

PCGK: Pressure Case Gamma
PCDC: Pressure Case Directional


Country		: USA					
Field		: Wildcat					
Location		: Lat: 40° 41' 7.01" North Long: 103° 58' 22.51" West					
Well		: Bulleit Federal PC LG04-62HN					
Company		: Noble Energy					
Rig		: H&P 315					
LOCATION		Latitude : 40° 41' 7.01" North Longitude : 103° 58' 22.51" West		Company : Noble Energy Rig : H&P 315 Well : Bulleit Federal PC LG04-62HN Field : Wildcat Country : USA API Number : 05-123-38758			
		UTM Easting = 3,423,496.870 ft UTM Northing = 1,496,137.310 ft					
Permanent Datum		: Ground Level		Elevation : 4814.00 ft		Elev. KB N/A	
Log Measured From		: Drill Floor		24.00 ft Above Permanent Datum		DF 4838.00 ft GL 4814.00 ft WD N/A	
Drilling Measured From		: Drill Floor		TVD LOG			
Depth Logged		: 1,521.96 ft To 6,054.81 ft		Unit No. : 11610113		Job No. :CA-XX-0901058466	
Date Logged		: 21-Feb-14 To 21-Feb-14		Plot Type : Final			
Total Depth MD		: 6,425.00 ft TVD : 6,054.81 ft		Plot Date : 24-Feb-14			
Spud Date		: 15-Feb-14					
		Borehole Record (TVD)		Run No.		Borehole Record (TVD)	
Run No.		Size From To		Run No.		Size From To	
2		8.750 in 1,521.96 ft 5,371.33 ft					
3		8.750 in 5,371.33 ft 6,054.81 ft					
						Casing Record (TVD)	
				Size Weight From To			
				7.000 in 26.00 lbpf SURFACE 6,054.73 ft			

WELL INFORMATION

MWD Run Number	100	200		
Date run completed	19-Feb-14	22-Feb-14		
Rig Bit Number	2	3		
Bit Size (in)	8.750	8.750		
Tool Nominal OD (in)	6.750	6.750		
Log Start Depth (TVD, ft)	1,521.96	5,371.33		
Log End Depth (TVD, ft)	5,371.33	6,054.81		
Drill or Wipe	Drill	Drill		
Drill/Wipe Start Date and Time	18-Feb-14 02:40	21-Feb-14 07:30		
Drill/Wipe End Date and Time	19-Feb-14 05:00	21-Feb-14 20:10		
Min Inc (deg) @ Depth (TVD, ft)	0.31 @ 1,553.96	0.67 @ 5,361.33		
Max Inc (deg) @ Depth (TVD, ft)	13.22 @ 3,623.32	82.65 @ 6,050.41		
Bit TFA(in2) / Bit Type	0.77 / PDC	0.88 / PDC		
Flow Rate (gpm)	550.37	582.62		
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A	N/A / N/A		
Fluid Type	Polymer	Polymer		
Density (ppg) / Viscosity (spqt)	9.25 / 48.00	10.35 / 45.00		
Filtrate CL (ppm)	1,200.00	1,300.00		
pH / Fluid Loss (mptm)	9.80 / 0	9.10 / 0		
PV (cP) / YP (lbf2)	13 / 14.00	15 / 14.00		
% Solids / % Sand	7.1 / 0.50	11.9 / 0.50		
% 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	153.79 / PCM	153.79 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A			
Lead MWD Engineer	Paul Kock	Paul Kock			
Customer Representative	Martin Suarez	Martin Suarez			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.84	5.84			
Sub Serial Number	11382329	11382329			
Insert Serial Number	12230081	10868872			
Date and Time Initialized	17-Feb-14 00:27	20-Feb-14 02:26			
Date and Time Read	20-Feb-14 03:06	22-Feb-14 17:42			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	54.02	51.96			
Software Version	6.21	6.21			
Sub Serial Number	11382329	11382329			
Sonde Serial Number	11833237	11638625			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	32.49	251.89			

Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	49.02	46.96			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11382329	11382329			
Insert/Sonde Serial Number	12071277	12037424			

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:
 - All 2" (1:600) logs - 1 ft. interval, 3 ft. coercion distance.
 - All 5" (1:240) logs - .5 ft. interval, .6 ft. coercion distance.
5. INSITE version 8.0.0

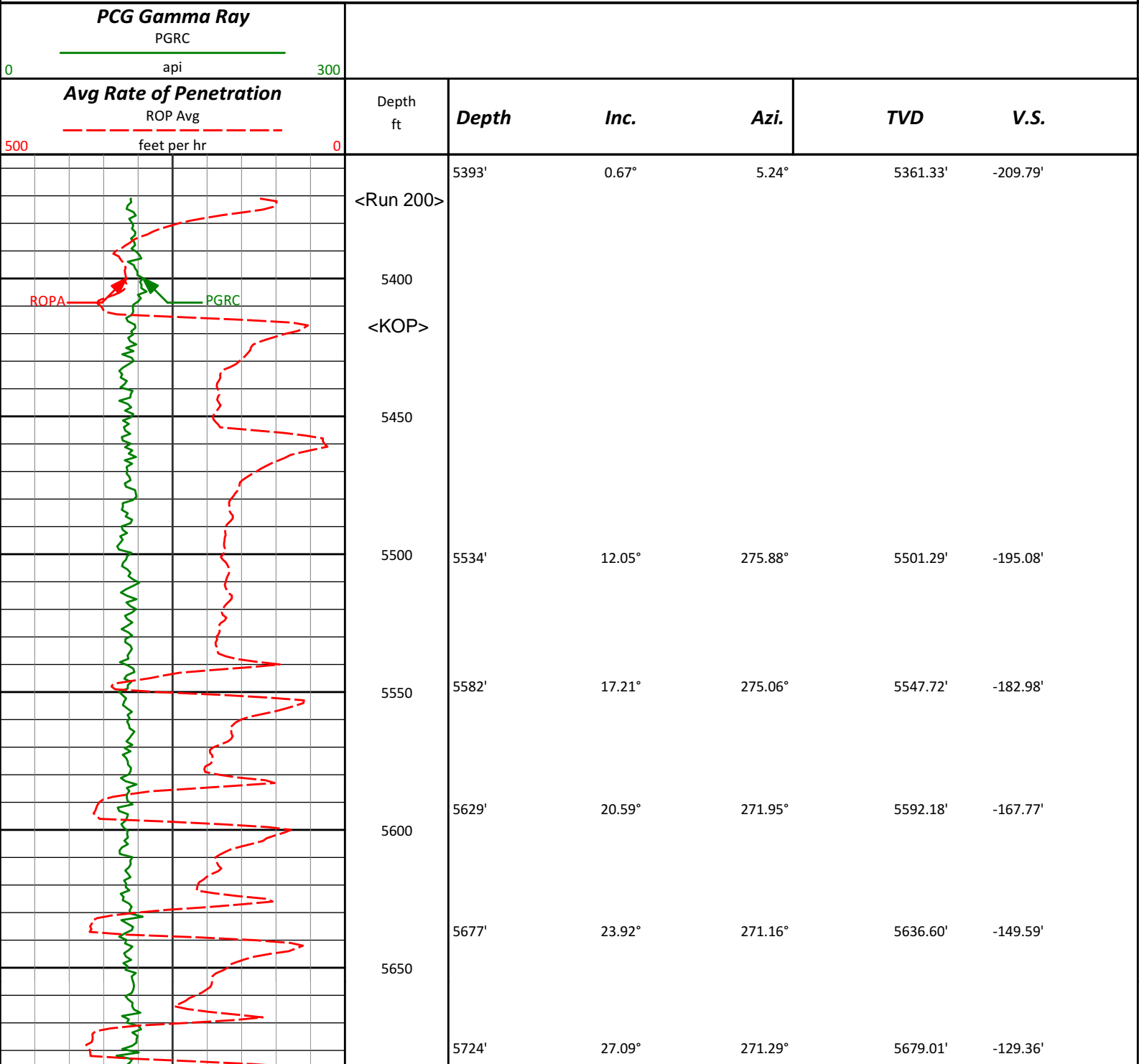
WARRANTY

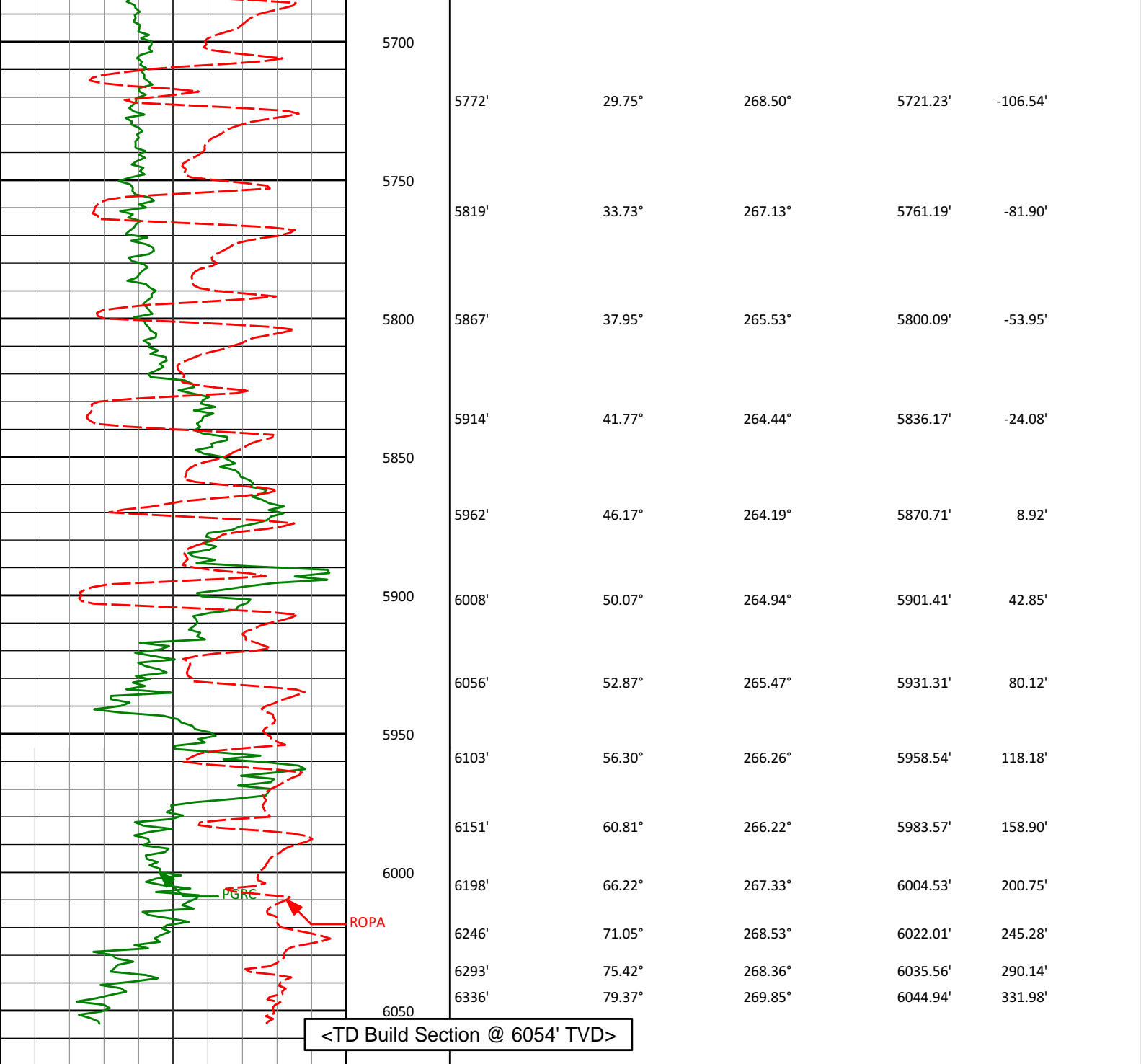
HALLIBURTON WILL USE ITS BEST EFFORTS TO FURNISH CUSTOMERS WITH ACCURATE INFORMATION AND INTERPRETATIONS THAT ARE PART OF, AND INCIDENT TO, THE SERVICES PROVIDED. HOWEVER, HALLIBURTON CANNOT AND DOES NOT WARRANT THE ACCURACY OR CORRECTNESS OF SUCH INFORMATION AND INTERPRETATIONS. UNDER NO CIRCUMSTANCES SHOULD ANY SUCH INFORMATION OR INTERPRETATION BE RELIED UPON AS THE SOLE BASIS FOR ANY DRILLING.

COMPLETION, PRODUCTION, OR FINANCIAL DECISION OR ANY PROCEDURE INVOLVING ANY RISK TO THE SAFETY OF ANY DRILLING VENTURE, DRILLING RIG OR ITS CREW OR ANY OTHER THIRD PARTY. THE CUSTOMER HAS FULL RESPONSIBILITY FOR ALL DRILLING, COMPLETION AND PRODUCTION OPERATION. HALLIBURTON MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE SERVICES RENDERED. IN NO EVENT WILL HALLIBURTON BE LIABLE FOR FAILURE TO OBTAIN ANY PARTICULAR RESULTS OR FOR ANY DAMAGES, INCLUDING, BUT NOT LIMITED TO, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, RESULTING FROM THE USE OF ANY INFORMATION OR INTERPRETATION PROVIDED BY HALLIBURTON.

HALLIBURTON
Sperry Drilling Services
TVD Detail Log 1:600

Noble Energy, Inc
Bulleit Federal PC LG04-62HN
H&P 315
T8N R59W





Avg Rate of Penetration ROP Avg 500 feet per hr 0		Depth ft	Depth	Inc.	Azi.	TVD	V.S.
--	--	-------------	--------------	-------------	-------------	------------	-------------

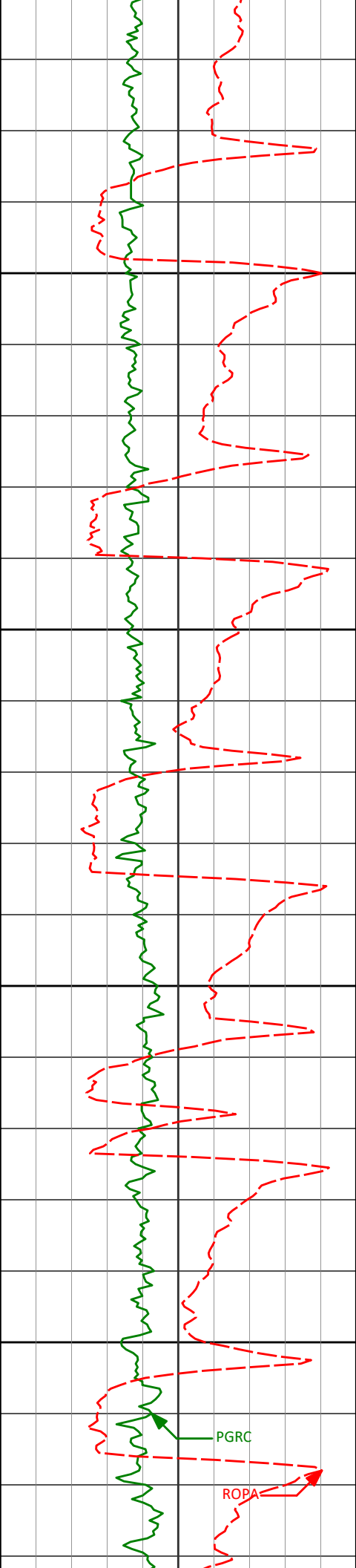
PCG Gamma Ray PGRC 0 api 300							
---	--	--	--	--	--	--	--

HALLIBURTON

Sperry Drilling Services

TVD Detail Log 1:240

Noble Energy, Inc
 Bulleit Federal PC LG04-62HN
 H&P 315
 T8N R59W



5600

5650

5700

5750

5629'

20.59°

271.95°

5592.18'

-167.77'

5677'

23.92°

271.16°

5636.60'

-149.59'

5724'

27.09°

271.29°

5679.01'

-129.36'

5772'

29.75°

268.50°

5721.23'

-106.54'

5819'

33.73°

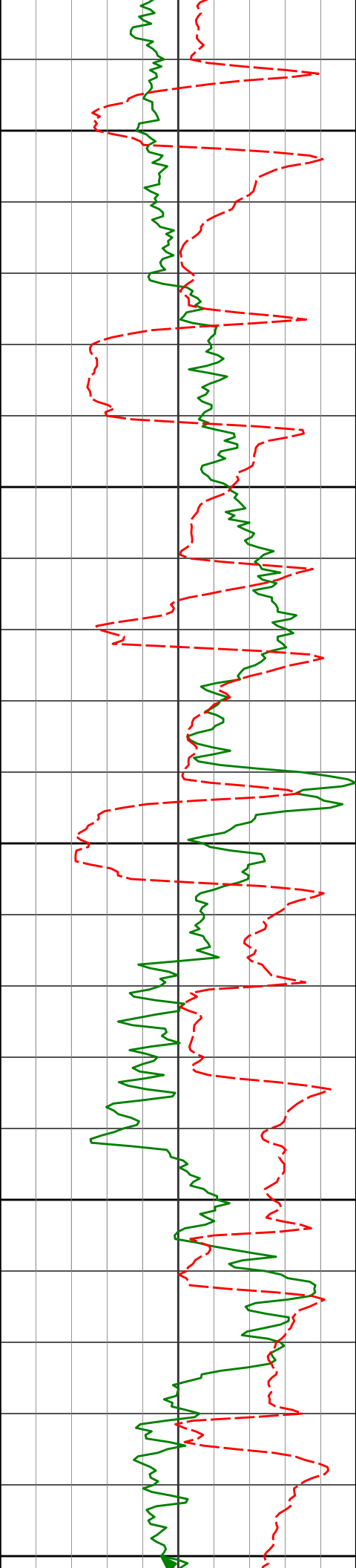
267.13°

5761.19'

-81.90'

PGRC

ROPA



5800

5867'

37.95°

265.53°

5800.09'

-53.95'

5850

5914'

41.77°

264.44°

5836.17'

-24.08'

5900

5962'

46.17°

264.19°

5870.71'

8.92'

5950

6008'

50.07°

264.94°

5901.41'

42.85'

6000

6056'

52.87°

265.47°

5931.31'

80.12'

6103'

56.30°

266.26°

5958.54'

118.18'

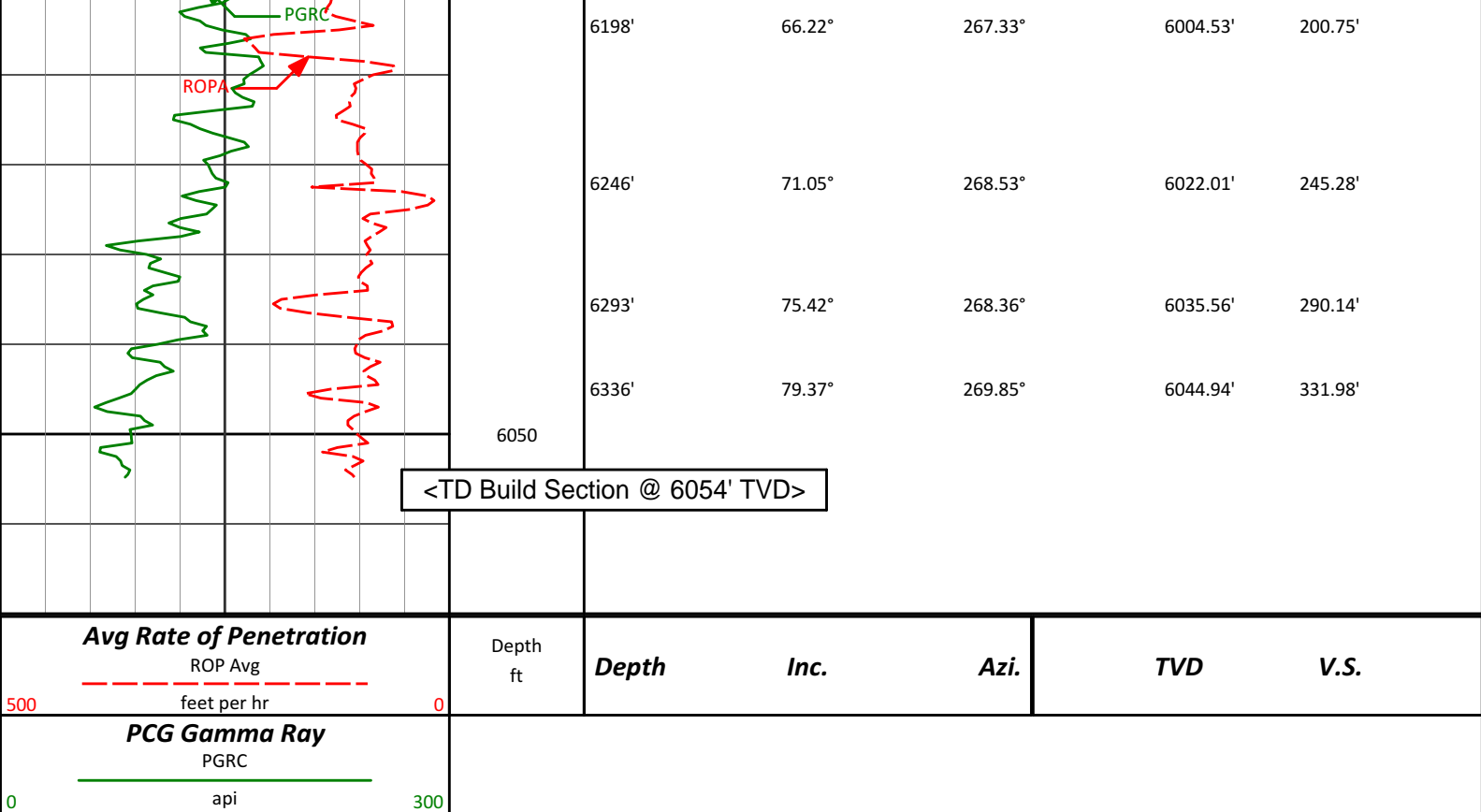
6151'

60.81°

266.22°

5983.57'

158.90'



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Bulleit Federal PC LG04-62HN
Wildcat
Weld Colorado
USA
CA-XX-0901058466

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
252.00	1.00	2.24	251.99	2.20 N	0.09 E	-0.00	0.40
515.00	0.50	129.14	514.97	3.77 N	1.07 E	-0.92	0.52
832.00	0.20	29.64	831.97	3.37 N	2.41 E	-2.28	0.18
1046.00	0.30	54.14	1045.97	4.03 N	3.05 E	-2.89	0.07
1292.00	0.60	311.24	1291.96	5.25 N	2.60 E	-2.40	0.30
1474.00	0.40	166.54	1473.96	5.26 N	2.04 E	-1.83	0.52
1554.00	0.31	195.29	1553.96	4.78 N	2.04 E	-1.86	0.25
1649.00	0.46	199.38	1648.96	4.18 N	1.85 E	-1.69	0.16
1743.00	0.44	184.43	1742.95	3.46 N	1.70 E	-1.56	0.13
1838.00	0.47	192.51	1837.95	2.72 N	1.58 E	-1.48	0.07
1933.00	0.50	190.35	1932.95	1.93 N	1.43 E	-1.35	0.04
2028.00	0.47	219.26	2027.94	1.22 N	1.10 E	-1.06	0.26
2123.00	0.52	216.06	2122.94	0.57 N	0.60 E	-0.58	0.06
2218.00	0.60	191.85	2217.94	0.27 S	0.24 E	-0.25	0.26
2313.00	0.50	203.04	2312.93	1.14 S	0.02 W	-0.02	0.15
2407.00	0.50	202.17	2406.93	1.89 S	0.33 W	0.26	0.01
2502.00	1.55	74.08	2501.92	1.92 S	0.75 E	-0.82	1.99
2597.00	3.38	38.54	2596.83	0.62 N	3.72 E	-3.70	2.42
2692.00	4.60	26.76	2691.60	6.21 N	7.18 E	-6.93	1.54
2787.00	6.38	34.72	2786.16	13.96 N	11.91 E	-11.35	2.04
2882.00	7.38	38.90	2880.48	23.05 N	18.75 E	-17.84	1.18
2977.00	8.85	39.13	2974.52	33.47 N	27.19 E	-25.87	1.55
3072.00	9.56	43.61	3068.30	44.85 N	37.25 E	-35.48	1.06
3167.00	11.16	40.54	3161.75	57.55 N	48.67 E	-46.39	1.78

3159.00	11.93	40.94	3159.00	48.00 N	48.00 E	48.00	1.70
3261.00	12.49	40.91	3253.75	72.14 N	61.23 E	-58.38	1.42
3356.00	12.73	39.94	3346.46	87.93 N	74.68 E	-71.20	0.34
3451.00	12.64	39.14	3439.14	104.02 N	87.96 E	-83.85	0.21
3546.00	13.01	38.26	3531.77	120.48 N	101.14 E	-96.38	0.44
3640.00	13.22	37.76	3623.32	137.28 N	114.27 E	-108.84	0.25
3735.00	13.03	43.79	3715.84	153.59 N	128.33 E	-122.26	1.45
3830.00	12.96	43.35	3808.41	169.07 N	143.05 E	-136.37	0.13
3925.00	12.30	45.40	3901.11	183.92 N	157.57 E	-150.29	0.83
4020.00	10.99	47.03	3994.16	197.20 N	171.40 E	-163.60	1.43
4115.00	10.94	42.09	4087.43	210.06 N	184.07 E	-175.75	0.99
4210.00	9.52	35.78	4180.92	223.12 N	194.70 E	-185.87	1.90
4305.00	7.49	35.62	4274.87	234.52 N	202.90 E	-193.62	2.14
4400.00	5.72	36.28	4369.23	243.37 N	209.31 E	-199.68	1.86
4495.00	4.92	38.38	4463.82	250.38 N	214.64 E	-204.73	0.87
4589.00	3.15	27.05	4557.59	255.83 N	218.31 E	-208.19	2.06
4684.00	2.35	12.95	4652.48	260.05 N	219.93 E	-209.65	1.10
4779.00	1.51	357.99	4747.43	263.20 N	220.32 E	-209.92	1.02
4874.00	1.21	357.10	4842.40	265.45 N	220.23 E	-209.73	0.32
4969.00	1.09	346.65	4937.38	267.33 N	219.97 E	-209.40	0.25
5064.00	0.98	1.75	5032.37	269.02 N	219.79 E	-209.15	0.31
5158.00	0.95	14.59	5126.35	270.58 N	220.01 E	-209.31	0.23
5253.00	0.70	9.84	5221.34	271.92 N	220.31 E	-209.56	0.28
5347.00	0.49	15.41	5315.34	272.88 N	220.51 E	-209.73	0.23
5393.00	0.67	5.24	5361.33	273.34 N	220.59 E	-209.79	0.45
5534.00	12.05	275.88	5501.29	275.68 N	205.97 E	-195.08	8.56
5582.00	17.21	275.06	5547.72	276.82 N	193.90 E	-182.98	10.76
5629.00	20.59	271.95	5592.18	277.71 N	178.71 E	-167.77	7.49
5677.00	23.92	271.16	5636.60	278.20 N	160.54 E	-149.59	6.96
5724.00	27.09	271.29	5679.01	278.63 N	140.31 E	-129.36	6.76
5772.00	29.75	268.50	5721.23	278.57 N	117.47 E	-106.54	6.19
5819.00	33.73	267.13	5761.19	277.61 N	92.77 E	-81.90	8.60
5867.00	37.95	265.53	5800.09	275.79 N	64.73 E	-53.95	9.00
5914.00	41.77	264.44	5836.17	273.15 N	34.74 E	-24.08	8.26
5962.00	46.17	264.19	5870.71	269.85 N	1.58 E	8.92	9.18
6008.00	50.07	264.94	5901.41	266.61 N	32.50 W	42.85	8.57
6056.00	52.87	265.47	5931.31	263.48 N	69.92 W	80.12	5.90
6103.00	56.30	266.26	5958.54	260.72 N	108.12 W	118.18	7.42
6151.00	60.81	266.22	5983.57	258.03 N	148.97 W	158.90	9.41
6198.00	66.22	266.99	6004.53	255.55 N	190.95 W	200.75	11.59
6246.00	71.05	267.99	6022.01	253.60 N	235.59 W	245.28	10.25
6293.00	75.42	267.58	6035.56	251.86 N	280.55 W	290.14	9.34
6336.00	79.37	268.60	6044.94	250.46 N	322.48 W	331.98	9.47
6371.00	82.65	269.74	6050.41	249.96 N	357.04 W	366.50	9.91
6425.00	88.00	269.70	6054.81	249.70 N	410.84 W	420.25	9.91

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 272.23 DEGREES (GRID)
A TOTAL CORRECTION OF 7.14 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 6425.00 FEET
IS 480.77 FEET ALONG 301.29 DEGREES (GRID)

Surface surveys from 252 ft - 1474 ft have had azimuths corrected to grid north, but were not taken by Halliburton.

Last survey is a projection from 6371 ft MD to TD at 6425 ft MD.