv.; lt.-gy. to m.-gy. dns. op. cht., spic. in pt.
2765-2775 Ls., m. lt. gy., f. gr., sil.; lt.-gy. to m.-gy. dns. cht., spic. in pt.
2775-2790 Ls., pale yel. brn. to v. lt. gy., f. xl.; m.-gy. to m.-lt.-gy. dns. op. spic. cht.
2790-2800 Ls., m. lt. gy., f. gr., sil.; m.-gy. dns. op. cht.
2800-2807 Ls., lt. olv. gy., f. gr., sl. arg., spines
2807-2812 Ls., m. lt. gy., f. xl., Crin.
2812-2818 Ls., lt. olv. gy. to pale yel. brn., f. xl., Crin.
2818-2823 Ls., pale yel. brn., v. f. xl. to dns.
2823-2827 Ls., pale yel. brn., f. xl., Crin. ?, pyr.
2827-2830 Sh., olv. gy., v. lmy.
2830-2835 Ls., pale yel. brn., f. xl.
2835-2840 Ls., brn. gy., f. xl., sl. arg.
2840-2848 Sh., m. dk. to dk. gy.
2848-2854 Sh., gn. gy.
2854-2858 Sh., m. dk. gy.
2858-2865 Ls., pale yel. brn., f. xl.
2865-2867 Sh., dk. gy.
2867-2873 Sh., gn. gy.
2873-2879 Sh., m. dk. gy.
2879-2883 Ls., pale yel. brn. to brn. gy., m. to c. ool., few piso., Brac., Crin., pyr.

Devonian and Mississippian
Chattanooga Shale
2883-2890 Sh., dk. gy.
2890-2900 Sh., m. dk. gy., slty., sl. brn. tint
2900-2920 Sh., m. dk. to dk. gy.
2920-2930 Sh., as abv., pyr., Spr. cases

Misener sand
2930-2935 Ss., lt. gy., gl., v. f. to m. gr., pyr., sl. lmy. in pt., tt.

Ordovician—Middle Ordovician Series
Simpson Group
2935-2940 Ss., pale yel. brn. to m. lt. gy., v. f. to f. gr., scat. m. grs., ltl. pyr., few blk. shiny grs.
2940-2945 Ss., v. lt. gy. to wh., v. f. to f. gr., scat. m. grs., pyr., glau.
2945-2950 Ss., wh., v. f. gr., slty., pyr.
2950-2951 Sh., dk. gy., splty.
2951-2953 Sh., dk. gn. gy.
2953-2955 Ss., v. lt. gy., v. f. gr.
2955-2958 Sh., gy.
2958-2964 Ss., lt. gy., v. f. to m. gr.
2964-2967 Sh., gy.

Ordovician—Lower Ordovician Series
Arbuckle Group
Cotter and Jefferson City Dolomites
2967-2975 Dol., lt. gy. to pale yel. brn., f. to m. xl., por. in pt.
2975-2980 Dol., pale yel. brn., f. xl.
2980-2984 Dol., pale yel. brn. to lt. gy., f. to m. xl., scat. f. to m. rd. sd. grs. in pt., few vugs
2984-2987 Dol., as abv.; lt.-gy. cht.
2987 Total depth

WELL 19
BENNETT AND ROBERTS DRILLING CO.
No. 1 COLLINS
C N½ NW¼ NE¼ SEC. 2, T. 28 S., R. 4 E.
BUTLER COUNTY

Altitude: 1300 (estimated) Total depth: 2636 feet
Completion date: September 13, 1947
Initial production: 29 barrels
Electrical log: None
Sample intervals: 10-foot; 40-1350 feet
5-foot; 1350-1500 feet
10-foot; 1500-2560 feet
5-foot; 2560-2606 feet
Cored intervals: None

Depth, feet *Sample description*
0- 40 No samples

Permian—Lower Permian Series
Chase Group
Barneston Limestone
40- 42 Sh., m. to m. dk. gy.
42- 60 Ls., v. pale orng. to lt. gy., v. f. gr., Bry., s. fos. frags.; m.-lt.-gy. dns. mot. to fig. cht.
60- 73 Ls., as abv., Fus.; some m.-lt.-gy. spic. cht.

Matfield Shale

73- 77 Sh., m. gy., v. lmy.
77- 83 Ls., m. gy., v. f. gr., arg., dk.-gy. sps.
83- 90 Ls., v. pale orng., f. gr.; m.-lt.-gy. to m.-gy. cht. and spic. cht.
90- 95 Ls., m. lt. to m. gy., v. f. gr., arg., spines; cht. as abv.
95- 100 Ls., lt. gy., gran.; v. pale orng. f. gran. ls.
100- 103 Ls., v. pale orng., gran., Crin., Fus., vugs
103- 106 Sh., m. gy.
106- 110 Ls., m. gy., v. arg.; m.-lt.-gy. to m.-gy. dns. spec. cht.
110- 113 Ls., v. pale orng., f. gran.
113- 118 Sh., gn. gy., lmy.
118- 120 Sh., gy. red
120- 125 Sh., gn. gy., lmy.
125- 130 Ls., m. gy., v. f. gr., arg.

Wreford Limestone

130- 140 Ls., v. pale orng. to lt. gy., f. gr.; lt.-gy. to m.-lt.-gy. cht. and spic. cht.
140- 145 Sh., m. gy., v. lmy.
145- 148 Ls., m. gy., f. gr., arg.
148- 158 Ls., m. lt. gy., gran., sl. slty., spines, fos. frags.; m.-lt.-gy. to lt.-gy. dns. to gran. fos. cht.
158- 160 Sh., gy.
160- 190 Ls., v. pale orng., f. gr., Crin.; lt.-gy. to m.-lt.-gy. dns. fos. cht. and spic. cht.; m.-gy. to dk.-gy. cht.

Council Grove Group

190- 193 Sh., m. gy., lmy.
193- 200 Sh., gy. red, lmy.
200- 203 Sh., gn. gy., sl. lmy.
203- 207 Sh., m. dk. gy., lmy.
207- 210 Ls., m. lt. to m. gy., v. f. gr., arg.
210- 218 Ls., m. lt. gy., v. f. gr., dol.
218- 223 Sh., gy., lmy.
223- 226 Ls., m. lt. to m. gy., f. gr., mot. / dk. gy.
226- 228 Sh., m. gy., lmy.
228- 230 Sh., gy. red, lmy., cave ?
230- 235 Sh., gy., lmy.
235- 240 Ls., m. gy., f. gr., sl. arg.
240- 245 Ls., brn. gy., v. f. xl., dol.
245- 250 Ls., m. gy., f. gr., sl. arg.
250- 258 Sh., m. to m. dk. gy., lmy.
258- 264 Ls., m. gy., v. f. gr., arg.
264- 273 Sh., gn. gy.
273- 276 Sh., gy., lmy.
276- 282 Ls., brn. gy., f. xl.
282- 286 Sh., gy., lmy.
286- 295 Ls., pale yel. brn. to lt. gy., f. xl.
295- 300 Sh., gy., lmy.
300- 306 Ls., as abv.
306- 310 Sh., gy., lmy.

Beattie Limestone

310- 315 Ls., m. lt. gy., f. xl.
315- 320 Ls., pale yel. brn., f. xl.
320- 328 Sh., gy., lmy.
328- 340 Ls., brn. gy., v. f. gr., arg. in pt.
340- 348 Ls., pale yel. brn., f. xl.

Eskridge Shale

348- 353 Ls., m. gy., f. gr., arg.
353- 358 Sh., gy., lmy.

Grenola Limestone

358- 364 Ls., v. pale orng., gran., Fus., Crin.
364- 368 Sh., gy., lmy.
368- 374 Ls., as abv.
374- 382 Sh., gy., lmy.
382- 386 Ls., m. lt. gy., v. f. gr.
386- 400 Ls., m. gy., f. gr., arg., scat. dk.-gy. strs. and sps.

Roca Shale

400- 407 Sh., gy., lmy.
407- 415 Ls., v. pale orng. to pale yel. brn., f. gr.
415- 420 Ls., m. gy., f. gr., arg.
420- 423 Sh., gy., lmy.

Red Eagle Limestone, Johnson Shale, and Foraker Limestone

423- 434 Ls., v. pale orng. to pale yel. brn., f. gr., Fus., por.
434- 437 Sh., gy.
437- 442 Ls., as abv., por., ool. ?
442- 446 Ls., m. gy., f. gr., arg.
446- 448 Sh., gy.
448- 460 Ls., m. lt. gy., v. f. gr.
460- 464 Sh., gy., lmy.
464- 470 Ls., v. pale orng. to pale yel. brn., f. gr.
470- 474 Ls., m. lt. gy., gran. to f. gr., sl. arg., Fus.
474- 477 Sh., gy., lmy.
477- 480 Ls., m. gy., v. arg., Fus.
480- 485 Ls., brn. gy., f. gr.
485- 490 Sh., gy., lmy.
490- 496 Ls., m. gy., gran., sl. arg., many dk. fos. frags.
496- 500 Sh., gy., lmy.
500- 504 Ls., m. gy., f. gr., sl. brn., sl. arg., fos.
504- 507 Ls., m. gy., arg.

Admire Group

507- 511 Sh., m. dk. gy.
511- 515 Ls., m. gy., v. f. gr., arg., sl. gn. in pt.
515- 520 Sh., gn. gy., sl. dol.
520- 523 Sh., gy.
523- 525 Ls., m. lt. gy., f. gr.
525- 528 Sh., gy.
528- 532 Ls., m. lt. gy., f. gr., tr. of glau.
532- 540 Sh., m. gy., lmy.
540- 545 Ss., lt. to m. lt. gy., v. f. gr., slty., sl. lmy.
545- 550 Ss., lt. gy., v. f. gr., lmy., por.
550- 555 Sh., gy.
555- 560 Sltst., m. lt. gy., lmy., mica., tr. of glau.
560- 563 Ls., m. lt. gy., f. gr., sl. slty., glau.
563- 567 Sh., gy.
567- 573 Ls., brn. gy., v. f. xl., dol., sl. slty., tr. of glau.
573- 577 Sltst., m. lt. gy., lmy., mica.
577- 584 Sh., m. dk. gy., slty., carb., sl. mica.
584- 590 Sltst., m. dk. gy., lmy., fos. frags.
590- 600 Sh., m. dk. gy.
600- 605 Sltst., m. lt. gy.

Pennsylvanian—Virgil Series

Wabaunsee Group

605- 608 Ls., m. dk. gy., arg., fos. frags.
608- 616 Sh., gy.
616- 620 Sh., gy. red
620- 627 Sltst., m. lt. gy., lmy., Crin., Ost.
627- 630 Ls., brn. gy., v. f. xl.
630- 635 Sh., olv. gy.
635- 640 Sh., gy.
640- 644 Sltst., m. lt. gy., v. f. sdy., lmy.
644- 650 Sh., gy.
650- 658 Sltst., m. lt. to m. gy., lmy.
658- 660 Sh., gy.
660- 664 Ls., m. to m. dk. gy., v. arg.
664- 670 Sh., gy.
670- 674 Ls., as abv.
674- 683 Sltst., m. lt. to m. gy., lmy., sl. mica.
683- 690 Sh., gy.
690- 696 Sltst., m. lt. gy., v. f. sdy.
696- 700 Ss., lt. gy., v. f. gr., slty.

700- 704 Sltst., m. lt. gy., v. f. sdy.
704- 710 Sltst., m. lt. to m. gy.
710- 715 Sh., gy.
715- 720 Sltst., as abv.
720- 730 Sh., gy.
730- 737 Sltst., m. lt. to m. gy., v. f. sdy., sl. mica.
737- 740 Ss., lt. gy., v. f. gr., slty., mica.
740- 744 Sh., gy.
744- 750 Ss., lt. gy., v. f. gr., slty., sl. mica., sl. dol.
750- 755 Sltst., m. lt. gy., v. f. sdy., sl. mica.
755- 760 Sltst., m. lt. gy., sl. mica.
760- 765 Sh., gy.
765- 770 Sltst., m. lt. gy., v. f. sdy., sl. mica.

Zeandale Limestone and Willard Shale

770- 773 Ls., m. lt. to m. gy., f. gr., sl. arg.
773- 790 Sltst., m. lt. gy., v. f. sdy., sl. mica.; m.-lt.-gy. sl. mica. sltst.
790- 794 Sh., gy.
794- 797 Ls., brn. gy., arg.
797- 802 Sltst., m. lt. gy., sl. mica.
802- 808 Ss., lt. gy., v. f. gr., lmy., sl. mica.
808- 812 Ls., pale yel. brn. to brn. gy., f. gr., fos.
812- 816 Sh., gy.
816- 820 Ss., as abv.
820- 826 Sh., gy.
826- 830 Sltst., m. gy., sl. lmy.

Emporia Limestone

830- 840 Ls., lt. gy. to pale yel. brn., f. gr.
840- 843 Sh., gy.
843- 846 Ls., brn. gy., v. f. xl.
846- 850 Ls., brn. gy., v. f. xl., dol.

Auburn Shale

850- 854 Sh., gy.
854- 860 Sltst., lt. gy., v. f. sdy., sl. mica.
860- 863 Sh., gy.
863- 868 Sltst., as abv.
868- 873 Ss., lt. to m. lt. gy., v. f. gr., slty.
873- 876 Sh., gy.

Bern Limestone

876- 880 Ls., pale yel. brn., f. xl.
880- 883 Ls., m. lt. gy., f. gr.
883- 885 Sh., gy.
885- 890 Ls., m. gy., arg.
890- 897 Sh., gy.
897- 900 Ls., pale yel. brn., v. f. xl.
900- 910 Ls., m. gy., v. f. gr., sl. arg. in pt.

Scranton Shale

910- 920 Sh., gy.
920- 940 Sh., m. dk. gy., coal strgs., carb. films
940- 947 Sh., olv. gy.
947- 960 Sh., m. gy.
960- 970 Sh., m. gy., slty.
970- 990 Sh., m. dk. gy.
990-1000 Sh., m. gy., slty.

Happy Hollow Limestone and White Cloud Shale Members of Scranton Shale, and Howard Limestone

1000-1004 Ls., m. gy., v. f. gr., arg., Fus.
1004-1007 Sh., gy.
1007-1010 Ls., brn. gy., f. gr., sl. arg., Bry. ?
1010-1013 Ls., m. gy., arg.
1013-1020 Sh., m. gy., v. lmy., sl. olv.-gy. tint
1020-1025 Ls., pale yel. brn., v. f. xl., Fus.
1025-1030 Sh., gy.
1030-1044 Ls., m. lt. gy., f. gr., sl. arg., Fus., Crin.
1044-1050 Sh., gy.
1050-1060 Ls., pale yel. brn. to m. gy., f. gr., sl. arg., fos.
1060-1070 Ls., m. gy., f. gr., arg., Crin.

Severy Shale

1070-1077 Sh., gy.
1077-1085 Ls., brn. gy., f. gr., arg., fos., Crin.
1085-1095 Sh., m. gy.
1095-1100 Sh., gn. gy.
1100-1120 Sh., gy.
1120-1130 Sh., brn. gy.
1130-1140 Sh., gy.

Shawnee Group
Topeka Limestone, Calhoun Shale, and Deer Creek Limestone

1140-1145 Ls., m. gy., f. gr., arg.
1145-1150 Ls., m. lt. gy., f. gr.
1150-1153 Sh., gy.
1153-1166 Ls., pale yel. brn., f. gr., abnt. Fus.
1166-1168 Sh., gy.
1168-1175 Ls., m. to m. dk. gy., f. gr., v. arg., fos.
1175-1178 Ss., m. gy., v. f. gr., slty., lmy.
1178-1180 Sh., gy.
1180-1185 Ls., pale yel. brn. to m. lt. gy., v. f. xl.
1185-1188 Sh., gn. gy.
1188-1190 Sh., gy. red
1190-1193 Sh., dk. gy.
1193-1195 Sh., blk.
1195-1204 Ls., brn. gy. to m. gy., f. gr., sl. arg.
1204-1210 Sltst., m. gy., lmy., mica.
1210-1216 Ls., pale yel. brn., v. f. gr.
1216-1220 Sh., m. gy.
1220-1224 Ls., pale yel. brn., v. f. gr.
1224-1228 Sh., dk. gy.
1228-1230 Sh., gy. blk.
1230-1235 Ls., brn. gy., f. gr., sl. arg.
1235-1240 Sh., olv. gy.
1240-1260 Ls., v. pale orng., f. xl.
1260-1267 Ls., pale yel. brn., f. xl., Fus., Crin.

Tecumseh Shale

1267-1270 Sh., olv. gy.
1270-1274 Sh., m. dk. gy.

Lecompton Limestone

1274-1280 Ls., pale yel. brn. to brn. gy., f. gr.; m.-lt.-gy. dns. fos. cht.
1280-1293 Ls., v. pale orng., f. gr.
1293-1296 Sh., gy. red, cave ?
1296-1300 Sh., olv. gy.
1300-1303 Sh., gy.
1303-1308 Sltst., m. lt. gy., v. lmy.
1308-1310 Ls., m. gy., f. gr., sl. arg.
1310-1311 Ls., pale yel. brn., f. gr.
1311-1316 Sh., gy.
1316-1320 Sh., gy. red, cave ?
1320-1324 Sh., olv. gy. and gn. gy.
1324-1327 Sh., gy.
1327-1338 Ls., v. pale orng. to pale yel. brn., f. gr.
1338-1343 Sh., blk.
1343-1346 Sh., dk. gy.
1346-1350 Ls., m. gy. to brn. gy., f. gr., arg., Fus.
1350-1353 Sh., gy.
1353-1360 Ls., v. pale orng., f. gr., sft., Fus.
1360-1367 Ls., pale yel. brn., f. xl., calc. xls.
1367-1372 Sh., gy., lmy.
1372-1380 Ls., v. pale orng., f. gr.

Kanwaka Shale

1380-1387 Sh., m. gy. and gn. gy., sl. lmy.
1387-1390 Sh., gy. red, lmy., cave ?
1390-1400 Sh., gy., sl. lmy.
1400-1405 Sh., olv. gy., lmy.
1405-1410 Sh., gy., sl. lmy.
1410-1420 Sh., m. dk. gy.

1420-1425 Sh., gn. gy.
1425-1443 Sh., gy.

Oread Limestone

1443-1450 Ls., v. pale orng., f. xl., fos.
1450-1460 Sh., gy.
1460-1468 Ls., lt. gy. to v. pale orng., f. xl.
1468-1474 Sh., gy.
1474-1480 Ls., as abv.; lt.-gy. to m.-gy. cht., cave ?
1480-1488 Ls., brn. gy. to pale yel. brn., f. xl.
1488-1490 Sh., gy.
1490-1506 Ls., pale yel. brn., f. xl.
1506-1509 Sh., dk. gy.
1509-1513 Sh., gy. blk.
1513-1518 Ls., pale yel. brn., f. xl.; m.-gy. v. f. xl. ls.
1518-1520 Sh., gy.
1520-1525 Sh., gn. gy.
1525-1528 Ls., pale yel. brn., v. f. gr.
1528-1530 Sh., gy., Fus.
1530-1533 Ls., as abv.

Douglas Group

1533-1537 Sltst., lt. gy., mica.
1537-1543 Ss., lt. gy., v. f. gr., slty., lmy., mica.
1543-1547 Sh., gy.
1547-1555 Sh., brn. gy., slty.
1555-1560 Sltst., m. lt. gy., v. f. sdy., sl. dol. and mica.
1560-1565 Sh., m. dk. gy.
1565-1570 Sltst., m. lt. to lt. gy., v. f. sdy., sl. mica.
1570-1573 Sh., gy.
1573-1578 Ls., brn. gy., f. gr., sl. arg., Crin., spines, Fus.
1578-1582 Sh., gy.
1582-1590 Ss., lt. gy. to pale yel. brn., v. f. gr., slty., sl. mica., dol. in pt.
1590-1594 Sh., m. dk. gy.
1594-1595 Tr. coal
1595-1600 Sh., m. dk. gy.
1600-1604 Sltst., m. lt. gy. to pale yel. brn., sl. mica.
1604-1620 Ss., lt. gy. to pale yel. brn., v. f. gr., slty., sl. mica., carb. frags. in pt.
1620-1627 Sh., olv. brn. and pale to dusky brn.
1627-1630 Sltst., m. lt. to m. gy.
1630-1640 Sh., m. to m. dk. gy.
1640-1646 Sltst., m. lt. gy., v. f. sdy., mica.
1646-1650 Ss., lt. gy., v. f. gr., slty., sl. mica.
1650-1656 Sh., gy.
1656-1660 Sltst., m. lt. to m. gy., v. f. sdy., mica.
1660-1664 Sh., gy.
1664-1670 Sltst., m. lt. gy. to pale brn., mica.
1670-1683 Sh., m. to m. dk. gy.
1683-1686 Ls., brn. gy., f. xl., arg.
1686-1693 Ls., pale yel. brn., f. xl., Fus., Crin.
1693-1700 Sh., gy.
1700-1707 Sltst., lt. gy. to pale brn., mica.
1707-1710 Sh., m. dk. gy.

Pennsylvanian—Missouri Series
Lansing Group

1710-1720 Ls., pale yel. brn., f. gr. to f. xl., Crin., Ost.
1720-1725 Ls., m. lt. gy., v. f. gr.
1725-1740 Ls., v. pale orng. to pale yel. brn., v. f. to f. gr., Crin.
1740-1742 Ls., m. gy. to brn. gy., f. gr., arg.
1742-1747 Sh., olv. gy. to olv. brn.
1747-1756 Sh., gy.
1756-1760 Ls., v. pale orng. to pale yel. brn., f. gr., Fus.
1760-1770 Ls., lt. gy., v. f. gr.; ls. as abv.
1770-1773 Sh., gy.
1773-1785 Ls., v. pale orng. to pale yel. brn., f. xl., Fus., calc.
1785-1790 Ls., m. gy., v. f. to f. xl.
1790-1794 Sh., gy.
1794-1796 Ls., m. gy., v. f. xl., sl. arg.
1796-1805 Ls., pale yel. brn., f. xl.
1805-1810 Ls., v. pale orng., f. xl., Crin.
1810-1816 Ls., pale yel. brn., v. f. to f. xl.
1816-1818 Sh., gy.
1818-1830 Ls., as abv., scat. f. to m. vugs, Crin.
1830-1836 Ls., v. pale orng., v. f. xl.
1836-1840 Ls., as abv., v. f. to f. ool. and ooc.
1840-1850 Ls., v. pale orng. to pale yel. brn., v. f. to f. xl.
1850-1852 Sh., gy.
1852-1860 Ls., lt. to m. lt. gy., f. xl.; v. lt. gy. to m.-gy. dns. cht.
1860-1870 Ls., v. pale orng. to pale yel. brn., f. xl.
1870-1878 Ls., m. to m. dk. gy., v. f. xl., sl. arg.
1878-1883 Sh., gy.
1883-1890 Ls., pale yel. brn. to brn. gy., v. f. xl.
1890-1895 Ls., v. pale orng., f. xl.
1895-1900 Ls., m. gy., v. f. xl.
1900-1910 Ls., pale yel. brn., f. xl.
1910-1920 Ls., m. lt. to m. gy., v. f. xl.
1920-1925 Ls., pale yel. brn., f. xl.

Kansas City Group
Bonner Springs and Lane Shales 1925-2060

1925-1930 Sh., m. dk. gy.
1930-1940 Sh., m. gy., v. lmy., slty.
1940-1960 Sh., as abv., spine, Fus.
1960-1965 Sh., m. dk. gy.
1965-1966 Coal
1966-1975 Sh., m. dk. gy.
1975-1980 Sh., m. gy., lmy.
1980-1985 Sh., olv. gy., lmy., slty.
1985-2005 Sh., m. gy., lmy., sl. slty.
2005-2035 Sh., m. to m. dk. gy., lmy. in pt.
2035-2040 Sh., gn. gy.
2040-2050 Sh., gy.
2050-2060 Sh., m. gy., lmy.
2060-2067 Ls., pale yel. brn. to v. pale orng., f. xl.
2067-2070 Sh., gy., lmy.
2070-2076 Ls., m. gy. to brn. gy., v. f. xl.
2076-2080 Sh., m. to m. dk. gy.
2080-2085 Ls., pale yel. brn., v. f. to f. xl.
2085-2087 Sh., gy.
2087-2090 Ls., m. gy., f. to m. ool.
2090-2096 Ls., m. lt. gy. to pale yel. brn., f. to m. ool., Crin., Ost.
2096-2103 Ls., pale yel. brn., f gr..
2103-2106 Sh., gy., Fus.
2106-2120 Ls., pale yel. brn., v. f. xl.; lt.-gy. to m.-lt.-gy. dns. spic. cht.
2120-2122 Sh., gy.
2122-2125 Ls., brn. gy., v. f. xl.; m.-dk.-gy. dns. cht.
2125-2130 Ls., pale yel. brn., f. xl.
2130-2135 Ls., v. pale orng., v. f. gr., Crin., calc.; lt.-gy. to m.-lt.-gy. dns. cht.
2135-2148 Ls., as abv., Crin.
2148-2152 Sh., gy.
2152-2170 Ls., pale yel. brn., f. gr., some v. f. fnt. ool. ?
2170-2172 Sh., m. gy. to gn. gy., pyr.
2172-2180 Ls., pale yel. brn., f. xl., Fus.
2180-2183 Sh., blk.
2183-2186 Sh., dk. gy.
2186-2190 Ls., brn. gy., f. gr., sl. arg.
2190-2200 Ls., pale yel. brn., v. f. xl.
2200-2210 Ls., v. pale orng. to pale yel. brn., v. f. gr.; lt.-gy. to m.-lt.-gy. dns. cht.
2210-2213 Sh., blk.
2213-2217 Ls., m. gy., f. gr., arg.
2217-2218 Sh., gy.
2218-2225 Ls., pale yel. brn., f. xl.
2225-2230 Ls., pale yel. brn., f. gran.

2230-2240 Ls., m. gy. to brn. gy., f. xl., mot. and sp. in pt., sl. arg.
2240-2244 Ls., m. gy., f. gr., arg.
2244-2250 Sh., m. gy., lmy.
2250-2255 Sh., pale to mod. brn., lmy. in pt.
2255-2260 Ls., m. to m. dk. gy., v. f. xl., sl. arg.
2260-2270 Ls., pale yel. brn. to brn. gy., f. xl.; m.-dk.-gy. to dk.-gy. dns. spic. cht.

Pleasanton Group

2270-2273 Sh., m. dk. gy., v. lmy.
2273-2293 Sh., m. dk. gy.
2293-2298 Sh., m. gy., slty., lmy.
2298-2300 Ls., pale yel. brn., f. gr.
2300-2304 Sh., gy.
2304-2311 Ls., pale yel. brn., f. xl.
2311-2314 Ls., pale yel. brn., slty., fos.
2314-2316 Sh., gy.
2316-2320 Sltst., lt. gy. to lt. gn. gy., v. f. sdy., sl. lmy.
2320-2330 Sltst., m. lt. gy. to pale brn., mica.
2330-2343 Sh., gy.
2343-2345 Ls., brn. gy., f. gr., arg.
2345-2350 Sh., m. gy.
2350-2360 Sh., gn. gy.

Pennsylvanian—Des Moines Series
Marmaton Group
Altamont Limestone 2360-2372

2360-2372 Ls., pale yel. brn. to brn. gy., v. f. xl.
2372-2375 Sh., blk., tr. of coal
2375-2378 Sh., gy.
2378-2383 Ls., brn. gy., gran.
2383-2386 Sh., gy.
2386-2393 Ls., m. dk. gy., f. gr., arg.
2393-2397 Sh., gy.
2397-2403 Ls., pale yel. brn., v. f. xl., Fus.; brn.-gy. v. f. xl. ls.
2403-2406 Ls., m. gy., f. gr., arg.
2406-2410 Sh., olv. gy.
2410-2412 Ls., brn. gy., v. f. xl.
2412-2417 Sh., gy.
2417-2422 Ls., brn. gy., f. xl.
2422-2426 Sh., blk.
2426-2430 Ls., brn. gy., v. f. xl., sl. arg.
2430-2432 Sh., gy.
2432-2438 Ls., pale yel. brn., v. f. xl.
2438-2442 Sh., blk.
2442-2445 Sh., dk. gy.
2445-2448 Ls., pale yel. brn., v. f. xl.

Cherokee Group

2448-2450 Sh., blk.
2450-2455 Sltst., lt. to m. lt. gy., lmy.
2455-2460 Sh., gy.
2460-2465 Sltst., m. lt. gy., v. f. sdy., lmy., sl. gn.
2465-2470 Sh., gy.
2470-2475 Sh., olv. gy.
2475-2480 Sh., mod. brn.
2480-2485 Sh., pale brn.
2485-2490 Sltst., lt. gy. to pale yel. brn., v. f. sdy.
2490-2495 Sh., gn. gy.
2495-2504 Sh., m. dk. to dk. gy.
2504-2507 Ls., m. dk. gy., v. f. xl., dol., sl. arg., sl. brn.
2507-2510 Sh., gy.
2510-2520 Ls., pale yel. brn., v. f. xl.; brn.-gy. v. f. xl. ls.
2520-2523 Ls., m. dk. gy., v. f. gr., arg.
2523-2527 Sh., blk.
2527-2530 Ss., lt. gy., v. f. gr., slty.
2530-2532 Ss., lt. gy., v. f. gr., lmy.
2532-2540 Sh., gy.
2540-2546 Sltst., lt. to m. lt. gy. and lt. gn. gy.
2546-2548 Ss., lt. gy., v. f. gr., slty., few m. sbrd. grs.
2548-2557 Sh., gn. gy. mot. / gy. red

Ordovician—Middle Ordovician Series
Simpson Group

2557-2560 Ss., wh., f. to m. gr., sbrd., dol. in pt., some c. sbrd. grs., o. stn., blk. asph.
2560-2562 Ss., wh., v. f. to f. gr., glau. in pt.
2562-2564 Sltst., wh. to lt. gy., v. f. sdy., glau.
2564-2567 Sh., gn. gy.
2567-2570 Sh., gy. red, cave ?
2570-2580 Sh., m. gy.
2580-2583 Sltst., pale yel. brn., sl. dol.
2583-2586 Ss., lt. gy. to wh., v. f. to f. gr.
2586-2593 Sh., gy.
2593-2597 Sh., dk. gn. gy.
2597-2600 Sh., gy.
2600-2606 Ss., wh. to lt. gy., m. to c. gr., sbrd., drills loose
2606-2636 No samples
2636 Total depth