DUAL INDUCTION LOG

Company	H & D EXPLORATION LLC.
Well	HERRMAN #2
Field	WALNUT CREEK
County	BARTON
State	KANSAS

Company H & D EXPLORATION LLC.
Well HERRMAN #2
Field WALNUT CREEK
County BARTON State KANSAS

Location: API # : 15-009-26161-0000

381' FNL & 2028' FEL

SEC 8 TWP 19S RGE 13W

Other Services
CDL/CNL
MEL

Permanent Datum GROUND LEVEL Elevation 1856
Log Measured From KELLY BUSHING 8' A.G.L.
Drilling Measured From KELLY BUSHING

Elevation
K.B. 1864
D.F. 1862
G.L. 1856

Date	02/05/17		
Run Number	ONE		
Depth Driller	3800		
Depth Logger	3803		
Bottom Logged Interval	3801		
Top Log Interval	00		
Casing Driller	8 5/8"@790'		
Casing Logger	790'		
Bit Size	7 7/8"		
Type Fluid in Hole	CHEMICAL MUD	CHLORIDES 6000 PPM	
Density / Viscosity	9.3/53		
pH / Fluid Loss	9.8/5.6		
Source of Sample	FLOWLINE		
Rm @ Meas. Temp	.70 @ 80F		
Rmf @ Meas. Temp	.53 @ 80F		
Rmc @ Meas. Temp	.84 @ 80F		
Source of Rmf / Rmc	MEASUREMENT		
Rm @ BHT	.49 @ 114F		
Time Circulation Stopped	2 HOURS		
Time Logger on Bottom	6:25 P.M.		
Maximum Recorded Temperature	114F		
Equipment Number	922339		
Location	HAYS, KANSAS		
Recorded By	GUS PFANENSTIEL		
Witnessed By	JIM MUSGROVE		

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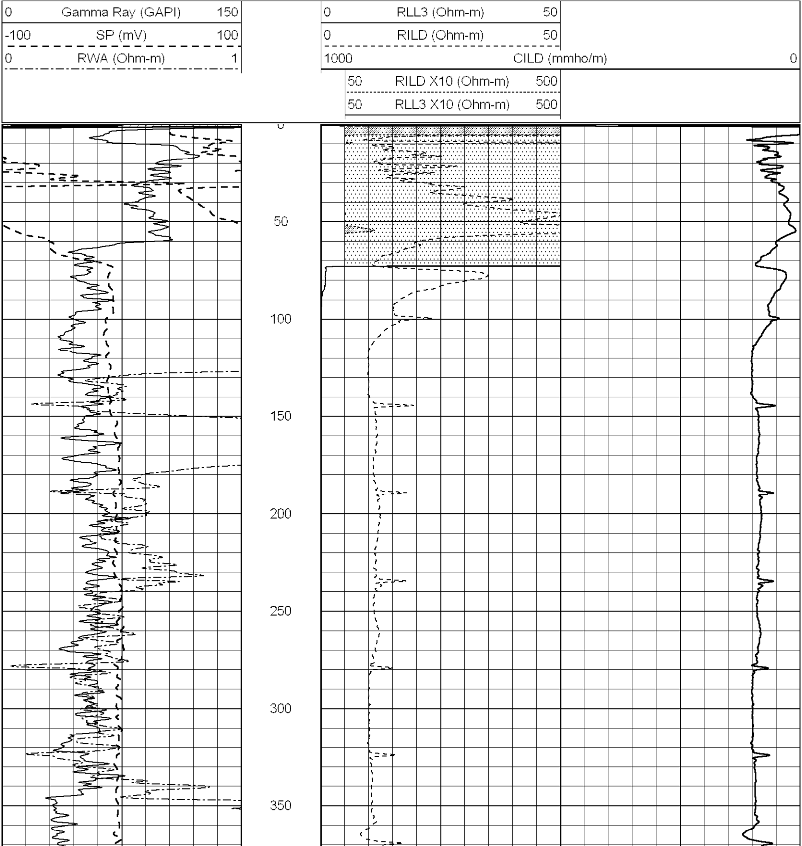
All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions set out in our current Price Schedule.

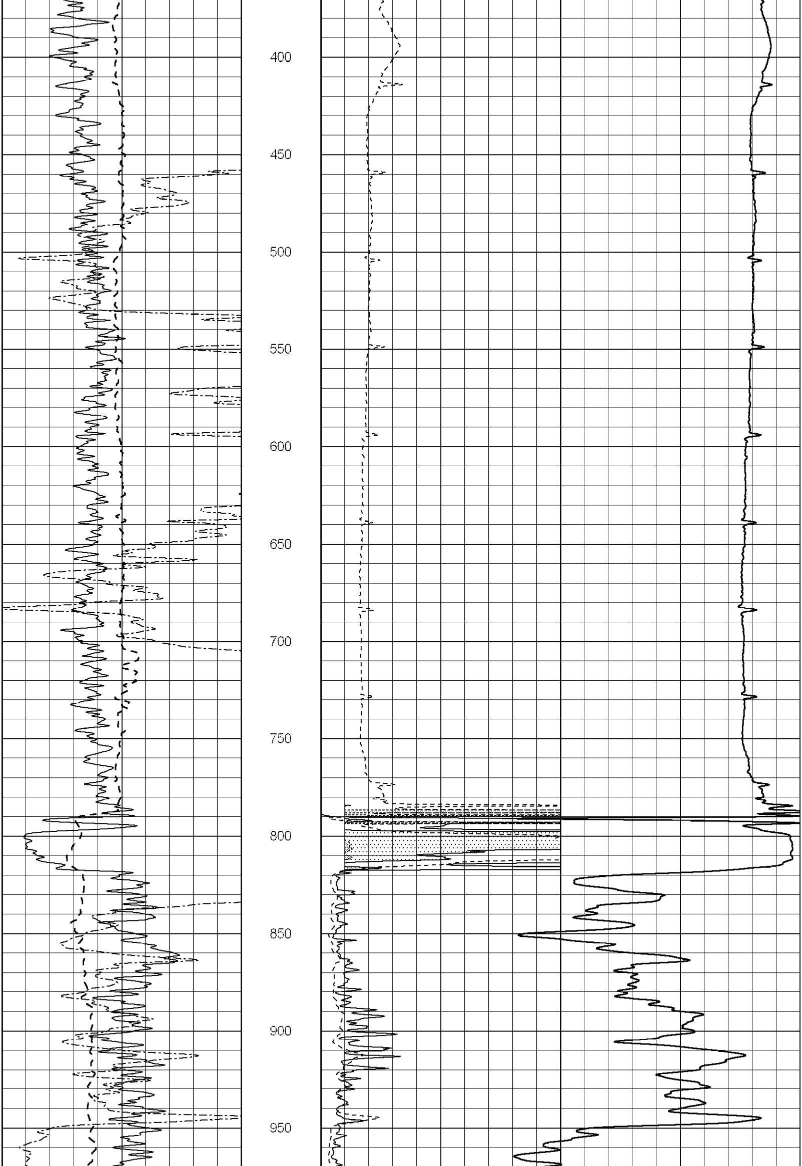
Comments

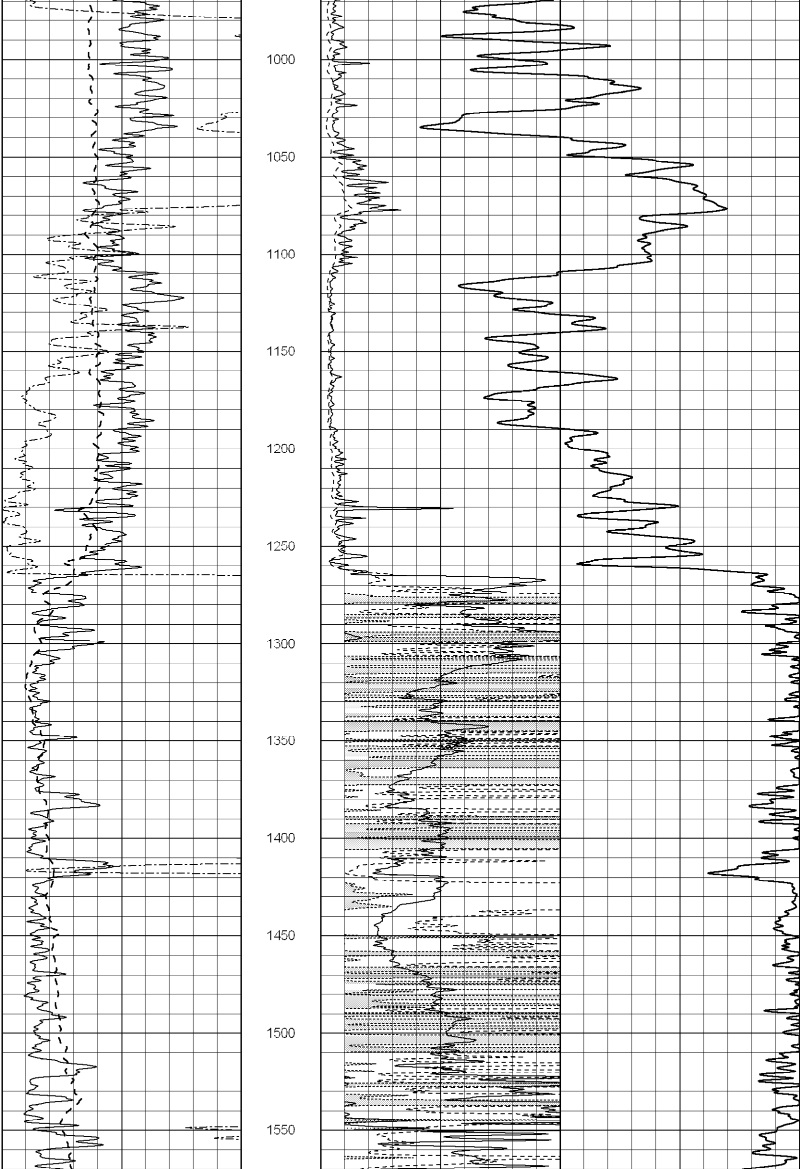
THANK YOU FOR USING ELI WIRELINE HAYS, KANSAS (785) 628-6395
DIRECTIONS
HOISINGTON SOUTH TO NW 5O RD TO
WASHINGTON ST. SOUTH 1.5 MILES
WEST INTO.

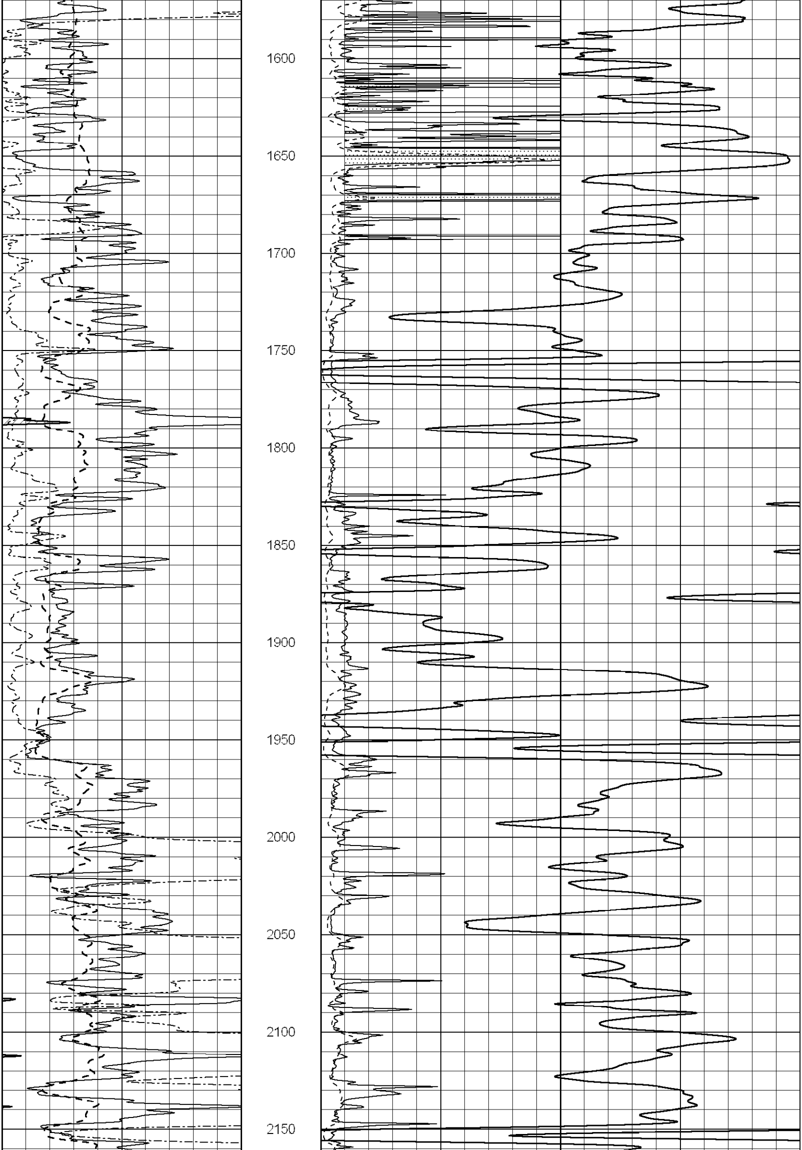
MAIN PASS

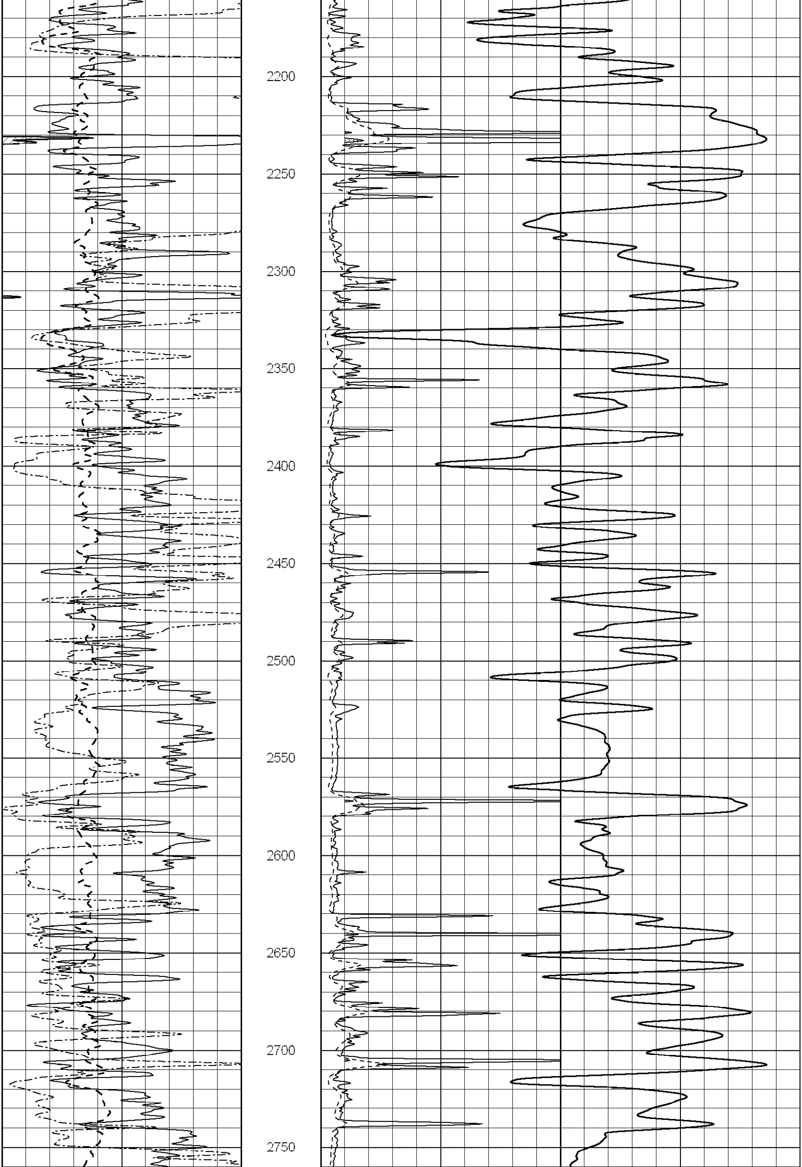
Database File:	1347hd.db
Dataset Pathname:	pass4MAIN
Presentation Format:	dil2
Dataset Creation:	Sun Feb 05 20:14:36 2017 by Calc SOC 120430
Charted by:	Depth in Feet scaled 1:600

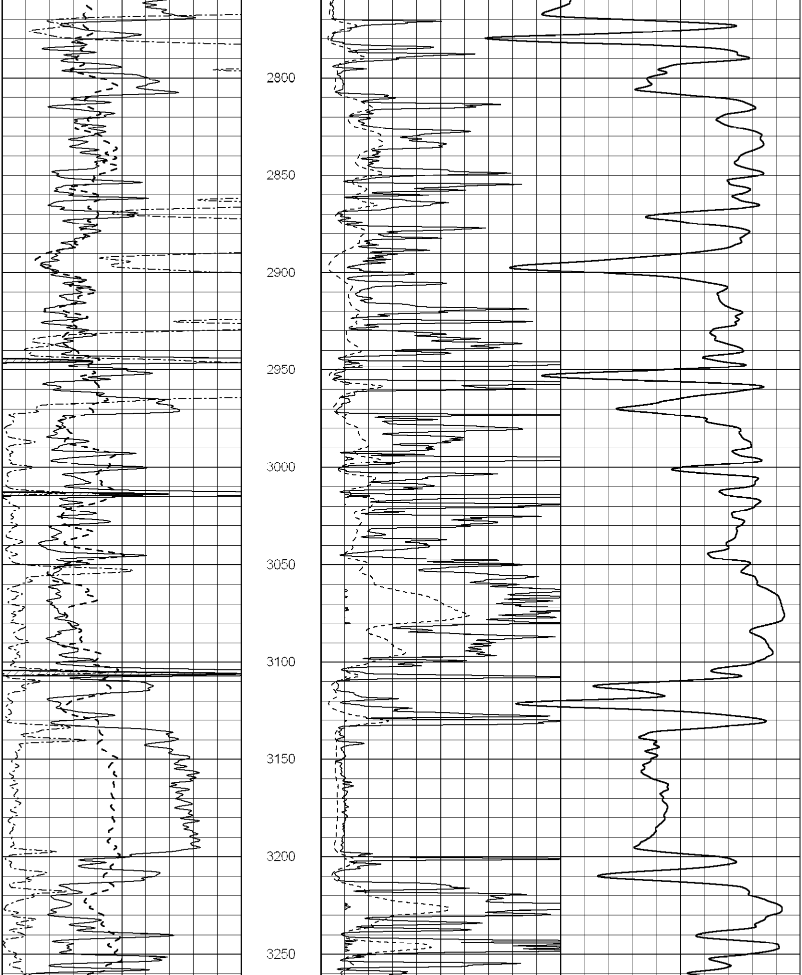


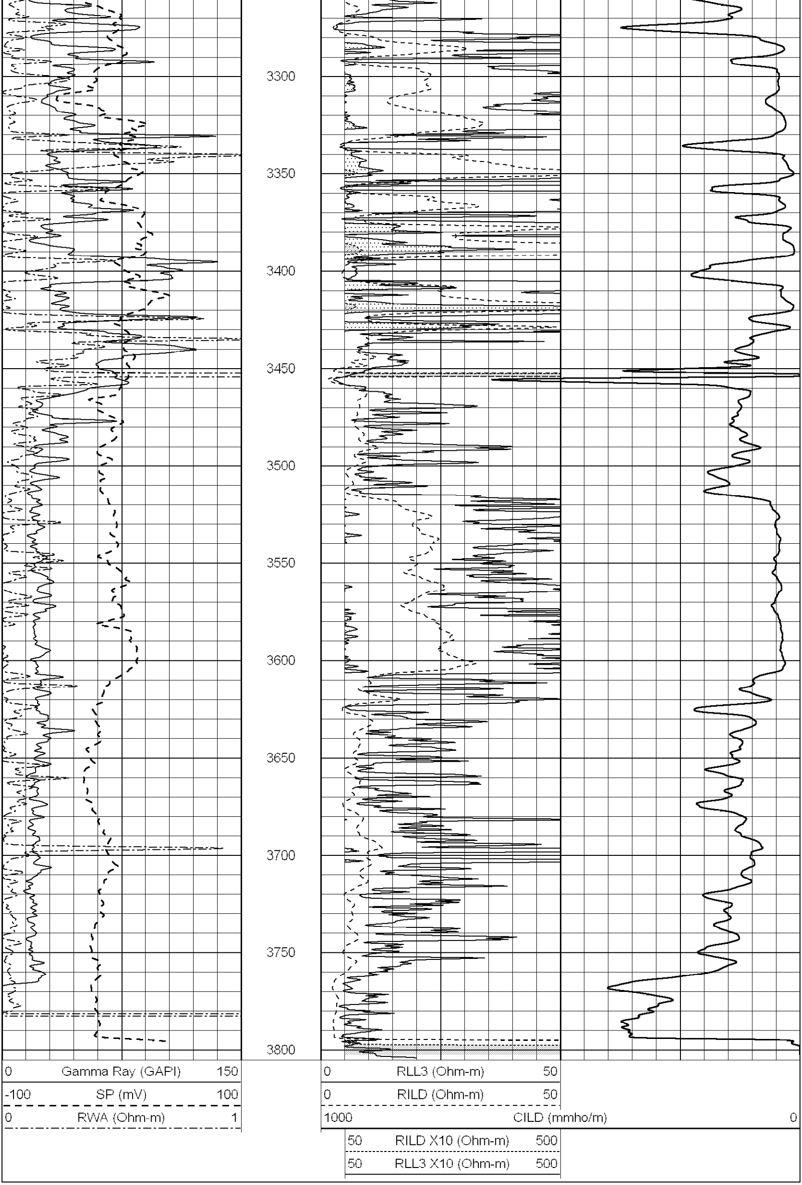








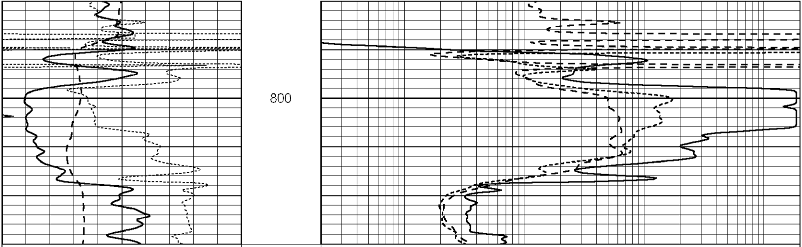




ANHYDRITE

Database File: 1347hd.db
Dataset Pathname: pass4ANH
Presentation Format: dil
Dataset Creation: Sun Feb 05 20:54:09 2017 by Calc SOC 120430
Charted by: Depth in Feet scaled 1:240

0	GAMMA RAY (GAPI)	150	0.2	SHALLOW GUARD (Ohm-m)	2000
-100	SP (mV)	100	0.2	DEEP INDUCTION (Ohm-m)	2000
-250	Rxo/Rt	50	0.2	MEDIUM INDUCTION (Ohm-m)	2000
0	MINMK	20			

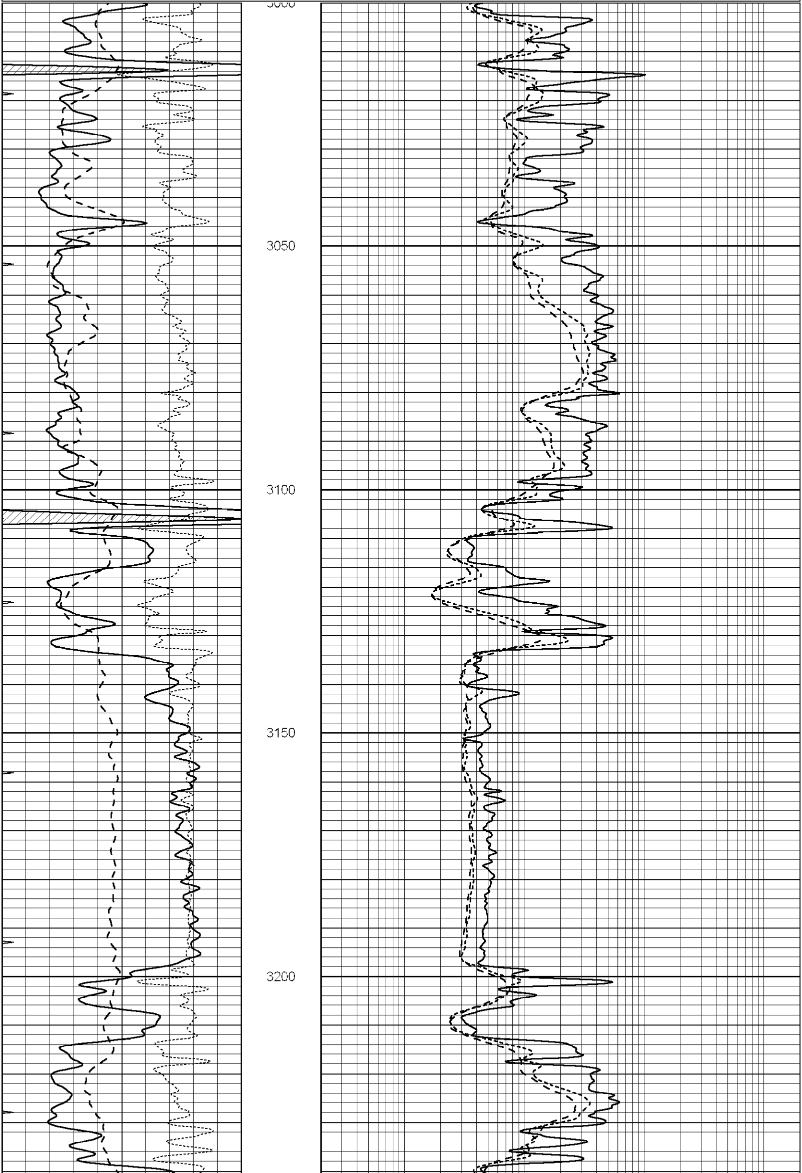


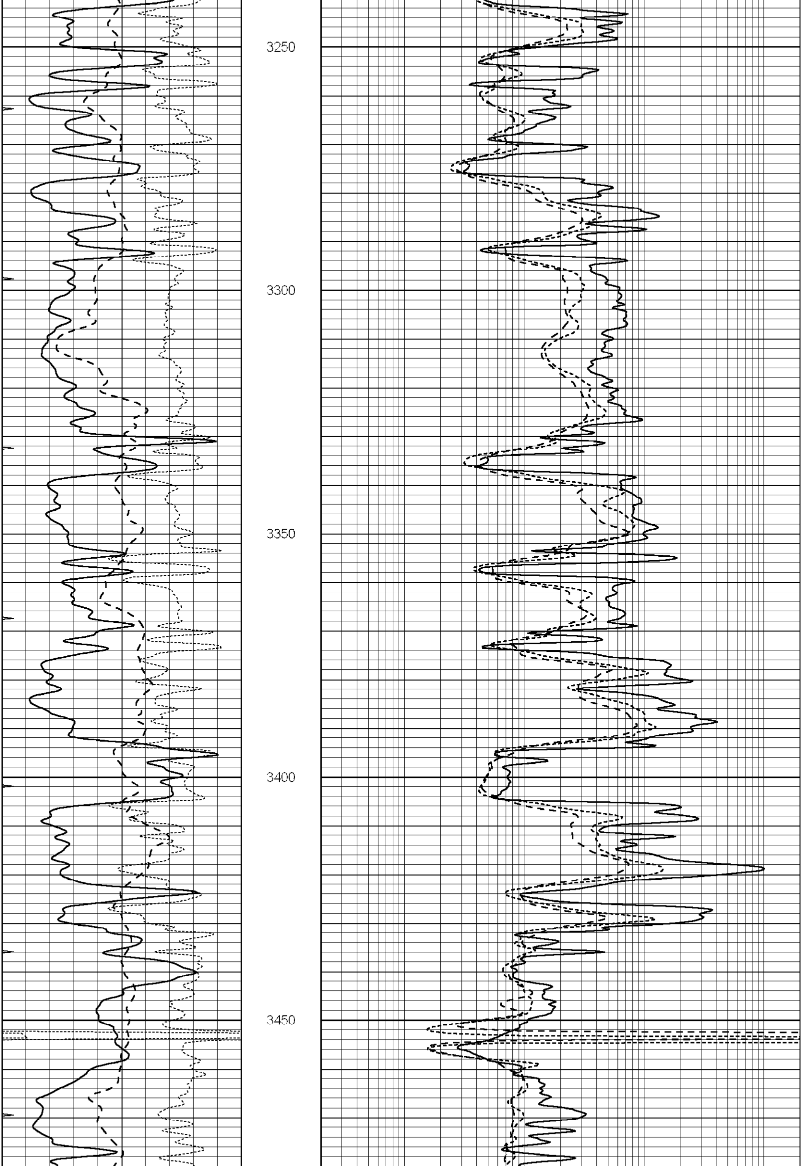
0	GAMMA RAY (GAPI)	150	0.2	SHALLOW GUARD (Ohm-m)	2000
-100	SP (mV)	100	0.2	DEEP INDUCTION (Ohm-m)	2000
-250	Rxo/Rt	50	0.2	MEDIUM INDUCTION (Ohm-m)	2000
0	MINMK	20			

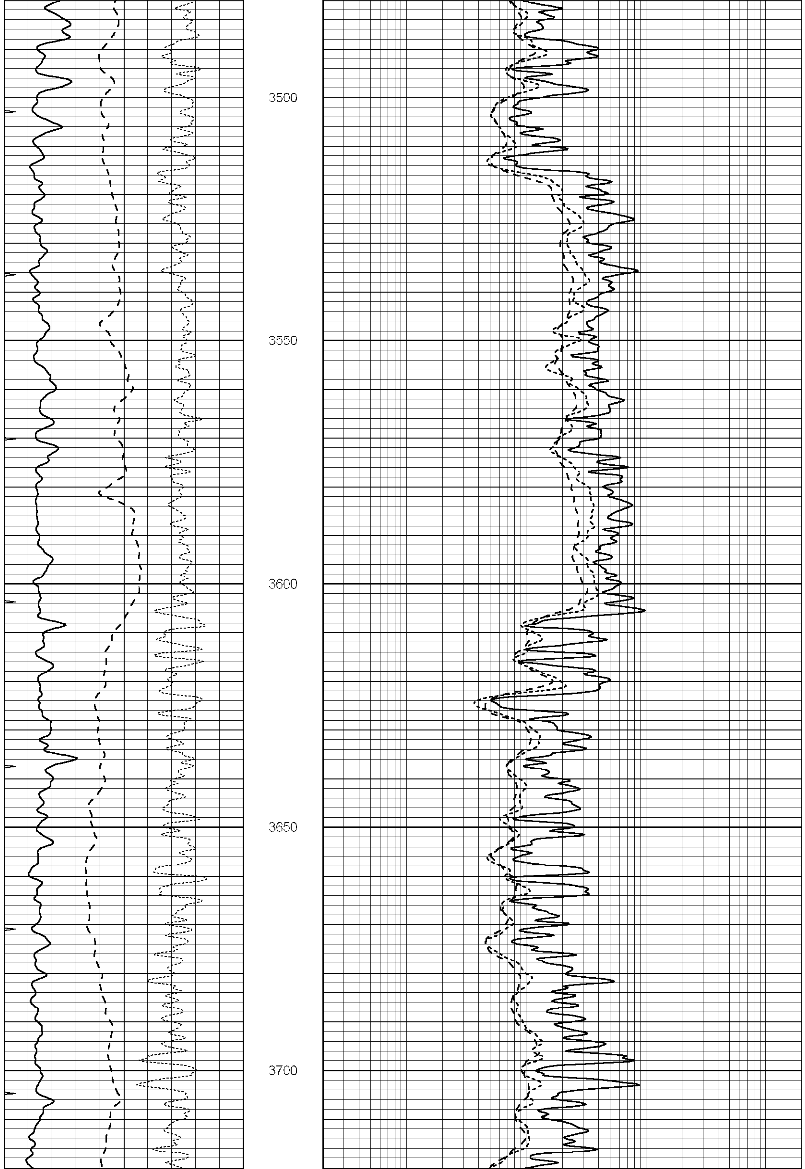
MAIN PASS

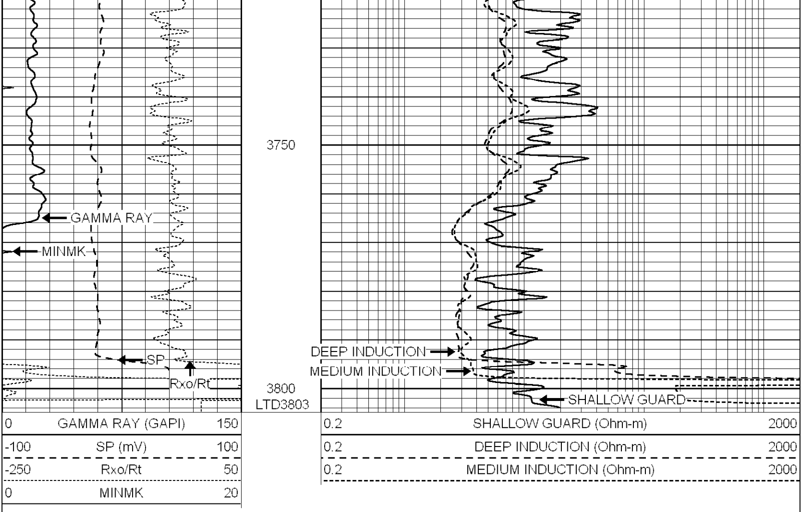
Database File: 1347hd.db
Dataset Pathname: pass4MAIN
Presentation Format: dil
Dataset Creation: Sun Feb 05 20:14:36 2017 by Calc SOC 120430
Charted by: Depth in Feet scaled 1:240

0	GAMMA RAY (GAPI)	150	0.2	SHALLOW GUARD (Ohm-m)	2000
-100	SP (mV)	100	0.2	DEEP INDUCTION (Ohm-m)	2000
-250	Rxo/Rt	50	0.2	MEDIUM INDUCTION (Ohm-m)	2000
0	MINMK	20			



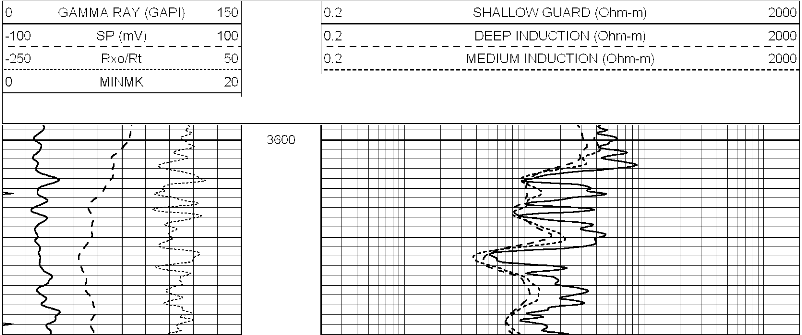


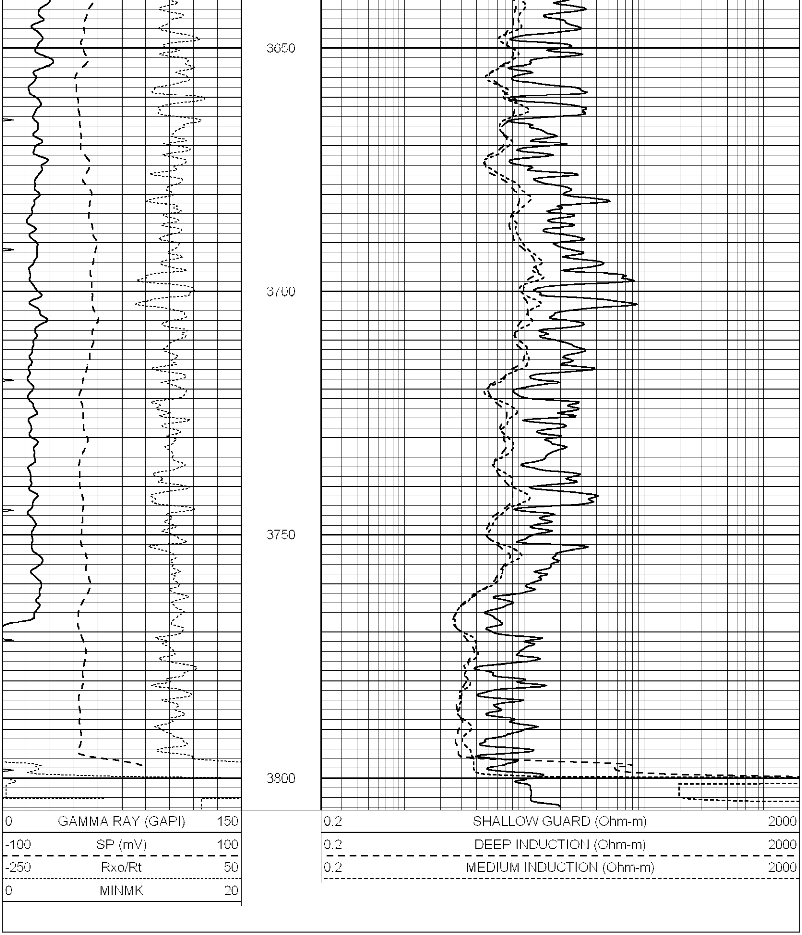




REPEAT SECTION

Database File:	1347hd.db
Dataset Pathname:	pass3RP
Presentation Format:	dil
Dataset Creation:	Sun Feb 05 19:02:38 2017 by Calc SOC 120430
Charted by:	Depth in Feet scaled 1:240





Calibration Report

Database File: 1347hd.db
Dataset Pathname: pass3RP
Dataset Creation: Sun Feb 05 19:02:38 2017 by Calc SOC 120430

Dual Induction Calibration Report

Serial-Model: PROBE7-DILG
Surface Cal Performed: Mon Jan 30 22:23:09 2017
Downhole Cal Performed: Mon Jul 28 12:02:56 2008
After Survey Verification Performed: Mon Jul 28 12:02:56 2008

Surface Calibration

	Readings			References			Results	
Loop:	Air	Loop		Air	Loop		m	b
Deep	-0.014	0.629	V	0.000	400.000	mmho/m	625.000	-5.000
Medium	0.039	0.728	V	0.000	464.000	mmho/m	675.000	-53.000
Internal:	Zero	Cal		Zero	Cal		m	b
Deep	0.011	0.610	V	0.000	400.000	mmho/m	667.135	-7.256
Medium	0.005	0.712	V	0.000	464.000	mmho/m	655.677	-3.102

Downhole Calibration

	Readings			References			Results	
	Zero	Cal		Zero	Cal		m'	b'
Deep	0.000	0.000	mmho/m	14.508	388.384	mmho/m	1.000	0.000
Medium	0.000	0.000	mmho/m	166.367	504.400	mmho/m	1.000	0.000
LL3		7.500	V		1400.000	Ohm-m		
		0.000	V		20.000	Ohm-m		
		-7.200	V		4000.000	mmho-m		

After Survey Verification

	Readings			Targets			Results	
	Zero	Cal		Zero	Cal		m'	b'
Deep	0.000	0.000	mmho/m	0.000	0.000	mmho/m	0.000	0.000
Medium	0.000	0.000	mmho/m	0.000	0.000	mmho/m	0.000	0.000
LL3		1.000	Ohm-m		1.000	Ohm-m		
		0.000	Ohm-m		0.000	Ohm-m		
		1.000	mmho-m		1.000	mmho-m		

Litho Density Calibration Report

Serial: 004N Model: PRB

Master Calibration

Performed Fri May 30 11:01:00 2014

	Background	Magnesium	Aluminum	Sandstone	
Window 1	1378.8	10804.6	3492.0	12453.4	cps
Window 2	1262.4	9313.5	3076.7	10594.7	cps
Window 3	1077.6	5668.7	2076.0	6314.8	cps
Window 4	306.4	313.0	306.4	315.6	cps
Long Space	0.0	8051.0	1814.3	9332.3	cps
Short Space	1.9	1706.1	1146.0	1707.6	cps
Rho		1.7100	2.5900	1.3800	g/cc
Pe		0.0000	2.5700	1.5500	

Rib Angle : 45.0 Rib Slope : 1.002 Density/Spine Ratio : 0.571
Spine Angle : 75.0 Spine Slope : 3.745 Spine Intercept : -18.9

Before Survey Verification Performed Wed Dec 31 18:00:00 1969

Window 1	0.0	0.0	0.0	0.0	cps
Window 2	0.0	0.0	0.0	0.0	cps
Window 3	0.0	0.0	0.0	0.0	cps
Window 4	0.0	0.0	0.0	0.0	cps
Long Space	0.0	0.0	0.0	0.0	cps
Short Space	0.0	0.0	0.0	0.0	cps
Measured Rho		0.0000	0.0000	0.0000	g/cc
Measured Correction		0.0000	0.0000	0.0000	g/cc
Measured Pe			0.0000	0.0000	

After Survey Verification Performed Wed Dec 31 18:00:00 1969

Window 1	0.0	0.0	0.0	0.0	cps
Window 2	0.0	0.0	0.0	0.0	cps
Window 3	0.0	0.0	0.0	0.0	cps
Window 4	0.0	0.0	0.0	0.0	cps
Long Space	0.0	0.0	0.0	0.0	cps
Short Space	0.0	0.0	0.0	0.0	cps
Measured Rho		0.0000	0.0000	0.0000	g/cc
Measured Correction		0.0000	0.0000	0.0000	g/cc
Measured Pe			0.0000	0.0000	

Compensated Neutron Calibration Report

Serial Number: 070808
Tool Model: Probe

PRE-SURVEY VERIFICATION

Detector	Readings	Measured	Target
Short Space	cps		
Long Space	cps	pu	pu

POST-SURVEY VERIFICATION

Detector	Readings	Measured	Target
Short Space	cps		
Long Space	cps	pu	pu

Gamma Ray Calibration Report

Serial Number:	070558	
Tool Model:	OPEN_GR	
Performed:	Mon Aug 22 01:00:15 2016	
Calibrator Value:	1.0	GAPI
Background Reading:	0.0	cps
Calibrator Reading:	1.0	cps
Sensitivity:	0.2800	GAPI/cps