Operator: Pipe Line Construction and Drilling Co.
Farm: R. J. Carlson
Well No.: 1
Location: Buchanan County
650' N. of 37°15'
4600' W. of 81°55'
Elevation: 2122.62' Ground
Total Depth: 4731'
Drilling Commenced: June 10, 1948
Well Completed: February 23, 1949
Result: Gas well
Geologic summary and review by Marshall S. Miller, August, 1970.

This well has been logged by the USGS, beginning at a depth of 638'. Although samples are available in the repository, Milichi also omitted the upper 638', and drafted a geologic section from the sample descriptions of Jacobsen, etc (USGS). The samples are therefore described below in detail from 0'-638', and then summarized from that depth on.

Geologic Log

1- 18	18'	Gravel, pebbles and loose material, weathered orange to brownish
18- 48	30'	Siltstone, with ironstone. Siltstone is brownish-orange, siliceous and micaceous. About 20% ironstone.
48- 56	8'	Shale, siltstone, sandstone and ironstone. About 30% shale, 30% sand, 30% siltstone and 10% ironstone. Shale is gray, silty, slightly carbonaceous; sandstone is fine grained, light gray to brown, micaceous, feldspathic, poorly sorted with coaly laminations. Siltstone, gray, siliceous
56- 65	9'	Shale, gray, finely micaceous, silty. Lesser amounts of sand and silt
65- 77	12'	Siltstone, dark gray, carbonaceous 70%; and coal, 30% dull, impure, silty. Possibly a 1' coal seam present. A coal is indicated on drillers log 70-72.

77- 95	18'	Shale and sandstone: shale, 70%, gray, micaceous, locally silty, locally carbonaceous. Sandstone, 30%, fine to medium grained, very poorly sorted, subround to subangular, feldspathic, with abundant clay, and carbonaceous material, clay and calcareous cement, occasional large muscovite flakes, interstitially silty. The sand has angular, "bumpy" appearance, non-porous
95-243	148'	Shale, gray, finely micaceous, locally silty, locally carbonaceous, with occasional ironstone, and rare sand stringers in upper 50', like that sand described above except is very fine grained and more rounded. Shale becomes slightly calcareous in lower interval (185-243)
243-244	1'	Coal, estimated depth and thickness, bony, dull, impure
244-270	26'	Sandstone, light gray, fine to medium grained, poorly sorted, subrounded to subangular, micaceous, feldspathic, with abundant coal, biotite, chlorite, siderite, and hematite, with clay and silica cement. No visible porosity
270-284	14'	Interbedded; sandstone and shale, about 50% of each. Sandstone is light gray to brown, fine grained, and remains micaceous, feldspathic, with abundant coal material. Shale, is dark gray, calcareous.
284-294	10'	Sandstone, light gray to white, mostly medium grained, subrounded, poorly sorted, with considerable muscovite, coal, feldspar, and chlorite. Poorly cemented with clay. Slight porosity
294-331	37'	Shale, dark gray, carbonaceous, which interbeds with a gray, fine grained, micaceous, interstitially silty, sand (304-325). Interval continues to be interbedded, but sand becomes medium to coarse grained (occasional conglomerate) with large subangular granules of quartz feldspar, coal, and dark argillaceous material, mostly calcareous cement. Poor porosity.
331-345	14'	Sandstone, white to light gray, continues like that sand as described in lower interval of (294-331). Continued coarse grained and occasionally conglomeratic.

345-358	13'	Shale, gray, micaceous
358-466	108'	Sandstone, light gray, very fine to medium grained, occasionally coarse grained, interstitially silty, moderately sorted, subangular, to subround, micaceous although less micaceous downward, feldspathic, with abundant chlorite and dark coaly and argillaceous material, lesser amounts of siderite and limonite. Poor porosity. Occasionally conglomeratic in interval (430-446) with large quartz grains. Interval generally contains about 65-75% quartz
466-619	153'	Shale, gray, micaceous, occasionally silty, locally carbonaceous, locally calcareous. (An interval and sample listed as 471 to ? is obviously misplaced and is probably from a depth of over 4,700. The sample contains lime and fragments of marine fossil shells. Is probably of the Greenbrier Formation.)
619-638	19'	Sandstone, gray to light brown, very fine grained, poorly sorted, micaceous, feldspathic, with abundant coaly and argillaceous material
638-1624	986'	This interval has been very well described by Jacobsen and McFarlan of the USGS. No sandstone in this interval would be considered quartzose. All the sandstones are referred to as graywacke by Jacobsen. McFarlan then continues the use of "sandstone" beginning at 1055'. The sands are as they describe; usually micaceous, silty, with dark and green inclusions, generally poorly sorted, fine grained, subangular. No "clean" quartzose sands are mentioned until a large sand interval is present, beginning at 1624'. The sands from that depth on are described below.
1624-1700	76'	Sandstone, white to light gray to orange (due to iron staining) very fine grained, becomes fine to medium grained downward, subround to subangular, moderately well sorted, appears to be composed mostly of quartz, although considerable amount of mica, some feldspar and dark argillaceous or shaly material is present. Is not typical of the Lee quartzose sand.

*1700-1750	50'	Sandstone, white mostly, but orange due to iron staining, medium to coarse grained, subround to subangular, and composed almost entirely of quartz, over 95% quartz, quartzose, with just a trace of feldspar, silica cemented. Appears to be porous, but degree of cementing would determine much of the effective porosity. Good porosity (1723-1750). This interval is the basal Lee sandstone. A coal is present in interval (1735-1750) which is pure, with vitreous luster and concoidal fracture. The quartz and coal appear to be separate and do not include the material of the other. The coal makes up about 5% of sample.
*1750-1771	21'	This interval represents the beginning of a less quartzose interval continued below. Is somewhat of a "junk" interval. Contains large white conglomeratic quartz grains, "bits" of loose coal and reworked coal cemented within the sandstone, some coarse grained quartz sands, some finer grained sands with silt, coal, and muscovite, and large loose flakes of muscovite. It is supposed here that the Lee quartz sand continues with a basal conglomerate to a depth of 1760' and reworked less quartzose material from 1760 to 1771. This interval (1750-1771) probably goes through the unconformity and thus includes Lee quartzose and conglomeratic sands from above the unconformity, and coal, shale, and micaceous sand from below the unconformity. Wilpolt designated the bottom of the sand interval above as the base of the Pennsylvanian Formation and the interval from 1750-2217 as the upper gray member of the Bluestone Formation.
1771-1790	19'	Sandstone, light gray, fine grained, subangular, poorly sorted, with abundant micas, (muscovite, biotite, chlorite and phlogopite) some feldspar, hematite, and coal. Calcareous and clay cementing. *A contrasting sand interval from that sand in (1700-1750).
1790-1810	20'	Shale, dark gray, micaceous, silty

1810-1900	90'	Sandstone, white to light gray, but not quartzose, fine to medium grained, poorly sorted with abundant brown and green inclusions, carbonaceous material, muscovite, feldspar, no porosity, abundant clay and silt matrix
1900-1906	6'	Coal, mostly. Could be the Pocahontas #3 coal, is fairly clean with vitreous luster, conchoidal fracture and abundant plant fragments
1906-1985	79'	The sands in this interval continue to be fine grained, poorly sorted, micaceous, feldspathic, with abundant silt, clay, and coal
1985-2000	15'	Shale, gray, silty
2000-2025	25'	Siltstone to very fine-grained sandstone, light gray to medium gray, with considerable matrix material, scattered muscovite, and biotite, and dark argillaceous material, poorly sorted, low quartz content
2025-2050	25'	Missing
2050-2057	7'	Sandstone, light gray, very fine to medium grained, subangular, poorly sorted, with abundant clay matrix, muscovite, biotite, siderite, traces of feldspar, and abundant dark argillaceous material
2057-2070	13	Light gray, siltstone, siliceous and argillaceous with "siderite" nodules
2070-2093	23'	Varicolored shales and siltstones, light tan, light gray to dark gray, green, and greenish gray, with scattered "siderite" nodules. Appears to be more typical of Bluestone lithology, is not calcareous
2093-2105	12'	Dark grayish brown "mudstone" or shale with no siderite nodules and a light greenish gray, fine grained calcareous sandstone
2105-2210	105'	Sandstone, light gray, very fine to fine grained, subangular, poorly sorted, micaceous (muscovite, biotite, chlorite, and phlogopite) with scattered carbonaceous material, mostly occuring in thin laminations, sand is locally calcareous, grain size increases downward, approaches a medium grained sand by 2131
2210		Red and green calcareous shales with some occasional brown chert