HALLIBURTON | Sperry Drilling

PCDC - Pressure Case Directional
PCGK - Pressure Case Gamma

Powered by INSITE™

1 : 240

Company	: **Noble Energy**
Rig	: **H&P 322**
Well	: **Castor Federal LC23-62HN**
Field	: **Wattenberg**
Country	: **USA**
API Number	: **05-123-36392**

Country : **USA**
Field : **Wattenberg**
Location : **Lat: 40° 43' 48.50" North Long: 103° 57' 10.55" West**
Well : **Castor Federal LC23-62HN**
Company : **Noble Energy**
Rig : **H&P 322**

LOCATION
Latitude : **40° 43' 48.50" North**
Longitude : **103° 57' 10.55" West**
UTM Easting = 3428754.752ft
UTM Northing = 1512574.211 ft

Other Services
Directional Drilling

Permanent Datum : **Ground Level** Elevation : **4847.00 ft**
Log Measured From : **Drill Floor** **24.00 ft** Above Permanent Datum
Drilling Measured From : **Drill Floor**

TVD LOG

Elev. KB **N/A**
DF **4871.00 ft**
GL **4847.00 ft**
WD **N/A**

Depth Logged : **682.00 ft** To **6,443.00 ft**
Date Logged : **14-Jan-13** To **16-Jan-13**
Total Depth MD : **6,443.00 ft** TVD : **6,006.62 ft**
Spud Date : **13-Jan-13**

Unit No. : **11210425** Job No. : **CA-XX-0900071989**
Plot Type : **Final**
Plot Date : **18-Jan-13**

Run No.	Borehole Record (TVD) Size	From	To
2	8.750 in	682.00 ft	5185.53 ft
3	8.750 in	5185.53 ft	6006.62 ft

Run No.	Borehole Record (TVD) Size	From	To

Casing Record (TVD)

Size	Weight	From	To
9.625 in	36.00 lbpf	SURFACE	672.00 ft
7.000 in	24.00 lbpf	SURFACE	6433.00 ft

WELL INFORMATION

MWD Run Number	100	200																											
Date run completed	15-Jan-13	16-Jan-13																											
Rig Bit Number	2	3																											
Bit Size (in)	8.750	8.750																											
Tool Nominal OD (in)	6.750	8.000																											
Log Start Depth (MD, ft)	682.00	5,300.00																											
Log End Depth (MD, ft)	5,300.00	6,443.00																											
Drill or Wipe	Drill	Drill																											
Drill/Wipe Start Date and Time	14-Jan-13 21:30	15-Jan-13 18:00																											
Drill/Wipe End Date and Time	15-Jan-13 10:21	16-Jan-13 06:04																											
Min Inc (deg) @ Depth (MD, ft)	.17 @ 4,511.00	1.59 @ 5,358.00																											
Max Inc (deg) @ Depth (MD, ft)	16.54 @ 2,803.00	81.16 @ 6,387.00																											
Bit TFA(in2) / Bit Type	.75 / PDC	.86 / PDC																											
Flow Rate (gpm)	592.00	577.00																											
Max AV (fpm) / CV (fpm) @ MWD	473.2 / 473.2	473.2 / 473.2																											
Fluid Type	Fresh Water Gel	Fresh Water Gel																											
Density (ppg) / Viscosity (spqt)	8.60 / 27.00	8.60 / 27.00																											
Filtrate CL (ppm)	650.00	650.00																											
pH / Fluid Loss (mptm)	8.20 / N/A	8.20 / N/A																											
PV (cP) / YP (lhf2)	1 / 3.00	1 / 3.00																											
% Solids / % Sand	0.4 / .10	0.40 / 0.10																											
% 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	133.30 / PCM	154.30 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A			
Lead MWD Engineer	Osahon Igunbor	Osahon Igunbor			
Customer Representative	Jeremy Stolz	Jeremy Stolz			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.76	5.76			
Sub Serial Number	11341341	11341341			
Insert Serial Number	11680785	11680785			
Date and Time Initialized	13-Jan-13 20:28	13-Jan-13 20:28			
Date and Time Read	16-Jan-13 13:07	16-Jan-13 13:01			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	57.00	56.00			
Software Version	6.21	6.21			
Sub Serial Number	11341341	11341341			
Sonde Serial Number	11833258	11833258			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	312.76	249.11			

Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	49.95	49.08			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11341341	11341341			
Insert/Sonde Serial Number	11293280	11293280			

REMARKS

1. All depths are true vertical depths and are calibrated to the driller' pipe tally and are measured from the 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.

4. The Following smoothing parameters have been applied to the data"

PGXC (Gamma CG Corrected):
Interval Resolution: 0.5 feet
Coercion Distance: 0.6 feet
Gap Fill: 3.0 feet

ROPA (Rate of Penetration):
Interval Resolution: 0.5 feet
Coercion Distance: 1.2 feet

WARRANTY

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MD Detail Log 1:240

Gamma CG Cor
(PGXC)
(Api)
0 300

Avg Rate of Penetration
feet per hr
600 0

Feet

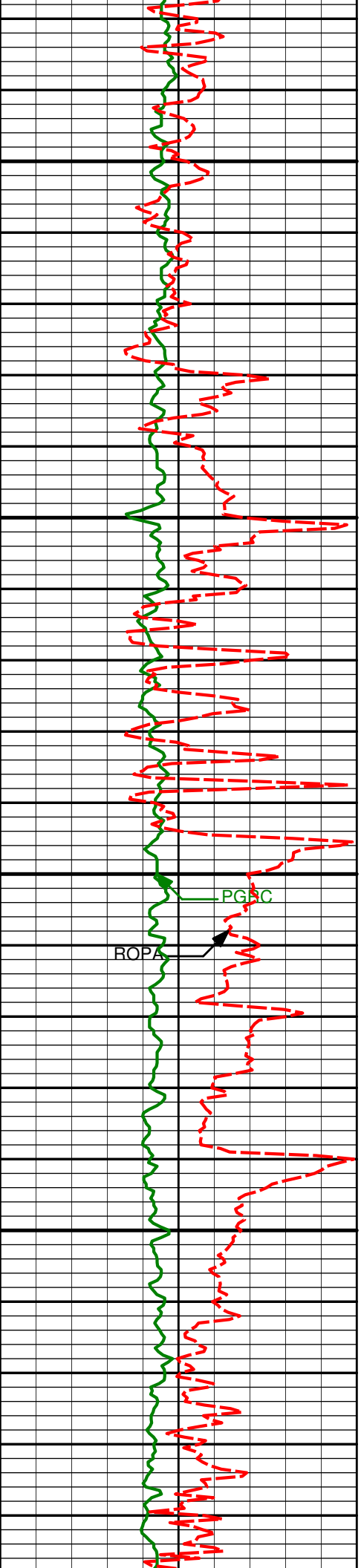
Depth	Inc	Azm	TVD	Vsec
5358'	1.59°	70.72°	5300.51'	-381.53'

Run 200

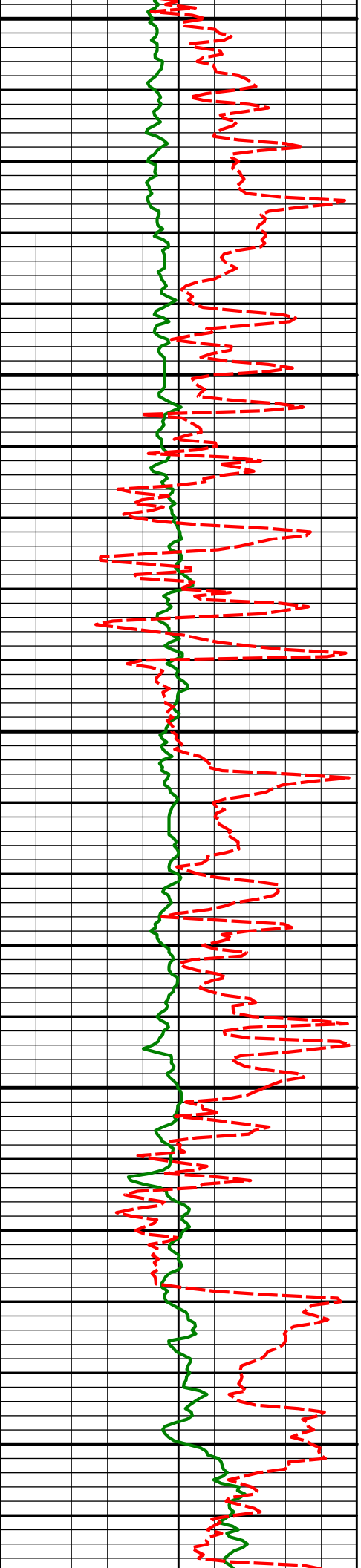
5300'

KOP

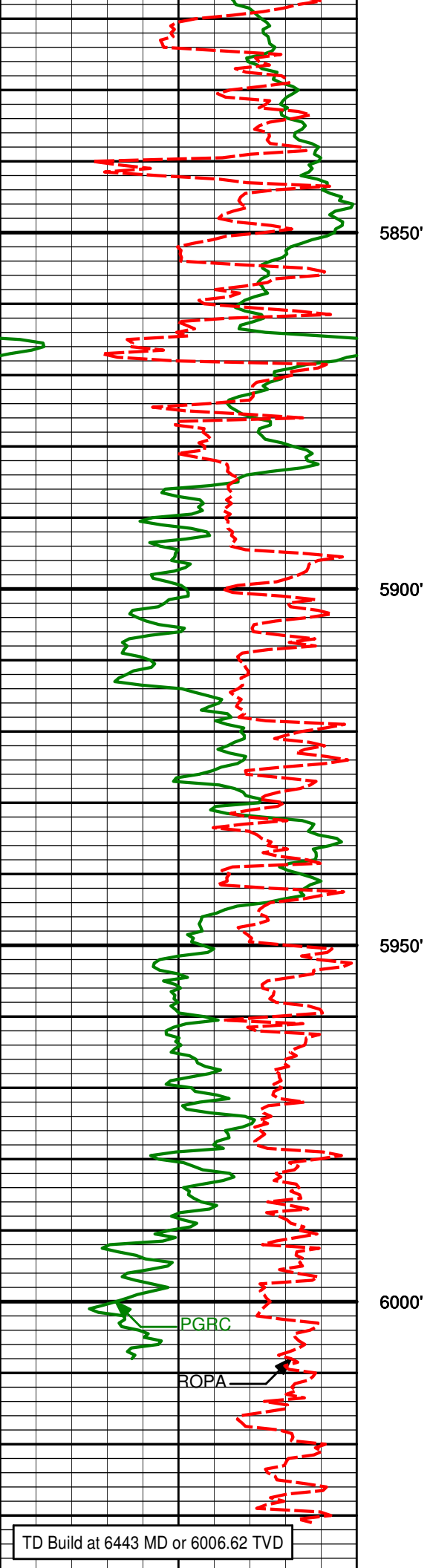
5350'



5453'	11.66°	82.32°	5394.76'	-370.65'
5500'	15.13°	81.93°	5440.47'	-359.79'
5548'	17.67°	89.46°	5486.52'	-346.26'
5644'	25.76°	92.28°	5575.64'	-310.95'



5739'	32.44°	89.43°	5658.60'	-264.96'
5786'	35.09°	88.13°	5697.67'	-238.88'
5834'	37.73°	92.20°	5736.30'	-210.50'
5929'	47.29°	93.84°	5806.25'	-146.92'



5976'	52.47°	90.46°	5836.54'	-111.23'
6024'	56.27°	87.94°	5864.49'	-72.30'
6071'	56.94°	89.16°	5890.36'	-33.11'
6119'	59.95°	88.91°	5915.48'	7.72'
6166'	62.54°	89.90°	5938.09'	48.83'
6214'	65.75°	87.30°	5959.02'	91.95'
6261'	70.73°	86.79°	5976.44'	135.58'
6309'	75.76°	86.63°	5990.27'	181.52'
6356'	77.89°	87.81°	6000.99'	227.26'
6387'	81.16°	88.41°	6006.62'	257.71'

	6050'		
Avg Rate of Penetration feet per hr 600 0	Feet	Depth Inc Azm	TVD Vsec
Gamma CG Cor (PGXC) (Api) 0 300			

HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Castor Federal LC23-62HN
Wattenberg
Weld Colorado
USA
CA-XX-0900071989

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
682.00	0.00	0.00	682.00	0.00 N	0.00 E	0.00	TIE-IN
729.00	0.94	5.09	729.00	0.38 N	0.03 E	0.06	2.00
1008.00	1.18	28.55	1007.95	5.18 N	1.61 E	1.99	0.18
1287.00	0.83	46.19	1286.91	9.09 N	4.43 E	5.10	0.17
1572.00	0.56	26.00	1571.89	11.76 N	6.52 E	7.39	0.13
1758.00	0.64	36.48	1757.88	13.41 N	7.54 E	8.53	0.08
1853.00	2.18	314.96	1852.85	15.11 N	6.58 E	7.70	2.29
1948.00	4.78	301.65	1947.67	18.46 N	1.93 E	3.32	2.86
2043.00	6.89	297.02	2042.17	23.13 N	6.52 W	-4.75	2.27
2138.00	8.86	286.73	2136.28	27.83 N	18.60 W	-16.44	2.54
2233.00	11.36	290.73	2229.80	33.25 N	34.36 W	-31.74	2.73
2328.00	13.45	293.12	2322.57	40.90 N	53.27 W	-50.02	2.27
2423.00	15.40	289.61	2414.58	49.47 N	75.32 W	-71.36	2.25
2518.00	14.93	286.65	2506.27	57.21 N	98.93 W	-94.31	0.95
2613.00	15.86	295.76	2597.87	66.36 N	122.34 W	-116.97	2.72
2708.00	15.96	299.29	2689.24	78.39 N	145.42 W	-139.08	1.02
2803.00	16.54	305.78	2780.45	92.69 N	167.79 W	-160.30	2.01
2898.00	16.48	306.15	2871.53	108.55 N	189.65 W	-180.89	0.12
2992.00	15.21	305.50	2961.96	123.57 N	210.45 W	-200.50	1.37
3087.00	12.26	300.52	3054.23	135.94 N	229.29 W	-218.35	3.34
3182.00	13.34	304.79	3146.87	147.31 N	246.99 W	-235.13	1.50
3277.00	11.43	304.85	3239.66	158.94 N	263.71 W	-250.93	2.00
3372.00	12.50	304.55	3332.59	170.15 N	279.91 W	-266.23	1.13
3467.00	14.31	298.06	3425.00	181.51 N	298.74 W	-284.15	2.48
3562.00	15.24	297.68	3516.86	192.84 N	320.16 W	-304.65	0.98
3657.00	16.02	298.96	3608.35	204.98 N	342.69 W	-326.19	0.90
3752.00	14.78	303.53	3699.94	218.03 N	364.26 W	-346.72	1.82
3846.00	12.14	308.54	3791.35	230.81 N	381.99 W	-363.43	3.07
3941.00	9.47	312.06	3884.66	242.28 N	395.61 W	-376.15	2.89
4036.00	4.83	310.86	3978.89	250.14 N	404.45 W	-384.36	4.89
4131.00	1.60	343.24	4073.74	254.03 N	407.86 W	-387.47	3.77
4416.00	1.90	51.81	4358.63	260.76 N	405.30 W	-384.40	0.70
4511.00	0.17	24.48	4453.61	261.86 N	404.00 W	-383.03	1.85

4796.00	1.42	316.33	4738.58	264.79 N	406.26 W	-385.06	0.46
4891.00	0.79	357.39	4833.56	266.29 N	407.10 W	-385.78	1.02
5176.00	0.85	41.52	5118.54	269.83 N	405.79 W	-384.21	0.22
5243.00	0.69	40.41	5185.53	270.51 N	405.20 W	-383.56	0.23
5358.00	1.59	70.72	5300.51	271.57 N	403.24 W	-381.53	0.91
5453.00	11.66	82.32	5394.76	273.29 N	392.46 W	-370.65	10.64
5500.00	15.13	81.93	5440.47	274.79 N	381.67 W	-359.79	7.39
5548.00	17.67	89.46	5486.52	275.74 N	368.18 W	-346.26	6.88
5644.00	25.76	92.28	5575.64	275.04 N	332.71 W	-310.95	8.50
5739.00	32.44	89.43	5658.60	274.48 N	286.55 W	-264.96	7.18
5786.00	35.09	88.13	5697.67	275.04 N	260.44 W	-238.88	5.85
5834.00	37.73	92.20	5736.30	274.93 N	231.97 W	-210.50	7.45
5929.00	47.29	93.84	5806.25	271.47 N	167.95 W	-146.92	10.14
5976.00	52.47	90.46	5836.54	270.16 N	132.05 W	-111.23	12.31
6024.00	56.27	87.94	5864.49	270.73 N	93.05 W	-72.30	9.00
6071.00	56.94	89.16	5890.36	271.72 N	53.83 W	-33.11	2.60
6119.00	59.95	88.91	5915.48	272.41 N	12.94 W	7.72	6.29
6166.00	62.54	89.90	5938.09	272.83 N	28.26 E	48.83	5.81
6214.00	65.75	87.30	5959.02	273.89 N	71.43 E	91.95	8.28
6261.00	70.73	86.79	5976.44	276.15 N	115.01 E	135.58	10.64
6309.00	75.76	86.63	5990.27	278.78 N	160.88 E	181.52	10.48
6356.00	77.89	87.81	6000.99	281.00 N	206.59 E	227.26	5.15
6387.00	81.16	88.41	6006.62	282.01 N	237.05 E	257.71	10.72

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 85.66 DEGREES (GRID)
A TOTAL CORRECTION OF 7.29 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 6387.00 FEET
IS 368.40 FEET ALONG 40.05 DEGREES (GRID)

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