

GEOLOGICAL REPORT

#3 WALLGREN "B"
SW NW NW Sec. 7-6S-20W
Rooks County, Kansas

CONTRACTOR: Red Tiger Drilling Company, Rig No. 2

COMMENCED: October 28, 1985

COMPLETED: November 5, 1985

ELEVATION: 2125' G.L. 2128' D.F. 2130' K.B.

SURFACE CASING: 9 jts new 8 5/8", 20-lb casing, set @ 366' w/350 sx 60/40 Poxmix, 3% gel, 3% CaCl₂.

PRODUCTION CASING: 84 jts new 4 1/2", 10.5-lb casing, set @ 3508' w/150 sx 60/40 Pozmix, 2% KCl water (1st stage); cemented top of string w/350 sx Halliburton Light, 7 lb Gilsonite per sk (2nd stage). DV tool @ 1645'.

DRILLING TIMES: One-foot drilling times from 1600' to 1700', and one-foot drilling times from 2300' to 3532' DTD.

SAMPLE DEPTHS: Twenty-foot samples saved and examined from 2500' to 2940'; ten-foot samples, from 2940' to 3190'; and five-foot samples, from 3190' to 3532' DTD.

CORED DEPTHS: Vinson Diamond Coring Company cored from 3240' to 3271 1/2'.

ELECTRIC LOGS: Welox Gamma Ray-Neutron-Guard open-hole log.

FORMATION TOPS
(Kelly Bushing Elevation)

	<u>Log</u>	<u>Datum</u>
Base Ft. Hays	288'	+1842'
Stone Corral	1630'	+ 500'
Base Stone Corral	1662'	+ 468'
Wabaunsee	2756'	- 626'
Topeka	3024'	- 894'
Oread	3187'	-1057'
Heebner	3231'	-1101'
Toronto	3254'	-1124'
Lansing	3271'	-1141'
Base Kansas City	3464'	-1334'
Marmaton	3490'	-1360'
Granite Wash	3504'	-1374'
Granite	3512'	-1382'
Driller's Total Depth	3532'	
Rotary Total Depth	3535'	-1405'

SAMPLE DESCRIPTIONS

Deer Creek 3080'
3087-3090'

Limestone, tan, fine crystalline, fossiliferous, spotted stain to very light saturation of oil, very faint odor.

Oread 3187'
3187-3195'

Limestone, cream, fine crystalline, oolitic, fossiliferous, moderate intercrystalline pinpoint porosity with light to moderate saturation of oil, fair odor.

Drill Stem Test #1 3184-3198'

Open 45 min with very weak, steady blow. Closed 45 min. Open 30 min with weak blow after flushing tool; blow died in 10 min. Closed 45 min. Recovered 5 feet of mud-cut oil (45% mud) and 30 feet of oil- and water-cut mud (10% oil, 45% water, 45% mud).

IFP 32-33 psi
ISIP 1052

FFP 45-54
FSIP 1037

3206-3212'

Limestone, tan, fine crystalline, fossiliferous, oolitic, some pel-
letiferous, trace of light saturation of oil, very faint odor.

Toronto 3254'
3254-3260'

Limestone, white, fine crystalline, very fossiliferous, oolitic, good vuggy interfossiliferous porosity with good saturation of oil; much chert, tan, fossiliferous, with no apparent porosity. (Cored.)

3260-3266'

Limestone, light gray, fine to medium crystalline, slightly fos-
siliferous, spotted saturation and stain, no apparent porosity
except along fracture planes, spotted saturation and stain (on
fracture planes); chert, tan; interbedded with shale, greenish
gray, calcareous. (Cored.)

Lansing 3271'
"A" Zone
3271-3274'

Limestone, white, fine crystalline, very fossiliferous, very oolitic,
good to very good vuggy interfossiliferous porosity with good
saturation of oil. (Cored.)

3274-3275'

Chert, white with tan fossils, fine crystalline, very oolitic, very
fossiliferous, limestone as above along fracture planes (with same
porosity and saturation); chert, gray, fine crystalline, slightly
fossiliferous, no apparent porosity. (Cored.)

"B" Zone
3306-3312'

Limestone, white, fine crystalline, slightly fossiliferous, trace of
spotted stain; dolomite, cream, fine crystalline, spotted oil
saturation and stain.

"D" Zone
3325-3329'

Limestone, white, fine crystalline, fossiliferous, trace of spotted
oil saturation and stain.

"F" Zone
3336-3344'

Limestone, cream, fine crystalline, slightly fossiliferous, trace
of oil saturation and stain.

<u>"G" Zone</u> 3345-3354'	Limestone, cream, fine to medium crystalline, fossiliferous, slightly spotted oil saturation and stain; dolomite, cream, fine crystalline, slightly spotted oil saturation and stain; limestone, white, chalky, trace of spotted oil stain.
3357-3363'	Limestone, white, fine crystalline, very fossiliferous, moderate interfossiliferous porosity with spotted to light saturation of oil; dolomite, cream, fine crystalline, intercrystalline porosity with spotted to light saturation of oil; faint odor.
<u>"H" Zone</u> 3394-3402'	Limestone, white, chalky; limestone, white, fine crystalline, fossiliferous, slight oil staining.
<u>"I" Zone</u> 3415-3425'	Limestone, white, fine crystalline, chalky; limestone, white to cream, fine crystalline, fossiliferous, spotted light saturation of oil and stain, slight show of dark dead oil.
<u>"J" Zone</u> 3428-3432'	Limestone, cream, fine crystalline; limestone, light gray, fine crystalline, fossiliferous, spotted dark stain.
<u>"K" Zone</u> 3447-3452'	Limestone, cream, fine crystalline, fossiliferous, spotted saturation of oil and stain, spotted black stain, faint odor.

Rotary Total Depth 3535'

REMARKS

Based upon the excellent shows of oil encountered in the core samples taken from the Toronto and Lansing "A" Zones, and upon the apparent porosities of these zones, it was decided to set production pipe for further testing of this well.

R. D. Reber, Jr.

R. D. Reber, Jr.
Geologist

DRILLING TIMES

#3 Wallgren "B"

DEPTH	DRILLING TIMES	REMARKS
One-foot drilling times		
1600-1620'	$\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$	$\frac{1}{2}$ - $\frac{1}{2}$ -1-1-1-1-1-1-1-1
1620-1640'	$\frac{1}{2}$ - $\frac{1}{2}$ -1-1- $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$	1-2-3-3-5-3-3-4-3-4
1640-1660'	4-3-3-2-3-3-3-3-3-4	2-3-3-2-3-3-3-3-3-4
1660-1680'	2-3-3-1-2-1-2-3-2-1	1-1-1-1-2-2-1-1-1-2
1680-1700'	1-1-1-1- $\frac{1}{2}$ - $\frac{1}{2}$ -1- $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{4}$	$\frac{1}{4}$ - $\frac{1}{4}$ - $\frac{1}{4}$ -1-1-1-1-1-1-2
2300-2320'	2-1-2-1-2-2-2-2-1-1	2-1-1-2-2-2-1-2-1-2
2320-2340'	2-1-2-2-1-2-1-1- $\frac{1}{2}$ - $\frac{1}{2}$	$\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ -1-1-1-1-2-1
2340-2360'	2-1-2-2-1-2-1-2-2-2	2-2-2-1-1-1-1-1-1-1
2360-2380'	2-1-2-2-1-1-2-2-2-1	2-2-1-2-2-2-3-2-2-2
2380-2400'	3-2-3-3-1-1-1-1-1-1	1-2-1-1-2-2-2-2-1-1
2400-2420'	2-1-2-2-1-1-1-2-1-1	2-2-3-3-3-3-3-2-3-2
2420-2440'	2-1-1-3-2-2-2-3-2-2	2-2-3-2-2-3-1-1-2-2
2440-2460'	1-2-1-1-1-1-1-1-2-3	2-2-2-2-1-1- $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$
2460-2480'	$\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$	$\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ -1-1-3-2-2-1
2480-2500'	1-1-2-3-3-2-1-1-1-1	2-2-1-2-2-1-2-1-3-2
2500-2520'	2-2-3-3-2-2-1- $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$	$\frac{1}{2}$ -1- $\frac{1}{2}$ - $\frac{1}{2}$ -1-2-2-2-1-2
2520-2540'	3-2-3-4-1-2-2-2-3-2	2-3-2-3-2-3-3-3-3-2
2540-2560'	3-4-2-3-2-3-2-2-3-2	3-3-2-3-1-1-1-1- $\frac{1}{2}$ - $\frac{1}{2}$
2560-2580'	2-1-1-2-3-2-2-2-2-2	2-2-2-2-3-3-1-2-1-1
2580-2600'	1-1-2-1-1-2-1-1-1-1	1-2-1-1-2-1-2-1-2-2
2600-2620'	1-2-1-1-1-2-2-2-1-2	1-1-2-1-2-1-3-2-1-2
2620-2640'	1-1-2-2-2-1-2-2-2-1	2-2-2-2-2-2-1-1-1-2
2640-2660'	2-1-2-2-2-2-2-3-2-2	2-2-1-2-2-3-2-3-2-2
2660-2680'	2-2-2-2-2-1-1-1-2-2	1-1-1-1-2-1-2-2-2-3
2680-2700'	1-2-1-1-1-2-1-2-2-3	2-2-2-1-2-2-3-2-2-2
2700-2720'	2-1-2-1-1-2-1-1-1-1	2-2-3-2-2-2-2-2-2-3
2720-2740'	2-2-1-1-1-2-1-1-1-1	2-1-1-2-2-3-1-1-2-2
2740-2760'	2-2-2-2-2-2-1-2-2-2	2-2-2-1-2-3-2-2-2-2
2760-2780'	2-2-2-2-2-2-1-2-1-1	1-1-2-2-2-2-2-1-1-2
2780-2800'	2-2-2-2-2-2-1-2-1-1	1-1-1-2-2-2-2-3-2-2
2800-2820'	3-2-2-2-2-3-2-2-2-4	2-1-1-1-1-1-1-2-2-2
2820-2840'	2-2-2-2-1-3-1-1-1-2	1-2-2-1-1-1-1-2-1-2
2840-2860'	1-1-1-1-1-1-2-1-1-1	1-1-1-2-1-2-1-1-1-1
2860-2880'	1-1-1-1-1-1-1-1-1-2	2-1-2-2-2-1-1-1-1-1
2880-2900'	1-2-2-1-2-2-2-2-3-2	2-1-2-3-3-3-2-2-3-2
2900-2920'	2-3-2-2-1-3-3-3-3-3	3-1-2-3-2-2-3-2-1-1
2920-2940'	2-2-1-1-1-2-2-2-2-2	3-3-2-2-3-3-1-2-2-4
2940-2960'	3-3-2-3-1-2-2-1-3-2	3-2-3-2-3-2-1-1-2-2
2960-2980'	3-2-3-4-3-4-3-4-3-3	4-3-3-4-2-3-3-3-1-3
2980-3000'	1-2-2-2-4-4-3-4-2-4	4-2-4-4-3-3-2-3-3-4

Bit trip @ 1676'

DEPTH	DRILLING TIMES	REMARKS	
3000-3020'	5-2-2-3-2-3-1-1-1-2	2-4-4-3-2-3-2-3-3-2	
3020-3040'	4-1-2-3-3-4-2-3-3-2	4-3-4-4-3-5-4-4-5-5	
3040-3060'	4-3-3-3-4-4-4-5-3-4	3-3-4-5-3-5-3-4-3-3	
3060-3080'	4-3-4-3-4-4-3-4-3-2	3-2-3-2-4-3-4-3-3-3	
3080-3100'	3-3-3-3-3-2-2-3-3-2	3-2-2-3-3-4-4-4-4-2	Circ. @ 3094'
3100-3120'	2-3-2-2-1- $\frac{1}{2}$ - $\frac{1}{2}$ -1-1-1	3-2-3-3-4-4-4-4-4-4	
3120-3140'	3-3-4-3-3-2-2-2-2-2	2-1-1-2-2-2-1-3-2-2	
3140-3160'	3-3-3-4-3-4-2-4-3-4	4-3-3-3-4-4-3-4-4-4	
3160-3180'	5-4-4-4-4-3-3-3-2-3	5-4-3-4-5-5-4-4-2-2	
3180-3200'	6-4-4-4-3-4-2-2-1-2	3-3-4-4-5-5-5-5-5-4	DST #1 @ 3195'
3200-3220'	4-3-3-2-2-2-2-1-2-2	2-3-1-3-3-4-3-3-2-3	
3220-3240'	3-3-2-3-3-4-4-5-4-3	2-2-4-5-4-5-5-5-4-4	
3240-3260'	16-16-16-14-17-16-18-14-17-16	18-26-23-32-31-17-27-14-18-34	Cored
3260-3280'	24-26-22-23-14-17-20-26-31-20	21-2-6-8-7-5-7-6-6-7	from 3240' to 3271 $\frac{1}{2}$ '
3280-3300'	7-7-7-7-7-6-7-6-7-7	4-7- -4-4-3-3-4-4-3	Kelly 1' short
3300-3320'	4-4-4-2-3-5-6-6-7-7	9-8-8-5-4-4-4-3-4-4	
3320-3340'	3-6-6-6-5-6-7-9-5-6	5-4-7-8-5-6-8-7-6-8	
3340-3360'	2-4-4-4-3-4-4-3-3-3	4-3-4-3-3-3-4-4-4-5	
3360-3380'	5-5-5-6-5-5-5-5-5-5	5-5-7-5-6-5-7-7-7-5	
3380-3400'	3-6-6-4-4-3-5-4-5-5	3-5-5-4-5-5-6-6-5-5	
3400-3420'	4-5-6-5-4-6-5-6-4-4	3-3-6-3-4-4-4- -3-5	Kelly 1' short
3420-3440'	6-6-6-7-5-7-4-5-3-4	6-5-6-5-6-5-5-6-6-6	
3440-3460'	4-5-5-5-3-5-5-5-6-4	5-5-5-3-3-5-5-4-4-4	
3460-3480'	4-5-6-6-4-2-3-2-2-1	2-1-1-2-2-1-2-1-1-2	
3480-3500'	2-2-2-2-2-3-3-3-5-4	3-2-1-2-1-1-2-3-3-4	
3500-3520'	3-4-4-5-3-2-3-3-4-3	4-4-3-3-5-4-4-4-5-5	
3520-3532'	4-5-4-4-5-4-4-4-4-4	4-3	

COMPLETION REPORT

#3 WALLGREN "B"
SW NW NW Sec. 7-6S-20W
Rooks County, Kansas

ELEVATION: 2125' G.L. 2130' K.B.

SURFACE CASING: 9 jts new 8 5/8", 20-lb casing, set @ 366' w/350 sx 60/40 Pozmix, 3% gel, 3% CaCl₂.

PRODUCTION CASING: 84 jts new 4 1/2", 10.5-lb casing, set @ 3508' w/150 sx 60/40 Pozmix, 2% KCl water (1st stage); cemented top of string w/350 sx Halliburton Light, 7 lb Gilsonite per sk (2nd stage). DV tool @ 1645'.

RTD: 3535'

November 11, 1985 Moved in Rig #1.

November 12, 1985 Rigged up. Ran 2" tubing with 3 7/8" bit and 2 drill collars. Drilled on DV tool at 1645'.

November 13, 1985 Drilled out inside of DV tool. Ran mill through DV tool to smooth out casing walls.

November 14, 1985 Pulled tubing and swabbed hole down. Ran Welex gamma ray/collar log. Perforated opposite shales with 2 holes each at 3250', 3268, 3299', 3320', 3345', 3367', 3413', and 3427'; hole was dry after perforating. Ran tubing with RTTS packer below bottom perforations to 3350'. Loaded casing with lease water. Spotted 25 sx common cement, with 6/10% Halad 9, over all perforations and up to 3086' in casing. Pulled RTTS to 3026'. Washed out to clean up packer and circulated approx 2 BO out of casing. Set RTTS at 3026' and squeezed. Ran pres to 700 psi; in 15 min, dropped to 650 psi. Pumped back up to 700 psi; pres stayed at 700 psi for 15 min. Pulled RTTS to approx 2750'. Pressured back up to 700 psi; no drop in pres for 15 min. Closed well in with 700 psi for the night.

November 15, 1985 Pulled tubing. Took off RTTS and put on 3 7/8" bit and 2 drill collars. Ran tubing and drilled cement out of 4 1/2" casing from 3080' to 3355'.

Noavember 16, 1985 Finished drilling cement out of casing from 3355' to 3488'. Pulled tubing. Swabbed hole down to 3100'. Perforated "A" Zone (3272-3281') with sidewinder jets, 4 spf. Ran swab; had muddy oil on end of swab. Ran swab in 15 min: recovered 15 gal mud-cut oil; next 15 min, 1 bbl slightly mud-cut oil; next 15 min, 2 1/4 bbl clean, gassy oil.

November 18, 1985

1800' FIH, all oil. Swabbed down and recovered 28 BO.
Tested:

First hr	9.2 BO
2nd hr	10.2 BO
3rd hr	9.2 BO
4th hr	8.35 BO

Ran tubing with Baker tool (special tool to wash 6" of perforations at a time).

November 19, 1985

Started from bottom of perforations at 3281' and jetted ½ bbl reg acid with iron inhibitor every 6" up to top of perforations at 3272' (1300 to 1500 psi). Set packer above "A" Zone and treated with 1000 gal MOD 101 with 10 lb Fercheck (iron inhibitor) at 2½ BPM, 300 psi; in 2 min, vac. Swabbed back 17 BF with good acid kick. Had 50% oil on last pull off bottom.

November 20, 1985

1800' FIH. Swabbed down and recovered 8.35 BO. Pulled tubing. Swabbed casing down and recovered 48½ BO. Tested 1 hr: recovered 23.3 BO. Made up 15' mud anchor and seating nipple and ran in hole on tubing.

November 21, 1985

Ran rods and 10' pump. Spaced rods out and rigged down.

SUMMARY

<u>Perforations</u>	<u>Treatment</u>	<u>Results</u>
3250' 3268' 3299' 3320' 3345' 3367' 3413' 3427'	Shale zones perforated with 2 shots at each point	Squeezed with 25 sx common cement, 6/10% Halad 9
3272-3281' ("A" Zone)	None	8.35 BOPH
	378 gal reg acid w/iron inhibitor (washed each 6" interval w/½ bbl acid)	
	1000 gal MOD 101 w/10 lb Fercheck (iron inhibitor)	23.3 BOPH