MIKE ENGELBRECHT

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GEOLOGIST'S REPORT
DRILLING TIME AND SAMPLE LOG

OPERATOR RITCHIE EXPLORATION INC.
LEASE PHILLIPS TRUST 18C #1
FIELD WILDCAT
LOCATION N/2 NW SW = 2215' FSL & 780' FWL
SEC. 18 TWP. 13 RGE. 31W
COUNTY GOVE STATE KS.

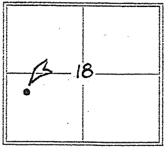
ELEVATION
KB 2966
DF
GL 2956
Measurements Are All From KB 2966

CONTRACTOR MURFIN DRLG RIG #14
COMM: 2-9-12 COMP: 2-19-12
RTD 4725' LOG TD 4726'
SAMPLES SAVED FROM 3600 TO RTD
DRILLING TIME KEPT FROM 3600' TO RTD
SAMPLES EXAMINED FROM 3600' TO RTD
GEOLOGICAL SUPERVISION FROM 3652 TO RTD
MUD UP DISPLACED 3394 TYPE MUD CHEMICAL
API # 15-063-21,969-00-00

CASING RECORD
SURFACE 8 5/8" @ 224'
w/175 SXS.
PRODUCTION 5 1/2" @ 4723'
w/225 SXS.

WELL LOG SURVEYS
COMP. DENSITY POROSITY
DUAL INDUCTION

FORMATION	LOG TOP	LOG DATUM	SAMPLE TOP	SAMPLE DATUM	STRUCT. COMP.
ANHYDRITE	2463	+503			+7
BASE	2482	+484			+10
HEEBNER SH	3960	-994	3962	-996	+8
LANSING	4001	-1035	4002	-1036	+10
MUNCIE SH	4149	-1183	4150	-1184	+13
STARK SH	4235	-1269	4236	-1270	+11
ALTAMONT	4344	-1378	4344	-1378	+14
PAWNEE	4436	-1470	4435	-1469	+12
MYRICK	4470	-1504	4470	-1504	+16
CHEROKEE SH	4512	-1546	4514	-1548	+20
JOHNSON	4557	-1591	4558	-1592	+14
MORROW SD	4597	-1631	4594	-1628	+9
MISSISSIPPIAN	4610	-1644	4612	-1646	+16



REFERENCE WELL FOR STRUCTURAL COMPARISON RITCHIE EXPLORATION #2 CAMPBELL 19
360' FNL & 1490' FWL 19-13-31W

ACTIVITY @ 7:00 A.M.		BIT & SURVEY RECORD				
DATE	DEPTH	NO	SIZE	MAKE	TYPE	DEPTH OUT
2-9-12	MIRT-RU					
2-10	DRLG. @ 300'					
2-11	DRLG. @ 3299'					
2-12	DRLG. @ 3817					
2-13	DST#1 @ 4048					
2-14	DST#2 @ 4082					
2-15	COND HOLE @ 4214					
2-16	DRLG @ 4346					
2-17	DST#5 @ 4572'					
2-18	RTD 4725					
2-19	LOGGING					
*	SEE NOTES @ BOTTOM.					

FORMATION	INTERVAL	DESCRIPTION OF SAMPLES

FEET	HOURS

LOG ANALYSIS

DRILL STEM TESTS

No.	Interval	IFP/Time	ISIP/Time	FFP/Time	FSIP/Time	[illegible]	Recovery

REMARKS AND RECOMMENDATIONS IT WAS RECOMMENDED TO RUN 5½" PRODUCTION CASING TO PRODUCE THE JOHNSON ZONE AS A RESULT OF POSITIVE DRILL STEM TEST RECOVERY AND E-LOG EVALUATION.

MIKE ENGELBRECHT
GEOLOGIST LIC. # 334

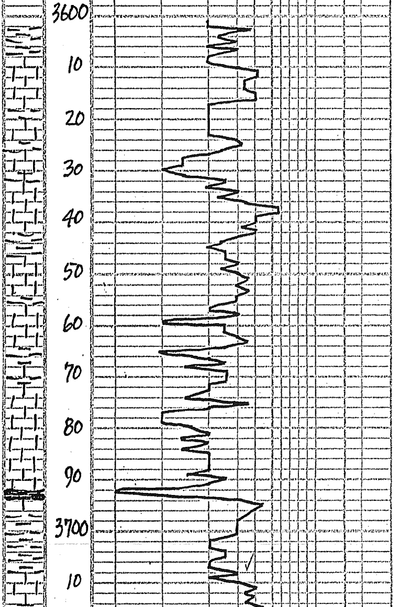
MUD BY MUD. CO.
DSTS BY SUPERIOR
E-LOG BY SUPERIOR

LEGEND

▥ Anhydrite
▦ Salt
▤ Sandstone
▤ Shale
▒ Carb sh
▦ Limestone
▦ Ool.Lime
▦ Chert
▨ Dolomite

LITHOLOGY	DEPTH	DRILLING TIME (Logarithmic Scale) .5 1 5 10 15 20 30	SAMPLE DESCRIPTIONS	REMARKS

ENGL-11



10 LT GRY SILTY SHS & LT CRM SLI-FO LS POOR Ø - NS NO ODOR

DISPLACED @ 3394'
BIT TRIP @ 3521'

20 LT CRM FN-XLN LS POOR Ø - NS

PIPE STRAP 1.36' SHORT

30 LT GRY MEALY LS POOR Ø - NS

40 LOTS GRY SHS!

50 CRM - LT GRY SLI-FOSS LS - NS

1000 # PP

60 LT CRM - LT TAN DOLS POOR Ø SOME NODS - Δty

GEOL. ON LOC.
10:30 PM SAT. 2-11-12

70 LOTS LT GRY - GRN GUMBO SHS

VISC: 65
WT: 8.6
LCM: 2#

80 WH - LT CRM SLI-FOSS LS PTLY CKY POOR Ø - NS NO ODOR

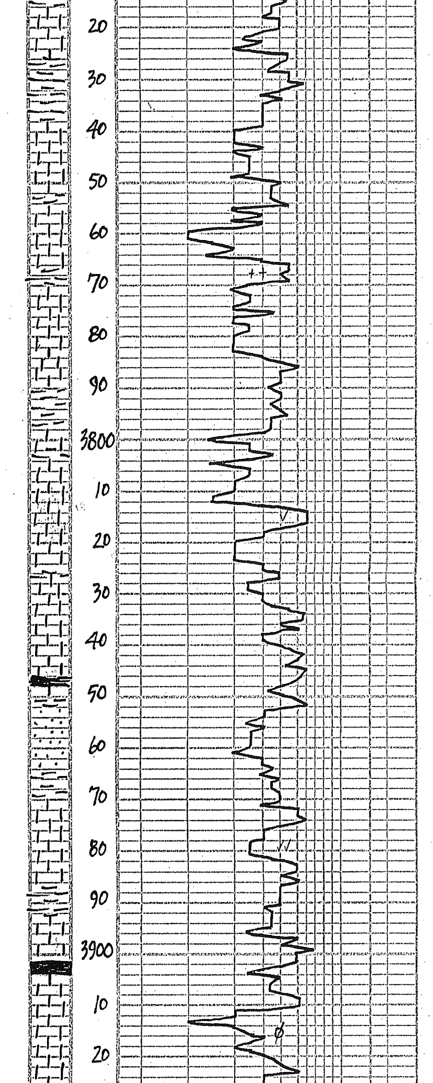
90 FLOOD RUST-BRN SHS

00 LOTS WH - CKY LS POOR Ø - NS

VISC: 60
WT: 8.6
LCM: 2#

10 LT CRM FN-XLN LS POOR Ø - NS NO ODOR

20 LT GRY - LT TAN SLI-FOSS LS POOR Ø - NS NO ODOR



30 LT CRM-LT TAN SLI-FOSS LS
POOR Ø-NS

40 LT TAN-BUFF SEMI-FOSS LS
FAIR Ø-NS NO ODOR

50 FLOOD RUST-BRN GUMBO SHS

60 WH-LT CRM SEMI-FOSS LS FAIR Ø
NS, NO ODOR

PP#1000

70 LT CRM SLI-FOSS LS POOR Ø-NS

VISC: 58
WT: 9.0
LCM: 2#

80 WH-LT CRM FN-XLN LS POOR Ø
NS

90 LT CRM-LT TAN SLI-FOSS LS
POOR Ø-NS NO ODOR

00 LT CRM-LT TAN SLI-FOSS LS
NS

MUD-CO CIL
VISC: 57 FILT: 6.4
WT: 9.0 CHL: 2,000

10 LS AA-NS & DK GRY SHS

20 LT CRM WH-CLKY LS POOR Ø NS

30 WH-LT CRM-LT TAN SLI-FOSS
LS POOR Ø-NS NO ODOR

40 CRM-LT TAN SLI-FOSS LS
POOR Ø-NS LOTS SHS

50 LOTS LT CRM-LT TAN SLI-FOSS
LS POOR Ø-NS

60 LT CRM FN-XLN LS-NS &
LT-DK GRY SHS

70 LT GRN-GRY SILTY SHS

80 V. LT TAN FN-XLN LS POOR Ø
NS NO ODOR

VISC: 52
WT: 9.3

90 FLOOD LT CRM V. FOSS-OOL LS
FAIR Ø-NS PTLY CKY

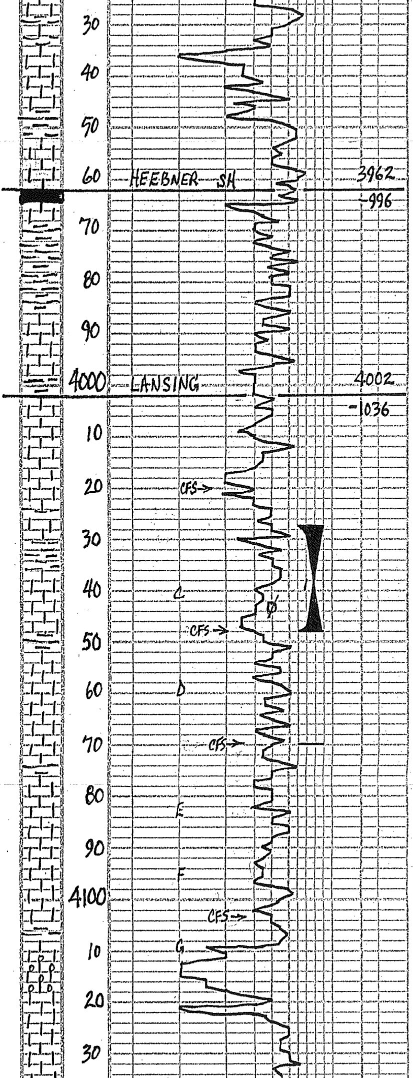
00 WH-LT CRM V. LT TAN FOSS LS
FAIR Ø-NS NO ODOR

10 CRM-LT TAN FOSS LS P-F Ø
NS NO ODOR

20
NO SPL SHIFT CHANGE

30 WH-LT CRM FOSS LS W/ FAIR Ø
NS NO ODOR

VISC: 48
WT: 9.1
LCM: 3#



40 LT CRM-LT TAN SLI-FOSS LS P-F Ø-NS, NO ODOR, SLI CKY

50 FLOOD PURE WH CKY LS-SOFT NS, NO ODOR.

60 PRED WH-LT CRM SEMI-FOSS CKY LS P-F Ø-NS CKY

70 BLK CARB SH

80 LT CRM LT TAN FN-XLN DNSE LS POOR Ø-NS NO ODOR

90 LT GRY SHS SOME SILTY

00 LT CRM LS MOSTLY FN-XLN POOR Ø-NS NO ODOR

10 GRY & RUST SHS CRM-LT TAN FN-XLN LS POOR Ø-NS

20) PRED RUST SHS, FEW LT TAN SLI-FOSS LS POOR Ø-NS

30MIN: WH-LT CRM SUB OOL LS P-F INTER OOL Ø-NS NO ODOR

30 LOTS LT CRM SLI-FOSS LS P-F Ø NS NO ODOR LOTS RUST SHS

40 WH-LT CRM FN-XLN LS SLI-CKY POOR Ø-NS LOTS RUST SHS

48) FEW PCS 5 PER TRY CRM FOSS-OOL LS W/P-F FOSS INTER-OOL Ø W/SSGFO, LT ODOR, CLEAN Ø
30MIN: FAIR AMT LT CRM FOSS LS W/S-FS BRNFO, LT ODOR
60MIN: FEW PCS AA W/S-FSFO LT ODOR, SLI INC IN CKY OOL

60 TRACE FOSS LS AA PRED RUST-GRY SHS

70) FLOOD WH-CRM OOL CKY LS P-F FOSS Ø-NS, NO ODOR
30MIN: PRED WH-CRM SLI-FOSS LS P-F Ø-NS NO ODOR CKY
60MIN: WH-CKY SEMI-FOSS LS NS, NO ODOR

80 PRED WH-CRM SUB OOC CKY LS POOR Ø-NS NO ODOR

90 LOTS LT CRM-V. LT TAN SEMI-FOSS LS PTLY CKY P-F Ø NS NO ODOR

00) LOTS LT CRM SEMI-FOSS CKY LS P-F Ø-NS NO ODOR, INC CKY
30MIN: WH-LT CRM SEMI-FOSS LS P-F FOSS Ø-NS, NO ODOR CKY
60MIN: PRED WH-LT CRM LS LOTS CKY NS NO ODOR

10 FLOOD WH-LT CRM LS FN-XLN CKY POOR Ø-NS NO ODOR

20 WH-CRM FN-XLN CKY LS-NS NO ODOR & LT GRY GUMBO SH-STICKY

30 FLOOD LT CRM SUB OOC CKY LS P-F OOC Ø-NS NO ODOR LOTS CKY

40 WH-LT CRM SUB OOC CKY LS NS NO ODOR

1000# PP

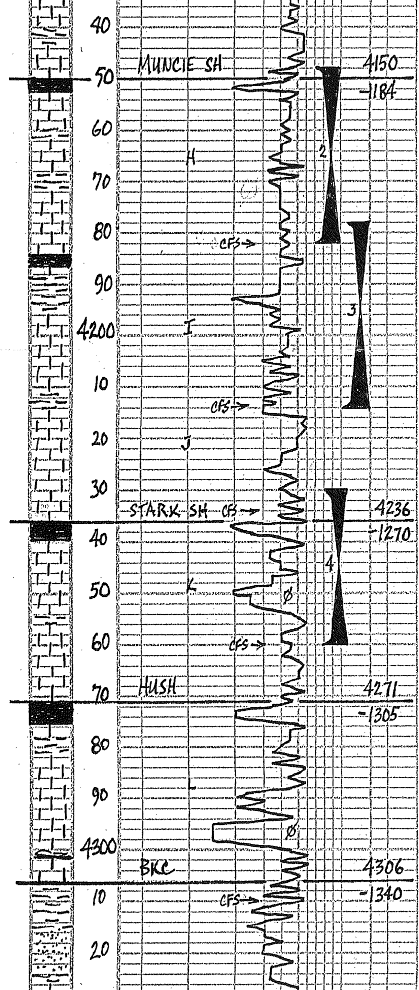
< CONN. @ 3933' STUCK FOR 20 MINS. PULLED LOOSE @ 180K-REAMED

ADDING PRE-MIX

< VISC: 63
WT: 9.0
LCM: 8#

DST #1 4027-4048
30-45-45-60
IF: WK BLOW BUILT TO 2½"
FF: WK BLOW BUILT TO 2½"
REC: 10' MO = 80% O, 20% M
95' O&GCM = 10% O, 10% G, 80% M
105 TOTAL FLUID
SIP: 1201-1182
IFP: 53-61 FFP: 63-86
TEMP:

10' FILL ON BOTTOM AFTER DST #1



50 LOTS GRY-BLUE SHS & CRM FN-XLN LS POOR Ø - NS

60 FEW BLK SHS & CRM - LT TAN FN-XLN LS POOR Ø - NS NO ODOR

70 LT GRY - LT TAN - BUFF SLI-FOSS LS MEALY - Δty FEW W/ SCAT STN NO FO NO ODOR

80 LT TAN - ROOT BEER SLI-FOSS LS FEW W/ POOR Ø SCAT STN, NO ODOR MEALY - DNSE
30 MIN: TAN - BUFF SLI-FOSS LS FEW W/ SCAT STN - MEALY TINY PPT Ø NO ODOR
60 MIN: LT CRM SEMI-FOSS LS W/ P-F Ø FEW SCAT STN, NO ODOR
90 MOSTLY GRY - BLK - RUST SHS

00 LT TAN - BUFF FN-XLN LS POOR Ø NS PRED GRY - RUST - BLK SHS!

10 LT CRM, SEMI-OOL LS W/ P-F INTER-OOL Ø W/ SSBRNFO W/ GAS BUB
14) FEW PCS CRM SEMI-FOSS LS W/ P-F FOSS Ø W/ SSLGFO LT ODOR
30 MIN: FEW PCS AA W/ SS FO DECREA INCREASE CRM CKY LS - NS
60 MIN: DECREASE IN LS AA INC CKY
20 WH - CRM - LT TAN FN-XLN LS DNSE - CKY POOR Ø - NS NO ODOR, LOTS SHS
30 LT CRM - LT TAN FN-XLN LS DNSE - CKY POOR Ø - NS NO ODOR,

34) FLOOD LT TAN SLI-FOSS LS FN-MD XLN P-F Ø - NS NO ODOR
30 MIN: FLOOD LT CRM - V. LT GRY LS FEW SEMI-OOC POOR Ø - NS NO ODOR
60 MIN: CRM - LT TAN SLI-FOSS LS POOR Ø - NS TRACE BLK SH
40 LT CRM - LT TAN SLI-FOSS LS DNSE - CKY POOR Ø - NS NO ODOR
50 FLOOD BLK SHS CRM - BUFF FN-XLN MEALY - DNSE LS POOR Ø LT ODOR

60) CRM FOSS-OOL LS W/ FAIR FOSS Ø W/ S-FLGFO, STR ODOR, SLI CKY
30 MIN: DECREASE IN LS AA W/ SFO INCR IN CKY STILL GD ODOR
60 MIN: LT CRM SLI-FOSS LS POOR Ø - NS STILL FAIR ODOR
70 V. LT GRY SLI-FOSS LS POOR Ø NS NO ODOR

80 LT TAN - V. LT GRY DNSE LS POOR Ø NS NO ODOR SOME Δty FEW BLK SHS

90 LT CRM - LT TAN FN-XLN LS LOTS Δty NODS - NS BLK SH

00 V. LT GRY - TAN - BUFF FN-XLN LS DNSE - MEALY POOR Ø - NS NO ODOR

10) FLOOD V. LT TAN BUFF FN-XLN
10 SUGAR DOLO LS P-F INTER-XLN Ø - NS NO ODOR
30 MIN: V. LT TAN, CRM MEALY LS PTLY CKY POOR Ø - NS
60 MIN: GRY-TAN MEALY LS POOR Ø - NS NO ODOR LOTS GRY SHS
20 LOTS RUST LT GRY - GRN GUMBO SH

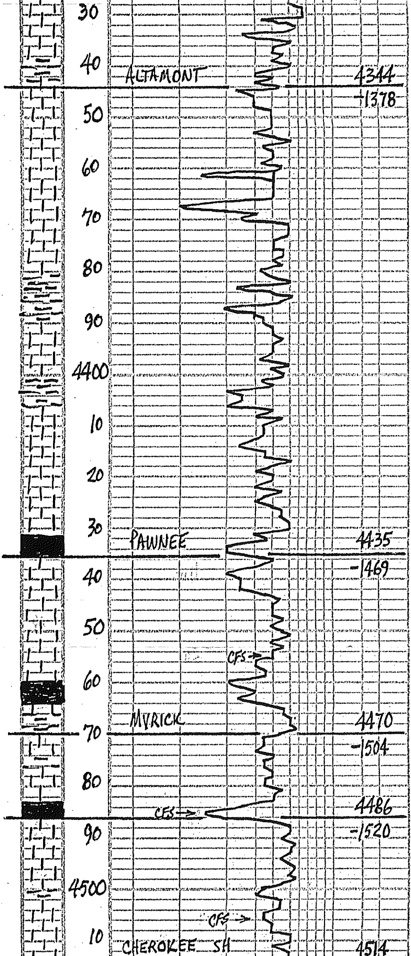
30 LT PEACH - FLESH GUMBO SH STICKY

DST #2 4148-4182
30-30-30-30 (H)
IF: V. WK. BLOW BUILT TO 1/2"
FF: NO BLOW - FLUSH - SURGE
REC: 2' MUD
SIP: 202-97
IFP: 43-45 FFP: 45-47

DST #3 4178-4214
30-30-30-30 (I)
IF: V. WK. BLOW BUILT TO 1/2"
FF: NO BLOW - FLUSH - SURGE
REC: 2' MUD
SIP: 106-75
IFP: 53-54 FFP: 47-52

DST #4 4230-4260
30-45-45-60 (K)
IF: WK BLOW BUILT TO 2 1/2"
FF: WK BLOW BUILT TO 1"
REC: 5' MO = 20% O, 80% M
95' OCM = 10% O, 90% M
100 TOTAL FLUID
SIP: 1204-1191
IFP: 38-60 FFP: 65-87

← VISC: 62
WT: 9.2
LCM: 4#



40 V. LT GRY V. FN-GR SST - NS

50 LT CRM = V. LT TAN FN-XLN LS
POOR Ø - DNSE - CKY - NS NO ODOR

60 FLOOD LT CRM SEMI-FOSS LS
POOR FOSS Ø - NS NO ODOR

70 LT CRM - LT TAN FN-MD-XLN
CKY LS POOR Ø - NS NO ODOR

80 PRED SHS CRM-LT TAN FN-XLN LS
POOR Ø - NS, LT ODOR?

90 CRM = LT GRY FN-XLN LS POOR Ø
NS NO ODOR, LOTS GRY SHS

00 LT CRM = LT TAN FN-XLN LS POOR Ø
NS NO ODOR

10 LOTS GRY SHS & LS AA - NS

20 FLOOD LT GRY SILTY SHS &
LT GRY MEALY CKY LS - NS

30 FLOOD LT BRN - TAN = FLESH LS
FN-MD XLN POOR Ø - NS NO ODOR
MOSTLY DNSE

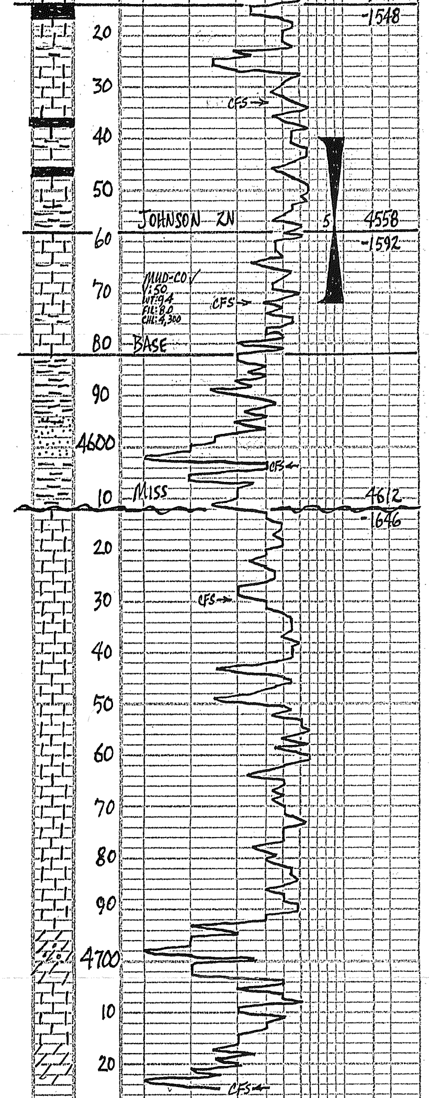
40 LT TAN SLI-FOSS DNSE LS - NS &
LOTS WH CK, NO ODOR

50 LT TAN FN-XLN DNSE LS - NS &
WH CKY LS POOR Ø - NS NO ODOR

55) LT CRM - LT TAN FN-XLN LS POOR Ø
DNSE - NS NO ODOR
30 MIN: LT TAN - V. LT GRY △ty
LS POOR Ø - NS NO ODOR
60 CRM - LT TAN FN-XLN LS - NS

70 FLOOD BLK SHS!

80 GRY-TAN NOD - MEALY LS POOR Ø
NS NO ODOR, BLK, GRY, GRN SHS
85) CRM - LT TAN SLI. FOSS NOD LS
POOR Ø - NS NO ODOR
30 MIN: LT TAN - BUFF NOD LS
POOR Ø, NO ODOR LOTS BLK SHS
60 MIN: FLOOD BLK SHS, LS - NS
90 WH - LT CRM FN-XLN LS SLI-FOSS
LS POOR Ø - NS LOTS SHS
PRED BLK SHS!
00 LT CRM SLI-FOSS LS POOR PPT Ø
2 PCS W/ LT STN & 1 TRACE FO
06) CRM - LT TAN SLI FOSS LS POOR Ø
NS NO ODOR
30 MIN: CRM - LT TAN LS POOR Ø
NS NO ODOR
60 MIN: WH - LT CRM CKY LS
POOR Ø - NS NO ODOR
10
20 LT TAN, LT GRY FN-XLN LS DNSE
POOR Ø - NS NO ODOR



30) LOTS BLK SHS & TAN OOL DNSE LS
POOR Ø - NS NO ODOR
30 MIN: CRM - LT TAN FN-XLN LS
DNSE - SLI CKY NS NO ODOR
60 MIN: LT CRM - LT TAN FN-XLN
LS POOR Ø - NS NO ODOR &
LOTS SHS

40 CRM - TAN FN-XLN DNSE LS
POOR Ø - NS NO ODOR

50 FLOOD BLK SH! SPL WASH GRY

60 WH-LT CRM-LT GRY FN-XLN LS
POOR Ø - NS NO ODOR LOTS SHS

70) TAN SEMI-FOSS △Y LS P-F VUG Ø
W/S-FS BRN FO, BIG DROPS BRN
OIL SLI GSY - LIGHT ODOR
30 MIN: TAN LS W/ FAIR VUG Ø
W/S-FS DK BR FO SLI GSY FAIR ODOR
60 MIN: LT CRM - LT TAN SLI-FOSS
LS W/ SCAT VUG Ø W/ SSLTG FO
FAIR ODOR, CLEAN Ø

90 LT CRM LT TAN FN-XLN LS MOSTLY
DNSE POOR Ø - NS NO ODOR SLI CKY

00) WH CK & YELL-GOLD SHS WH-LT CRM
FN-XLN CKY LS POOR Ø 2 PCS
W/SS FO LT ODOR ON BREAK

30 MIN: LOTS WH - V. LT GRY FN-GR
SST GD SORT, FAIR Ø SOFT - NS
ALSO SOME CKY
60 MIN: LOTS WH-LT GRY - V. LT GRN
FN-GR SST - SOFT SOME CKY
NS, NO STN, NO ODOR SEMI-FRI

10 WH V. LT GRY V. FN-GR SST - NS
LOTS SHS GOLD, GRY, GRN

20 FLOOD GRY SHS - GUMBO SH
& GRY MUDSTONE & PYRITE

30) WH-CRM - V. LT TAN FN-XLN LS
SDY - CKY POOR Ø - NS NO ODOR
LOTS PYRITE
30 MIN: LOTS WH-LT CRM FN-XLN LS
POOR Ø - NS NO ODOR LOTS CKY
60 MIN: WH - LT CRM FN-XLN LS
SDY - CKY POOR Ø - NS NO ODOR

40 WH - LT CRM CKY - SDY LS
P-F INTER-XLN Ø - NS NO ODOR
LOTS CKY

50 LT TAN-BUFF V. FN-XLN LS
DNSE V. POOR Ø - NS

60 LT CRM - LT TAN MICRO-OOL LS
P-F INTER OOL Ø - NS, NO ODOR

70 LT TAN LT CKY SDY - OOL LS
POOR - FAIR Ø - NS

80 LT CRM LT TAN FN-MD-XLN LS
POOR Ø - NS NO ODOR

90 FEW CRM - V. LT TAN FN-XLN LS
NS NO ODOR LOTS SHS!

00 FEW CRM SDY, LS POOR Ø - NS
LOTS SHS!!

10 LT CRM - FN-XLN CKY LS
P-F INTER-XLN Ø - NS NO ODOR
CKY

20 LT TAN FLESH FN-XLN SUCR DOLO
W/ FAIR VUG Ø - NS NO ODOR

25 TAN - FLESH FN-XLN SUCR DOLO
P-F Ø - NS NO ODOR

30 MIN: WH - LT CRM FN-XLN LS
LOTS CKY - NS NO ODOR

60 MIN: DK TAN FN-XLN SUCR
DOLO W/ FAIR VUG Ø - NS
NO ODOR

PULLED 5 STDS SHORT T.
COND HOLE 1 1/4 HRS.

DST #5 4540-4572'
30-45-45-60 (JZN)
IF: STR BLOW BOB IN 2 mins
FF: STR BLOW BOB IN 3 mins
REC: 715' GIP
1475' CGO = 5% G, 95% O
190' GO = 10% G, 90% O
1665 TOTAL FLUID 28° G.
SIP: 969-812
IFP: 123-409 FFP: 427-578

VISC: 58
WT: 9.2
LCM: 3#

ADDING PRE-MIX

VISC: 64
WT: 9.3
LCM: 3#

VISC: 64
WT: 9.3
LCM: 3#

30

RTD 4725'

LTD 4726'

(120 MIN: AFTER STUCK = LOTS SHS)
(SOME RED BEDS.)
GOT STUCK STARTING TO COME
OUT FOR SHORT TRIP, ±40' OFF BOT.
6:15 AM SAT. 2-18-12, SPOTTED
60 BARRELS OIL APROX. 10:00AM.
MOVED 1 BAR. EVERY HOUR &
WORKED PIPE ALL DAY.
PULLED FREE 7:30 PM - REAMED
THRU TIGHT SPOT & CIRC ON
BOTTOM FOR 1½ HRS.
PULLED 30 STAND WIPER TRIP
CONDITIONED HOLE 2 HRS.
T.O.O.H. FOR LOG, ON BANK
7:00AM - WENT FINE.