

State of
Colo.

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GOLD. OIL & GAS CONS. COMM.

GEOLOGICAL WELL REPORT

FLANK OIL COMPANY

#2 WEBSTER

SW NW NW SEC. 18, T. 9N., R. 78W.,

JACKSON COUNTY, COLORADO

McCALLUM FIELD SHALLOW PAY

DVR	<input checked="" type="checkbox"/>
FJP	<input checked="" type="checkbox"/>
HHM	<input checked="" type="checkbox"/>
JAM	<input checked="" type="checkbox"/>
JJD	<input type="checkbox"/>
GCH	<input type="checkbox"/>
CGM	<input type="checkbox"/>

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WELL DATA

LOCATION: 350' from the West line and 973' from the North line, approximate center SW NW NW Sec. 18, T. 9N., R. 78 W., Jackson County, Colorado. (Powers)

ELEVATION: 8081 ground (Powers - before dozing).
8090 K.B.

TYPE WELL: Development - McCallum Field - Shallow Pierre "B" Sand Pay.

SPUD DATE: Spudded 11:15 P.M., July 19, 1974.

COMPLETION DATE: July 22, 1974 (Ran production casing and cemented).

CASING RECORD: Ran 6 joints of new and used 8-5/8" surface casing, 8 round, 24#, totalling 139.65'. Set @ 150.65. Cemented with 110 sacks, 2% Ca Cl. Good returns throughout job.

Ran 33 joints of 5-3/8" production casing, used; landed @ 1058.62. Cemented with 75 sacks of class G cement, 10% salt, preceded by 300 gallons of mud-flush. Good returns.

TOTAL DEPTH: 1470 - Driller
1469 - Logger

DEEPEST FORMATION PENETRATED: Pierre shale - Pre-Pierre "B" sand.

DEPTH DATUM: 8090 K.B.

WELL STATUS: Being completed as a producer.

MUD PROGRAM: Drilled from 0 to 40 with Gel, Casulis (?), and CMC. From 155 to 626 added Gel, CMC, Caustic soda, soda ash, and Ray van. At 1470 T.D. mud weight was 9.5, viscosity 40, and water loss 8.0 cc. No hole trouble was encountered logging.

Mud furnished by Pro-Chem Mud Company, Casper, Wyoming.

HOLE SIZE: 12-1/4" from surface to 155.
7-7/8" from 155 to 1470 T.D.

CORES: Sidewall Dresser Atlas core samples from 940 to 958 (in Pierre "B" pay sand); shot 18, recovered 16.

DRILL-STEM TESTS: (None).

LOGS: Ran Dresser Atlas Induction Electrolog from 1469 T.D. up to 190, including both a 5" and 2" scaling over this interval. A repeat was run from 1469 T.D. up to 1261.

Second log run was a Compensated Densilog with Gamma Ray Log and Caliper Log. This was run on normal 5" scale from 1469 T.D. up to 190, with a repeat from 1470 to 1254.

Logging Engineers: Rich Higgins and Chuck McCall, Trainee, Fort Morgan, Colorado.

CONTRACTOR & RIG
EQUIPMENT:

Brinkerhoff Drilling Company, Denver, Colorado.
Rig No. 61.

Pusher: Harry Forbes (on vacation).

Ideco Rambler or Roadair (brand new).

4-1/2" drill pipe, 16.60#/ft.

Grade E.

Emsco D-300 with a 14" stroke.

Metal mud tanks.

Shale shaker.

SAMPLE STORAGE: Cuts of Pierre "B" sand. Pay section only were given to Flank glued in trays.

DRILLING TIME
RECORDS:

Original copy of Totco 1' drilling time charts is in files of G. A. Nelson, Consultant, Denver, Colorado.

LOG FORMATION TOPS

All depths are from 8090 K.B.

<u>FORMATION</u>	<u>DEPTH</u>	<u>DATUM</u>
SANDSTONE MARKER	820	
PIERRE "B" SAND	940	+7150
TOP OF POROSITY	944	
TOP OF PAY ZONE	946	
BOTTOM OF POROSITY	955	
BASE OF PIERRE "B" SAND	958	
TOTAL DEPTH LOGGER	1469	
TOTAL DEPTH DRILLER	1470	

SAMPLE LITHOLOGIC DESCRIPTION

All depth measurements are from 8090 K.B.

All shows are underlined with a solid line. Possible shows are shown with a dashed line.

DEPTH

LITHOLOGY

(Following depths are drillers depths not corrected for lag, and sample lithology is not matched to log lithology).

670 - 80	Possible very silty shale.
680 - 90	Same as above.
690 - 700	Noticeable Pierre Shale, silty, black.
700 - 20	Same as above.
730 - 40	Same as above.
750 - 60	Same as above.
790 - 800	Same as above.
820 - 30	Same as above.
830 - 40	Very silty shale, very black, soft.
820 (log)	SANDSTONE MARKER FOR PIERRE "B".
840 - 50	Sandstone, traces snow white, mostly medium gray to dark gray, highly salt & pepper, very well-cemented, very fine, no visible porosity, hard to soft.
850 - 60	Fair amount of same sand, white with abundant tiny black spots, very fine, well-cemented, no porosity, tight, mostly same sand but dark gray, shaley, dirty, soft.
860 - 70	Same; also black silty to sandy shale.
870 - 900	Silty shale, very black, soft; shaley sand, gray, very fine, salt & pepper, well-cemented, no show, no porosity.
900 - 30	Very very silty to same sandy shale, black.
930 - 60	Same shale and Pierre "B" pay sand (see below).

SIDEWALL CORE SAMPLE LITHOLOGY (matches log lithology)

940 - 58	Shot 18 samples. Recovered 16 samples.
940 (+7150)	TOP OF PIERRE "B" SAND
941	Very silty shale, dark gray, poorly bed and thinly bed with very silty sand, no show, light gray white, dirty, very fine to very very fine, well-sorted, no visible porosity, glauconitic, very limy; thin vertical shale lamination suggesting possible vertical fractures, no fluorescence.

- 942 Same poorly bed dark gray to blackish silty shale lamtus plus same dirty very silty sand as above, no show, no fluorescence, salt & pepper with biotite, glauconitic, very limy.
- 943 Same as above, dark gray thinly laminated silty shale finely bedded with same dirty, very silty sand, light gray, no show, no porosity, glauconitic, very fine, well-sorted, trace mica, no fluorescence, bedding appears to be vertical or stands on end.
- 944 TOP OF LOG POROSITY
- 944 Same poorly bed dark gray silty shale and dirty sand, light gray, gray, very silty, no show, no porosity, soft, glauconitic, no fluorescence, very fine and fine, well-cemented, limy.
- 945 (Better chip - excellent) Sandstone, tannish light gray, possible stain, highly glauconitic, very well-cemented, no visible porosity, dirty, very silty, fine blackish silty shale, spots scattered, very fine to fine, fair sorting, non-calcareous so all clay-filled, acid goes into sand. Like some porosity; true reddish brownish black silty spot like iron oxide silt, no fluorescence.
- 946 TOP OF PAY ZONE
- 946 Same sand as above but very friable and crumbly with excellent visible porosity, any clay-fill not obvious or limited, irregular dark brown streaks of live oil stain in 15%, very fine to fine grained, abundant glauconite, abundant black grains possible shale particles, overall sugary, 50% with fair yellow fluorescence.
- 947 Same sand as above with stain less obvious, highly glauconitic plus abundant blackish grains, very silty, dirty, very fine to fine porous, friable, crumbly, few blackish silty shale spots, very silty clay-fill, poor to fair yellowish fluorescence in lot of total cuttings (2).
- 948 Sandstone, light gray with traces possible tan stone, very silty, dirty, very fine to fine, friable, crumbly, very good or better visible porosity, abundant glauconitic in part where highly clay-filled, limited tight yellow fluorescence in 20% of 1 piece.
- 949 (Good chip) Sandstone, tan finely uneven stain throughout, very fine to fine, fair sorting, very silty, slightly dirty, highly glauconitic, highly salt & pepper with scattered black grains well-cemented with silty material but some porosity visible, angular to subangular

- 950 grains, fair or less light gray to yellowish gray fluorescence in 50%, non-calcareous. Same sand as above, streaky dark tan live oil stain in part, very crumbly and friable, very silty, very fine to fine, excellent visible porosity, highly glauconitic, abundant black grains, good sorting, bright gray fluorescence throughout but not yellowish.
- 951 (No recovery).
- 952 Sandstone as above, very silty, tannish light gray possible stain (good chip), very silty, very fine, good sorting, highly glauconitic, abundant scattered black grains, well-cemented with silty material like silty clay, angular grains, non-calcareous, bright gray to possible yellowish gray fluorescence. Where dry, becoming slightly yellowish fluorescence where wet after acid; when wet more of overall tannish stain.
- 953 Sandstone, very silty, dirty very well-cemented, tan stain throughout, very fine, excellent sorting, no visible porosity, slightly limey, fine glauconitic, fine black specks or grains scattered, tight, slightly limey, very light yellowish faint fluorescence, slightly hard to hard.
- 954 Same, highly glauconitic sand as above with abundant scattered black grains, very soft, crumbly, friable, very silty, dirty, good visible porosity, very fine to fine, fair sorting, fair grayish fluorescence throughout, tannish light gray under white light, non-calcareous.
- 955 BOTTOM OF LOG POROSITY
- 955 Same sand as above, light gray, tannish light gray, dirty, very silty, very well-cemented, poor visible porosity, soft, friable, no show, part highly glauconitic; few dark gray silty shale lamtus poorly bed, no fluorescence.
- 956 Sandstone, light gray, no show, very very silty, very fine grains, no visible porosity, soft, friable, glauconitic, well-sorted, scattered black grains, gray fluorescence.
- 957 (No recovery).
- 958 Same sand as above, white, no show, very, very silty, very fine and finer, excellent sorting, very well-cemented, no visible porosity, fine glauconitic, scattered fine black specks, soft, very limey, no fluorescence.
- 958 BASE OF PIERRE "B" SAND

960 - 90 (Cave from pay sand just above) Sandstone, gray to tannish gray possible stain, abundant black spots scattered, highly glauconitic, very fine, well-cemented, poor visible porosity, also fine, poor sorting, non-calcareous, possible clay-fill, slightly hard to slightly soft, faint yellowish brown poor fluorescence.

990 - 1020 Sandstone as above, tan to tannish gray possible stain, abundant black spots, very fine, tight, no porosity, well-sorted, very well cemented, glauconitic, fair or better yellow fluorescence throughout.

(Following samples were first observed of Pierre "B" sand while circulating @1470 T.D. to run "correlation" log. Being the "freshest" samples they reflect the best show.)

(All of the following are cave from 940 - 958 Pierre "B" pay sand.)

1380 - 1410 Irregular orange brown possible spotty stain, good yellow fluorescence in all, very fine, dirty, very silty, well-sorted, soft, abundant salt & pepper, glauconitic, well-cemented, poor visible porosity.

1410 - 40 Same as above, better stain, abundant clay-fill, good yellow fluorescence throughout.

1440 - 70 Same as above, part limy; some not limy, some fluorescence.

1470 (T.D.) Circulated 15" sample @ 1470 T.D.) Silty shale, black, thinly laminated with light gray, gray sand, highly salt & pepper, very fine, excellent sorting, no show, no porosity, slightly soft.

Samples examined and described on location by G. Allen Nelson, Consultant, Denver, Colorado.

HOLE DEVIATION SURVEYS

Surveys were run using an Eastman instrument with a 12° maximum reading.

<u>DEPTH</u>	<u>DEVIATION</u>	<u>FORMATION</u>
99	1/2°	- -
440	2-1/4°	- -
782	2-1/4°	Pierre (Pierre)
1470	9	Pierre (Pierre)

BIT RECORD



First 155' of hole was 12-1/4". Below 155' bit size was 7-7/8".

Bit No.	Make	Type	From	To	Ft.	Hours	Formation at Base of Run
1A	HTC	OSC3 (RR)	o	155	155	4-3/4	---
1	Reed	Y12J	155	1470	1315	14-i/4	Pierre

DRILLING PROGRESS SUMMARY

Drilling Depths as of:

Date	No. of Days	Depth	Formation @ P.D.	Ft. Drilled last 24 hrs	Status
July 19, 1974	-	-	---	----	Preparing to move rotary.
July 20, 1974	1 (-)	155	---	155	Drilling.
July 21, 1974	2	1385	Pierre	1230	Drilling.
July 22, 1974	3	1470	Pierre	85	Waiting on Production Casing.

Respectfully Submitted,

G. Allan Nelson
G. Allan Nelson, Consultant
Denver, Colorado
July 29, 1974

GAN:sah