Buchanan County
United Fuel Gas Co.
Zach Justice Well No. 8606
Index No.: 25
Elevation: 1101.64'
Remarks: Coal correlations and general stratigraphic boundaries were determined from Buchanan County geologic map, particularily along Pawpaw and Lester creeks; measured section No. 730; and Shawmut Core #3 approximately 2 1/2 miles to the SE. Elevation and location of well site indicates well located about 50' above the Splash Dam coal, about 250' above the Kennedy coal and 1100' above the War Creek coal.

Formational boundaries of quartzose sands as noted below determined from John Wilson's log, gamma ray log, and microscopic observation of well cuttings.
Correlations by Marshall Miller, 1970-74, VDMR.

Formation	Top	Bottom	Thickness
Pennsylvanian System			
Post Lee Formation "in at surface"		304	304'
Splash Dam coal 44-46'			
Kennedy coal at 250'			
War Creek coal at 1160'			
Lee Formation	304	1571	1267'
conglomeratic quartzose sand 304-353			49'
quartzose sand 353-379			26'
quartzose sand 399-421			22'
conglomeratic quartzose sand 421-442			21'
quartzose sand 792-890			98'
quartzose sand 972-1010			38'
quartzose sand 1020-1032			12'
quartzose sand 1042-1057			15'
quartzose sand 1162-1176			14'
conglomeratic quartzose sand 1181-1192			11'
quartzose sand 1212-1274			62'
quartzose sand 1278-1330			52'
conglomeratic quartzose sand 1330-1366			36'
quartzose sand 1366-1412			46'
quartzose sand 1422-1487			65'
conglomeratic quartzose sand 1487-1498			12'
conglomeratic quartzose sand 1501-1571			70'
total quartzose sand			649'
total conglomerate			199'
Pocahontas Formation	absent		

Mississippian System			
Bluestone Formation	1571	1790	219'
Pride Shale	1700	1790	90'
Princeton Sand	1790	1870	80'
Little Stone Gap Member	1870	1893	23'
Stony Gap Sand?	2045	2155	110'
Lower Maxon Sand	2375	2390	15'
Greenbrier Formation	2422	2824	402'
MacCrady Formation	2824		

VDMR Well No.: W-642

Operator: United Fuel Gas Co.
Farm: Zach Justice et al
Well No.: 8606
Location: Buchanan County
12,650' S. of 37°30'
6,200' E. of 82°05'
Elevation: 1101.64' Grd.
Total Depth: 4780'
Drilling Commenced: April 25, 1961
Drilling Completed: August 30, 1961
Geologic summary by Marshall S. Miller, VDMR. Well logged previously by John Wilson, 1963, VDMR. All other descriptions except those below are reviewed from Wilson's log (dashes are indicated)
*Geophysical logs used extensively for correlation purposes.

Depth	Thickness	Description
0- 20	20'	No samples
20- 44	24'	Wilson's log, about 60% quartz
44- 46	2'	Coal, noted by Wilson, thickness estimated from gamma ray log, drillers log, and well cuttings
46- 62	16'	Shale, gray, silty, with sandstone stringers
62-125	63'	Wilson's log, about 70% quartz
125-134	9'	Wilson's log
134-163	19'	Wilson's log
163-224	61'	Wilson's log, about 65-75% quartz
224-239	15'	Wilson's log
239-250	11'	No samples
250-275	25'	Wilson's log
275-301	26'	Wilson's log

301-353	52'	Sandstone, white, medium to coarse grained, to granular and conglomeratic, subround to subangular, poorly sorted, with scattered dark rock fragments, and carbonaceous material, little to no clay matrix material, rare amounts of muscovite, chlorite, generally around 95% quartz (Gamma ray log indicates top of quartzose sand is at 304'.)
353-376	23'	Sandstone, white, quartzose, fine to coarse grained, subround to subangular, moderately sorted, 95% quartz (Gamma ray log indicates base of quartzose sand is at 379')
376-399	23'	Sandstone, light gray, fine grained, subangular, moderately sorted, micaceous with abundant chlorite, biotite, phlogopite, muscovite, considerable amount of dark rock fragments, carbonaceous rock fragments, about 10% matrix, 10% rock fragments and accessory minerals, and 80% quartz
399-448	49'	Sandstone, white, medium to coarse grained, subangular to subround, moderately to poorly sorted, scattered dark rock fragments, little to no clay matrix material, conglomeratic at base, about 90-95% quartz (Gamma ray log indicates base of sand at 442')
448-461	13'	No samples, gamma ray log indicates siltstones
461-486	25'	Wilson's log
486-562	76'	Wilson's log
562-593	31'	Wilson's log
593-660	67'	Wilson's log
660-685	25'	Wilson's log, about 75 to 80% quartz
685-750	65'	Wilson's log
750-773	23'	Wilson's log

773-787	14'	No samples, gamma ray log indicated a moderately quartzose sand
787-792	5'	Wilson's log
792-895	103'	Sandstone, white, fine to medium grained to coarse grained, moderately to poorly sorted, subround to subangular, scattered dark rock fragments, little to no matrix material, 95 to 100% quartz, shale and siltstone contamination in upper 25' (Gamma ray log shows quartzose sand from 792-890'.)
895-928	33'	Wilson's log
928-972	44'	Wilson's log
972-1010	38'	Sandstone, white, quartzose, fine to coarse grained, subround to subangular, moderately to poorly sorted, little to no matrix material, scattered rock fragments, locally silty and micaceous, generally about 90 to 95% quartz
1010-1020	10'	Sandstone, micaceous, silty, about 60% quartz
1020-1032	12'	Sandstone, quartzose, as shown by gamma ray curve, cuttings are contaminated with siltstone
1032-1042	10'	Sandstone, light gray, micaceous, silty, about 80% quartz
1042-1057	15'	Sandstone, quartzose, as shown by gamma ray curve, cuttings contaminated with siltstone
1057-1068	11'	Sandstone, light gray to white, fine to coarse grained, silty, micaceous, abundant matrix material, about 75% quartz
1068-1126	58'	Wilson's log
1126-1145	19'	Sandstone, white, very fine to fine grained, moderately sorted, subround to subangular, with thin coaly partings, silt partings, scattered micas, rock fragments, clay-silt matrix, 80 to 85% quartz

1145-1155	10'	Wilson's log
1155-1162	7'	Shale, as shown by gamma ray curve
1162-1175	13'	Sandstone, white, quartzose, mostly medium grained, moderately sorted, subangular to subround, little to no matrix material, scattered dark rock fragments, 95 to 100% quartz
1175-1185	10'	Sandstone as in 1162-1175, medium to coarse grained
1185-1199	14'	Sandstone as in 1162-1175, conglomeratic
1199-1207	8'	Sandstone, quartzose, fine grained
1207-1228	21'	Sandstone, white, quartzose, coarse grained to conglomeratic, 100% quartz
1228-1269	41'	Sandstone, white, quartzose, medium to coarse grained, moderately to well sorted, 100% quartz
1269-1285	16'	Sandstone, white, quartzose, coarse grained and conglomeratic, interbedded with dark carbonaceous shale
1285-1304	19'	Sandstone, white, quartzose, fine to medium grained, 95% quartz
1304-1330	26'	Sandstone, white, quartzose, medium grained, subround, well sorted, 100% quartz
1330-1366	36'	Sandstone, white, quartzose, conglomeratic
1366-1373	7'	Sandstone, white, quartzose, medium grained
1373-1375	2'	Coal ? vitreous luster
1375-1383	8'	Sandstone, as in 1366-1373

1383-1412	29'	Sandstone, white, quartzose, medium to coarse grained, scattered muscovite, rock fragments, small amount of matrix material, 90 to 95% quartz
1412-1430	18'	Siltstone, dark gray, carbonaceous, interbedded with quartzose sandstone
1430-1446	16'	Sandstone, white, quartzose, fine to coarse grained, subround to subangular, poorly sorted, small amount of matrix material, rare micas, about 95% quartz
1446-1460	14'	Sandstone, as in 1430-1446 with scattered carbonaceous and argillaceous rock fragments, thin silt partings, 90% quartz
1460-1468	8'	Sandstone, white, quartzose, medium grained, well sorted, 95 to 100% quartz
1468-1487	19'	Sandstone, white, quartzose, medium to granular grained, subangular to subround, moderately to poorly sorted, little to no matrix material, 95% quartz
1487-1496	9'	Sandstone, as in 1468-1487, conglomeratic
1496-1501	5'	Sandstone, as in 1468-1487
1501-1571	70'	Sandstone, white, quartzose, medium grained to conglomeratic, subangular to round, no matrix material, 95 to 100% quartzose
1571		Red and green shales and siltstones