

ELEVATIONS
KB 2673'
GL 2664'

Tim J. Lauer

Petroleum Geologist

GEOLOGIST'S REPORT

DRILLING TIME AND SAMPLE LOG

Office 316.832.0530
Cell 316.253.1275

COMPANY & WELL: Shakespeare #4-28 Ottley
LOCATION: 1800' FNL, 1277' FWL, NW/4
SEC 28 TWP 14S RGE 32W
COUNTY Logan STATE Kansas

LEASE: # 4-28 Ottley
FIELD: APPX SE NE SW NW
LOCATION: 1800' FNL, 1277' FWL, NW/4
SEC 28 TWP 14S RGE 32W
COUNTY Logan STATE Kansas

CONTRACTOR: Duke Drilling Rig #4
SPUD: 6-20-2019 COMP: 7-2-2019
RTD: 4385' LTD: 4386'
MUD UP: 3395' TYPE MUD: Chemical

ELEVATIONS: KB 2673'
DF: _____
GL 2664'
Measurements Are All From Kelly Bushing

SAMPLES SAVED FROM: 3500' TO RTD
DRILLING TIME KEPT FROM: 3450' TO RTD
SAMPLES SAVED FROM: 3500' TO RTD
LOGICAL SUPERVISION FROM: 3395' TO RTD
GEOLOGIST ON WELL: Tim J. Lauer

CASING: CONDUCTOR SURFACE: 8-5/8" @ 266'
PRODUCTION: 4-1/2" @ 4385'

ELECTRICAL SURVEYS: Pioneer DCPL, DIL, ML
Engineer: Justin Henrikson

FORMATION TOPS

Base Anhydrite	2109 (+564)	2108 (+565)
Heebner	3606 (-933)	3606 (-933)
Lansing	3646 (-973)	3644 (-971)
Stark	3903 (-1230)	3904 (-1231)
Marmaton	4041 (-1368)	4041 (-1368)
Pawnee	4111 (-1438)	4111 (-1438)
L. Cherokee Shale	4194 (-1521)	4192 (-1519)
Johnson Zone	4233 (-1560)	4230 (-1563)
Mississippian	4310 (-1637)	4310 (-1637)
Total Depth	4385 (-1712)	4385 (-1712)

ELECTRIC LOG SAMPLE LOG

REMARKS: Due to drill stem test results, and log evaluation, operator elected to run production casing to further test the location.

Respectfully submitted,

Tim J. Lauer
7/3/2019

Lat: 38.810061191
Long: 100.887054520
NAD 83
API: 15-109-21,595-00-00

APOTONH LIT

SECTE WELLS THING

DRILLING TIME IN MINUTES PER FOOT

Rate of Penetration Decreases

DEPTH

SAMPLE DESCRIPTION

REMARKS

2050

Anhy 2089 (+584)

2100

B/Anhy 2108 (+565)

B/Anhy (Drilr) 2123 (+550)

2150

3450

3500

3550

3600

Tor 3623 (-950)

3650

Lans 3644 (-971)

3700

Mun. Crk 3823 (-1130)

3850

3900

Stark 3904 (-1231)

3950

Hush 3944 (-1268)

4000

BKC 3997 (-1324)

4050

Marm C 4083 (-1410)

4100

Pawnee 4109 (-1438)

4150

Cher Sh 4192 (-1519)

4200

Myr 4143 (-1470)

4250

Marm C 4083 (-1410)

4300

Johnson Zn 4236 (-1563)

4350

Miss 4310 (-1637)

4400

RTD 4385 (-1712)

Pioneer 4386 (-1713)

4400

SPUD 5:30 PM 6-20-2019
RTD 12:05 AM 7-2-2019

"BIT RECORD"
1) Smith FHI24Y (New)
Under Surface to 3103'
2) Smith FHI24Y (RR)
3103 to 4385' RTD

"VERTICAL SURVEYS"
0' @ 268'
3/4' @ 950'
3/4' @ 1447'
3/4' @ 2241'
3/4' @ 2839'
3/4' @ 3332'
3/4' @ 3695'
0' @ 4315'
0' @ 4385'

6-20-2019 - MIRT RURT
Prep to set Surf Csg.

6-21-2019 - 7:00 AM
PTD @ 266' WOC
set 8-5/8" @ 266'

6-22-2019 - 7:00 AM
Drig @ 1480'

6-23-2019 - 7:00 AM
Drig @ 2500'

6-24-2019 - 7:00 AM
Drig @ 3116'

6-25-2019 - 7:00 AM
CFS @ 3660'

6-26-2019 - 7:00 AM
Drig @ 3730'

6-27-2019 - 7:00 AM
Drig @ 3880'

6-28-2019 - 7:00 AM
Drig @ 4035'

6-29-2019 - 7:00 AM
PTD @ 4110'
GIH after DST(4)

6-30-2019 - 7:00 AM
Drig @ 4220'

7-1-2019 - 7:00 AM
PTD @ 4315'
GIH to run DST(7)

7-2-2019 - 7:00 AM
RTD @ 4385'
Running Pioneer OH logs

7-3-2019 - 7:00 AM
Ran 4 1/2" Prod. Csg.
set at 4385'
Port collar at 2180'
Plug dn. 9:15 pm 7-2-2019

Call Point 3300'
3:00 PM 6-24-2019
Geologist on location 3395'
8:00 PM 6-24-2019

Displace native fluid at 3395'
Added Premix to bring mud up

Rig Check at 3507'
vis: 57 wt 8.8 Chlor: 2.8 LCM: 2#

Rig Check at 3667'
vis: 53 wt 8.9 Chlor: 2.800 LCM: 2# Ph: 11.0 WL: 7.2

DST (1) 3635'-3695'
30-30-30-60
Blow: weak, built to 2 1/2" on IFF
no blowback on SISP

40' WCM with oil spots

IHP: 1750 FFP: 25-31
ISIP: 586 FHP: 1683
Temp: 108°F

Chlorides MUD: 2.000 PPM
DST: NA (possible filtrate?)
Gravily = NA

*Note: Both Shut-in curves still building

Mud Check at 3765 before DST:
vis: 54 wt 8.9 Chlor: 2.800 LCM: 1.5# Ph: 11.5 WL: 6.4

DST (2) 3710'-3765'
30-30-45-90
Blow: fair, built to 2 1/2" on IFF
no blowback on SISP
fair, built to 5 1/2" on FFP
no blowback on SISP

62' Oil Spd WCM
(0% gas, 0% oil, 60% mud, 40% wtr)

124' Total Fluid

IHP: 1783 FFP: 42-62
ISIP: 16-38 FHP: 583
ISIP: 586 FHP: 1683
Temp: 108°F

Chlorides MUD: 2.000 PPM
DST: 16.000 PPM
Rw: 0.32 Ohms @ 88°F

Gravily = NA

*Note: Both Shut-in curves still building

Mud Check at 3830:
vis: 45 wt 8.9 Chlor: 1.1#

DST (3) 3705'-3905'
30-30-45-60
Blow: fair, built to 10 3/4" on IFF
no blowback on SISP
fair, built to 8 1/2" on FFP
no blowback on SISP

216' SOCM
(0% gas, 2% oil, 98% mud, 0% wtr)

124' SWOCM
(0% gas, 40% oil, 37% mud, 1% wtr)

340' Total Fluid

IHP: 1851 FFP: 97-150
ISIP: 23-81 FHP: 477
ISIP: 481 FHP: 1797
Temp: 108°F

Chlorides MUD: 2.500 PPM
DST: NA (possible filtrate?)
Rw: Gravily = NA

*Note: Both Shut-in curves still building

Mud Check at 3905 before DST (3.4):
vis: 59 wt 9.0 Chlor: 2.500 LCM: 2# Ph: 11.5 WL: 6.3

DST (4) 3985'-4110'
30-30-45-90
Blow: strong, Built to 10 3/4" on IFF
no blowback on SISP
strong, Built to 15 min, built 33" on FFP
no blowback on SISP

108' OGCM
(10% gas, 10% oil, 80% mud, 0% wtr)

172' MC GSY Oil
(40% gas, 20% oil, 37% mud, 0% wtr)

62' Oil Spd WCM
(0% gas, 0% oil, 60% mud, 40% wtr)

124' Total Fluid

IHP: 2102 FFP: 115-135
ISIP: 7-108 FHP: 369
ISIP: 732 FHP: 1957
Temp: 111°F

Chlorides MUD: 2.000 PPM
DST: NA

*Note: Shut-in curve still building. Final Shut-in curve broken over

Mud Check at 4120:
vis: 67 wt 8.8 Chlor: 3.000 LCM: 1# Ph: 11.0 WL: 8.0

DST (5) 4105'-4195'
30-30-30-60
Blow: weak, built to 3 1/4" on IFF
no blowback on SISP
weak surf flow, died 15 min on FFP
no blowback on SISP

30' SOCM
(0% gas, 1% oil, 99% mud, 0% wtr)

62' MC GSY Oil
(40% gas, 20% oil, 37% mud, 0% wtr)

124' Total Fluid

IHP: 2112 FFP: 57-63
ISIP: 51-57 FHP: 2788
ISIP: 711 FHP: 2688
Temp: 115°F

Chlorides MUD: 4.000 PPM
DST: NA

*Note: Initial Shut-in curve still bldg. Final Shut-in curve breaking over

Rig Check at 4218:
vis: 64 wt 9.0 Chlor: 1.8 LCM: 1# Ph: 10.0 WL: 8.0

DST (6) 4190'-4280'
30-30-30-60
Blow: weak, built to 3 1/4" on IFF
no blowback on SISP
weak surface blow thru-out FFP, no blowback on SISP

215' SOCM
(0% gas, 10% oil, 90% mud, 0% wtr)

45' OGCM
(10% gas, 20% oil, 37% mud, 0% wtr)

62' Total Fluid

IHP: 2214 FFP: 33-166
ISIP: 22-36 FHP: 369
ISIP: 800 FHP: 2082
Temp: 116°F

Chlorides MUD: 4.000 PPM
DST: NA

*Note: Both Shut-in curves still bldg.

Mud Check at 4315 during DST:
vis: 62 wt 8.8 Chlor: 4.000 LCM: 2# Ph: 10.0 WL: 8.8

RTD reached
12:05 AM 7-2-2019

SPUD 5:30 PM 6-20-2019
RTD 12:05 AM 7-2-2019

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6-29-2019 - 7:00 AM
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GIH after DST(4)

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RTD @ 4385'
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DST (2) 3710'-3765'
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no blowback on SISP
fair, built to 5 1/2" on FFP
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fair, built to 8 1/2" on FFP
no blowback on SISP

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vis: 62 wt 8.8 Chlor: 4.000 LCM: 2# Ph: 10.0 WL: 8.8

COMPANY & WELL: Shakespeare #4-28 Ottley
LOCATION: 1800' FNL, 1277' FWL, NW/4
SEC 28 TWP 14S RGE 32W
COUNTY Logan STATE Kansas

ELEVATIONS: KB 2673'
GL 2664'

Chart for DST (1) Lans A - B zones

Chart for DST (2) Lansing C - F zones

Chart for DST (3) Lansing H - J zones

Chart for DST (4) Marmaton

Chart for DST (5) Pawnee - Fort Scott zones

Chart for DST (6) Johnson zone

Chart for DST (7) Morrow Sand