12-5N-11E
Addison Twp. (Oakland Co.)

Exploratory (02)
Gas Well
TD 4339 in Niagaran (46)

Reef Petroleum Corporation

Permit No. 32168

Melvin F. Lanphar 1-12

Location: NW 1/4 SW 1/4 SE 1/4 Section 12, T. 5N, R. 11E
990 feet from South and 330 feet from West line of quarter section.

This well record assembly is a compilation of well data filed by or on behalf of the operator, as required by Act 61, P.A. 1939, as amended; formation tops and stratigraphic intervals determined or confirmed where possible by Geological Survey Division personnel from mechanical logs and preliminary information collected while drilling was in progress. Records compiled by Allan G. Ostrander, Geologist.

Elevations: 1054 Kelly Bushing (use for datum), 1052 Rig Floor, 1041 Ground

Formation tops and stratigraphic intervals determined or confirmed by Geological Survey Division personnel from Schlumberger Compensated Neutron-Formation Density, Gamma Ray logs and records filed by operator.

| | |
|---|---|
| PLEISTOCENE: | |
| Drift to | 295 |
| MISSISSIPPIAN: | |
| Coldwater | 295 |
| Sunbury | 1027 |
| Berea | 1084 |
| Bedford | 1154 |
| DEVONIAN: | |
| Antrim | 1366 |
| Traverse Group | 1507 |
| Bell Shale | 1786 |
| Dundee | 1826 |
| Detroit River | 1986 |
| Amherstburg | 2182 |
| Sylvania | 2326 |
| Bois Blanc | 2411 |
| SILURIAN: | |
| Bass Islands | 2503 |
| Salina G Unit | 2701 |
| F Evaporites | 2728 |
| E Unit | 3220 |
| D Evaporites | 3316 |
| C Unit | 3348 |
| B Unit | 3414 |
| B Evaporite | 3457 |
| A2 Carbonate | 3762 |
| A2 Evaporite | 3933 |
| A1 Carbonate | 3959 |
| Niagaran | 3984 |

Preliminary or pre-reported formation tops and other well information obtained from Geological Survey Division field reports compiled while drilling was in progress.

| | |
|---|---|
| Drift | 322 Sj. |
| Sunbury | 1026 Sj. |
| Berea | 1084 Sj. |
| Antrim | 1366 Sj. |
| Traverse Formation | 1508 Sj. |
| Dundee | 1826 Sj. |
| Sylvania | 2326 Sj. |
| Bois Blanc | 2410 Sj. |
| Bass Islands | 2502 Sj. |
| Salina G Unit | 2701 Sj. |
| E Unit | 3220 Sj. |
| D Evaporite | 3316 Sj. |
| C Unit | 3348 Sj. |
| B Evaporite | 3416 Sj. |
| A2 Carbonate | 3762 Sj. |
| A2 Evaporite | 3934 Sj. |
| A1 Carbonate | 3959 Sj. |
| Brown Niagaran | 4000 Sj. |

The following documents are reproductions of official records submitted by: Thomas C. Pangborn, Geologist, on behalf of Reef Petroleum Corporation.

blf
3/12/80

ST. OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

# LOG OF OIL, GAS, DISPOSAL OR STORAGE WELL (ACT 61)

Submit in DUPLICATE Within 30 Days after Well Completion

Page 2 - 7

PERMIT NUMBER: 32168

DEEPENING PERMIT NUMBER:

| NAME(S) & ADDRESS OF OWNER(S) SHOWN ON PERMIT | NAME & ADDRESS OF DRILLING CONTRACTOR(S) |
|---|---|
| Reef Petroleum Corporation<br>P.O. Box 148<br>Traverse City, Mi 49684 | Bigard Drilling Company, Rig No. 3<br>1315 N. Mission Rd.<br>Mt. Pleasant, Mi 48858 |

| LEASE NAME(S) & WELL NUMBER SHOWN ON PERMIT | DIRECTIONALLY DRILLED |
|---|---|
| Lanphar #1-12 | YES ☐ NO ☒ |

| SURFACE LOCATION | SECTION | TOWNSHIP | RANGE | TOWNSHIP NAME |
|---|---|---|---|---|
| NW SW SE | 12 | 5N | 11E | Addison |

| FOOTAGES (North/South) | (East/West) | COUNTY NAME |
|---|---|---|
| 990' Ft. from South Line and | 330' Ft. from West Line of quarter section | Oakland |

| SUBSURFACE LOCATION | SECTION | TOWNSHIP | RANGE | TOWNSHIP NAME |
|---|---|---|---|---|
| | | | | |

| FOOTAGES (North/South) | (East/West) | COUNTY NAME |
|---|---|---|
| Ft. from Line and | Ft. from Line of quarter section | |

| DATE | | | | ELEVATIONS | |
|---|---|---|---|---|---|
| DRILLING BEGUN | TOTAL DEPTH OF WELL | TYPE WELL | | | |
| 2-9-78 | Driller 4337' Log 4339' | Gas well | | | |
| DRILLING COMPLETED | FORMATION AT T.D. | FT. DRLD. – ROTARY TOOLS | | K.B. | B.F. |
| 2-23-78 | Grey Niagaran | From 0 To 4339' | | 1054 | 1052 |
| WELL COMPLETED | PRODUCING FORMATION(S) | FT. DRLD. – CABLE TOOLS | | R.T. | Grd. |
| 12-27-78 | Salina-Niagaran | From To | | | 1041 |

## CASING, CASING LINERS AND CEMENTING

| SIZE | WHERE SET | CEMENT | Ft. Pulled |
|---|---|---|---|
| 11 3/4" | 567' | 550 sxs | None |
| 8 5/8" | 2532' | 200 sxs | None |
| 5½" | 4339' | 150 sxs | None |

## PERFORATIONS

| DATE | NUMBER HOLES | INTERVAL PERFORATED | OPEN YES | OPEN NO |
|---|---|---|---|---|
| 9-27-78 | 20 | 4268' - 78' | | |

## GROSS PAY INTERVALS

| FORMATION | OIL OR GAS | FROM | TO |
|---|---|---|---|
| Niagaran | * | 4010' | 4297' |
| GOC * indeterminate | | | |

## ALL OTHER OIL AND GAS SHOWS OBSERVED OR LOGGED

| FORMATION | OIL OR GAS | DEPTH | WHERE OBSERVED (X) Samples | Odor | Pits | Mud Line | Gas Log | Fill Up |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |

## STIMULATION BY ACID OR FRACTURING

| DATE | Interval Treated | Materials and amount used |
|---|---|---|
| 9-28-78 | 4268' - 78' | 10,000 gals 28% HCl |

## WATER FILL UP (F.U.) OR LOST CIRCULATION (L.C.) (X)

| FORMATION | F.U. | L.C. | DEPTH | AMOUNT |
|---|---|---|---|---|
| | | | | |

## MECHANICAL LOGS, LIST EACH TYPE RUN

| Brand | (X) | LOG TYPES | LOGGED INTERVALS |
|---|---|---|---|
| Schlumberger | X | CNL-Density | 0 - 4338' |
| Birdwell | | DLL-Micro | 2531' - 4336' |
| OTHER | | | |

## DEPTH CORRECTION / DEVIATION SURVEY / PLUGGED BACK

| DEPTH | CORRECT'N | RUN AT | DEGREES | YES | NO | DEPTH |
|---|---|---|---|---|---|---|
| | | | | | | |

## PRODUCTION TEST DATA

| OIL – Bbls/day | GRAVITY – °API | COND. Bbls/day | GAS – MCF/day | WATER – Bbls/day | $H_2S$ – Grains/100 cu. ft. | B.H.P. AND DEPTH |
|---|---|---|---|---|---|---|
| 1. | 32.8 | – | 1380 AOF | 0 | 97.5 | 1557 (4273) |

I AM RESPONSIBLE FOR THIS REPORT. THE INFORMATION IS COMPLETE AND CORRECT.

| DATE | NAME AND TITLE (PRINT) | SIGNATURE |
|---|---|---|
| 3-6-78 | Thomas C. Pangborn, Geologist | Thomas C. Pangborn |

NOTICE REPORT COMPLETE SAMPLE AND FORMATION RECORD AND DRILL STEM TEST INFORMATION ON REVERSE SIDE

R - 7210
Rev. 3/77

# FORMATION RECORD

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

Lanphar #1-12
Permit No. 32168

| ELEVATION USED: | GEOLOGIST NAME: | TOPS TAKEN FROM: |
|---|---|---|
| 1054 | Thomas C. Pangborn | [ ] DRILLERS LOG [X] SAMPLE LOG [X] ELECTRIC LOG |

NOTE: IF WELL DIRECTIONALLY DRILLED, *ADD* TRUE VERTICAL DEPTH FORMATION TOPS WHERE APPROPRIATE.

| FROM | TO | FORMATION (TYPE, COLOR, HARDNESS) |
|---|---|---|
| 0 | 322 | No spls |
| BOD | | 322 |
| 322 | 560 | No spls |
| 560 | 580 | Sh-lt/med gy, frm fis, silty, non calc, abnt intbd ss-lt gy, f/vfg, sub ang, fri, p sort |
| 580 | 600 | Sh & ss-aa |
| 600 | 620 | Sh & ss-aa |
| 620 | 660 | Sh & ss-aa |
| 660 | 680 | Sh-lt/med gy, ss-lt gy aa |
| 680 | 760 | Sh ss-aa |
| 760 | 780 | Sh-med gy, frm, fis, non calc silty |
| 780 | 800 | Sh-aa |
| 800 | 820 | Sh-med gy aa |
| 820 | 840 | Sh & ss-aa |
| 840 | 860 | Sh & ss-aa |
| 860 | 880 | Sh-lt/med gy, frm, fis, silty, non calc, abnt intbd ss-lt gy, f/vfg, sub ang, fri, p sort |
| 880 | 900 | Litho-aa |
| 900 | 920 | Lihto-aa |
| 920 | 940 | Sh & ss-aa |
| 940 | 960 | Sh-med gy, vfrm, blky, waxy, non calc |
| 960 | 1000 | Sh-aa |
| 1000 | 1026 | Sh-dk gy, vfrm, fis, waxy |
| SUNBURY | | 1026 |
| 1026 | 1060 | Sh-aa |
| 1060 | 1084 | Sh-dk gy aa |
| BEREA | | 1084 |
| 1084 | 1120 | SS-lt gy/fros, s & p, sub ang to sub rnd, p sort, tt, abnt intbd sh-med gy, frm, blky, non calc |
| 1120 | 1140 | Litho-aa, abnt sh-dk gy, vfrm, fis, waxy |
| 1140 | 1154 | Sh-med/dk gy, frm, fis, non calc sm ss-aa |
| BEDFORD | | 1154 |
| 1154 | 1180 | Sh-aa |
| 1180 | 1200 | Sh-aa |
| 1200 | 1220 | Sh-med/dk gy aa |
| 1220 | 1240 | Sh-aa |
| 1240 | 1260 | Sh-med/dk gy, frm to hd, waxy in app, non calc |
| 1260 | 1320 | Sh-aa |
| 1320 | 1340 | Sh-med/dk gy aa |
| 1340 | 1366 | Sh-aa |
| ANTRIM | | 1366 |
| 1366 | 1380 | Sh-dk brn/blk, hd, brit, v carb, organic, pyr, sm sh-med/dk gy AA |
| 1380 | 1400 | Sh-aa |
| 1400 | 1420 | Sh-dk brn/blk aa |
| 1420 | 1440 | Sh-aa |
| 1440 | 1460 | Sh-aa, pyr |
| 1460 | 1480 | Sh-aa |
| 1480 | 1500 | Sh-dk brn/blk aa |
| 1500 | 1508 | Sh-aa |
| TRAV | FORM | 1508 |
| 1508 | 1540 | Ls-buff/gy, fxln, dns, hd, cl abnt ls-med gy, vfxln, dns hd, arg/shaly, abnt cht-lt gy/brn/fros |
| 1540 | 1560 | Dol-buff/brn, fxln, dns, hd, cln, pyr, tr cht-aa, abnt sh med gy, hd, brit, dolic |
| 1560 | 1580 | Dol-lt brn/tn, fxln, dns, hc cln, sm limy, abnt sh-aa |
| 1580 | 1600 | Ls-lt gy/brn to buff, fxln, dns, hd, cln, sli dolic |
| 1600 | 1620 | Sh-med gy, hd, brit, calc/limy |
| 1620 | 1641 | Ls-chky/wh to tn, fxln, dns, hd, cln, tr intbd sh-med gy aa |
| TRAV | SHALE | 1641 |
| 1641 | 1660 | Sh-med gy aa, sh-med/dk gy, frm, fis, calc |
| 1660 | 1680 | Sh-aa |
| 1680 | 1700 | Sh-med/dk gy aa, w/intbd ls-aa |
| 1700 | 1720 | Sh-aa |
| 1720 | 1740 | Sh-med/dk gy aa |
| ~~1740~~ | ~~1760~~ | ~~Sh-med gy, sft, gummy calc~~ |
| 1760 | 1780 | Sh-aa |
| 1780 | 1800 | Sh-aa, gummy |
| 1800 | 1826 | Sh-aa, sh-med/dk gy, blky, h brit, calc |
| DUNDEE | | 1826 |
| 1826 | 1840 | Ls-tn/buff to wh, fxln, dns, mhd, cln, fos |
| 1840 | 1860 | Ls-aa |
| 1860 | 1880 | Ls-aa |
| 1880 | 1900 | Ls-tn/buff to wh aa, fos |
| 1900 | 1920 | Ls-aa, tr cht-wh/trip to tn |
| 1920 | 1940 | Ls-tn/buff, fxln, dns, mhd, cln, fos, tr ddo stn |
| 1940 | 1960 | Dol-lt brn, fxln, mhd, suc, cln, dol-aa |
| 1960 | 1980 | Dol-aa, sm anhy, wh, mhd |
| 1980 | 2000 | Dol-lt brn/tn, fxln, lse, su cln, anhy |
| 2000 | 2020 | Litho-aa |
| 2020 | 2040 | Dol-aa, bcmg lt/med brn |

IF WELL WAS CORED, ATTACH CORE DESCRIPTION

DRILL STEM TEST DATA

Lanphar #1-12
Permit No. 32168

# FORMATION RECORD

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

| ELEVATION USED: | GEOLOGIST NAME: | TOPS TAKEN FROM: |
|---|---|---|
| 1054 K.B. | Thomas C Pangborn | [ ] DRILLERS LOG [x] SAMPLE LOG [x] ELECTRIC LOG |

NOTE: IF WELL DIRECTIONALLY DRILLED, *ADD* TRUE VERTICAL DEPTH FORMATION TOPS WHERE APPROPRIATE.

| FROM | TO | FORMATION (TYPE, COLOR, HARDNESS) |
|---|---|---|
| 2040 | 2060 | Dol-aa, abnt intbd sh-med/dk gy, frm, fis, non calc |
| 2060 | 2080 | dol-lt/med brn aa, tr sh-aa |
| 2080 | 2100 | Litho-aa, dol-lt brn/tn aa, abnt anhy-wh, mhd, sm sh-aa |
| 2100 | 2120 | Dol-med brn, fxln, lse, suc, cln |
| 2120 | 2140 | Dol-tn, fxln, lse, suc, cln, t anhy-wh, mhd, tr sh-aa |
| 2140 | 2160 | Litho-aa |
| 2160 | 2180 | Pred sh-aa |
| 2180 | 2200 | Dol-lt/med brn, fxln, lse, suc cln, tr ddo stn, tr sh-med/dk gy aa dol-aa |
| 2200 | 2220 | Dol-aa |
| 2220 | 2240 | Ls-med/dk brn, fxln, dns, hd, cln, sm dol-aa, tr ddo stn |
| 2240 | 2260 | Dol-dk brn, fxln, suc in app, hd, cln, sli calc |
| 2260 | 2280 | Dol-red aa, bcmg med brn |
| 2280 | 2300 | Dol-dk brn aa |
| 2300 | 2326 | Dol-aa |
| SYLVANIA | | 2326 |
| 2326 | 2340 | Ss-clr, fg, sub rnd, pred tt, sm fri, f sort, calc, sm sh-dk gy, frm, fis, abnt trip |
| 2340 | 2360 | No spls |
| 2360 | 2380 | Ss-aa |
| 2380 | 2400 | Ss-pred aa, bcmg f/vfg, p sort |
| 2400 | 2410 | Ss-aa, trip |
| BOIS BLANC | | 2410 |
| 2410 | 2440 | Ls-buff/wh to med brn, mot, fxln dns, hd, cln, tr cht-lt brn/fros |
| 2440 | 2460 | Ls-aa |
| 2460 | 2480 | Ls-aa, sm cht-wh, trip |
| 2480 | 2502 | Litho-aa |
| BASS ISL | | 2502 |
| 2502 | 2520 | Dol-lt brn, vfxln, dns, hd, cln sm dol-med gy, vfxln, dns, hd, arg, dol-aa |
| 2520 | 2540 | Dol-med brn, vfxln, dns, hd, cln, tr ddo stn |
| 2540 | 2560 | Dol-lt brn aa, dol-lt/med brn, vfxln, dns, hd, cln, abnt, ahhy-wh, mhd |
| 2560 | 2580 | Dol-aa, anhy |
| 2580 | 2600 | Pred anhy, sm dol-aa |
| 2600 | 2620 | Litho-aa, Dol-dk brn, vfxln, dns, hd, cln |
| 2620 | 2640 | Dol-lt/med brn, vfxln, dns, hd, cln, abnt p-p vug o/ |
| 2640 | 2660 | Dol-med/dk brn/gy, vfxln, dns, hd, cln, anhy |
| 2660 | 2680 | Dol-aa |
| 2680 | 2701 | Dol-med/dk gy, vf/micro xln, dns, hd, cln to sli arg |
| SALINA G | | 2701 |
| 2701 | 2720 | Dol-aa |
| 2720 | 2740 | Dol-med/dk brn, vfxln, dns, hd, cln |
| 2740 | 2752 | Dol-aa, dol-lt/med gy, fxln, dns, mhd, arg/shaly |
| F UNIT | | 2752 |
| 2752 | 2780 | Dol-aa |
| 2780 | 2800 | Dol-pred aa, sm sh-rd, blky, hd, brit, dolic |
| 2800 | 2823 | Dol-lt brn, fxln, lse, suc, arg, abnt sh-med gy, blky, hd brit, dolic |
| F SALT | | 2823 |
| 2823 | 2840 | Salt |
| 2840 | 2860 | Sh & Dol-aa |
| 2860 | 2880 | Salt w/intbd sh & dol strgs |
| 2880 | 2960 | Salt |
| 2960 | 2980 | Salt w/dol strgs anhy |
| 2980 | 3000 | Salt |
| 3000 | 3020 | Salt |
| 3020 | 3040 | Dol-med/dk brn, vfxln dns hd cln, sm dol-lt brn/fxln, lse, suc, arg, sm sh-med gy aa |
| 3040 | 3060 | Dol-aa w/salt strgs |
| 3060 | 3080 | Dol-med/dk brn aa, sm anhy |
| 3080 | 3100 | Salt |
| 3100 | 3120 | Dol-lt/med brn, fxln, lse, su arg |

IF WELL WAS CORED, ATTACH CORE DESCRIPTION

DRILL STEM TEST DATA

| FROM | TO | FORMATION (TYPE, COLOR, HARDNESS) |
|---|---|---|
| 3120 | 3140 | Dol-aa |
| 3140 | 3160 | Salt |
| 3160 | 3180 | Salt w/intbd dol-lt/med brn a |
| 3180 | 3200 | Salt |
| 3200 | 3220 | Salt |
| E CARB | | 3220 |
| 3220 | 3240 | Sh-lt gy, frm, blky, dolic, s intbd dol-lt brn, fxln, lse, suc, arg |
| 3240 | 3260 | Dol-lt/med brn, v/vfxln, dns, mhd, arg, tr anhy-wh, mhd |
| 3260 | 3280 | Dol-pred aa, sm lt gy, dol-me brn, vfxln, dns, hd, cln, sm lse, suc |
| 3280 | 3300 | Dol-aa |
| 3300 | 3316 | Dol-lt/med brn aa |
| D SALT | | 3316 |
| 3316 | 3340 | Salt, dol-lt brn, fxln, dns. mhd, anhy |
| 3340 | 3348 | Salt |

Permit No. 32168

# FORMATION RECORD

(ATTACH ADDITIONAL SHEETS IF NECESSARY)



| ELEVATION USED: | GEOLOGIST NAME: | TOPS TAKEN FROM: |
|---|---|---|
| 1054 K.B. | Thomas C. Pangobrn | ☐ DRILLERS LOG ☒ SAMPLE LOG ☒ ELECTRIC LOG |

NOTE: IF WELL DIRECTIONALLY DRILLED, *ADD* TRUE VERTICAL DEPTH FORMATION TOPS WHERE APPROPRIATE.

| FROM | TO | FORMATION (TYPE, COLOR, HARDNESS) |
|---|---|---|
| C SHALE | | 3348 |
| 3348 | 3360 | Sh-med/dull gy, sft, gummy, non calc |
| 3360 | 3380 | Sh-aa |
| 3380 | 3416 | Sh-aa, gummy, pred sh-med gy aa, abnt dol-med/ dk brn, vfxln, dns, hd, arg |
| B SALT | | 3416 |
| 3416 | 3440 | Litho-aa, salt, pred sh-med gy aa, sm dol-aa |
| 3440 | 3460 | Litho-aa |
| 3460 | 3480 | Salt |
| 3480 | 3500 | Salt w/intbd sh & dol strgs |
| 3500 | 3520 | Salt |
| 3520 | 3540 | Salt |
| 3540 | 3560 | Salt w/thin sh & dol strgs |
| 3560 | 3720 | Salt |
| 3720 | 3740 | Dol-lt/med brn, fxln, lse, suc cln, anhy |
| 3740 | 3762 | Salt |
| A-2 CARB | | 3762 |
| 3762 | 3780 | Dol-med/dk brn, fxln, dns, mhd to lse, suc, arg |
| 3780 | 3800 | Dol-aa, bcmg pred med brn, occ tr ddo stn dol-aa |
| 3800 | 3820 | Dol-aa |
| 3820 | 3840 | Dol-med brn, fxln, lse, suc to mhd, dns, arg, occ tr ddo stn dol-aa |
| 3840 | 3860 | Ls-med/dk brn, f/vfxln, dns, hd, sli arg, sli dolic, ls-aa |
| 3860 | 3880 | Ls-dk brn/gy, vfxln, dns, hd, arg |
| 3880 | 3900 | Dol-dk brn/gy, vfxln, dns, hd, sli arg dol-aa |
| 3900 | 3920 | Anhy-wh/sft, abnt dol-dk brn/ gy aa, anhy-aa |
| 3920 | 3934 | Dol-dk gy/brn vfxln, dns, hd, arg abnt intbd-salt |
| A-2 EVAP | | 3934 |
| 3934 | 3959 | Anhy-wh/sft, sm dol-aa |
| A-1 CARB | | 3959 |
| 3959 | 3980 | Dol-lt/med brn, fxln, pred lse, suc, cln, sm dns, hd, abnt vug ϕ app salt plgd |
| 3980 | 4000 | Dol-med gy/brn, fxln, dns, hd, cln dol-aa, bcmg lt/med gy/brn |
| 4000 | 4020 | Dol-aa, salt plugd |
| 4020 | 4040 | Dol-aa, tr anhy |
| 4040 | 4060 | Dol-med gy/brn, fxln, suc, cln, abnt salt plgd vug ϕ |
| 4060 | 4080 | Dol-aa, bcmg lt gy/brn, less suc dol-aa, anhy |
| 4080 | 4100 | Dol-aa |
| 4100 | 4120 | Dol-pred aa, bcmg med/dk gy/ brn |
| 4120 | 4140 | Dol-aa |
| 4140 | 4160 | Dol-med gy/brn |
| 4160 | 4180 | Dol-aa |
| 4180 | 4200 | Dol-aa, sm salt plgd ϕ |
| 4200 | 4220 | Dol-aa |
| 4220 | 4240 | Dol-aa |
| 4240 | 4260 | Dol-med gy/brn |
| 4260 | 4280 | Dol-aa |
| 4280 | 4300 | Dol-aa |
| 4300 | 4320 | Dol-aa, dns, tt |
| 4320 | 4337 | Dol-aa |
| | | D.T.D. - 4337' |
| CORE #1 | | 3988' - 4041' Full Recovery |
| 3983 | 3988 | Dol-med gy/brn, f/vfxln, lg salt plgd vert frac vugs 12" long. abnt p-p open vugs. fa mot. abnt small vugs 50% sal plgd. |
| 3988 | 4006 | Dol-lt/med gy/brn, f/vfxln, num p-p open vugs, scat lgr vugs to 1½" 98% salt plgd. m max est open ϕ 5-6%. abnt coraline mtl at 4001' - 06' |
| 4006 | 4012 | Dol-aa bcmg more fos, num salt plgd brac vugs. abnt p- vugs 60% open. |
| 4012 | 4015 | Dol-aa, abnt brac vugs ¼" tc ½" 80% salt plgd. |

IF WELL WAS CORED, ATTACH CORE DESCRIPTION

DRILL STEM TEST DATA

| FROM | TO | FORMATION (TYPE, COLOR, HARDNESS) |
|---|---|---|
| 4015 | 4020 | Dol-aa, no bracs. num corals sm open p-p vugs. sm salt plgd lgr vugs to ½" |
| 4020 | 4034 | Dol-aa, brac an at 4020 - 4021.5, 95% salt plgd. 4" salt plgd vug at 4030'. sm salt plgd 1" vugs. |
| 4034 | 4041 | Dol-aa, sm vugs to 1½" anhy plgd. num p-½ vugs. tr salt plugging. General core desc. - abnt bleeding gas, abnt blk sul stn, minor amts bldg blk su resd, strong odor on fresh break sli sour odor. |
| CORE #2 | | 4041' - 4100' Full Recovery |
| 4041 | 4055 | Dol-med gy/brn, f/mxln, vsu abnt p-p vugs 40% open, num 1/8" to ½" vugs 95% salt & anhy plgd, vfos |

# FORMATION RECORD

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

LANPHAR #1-12
Permit No. 32168

| ELEVATION USED: | GEOLOGIST NAME: | TOPS TAKEN FROM: |
|---|---|---|
| 1054 K.B. | Thomas C. Pangborn | ☐ DRILLERS LOG ☒ SAMPLE LOG ☒ ELECTRIC LOG |

NOTE: IF WELL DIRECTIONALLY DRILLED, *ADD* TRUE VERTICAL DEPTH FORMATION TOPS WHERE APPROPRIATE.

| FROM | TO | FORMATION (TYPE, COLOR, HARDNESS) |
|---|---|---|
| 4055 | 4065 | Litho-aa |
| 4065 | 4067 | Dol-aa, brec. lg 6" anhy filled vug. sm salt filled vugs to 2" |
| 4067 | 4077 | Dol-aa bcmg less suc. losing sm p-p vugs. sm corals |
| 4077 | 4088 | Dol-lt gy/brn. fxln, dns, sli suc, scat p-p vugs, lg anhy filled vug at 4081.5. num ¼" to ½" anhy & salt filled vugs. |
| 4088 | 4100 | Dol-aa, bcmg vdns, v few vugs. all anhy or salt plgd. no vis open ϕ |
| | | General core desc. - abnt bleeding gas. abnt blk sul stn, strong odor on fresh break |
| CORE #3 | 4100' - 4160' Full Recovery | |
| 4100 | 4108 | Dol-med/dk gy/brn, f/mxln, scat vugs to 1½" salt plgd sm slt plgd p-p vugs. mot dns. 75% plgd |
| 4108 | 4121 | Dol-aa, incr ϕ 1/8" to 3" vugs apprs 100% salt plgd. scat p-p vugs 80- 90% salt plgd. |
| 4121 | 4139 | Dol-med gy/brn, dns, fxln, abnt corals, incr lgr vugs, tr bleeding live green oil at 4127'. Lg coral structure 40 - 80% salt plgd at 4127'. 30% salt plgd ϕ at 4136' to 4139', v fos, num p-p vugs 60% salt plgd. |
| 4139 | 4145 | Dol-lt gy/brn, vdns, fxln, sm scat lg vugs to 2", tr p-p vugs 40% salt plgd sm slump structure sli frac. fair amt open p-p vug ϕ |
| 4145 | 4156 | Dol-aa, abnt p-p vugs 60% open, sm ¼" open vugs, sm stvo, abnt bldg gas |
| 4156 | 4160 | Dol-aa, bcmg more dns, minor amt p-p ϕ 20% salt plgd. |
| | | General core appears to be less salt plgd. possible pay sones -4138.5 to 4139.5, 4145 to 4148, 4150 to 4157 |
| CORE #4 | 4160 - 4220' Full Recovery | |
| 4160 | 4178 | Dol-med gy/brn, fxln, vfos, abnt p-p & pen pt vugs open, lgr vugs 80% salt plgd. scat open ½" vugs at 4162' Salt plugging dec to 50% |
| 4178 | 4182 | Dol-aa, lgr vugs open, scat ½" to 3" anhy inclusions at 4177.5 |
| 4182 | 4188 | Incr p-p & pen pt vugs |
| 4188 | 4191 | Incr ¼" to ½" vugs. num p-p & pen pt vugs. est 6-8% ϕ |
| 4191 | 4195 | ϕ decr to 5 - 6% |
| 4195 | 4202 | ϕ incr to 6 - 7% |
| 4202 | 4210 | ϕ decr to 5% abnt reworked org mtl from 4205.9 to 4210. salt plgd at 4208.5 |
| 4210 | 4211 | ϕ incr to 9% |
| 4211 | 4214 | ϕ decr to 7% |
| 4214 | 4216 | ϕ decr to 5 - 7% |
| 4216 | 4220 | ϕ incr to 6 - 8% |
| | | General core desc - very little evidence of salt plugging. Whole core bled gas w/ slight sour odor. Many of the vugs lined w/dark carb mtl (may be due to sulphides est 40' is gas pay occ tr of bleeding live oil. approx. base of salt plugging at 417 |
| CORE #5 | 4220 - 4279' Rec. 58.5' | |
| 4220 | 4227.5 | Dol-med gy/brn, abnt p-p & pen pt. vugs. exc gas pay es ϕ at 6 - 9% abnt org mtl. no visible evidence of salt plugging |
| 4227.5 | 4233 | Dol-aa, gas/oil contact ϕ decr to 5 - 7T num p - p & pen pt vugs, scat lgr vugs t 3/8" bleeding gas & lt golde brn oil. |
| 4233 | 4235 | Dol-aa, ϕ decr to 3 - 5% |

IF WELL WAS CORED, ATTACH CORE DESCRIPTION

DRILL STEM TEST DATA

| FROM | TO | FORMATION (TYPE, COLOR, HARDNESS) |
|---|---|---|
| 4235 | 4238.5 | ϕ incr to 4 - 6% |
| 4238.5 | 4239.5 | ϕ decr t0 3% sm bldg oil aa |
| 4239.5 | 4246.5 | ϕ incr to 3 - 5% oil bldg from hairline fracs & p-p vugs. sm dk carb mtl |
| 4246.5 | 4255 | Dol-aa, pred salt plgs, bcmg TT, ϕ decr to 3%, tr bldg O & G. |
| 4255 | 4257 | ϕ incr to 3 - 5% decr salt plugging, num open p-p & pen pt vugs, sm lgr salt plgd vugs, abnt bldg O & G |
| 4257 | 4259 | ϕ bcmg 80% salt plgd. scat bldg O & G from hairline fr & p - p vugs. |
| 4259 | 4260 | ϕ incr to 3% |
| 4260 | 4274 | 80% salt plgd. lgr vugs 100 salt plgd. TT, dns. lg ½" X 1" salt filled vug at 4271. |
| 4274 | 4279 | ϕ incr to 3 - 4% 50% salt plgd, abnt bldg oil from |

# FORMATION RECORD

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

Lanphar #1-12
Permit No. 32168

| ELEVATION USED: | GEOLOGIST NAME: | TOPS TAKEN FROM: |
|---|---|---|
| 1054 K.B. | Thomas C. Pangborn | ☐ DRILLERS LOG ☒ SAMPLE LOG ☒ ELECTRIC LOG |

NOTE: IF WELL DIRECTIONALLY DRILLED, *ADD* TRUE VERTICAL DEPTH FORMATION TOPS WHERE APPROPRIATE:

| FROM | TO | FORMATION (TYPE, COLOR, HARDNESS) |
|---|---|---|
| | | horz fracs & scat p - p vugs. general core desc - very uniform ϕ decr in oil column, best oil pay from 4227.5 to 4246.5, rest of core appears tt. |
| CORE #6 | 4279 - 4337 | Full Recovery |
| 4279 | 4297 | Dol-med gy/brn, pred tt, scat p-p & pen pt open vugs. random lgr vugs salt plgd. abnt O & G bleeding from p - p & horz frac ϕ, more abnt oil bldg from 4291 - 4294. |
| 4297 | 4313.5 | Oil/water contact, dol-aa, bcmg from 4291 - 4294. |
| 4297 | 4313.5 | oil/water contact, dol-aa, bcmg v tt, salt plgd ϕ, occ tr bldg oil |
| 4313.5 | 4334.3 | Dol-aa tt. |
| 4334.3 | 4337 | Gy niag. dol-med/dk gy, dns arg. |

| FROM | TO | FORMATION (TYPE, COLOR, HARDNESS) |
|---|---|---|

IF WELL WAS CORED, ATTACH CORE DESCRIPTION

DRILL STEM TEST DATA