

Operator: United Fuel Gas Co.
 Farm: Lynn Camp Coal Corp.
 Well No.: 9590
 Location: Buchanan County
 1700' S of 37°20'
 3800' W of 82°10'

Elevation: 1094.22'

Total Depth: 3815'

Remarks: Elevation and location of well site with reference to: measured section 134; Stiltons Creek core 2 1/2 miles SE; and geology along Levisa Fork; indicate that well spudded in about 150' below the Splash Dam coal and about 135' above the Kennedy coal. (See Harman Topo)

Formation boundaries of Mississippian rocks determined from geophysical well logs; formational boundaries of Pennsylvanian rocks determined from geological description of well cuttings. Depths recorded below are 10 feet deep, in relation to ground level.

<u>Formation</u>	<u>Top</u>	<u>Bottom</u>	<u>Thickness</u>
Pennsylvanian System			
Post Lee Formation "in at surface"		180	180'
		Splash Dam coal at -150'	
		Kennedy coal 108-110	
Lee Formation	180	1400	1220'
		quartzose sand 180-200	20'
		quartzose sand 210-300	90'
		Jawbone coal 398-400	
		Upper Seaboard coal 568-570	
		quartzose sand 580-790	210'
		Upper Horsepen coal 820-822	
		quartzose sand 880-930	50'
		quartzose sand 950-970	20'
		War Creek coal 975-980	
		Lower Horsepen coal 1070-1071	
		Pocahontas #9 coal 1091-1092	
		quartzose sand 1150-1180	30'
		quartzose sand 1200-1210	10'
		quartzose sand 1250-1278	28'
		quartzose sand 1300-1320	20'
		quartzose sand 1375-1400	25'
		total quartzose sand	503'

Pocahontas Formation	?	?	*
	*Is probably absent		

Mississippian System

Bluestone Formation	1400	1861	461'
Pride Shale	1754	1861	107'
Princeton Interval	1861	1959	98'
Little Stone Gap Member	1959	?	?
	2082	2104	22'
Maxon Sands	2256	2382	126'
	2432	2510	78'
Greenbrier Formation	2558	2998	440'
Maccrady	2998	$\begin{array}{r} 2998 \\ 1968 \\ \hline 1030 \end{array}$	$\begin{array}{r} 2998 \\ 1094 \\ \hline 1904 \end{array}$

Operator: United Fuel Gas Co.

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Well No.: 9590

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~~700-800'~~ S of 37°20'

3700' W of 82°10'

Elevation: 1094.22'

Total Depth: 3815'

Geologic log by Marshall S. Miller, January 1972.

Samples are measured from N. B., 10 feet above ground level.

<u>Depth</u>	<u>Thickness</u>	<u>Description</u>
0- 50	50'	No samples
50-100	50'	Siltstone, gray, light gray to dark gray, finely micaceous, generally argillaceous, with abundant carbonaceous material, locally calcareous
100-108	8'	Shale, dark gray, fairly fissile, slightly silty
108-110	2'	Coal, pure to impure, dull to vitreous luster
110-125	15'	Shale, dark gray to black, locally carbonaceous
125-160	35'	Siltstone, gray to light gray, generally argillaceous and pebbly, locally siliceous
160-180	20'	Sandstone, light gray, very fine to fine grained, subrounded, moderately sorted, with scattered muscovite, abundant dark rounded rock fragments, calcareous clay matrix, moderately quartzose, 80 to 85% quartz
180-200	20'	Sandstone, white, quartzose, fine to medium grained, subrounded, well sorted, rare muscovite, rare rock fragments, over 90% quartz
200-210	10'	Sandstone, light gray to tan, very fine to medium grained, subangular to subround, with scattered muscovite, and abundant dark rock fragments, interstitially silty, about 80% quartz, a shale stringer is present within interval

210-240	30'	Sandstone, white, quartzose, fine to coarse grained, subangular to subround, moderately sorted, rare matrix material and dark rock fragments, over 95% quartz
240-250	10'	Sandstone, white, quartzose, coarse grained to granular with rare conglomerate, subangular to rounded, moderately to poorly sorted, over 95% quartz
250-300	50'	Sandstone, as in 210-240, with rare quartz pebbles throughout
300-320	20'	Shale, dark gray, hard and brittle, locally pyritic
320-380	60'	Siltstone, gray to dark gray, shaly or argillaceous
380-398	18'	Sandstone, light gray to tan, very fine to fine grained, subangular to subround, poorly sorted, very silty, with considerable muscovite, and dark argillaceous rock fragments
398-400	2'	Coal, dull, bony and silty
400-420	20'	Siltstone, gray to light gray, locally carbonaceous
420-460	40'	Sandstone, light gray to gray, fine to coarse grained, subangular, poorly sorted, with abundant muscovite, and dark rock fragments, abundant clay-silt matrix material, traces of feldspar, about 70% quartz
460-480	20'	Siltstone, gray, hard, argillaceous or shaly, locally calcareous, finely micaceous
480-520	40'	Shale, dark gray, hard, brittle, finely micaceous
520-540	20'	Sandstone, white, moderately quartzose, fine grained, rounded, well sorted, considerable white clay-silica matrix, rare muscovite and dark rock fragments, 85 to 90% quartz
540-568	28'	Shale, dark gray, hard, pebbly, locally carbonaceous, locally silty

568-570	2'	Coal
570-580	10'	Shale, as in 540-568
580-630	50'	Sandstone, white, quartzose, very fine to medium grained, and coarser grained downward, subrounded, moderately sorted, rare dark rock fragments and carbonaceous material, rare muscovite and small amount of clay matrix material, 90 to 95% quartz
630-710	80'	Sandstone, white, quartzose, medium grained to granular, with scattered conglomeratic quartz pebbles throughout, subangular to subround, poorly sorted, with little or no matrix material, rare dark colored chert, rare tourmaline, over 95% quartz
710-720	10'	Sandstone, white, quartzose, medium to coarse grained, subrounded, moderately sorted, over 95% quartz
720-730	10'	Sandstone, as in 630-710
730-760	30'	Sandstone, as in 630-710, lesser amounts of dark gray, carbonaceous, shaly material
760-770	10'	Sandstone, white, quartzose, medium grained to granular and conglomeratic, subangular to subround, poorly sorted, no visible matrix material, rare dark rock fragments, some secondary quartz overgrowths, almost 100% quartz
770-790	20'	Sandstone, white, quartzose, very fine to fine grained, subrounded, well sorted, white clay silica material, and occasional thin coaly laminations, about 90% quartz
790-820	30'	Sandstone, light gray, fine grained, interstitially silty, slightly micaceous with abundant coaly laminations, about 75 to 80% quartz
820-822	2'	Coal, dull, silty and bony
822-830	8'	Sandstone, as in 790-820
830-840	10'	Shale, dark gray, hard, brittle, locally carbonaceous

840-860	20'	Sandstone, light gray, medium to very coarse grained, subangular, poorly sorted, with scattered muscovite, biotite, and chlorite, abundant reworked carbonaceous and argillaceous rock fragments, considerable feldspar, abundant clay-silt matrix material, about 70% quartz, 5% feldspar, 10% matrix, 10% rock and accessory mineral fragments
860-880	20'	Sandstone, light gray, moderately quartzose, fine grained, silty with abundant argillaceous partings and thin shale stringers
880-900	20'	Sandstone, white, quartzose, mostly medium grained, subrounded, well sorted, rare dark rock fragments, small amount of matrix material, about 95% quartz
900-930	30'	Sandstone, white, quartzose, medium grained to granular with large quartz pebbles, subangular to subround, poorly sorted, with rare muscovite, dark rock fragments, and chert fragments, little or no matrix material, 90 to 95% quartz
930-940	10'	Shale, gray, finely micaceous, slightly silty
940-950	10'	Siltstone, gray, argillaceous, finely micaceous
950-970	20'	Sandstone, white, quartzose, fine grained, subrounded, well sorted, little or no matrix material, scattered dark, rounded, argillaceous rock fragments, about 90% quartz
970-975	5'	Shale, dark gray, silty, micaceous
975-980	5'	Coal, good show, dull to high vitreous luster, irregular and conchoidal fracture, bony and silty in part
980-1000	20'	Siltstone, gray, argillaceous, carbonaceous in part
1000-1070	70'	Shale, dark gray, finely micaceous, silty, locally carbonaceous
1070-1071	1'	Coal, pure, high luster, blocky fracture

1071-1091	20'	Siltstone, gray, siliceous, with carbonaceous-shale partings, and thin shale stringers
1091-1092	1'	Coal, hard, shaly in part
1092-1100	8'	Siltstone, as in 1071-1091
1100-1125	25'	Shale, dark gray to black, carbonaceous, locally silty
1125-1150	25'	Sandstone, light gray to buff, very fine to fine grained, micaceous and very silty, with white clay silt matrix material, thin argillaceous partings throughout, grades downward to a fine to medium grained, moderately quartzose sand
1150-1180	30'	Sandstone, white, quartzose, fine to medium grained, subangular to subround, moderately sorted, rare muscovite, scattered dark rock fragments, small amount of clay-silt matrix material, about 90% quartz
1180-1200	20'	Sandstone, light gray, very fine to medium grained, subangular to subround, poorly sorted, abundant clay-silt matrix material and dark rock fragments, scattered muscovite, about 80 to 85% quartz
1200-1210	10'	Sandstone, white, quartzose, fine to coarse grained, subangular to rounded, moderately to poorly sorted, small amount of matrix material, very rare rock fragments, over 90% quartz
1210-1250	40'	Sandstone, light gray, fine to coarse grained, subangular, poorly sorted, very silty, with abundant argillaceous material present, a moderately quartzose sand
1250-1278	28'	Sandstone, white, quartzose, fine to medium grained, subrounded, moderately sorted, small amount of matrix material, rare dark rock fragments, over 90% quartz, conglomeratic at base
1278-1280	2'	Coal, high vitreous luster, blocky fracture

1280-1290	10'	Sandstone, light tan, very fine to medium grained, subangular, poorly sorted, with scattered muscovite, dark argillaceous and coaly material, interstitially silty, about 75% quartz
1290-1293	3'	Coal, hard and shaly in part
1293-1300	7'	Siltstone, dark gray, argillaceous, carbonaceous in part
1300-1310	10'	Sandstone, white to light gray, fine to very fine grained, subangular to subround, moderately sorted, with rare muscovite, and scattered dark rock fragments, moderately quartzose to quartzose, about 90% quartz
1310-1320	10'	Sandstone, white, with yellow iron stains, fine to medium grained, subangular to subround, poorly sorted, little or no matrix material, continued presence of dark argillaceous rock fragments which could be due to contamination, about 90% quartz
1320-1330	10'	Siltstone, dark gray, argillaceous, finely micaceous
1330-1350	20'	Sandstone, light gray to white, very fine to medium grained, subangular to subround, moderately to poorly sorted, with scattered muscovite, and considerable amount of dark argillaceous rock fragments, a moderately quartzose sand, 80 to 85% quartz
1350-1400	50'	No samples
1350-1357	7'	Sandstone, as in 1330-1350 (interpretation from gamma ray log)
1357-1362	5'	Shale, silty (gamma ray log)
1362-1375	13'	Sandstone, moderately quartzose (gamma ray log)
1375-1400	25'	Sandstone, quartzose (gamma ray log)