

KAN-948
Low 5059

W. S. Jarrett No. 10 Well

Elk District, Kanawha County.

By South Penn Natural Gas Company, Parkersburg, W. Va.

Located 5.49 mi. S. of 30°30' and 5.50 mi. W. of 81°25' - NW - Clendenin
Quadrangle.

Elevation, 209.52' L.

Permit Kan- 948

Drilling commenced July 29, 1942; completed Sept. 18, 1942.

Oil Well.

Section based on samples from 1509 to 1920' examined by J.H.C. Martens.

Top	Bottom	Thickness	
<u>Greenbrier Limestone, 169 feet</u>			
1495			Top "Big Lime" in driller's record.
1509	1526	17	Limestone, nearly white
1526	1546	20	Limestone, light-brown
1546	1552	6	Limestone, light-brown, sandy and oolitic
1552	1566	14	Limestone very light brown (gas and water, 1557') gas 1662-1667')
1566	1572	6	Limestone, very light brown, oolitic
1572	1612	40	Limestone, nearly white, sandy and oolitic; there are large variations in amount of sand in different samples
1612	1617	5	Limestone, nearly white to greenish
1617	1626	9	No sample
1626	1631	5	Limestone, nearly white to greenish
1631	1642	11	Limestone, very light brown, sandy
1642	1653	11	Limestone, very light brown, dolomitic
1653	1664	11	Limestone, very light brown, dolomitic and sandy
<u>Pocono Formation, 256+ feet</u>			
1664	1667	3	Shale, dark-gray, silty (gas, 1662-1667')
1667	1683	16	Sandstone, gray, red and green
1683	1689	6	Shale, gray and red, sandy
1689	1694	5	Shale, dark-red, sandy
1694	1745	51	Shale and siltstone, gray; most of the shale is very dark; siltstone increases in amount toward bottom of the interval
1745	1761	6	Sandstone, gray, coarse, pyritic

Top	Bottom	Thickness	
1751	1765	14	Sandstone, light-gray to nearly white, coarse - to medium-grained (Squaw Sand, 1751-1773; show of oil, 1763')
1765	1767	2	Sandstone, very light gray, fine - to medium grained
1767	1773	6	Sandstone, gray, fine to very fine, interstratified with some gray shale
1773	1779	6	No sample
1773	1794	16	Shale, dark-gray
1794	1843	54	No sample
1843	1857	9	Sandstone, light-brown, very fine, 80%; gray silty shale, 20%
1857	1864	7	Shale, dark-gray
1864	1875	11	Sandstone, light-gray, fine, 50%; dark-gray, sandy shale, 50%
1875	1879	4	Sandstone, light-gray, fine (gas and oil, 1877'; Weir Sand, 1875-1915')
1879	1885	6	Sandstone, white to light-gray, fine, interstratified with gray silty shale (oil, 1883-1885')
1885	1889	4	Sandstone, very light gray, fine
1889	1893	4	Sandstone, light-gray, very fine, 75%; darker gray silty shale, 25%
1893	1899	6	Sandstone, very light gray, fine
1899	1905	6	Sandstone, nearly white, fine - to medium-grained
1905	1907	2	No sample
1907	1915	8	Sandstone, nearly white, medium-grained; contains some shale pebbles
1915	1920	5	Shale, gray, silty
	1920		Total depth

W.S. Garrett No. 10 Well by South Penn Natural Gas Company Kan 948
 Squaw By James H. G. Martin, Mineralogist
 West Virginia Geological Survey
 Sand. 1942 *Martins*
 M

1751-1765 7 Samples.

All of these consist of coarse- to medium-grained, light-gray to nearly white sandstone composed mostly of quartz grains. Crystal faces are conspicuously developed on many of the quartz grains. Pore spaces are numerous and plainly visible. Pyrite in small amount is present throughout and at least a considerable part of it is in exceedingly small crystals on the outside of secondary quartz projecting into the pores. Kaolinite is present in all samples as white to very light yellow fine and loosely coherent aggregates. Some of these look as if they are an alteration product of grains comparable in size with the quartz grains, and some of ^{the kaolinite} appears to occur as a partial filling of pore spaces. At least a part of the kaolinite must have been formed after the secondary quartz since it occurs as a coating on the quartz crystals.

Only two pieces of shale were seen in these samples and these appear to be from pebbles rather than interstratified shale layers.

1765-1767 Very light gray fine- to medium-grained sandstone containing numerous flat gray shale pebbles. Sandstone contains fine aggregates of kaolinite, a little pyrite, and a few flakes of mica.

1767-1769

Sample is made up approximately as follows.

Fine light-gray sandstone 50%
Gray sandy and micaceous shale 30%
Brownish-gray hard siltstone containing siderite? 20%

The sandstone and shale are irregularly interstratified. A few of the quartz grains in the sandstone have crystal faces. If many pore spaces are present they are too small to be easily seen. There is a little pyrite and kaolinite.

1769-1771

Gray fine sandstone with thin streaks of darker gray shale. There is a little mica in both the shale and sandstone and some kaolinite aggregates in the sandstone.

A few pore spaces are visible in the sandstone and some of the grains have crystal faces.

1771-1773

Fine to very fine gray shaly and micaceous sandstone with no visible pore spaces. There are a few fragmentary carbonized plant remains.

W. S. Garrett No. 10 Well South Penn Natural
Weir Sand Gas Company

1875-1879 Sample labelled "Top of Weir, extracted"

Consists of very small fragments; about 90% white fine sandstone and 10% gray shale. Many of sand grains show crystal faces.

1879-1885 3 samples.

Fine white to light-gray sandstone interstratified with gray silty shale. Some quartz in sandstone have crystal faces and some pore spaces are visible. Some fine white aggregates of kaolinite in spaces between the quartz grains in sandstone, which also contains a few flakes of mica, few pieces of carbonaceous matter (coal) and a little pyrite.

1885-1887 Very light gray fine sandstone with none of the darker shaly material as in the last three samples. Texture is a little coarser than in any of the three preceding samples and pore spaces and crystal faces (on the quartz) are more plainly visible. Kaolinite partly fills the pores and occurs as a coating on some of the quartz grains.

1887-1889 Sandstone about the same as last but has a slight concentration of mica along the bedding planes and contains a few pieces of carbonaceous matter.

Two samples

1889-1893 Very fine, light - gray sandstone (about 75%) irregularly interstratified with darker gray silty shale (25%). Both shale and sandstone contain some mica. Some fragments of sandstone without any shale attached are a little coarser than the rest and similar to the sandstone from 1885 - 1889.

1893-1895 Very light gray fine sandstone with a few thin shaly and micaceous streaks. Many of quartz grains show crystal faces.

1895-1899 Very light gray fine sandstone with thin shaly streaks. Some mica flakes and small pieces of coal along bedding planes. Some of quartz grains show crystal faces. One piece of sandstone from 1895 - 1897 contains flat shale pebbles.

1899-1903 2 samples. Nearly white, fine - to medium - grained sandstone with high proportion of quartz. Texture is a little coarser and pore spaces more plainly visible than in the preceding samples of the Weir sand. Many of quartz grains have crystal faces. No shale streaks or pebbles. Some fine aggregates of kaolinite which seem to partly fill the spaces between the quartz grains. There is a very little pyrite.

- similar to
- 1903-1905 Sandstone, medium-grained \wedge two samples except that some it contains as a few flat shale pebbles.
- 1905-1907 No core.
- 1907-1909 Nearly white medium-grained sandstone containing a few flat shale pebbles up to 1 inch long. Pore spaces are plainly visible and many grains have crystal faces. Similar to 1903-1905.
- 1909-1911 Nearly white medium-grained sandstone with plainly visible pore spaces and crystal faces on many grains. Some white aggregates of kaolinite, part of which are visible porons. A few thin shale pebbles and one dark shaly layer less than 1 mm. thick.
- 1911-1913 Nearly white - medium-grained sandstone with general appearance similar to last sample but has more pebbles of gray shale around the borders of which there are many small octahedral crystals of pyrite.
- 1913-1915 Sample contains two pieces of sandstone each ~~to~~ about $\frac{1}{2}$ inch thick. One is similar to the sandstone in the last two samples, but has no shale pebbles. The other is darker, more poorly sorted and contains grains and small pebbles of shale. It is coarser in texture but poorly sorted. It appears to be tightly cemented, partly with dolomite and siderite.

1915-1917 Gray silty shale, irregularly interstratified with lighter gray siltstone & or very fine sandstone. Two small pieces of light-gray, medium-grained sandstone which appear to have little or no porosity. Cement is partly dolomite.

1917-1920 Gray silty shale with some thin irregular streaks of light-gray siltstone

ETK Dist Kawawha Co.
Kan-948 - 1942

Jar No. 1

Jarrett Well

1751 1753

Coarse light-gray sandstone composed mostly of quartz grains. Pore spaces are plainly visible with 9x magnification. Many of grains show crystal faces due to secondary growth. There are many small pyrite crystals on the outside of the quartz grains and projecting into the pores but apparently not anywhere nearly filling any of the larger ones. Also occurring opening between the grains and filling thereof to a much greater extent than does the pyrite are very fine loosely coherent aggregates of a white to very slightly yellow mineral, apparently micaceous in structure. The few sandstone fragments in the sample are all very nearly alike.

In addition to the sandstone there is one gray shale fragment $\frac{1}{4}$ inch thick. One side is rough, probably where it was in contact with sandstone. The shale is highly pyritic.

Jarrett

Bayou Boyer.

1751-1753

some of clay mineral scraped off has index slightly
over 1.56 and general appearance like kaolinite from
Weir sand. With it we obtained a few fragments of
potash feldspar.

Jarrett

at No. 2
 1753-1755 Light-gray, medium- to coarse-grained sandstone, very similar to that from 1751-1753. At least a considerable part of the pyrite is definitely later than the secondary quartz since it is on the outside of it. Some of aggregates of clay or micaceous mineral in the pore spaces are themselves porous.

One sandstone fragment has gray shale attached which seems to be part of a shale pebble rather than a layer of shale interstratified.

1755-1757 Light-gray coarse sandstone, same as 1751-1753

1757-1759 Light-gray coarse sandstone, same as 1751-1753

1759-1761 Light-gray medium-grained sandstone, many quartz grains have crystal faces. Many of grains are partially coated and many pores partially filled with micaceous? white mineral in very small crystals. It is in fine aggregates at least part of which appear porous. Some of it at least is later than the secondary quartz since small crystals of it are on the outside of crystal faces of the quartz. Also interstratified shale layers.

1761-1763 Very light gray medium-grained sandstone. Crystal faces on many of quartz grains. Pore spaces are plainly visible. Contains less pyrite than preceding samples. Contains the same white clayey or micaceous mineral.

Jarrett

1763-65

Very light gray medium grained fine sandstone with crystal faces on many quartz grains. Many small pyrite crystals and white fine aggregates of micaceous mineral on the outside of some of the pores.

1765-67

Very light gray sandstone with texture about on the border between medium - and fine grained. Contains numerous flat ^{gray} shale pebbles up to about an inch in length. The sandstone contains a few flakes of mica, mostly muscovite. Many small pyrite crystals and aggregates of them. Amount of pyrite in two or any of preceding is probably not over 1% at most 2 per cent. Fine aggregates of white mineral most of which appear to have formed in the cavities but some are perhaps altered grains.

1767-69

Sample consists approximately of

Fine light gray sandstone 50%

Gray sandy and micaceous shale 30%

Brownish gray hard siltstone containing siderite? 20%

The three pieces of siderite? siltstone present all fit together to make a bed $\frac{1}{2}$ inch thick without any of the sandstone or shale attached to it.

The sandstone and shale are irregularly interstratified. A few of quartz grains in the sandstone have crystal faces. These faces spaces are either not plentiful as they are too small to be seen easily. A little pyrite and about same amount of white clayey mineral.

Garrett

1769-71

gray fine sandstone with thin streaks of darker gray shale
a little mica in both shale and sandstone. Crystal faces
on a few quartz grains in sandstone. A few pore spaces are
visible. Some aggregates of fine white mineral part of which
look like altered sand grains.

1789-73

One piece of grayish - brown ^{sideritic?} siltstone about $\frac{1}{4}$ " thick
Thin to very fine gray shaly ^{mudstone} sandstone. Dark silty
shale is irregularly interstratified with a larger quantity
of lighter gray sandstone which contained a few fragmentary
carbonized plant remains. No visible pore spaces.

Jarrett

1879-1880 White fine sandstone interstratified with gray silty shale. Sample is about $\frac{2}{3}$ sandstone and $\frac{1}{3}$ shale. One of larger pieces of sandstone has a plant fossil about 2 in x $\frac{1}{2}$ in consisting of coal and pyrite. Many of quartz grains have crystal faces. Some white clayey material between quartz grains. Very small amount of pyrite.

1881-83 Fine light - gray to slightly yellowish sandstone. Slightly micaceous and has large amount of dark shaly streaks which might be described as silty and sandy shale. Some crystal faces on quartz grains in sandstone. Few pore spaces possible. Considerable amount of white to slightly yellowish clayey material in spaces between quartz grains. Very little pyrite.

1883-85 Fine very light gray sandstone with some darker shaly streaks. Contains small amounts of both muscovite and biotite, a few pieces of carbonaceous matter (like coal) and a little pyrite. Some crystal faces on quartz grains. Fine white clayey? material partly filling spaces between grains.

1885-87 Fine very light gray to slightly yellowish ^{fine} sandstone. Has more of darker shaly material present in last three samples. Crystal faces on many quartz grains. Pore spaces are more apparent than in any of three preceding samples. Very finely crystalline clayey or micaceous mineral partly filling pores and coating some of quartz grains. No pyrite seen. Texture is a little coarser than any of three preceding.

garnet

1887-89

Very light gray fine sandstone with crystal faces on many of quartz grains. A few flakes of mica and a little white clayey material. Slight concentration of mica along bedding planes. A few pieces of carbonaceous matter.

1889-91

About $\frac{3}{4}$ fine to very fine, light gray sandstone and $\frac{1}{4}$ darker gray, silty shaly fine and irregularly interstratified. Both shale and sandstone contain some mica. Several fragments consist entirely of sandstone which is practically the same as that in the sample above.

1895-97

Thin nearly white sandstone, contains flakes of mica and small pieces of coal along bedding planes. One of larger fragments shows sandstone irregularly interstratified with thin layers of gray shale. Another shows sandstone containing flat shale pebbles.

1891-93

Almost identical with samples from 1889-91

1893-95

Very light gray fine sandstone. Many of quartz grains show ~~to~~ crystal faces. Splits along bedding planes ~~along~~ which there is a slight concentration of mica. There are a few thin shaly streaks.

1897-99

Very light gray fine sandstone. Some concentration of mica along bedding planes; also some thin shaly streaks and some carbonized plant remains containing pyrites. Some of quartz grains have crystal faces. There is some white clayey material in this as in all of the preceding samples.

Garrett

1899-1901

Nearly white, fine to medium-grained sandstone. More nearly pure quartz than the preceding samples of the Weir from this well and a little coarser in texture. Many of quartz grains have crystal faces. Pore spaces are plainly visible. No shale streaks or ~~flat~~ pebbles. Many of spaces between quartz grains are partly filled by fine aggregates of white clayey or micaceous mineral.

1901-1903

Nearly white, medium-grained sandstone. Has high proportion of quartz and many of the grains show crystal faces. Pore spaces are plainly visible. Many of them are partly lined with very fine textured white clayey or micaceous mineral. Contains a very little pyrite.

1903-05

Sandstone, same as last except that a few flat shale pebbles are enclosed in some of the sandstone.

1905-07

No core

1907-09

Nearly white ^{medium-grained} fine sandstone. Crystal faces on many of quartz grains. Pore spaces are plainly visible. A few flat shale pebbles up to about an inch long. Almost the same as 1903-05 but probably has a few more pebbles of shale.

1909-11

Nearly white medium-grained sandstone. Crystal faces on many quartz grains. Pore spaces are plainly visible. Some are partly filled with fine aggregate of clayey material. Some of these aggregates are porous. A few very thin shale pebbles and one dark shaly layer less than 1 mm thick.

white mineral in fine aggregates

1957-09

$n = 1.56$. immersion liquid.

n of mineral distinctly less than 1.56. D.R. apparently low, but crystals very small

$n > 1.54$



$n < 1.56$ but close

n apparently a little greater than 1.55 but difficult to find many pieces of the mineral in this liquid.

Crushed portion of the sandstone and separated fine

material by decantation

in liquid of $n = 1.55$

Clay mineral - small crystals and crystals aggregates.

Some basal sections have hexagonal appearance.

well developed platy structure. Good basal cleavage shown on crystals which are on edge. Comparison with liquid $n = 1.55$ shows that both indices of quartz are undoubtedly less than index of clay mineral.

Checked refractive indices of liquid and found that on the basis of corrected indices the clay mineral has indices between 1.561 and 1.571. Since it has very low double refraction and characteristic shapes for kaolinite, it is undoubtedly kaolinite.

In addition to kaolinite the fine fraction contains many angular fragments of quartz and a very few pieces of a mineral with lower index, apparently potash feldspar.

Garrett

1911-13

Nearly white medium-grained sandstone. Has slight brownish stain. Contains many flat pebbles of gray shale; also a few pieces of shale no larger than the quartz grains in the sandstone. In these pebbles and especially along their contact with the enclosing sandstone are many small octahedral crystals of pyrite. Pyrite is much scarcer in the rest of the sandstone, although there is a little more than in most of the other samples of the well sand from this well. ~~For~~ many of quartz grains have crystal faces. Pore spaces are plainly visible. Some of the pore appear to be entirely and other partly filled with fine, white, clayey? mineral.

1913-15

Sample is about half sandstone and half gray shale. The two pieces of sandstone, each of about $\frac{1}{2}$ inch thick across the bedding are of different kinds! (1) One is porous and similar to the sandstone in last sample but has no shale pebbles. (2) The other is darker, more poorly sorted, and appears to be tightly cemented. Maximum grain size is larger and there are some sand grains and small pebbles of shale. There is a little pyrite and many small brown specks, apparently siderite. Cement is partly dolomite.

1915-17

Most of the sample is gray shale irregularly interstratified with lighter gray siltstone or very fine sandstone. Two small pieces of light-gray medium-grained sandstone which appear to have little or no porosity. Part of cement in this sandstone is white to orange dolomite.

Garrett

1917-20

gray silty shale with some thin irregular streaks
of light gray siltstone
