H. W. ADDINGTON & ASSOC.

WREN 3452-9

SW/NW Sec. 9-34S-52W

Las Animas County, Colo.

JOSEPH R. CLAIR
Geological Consultant
C.P.G. #713
R.P.E. #8726

WELL SUMMARY

Operator:	H. W. Addington & Assoc.
Well:	Wren 3452-9
Location:	Approximate SW/NW Section 9, Township 34 South, Range 52 West, Las Animas County, Colorado. (1420' S of NL; 1180' E of WL).
Field:	Wildcat
Elevation:	5201' Ground, 5212' K.B.
Spudded:	March 15, 1975 at 7:45 A.M.
Completed:	Finished drilling March 28, 1975 at 1:05 A.M. Finished plugging March 29, 1975 at 2:30 P.M.
Casing:	10 3/4" surface casing set at 197' Driller, 208' Schlumberger.
Cores:	None.
Drill Stem Tests:	One. 2295-2409'.
Total Depth:	2898' - Driller. 2896' - Schlumberger.
Testing Co.	Halliburton
Mud Logging:	Monaco Engineering, Inc. - Don Hardy and Jim Schellhase. Logging Engineers.
Air Equipment:	Ingersoll Rand - Two 1500 CFM Compressors, mist pump and other equipment. - Doyle Noland, Engineer.
Logs:	Drilling Time Log - 200' to 2898' Detailed Sample Log - 200' to 2898' Schlumberger: Dual Induction-Laterolog - 208' to 2896' Compensated Neutron-Formation Density - 200' to 2896'
Contractor:	Signal Oilfield Services, Inc. - Rig #8 Buck Taylor - Tool Pusher
Equipment:	Mast: Ideco 96' telescoping derrick - 212,000# capacity with 8' wide, 15' long, 10' high substructure with 3' folding wings. Drawworks: Ideco H-37, Drive-in with double drum. Power: One 8V-71 GMC diesel motor - 250 HP through Allison torque converter. Pump: Gardner-Denver FXK - 14" x 5 1/2" Power: Two 671 GMC diesel engines. Drill Collars: 20 - 5 3/4" x 2 1/4" x 590' Drill Pipe: 3 1/2" IF
Status:	Plugged and abandoned March 29, 1975.

WELL CHRONOLOGY

H. W. ADDINGTON & ASSOC.
WREN 3452-9

SW/NW Sec. 9-34S-52W
Las Animas County, Colo.
Elevation: 5212' K.B.

1975

Mar. 15 Spudded at 7:45 A.M. Drilling 14 3/4" surface hole.

Mar. 16 Finished drilling 14 3/4" hole to 200'. Ran 10 3/4" surface casing and set at 197'. Cemented with 150 sacks of common cement plus 3% calcium chloride. Plug down at 1:30 P.M.

Mar. 17 Drilled out from under surface at 5:09 A.M. Drilling @ 365' at 12:30 P.M. Geologist on well.

Mar. 18 Trip for new bit @ 874' at 5:00 A.M. Drilling @ 932' at 9:06 A.M.

Mar. 19 Trip for new bit @ 1434' at 1:30 A.M. Converting to straight mud. Started back in hole at 4:30 A.M. 11 stands off bottom at 8:00 A.M. Got back to bottom at 12:17 P.M. Drilling ahead from 1434' at 12:17 P.M. Lost circulation at 1444'. Back to drilling at 5:00 P.M.

Mar. 20 Trip for new bit @ 1590'. Started at 7:15 A.M. Back to drilling from 1590' at 3:00 P.M.

Mar. 21 Trip for new bit @ 1786' at 1:30 A.M. Drilling @ 1831' at 9:00 A.M. Ran J-44.

Mar. 22 Drilling @ 2089' at 9:55 A.M.

Mar. 23 Drilling @ 2297' at 5:00 A.M. Drilling @ 2339' at 8:00 A.M. Preparing to run DST #1 from 2295' to 2409' at 4:45 P.M.

Mar. 24 Finished pulling DST. On bank preparing to go back in hole at 9:30 A.M. Back to drilling at 11:30 A.M. from 2409'.

Mar. 25 Drilling @ 2547' at 8:00 A.M. Shut down at 10:35 A.M. for rig repairs (repack swivel, repair pump and pump motor). Back to drilling at 2:10 P.M.

Mar. 26 Drilling @ 2685' at 8:30 A.M.

Mar. 27 Drilling @ 2824' at 7:00 A.M. Tripping from 2825' at 8:00 A.M.

Mar. 28 Drilled to 2898' TD at 1:05 A.M. Circulated two hours and started out to log at 3:00 A.M. Started logging about 6:00 A.M. Density tool would not work, so had to get another tool from Liberal. Finally finished logging at 6:00 P.M. Got logs at 8:30 P.M.

Mar. 29 Plugged according to instructions from State Plugging Engineer in the following manner.

2475-2600'	40 sacks
2300-2400'	30 sacks
1325-1450'	60 sacks
175- 200'	15 sacks

10 sacks in top of surface casing.

Finished plugging at 2:30 P.M. Geologist returned to Denver at 12:00 noon.

GEOLOGICAL REPORT

H. W. ADDINGTON & ASSOC.
WREN 3452-9

SW/NW Sec.9-34S-52W
Las Animas County, Colo.
Elevation: 5212' K.B.

The Wren 3452-9 was spudded at 7:45 A.M. on March 15, 1975. 14 3/4" surface hole was drilled to 200'. New 10 3/4" surface casing was set at 197' and cemented with 150 sacks of common cement plus 3% calcium chloride. Cement circulated. Plug was pumped down at 1:30 P.M., March 16, 1975.

The well was drilled out from under surface casing at 5:09 A.M., March 17.

The following formation tops, corrected to Schlumberger Electrical Logs, were picked on the well.

Cretaceous System:			
Dakota		At surface	
Jurassic System:			
Morrison	-	165	(+5047)
Wanakah	-	342	(+4870)
Ocate	-	524	(+4688)
Triassic System:			
Santa Rosa	-	872	(+4340)
Permian System	-	971	(+4241)
Day Creek	-	1083	(+4129)
Blaine	-	1282	(+3930)
Glorietta	-	1405	(+3807)
Stone Corral	-	1780	(+3432)
Pennsylvanian System:			
Madera Clastics	-	1886	(+3326)
Madera Carbonates	-	1942	(+3270)
Lower Madera Arkose	-	2212	(+3000)
Morrow	-	2334	(+2878)
Mississippian System ?	-	2582	(+2630) *
St. Louis ?	-	2582	
Spergen-Warsaw ?	-	2699	
Osage ?	-	2815	
Total depth	-	2898	Driller
	-	2896	Schlumberger

* Note: The questioning of the Pre-Pennsylvanian carbonate section is due to the presence of many conflicting lithologic criteria in the samples, most of which are normally attributed to Arbuckle rocks. However, the electric logs indicate the section is probably Mississippian in age, and the interpretation is thus more electric log correlation than lithologic criteria.

The Wren 3452-9 was the eighth in the series of wildcat wells drilled for the Weyerhaeuser Company under the supervision of H. W. Addington & Associates.

The test ran much lower structurally on all the upper tops than the State 3353-36-2 in the NE/NE of Sec. 36-33S-53W approximately three miles to the northwest, and on top of the Blaine it was 518' low.

The Glorietta sandstone section was well developed but, since the drilling medium was switched to mud after bit trip at 1434', no attempt was made to test the formation. After electric logs were run, the usual positive indication of gas throughout the sequence was noted from the Neutron-Formation Density crossplot. Also, the 311' of total Glorietta interval was the thickest encountered thus far in this program.

The presence of the Stone Corral in this test was not completely unexpected in view of its presence in the Steinford 3351-7-4, but to find it this far up on the flank of the Sierra Grande Uplift was quite surprising.

The first Pennsylvanian (Madera Clastics) was found in the 1890' to 1900' sample, and top is placed at 1886' by electric logs. The Madera Carbonate top is placed at 1942' and the Lower Madera Arkose at 2212' by electric logs.

The first Morrow was found in the 2350' to 2360' sample and top is placed at 2334' by electric logs. There was an excellent drilling break starting at 2389', and while drilling at 2400' there was a 23 unit kick recorded on the hot wire with 62 units on the chromatograph, all methane. The drilling break ended at 2405' and samples were circulated at 2409'. The lithology was mostly loose, clear to frosted, coarse to very, very coarse Quartz Wash with absolutely no stain or fluorescence in either wet or dry samples (see Detailed Sample Log).

Having decided that the zone should be tested, Drill Stem Test #1 was run from 2285' to 2409'. The tool was opened with a weak blow which increased to a strong blow in seven minutes (blew from bottom of tall bucket). Blow decreased slightly after 30 minutes of the 90 minute flow period, and at 45 minutes the back pressure was bled off. Thereafter there was a weak blow with continued slight increase. The tool was then shut in for 90 minutes and test was pulled. Recovery was 380' of fluid as follows:

200' of Drilling mud.
180' of Heavily gas cut mud.

Pressures were as follows:

Initial Hydrostatic	-	1217#
Open Flow (90")	-	66# to 231#
Shut In (90")	-	478#
Final Hydrostatic	-	1217#

Results of the Drill Stem Test indicated the zone was not commercial, which was disappointing, of course. (Note: I have never received the final DST report nor the results from the sample chamber which was not opened at the well.)

The well was then drilled ahead. The first carbonates were found in the 2600' to 2610' sample and top placed at 2591' by drilling time. This is corrected to 2582' by electric logs.

The section from 2582' to 2600' was mainly gray and tan, crystalline to very crystalline, in part rhombic dolomite with poor to fair, vugular porosity. There was no sign of stain, wet or dry, but there was a dull gold fluorescence which is characteristic of the Arbuckle rocks along the Las Animas Arch to the north. There was no kick of any kind either on the hot wire or the chromatograph (see Detailed Sample Log and Mud Log).

I thought we had gone into the carbonates in the lower part of the Jefferson City member of the Arbuckle in this section (2582'-2600'). However, below 2600' there was an abrupt change in color and lithology with imbedded sand grains in the dolomite and traces of oolitic cherts and glauconite, which I thought indicated the Roubidoux formation. None of these are normally present in the upper part of the Mississippian sequence. Further, the minimal amount of cherts throughout the entire sequence, particularly below 2815', is not narmal for the lower part of the Mississippian. However, the electric logs strongly indicated that the carbonates penetrated are Mississippian in age. Despite the greater thickness (316') of the rocks penetrated than those which were present in the closest wells for which control is available, (288' in Steinford 3251-7-4, NW/NW Sec. 7-32S-51W to the northeast, and 150' in Boswell-Frates #1 Government, SW/NE Sec. 2-34S-52W slightly to the east and south), there is no indication in the lithology found in the samples that older rocks than Mississippian were reached.

Due to the extremely low structural position of this well, it was decided not to attempt to test the carbonate sequence for fluids inasmuch as water had been recovered at a higher structural datum.

Orders were given to plug and abandon, and the well was plugged according to instructions from the State Plugging Engineer. Plugging was completed at 2:30 P.M. on March 29, 1976.

Results of this test were disappointing, of course, since this was the first time in any of the tests drilled to date that porosity had been encountered in the carbonates at the unconformity. Further, the conflicting lithologies in the carbonate section are an enigma to me and indicate that the structural and depositional history of the Sierra Grande Uplift is extremely complex.

Joseph R. Clair

JOSEPH R. CLAIR
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DETAILED SAMPLE LOG

H. W. ADDINGTON & ASSOC.
WREN 3452-9
SW/NW Sec. 9-34S-52W
Las Animas County, Colo.
Elevation: 5212' K.B.

Sample study starts at 200' in Jurassic-Morrison topped at 165'.

200-210	Shale, pale green, pale gray, maroon, hard, in part sandy, talcy, clay.
210-214	Limestone, brown-gray, finely crystalline, dense, in part algal.
214-256	Shale, pale green, pale gray, little maroon, hard, some sandy, talcy, clay.
256-278	Sandstone, buff-brown, gray, very fine to fine, angular to subangular, tight, limey.
278-281	Shale, as above; and Shale, brown, hard, in part sandy, clay.
281-302	Sandstone, as above.
302-308	Sandstone, gray, little brown, very fine to fine, angular to subangular, tight, some limey; some white, intergranular Clay or Gypsum; most dirty.
308-328	Shale, brown, hard, clay, most sandy.
328-342	Sandstone, as above.
342	Top - WANAKAH (+4870)
342-360	Shale, chocolate, dark red, hard; with red and dark red, dense, limestone nodules.
360-406	Siltstone to very, very fine Sandstone, red, dark red, brown-red, chocolate, very tight, some micromicaceous.
406-456	Shale, chocolate, dark chocolate-brown, chocolate-gray, mottled, hard; with abundant imbedded, chocolate, dark red, dense, limestone nodules.
456-475	Siltstone, dark brown-red, brown-red, micromicaceous, slightly limey.
475-524	Siltstone, as above; with some interbedded Shale, dark brown-red, chocolate-maroon mottled, hard, with varicolored, dense, limestone nodules imbedded.
524	Top - OCATE (+4688)
524-568	Siltstone to very fine Sandstone, red-gray and pale purple-gray mottled, very tight, angular to subangular, micromicaceous, limey; with some interbedded Shale, dark brown-red, hard, slightly limey.
568-570	Shale, purple-red, chocolate, dark brown-red, hard; with varicolored, dense, limestone nodules.

570-585	Sandstone, red-gray, dark red, very fine, angular, micromicaceous, very tight, limey.
585-592	Shale, as above; some mottled.
592-604	Sandstone, as above.
604-614	Shale, purple-red, purple-gray, chocolate-gray, mottled, hard, slightly limey; with varicolored, dense, limestone nodules.
614-640	Sandstone, red-gray, very fine, angular to subangular, slightly micromicaceous, very tight, limey; with some interbedded Shale, as above.
640-678	Shale, highly varicolored, much mottled, hard Clay.
678-728	Shale, highly varicolored, much mottled; some sandy, hard Clay (some has metamorphic appearance); trace gray-green, dense, limestone nodules.
728-742	Shale, varicolored, hard to soft, much mottled, somewhat nodular Clay.
742-820	Shale, as above; some is nodular; with some varicolored, dense, limestone nodules.
820-872	Shale, highly varicolored, much mottled, hard to soft, somewhat nodular; with varicolored, dense, limestone nodules.
872	Top - TRIASSIC (SANTA ROSA) (+4340)
872-931	Sandstone, gray-white, some varicolored, very fine to fine and some medium grains, angular to slightly subangular, very tightly cemented, slightly limey.
931-933	Shale, brown-red, hard.
933-971	Sandstone, gray-white, some varicolored, very fine to medium, angular to subangular and subrounded, very tightly cemented with silica; some varicolored, with very coarse subrounded grains imbedded.
971	Top - PERMIAN (+4241)
971-987	Siltstone to very fine Sandstone, orange-red, micromicaceous, tight, some shaly.
987-988	Shale, orange-brown-red, micromicaceous, silty.
988-1000	Sandstone, orange-red, orange-brown, very fine, angular, micromicaceous, very tight, some silty.
1000-1003	Shale, as above.
1003-1020	Siltstone to very fine Sandstone, orange-red, orange-brown, micromicaceous, very tight; some silty and shaly.
1020-1022	Shale, orange-brown-red, micromicaceous, silty.

1022-1056	Siltstone to very fine Sandstone, as above; with some shaly laminae.
1056-1062	Shale, orange-red, orange-brown-red, chocolate-brown, hard, some micromicaceous.
1062-1070	Siltstone to Sandstone, as above.
1070-1083	Shale, as above.
1083	Top - DAY CREEK (+4129)
1083-1111	Dolomite, pink-red, pink, red, buff, orange-buff and varicolored, very finely crystalline, some granular and silty; dense to slight pinpoint vug porosity.
1111-1145	Siltstone, orange-brown, micromicaceous; with interbedded Shale, dark orange-brown, orange-brown, orange-red, hard, some silty and micromicaceous.
1145-1181	Siltstone to very, very fine Sandstone, orange-red, micromicaceous, very tight; with interbedded Shale, dark orange-red, orange-brown, hard, some silty and some micromicaceous 1166-81.
1181-1188	Shale, orange-red, orange-brown, hard, some micromicaceous.
1188-1198	Siltstone to very, very fine Sandstone, orange-red, dark orange, orange-brown, micromicaceous, very tight, some shaly laminae.
1198-1200	Shale, as above.
1200-1204	Siltstone to Sandstone, as above.
1204-1216	Shale, orange-red, orange-brown, trace green spots; trace Gypsum crystals imbedded.
1216-1230	Siltstone, dark orange-red, orange-brown, dark orange, micromicaceous, very tight.
1230-1236	Shale, orange-brown, dark orange, hard; trace dark red with green spots; trace Gypsum crystals imbedded.
1236-1260	Siltstone, as above; some almost very, very fine Sandstone.
1260-1282	Shale, orange-red, orange-brown, micromicaceous, hard; with some interbedded Siltstone, as above.
1282	Top - BLAINE (+3930)
1282-1294	Anhydrite, gray-white, slightly crystalline to massive, dense; trace white, crystalline Gypsum.
1294-1296	Shale, dark red, orange-red, fairly soft.
1296-1304	Anhydrite, white, orange-gray, massive, dense; some white, crystalline Gypsum.
1304-1305	Shale, as above.

1305-1316 Anhydrite, etc., as above.

1316-1349 Anhydrite, white, finely crystalline to massive, dense; with little white, crystalline and soft Gypsum; and traces of red, very finely crystalline, dense Dolomite interbedded.

1349-1380 Shale, orange-brown, dark brown, hard, some silty and slightly micromicaceous; and Siltstone, dark orange-brown, very tight; traces of Anhydrite inclusions in Shale.

1380-1405 Shale, dark chocolate-brown, dark orange-brown, hard; with traces of Anhydrite and white Gypsum as inclusions in Shale.

1405 Top - GLORIETTA (+3807)

1405-1452 Sandstone, gray-white, pale purple-gray, very fine to fine, angular to subangular, tight, slightly limey; with some to considerable, fine to medium and some coarse, subangular to subrounded, floating grains.

1452-1456 Shale, dark orange-brown, hard.

1456-1476 Sandstone, gray-white, very fine to fine, angular to subangular, slightly limey, some very tight; with some medium, subangular to subrounded, floating grains; trace pyrite.

1476-1479 Shale, dark orange-red, hard.

1479-1509 Sandstone, gray-white, gray, very fine to fine, angular to subangular, very tight, slightly limey; with some Siltstone to very, very fine Sandstone, gray, very tight, slightly limey, quite dirty, probably interbedded as stringers; some pyrite.

1509-1528 Siltstone to very, very fine Sandstone, as above; with interbedded Sandstone, gray-white, gray, fine to slightly medium, angular to subangular, very tight, slightly limey to limey; some pyrite.

1528-1542 Sandstone, as above; with some Siltstone to very fine Sandstone, orange-buff, orange, orange-red, red, micromicaceous, very tight, limey, dirty; some pyrite and traces of Shale.

1542-1562 Siltstone to Sandstone, orange-red, dark red, orange-buff, gray, gray-white, very very fine to fine and little medium, angular to subangular, considerable micromicaceous, slightly limey to limey; most dirty; little pyrite.

1562-1563 Shale, dark orange-red, hard.

1563-1596 Sandstone, gray, gray-white, orange-buff, fine to medium, angular to subangular, very tight, slightly limey; with few medium and coarse, subangular to subrounded, floating grains imbedded; with interbedded Siltstone to very fine Sandstone, orange-red, orange-buff, dark orange-red, dark red, very tight, slightly limey to limey, most dirty; some Siltstone to Sandstone is quite quartzitic.

1596-1598 Shale, dark brown-red, chocolate, hard, some micromicaceous.

1598-1619 Sandstone, gray-white, gray, orange-buff, very fine to slightly medium, angular to subangular, very tight, limey; with few medium and coarse, subrounded floating grains; and Siltstone to Sandstone, green-gray, orange-red, dark orange-red, very very fine to very fine, angular, tight, micromicaceous, limey; some pyrite.

1619-1639 Siltstone to Sandstone, gray, green-gray, gray-white, orange, dark orange-red, orange-buff, very very fine to some medium, angular to subangular; with some medium to coarse, subangular to subrounded floating grains, very tight, limey; little pyrite.

1639-1649 Shale, dark chocolate-brown, dark brown-red, hard, some micromicaceous, little silty.

1649-1660 Sandstone, pale orange-buff, orange, dark brown-red, very fine to medium and some coarse grains, angular to subangular and few subrounded grains, very tight to slightly friable, slightly limey; much intergranular cement; some very dirty.

1660-1683 Sandstone, as above; considerable medium to coarse aggregates and considerable coarse, loose, subrounded floating grains.

1683-1690 Shale, dark chocolate, red, dark red, hard.

1690-1716 Sandstone, orange-buff, orange, gray-white, very fine to medium, angular to subangular and some subrounded, very tight, limey.

1716-1724 Shale, dark chocolate, brown-red, dark red, hard; and Siltstone, dark orange-brown, brown-red, micromicaceous, very tight, slightly limey.

1724-1736 Siltstone to very, very fine Sandstone, dark orange-brown, brown-red, micromicaceous, very tight; with dark chocolate, shaly laminae.

1736-1740 Shale, dark chocolate, dark red, hard, some micromicaceous.

1740-1766 Siltstone to very, very fine Sandstone, dark orange-brown, dark brown-red, micromicaceous, very tight, very slightly limey; some shaly; with interbedded Shale, chocolate, dark orange-brown, hard, some micromicaceous.

1766-1768 Shale, chocolate, dark orange-brown, hard.

1768-1780 Siltstone to very, very fine Sandstone, as above.

1780 Top - STONE CORRAL (+3432)

1780-1800 Anhydrite, gray, gray-white, pale purple-gray, mottled, very finely crystalline to massive, very dense; with interbedded Dolomite, gray, purple-gray mottled, pale purple, very finely crystalline, dense; some anhydritic.

1800-1816 Siltstone to very, very fine Sandstone, orange, dark orange-red, micromicaceous, tight, very slightly dolomitic; some shaly particularly toward bottom.

1816-1818 Shale, dark red, chocolate, dark orange-red, hard.

1818-1827 Siltstone to very, very fine Sandstone, as above.

1827-1839 Shale, dark orange-red, brown-red, chocolate, hard.

1839-1873 Siltstone to very, very fine Sandstone, dark orange, dark orange-red, little gray, micromicaceous, very tight, slightly dolomitic.

1873-1886 Siltstone to very, very fine Sandstone, as above; with considerable interbedded Shale, dark red, chocolate, hard; with trace dark red, dense, dolomite nodules.

1886 Top - PENNSYLVANIAN (MADERA CLASTIC) (+3326)

1886-1896 Sandstone, red-gray mottled, fine to slightly medium, angular to subangular, very tight, micromicaceous, slightly dolomitic, some shaly.

1896-1915 Sandstone, red-gray, dark red-gray, trace purple-red, fine to medium and little coarse, angular to subangular, micromicaceous, very tight, dolomitic, dirty.

1915-1918 Shale, dark purple-red, hard.

1918-1942 Sandstone, dark red, red-gray, purple-red, purple-gray, some mottled, fine to medium and some coarse grains, angular to subangular, very tight, micromicaceous, dolomitic, dirty; has conglomeratic appearance.

1942 Top - MADERA CARBONATE (+3270)

1942-1954 Dolomite, red, dark red, very finely crystalline, dense, some silty.

1954-1958 Shale, dark red, brown-red, hard.

1958-1968 Sandstone, purple-red, dark red, very fine to medium, angular to subangular, very tight, dolomitic, dirty.

1968-1972 Dolomite, dark red, red, purple-red, very finely crystalline, dense; some quite silty; some nodular.

1972-1978 Sandstone, as above; some conglomeratic in appearance.

1978-1979 Shale, red, dark red, chocolate, hard.

1979-1988 Sandstone, purple, purple-red, purple-gray, very very fine to medium, angular to subangular, micromicaceous, very tight, very dolomitic, dirty; some conglomeratic in appearance.

1988-1996 Dolomite, red, orange-red, dark red, purple-red, very finely crystalline to finely crystalline, dense, considerable silty.

1996-1998 Shale, red, dark red, hard.

1998-2014 Sandstone, varicolored, very very fine to very fine, micromicaceous, dirty, dolomitic.

2014-2015 Shale, dark red, chocolate, hard.

2015-2030 Dolomite, red, red-gray, dark red, purple-red, very finely crystalline to finely crystalline, dense; some silty; some with imbedded quartz grains; looks conglomeratic.

2030-2038 Siltstone to very fine Sandstone, red, dark red, brown-red, gray, micromicaceous, dirty, dolomitic.

2038-2045 Dolomite, red, dark red, red-gray, purple-red, very finely crystalline to finely crystalline, dense; some silty; some nodular.

2045-2050 Siltstone to very fine Sandstone, as above.

2050-2080 Siltstone to Sandstone, red and varicolored, very very fine to little medium, angular to subangular, very tight, very dolomitic, dirty; with little Sandstone, purple-red, fine to medium and little coarse and very coarse, angular to subangular, very tight, very dolomitic, dirty, which looks arkose derived; little Dolomite, red, purple-red, red-gray, very finely crystalline to finely crystalline, dense, some silty (probably as lentils).

2080-2082 Shale, chocolate, dark red, hard.

2082-2108 Siltstone to very fine Sandstone, red, dark red, red-gray, gray, micromicaceous, tight, dirty dolomitic; with interbedded Dolomite, red, dark red, very finely crystalline, dense; most silty.

2108-2114 Shale, chocolate, dark red, hard.

2114-2128 Siltstone to very fine Sandstone, red, dark red, micromicaceous, tight, dirty, dolomitic.

2128-2149 Siltstone to very fine Sandstone, red, dark red, brown-red, micromicaceous, tight, dirty, dolomitic; with some interbedded Sandstone, red, purple-red, fine to slightly medium, angular to subangular, tight, dolomitic; with few coarse, floating grains.

2149-2169 Siltstone to Sandstone, red, dark red, very fine to fine, very micromicaceous, tight, dolomitic, some shaly.

2169-2180 Siltstone to Sandstone, as above; with interbedded Sandstone, varicolored, fine to medium and little coarse, angular to subangular, with few subrounded grains, very tight, slightly dolomitic.

2180-2200 Siltstone to Sandstone, red, dark red, pink-red, chocolate, very very fine to little fine, angular, micromicaceous, very tight, dolomitic, dirty; with little Dolomite, red, dark red, very finely crystalline, dense, trace granular, most silty.

2200-2212 Shale, dark red, hard.

2212 Top - LOWER MADERA ARKOSE (+3000)

2212-2230 Sandstone, varicolored, coarse to very very coarse, weathered, arkosic, very tight; with some loose, very coarse, subrounded quartz and weathered feldspar grains.

2230-2238	Shale, dark red, red, hard; with some weathered arkosic grains.
2238-2258	Arkosic Wash and Granite Wash, varicolored, coarse to very very coarse, angular to subrounded, tight; with loose quartz and feldspar grains; some Shale, red, dark red, purple-red, hard, possibly interbedded.
2258-2274	Arkosic Wash and little Granite Wash, as above; more interbedded Shale, as above.
2274-2282	Dolomite, buff, gray, pink-red, gray-buff, salmon, very finely crystalline to slightly crystalline, dense; traces of Chert, light gray, white, opaque.
2282-2284	Shale, dark red, red, chocolate, hard.
2284-2290	Dolomite, as above; traces of Chert, gray, tan, semitranslucent, and white, light gray, tan, opaque and semiopaque.
2290-2298	Shale, red, dark red, chocolate.
2298-2300	Quartz Wash, varicolored, coarse to very coarse, loose grains.
2300-2307	Shale, as above.
2307-2310	Quartz Wash and Arkose, varicolored, coarse to very very coarse, angular to subangular and slightly subrounded, loose grains.
2310-2322	Shale, red, dark red, purple-red, hard.
2322-2334	Quartz Wash and Arkose, varicolored, coarse to very very coarse, angular to subrounded, most loose quartz and feldspar; with scattered slightly weathered, tight Arkose aggregates.
2334	Top - MORROW (+2878)
2334-2341	Shale, purple-red, splintery, slightly waxy.
2341-2350	Quartz Wash, varicolored, coarse to very very coarse, some weathered, loose; with scattered weathered Arkose aggregates.
2350-2352	Shale, pale purple-red, pale purple, considerable varicolored, splintery, slightly waxy.
2352-2364	Quartz Wash and Arkose, as above.
2364-2365	Shale, as above.
2365-2383	Quartz Wash, Arkose, varicolored, coarse to very very coarse, angular to subangular; with traces of weathered arkosic aggregates, most loose grains.
2383-2385	Shale, pale purple, purple-red, slightly waxy, some splintery, some hard.
2385-2402	Quartz Wash, clear to frosted and some varicolored, medium to very very coarse, angular to subangular and little subrounded, all loose; some weathered feldspar and scattered weathered Arkose aggregates. No stain of fluorescence, wet or dry. (Note: Had 23 unit kick on hot wire, 62 units on chromatograph, all Methane.)

2402-2404	Shale, as above.
2404-2420	Quartz Wash, as above.
2420-2422	Shale, purple-red, purple, red, hard, slightly waxy, trace splintery.
2422-2431	Sandstone, gray, very fine, angular, micromicaceous, tight to slightly friable, some with much intergranular cement.
2431-2444	Quartz Wash, coarse to very very coarse, angular to subangular and slightly subrounded, loose, some weathered; trace feldspar grains.
2444-2456	Shale, dark purple, dark red, traces of gray and green, waxy and splintery; with interbedded Quartz Wash, as above.
2456-2466	Sandstone, gray, very fine to very coarse, angular to subangular, quartzitic with some varicolored grains imbedded in finer matrix, trace glauconitic; some loose Quartz Wash grains.
2466-2483	Shale, dark purple, purple-red, purple-gray, pale green, much splintery, some waxy to talcy; and Shale, pale green, hard, in part micromicaceous and siliceous, slightly glauconitic; with traces of quartzitic Sandstone and Quartz Wash, as above.
2483-2499	Quartz Wash Sandstone, varicolored, coarse to very very coarse, subangular to slightly subrounded, very tightly cemented, very dirty; some loose Quartz Wash grains.
2499-2521	Shale, purple-gray, purple-red, light green, gray, fairly hard, considerable splintery; with interbedded Quartz Wash Sandstone, as above; with little Dolomite, brown, red-brown, gray, very finely crystalline to finely crystalline, dense, probably as nodules.
2521-2535	Quartz Wash Sandstone, varicolored, coarse to very very coarse, angular to subangular, very tightly cemented, some very dirty; some loose Quartz Wash grains.
2535-2539	Shale, purple-red, purple, dark red, traces of green, hard, some splintery, some talcy; with traces of Dolomite, brown, gray, very finely crystalline to finely crystalline, dense, very nodular.
2539-2548	Quartz Wash Sandstone, varicolored, coarse to very very coarse, angular to subangular, very tightly cemented, very dirty; with more loose Quartz Wash grains than in 2521-35.
2548-2574	Shale, gray, purple, purple-red, dark red, trace green, hard, some talcy, some splintery; with trace Dolomite, as above (probably nodule).
2574-2580	Quartz Wash Sandstone, gray and some varicolored, coarse to very very coarse, angular to subangular and some slightly subrounded, dirty; some loose Quartz Wash grains; some weathered.
2580-2582	Shale, as above.

2582 Top - MISSISSIPPIAN (+2630) ?

2582-2600 Dolomite, gray, tan, crystalline to very crystalline, considerable rhombic; with abundant poor to fair vugular porosity; little argillaceous.

2600-2615 Dolomite, dark red, purple-red, red, very finely crystalline to slightly crystalline, dense to some vug porosity; considerable silty and some argillaceous.

2615-2640 Dolomite, purple-red, dark red, pink-red, trace buff and gray, very finely crystalline to finely crystalline, dense to slight vugular porosity.

2640-2648 Dolomite, purple-red, purple, red-gray, pink-buff, and gray, very finely crystalline to some crystalline, most dense to some poor vugular porosity; some silty and argillaceous.

2648-2667 Dolomite, purple-red, dark red, and highly varicolored, very finely crystalline to quite crystalline, dense to fair vugular porosity; Chert, white, gray-white, opaque and semiopaque, rough and smooth, trace oolitic; little slightly dolomitic; trace quartzose; some Dolomite is silty and slightly argillaceous.

2667-2684 Dolomite, purple-red, dark red, and highly varicolored, very finely crystalline to quite crystalline, dense to slight vugular porosity; little silty and slightly argillaceous; traces of Chert, white, gray, red, opaque and semiopaque, rough and smooth.

2684-2697 Dolomite, purple-red, dark red, pale purple, buff, pink-buff, tan, brown, gray, very finely crystalline to crystalline, dense to slight vugular porosity; little silty and slightly argillaceous; little Chert, white, gray, orange, orange-red, opaque and semiopaque; trace quartzose; trace weathered; trace white, opaque Chert; trace glauconite; trace glauconite in Dolomite.

2697-2699 Shale ? Note: None found in samples but looks like "X" Marker on logs.

2699-2713 Dolomite, purple-red, pale purple, tan, brown, gray, buff, very finely crystalline to crystalline, most dense; trace imbedded sand grains; little vugular porosity at bottom; and little Dolomite is quite rhombic; little Chert, gray-white, brown, gray, orange-red, opaque and semiopaque; little weathered; trace glauconite in Dolomite.

2713-2748 Dolomite, buff, tan, brown, very finely crystalline to slightly crystalline, dense to traces of vugular porosity; trace imbedded sand grains; trace Chert, white, gray, dark gray, opaque; little Dolomite is slightly argillaceous.

2748-2776 Dolomite, buff, tan, brown, little gray, finely crystalline to crystalline, dense; little with imbedded sand grains; some very finely granular; some silty and argillaceous; some with dark inclusions; trace Chert, brown, white, gray, opaque.

2776-2778 Shale ? Note: No shale found in the samples for this interval, but looks like Shale on log.

2778-2815 Dolomite, buff, tan, brown and dark purple-red, purple, pink-red, very finely crystalline to some quite crystalline, dense; some silty and argillaceous; trace with imbedded sand grains; little Chert, gray, white, gray-white, buff, opaque and trace semiopaque; trace oolitic; trace very finely oolitic and slightly oolicastic Dolomite; trace dolomitic Chert.

2815-2854 Dolomite, buff to tan, trace brown and gray, very finely crystalline to quite crystalline, dense; little Chert, white, light gray, traces tan, brown, pink, opaque and semiopaque; trace oolitic Chert; trace finely oolitic, buff, slightly weathered, opaque Chert; more Chert toward bottom.

2854-2858 Shale ? Note: None found in samples; looks like Osage Shale Marker on logs.

2858-2898 Dolomite, buff, tan, gray, traces of pink-buff, very finely crystalline to very slightly crystalline, dense; some Chert, white, light gray, tan, brown, opaque and semiopaque; some slightly weathered to weathered; trace dolomitic.

2898 Total depth - Driller.
2896 Total depth - Schlumberger.

Samples described:

Joseph R. Clair

JOSEPH R. CLAIR
(on well)

DRILLING TIME LOG

H. W. ADDINGTON & ASSOC.
WREN 3452-9

SW/NW Sec. 9-34S-52W
Las Animas County, Colo.
Elevation: 5212' K.B.

5' drilling time starts at 200'.

200- 300	8-17-15-17-5-11-15-10-10-6	10-5-4-5-5-5-5-5-3-4	Bit #3 in at 200'. Drlg. w/air and mis
300- 400	8-3-4-3-3-7-5-5-5-5	5-5-5-7-8-8-6-7-5-6	
400- 500	6-6-4-5-4-3-5-4-5-6	7-10-9-11-6-9-7-6-8-7	
500- 600	7-8-6-6-6-6-9-1-1-5-5	6-8-8-5-7-3-3-6-5-6	
600- 700	6-7-5-5-5-3-2-2-3-2	4-3-2-5-3-2-2-2-3-3	
700- 800	3-2-2-2-2-3-3-2-3-5	3-5-4-5-5-6-5-5-4-3	
800- 900	6-5-3-4-4-5-4-5-6-5	6-6-5-6-9-2-2-2-2-2	Trip for Bit
900-1000	2-3-3-5-3-3-4-3-2-2	2-3-2-4-3-4-2-2-2-4	at 874'.
1000-1100	6-4-3-4-4-3-3-2-3-4	5-6-6-5-6-10-8-8-5-6	
1100-1200	8-8-8-14-8-2-4-4-5-5	7-4-6-5-6-3-4-7-4-7	
1200-1300	7-7-6-13-14-3-8-9-13-12	9-9-9-6-7-8-8-14-12-7	
1300-1400	11-5-10-14-16-11-16-17-11-13	11-10-11-14-9-12-11-12-13-13	Trip for Bit
1400-1500	12-12-8-10-6-7-5-9-7-9	11-15-15-20-9-13-11-12-11-17	at 1434'. Changed from air to mud.

1' drilling time starts at 1500'.

1500-1520	3-3-3-3-3-4-5-4-4-5	4-5-5-6-3-4-4-4-4-5	
1520-1540	4-5-1-5-4-15-15-8-7-8	16-10-7-7-6-8-8-9-10-7	
1540-1560	8-5-5-10-10-6-6-7-7-7	8-9-10-8-5-6-6-8-9-9	
1560-1580	5-5-11-9-6-7-10-10-8-10	10-8-7-10-9-9-12-8-12-10	Trip for Bit
1580-1600	8-5-7-7-7-4-4-6-9-8	2-2-1-2-3-1-2-2-1-2	at 1590'.
1600-1620	2-1-2-1-1-3-1-1-2-1	1-1-1-1-2-1-2-2-2-1	
1620-1640	1-3-1-2-2-2-2-3-1-2	2-2-3-1-2-2-1-1-2-2	
1640-1660	2-2-2-3-3-3-2-2-4-5	2-2-3-3-2-3-1-2-3-3	
1660-1680	3-2-2-2-3-2-2-2-3-2	3-2-2-2-1-2-2-2-2-1	
1680-1700	2-2-4-3-3-3-2-4-4-4	3-3-4-2-4-4-2-4-2-3	
1700-1720	1-2-3-1-2-2-2-3-2-2	1-2-2-1-2-2-1-2-2-3	
1720-1740	3-3-3-4-6-4-4-5-4-4	3-4-5-3-4-9-4-2-4-5	
1740-1760	4-5-6-5-3-4-4-4-2-4	4-3-5-4-3-2-4-8-7-4	
1760-1780	3-4-3-2-4-4-4-4-4-4	4-4-5-8-7-4-4-7-10-10	Trip for Bit
1780-1800	6-7-7-9-12-13-5-8-7-5	5-5-5-5-5-5-5-5-5-5	at 1786', J-4
1800-1820	5-5-4-5-8-7-6-6-4-4	5-4-3-3-5-6-4-4-6-5	
1820-1840	4-4-4-4-4-4-3-3-3-3	5-5-4-6-5-4-5-6-5-7	
1840-1860	6-7-3-2-4-3-3-2-4-3	4-2-2-2-2-2-4-5-4-5	
1860-1880	4-3-3-3-4-7-5-2-3-9	5-2-3-3-2-3-3-2-2-3	
1880-1900	6-4-3-3-2-2-10-10-14-6	5-8-6-6-5-5-8-4-3-2	

1900-1920	2-2-4-4-3-7-5-4-2-4	4-5-5-6-3-3-7-7-8-8	
1920-1940	6-6-5-5-5-2-3-5-6-6	4-6-5-4-6-5-6-7-7-5	
1940-1960	6-5-5-6-7-7-5-4-6-3	5-4-3-5-5-5-4-3-3-6	
1960-1980	4-4-4-5-5-4-5-5-4-4	6-7-6-7-6-5-6-7-6-6	
1980-2000	5-5-5-6-6-5-6-4-5-6	5-6-5-7-8-7-7-5-7-7	
2000-2020	8-7-7-6-6-6-7-8-6-5	7-6-6-8-7-7-7-4-5-5	
2020-2040	4-6-5-5-4-5-5-5-4-5	5-5-6-5-5-6-6-5-6-6	
2040-2060	6-6-5-6-6-6-5-4-4-4	4-4-4-4-4-4-3-3-4-5	
2060-2080	5-5-5-5-4-3-4-4-3-2	3-3-3-3-3-3-2-3-3-5	
2080-2100	3-3-5-7-5-6-8-6-7-5	6-6-5-6-4-4-5-2-6-7	
2100-2120	6-7-5-7-6-6-7-7-6-6	6-3-3-8-9-7-4-5-6-4	
2120-2140	4-3-6-5-4-5-6-5-6-5	5-5-3-4-3-3-3-2-3-4	
2140-2160	4-4-3-2-3-3-2-3-4-5	5-6-6-5-5-5-5-4-7-5	
2160-2180	5-5-4-5-4-5-5-5-4-5	4-3-3-4-3-4-3-4-5-5	
2180-2200	6-6-6-5-6-6-6-6-5-6	7-5-6-5-6-5-6-6-5-6	
2200-2220	8-7-8-5-5-3-5-2-2-2	3-4-4-5-1-7-6-6-6-5	
2220-2240	5-6-5-5-6-6-5-5-6-6	5-6-7-7-8-5-9-3-4-4	
2240-2260	6-5-5-6-5-5-5-4-3-3	4-5-5-5-4-5-5-6-4-3	
2260-2280	4-4-5-5-4-4-5-4-4-5	5-5-5-5-6-5-6-6-8-8	
2280-2300	8-7-8-8-8-9-9-8-9-9	8-7-9-8-8-8-5-5-5-5	
2300-2320	5-3-3-7-4-4-4-4-5-5	4-2-5-6-6-6-5-4-4-2	
2320-2340	4-3-3-5-5-3-2-1-1-1	1-1-1-3-1-2-3-4-2-4	
2340-2360	4-5-5-5-5-5-5-6-4-7	5-7-5-4-5-5-6-7-6-7	
2360-2380	4-6-6-6-4-4-4-4-5-5	5-5-6-2-1-1-5-7-5-6	
2380-2400	6-5-7-7-6-6-6-6-6-2	1-1-1-1/4-1/4-1/4-1/4-1/4-1/4-1/4-1/4	
2400-2420	1/4-1/4-1/4-1/4-1-4-4-4-4-4	5-6-4-3-4-3-5-9-8-5	Ran DST #1
2420-2440	7-7-5-5-6-7-9-6-8-7	10-11-9-15-13-8-11-11-10-7	2295-2409.
2440-2460	9-10-10-9-9-7-9-9-10-10	13-11-13-9-9-8-7-11-7-8	
2460-2480	10-9-13-9-9-13-12-13-12-13	10-6-11-7-8-8-9-8-7-11	
2480-2500	13-7-8-7-3-10-6-7-7-9	11-11-12-12-15-9-11-15-8-8	
2500-2520	8-12-13-14-13-7-9-11-9-8	6-5-6-6-9-3-7-5-6-7	Rough 15-20
2520-2540	7-10-6-6-5-5-8-6-6-5	4-6-3-5-5-6-6-5-5-5	Rough 20-25
2540-2560	5-4-4-5-5-4-4-4-12-8	9-10-6-5-5-5-5-6-6-6	
2560-2580	6-6-8-8-6-6-5-4-3-5	3-3-5-6-8-7-9-2-5-6	
2580-2600	9-6-6-7-5-5-4-6-5-5	5-3-3-3-3-4-4-4-4-4	
2600-2620	8-5-7-7-7-7-9-10-9-7	5-10-9-8-7-6-10-6-5-7	
2620-2640	8-10-9-8-9-4-4-8-9-8	9-11-10-5-7-7-8-6-9-8	
2640-2660	10-12-10-13-10-7-10-11-10-9	6-11-8-9-8-8-7-10-8-6	
2660-2680	9-10-15-10-6-7-10-13-12-7	8-7-10-9-13-9-8-9-11-10	
2680-2700	9-8-7-13-10-9-6-8-8-8	8-10-10-6-7-7-5-8-12-10	
2700-2720	8-5-5-4-6-3-4-3-5-4	5-4-10-10-9-7-7-5-7-7	
2720-2740	7-6-6-9-7-8-9-10-8-7	9-8-7-9-9-9-8-10-9-9	
2740-2760	7-6-9-10-13-12-7-5-10-9	9-6-9-7-7-12-13-10-10-9	
2760-2780	11-12-9-8-5-8-9-11-8-10	9-7-8-6-8-11-10-7-4-5	
2780-2800	7-8-7-8-8-12-8-8-9-8	8-10-10-11-12-10-15-11-11-10	

2800-2820	10-11-10-10-12-12-12-10-12-11	10-10-11-10-9-8-9-10-11-10	Trip for Bit #8
2820-2840	10-10-10-16-12-10-8-11-7-14	13-10-9-9-8-13-8-6-9-7	at 2825'. S-88
2840-2860	9-10-9-10-8-7-7-9-8-8	8-9-8-11-9-5-9-8-7-9	Rerun.
2860-2880	10-5-11-10-7-8-11-9-6-7	7-7-8-11-8-10-11-10-8-5	
2880-2898	6-9-7-10-6-5-8-13-6-7	8-9-7-9-6-6-7-7	

2898	Total depth - Driller
2896	Total depth - Schlumberger

BIT RECORD

H. W. ADDINGTON & ASSOC.
WREN 3452-9

SW/NW Sec. 9-34S-52W
Las Animas County, Colo.
Elevation: 5212' K.B.

Run No.	Size	Make	Type	Jet Size 1	2	3	Serial	Depth out	Feet	Hours
1	14 3/4	HTC	OSC3G		open		Retip	111	111	10
2	14 3/4	HTC	OSC3G		open		Retip	200	89	11
3	9 7/8	Sec.	M4NJ		open		483631	874	674	14 1/2
4	9 7/8	Sec.	M4NJ		open		574548	1434	560	16
5	8 3/4	HTC	ODVJ	3/8	3/8	3/8	HR481	1590	156	15
6	8 3/4	Smith	DGTJ	3/8	3/8	3/8	TA800	1786	196	10 1/2
7	7 7/8	HTC	J-44	3/8	3/8	3/8	BT618	2825	1039	108 3/4
8	7 7/8	Sec.	S-88	3/8	3/8	3/8	Rerun	2898	73	11