



Mudgrouve

Petroleum Geology
212 Main Street, Claflin KS

GEOLOGIST'S REPORT

DRILLING TIME AND SAMPLE LOG

COMPANY <u>H&D Exploration, LLC</u>	ELEVATIONS
LEASE <u>Steinle #2</u>	KB <u>1679'</u>
FIELD <u>Hall Gurney</u>	DF _____
LOCATION <u>SE-NW-SE-NE(1830' FNL& 770' FEL)</u>	GL <u>1670'</u>
SEC <u>30</u> TWSP <u>14S</u> RGE <u>12W</u>	Measurements Are All From <u>KB</u>
COUNTY <u>Russell</u> STATE <u>Kansas</u>	
CONTRACTOR <u>Southwind Drilling, inc. (Rig # 3)</u>	CASING
SPUD <u>05/13/2019</u> COMP <u>05/19/2019</u>	SURFACE <u>8 5/8"@412'</u>
RTD <u>3210'</u> LTD <u>3210'</u>	PRODUCTION <u>5 1/2"@3208</u>
MUD UP <u>2050'</u> TYPE MUD <u>Chemical</u>	ELECTRICAL SURVEYS
	ELI Wireline
	Micro, DIL, CDL/CNL

SAMPLES SAVED FROM 2100' TO RTD

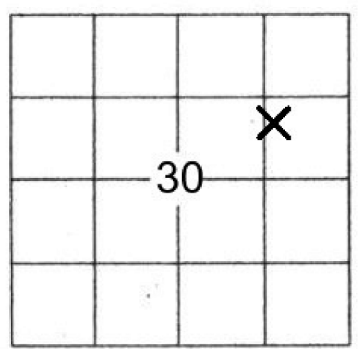
DRILLING TIME KEPT FROM 2100' TO RTD

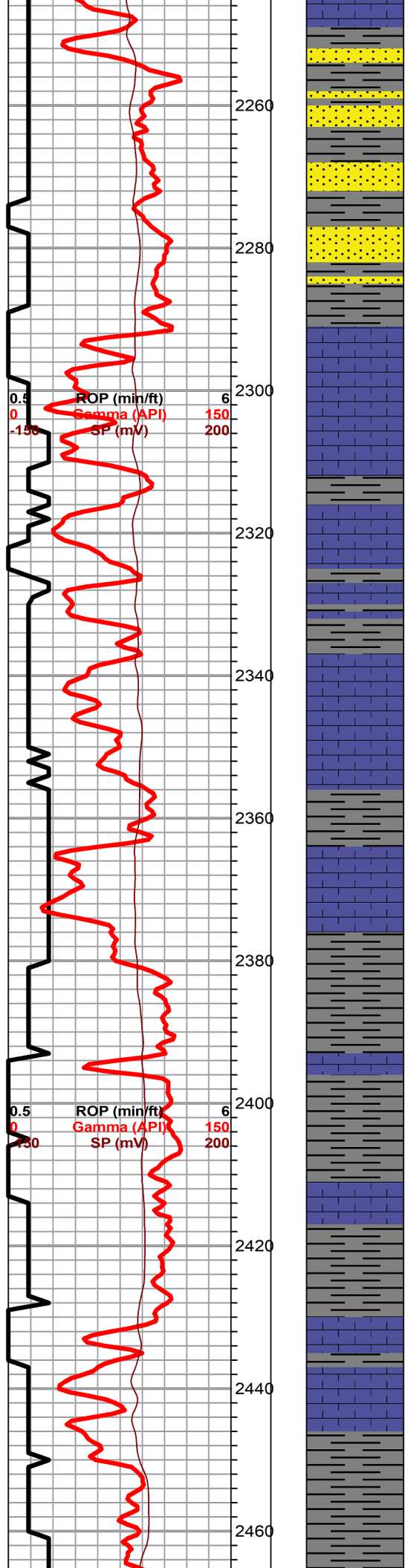
SAMPLES EXAMINED FROM 2100' TO RTD

GEOLOGICAL SUPERVISION FROM 2150' TO RTD

GEOLOGIST ON WELL Wyatt Urban

FORMATION TOPS	LOG	SAMPLES
Anhydrite	599 (+1080)	Lansing 2818 (-1139)
B. Anhydrite	634 (+1045)	Base KC 3092 (-1413)
Grand Haven	2158 (-824)	Congl. 3103 (-1424)
Dover	2182 (-503)	Arbuckle 3160(-1481)
2nd Tarkio Sd.	2192 (-513)	RTD 3210(-1531)
Tarkio Lime	2231 (-555)	LTD 3210(-1531)
Topeka	2503 (-824)	
Heebner	2740 (-1061)	
Toronto	2757 (-1078)	
Douglas	2772 (-1093)	





Sd. gry, poorly developed porosity, mica, dk blk stain (flakey), no shows

Sh, gry, dk, gry, mica, tr. sd. a/a , no shows, abd. black carb sh.

LS, white, foss, poor vis. porosity, chalky, no shows,

LS, tan, buff, foss, poor vis. porosity, chalky, no shows,

Abd. gry silty shale

LS, cream, foss, poor vis. por. no shows, no odor .

Sh, gry, dk gry,

Tr. LS, cream, tan, fxl, few foss, no shows

Sh, gry silty, soft no shows

Sh, dk gry, soft, tr. sd. gry, vfg. well sorted, well sorted, no shows

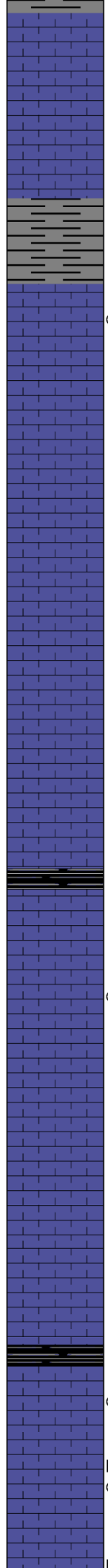
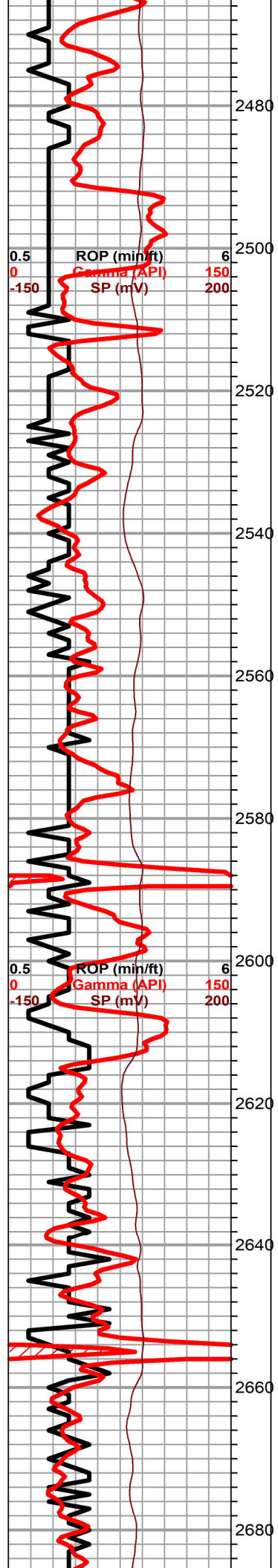
Sh, gry, silty, soft, tr. sd. vfg., gry, mica., no shows,

LS, cream, foss, poor / fair scattered p.p. porosity sl. chalky, tr. red / brn, discoloration, no odor.

Abd. slug dk gry soft sh.

30 Neutron Porosity (pu)
30 Density Porosity (pu)

30 Neutron Porosity (pu)
30 Density Porosity (pu)



LS, tan, brn, foss, gran. chalky, no shows, no odor

Sh, gry, soft

Topeka 2508.0 (-829.0)

LS, cream white, fxl, poor vis. porosity, Tr. spty wk sfo, faint odor ???

LS, gry, few foss, dense, poor to fair porosity, no shows, no odor

LS, tan, crm, foss, sl. chalky, poor vis. porosity, no shows, tr. dk gry silty sh.

LS, a/a, foss, chalky, poor p.p. porosity, no shows

Sh, black carb

LS, dense, few foss, poor porosity, sl. chalky, no shows

LS, tan, foss . sl. chalky, fair scatt. porosity, tr. blk stain, nsfo, ??? odor

LS, brn, dense sl. chalky , poor porosity, few foss, tr. brn stain, nsfo, no odor

LS, gry/ white, crm, foss, chalky, few cherty, nsfo, tr. LS, tan, ool, foss, chalky,

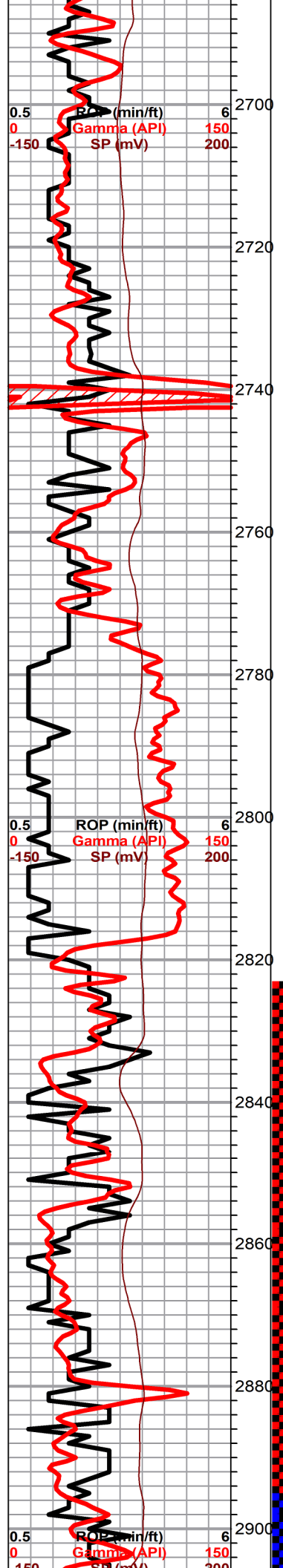
Sh, black carb

LS, tan, foss, scattered porosity, chalky, tr. brn stain

LS, tan, brn, ool, poorly deve. chalky, tr. spty brn sfo (flky) no odor

30 Neutron Porosity (pu)
30 Density Porosity (pu)

30 Neutron Porosity (pu)
30 Density Porosity (pu)



LS, tan, brn. ool. poorly dev. porosity, chalky tr. spty dk brn sfo <flakey> dead in app. (no odor)

LS, tan, buff, fxl, foss, fair scattered vuggy porosity, nsfo, tr. tan cherts

LS, tan, cream, foss, poorly developed p.p. / vuggy porosity, v. chalky, lt. brn stain, flky in appearance, no odor

Heebner 2740.0 (-1097.0)
Sh, black carb

Sh. arv. siltv soft
Toronto 2755.0 (-1076.0)

LS, tan, gran./dol., scatt p.p. porosity, lt. brn stain, tr. spty sfo, ??? odor

Douglas 2775.0 (-1096.0)

Sh, gry sily mica, no shows

Sd. gry, f. grain, mica, poorly developed porosity, tr. blk stain, nsfo, no odor

Sh, gry, silty tr. sd, a/a, no shows no odor

Lansing 2818.0 (-1139.0)

LS, cream, white, fxl, fair scattered porosity, lt. brn stn, spty sfo, faint-fair odor

LS, tr. white/tan, foss, fair oom vuggy type porosity, sl. chalky, brn stain, sfo/ sat., odor

LS, white, ool, fair scatt. oom vuggy porosity. chalky, dk brn stain, spty sfo, odor

LS, gry, dense, cherty, poor vis. porosity, no shows

LS, tan, gry, foss, poor-fair scattered vuggy porosity, tr. brn stain, spty sfo, faint odor

30 Neutron Porosity (pu)
30 Density Porosity (pu)

DST#2 2822-
2895
45
30-30-

1st Open:
BOB 6 mins.

1st Shut in:
30.73" in 11 mins. t
3 died

2nd Open:
BOB 4 mins.

2nd Shut in :
Slow build 2.16"

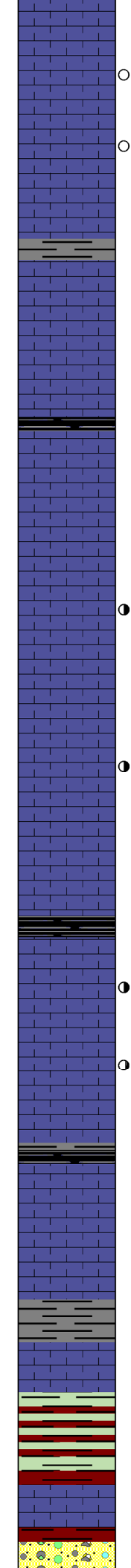
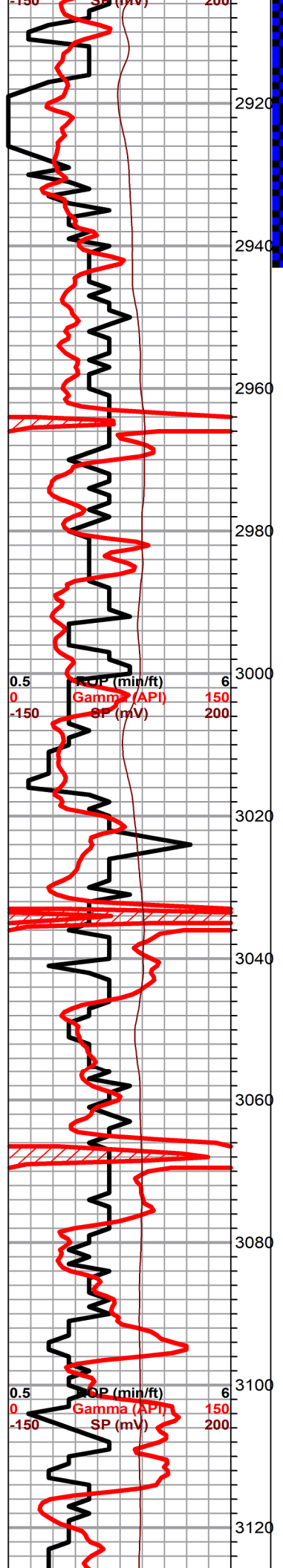
Recovery
850' GIP

160' GWOCM
(15%G, 25%O, 10
W, 50%M)

Pressures:
ISIP 332 psi
FSIP 369 psi
IFP 31-55 psi
FFP 62-80 psi
HSH 1508-1427 p

DST#3 2890-
2940
30-30-45

1st Open:
Slow build to 3.41"



LS, brn tan, fair vuggy/ p.p. porosity, lt. brn stain, lt. brn spty sfo, faint odor

LS, tan, white, oom , good vuggy porosity , golden brn stain/sat. , good dk brn, sfo, <Increase sfo & odor in 40 min. sample >

Slug sh. soft silty

LS, tan,gry, fxl, few foss, dense, poor vis. por. no shows

Blk carb Sh.

LS, brn, tan, fxl, dns, poor vis porosity, nsfo, ??? odor

LS, tan, foss, poor p.p. porosity, tr. blk stain, nsfo, no odor

LS, white, foss, oom, poor - fair vuggy oom type porosity, sl. chalky, tr. spty brn stain, wk sfo, vis. gas bubbles, fair odor

Sh, black carb

LS, white, cream, foss, fxl, sl. cherty heavily fractured dk brn spty sfo, fair odor

LS, cream, tan, white, oom good vuggy porosity, tr. brn stain, nsfo, odor ???

Slug black carb Sh.

LS, brn dense, poor vis. porosity, no shows, no odor

BKC 3092.0 (-1413.0)
v.c. shale, gry, maroon , greenish, silty soft, + Tr. LS, gry, fxl, dense, poor vis. porosity no shows

Conglomerate 3103.0 (-1424.0)

Tr. gry , maroon, greenish- gry, silty shale

LS, tan, maroon tinted, foss poor vis. porosity, nsfo, no odor, tr. sd. gry, f. g. well sorted, nsfo, tr. blk stain

2nd Open:
slow build to 12.6'

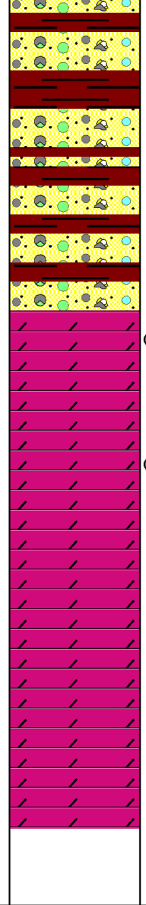
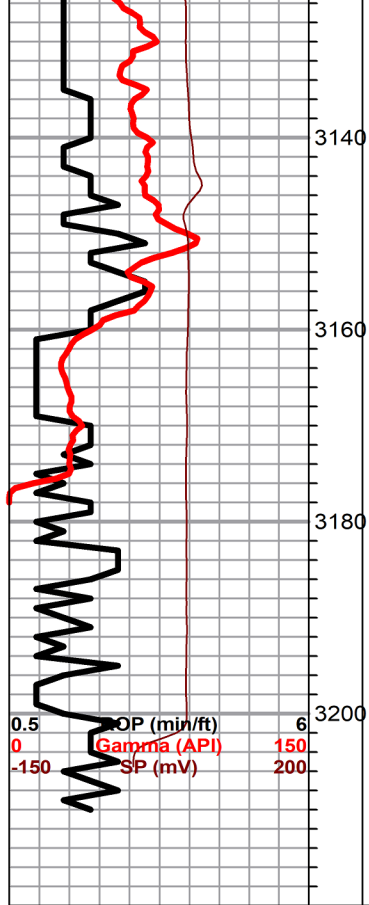
Recovery:
50' OSM

Pressures:
ISIP 274 psi
FSIP 405 psi
IFP 18-29 psi
FFP 27-39 psi
HSH 1540-1470 p

30 Neutron Porosity (pu)
30 Density Porosity (pu)

Due to heavy rain - mud problems decision was made to drill to TD & log. No further testing

30 Neutron Porosity (pu)
30 Density Porosity (pu)



Sh, maroon, greenish, gry, tr. v. c. cherts, few ool

Sh, maroon, greenish, sdy, tr. white, boney/ opaque cherts, few orange ool.

Arbuckle 3158.0 (-1479.0)

Dol. med xln, fair inxln porosity, lt. golde brn stain, wk spty golden brn sfo ---> dark brown sfo, fair odor

Dol, white, cream, suc. fair inxln porosity, tr. blk stain on few , nsfo, tr. pyrite, sulfuric odor.

Dol. white/ cream, f- med xln , chalky in pt poor porosity,nsfo

Dol. white, cream, fxl, dense, poor vis. porosity, no shows

RTD 3210.0 (-1531.0)

30 Neutron Porosity (pu)
30 Density Porosity (pu)