| Joshua R. Austin<br>Petroleum Geologist<br>report for<br>Thomas Garner, Inc.                                                                                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| COMPANY: Thomas Garner, Inc.                                                                                                                                                      |
| LEASE: Garner #7                                                                                                                                                                  |
| FIELD: Leiss Northwest                                                                                                                                                            |
| LOCATION: SE-SW-NE-NE (1442' FNL & 930' FEL)                                                                                                                                      |
| SEC: 15 TWSP: 25s RGE: 13w                                                                                                                                                        |
| COUNTY: Stafford STATE: Kansas                                                                                                                                                    |
| KB: <u>1938'</u> GL: <u>1927'</u>                                                                                                                                                 |
| API# 15-185-23993-0000                                                                                                                                                            |
| CONTRACTOR: Sterling Drilling Company (Rig #4)                                                                                                                                    |
| Spud: <u>08/23/2017</u> Comp: <u>08/31/2017</u>                                                                                                                                   |
| RTD: <u>4380'</u> LTD: <u>4378'</u>                                                                                                                                               |
| Mud Up: 2900' Type Mud: Chemical was displaced                                                                                                                                    |
| Samples Saved From: <u>3400 to RTD</u><br>Drilling Time Kept From: <u>3400' to RTD</u><br>Samples Examined From: <u>3400' to RTD</u><br>Geological Supervision From: 3400' to RTD |
| Geologist on Well: Josh Austin                                                                                                                                                    |
| Surface Casing: <u>8 5/8" @308'</u>                                                                                                                                               |
| Production Casing: 5 1/2" @ 4375'                                                                                                                                                 |
| Electronic Surveys: Pioneer Energy Services                                                                                                                                       |

### NOTES

On the basis of the high structural position, positive drill stem test and after reviewing the logs it was recommened by all parties involved in the Garner #7 to run 5 1/2" production casing to further test the following zones; Viola 4100-4110, Lansing 3789-3796. Before plugging the well the following zones should be tested; Arbuckle 4282-4283, Simpson Sand 4217-4223.

Respectfully Submitted by;

Joshua Austin

И

|               |        |          |      |         | vel      |                   | SM       | pa     | ris               | on      | sn       | eet     |      |         |          |      |
|---------------|--------|----------|------|---------|----------|-------------------|----------|--------|-------------------|---------|----------|---------|------|---------|----------|------|
|               |        | DRILLING | WELL |         |          | COMPARIS          | SON WELL |        |                   | COMPARI | SON WELL |         |      | COMPARI | SON WELL |      |
|               |        | Garner   | r #7 |         |          | Garner            | #5-15    |        |                   | Garne   | r #4     |         |      | Shan    | k #1     |      |
|               |        |          |      |         | C-N/2-NE |                   |          |        | NE-SI             | E-NE    |          | C-NE-NE |      |         |          |      |
|               |        |          |      |         |          |                   | Struct   | ural   |                   |         | Struct   | ural    |      |         | Struct   | tura |
|               | 1938   | KB       |      |         | 1933     | KB                | Relatio  | onship | 1930              | ) KB    | Relati   | onship  | 1931 | KB      | Relati   | onsh |
| Formation     | Sample | Sub-Sea  | Log  | Sub-Sea | Log      | Sub-Sea           | Sample   | Log    | Log               | Sub-Sea | Sample   | Log     | Log  | Sub-Sea | Sample   | Lo   |
| Anhydrite     | 779    | 1159     | 768  | 1170    | 773      |                   |          |        | 785               | 1145    | 14       |         | 785  | 1145    | 14       |      |
| Heebner       | 3478   | -1540    | 3476 | -1538   | 3479     | -1546             | 6        | 8      | 3483              | -1553   | 13       | 15      | 3483 | -1553   | 13       | 1    |
| Toronto       | 3500   | -1562    | 3494 | -1556   |          | Sector Particular |          | t.ed   | A Real Production |         |          |         |      |         |          |      |
| Douglas       | 3522   | -1584    | 3518 | -1580   |          |                   | 2        |        |                   |         |          |         | 24   | 3       | ().      |      |
| Brown Lime    | 3628   | -1690    | 3626 | -1688   | 3633     | -1700             | 10       | 12     | 3624              | -1694   | 4        | 6       | 3633 | -1703   | 13       | 1    |
| Lansing       | 3650   | -1712    | 3648 | -1710   | 3661     | -1728             | 16       | 18     | 3650              | -1720   | 8        | 10      | 3665 | -1735   | 23       | 2    |
| BKC           | 3935   | -1997    | 3936 | -1998   | 3945     | -2012             | 15       | 14     | 3937              | -2007   | 10       | 9       |      |         |          |      |
| Mississippi   | 4022   | -2084    | 4020 | -2082   | 4028     | -2095             | 11       | 13     | 4015              | -2085   | 1        | 3       | 4027 | -2097   | 13       | 1    |
| Viola         | 4085   | -2147    | 4081 | -2143   | 4114     | -2181             | 34       | 38     | 4105              | -2175   | 28       | 32      | 4114 | -2184   | 37       | 4    |
| Simpson Shale | 4197   | -2259    | 4206 | -2268   | 4219     | -2286             | 27       | 18     | 4200              | -2270   | 11       | 2       | 4216 | -2286   | 27       | 1    |
| Simpson Sand  | 4214   | -2276    | 4212 | -2274   | 4226     | -2293             | 17       | 19     | 4206              | -2276   | 0        | 2       | 4220 | -2290   | 14       | 1    |
| Arbuckle      | 4276   | -2338    | 4276 | -2338   | 4286     | -2353             | 15       | 15     | 4271              | -2341   | 3        | 3       | 4283 | -2353   | 15       | 1    |
| Total Depth   | 4380   | -2442    | 4378 | -2440   | 4229     | -2296             |          |        | 4311              | -2381   |          |         | 4316 | -2386   |          |      |

|                                                                                                                                     | DRILL STEM TES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | DRILL STEM TEST REPORT                       |                                                                                                                    |                                                      |                                                          |                        |                    |  |  |
|-------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|----------------------------------------------------------|------------------------|--------------------|--|--|
| I HILUDITE                                                                                                                          | Thomas Garner inc                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                              | 15-                                                                                                                | 15-25S-13W Stafford                                  |                                                          |                        |                    |  |  |
| ESTING , INC                                                                                                                        | 305 E 7th<br>ST John, KS 67576<br>ATTN: Josh Austin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Ga<br>Job<br>Tes                             | Garner 7       Job Ticket: 63620     DST#:1       Test Start: 2017.08.28 @ 15:21:56                                |                                                      |                                                          |                        |                    |  |  |
| GENERAL INFORMATION:                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                              |                                                                                                                    |                                                      |                                                          |                        |                    |  |  |
| Formation: Viola<br>Deviated: No Whipstock:<br>Time Tool Opened: 18:27:41<br>Time Test Ended: 01:43:41                              | ft (KB)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                              | Tes<br>Tes<br>Unit                                                                                                 | tType: (<br>ter: L<br>No: 7                          | Conventional<br>Leal Cason<br>74                         | Bottom Hol             | e (Initial)        |  |  |
| Interval:     4085.00 ft (KB) To     4       Total Depth:     4133.00 ft (KB) (T     (KB) (T                                        | 133.00 ft (KB) (TVD)<br>VD)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                              | Ref                                                                                                                | Reference Elevations: 1938.00 ft (I<br>1927.00 ft (I |                                                          |                        | ft (KB)<br>ft (CF) |  |  |
| Hole Diameter: 7.88 inches Ho                                                                                                       | le Condition: Good                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                              |                                                                                                                    | KBt                                                  | o GR/CF:                                                 | 11.00                  | ft                 |  |  |
| Serial #:     8159     Inside       Press@RunDepth:     733.01 psig       Start Date:     2017.08.28       Start Time:     15:21:57 | 2017.08.29<br>01:43:41                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Capacity<br>Last Cali<br>Time On<br>Time Off | acity: 8000.00 psig<br>t Calib.: 2017.08.29<br>e On Btm: 2017.08.28 @ 18:18:41<br>e Off Btm: 2017.08.28 @ 21:34:11 |                                                      |                                                          | psig                   |                    |  |  |
| TEST COMMENT: IF: Strong Blow<br>ISI: 1 inch Blow<br>FF: Strong Blow<br>FSI: Would Not                                              | , BOB in 30 seconds, GTS in 10 min<br>Back<br>, GTS immediate, BOB in 1 minute, 0<br>Bleed Off                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | utes, Gauged<br>Gauged Gas                   | l, & Caught S                                                                                                      | Sample                                               |                                                          |                        |                    |  |  |
| Pressure vs.                                                                                                                        | Time                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                              | PI                                                                                                                 | RESSUR                                               | RE SUMMA                                                 | RY                     |                    |  |  |
| 200 Hose                                                                                                                            | 5759 TorponAcc<br>- +2<br>- | Time<br>(Min.)<br>9<br>39                    | Pressure<br>(psig)<br>2213.64<br>303.39<br>434.76                                                                  | Temp<br>(deg F)<br>112.93<br>113.52<br>116.03        | Annotation<br>Initial Hydro<br>Open To Flo<br>Shut-In(1) | n<br>-static<br>ow (1) |                    |  |  |
|                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 87<br>88<br>133<br>194                       | 1137.43<br>468.73<br>733.01<br>1131.15                                                                             | 118.48<br>118.10<br>119.12<br>119.58                 | Open To Flo<br>Shut-In(2)<br>End Shut-In(2)              | (1)<br>ow(2)<br>(2)    |                    |  |  |
|                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 196                                          | 1989.90                                                                                                            | 119.13                                               | Final Hydro-                                             | static                 |                    |  |  |



| Length (ft) | Description         | Volume (bbl) |
|-------------|---------------------|--------------|
| 0.00        | 480 GIP             | 0.00         |
| 60.00       | GOCM 20%G 30%O 50%M | 0.30         |
| 3531.00     | GSY Oil 40%G 60%O   | 48.12        |
|             |                     |              |
|             |                     |              |
|             |                     |              |

|                | Choke (inches) | Pressure (psig) | Gas Rate (Mcf/d) |
|----------------|----------------|-----------------|------------------|
| First Gas Rate | 0.25           | 22.00           | 57.74            |
| Last Gas Rate  | 0.25           | 10.00           | 38.71            |
| Max. Gas Rate  | 0.25           | 28.00           | 67.26            |

|                                                                                                                                                                                 | DRILL STEM TES                                                                                                                                                                          | TREP              | ORT                |                             |                                                        |                       |  |  |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|-----------------------------|--------------------------------------------------------|-----------------------|--|--|--|
| I RILUDITE                                                                                                                                                                      | Thomas Garner inc                                                                                                                                                                       | Thomas Garner inc |                    |                             |                                                        | 15-25S-13W Stafford   |  |  |  |
| ESTING , INC                                                                                                                                                                    | 305 E 7th                                                                                                                                                                               |                   | Garner 7           |                             |                                                        |                       |  |  |  |
|                                                                                                                                                                                 | ST John, KS 67576                                                                                                                                                                       |                   | Job                | Ticket: 63                  | 621                                                    | DST#:2                |  |  |  |
|                                                                                                                                                                                 | ATTN: Josh Austin                                                                                                                                                                       |                   | Tes                | t Start: 20                 | 17.08.29 @                                             | 15:24:53              |  |  |  |
| GENERAL INFORMATION:                                                                                                                                                            |                                                                                                                                                                                         |                   |                    |                             |                                                        |                       |  |  |  |
| Formation: Simpson   Deviated: No Whipstock:   Time Tool Opened: 17:03:23   Time Test Ended: 21:29:38                                                                           | ft (KB)                                                                                                                                                                                 |                   | Tes<br>Tes<br>Unit | tType: (<br>ter: L<br>No: 7 | Conventional<br>Leal Cason<br>74                       | l Bottom Hole (Reset) |  |  |  |
| Interval: 4182.00 ft (KB) To 4                                                                                                                                                  | 225.00 ft (KB) (TVD)                                                                                                                                                                    |                   | Ref                | erence Be                   | vations:                                               | 1938.00 ft (KB)       |  |  |  |
| Total Depth: 4225.00 ft (KB) (T                                                                                                                                                 | VD)<br>Condition: Cood                                                                                                                                                                  |                   |                    | VD+                         | CD/CE.                                                 | 1927.00 ft (CF)       |  |  |  |
| Hole Diameter. 7.00 Incheshol                                                                                                                                                   | e Condition. Good                                                                                                                                                                       |                   |                    | KD U                        | O GRICE.                                               | 11.00 11              |  |  |  |
| Serial #: 8159 Inside<br>Press@RunDepth: 37.40 psig<br>Start Date: 2017.08.29<br>Start Time: 15:24:54<br>TEST COMMENT: IF: Weak Blow, I<br>ISI: No Blow Bac<br>FF: Weak Surface | Capacity:     8000.00     psig       2017.08.29     Last Calib.:     2017.08.29       21:29:38     Time On Btm:     2017.08.29 @ 17:01:53       Time Off Btm:     2017.08.29 @ 19:37:38 |                   |                    |                             | 8000.00 psig<br>2017.08.29<br>@ 17:01:53<br>@ 19:37:38 |                       |  |  |  |
| T SE NO BIOW Da                                                                                                                                                                 |                                                                                                                                                                                         | T                 |                    |                             |                                                        |                       |  |  |  |
| Pressure vs. 7                                                                                                                                                                  | Sime<br>\$10 Temperature                                                                                                                                                                | True              | Pl                 | RESSUR                      | RE SUMMA                                               | ARY                   |  |  |  |
|                                                                                                                                                                                 |                                                                                                                                                                                         | (Min.)            | (psig)             | (deg F)                     | Annotatio                                              | 'n                    |  |  |  |
|                                                                                                                                                                                 |                                                                                                                                                                                         | 0                 | 2130.69            | 109.35                      | Initial Hydro                                          | o-static              |  |  |  |
|                                                                                                                                                                                 | · · ·                                                                                                                                                                                   | 31                | 37.40              | 109.25                      | Open To Fi<br>Shut-In(1)                               | ow(1)                 |  |  |  |
|                                                                                                                                                                                 |                                                                                                                                                                                         | 76                | 1105.70            | 112.15                      | End Shut-In                                            | n(1)                  |  |  |  |
|                                                                                                                                                                                 |                                                                                                                                                                                         | 110               | 30.36              | 111.65                      | Shut-In(2)                                             |                       |  |  |  |
|                                                                                                                                                                                 |                                                                                                                                                                                         | 155               | 1048.83            | 113.91                      | End Shut-In                                            | n(2)                  |  |  |  |
|                                                                                                                                                                                 |                                                                                                                                                                                         | 156               | 2046.31            | 114.44                      | Final Hydro                                            | -static               |  |  |  |
| E<br>29 Tax Ag 2007 Time (Hand)                                                                                                                                                 |                                                                                                                                                                                         |                   |                    |                             |                                                        |                       |  |  |  |

|                   | Recovery       |              | Gas Rates |                |                 |                  |  |
|-------------------|----------------|--------------|-----------|----------------|-----------------|------------------|--|
| Length (ft)       | Description    | Volume (bbl) |           | Choke (inches) | Pressure (psig) | Gas Rate (Mcf/d) |  |
| 10.00             | VSOCM 2%O 98%M | 0.05         |           |                |                 | 50               |  |
|                   |                |              |           |                |                 |                  |  |
|                   |                |              |           |                |                 |                  |  |
|                   |                |              |           |                |                 |                  |  |
|                   |                |              |           |                |                 |                  |  |
|                   |                |              |           |                |                 |                  |  |
| * Recovery from n | nultiple tests |              |           |                |                 |                  |  |

| 113                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | DRILL STEM TES                 | T REP                                                   | ORT                                                                                       |                                                                                                           |                                                                                                                                |                    |  |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|---------------------------------------------------------|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|--------------------|--|--|
| RILOBITE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Thomas Garner inc              |                                                         | 15-2                                                                                      | 15-25S-13W Stafford.KS                                                                                    |                                                                                                                                |                    |  |  |
| ESTING , INC.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 305 E 7th<br>St John, KS 67576 |                                                         | Garner #7                                                                                 |                                                                                                           |                                                                                                                                |                    |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | ATTN: Josh Austin              |                                                         | JOD I                                                                                     | Start: 2017                                                                                               | 22 UST<br>7 08 30 @ 06:59:18                                                                                                   | #: 3               |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                |                                                         | 1001                                                                                      | 00010.2011                                                                                                |                                                                                                                                |                    |  |  |
| GENERAL INFORMATION:<br>Formation: Arbuckle<br>Deviated: No Whipstock:<br>Time Tool Opened: 09:00:03<br>Time Test Ended: 14:12:18                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | ft (KB)                        |                                                         | Test<br>Teste<br>Unit N                                                                   | Type: Cor<br>er: Lea<br>No: 74                                                                            | nventional Bottom<br>al Cason                                                                                                  | Hole (Reset)       |  |  |
| Interval: 4278.00 ft (KB) To 42                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 84.00 ft (KB) (TVD)            |                                                         | Reference Bevations: 1938.00 ft (KB)                                                      |                                                                                                           |                                                                                                                                |                    |  |  |
| Total Depth: 4284.00 ft (KB) (TV<br>Hole Diameter: 7.88 inchesHole                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | /D)<br>Condition: Good         |                                                         |                                                                                           | KB to G                                                                                                   | .1927.<br>GR/CF: 11.                                                                                                           | 00 ft(CF)<br>00 ft |  |  |
| Serial #: 8159   Inside     Press@RunDepth:   185.54 psig     Start Date:   2017.08.30     Start Time:   06:59:19     TEST COMMENT:   IF: Fair Blow, Build St:No Blow Back     FF: Fair Blow, Build St: No Blow Back     FSt No Blow Back                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 2017.08.30<br>14:12:18         | Capacity:<br>Last Calib.<br>Time On B<br>Time Off E     | .:<br>ltm: 201<br>3tm: 201                                                                | 8000.<br>2017.08.<br>17.08.30 @ 08:59:<br>17.08.30 @ 12:04:                                               | 00 psig<br>30<br>33<br>33                                                                                                      |                    |  |  |
| Pressure vs. T<br>v<br>#0 Resse                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | inc.<br>V<br>M9 forposice 10   | Time                                                    | PR                                                                                        | ESSURE                                                                                                    | SUMMARY                                                                                                                        |                    |  |  |
| Class and the second se | Trivianda dag P                | (Min.)<br>0<br>1<br>30<br>75<br>76<br>121<br>182<br>185 | (psig)<br>2183.07<br>18.32<br>117.06<br>1535.94<br>120.84<br>185.54<br>1535.26<br>2105.14 | (deg F)<br>111.07 In<br>112.51 O<br>126.07 S<br>122.70 E<br>122.33 O<br>126.48 S<br>124.36 E<br>122.70 Fi | nitial Hydro-static<br>Open To Flow (1)<br>Shut-In(1)<br>Open To Flow (2)<br>Shut-In(2)<br>Ind Shut-In(2)<br>Inal Hydro-static |                    |  |  |
| Recovery                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                |                                                         |                                                                                           | Gas F                                                                                                     | Rates                                                                                                                          |                    |  |  |
| Length (ft) Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Volume (bbl)                   |                                                         |                                                                                           | Choke (inche                                                                                              | es) Pressure (psig)                                                                                                            | Gas Rate (Mcf/d)   |  |  |

|   | 330.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Water              |      | 3        | 2.67 |            |  |       |  |  |  |
|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------|----------|------|------------|--|-------|--|--|--|
|   | 30.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | OMCW 2%O 10%M 88%W |      | 1        | 0.42 |            |  |       |  |  |  |
|   | 70.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Oi                 |      |          | 0.98 |            |  |       |  |  |  |
|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                    |      |          |      |            |  |       |  |  |  |
|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                    |      |          |      |            |  |       |  |  |  |
| L | * Recovery from m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ultiple tests      |      |          |      |            |  |       |  |  |  |
|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                    |      |          |      |            |  |       |  |  |  |
|   | ROCK TYPES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                    |      |          |      |            |  |       |  |  |  |
|   | $\begin{tabular}{ c c c c c } \hline $\Delta_{\Delta} & \Delta_{\Delta} & \Delta \\ \hline \hline $\Delta_{\Delta} & \Delta & \Delta \\ \hline \hline $\Delta_{\Delta} & \Delta & \Delta & \Delta \\ \hline \hline $\Delta_{\Delta} & \Delta & \Delta & \Delta \\ \hline \hline \hline $\Delta_{\Delta} & \Delta & \Delta & \Delta \\ \hline \hline \hline \hline $\Delta_{\Delta} & \Delta & \Delta & \Delta & \Delta \\ \hline $\Delta_{\Delta} & \Delta \\ \hline \hline$ | Cht                | Dols | sec      |      | shale, gry |  | Sltst |  |  |  |
|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Cht vari           | Lms  | st fw7>  |      | Carbon Sh  |  |       |  |  |  |
|   | •. •. •. •.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Chtcongl           | sha  | lle, grn |      | Ss         |  |       |  |  |  |

0.00

0.00

40 GIP

### **OTHER SYMBOLS** DST DST Int DST alt Core tail pipe Printed by GEOstrip VC Striplog version 4.0.7.0 (www.grsi.ca) TG, C1 - C5 Curve Track #1 Total Gas (units) ROP (min/ft) Depth | Intervals Gamma (API) C1 (units) Cal (in) C2 (units) C3 (units)





Limestone; lt. gray-cream, fine xln, dense, fossiliferous in part, no shows

as above

dark grey-black shale, plus gray siltstone

Limestone; cream-lt. gray, fine xln, chalky, dense, plus Chert; white, opaque, boney

### HEEBNER 3478 (-1540)

black carboniferous shale

Shale; grey-green

### TORONTO 3500 (-1562)

Limestone; cream, fine xln, chalky poor visible porosity, no shows

### DOUGLAS 3522 (-1584)

Shale; gray-grayish green, plus gray, siltstone, micaceous in part

Shale; gray-grayish green, micaceous, silty in part

Siltstone; gray-grayish green, micaceous in part, shale; gray-dark gray-grayish green

Siltstone and Shale as above

Shale; gray-lt. gray, silty, micaceous, soft

Shale; gray-dark gray, silty in part, few micaceous pieces, soft/ gummy

### **BROWN LIME 3628 (-1690)**





Limestone; brown-buff, fine xln, fossiliferous,

Limestone; cream-lt. gray, fossiliferous, poorly developed porosity, no shows

Limestone; cream, fossiliferous, slightly granular, few dense pieces, no shows

Limestone; cream-gray, fine-medium xln, fossiliferous, scattered porosity in part, plus

Limestone; white-cream, sub oomoldic, fossiliferous, fair oomoldic porosity, (barren)

Limestone; buff-tan, fine xln, dense, cherty, poor visible porosity, Chert; amber-smokey

Limestone and Chert as above

trace black carboniferous shale

Limestone; cream-lt.gray, fine xln, dense, poor porosity, cherty, slighlty fossiliferous, no

Limestone; cream, oomoldic, fair oomoldic porosity, trace spotty brown stain, slight SFO,

Limestone; cream fine-medium xln, slightly granular, few inter xln porosity, trace spotty brown stain, trace spotty free oil, faint odor

Limestone; cream, fine xln, chalky, dense, no

Limestone; cream, fine xln, fossiliferousoolitic, chalky in part, poorly developed





porosity, plus Chert; gray-tan Limestone; cream-tan, fine xln, chalky, dense, slighlty fossiliferous, no shows Limestone; cream, fine xln, chalky in part, finely vuggy porosity, spotty brown stain, trace free oil, faint odor black carboniferous shale Limestone; tan, finely oolitc, few oomoldic porosity, trace spotty free oil, golden brown stain, no odor black carboniferous shale Limestone; It. gray, fine xln, chalky, slighlty fossiliferous, no shows BASE KANSAS CITY 3935 (-1997) Shale; gray-grayish green, maroon plus black carbonifierous shale Limestone; cream, fine xln, fossiliferous in part, trace brown stain, slight SFO, no odor plus abundant Shale variety of colors Limestone; cream-grayish green, fine xln, dense, cherty, poor visible porosity, no shows, plus Chert; white, orange, gray MISSISSIPPI 4022 (-2084) Chert; white-smokey gray, fresh, boney, fair porosity, brown-dark brown stain, trace spotty FO in a few pieces, faint gassy odor Chert; as above white-gray, boney semi tripolitic, plus Limestone; cream, fine xln, Shale; gray-grayish green, soft

trace Sand; clear-grayish green, sub rounded, sub angular, friable no shows





Shale and Sand as above

### VIOLA 4085 (-2147)

Chert; white-lt. grey, weathered in part, slighlty dolomitic, brown stain, SFO when sample broke, good gassy odor

Chert; white-yellow-gray, boney, semi tripolitic, few black edge staining NSFO

Chert; white-It. gray, weathered, brown stain, SFO when sample broke, good gassy odor

Chert; white-cream, semi tripolitic, few weathered pieces

Chert as above, plus Limestone; It graywhite-cream, fine xIn, dense, cherty

Limestone; cream-buff-lt. grey, fine xln, dense, cherty, few dolomitic pieces, plus Chert; lt. gray-white, boney, semi-tripolitic in part, no shows

## SIMPSON SHALE 4197 (-2259)

Shale; green waxey, silty in part

# SIMPSON SAND 4214 (-2276)

Sand; clear, sub rounded, sub angular, friable, good intergranular porosity, brown spotty stain, good SFO, fair-good odor

Sand; tan-brown, dolomitic, friable, good intergranular porosity, dull grey fluorescence, no shows

Shale; gray-green, waxey, slighlty silty in part

Shale; gray-green-maroon

Chert; brown, fossiliferous-oolitic, boney **ARBUCKLE 4276 (-2338)** 

Dolomite; cream, sucrosic, few scattered vuggy porosity, spotty brown stain, spotty SFO when sample broke, fair odor





Dolomite; cream-pink, sucrosic, few scattered porosity, no shows

Dolomite; gray-cream, fine xln, few sucrosic, inter xln porosity in part, no shows

Dolomite; as above plus Chert; white-translucent

Dolomite; tan-buff, fine-medium xln, dense, poorly developed porosity, cherty in part, no shows, Chert; white-translucent

Dolomite;cream-gray-buff, fine-medium xln, scattered porosity, no shows

Dolomite; tan-cream, medium xln, fair-good inter xln porosity, Chert; white, boney

# ROTARY TOTAL DEPTH 4380 (-2442)

DST #1 4085-4133 (30-45-45-60) VIOLA Blow; BOB in 30 minutes, GTS in 10 min, 1" blow back Final; BOB in 1 minute, FSI; would not bleed off Recovery; 480' GIP 60' GOCM (20%G 30%O 50%M) 3531' gassy oil (40%G 60%O)

Pressures; IFP 303-435, FFP 468-733,

DST #2 4182-4225 (30-45-30-45) Simpson Sand Blow; weak, built to 1". no blow back Final; Weake surface blow. no blow back Recovery; 10' VSOCM (2%O 98%M) Pressures; IFP 19-37, FFP 30-63, ISIP 1105, FSIP 1048, HSH 2130-2046

DST #3 4278-4284 (30-45-45-60) Arbuckle Blow; fair, built to 9.5". no blow back Final; fair, built to 10". no blow back Recovery; 40' GIP 70' Oil 30' OMCW (2%O 10%M 88%W) 330' water Pressures; IFP 18-117, FFP 121-185, ISIP 1536, FSIP 1535, HSH 2183-2105

