HALLIBURTON | Sperry Drilling

PCGK: Pressure Case Gamma
PCDC: Pressure Case Directional

Powered by INSITE™

1 : 600 / 1 : 240

Country	: USA
Field	: Wattenberg
Location	: Lat: 40° 42' 53.75" North Long: 104° 0' 0.76" West
Well	: Tina LC29-75-1HNA
Company	: Noble Energy
Rig	: H&P 273

Company : **Noble Energy**
Rig : **H&P 273**
Well : **Tina LC29-75-1HNA**
Field : **Wattenberg**
Country : **USA**
API Number : **05-123-38781**

LOCATION
Latitude : **40° 42' 53.75" North**
Longitude : **104° 0' 0.76" West**
UTM Easting = **3,415,746.710 ft**
UTM Northing = **1,506,808.850 ft**

Other Services
Directional Drilling

Permanent Datum : **Ground Level** Elevation : **4872.00 ft**
Log Measured From : **Drill Floor** **24.00 ft** Above Permanent Datum
Drilling Measured From : **Drill Floor**

MD LOG

Elev. KB **N/A**
DF **4896.00 ft**
GL **4872.00 ft**
WD **N/A**

Depth Logged : **640.00 ft** To **6,545.00 ft**
Date Logged : **07-Jun-14** To **09-Jun-14**
Total Depth MD : **6,545.00 ft** TVD : **6,200.95 ft**
Spud Date : **06-Jun-14**

Unit No. : **11703717** Job No. :**CA-XX-0901286893**
Plot Type : **Final**
Plot Date : **09-Jun-14**

Run No.	Borehole Record (MD) Size	From	To
2	8.750 in	640.00 ft	5,517.00 ft
3	8.750 in	5,517.00 ft	6,545.00 ft

Run No.	Borehole Record (MD) Size	From	To

Casing Record (MD) Size	Weight	From	To

WELL INFORMATION

MWD Run Number	200	300			
Date run completed	08-Jun-14	09-Jun-14			
Rig Bit Number	2	3			
Bit Size (in)	8.750	8.750			
Tool Nominal OD (in)	6.750	6.750			
Log Start Depth (MD, ft)	640.00	5,517.00			
Log End Depth (MD, ft)	5,517.00	6,545.00			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	07-Jun-14 15:40	08-Jun-14 12:55			
Drill/Wipe End Date and Time	08-Jun-14 04:15	09-Jun-14 05:25			
Min Inc (deg) @ Depth (MD, ft)	0.09 @ 5,055.00	7.13 @ 5,526.00			
Max Inc (deg) @ Depth (MD, ft)	6.93 @ 5,434.00	85.83 @ 6,491.00			
Bit TFA(in2) / Bit Type	0.74 / PDC	0.91 / PDC			
Flow Rate (gpm)	581.73	550.00			
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A	N/A / N/A			
Fluid Type	Polymer	Polymer			
Density (ppg) / Viscosity (spqt)	9.50 / 27.00	10.40 / 37.00			
Filtrate CL (ppm)	200.00	200.00			
pH / Fluid Loss (mptm)	8.50 / 0	8.10 / 9			
PV (cP) / YP (lhf2)	1 / 1.00	15 / 11.00			
% Solids / % Sand	2 / .1	11.40 / 0.15			
% Oil / Oil:Water Ratio	N/A / N/A	N/A / N/A			
Rm @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Rmf @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			

Max Tool Temp (degF) / Source	150.10 / PCM	158.60 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A			
Lead MWD Engineer	Paul Kock	Paul Kock			
Customer Representative	Justin Fields	Justin Fields			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.84	5.84			
Sub Serial Number	11404264	11404264			
Insert Serial Number	11620315	11620315			
Date and Time Initialized	07-Jun-14 04:53	07-Jun-14 04:53			
Date and Time Read	09-Jun-14 12:01	09-Jun-14 12:04			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	52.99	52.05			
Software Version	6.21	6.21			
Sub Serial Number	11404264	11404264			
Sonde Serial Number	11638628	11638628			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	299.13	60.53			

Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	47.89	46.95			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11404264	11404264			
Insert/Sonde Serial Number	11579806	11579806			

REMARKS

1. All depths are calibrated to the driller's pipe tally and are measured from the rig drill floor.

2. No depth corrections have been made for pipe stretch or compression.

3. All data presented is recorded (memory data) unless otherwise stated.
- ROPA: Average Rate of Penetration is real time data.
- PGRC: Smooth Pressure Case Gamma Ray Borehole corrected is recorded data.

4. The following smoothing parameters have been applied to the data:
- 2" (1:600) log - 1 ft. interval, 3 ft. coercion distance, 5 ft. gap fill.
- 5" (1:240) log for ROP - 0.5 ft. interval, 1.2 ft. coercion distance, 3 ft. gap fill.
- 5" (1:240) log for Gamma Ray - 0.5 ft. interval, 0.6 ft. coercion distance, 3 ft. gap fill.

5. INSITE version 8.0.20

WARRANTY

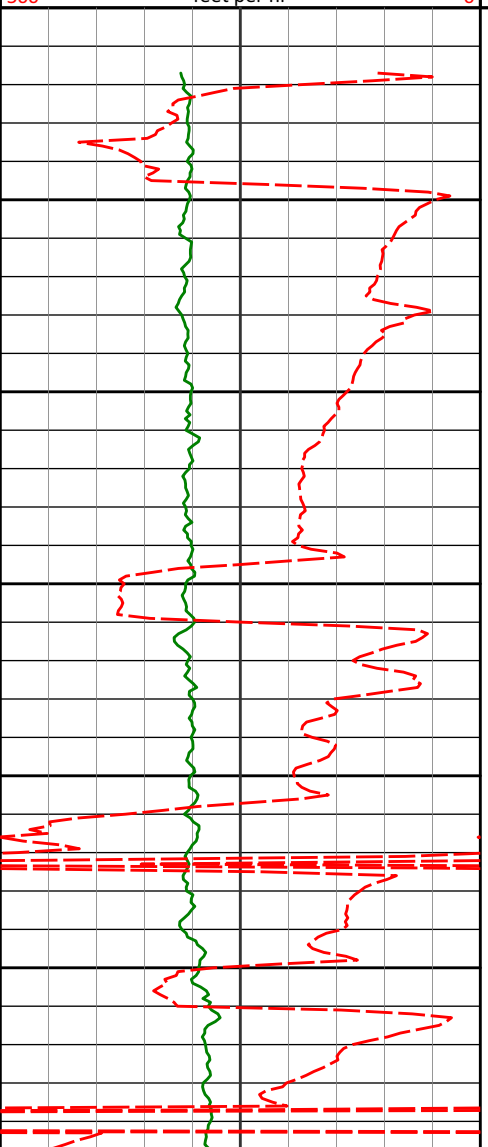
HALLIBURTON
Sperry Drilling Services

MD Main Log 1:600

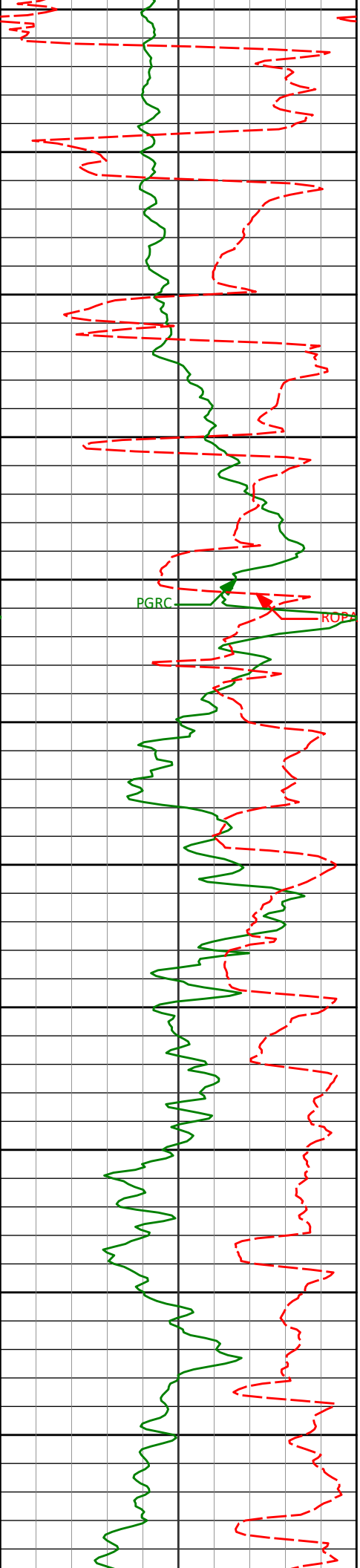
Noble Energy
Tina LC29-75-1HNA
H&P 273
T9N, R59W

PCG Gamma Ray
PGRC
0 api 300

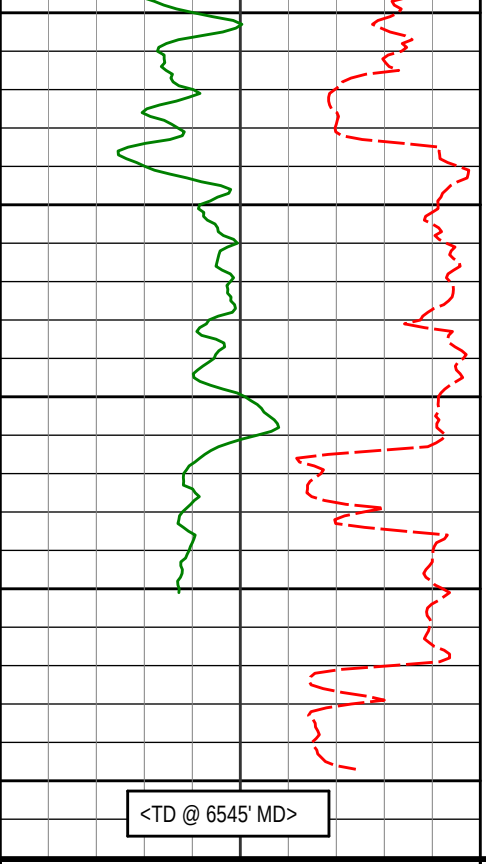
Avg Rate of Penetration
ROP Avg
500 feet per hr 0



Depth ft	*Depth*	*Inc.*	*Azi.*	*TVD*	*V.S.*
<Run 300>	5526'	7.13°	267.17°	5523.72'	-0.72'
<KOP> 5550	5574'	7.90°	295.27°	5571.32'	0.74'
5600	5621'	11.88°	326.33°	5617.65'	6.33'
5650	5669'	14.01°	341.30°	5664.44'	16.10'
5700	5716'	16.83°	346.85°	5709.75'	28.22'
5750	5764'	20.27°	354.47°	5755.25'	43.34'



5811'	22.13°	356.47°	5799.07'	60.32'
5859'	24.64°	352.62°	5843.13'	79.32'
5906'	28.88°	348.58°	5885.09'	100.28'
5954'	33.63°	347.63°	5926.11'	124.79'
6000'	38.17°	349.79°	5963.36'	151.40'
6048'	42.38°	349.83°	5999.97'	182.10'
6095'	44.72°	349.99°	6034.04'	214.14'
6143'	48.92°	349.58°	6066.88'	248.77'
6190'	54.05°	350.18°	6096.13'	285.15'
6238'	58.82°	351.72°	6122.67'	324.83'
6285'	64.44°	352.89°	6144.99'	365.95'
6333'	69.46°	354.15°	6163.78'	409.97'



Depth ft	Depth	Inc.	Azi.	TVD	V.S.
	6380'	73.52°	355.96°	6178.70'	454.46'
	6428'	79.08°	356.72°	6190.06'	501.05'
	6474'	83.67°	358.00°	6196.96'	546.52'
	6491'	85.83°	358.44°	6198.51'	563.44'

Avg Rate of Penetration
ROP Avg
500 feet per hr 0

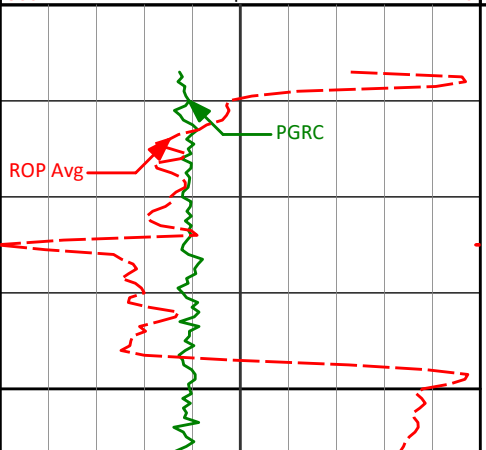
PCG Gamma Ray
PGRC
0 api 300

HALLIBURTON
Sperry Drilling Services
MD Detail Log 1:240

Noble Energy
Tina LC29-75-1HNA
H&P 273
T9N, R59W

PCG Gamma Ray
PGRC
0 api 300

Avg Rate of Penetration
ROP Avg
500 feet per hr 0



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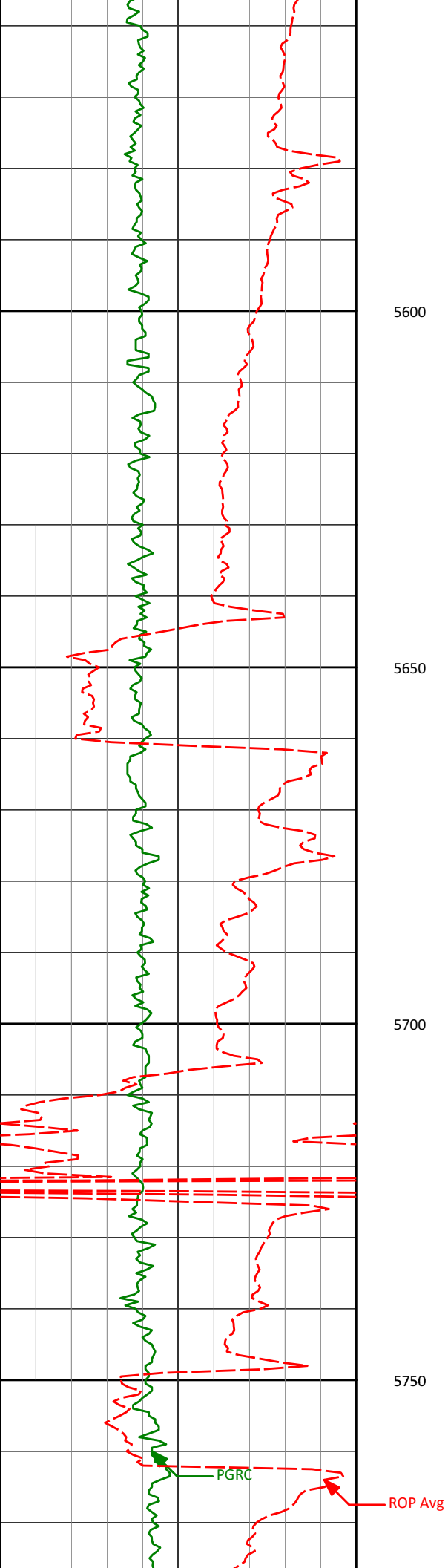
<Run 300>					
	5526'	7.13°	267.17°	5523.72'	-0.72'
<KOP> 5550					



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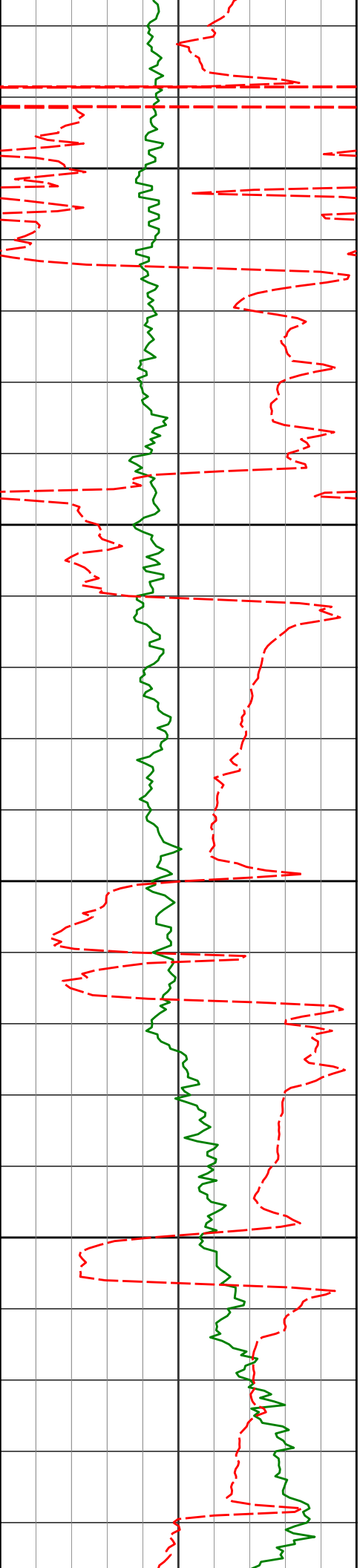

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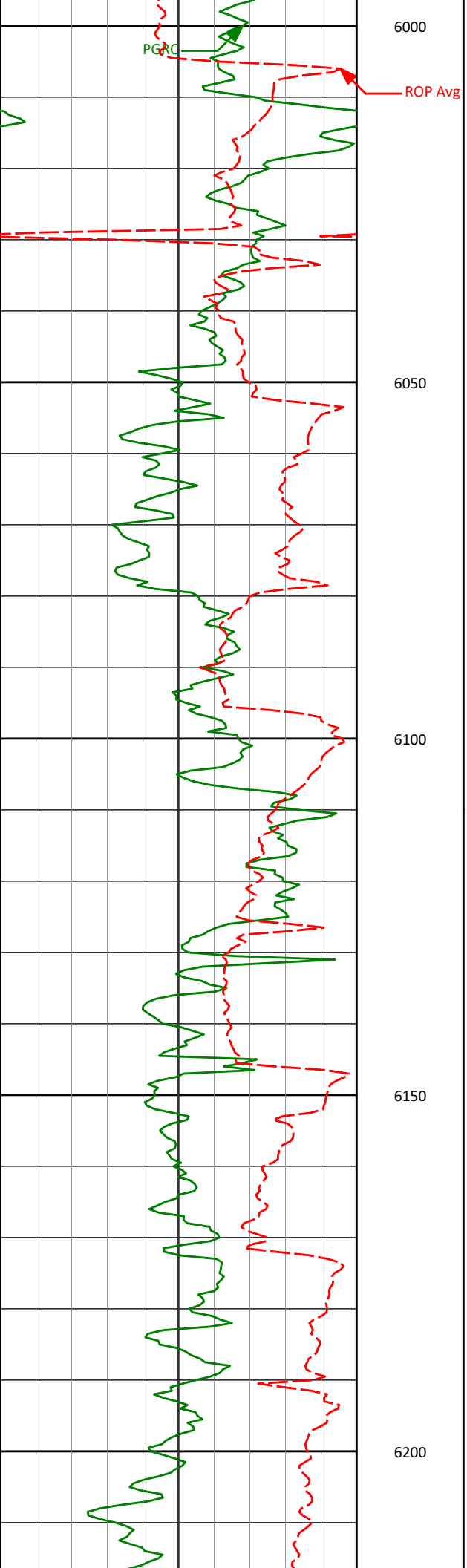

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6048'	42.38°	349.83°	5999.97'	182.10'
6095'	44.72°	349.99°	6034.04'	214.14'
6143'	48.92°	349.58°	6066.88'	248.77'
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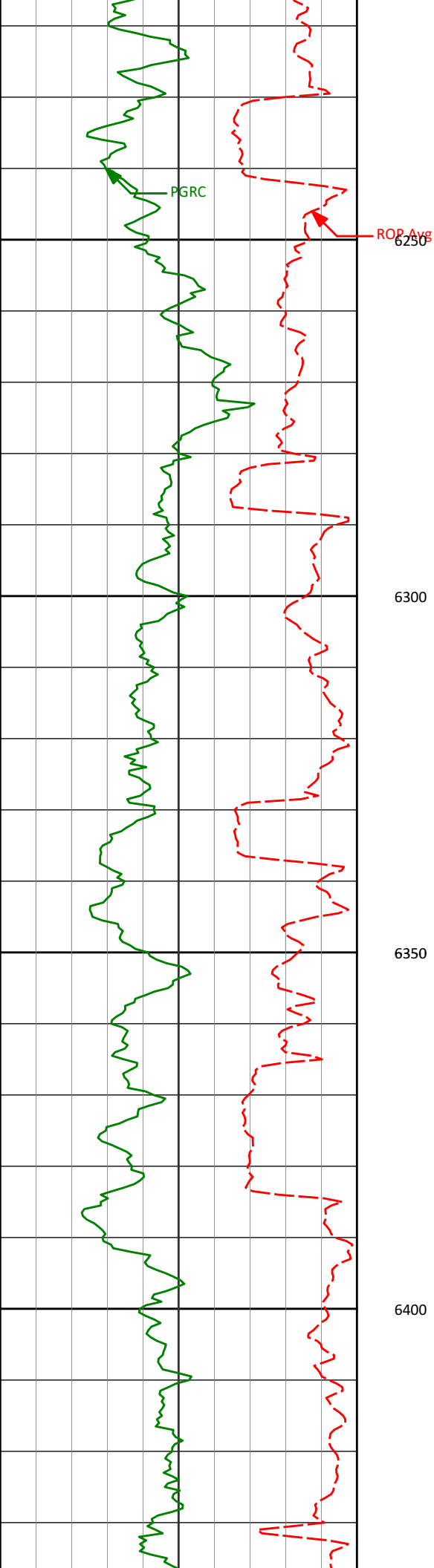

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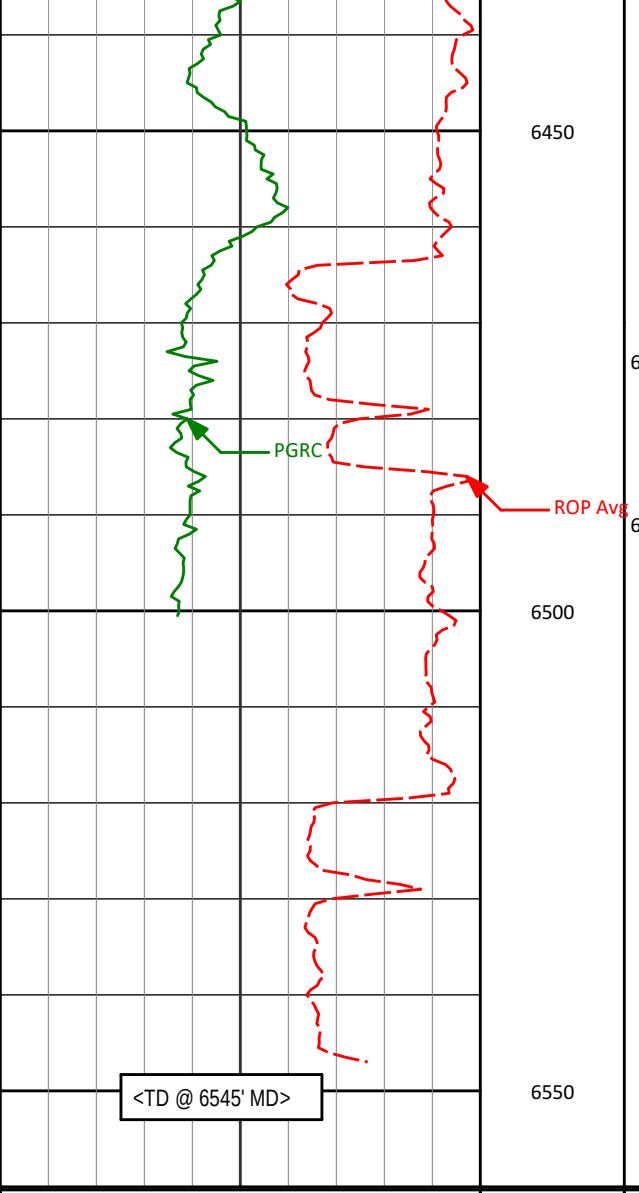
6428'	79.08°	356.72°	6190.06'	501.05'



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Avg Rate of Penetration
ROP Avg
500 feet per hr 0

PCG Gamma Ray
PGRC
0 api 300

Depth ft

HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Tina LC29-75-1HNA
Wattenberg
Weld Colorado
USA
CA-XX-0901286893
Surveys are IFR1 and MSA corrected.

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
0.00	0.00	0.00	0.00	0.00 N	0.00 E	0.00	TIE-IN
280.00	1.00	98.18	279.99	0.35 S	2.42 E	-0.43	0.36
627.00	0.20	116.78	626.96	1.05 S	5.96 E	-1.25	0.23
716.00	0.24	163.31	715.96	1.30 S	6.15 E	-1.50	0.20
809.00	0.33	202.14	808.96	1.73 S	6.10 E	-1.93	0.22

995.00	0.28	212.74	994.96	2.61 S	5.66 E	-2.80	0.04
1180.00	0.22	216.89	1179.96	3.28 S	5.20 E	-3.45	0.03
1365.00	0.11	239.58	1364.96	3.65 S	4.83 E	-3.81	0.07
1551.00	0.10	201.03	1550.96	3.89 S	4.62 E	-4.04	0.04
1737.00	0.23	261.55	1736.96	4.10 S	4.19 E	-4.24	0.11
1831.00	0.18	286.29	1830.96	4.09 S	3.86 E	-4.21	0.11
1926.00	0.14	142.76	1925.96	4.14 S	3.79 E	-4.26	0.32
2020.00	0.34	164.23	2019.95	4.50 S	3.94 E	-4.62	0.23
2115.00	0.32	162.16	2114.95	5.02 S	4.09 E	-5.15	0.02
2210.00	0.42	175.92	2209.95	5.62 S	4.20 E	-5.75	0.14
2399.00	0.71	186.77	2398.94	7.47 S	4.11 E	-7.60	0.16
2494.00	0.76	175.52	2493.93	8.69 S	4.09 E	-8.82	0.16
2589.00	0.81	175.96	2588.93	9.98 S	4.19 E	-10.12	0.05
2684.00	0.78	173.19	2683.92	11.30 S	4.31 E	-11.43	0.05
2778.00	0.94	168.88	2777.91	12.69 S	4.54 E	-12.83	0.18
2968.00	0.74	187.38	2967.89	15.43 S	4.68 E	-15.58	0.18
3063.00	0.77	189.83	3062.88	16.67 S	4.49 E	-16.81	0.05
3158.00	1.00	197.41	3157.87	18.09 S	4.13 E	-18.22	0.27
3252.00	1.43	162.67	3251.85	19.99 S	4.24 E	-20.12	0.89
3347.00	1.32	149.07	3346.82	22.06 S	5.15 E	-22.22	0.36
3537.00	0.47	48.33	3536.80	23.42 S	6.86 E	-23.64	0.78
3727.00	0.28	48.29	3726.80	22.60 S	7.79 E	-22.84	0.10
3822.00	0.36	43.49	3821.79	22.22 S	8.17 E	-22.48	0.09
3916.00	0.19	20.31	3915.79	21.86 S	8.43 E	-22.13	0.21
4011.00	1.08	350.49	4010.79	20.83 S	8.33 E	-21.10	0.97
4106.00	1.31	341.82	4105.77	18.92 S	7.85 E	-19.17	0.31
4201.00	1.40	330.65	4200.74	16.88 S	6.94 E	-17.10	0.29
4296.00	1.58	326.71	4295.71	14.77 S	5.65 E	-14.95	0.22
4391.00	2.06	323.44	4390.66	12.30 S	3.91 E	-12.43	0.52
4486.00	2.14	337.44	4485.60	9.29 S	2.22 E	-9.36	0.55
4581.00	2.00	326.73	4580.54	6.27 S	0.63 E	-6.29	0.43
4675.00	2.04	346.71	4674.48	3.27 S	0.66 W	-3.25	0.75
4770.00	0.96	353.31	4769.44	0.83 S	1.14 W	-0.80	1.15
4865.00	0.99	336.52	4864.43	0.71 N	1.56 W	0.76	0.30
4960.00	1.05	332.36	4959.42	2.23 N	2.29 W	2.31	0.10
5055.00	0.09	194.49	5054.41	2.93 N	2.71 W	3.02	1.18
5150.00	2.68	257.04	5149.38	2.36 N	4.90 W	2.52	2.78
5244.00	3.47	261.95	5243.24	1.47 N	9.85 W	1.79	0.89
5339.00	5.31	258.65	5337.96	0.20 N	17.01 W	0.76	1.95
5434.00	6.93	264.74	5432.41	1.19 S	27.03 W	-0.30	1.83
5526.00	7.13	267.17	5523.72	1.98 S	38.26 W	-0.72	0.39
5574.00	7.90	295.27	5571.32	0.72 S	44.22 W	0.74	7.74
5621.00	11.88	326.33	5617.65	4.69 N	49.83 W	6.33	13.87
5669.00	14.01	341.30	5664.44	14.31 N	54.43 W	16.10	8.24
5716.00	16.83	346.85	5709.75	26.33 N	57.80 W	28.22	6.77
5764.00	20.27	354.47	5755.25	41.38 N	60.19 W	43.34	8.75
5811.00	22.13	356.47	5799.07	58.32 N	61.52 W	60.32	4.25
5859.00	24.64	352.62	5843.13	77.27 N	63.36 W	79.32	6.12
5906.00	28.88	348.58	5885.09	98.12 N	66.87 W	100.28	9.81
5954.00	33.63	347.63	5926.11	122.48 N	72.01 W	124.79	9.95
6000.00	38.17	349.79	5963.36	148.93 N	77.26 W	151.40	10.25
6048.00	42.38	349.83	5999.97	179.46 N	82.75 W	182.10	8.77
6095.00	44.72	349.99	6034.04	211.34 N	88.42 W	214.14	4.98
6143.00	48.92	349.58	6066.88	245.78 N	94.63 W	248.77	8.77
6190.00	54.05	350.18	6096.13	281.97 N	101.09 W	285.15	10.96
6238.00	58.82	351.72	6122.67	321.46 N	107.36 W	324.83	10.29
6285.00	64.44	352.89	6144.99	362.43 N	112.89 W	365.95	12.16
6333.00	69.46	354.15	6163.78	406.30 N	117.86 W	409.97	10.73
6380.00	73.52	355.96	6178.70	450.69 N	121.69 W	454.46	9.38
6428.00	79.08	356.72	6190.06	497.21 N	124.66 W	501.05	11.68
6474.00	83.67	358.00	6196.96	542.63 N	126.76 W	546.52	10.35
6491.00	85.83	358.44	6198.51	559.55 N	127.28 W	563.44	12.96
6545.00	89.00	359.00	6200.95	613.47 N	128.49 W	617.38	5.96

CALCULATION BASED ON MINIMUM CURVATURE METHOD

SURVEY COORDINATES RELATIVE TO WELL SYSTEM REFERENCE POINT
TVD VALUES GIVEN RELATIVE TO DRILLING MEASUREMENT POINT

VERTICAL SECTION RELATIVE TO WELL HEAD
VERTICAL SECTION IS COMPUTED ALONG A DIRECTION OF 358.11 DEGREES (GRID)
A TOTAL CORRECTION OF 7.20 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED

A TOTAL CORRECTION OF 14.25 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 6545.00 FEET
IS 626.79 FEET ALONG 348.17 DEGREES (GRID)

Surface surveys at 280 ft and 627 ft have had azimuths corrected to grid north, but were not taken by Halliburton.

Final survey is a projection from 6491' MD to TD at 6545' MD.

Date Printed:09 June 2014