

GEOLOGIST REPORT

Well Name: Herradura #1 API: 15035245790000

Location: NE, NW, NE, SW of Section 17, T33S, R6E, Crowley County, KS

SHL: 2,325' FSL & 1,913' FWL of NE, NW, NE, SW, Section 17, T33S, R6E

Region: Cowley County

Spud Date: 6/17/2014 Drilling Completed:6/23/2014

Ground Elevation (ft):1,318'

K.B. Elevation (ft): 1,328' Total Depth (ft):3,594'

Formation: Mississippian Type of Drilling

Fluid:WATER, GEL

NEVA @ 380' (660')

380-420' LS: PREDLT TN- TN, SME OFF WHT, PRED MODFRM- HRD, PRED PLTY, SME BLKY, TRHL
FRACPOD

420-465' SH: PREDLT GRY-MED GRY THRUOUT, OCC RED, TRDKGRY, MSTLY SFT-VRY SFT, OCC SLI-
MODFRM, SUB BLKY-CHNKY, OCCPLTY, OCCMICRO MICA, PRED MODSMTHTXT, OCCSLI RGH-RGHTXT

465-480' SS: MSTLY TN, SME OPQ, TRCLR, BRIT-SLI BRIT, ANG-SUBANG GRNS, TRSUBRND GRNS, V FN, PR
INTRGRNPOR, NON CONSOL GRNS, LS: PREDTNTHRUOUT, OCCOFF WHT-WHT, MSTLY BRIT-VRY BRIT,
OCCSLI FRM, PRED SUBBLKY-CHNKY, SME PLTY

480-570' SH: PREDLT GRY-MED GRY THRUOUT, OCC RED, TRDKGRY, MSTLY SFT-VRY SFT, OCC SLI-
MODFRM, SUB BLKY-CHNKY, OCCPLTY, OCCMICRO MICA, PRED MODSMTHTXT, OCCSLI RGH-RGHTXT

570-668' SH: PREDGRY, SME LT GRY, OCCRED- RED ORNG, TRDRKGRY- BLK, MSTLY SFT, TRSLI FRM,
MSTLY SUBBLKY, SME BLKY, OCCMICRO MICA, PREDMEDFNTXT

668-778' SH: MSTLY LT- MEDGRY, OCCDRKGRY, TRRED- REDORNG, MSTLY SFT, SME SLI FRM, SME SLTY,
MSTLY SUBBLKY, SME CHNKY, OCCSNDY TXT, INCRSNG PYR

778-820' SS: MSTLY OPQ- TRSL, SME LT GRY, OCCLT TN, FRM- MOD FRM, MSTLY FNGRNS, WEL SRTD,
SUBRND- SUBANG, NONCALCCMT, OCC UNCONSOL QRTZ GRNS, SLI FRINTERGRANPOR, TRPYR

820-870' SH: PREDGRY, SME LT GRY, OCCRED- RED ORNG, TRDRKGRY-BLK, MSTLY SFT, TRSLI FRM,
MSTLY SUBBLKY, SME BLKY, OCCMICRO MICA, PREDMEDFNTXT

870-880' SS: PREDOFF WHT- WHT, SME OPQ- CLR, FRM- MODFRM, PRED FNGRNS, PRSRTD, SUB RND-
SUBANG, NON CALCCMT, PRINTGR POR, PREDCONSOL

880-1062' SH: MSTLY LT GRY, SME GRY, TRRED- MAUVE, MSTLY SFT, SME SLI FRM, PREDSUBBLKY,
OCCBLKY, OCCMICRO MICA, SME SLTY, PRED RGHTXT, TR FREE PYR

1062-1075' LS: MSTLY CRM, SME LT GRY- LT TN, OCCWHT, MODFRM- VRY FRM, PREDSUBBLKY, FN- VRY
FNXLN, OCCSNDY TXT, INTERXLNPOR, TR HL FRACPOR, SH: PRED KD LT- MEDGRY, OCCRED- PALE RED,
SLI SFT- SLI FRM, MSTLY SUBBLKY- CHNKY, OCCBLKY, OCC MICRO MICA, FN- MOD RGHTXT, OCCSNDY
TXT, TRFREE PYR

1075-1148' SH: MSTLY LT GRY, SME GRY, TRRED- MAUVE, MSTLY SFT, SME SLI FRM, PREDSUBBLKY, OCCBLKY, OCCMICRO MICA, SME SLTY, PRED RGHTXT, TRFREE PYR

SHAWNEE @ 1147' (181')

1147-1340' LS: MSTLY TN, SME LT TN, OCCCRM, TRWHT, VRY FRM, OCCHRD, MSTLY SUBBLKY, OCC BLKY, VRYFNXLN, OCC SNDY TXT, SME HL FRACPOR, TRFRAC POR, SH: MSTLY LT GRY THRUOUT, TRGRY, TR RED- REDORNG, SLI FRM- FRM, OCCMOD FRM, MSTLY SUBBLKY, OCCBLKY, MODRGH TXT, OCCSMHTXT

1340-1478' SH: MSTLY LT GRY, SME GRY, TRRED- MAUVE, MSTLY SFT, SME SLI FRM, PREDSUBBLKY, OCCBLKY, OCCMICRO MICA, SME SLTY, PRED RGHTXT, TRFREE PYR

1478-1504' SS: PREDLT GY- GY, SME OFF WHT, ANG- SUBANG, MODSRT, PR INTRGRNPOR, CONSOL

1504-1618' SH: MSTLY MEDGRY THRUOUT, OCCLT GRY, TRRED- MAUVE, PRED SFT, SME SLI FRM, PREDSUBBLKY THRU OUT, OCCBLKY, SLI TR MICRO MICA, OCCSLTY, MSTLY RGHTXT, OCC SLI SMTH, TR-OCCLS

TORONTO @ 1618' (-290)

1618 -1662' LS: PREDOFF WHT-CRM, SME TN-DK TN, TRLT GRY, MOD FRM- FRM, OCCVRY FRM, TRBRIT, MSTLY SUBBLKY-BLKY, SME PLTY, V FNXLN, SME HL FRACPOR

1662-1790' SH: PREDLT GRY THRU OUT, OCCRED, TRMED- DKGRY, MSTLYSLI-MOD FRM, OCCSFT, PRED SUBBLKY, OCCCHNKY, TRSPLNTRY, OCC MICRO MICA, TRSLTY, MSTLY RGHTXT, OCC SLI-MODSMHTXT, TR-OCCLS

IATAN @ 1864 (-536)

1864-1892' LS: PREDOFF WHT- CRM, TRLT TN, MOD FRM, TRHL FRACPOR

1892-2048' SS: MSTLY OFF WHT THRUOUT, OCC CRM-OPQ, TRLT TN-TN, PREDSUBRND- SUBANG, OCCANG, MOD SRT, SLI FR-FRINTRGRN POR, CONSOL GRNS, PREDFNGRNS, NON CALCCMT

2048-2112' SH: PREDGRY- DRK GRY, OCCLT GRY, SFT- MODFRM, PREDPLTY, SME BLKY, V SMHTXT

PERRY @ 2114 (-786)

2114-2154' SS: PREDOFF WHT- WHT, SME OPQ- TRANSLU, PREDSUB ANG, PRSRT, PRINTGR POR, PREDCONSOL, TR UNCONS, PREDFN GRNS, NONCALCCMT

2154-2294' SH: PREDGRY- DRK GRY, OCCLT GRY, SFT- MODFRM, PREDPLTY, SME BLKY, V SMHTXT, TROFF WHT SS STRNGS THUR OUT

LAYTON @ 2294 (-966)

2294-2374' SS: PREDLT GRY- GRY, SCAT TRANSLU- OPQ, PREDSUBANG- SUB RND, MODSRT, PRED CONSOL, FN-MEDGRNS, SLI CALCCMT, W/ SH: PREDLT GRY- GRY, SFT- MODFRM, PREDPLTY, SME BLKY, V SMHTXT

2374-2418' SH: GRY- DRKGRY, OCC LT GRY, SFT- MODFRM, PREDPLTY, SME BLKY, V SMHTXT, TROFF WHT SS STRNGS THUR OUT

2418-2456' SS: MSTLY LT GRY, SME KD WHT, OCCLT TN, PRED SUBANG- SUBRND, MOD- WEL SRTD, CONSOL FNGRNS, NON CALC, PRINTERGRAN POR

2456- 2511' SH: PREDGRY- LT GRY, OCCDRKGRY, MSTLY SFT, SME SLI FRM, MSTLY SUBBLKY, OCC BLKY, FNTXT, OCCSS STRNGR

KANSAS CITY @ 2511 (-1183)

2511-2582' LS: PREDTN- DRKTN, OCCLT TN, TRWHT, VRY FRM, SME HRD, VRY FNXLN, PREDSUB BLKY- BLKY, SME SNDY TXT, TRHL FRACPOR

2582-2619' SH: MSTLY DRKGRY, OCCGRY, TRBLK, SLI TRRED, MSTLY FRM, SME SLI FRM, PRED SUBBLKY, TRBLKY, FN-VRY FNTXT

CLEVELAND @ 2619 (-1291)

2619-2660' SS: MSTLY LT GRY-GRY, OCCOPQ-WHT, PRED SUBSUBRND-RND, OCC SUBANG, MODSRT, CONSOL FNGRNS, NON CALC, PRINTERGRAN POR, SME SNDY LME, TN-GRY, OCCHLFRAC POR

2660-2712' SH: PREDMEDGRY THRUOUT, SME LT GRY, MSTLY SLI FRM, SME MODFRM-FRM, MSTLY SUBBLKY, SME BLKY, TRCHNKY, FN-VRYFN TXT, OCCSLI RGHTXT, SLI TROF MICRO MICA

MARMATON @ 2712 (-1384)

2712-2760' LS: PREDOFF WHT-CRM, SME TN-DK TN, TRGRY-DKGRY, MSTLY VRYFRM, SME HRD, TRFRM, PREDSUB KD BLKY-BLKY, SME PLTY,VRY FNXLN, TRSNDY TXT, OCCHL FRACPOR

2760-2778' SH: PREDMEDGRY THRUOUT, SME LT GRY, MSTLY SLI FRM, SME MODFRM-FRM, MSTLY SUBBLKY, SME BLKY, TRCHNKY, FN-VRYFN TXT, OCCSLI RGHTXT, SLI TROF MICRO MICA

FT SCOTT @ 2812 (-1484)

2812-2860' LS: PREDTN- DRKTN, SME OFF WHT, MOD FRM- FRM, OCCHRD, PREDPLTY, SME BLKY, V FNXLN, TRHL FRAC POR, FRPP VUG POR

2860-2932' LS: PREDTN- DRKTN, SME OFF WHT, MOD FRM- FRM, OCCHRD, PREDPLTY, SME BLKY, V FNXLN, TRHL FRAC POR, FRPP VUG POR, BRI GRNFLORSCAT THRUOUT

CATTLEMAN @ 2932 (-1604)

2932-2988' SS: MSTLY LT GRY, SME GRY, OCCOPQ-WHT, TR TN, SUBANG-ANG GRNS, MODWEL SRT, V CONSOL FNGRNS, NON CALC, PRINTERGRAN POR

2988-3020' SH: PREDLT GRY, SME RED-PALE ORNG, OCC MUAVE, TRDKGRY, PREDSLI-MODFRM, OCCFRM, TRSFT, MSTLY SUBBLKY, SME BLKY-BLKY, SME PLTY, FN-VRY FNTXT, OCCSLI RGHTXT, SME MICRO MICA

BARTELSVILLE @ 3020 (-1692)

3020-3060' SS: PREDWHT, SME LT GRY, TROPQ-LT TN, MSTLY SUBRND-SUB ANG, OCCRND, MOD SRT, CONSOL VRY FN GRNS, NONCALC, PR INTERGRANPOR

3060-3130' SH: PREDLT GRY, SME RED-PALE ORNG, OCC MUAVE, TRDKGRY, PREDSLI-MODFRM, OCCFRM, TRSFT, MSTLY SUBBLKY, SME BLKY-BLKY, SME PLTY, FN-VRY FNTXT, OCCSLI RGHTXT, SME MICRO MICA

MISSISSIPPIAN @ 3130 (-1802)

3130-3150' CHT: PREDWHT-OFF WHT, SME LT TN- TN, CHLKY MSTLY VRY HRD, OCCVRY FRM-HRD,

3150-3222' LS: MSTLY TN- DRKTN, OCCTN, FRM- MODFRM, MSTLY SUBBLKY, OCC PLTY, FN- VRY FNXLN, OCCHL FRACPOR, TR FRACPOR

3222-3252' LS: MSTLY TN, SME GRY- LT GRY, OCCLT TN- CRM, FRM- VRY FRM, PREDSDY TXT, SUB BLKY, VRYFNXLN, TR FRACPOR

3252-3312' LS: PREDTN, SME DRK TN, OCCLT TN- LT GRY, MSTLY VRYFRM, SME FRM, OCCDECRSNG SDY TXT, VRY FNXLN, MSTLY SUBBLKY, INCRNSING BLKY, TR FRACPOR

3312-3376' LS: PREDDRKGRY, OCCGRY, TRDRKTN, VRY FRM- HRD, DNSE, PREDBLKY- SUBBLKY, VRY FNXLN, TRFRAC POR, VRY PRPOR

3376-3420' LS: PREDDRKGRY, OCCGRY, TRDRKTN, VRY FRM- HRD, DNSE, PREDBLKY- SUBBLKY, VRY FNXLN, TRFRAC POR, VRY PRPOR

3420-3488' LS: MSTLY DRKGRY- VRY DRKGRY, OCC GRY, TRLT GRY- CRM, VRY FRM- HRD, MSTLY SUBBLKY, OCCBLKY, TRPLTY, VRY FNXLN, DNSE, TRVRY PRFRAC POR

KINDERHOOK @ 3488 (-2160)

3488-3549' SH: BLCKCARBSH, SME DRKGRY, PRED SFT THRUOUT, MSTLY PLTY, SME SUBBLKY

ARBUCKLE @ 3549 (-2221)

3549-3594' DOL: MSTLY CRM- LT TN, SME OFF WHT, SLI FRM- FRM, SME MODFRM, PREDCHNKY- BLKY, FN- MEDFNXLN, SME SLI FRINTERXLNPOR, TR OF CHT

DRILLERS TD @ 3594