

NORTH DAKOTA GEOLOGICAL SURVEY CIRCULAR NO. 243

Summary of the Phillips Petroleum Co. - Glenn Brandt #1
Bottineau County, North Dakota
Well No. 2596 - Permit No. 2608

by William P. Eastwood
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Phillips Petroleum Co. Glenn Brandt #1 located in SE 1/4, NW 1/4, section 19, T. 160N., R.80W., (1840.4 FWL, 1980 FNL) Bottineau County, North Dakota. Elevation of K.B. 1511, ground 1499. Contractor - Phillips.

The drilling permit was issued on February 19, 1960. The well was drilled to a total depth of 6248 feet. The well was a dry hole and was plugged and abandoned on April 3, 1960.

Drill Stem Tests: None

Casing Record:

355 feet of 10 3/4" O.D. Surface casing with 185 sacks, cut off below plow depth.

Plugging Record:

Neat cement plugs spotted at following depths:

15 sacks at 6200	15 sacks at 3735
15 sacks at 6000	15 sacks at 3500
15 sacks at 5200	15 sacks at 2420
15 sacks at 5050	25 sacks at 359
15 sacks at 4400	5 sacks at 4
15 sacks at 4200	

Surface casing cut off below plow depth, pits filled, and location leveled.

Mechanical Logs:

Schlumberger Induction - Electrical 359-6240
Schlumberger Microlaterolog - Microcaliper 3500-6242

Core Record:

1. Winnipegosis 6075-6103 - Full recovery.

The formation tops were determined by samples and mechanical logs. Color names used are those of the Rock Color Chart of the National Research Council. Limestone Petrography terms are those proposed by Folk (1959) Bull. Amer. Assoc. Petroleum Geologists, Vol. 43, No. 1, PP. 1-38.

FORMATION TOPS

Cretaceous

Greenhorn formation	1898
Mowry formation	2184
Fall River formation	2402

Triassic		
	Spearfish formation	3472
Pre-Mesozoic Unconformity		3725
Mississippian		
	Ratcliffe interval	3725
	Midale subinterval	3833
	Frobisher-Alida interval	3873
	"X" Salt Bed	3947
	Base Frobisher-Alida Anhydrite	4100
	Tilston interval	4210
	Bottineau interval	4396
	Bakken Formation	5003
Devonian		
	Three Forks formation	5020
	Birdbear formation	5104
	Duperow formation	5195
	Souris River formation	5602
	Dawson Bay formation	5838
	Prairie formation	6000
	Winnipegosis formation	6018
Silurian		
	Interlake formation	6217 (?)

Description of Samples and Core Chips:

Most of samples badly caved.

0-140	Medium to fine loose quartz sand grains, rounded to subrounded. Rare to common reddish quartzite, silty at top becomes cleaner toward base. Rare to rounded particles of igneous rocks.
140-180	As above with common coarse subrounded fragments of igneous rocks.
180-220	Coarse subrounded fragments of igneous rocks. Common medium angular to rounded quartz grains.
220-240	Medium to dark gray sandy shale.
240-340	Medium gray sandy shale.
340-380	Dark gray, slightly micaceous shale. Rare to common, medium gray shale as above.
380-400	Light gray fissile clayey shale.
400-480	All three kinds of above shales. Probably cavings.
480-1520	Light gray shale as in 380-400. Mollusk fragments at 820-40. Dark gray shale 920-40. Rare light reddish brown very fine grained sandstone fragments at 1060-80. Rare white bentonite (?) at 1200-20. Small pieces of dark brown limestone at 1320-40. Common black shale 1340-1460.
1520-1700	Common gray shale as above with common black shale as above. Amount of light gray shale decreases downward.
1898 Top of Greenhorn formation	
1700-1980	Black fissile shale. Rare mollusk fragments. Common cavings of light gray shale.
1980-2020	Black shale as above with common "speckled shale".
2184 Top of Mowry formation	

2402 Top of Fall River formation

2020-2650 Black shale as above. "Speckled shale" at 2220-2260, and at 2400-2420. Large quartz fragments at 2500-20 which are probably cavings. Rare fragments of medium to fine grained white friable sandstone. Common bentonite 2520-30. Rare light olive gray waxy shale at 2580-90.

2650-2750 Black shale as above. Rare fine grained white friable quartz sandstone. Coarse-grained quartz cavings at 2720-50.

2750-2850 Common very fine grained white sandstone. Black shale as above.

2850-3010 Black shale as above. Common sandstone at 2880-90 and 2900-10. Rare white pelletoidal and sandy (?) limestone at 2910-2990. Rare medium gray fine grained sandstone at 2960-70.

3010-3020 Black shale as above with limestone as above.

3020-3090 Medium light gray shale with common black shale and rare limestone as above.

3090-3140 As above with light olive gray shale. Rare moderate red shale. Rare white fine grained calcareous quartz sandstone at 3110-40.

3140-3170 Shale as above with common sandstone as above and rare white sandy limestone.

3170-3210 As above with common moderate red shale and common light olive gray shale.

3210-3240 Mixtures of above shales with common white sublithographic limy dolomite.

3240-3250 Common light gray shale with rare dark greenish yellow shale.

3250-3320 Gray shale as above with common pale yellowish brown slightly pelletoid fine crystalline to sublithographic limestone.

3320-3470 Abundant black fissile shale, common limestone as above. Rare pale yellowish brown sandy shale.

3472 Top of Spearfish formation

3470-3500 Shale and limestone as above with rare to common moderate red shale.

3500-3640 Black fissile shale and brown sandy shale. Rare limestone. Rare to common moderate red shale. Rare moderate red fine-grained silty sandstone.

3640-3700 Black shale cavings as above. Common moderate red sandstone as above.

3725 Pre-Mesozoic Inconformity and top of Ratcliffe interval

3700-3740 Light brown to moderate red shale. Rare moderate red sandstone. Black shale cavings.

3740-3820 Black and brown shale as above with common pale olive very sandy shale which contains rare ostracodes.

3833 Top of Midale subinterval

3820-3860 Badly caved as above. Rare pieces of pale yellowish brown pelmicrosparite limestone.

3873 Top of Frobisher-Alida interval

3860-3920 Very pale orange finely granular limestone. Rare white anhydrite. Badly caved. Rare dark yellowish brown granular limestone at 3890-3900.

3920-4080 As above with rare pale bluish anhydrite. Rare pale yellowish brown sublithographic limestone, microlaterolog indicates a salt bed at 3947-3984.

4100 Base of Frobisher-Alida Anhydrite

4080-4107 Abundant white anhydrite. Badly caved.

4107 Circulation sample. Cavings as above. Rare moderate yellowish brown granular limestone.

4107-4160 Black shale and anhydrite cavings as above. Rare pale yellowish brown pelmicrosparite limestone. No stains. Also rare moderate to pale yellowish brown micrite limestone with pinpoint porosity.

4210 Top of Tilston interval

4160-4240 Very pale orange micrite, and microsparite limestone with fair pinpoint porosity. Badly caved. Rare pelmicrite and oomicrite limestone with good porosity from 4180 on down.

4240-4260 Limestone, as above but less pinpoint and intergranular porosity. Very little black shale cavings. Pale blue slightly limy anhydrite at 4250-60.

4260-4290 Limestone as above with common very light gray microsparite dolomitic limestone. No oomicrite limestone.

4290-4340 Pale yellowish brown micrite, microsparite, and peloomicrite limestone. Peloomicrite limestone has fair intergranular porosity. Moderate yellowish brown oosparite limestone at 4310-40.

4340-4370 Pale yellowish brown limestone as above. Common moderate yellowish brown finely granular limestone with good intergranular and pinpoint porosity.

4396 Top of Bottineau interval

4370-4400 As above with rare to common poorly cemented intrapelmicrite limestone.

4400-4450 As above with rare moderate yellowish brown microsparite limestone. Common black shale cavings.

4450-4470 Common pale yellowish brown microsparite limestone as above. Common moderate yellowish brown intrasparite limestone with coarse calcite. Very rare porous oosparite.

4470-4590 Common to abundant very pale yellowish brown microsparite limestone. Rare coarsely crystalline intrasparite as above at 4490-4510. Common black shale cavings.

4590-4630 As above with rare to common moderate yellowish brown intrapelsparite limestone. Rare dark yellowish brown sublithographic limestone.

4630-4790 As above with common intrapelsparite limestone. Fair intergranular porosity.

4790-4830 Abundant moderate yellowish brown to moderate gray intrasparite limestone. Fair intergranular porosity.

4830-4980 As above with rare to common moderate yellowish brown sublithographic limestone. Common moderate gray pelmicrite limestone.

5003 Top of Bakken formation

5020 Top of Three Forks formation

4890-5050 Limestone as above. Common large black shale fragments.

5050-5070 Shale and limestone as above with common very pale yellowish brown to very pale orange finely granular limestone.

5070-5090 As above with rare moderate red shale.

5104 Top of Birdbear formation
5090-5240 As above, common to abundant red shale.

5195 Top of Duperow formation
5240-5300 Common moderate to pale yellowish brown finely granular to pelmicrosparite limestone. Common black shale cavings (?). Common medium gray pelmicrosparite limestone. Some of the yellowish brown limestone has rare pinpoint pores. Rare pale yellowish brown pelmicrite with small patches of sparite.
5300-5420 As above. Rare to common moderate yellowish brown pelmicrosparite. Black, green and red shale cavings.
5420-5460 Abundant pale yellowish brown to very pale orange microsparite and pelmicrosparite. Rare shale cavings.
5460-5550 Abundant moderate yellowish brown pelmicrite and pelomicrite with some sparry calcite, good pinpoint porosity. Common very pale orange microsparite limestone as above.
5550-5580 Abundant very pale orange pelmicrite and pelmicrosparite. Rare to common moderate yellowish brown pelmicrite and pelintramicrite as above.

5602 Top of Souris River formation
5580-5620 As above with rare medium gray finely granular limy dolomite.
5620-5740 Moderate to pale yellowish brown pelmicrite and pelmicrosparite with good intergranular porosity. Rare gray finely granular limy dolomite. Very rare ostracodes in the pale yellowish brown limestone. Rare pale yellowish brown sublithographic limestone.
5740-5820 Common limestone as above. Common moderate to pale yellowish brown finely granular slightly limy dolomite.

5838 Top of Dawson Bay formation
5820-5890 Abundant dolomite as above. Rare limestone as above. Fair pinpoint porosity. Common moderate yellowish brown medium crystalline dolomite.
5890-5930 Abundant finely granular dolomite, as above. Common medium crystalline dolomite, as above. Good intergranular porosity and permeability in the medium crystalline dolomite. Rare moderate yellowish brown limestone,
5930-5980 Abundant medium crystalline dolomite, as above, rare fine crystalline dolomite, as above.
5980-6000 Dolomite, as above with common pale yellowish brown micrite and microsparite limestone.

6000 Top of Prairie formation
6000-6015 Dolomite as above, rare limestone.
6015 15 minutes circulation. Dolomite as above. Common limestone.

6018 Top of Winnipegosis formation
6015-6050 Abundant dark yellowish brown medium crystalline dolomite with good intergranular porosity and permeability. Common pale yellowish brown pelmicrite limestone. Rare light brown anhydrite. Black shale cavings (?) in sample at 6020-6050. No anhydrite below 6030.
6050-6075 Abundant limestone as above, common dolomite as above. Common black shale.

6075-6103 Samples missing.
6103-6150 Dolomite, pale yellowish brown to very pale orange, medium crystalline. Good intercrystalline porosity and permeability. Rare moderate yellowish brown microsparite limestone.
6150-6230 Abundant dolomite, as above, common limestone as above. A few pieces of lost circulation material (mica) at 6180-6190. A few pieces of very pale pink limy dolomite at 6225-6230.

6217 Top of Interlake formation
6230-6248 Abundant yellowish brown dolomite and limestone as above. Rare very pale pink dolomite as above. Rare to common very pale orange to white sublithographic limestone. Very rare moderate red medium crystalline dolomite (Ashern lithology ?).

Total Depth - 6248. 6246 driller.