

NORTH DAKOTA GEOLOGICAL SURVEY CIRCULAR NO. 163

A Summary of the Sohio Petroleum Co. and Argo Oil Co. - Harold Ritter B #1
Renville County, North Dakota
Well No. 1004 - Permit No. 1016

By Clarence Carlson
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Sohio Petroleum Company and Argo Oil Company - Ritter B #1, Renville County, North Dakota. Location: C NW NW Section 24, T. 163N., R. 86W. Elevation: 1735 G.L., 1745 K.B. Total Depth: 4650 feet.

The Sohio Petroleum and Argo Oil Co. - Ritter B #1 was spud October 24, 1955, drilled to a total depth of 4650 feet and completed as a producer February 24, 1956.

Logs: gamma ray-neutron by Schlumberger.

Cores: 4360-4649

Tests:

DST #1, 4392-4409; tool open 2 1/2 hours, shut in 30 minutes, recovered 640 feet of salt water, FP 50#-285#, HP 2550#-2335#, SIP 1985#.

DST #2, 4421-4450; open 2 hours, shut in 30 minutes, recovered 670 feet salt water. HP 2385#, FP 95-310#, SIP 1910#.

DST #3, 4479-4498, open 3 hours, shut in 30 minutes, recovered 90 feet of mud cut oil, 450 feet of free oil, 340 feet of salt water. FP 70-335#, HP 2380#, SIP 1795#.

DST #4, 4507-4517, open 3 hours, recovered 90 feet of highly oil and gas cut mud, 180 feet of free oil, 180 feet of salt water. FP 50-240#, HP 2290#.

DST #5, 4517-4547, 1 hour, recovered 90 feet of gas cut foamy salt water, 3910 feet of salt water. FP 285- 1860#, SIP (45 min)1980#, HP 2385#.

Perforations:

4504-4510; 4 shots per foot, swabbed dry. Squeezed perfs.
4481-4486; 4 jet shots per foot. Acidized with 500 gallons.
Swabbed and recovered acidized emulsion.

Completion Data:

Initial Production, 67 barrels of oil/day; 38% water, 6/0 ratio 60-80/1 API gravity 27.8°.

Casing Record:

10 3/4" casing set at 318' with 250 sacks of cement.
5 1/2" casing set at 4558' with 335 sacks of cement.

Formation tops were determined from samples and electric logs. Doubtful or obscure formations were not picked. Color names and identifying numbers are taken from the 1948 Rock-Color Chart which is distributed by the National Research Council, Washington, D. C.

FORMATION TOPS

Cretaceous System	
Pierre formation	780
Niobrara formation	2180
Greenhorn formation	2490
Dakota group	2755
Dakota group sandstone	3015
Jurassic System	
Piper limestone	3908
Triassic System	
Spearfish formation	4156
Mississippian System	
Charles formation	4350

360-390	Shale, medium light gray, slightly bentonitic, silty, micaceous.
390-420	Shale, light gray, bentonitic, lumpy; some lignite; a little siltstone, light gray.
420-450	Lignite, a little shale as above.
450-480	Sandstone, light gray, fine grained, argillaceous, slightly calcareous.
480-510	Sandstone as above, some shale, medium gray.
540-600	Sandstone as above, some shale, medium light gray.
600-630	Shale, medium light gray, some lignite.
630-660	Shale, as above, some sandstone, loose, subangular, fine grained, a little lignite.
660-690	Shale, light brown 5YR6/4, silty and medium light gray, silty, micaceous, slightly bentonitic.
690-720	Shale, medium light gray, slightly bentonitic, siltstone, light gray, slightly calcareous.
720-780	Sandstone, very light gray, fine grained, calcareous, some shale, light brown 5YR6/4, silty, micaceous.
780-810	Shale, light gray, silty, micaceous.
810-870	Shale, light gray and light brown 5YR6/4, silty micaceous, slightly bentonitic.
870-960	Shale, medium light gray, lumpy, bentonitic.
960-1020	Shale, medium gray, lumpy, compact,
1020-1540	Shale, medium light gray, lumpy, slightly bentonitic.
1540-1840	Shale, light gray, lumpy, compact.
1840-2000	Shale, medium gray and light olive gray lumpy.
2000-2060	Shale, medium gray and medium light gray, lumpy, compact.
2060-2120	Shale, medium gray, lumpy to platy, compact.
2120-2200	Shale, medium gray, platy, calcareous, with white specks.
2200-2340	Shale, medium gray, lumpy, compact.
2380-2400	Shale, medium dark gray, flaky.
2400-2440	Shale, medium dark gray and medium gray.
2440-2520	Shale, medium dark gray, flaky.
2520-2580	Shale, medium dark gray, flaky, calcareous, with white specks and Inoceramus fragments.
2580-2600	Shale, medium dark gray, flaky; many Inoceramus fragments.
2600-3020	Shale, medium dark gray, flaky.
3020-3030	Shale as above; some sandstone, fine grained, subangular, colorless quartz.

3030-3070 Sandstone, fine to medium grained, colorless, subangular to subrounded quartz with a little pyrite cement; shale as above.

3070-3100 Shale, medium gray to medium light gray, soft, flaky; some sandstone as above.

3100-3150 Sandstone, colorless to white, fine grained, calcareous.

3150-3180 Sandstone as above with some siderite pellets; some shale, light gray, soft, flaky.

3180-3190 Sandstone, fine to medium grained, subrounded to subangular quartz.

3190-3230 Shale, medium to medium light gray; some sandstone as above.

3230-3260 Shale, light olive gray and medium light gray, soft, flaky.

3260-3370 Shale, medium light gray to light gray.

3370-3380 Shale, medium light gray to medium gray; some sandstone medium, subangular quartz.

3380-3400 Sandstone, fine to medium, subrounded, colorless quartz; some shale as above.

3400-3480 Shale, medium gray.

3480-3510 Shale, light greenish gray, 5GY8/1, light olive gray 5Y6/1 and medium light gray, platy to flaky, slightly calcareous.

3510-3570 Shale, greenish gray 5GY6/1, flaky, calcareous.

3570-3720 Shale, light olive gray and greenish gray, flaky, to platy, calcareous.

3720-3740 Shale, pale reddish brown, greenish gray and light olive gray, platy, calcareous.

3740-3750 Shale as above, some sandstone light gray to light yellowish gray, fine grained, calcareous.

3750-3770 Sandstone, light yellowish gray, fine grained, calcareous, some shale, pale brown 5YR5/2, greenish gray and light olive gray, platy, calcareous.

3770-3870 Shale, as above, a little sandstone as above.

3870-3920 Shale, light greenish gray, light olive gray and pale brown, splintery, calcareous.

3920-4050 Limestone, light yellowish gray, very fine grained, with a little chert, light gray to white.

4050-4060 Limestone as above, some gypsum, colorless to white.

4060-4090 Shale, pale reddish brown, flaky to lumpy, calcareous, some gypsum, white.

4090-4130 Limestone, yellowish gray, very fine grained, gypsum, white to colorless.

4130-4160 Shale, pale reddish brown, platy to flaky, calcareous, some gypsum.

4160-4180 Shale, pale brown, pale reddish brown, platy to lumpy, slightly calcareous, a little gypsum.

4180-4240 Siltstone, moderate orange pink, slightly calcareous, with a few medium sand, grains.

4240-4270 Siltstone, moderate orange pink, with a little gypsum.

4270-4346 Siltstone, moderate orange pink, arenaceous.

CORES

4346-4347 Siltstone, moderate orange pink, anhydrite.

4347-4348 Shale, pale reddish brown and light greenish gray, silty, anhydritic, slightly calcareous.

4348-4352 Siltstone, moderate orange pink, anhydritic with some shale stringers, pale reddish brown.

4361-4367 Dolomite, sucrosic, argillaceous.
 4367-4394 Anhydrite.
 4394-4396 Dolomite, finely crystalline, argillaceous.
 4396-4404 Limestone, sucrosic, fair to good pinpoint porosity, fair stain, good fluorescence, very weak odor.
 4404-4408 Limestone, spotted stain and light shale stringers.
 4410-4411 Limestone, light brownish gray, oolitic with a fine grained matrix, oil stained, fair cut with CCl₄.
 4411-4415 Limestone, light gray, fine grained to finely crystalline, slightly argillaceous.
 4415-4416 Limestone, light brownish gray, fine grained, granular.
 4416-4421 Limestone, light gray, fine grained to finely crystalline, slightly argillaceous.
 4421-4422 Limestone, light brownish gray, fine to medium crystalline, granular with some medium crystals of pale brown anhydrite, oil stained.
 4422-4423 Anhydrite, light brownish gray, dense.
 4423-4425 Limestone, light yellowish gray, fine grained, with a few shell fragments, some scattered staining.
 4425-4426 Limestone, light brownish gray, fine grained, granular to finely crystalline with medium to coarse crystals of pale brown anhydrite oil stained.
 4426-4429 Limestone, light brownish gray, oolitic with a few Ostracods, oil stained.
 4429-4431 Limestone, light brownish gray, oolitic to finely crystalline, with some medium to coarse crystals of pale brown anhydrite, oil stained.
 4431-4432 Limestone, light gray, finely crystalline with lenses of light brownish gray oolitic, oil stained limestone.
 4432-4433 Limestone, light gray, fine grained to finely crystalline.
 4433-4454 Anhydrite, light gray to colorless with some stringers of limestone, light gray, fine grained, argillaceous and shale, greenish gray.
 4454-4455 Limestone, light brownish gray, finely crystalline with some medium crystals of pale brown anhydrite.
 4455-4458 Limestone, light gray, fine grained, argillaceous.
 4458-4460 Anhydrite, colorless to white.
 4460-4461 Limestone, light gray, fine grained.
 4461-4471 Anhydrite, colorless to white with stringers of limestone, light gray, fine grained, argillaceous.
 4471-4472 Limestone, light gray, fine grained, with anhydrite stringers.
 4472-4476 Limestone, light gray, fine grained.
 4476-4477 Limestone, light brownish gray, fine grained, granular, oil stained.
 4477-4478 Limestone, light gray, fine grained.
 4478-4480 Limestone, light yellowish gray, finely crystalline with some anhydrite, colorless and pale brown.
 4480-4481 Limestone, light yellowish gray, oolitic, anhydritic.
 4481-4483 Limestone, light gray, fine grained with some medium to coarse crystals of anhydrite.
 4483-4485 Limestone, light brownish gray, oolitic to pisolitic, partially recrystallized, oil stained.
 4485-4486 Limestone, light yellowish gray, finely crystalline with secondary filling of colorless anhydrite.

4486-4491 Limestone, light brownish gray, oolitic to pisolitic, re-crystallized to finely crystalline, some secondary filling of colorless anhydrite, some oil stain.

4491-4492 Limestone, light gray, finely crystalline with some secondary anhydrite, colorless and pale brown.

4492-4498 Limestone, light gray, fine grained, silty, anhydritic.

4499-4500 Limestone, dense.

4500-4504 Limestone, lithographic.

4504-4506 Limestone, dense.

4506-4540 Limestone, tan, oolitic, fractured, scattered stain of light oil.

4540-4547 Limestone, gray, dense.

4547-4550 Limestone, yellowish gray, oolitic, partly recrystallized to finely crystalline, some secondary filling with colorless anhydrite, with scattered oil stain and cut with Ccl_4 .

4550-4551 Limestone, yellowish gray, oolitic with a finely crystalline matrix.

4551-4559 Limestone, yellowish gray, pisolitic to oolitic, partly re-crystallized, vugs and pores largely filled with colorless anhydrite.

4559-4566 Limestone, light yellowish gray, oolitic to pisolitic, mostly recrystallized to a finely crystalline, vuggy limestone with the vugs filled with colorless anhydrite.

4566-4567 Siltstone, light gray, sandy, calcareous.

4567-4572 Limestone, light brownish gray, pisolitic, partly recrystallized to finely crystalline with secondary filling of pores by colorless anhydrite and pyrite.

4572-4578 Limestone, yellowish gray, oolitic to pisolitic, some pyrite and anhydrite filling of pores, slight oil stain from 72-74.

4578-4579 Dolomite, light gray, fine grained, granular.

4579-4581 Limestone, light brownish, oolitic to fine to medium crystalline.

4581-4584 Limestone, very light gray, fine grained, silty to sandy, some fine crystals of secondary colorless anhydrite and some pyrite.

4584-4590 Limestone, light brownish gray, oolitic to pisolitic, partly recrystallized to finely crystalline, vugs and pores filled with colorless anhydrite and pyrite.

4590-4595 Limestone, light gray, oolitic to pisolitic, partly recrystallized to finely crystalline, some colorless anhydrite filling of vugs and pores.

4601-4608 Limestone, light gray, oolitic to pisolitic, partly recrystallized to finely crystalline, some colorless anhydrite filling of pores.

4608-4613 Limestone, light brownish gray, oolitic to fragmental with some secondary anhydrite fillings.

4613-4622 Limestone, light brownish gray, oolitic to finely crystalline with secondary filling by colorless anhydrite (some Bryozoa? 4620-21).

4622-4633 Limestone, yellowish gray, fine grained, fragmental, some colorless anhydrite filling of pores.

4633-4635 Limestone, yellowish gray, oolitic to pisolitic with a finely crystalline matrix and some anhydrite filling.

4635-4641 Limestone, yellowish gray, very finely crystalline, dense; some secondary anhydrite, colorless, scattered oolites and limestone fragments, dense.

4641-4649 Limestone, yellowish gray, oolitic to pisolitic, partly re-crystallized to finely crystalline, some anhydrite filling.