

NORTH DAKOTA GEOLOGICAL SURVEY CIRCULAR NO. 273

Summary of the Sunray DX - Ervin V. Henke No. 1
Oliver County, North Dakota
Well No. 3277 - Permit No. 3289

by Clarence G. Carlson
May 1967

The Sunray DX - Ervin V. Henke No. 1 is located in NE SE Section 14, T. 142N., R. 85W., Oliver County, North Dakota. Elevation: 2193 K.B., 2183 G.L.

The well was spudded on November 19, 1962, drilled to a total depth of 8,000 feet and plugged and abandoned on December 13, 1962.

Cores: None

Drill Stem Tests:

DST. 1 - 7762-7834 (straddle test) Tool open 1 1/4 hours with fair to strong blow throughout test. Recovered 90 feet of salt water cut mud, 90 feet of mud cut salt water and 885 feet of salt water. IHP 4105#, ISIP (30 minutes) 3385#, IFP 95#, FFP 515#, FSIP (30 minutes) 3030#, FHP 4105#.

Casing Record:

Set 9 5/8" at 673 feet with 350 sacks of cement.

Plugging Record:

<u>Plug Set</u>	<u>Sacks Cement</u>
7738-7650	25 sacks
6363-6275	25 sacks
5000-4912	25 sacks
4024-3936	25 sacks
673- 605	25 sacks
28- 0	10 sacks

Drilling mud between cement plugs.

Logs:

Gamma Ray-Laterolog
Sonic
Microlaterolog with caliper

The formation tops were determined from samples and logs and corrected to log tops. Not all formation tops are called in the following list. Color names are those used in the Rock Color Chart of the National Research Council.

FORMATION TOPS

Cretaceous System	
Pierre	1360
Niobrara	2852
Greenhorn	3328
Mowry	3704
Fall River-Lakota	4027
Jurassic System	4230

Triassic System	
Spearfish	5092
Pennsylvanian System	
Minnelusa	5163
Tyler	5725
Mississippian System	
Kibbey	5928
Madison	6052
Ratcliffe interval	6197
Frobisher-Alida interval	6405
Tilston	6715
Bakken	7554
Devonian System	
Three Forks	7568
Birdbear	7738
Duperow	7815

0-30	Claystone, light gray, lignite.
30-120	Claystone, light gray to medium light gray; siltstone, very light gray to light gray, some carbonaceous shale and lignite.
150-180	Lignite.
180-210	Claystone, light gray to medium light gray; lignite.
210-240	Sandstone, light gray, very fine to fine grained, clayey.
240-300	Siltstone, light gray to medium light gray, clayey, sandy; claystone, light gray.
300-330	Limestone, medium light gray, fine grained argillaceous.
330-360	Sandstone, light gray, very fine to fine grained, clayey; some limestone as above.
360-390	Claystone, light gray to medium light gray; lignite.
390-450	Sandstone, light gray, very fine to medium grained, clayey.
450-480	Limestone, medium light gray, fine grained, argillaceous; claystone, light gray.
480-600	Claystone, light gray to medium gray, silty.
600-660	Sandstone, light gray, very fine to medium grained, clayey; claystone, light gray to medium gray.
700-820	Claystone, light gray to medium gray, silty.
850-970	Shale, light gray to medium gray, slightly bentonitic.
970-1000	Shale, as above; sandstone, medium light gray, very fine to fine grained, argillaceous.
1000-1180	Shale, as above.
1180-1300	Shale, medium gray, silty; lignite.
1300-1600	Shale, medium gray, silty.
1600-1840	Shale, medium gray, slightly bentonitic, lumpy to platy.
1840-2590	Shale, medium gray, lumpy, compact to platy, compact.
2590-2650	Shale, as above; traces of bentonite, very light gray.
2650-2820	Shale, medium gray, compact, lumpy to platy.
2820-3340	Shale, medium dark gray to medium gray, platy to lumpy, compact.
3820-4010	Shale, medium dark gray to dark gray, platy, compact in part; fissile in part.
4010-4050	Shale, dark gray, platy, compact; traces of sandstone, very fine to fine grained, subangular grains.
4050-4080	Siltstone, light gray, clayey; sandstone, very light gray, fine to very fine grained, silty, argillaceous.
4080-4110	Sandstone, as above, some pyritic cement, some iron oxide cement; shale, medium gray.

4110-4120 Shale, light brownish gray to light olive gray and medium gray; traces of sandstone, as above.

4120-4180 Shale, medium gray; some light olive gray shale.

4180-4210 Sand, fine to coarse, loose, rounded to angular colorless quartz grains; much shale, as above.

4210-4230 Sand, as above; some shale, brownish gray, carbonaceous, shale, medium gray and medium light gray.

4230-4260 Shale, medium gray and light olive gray; a little sandstone, white, fine to very fine grained, calcareous.

4260-4270 Shale, olive gray (5Y4/1) to light brownish gray, platy, brittle.

4270-4310 Shale, olive gray (5Y4/1) to medium dark gray, platy, brittle.

4310-4400 Shale, as above; some sandstone, very light gray, very fine to fine grained, slightly calcareous (pyritic from 4330-40).

4400-4420 Shale, medium gray to light brownish gray, micaceous, lumpy to platy; a little sandstone, as above.

4420-4470 Shale, light brownish gray, light olive gray, traces of greenish gray; some sandstone, as above.

4470-4490 Sandstone, grayish orange pink, fine to very fine grained, calcareous; some shale, light greenish gray and olive gray, platy, brittle.

4490-4580 Sandstone, very light gray and grayish orange pink, very fine to fine grained, calcareous; shale as above.

4580-4600 Shale, greenish gray and olive gray, platy, calcareous.

4600-4620 Shale, as above; sandstone, very light gray, very fine to fine grained, calcareous.

4620-4640 Shale, medium dark gray, platy; also shale and sandstone, as above.

4640-4690 Shale, medium dark gray, light olive gray, greenish gray and light brown, platy.

4690-4730 Limestone, very light gray to white, fine grained, sandy, grading to a limy sandstone.

4730-4790 Shale, dark greenish gray (5GY4/1) to olive gray, platy, brittle, calcareous.

4790-4830 Shale, as above and pale brown to pale reddish brown, calcareous.

4830-4840 Sandstone, very light gray, fine grained, calcareous; shale, pale reddish brown, lumpy, calcareous; traces of gypsum.

4840-4850 Limestone, very light gray, fine grained, sandy, silty; shale, pale reddish brown, light greenish gray and olive gray.

4850-4880 Shale, pale reddish brown, lumpy, calcareous and pale brown and pale red, platy, calcareous.

4880-4890 Limestone, white to very light gray, very finely crystalline to sublithographic.

4890-4910 Limestone, very light gray, fine grained, granular; some chert.

4910-4920 Shale, olive gray, light greenish gray, pale reddish brown, platy, calcareous; some limestone, as above.

4920-4930 Limestone, pale red, finely crystalline and very light gray, finely crystalline; shale as above.

4930-4940 Limestone, very light gray to white, finely crystalline.

4940-4980 Limestone, very light gray and pale red, finely crystalline.

4980-5000 Limestone, very light gray to light yellowish gray, finely crystalline.

5000-5030 Siltstone, moderate reddish orange, calcareous; some anhydrite, white.

5030-5040 Shale, pale reddish brown, lumpy to platy, calcareous.

5040-5110 Shale, as above; some siltstone, moderate reddish orange, calcareous; some anhydrite.

5110-5130 Siltstone, moderate reddish orange, slightly calcareous.

5130-5140 Siltstone, moderate reddish orange, sandy, very slightly calcareous.

5140-5155 Sandstone, moderate reddish orange, very fine to fine grained, silty, slightly calcareous; some loose, medium rounded, frosted quartz grains.

5155-5165 Dolomite, very light gray to light pinkish gray, very finely crystalline.

5165-5180 Dolomite, as above; some chert, pinkish gray and white.

5180-5205 Sandstone, pinkish gray, fine to very fine grained, slightly calcareous; dolomite, as above.

5205-5210 Dolomite, very light gray, finely crystalline.

5210-5220 Dolomite, pinkish gray, fine grained, limy.

5220-5230 Sandstone, very light gray to pinkish gray, very fine to fine grained, calcareous.

5230-5240 Dolomite, pinkish gray, fine grained, sandy; sandstone, as above.

5240-5280 Sandstone, pinkish gray, very fine to fine grained, calcareous.

5280-5290 Sandstone, as above; some dolomite, pinkish gray, finely crystalline.

5290-5300 Dolomite, grayish pink, finely crystalline; sandy in part; sandstone as above.

5300-5320 Dolomite, very light gray, fine grained; some dolomite as above.

5320-5330 Dolomite, pale red, fine to medium grained, silty; dolomite, very light gray to grayish pink, fine grained.

5330-5340 Dolomite, as above; sandstone, very light gray, very fine to fine grained, calcareous.

5340-5345 Sandstone, grayish pink, very fine to fine grained, calcareous.

5345-5350 Dolomite, pale red, fine grained.

5350-5355 Dolomite, very light gray to pinkish gray, fine grained.

5355-5365 Sandstone, grayish pink, very fine to fine grained, calcareous.

5365-5395 Dolomite, pinkish gray to pale red, fine grained; some sandstone, as above; shale, moderate reddish brown, lumpy to platy.

5395-5415 Sandstone, grayish pink, very fine to fine grained, calcareous.

5415-5435 Dolomite, pinkish gray, fine grained.

5435-5440 Shale, variegated, olive gray, greenish gray, splintery, brittle, slightly calcareous.

5440-5445 Sandstone, grayish pink to very light gray, very fine to fine grained, calcareous; shale, as above.

5445-5470 Shale, variegated, splintery, brittle, calcareous.

5470-5480 Sandstone, grayish pink, very fine to fine grained, calcareous; some shale, as above.

5480-5505 Shale, variegated, olive gray, greenish gray, very pale brown, pale red, splintery, brittle.

5505-5520 Shale, mostly greenish gray (5GY6/1) some variegated, splintery, slightly calcareous.

5520-5525 Sandstone, very light gray to pinkish gray, very fine to fine grained, slightly calcareous; shale, variegated, splintery.

5525-5545 Dolomite, pinkish gray, fine grained; sandstone, as above.

5545-5560 Dolomite, light gray, fine grained, limy; shale, variegated, calcareous.

5560-5605 Shale, as above.

5605-5615 Limestone, very light gray, finely crystalline; shale as above.

5615-5620 Shale, variegated, pale red, purplish gray, greenish gray, olive gray, splintery, slightly calcareous.

5620-5635 Limestone, very light gray to white, finely crystalline; shale, as above.

5635-5645 Dolomite, very light gray, finely crystalline; limestone, pinkish gray, finely crystalline.

5645-5670 Limestone, very light gray to yellowish and pinkish gray, finely crystalline.

5670-5675 Limestone, as above; shale, variegated, splintery, platy, slightly calcareous.

5675-5680 Shale, as above.

5680-5705 Limestone, very light gray to light yellowish gray, finely crystalline; shale, as above.

5705-5710 Shale, moderate red, pale red, platy, slightly calcareous.

5710-5725 Limestone, very light gray, finely crystalline, some red and yellow staining; shale, as above.

5725-5750 Shale, as above and dusky yellow.

5750-5755 Shale, dark gray to grayish black, carbonaceous, traces of coal, a few ostracods.

5755-5770 Shale, as above and variegated shale.

5770-5790 Sandstone, colorless to pinkish gray, fine to medium rounded, weakly cemented grains, calcareous.

5790-5795 Sandstone, as above; some shale, dark gray.

5795-5800 Shale, dark gray; some coal.

5800-5805 Sandstone, very light gray and pinkish gray, very fine to fine grained; shale, variegated.

5805-5815 Shale, dusky yellow, lumpy to platy; sandstone, very light gray, very fine to fine grained.

5815-5820 Shale, grayish red, brownish gray, olive gray, lumpy.

5820-5830 Shale, medium gray, lumpy.

5830-5835 Shale, as above; a little coal.

5835-5865 Shale, medium gray, brownish gray, lumpy, waxy.

5865-5890 Shale, as above and various shades of red and reddish brown, generally lumpy to platy.

5890-5930 Shale, brownish gray, lumpy to platy and medium gray, lumpy.

5930-5945 Sandstone, light gray, very fine to fine grained, calcareous.

5945-5960 Siltstone, very light gray, sandy, calcareous; sandstone, as above.

5960-6020 Siltstone, moderate orange pink to grayish pink, calcareous.

6020-6025 Dolomite, light gray, fine grained.

6025-6050 Siltstone, moderate orange pink, calcareous.

6050-6060 Dolomite, light gray, fine grained; siltstone, as above.

6060-6070 Anhydrite, white.

6070-6075 Limestone, light gray, fine grained; some anhydrite.

6075-6090 Limestone, light gray, oolitic with fine grained matrix.

6090-6120 Limestone, yellowish gray, fine grained.

6120-6130 Limestone, light gray, finely crystalline; anhydritic; white anhydrite.

6130-6135 Dolomite, light brownish gray, fine to medium grained, anhydrite, white.

6135-6145 Anhydrite, white; some dolomite, as above.

6145-6165 Limestone, light brownish gray, fine grained, granular.

6165-6185 Anhydrite, white.

6185-6205 Limestone, yellowish gray, finely crystalline.

6205-6210 Limestone, yellowish gray, fine grained, fragmental in part.
 6210-6225 Limestone, light gray, finely crystalline, dense.
 6225-6230 Anhydrite, white; limestone as above.
 6230-6235 Anhydrite, white; limestone, yellowish gray, fine grained.
 6235-6255 Limestone, yellowish gray, oolitic to pelletoidal; some anhydrite.
 6255-6280 Limestone, light gray, finely crystalline, anhydritic.
 6280-6295 Anhydrite, light gray.
 6295-6315 Anhydrite, light gray and white; limestone, yellowish gray, fine grained.
 6315-6335 Limestone, yellowish brown, oolitic to pelletoidal and finely crystalline.
 6335-6375 Anhydrite, light gray.
 6375-6390 Anhydrite, as above; limestone, yellowish brown, fine grained.
 6390-6415 Limestone, yellowish brown, fine grained.
 6415-6430 Anhydrite, light gray, calcareous.
 6430-6440 Anhydrite, light gray; limestone, yellowish brown, fine grained to finely crystalline.
 6440-6445 Limestone, yellowish brown, finely crystalline to fine grained.
 6445-6450 Anhydrite, light gray; limestone as above.
 6450-6565 Anhydrite, light gray to white.
 6565-6585 Anhydrite, as above; limestone, yellowish brown, fine grained.
 6585-6620 Limestone, yellowish brown, fine grained, granular, fragmental in part.
 6620-6705 Limestone, yellowish brown, fine grained, fragmental, a few argillaceous stringers, scattered ostracods.
 6705-6720 Anhydrite, light gray; limestone, as above.
 6720-6740 Anhydrite, light gray to white.
 6740-6750 Anhydrite, light gray; limestone, yellowish brown, fine grained, granular to finely crystalline.
 6750-6765 Limestone, yellowish brown, finely crystalline to fine grained, fragmental.
 6765-6785 Limestone, yellowish brown, fine grained, fragmental, fossiliferous.
 6785-6815 Limestone, brownish gray, microsucrosic, dolomite; limestone as above, traces of oolitic limestone 6795-6800.
 6815-6825 Limestone, brownish gray, fine grained, fragmental, traces of oolitic to pelletoidal.
 6825-6885 Limestone, yellowish brown, fine grained, fragmental.
 6885-6905 Limestone, yellowish brown, finely crystalline to fine grained, fragmental.
 6905-6920 Limestone, very light gray to yellowish gray, finely crystalline, fragmental, slightly argillaceous.
 6920-6935 Limestone, light gray, finely crystalline, fragmental.
 6935-6965 Limestone; as above; a little chert, light gray.
 6965-7035 Limestone, light gray, fine grained, fragmental.
 7035-7110 Limestone, light gray, fine grained, fragmental, slightly argillaceous, fossiliferous.
 7110-7145 Limestone, light gray, fine grained, fragmental, siliceous.
 7145-7175 Limestone, light gray, fine grained, fragmental.
 7175-7200 Limestone, light gray, fine grained, fragmental, slightly siliceous.
 7200-7220 Limestone, light gray, pelletoidal with a fine grained matrix.
 7220-7250 Limestone, light gray, fine grained, fragmental, siliceous, some chert.

7250-7285 Limestone, light gray, fine grained, fragmental, very siliceous.
 7285-7530 Limestone, medium light gray, finely crystalline, argillaceous, siliceous.
 7530-7540 Limestone, medium light gray, finely crystalline, argillaceous.
 7540-7560 Limestone, very light gray, finely crystalline, chalky.
 7560-7565 Limestone, as above; shale, brownish black, slightly calcareous.
 7565-7575 Shale, brownish black, platy to fissile.
 7575-7590 Dolomite, grayish orange pink, fine to medium grained.
 7590-7605 Dolomite, as above and shale, greenish gray, platy, calcareous.
 7605-7615 Dolomite, grayish orange pink to moderate orange pink, fine grained.
 7615-7640 Dolomite, as above; and shale, grayish red to pale reddish brown.
 7640-7740 Shale, grayish red to pale reddish brown, very calcareous; some anhydrite, colorless to white.
 7740-7745 Shale, moderate reddish brown, fissile, calcareous.
 7745-7760 Limestone, grayish pink, fine to medium crystalline, slightly argillaceous; shale as above - poor samples.
 7760-7765 Limestone, yellowish gray to light gray, fine to medium crystalline.
 7765-7785 Limestone, yellowish brown, fine to medium grained, granular.
 7785-7815 Limestone, yellowish brown, fine to medium grained, granular, dolomitic.
 7825-7845 Poor samples - all dark gray shale.
 7845-7855 Sample mostly dark gray shale; a few chips of limestone, light yellowish gray, finely crystalline.
 7855-7945 Sample mostly dark gray shale; a few chips of dolomite, light brown, fine to medium grained, granular, limy; few limestone chips, as above.
 7945-7975 Limestone, light gray to yellowish gray, fine grained to finely crystalline; much cavings.
 7975-8000 Limestone, as above; some dolomite, light brownish gray, fine to medium grained, granular; much cavings.