Realtime Log

Natural Formation Evaluation
Gamma Ray

BAKER HUGHES

Company: Anadarko
Well: Ralph 34C-19HZ
Field: Weld County
Region: Continental US **Country: United States**

Scale:
1:240 TVD
True Vertical Depth

Status:
Final Print

API Number:
05-123-36923

Surface Location:
Latitude: 40° 2' 35.484" N
Longitude: 104° 56' 17.470" W
Section 19 TWN: 1N Range 67W

Other Services:
Directional
VSS

Permanent Datum (P.D.): Ground Level Elevation: 5116.00 ft.
Log Measured From: Rig Floor 17.00 ft. Above P.D.
Depth Reference: Driller's Depth

Elevations:
KB: N/A
DF: 5133.00 ft.
GL: 5116.00 ft.

Interval Logged		Dates		Magnetic Field Reference	
Top:	7306.0 ft.	Date From:	12/Aug/13	Dip Angle:	66.63 ° Azi Reference North: True
Bottom:	8355.0 ft.	Date To:	14/Aug/13	Total	Mag to Reference
		Spud Date:	09/Aug/13	Field Strength: 52650.2 nT	North Correction: 8.69 °

Borehole Record			Casing Record			
Hole Size	From	To	Size	Weight	From	To
13.500 in.	Surface	921.0 ft.	9.625 in.	36.00 lb/ft	Surface	900.0 ft.
8.750 in.	921.0 ft.	8355.0 ft.				

Mud Record			Deviation Record			
Type	From	To	Hole Size	Interval	Inc / Az (Start)	Inc / Az (End)
Water Based	Surface	8355.0 ft.	13.500 in.	921.0 ft.	0.0 ° / 90.0 °	0.4 ° / 188.3 °
			8.750 in.	7476.0 ft.	0.2 ° / 126.9 °	86.5 ° / 176.9 °

Acquisition System	Software Version	Other	
Advantage	2.20U4	Rig: / Contractor:	Xtreme 6 / Xtreme Coil Services
PATS	6.4.1.34	Job No:	5460222
		District: / Unit:	RMD / D & E

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Log Run Summary

LWD Run No.	BHA Run No.	Bit Run No.	Bit Size (in.)	Bit Type	Bit Gauge Length (in.)	Assembly Type	Logged Interval Top (ft.)	Logged Interval Bottom (ft.)	Bit Depth Interval From (ft.)	Bit Depth Interval To (ft.)	Date / Time Start	Date / Time End	Circ. Time (hrs.)
1	1	2	8.750	PDC	0.750	Steerable	7306.0	8104.0	931.0	8152.0	09/Aug/2013 18:00	13/Aug/2013 03:30	55.6
2	2	3	8.750	PDC	0.750	Steerable	8104.0	8310.0	8152.0	8355.0	13/Aug/2013 05:30	14/Aug/2013 21:30	20.3

Crew

Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite
Donald Delay	10/Aug/13	20/Aug/13	Matthew Delmore	01/Aug/13	18/Aug/13	Jeremiah Davidson	18/Aug/13	20/Aug/2013
Nathan Leopold	14/Aug/13	16/Aug/13						

Mud Properties Record

Date / Time		LWD Run No.	Measured Depth (ft.)	Mud Type	Density (ppg)	Viscosity (sec/quart)	pH	Fluid Loss (bbl)	Oil / Water	Source	Total Chlorides (ppm)	K+ (%)
16/Aug/2013	09:00	3	8355.0	Water Based	9.8	42	9.0	5.4	0 / 92	Active Mud Pit	250	0.0
16/Aug/2013	15:00	3	8355.0	Water Based	9.8	42	9.0	5.4	0 / 92	Active Mud Pit	250	0.0
16/Aug/2013	21:00	3	8355.0	Water Based	9.8	41	9.0	5.4	0 / 92	Active Mud Pit	250	0.0
17/Aug/2013	09:00	3	9233.0	Water Based	9.8	48	9.5	5.9	3 / 88	Active Mud Pit	300	0.0
17/Aug/2013	11:00	3	9655.0	Water Based	9.8	45	9.2	6.0	3 / 89	Active Mud Pit	300	0.0
17/Aug/2013	11:00	3	9926.0	Water Based	9.8	42	9.2	6.0	4 / 89	Active Mud Pit	300	0.0
18/Aug/2013	23:26	3	10616.0	Water Based	9.8	43	9.0	6.0	4 / 89	Active Mud Pit	300	0.0
18/Aug/2013	23:26	3	11113.0	Water Based	9.8	44	9.0	5.9	4 / 88	Active Mud Pit	500	0.0
18/Aug/2013	23:26	3	11625.0	Water Based	9.9	44	9.0	5.9	4 / 88	Active Mud Pit	500	0.0

Mud Resistivity Record

Date / Time		LWD Run No.	Measured Depth (ft.)	Surface Temp (deg F)	Surface Rm (ohm.m)	Rmf (ohm.m)	Rmc (ohm.m)	BHCT (deg F)	Downhole Rm @ BHCT (ohm.m)	Rmf @ BHCT (ohm.m)	Rmc @ BHCT (ohm.m)
16/Aug/2013	12:36	3	8355.0	75	1.00	N/A	N/A	125	0.61	N/A	N/A
16/Aug/2013	23:22	3	8376.0	73	0.84	N/A	N/A	183	0.35	N/A	N/A
17/Aug/2013	03:21	3	8662.0	68	0.88	N/A	N/A	188	0.33	N/A	N/A
17/Aug/2013	14:33	3	9511.0	72	1.01	N/A	N/A	294	0.26	N/A	N/A
18/Aug/2013	03:15	3	10450.0	73	1.14	N/A	N/A	215	0.40	N/A	N/A
18/Aug/2013	14:01	3	11016.0	73	1.03	N/A	N/A	218	0.36	N/A	N/A
18/Aug/2013	23:14	3	11730.0	78	1.12	N/A	N/A	228	0.40	N/A	N/A

Mnemonics

Curve	Description	Units
GRAX	Gamma Ray Apparent, 0.5 ft. Avg	API
ROPA	Rate of Penetration, 3.0 ft. Avg	ft/hr
TCDX	Downhole Temperature	degF
WOBA	Surface Weight on Bit, 1.0 ft. Avg	klbs

Equipment and Service Data

LWD Run No.	Tool	Serial Number	Measurement	Bit Offset (ft.)	Max O.D. (in.)	Min I.D. (in.)
1	DIR	11730418	Directional	46.98	6.750	2.750
1	SRIG	12722372	Gamma	43.60	6.750	2.750
2	DIR	11730418	Directional	43.67	6.750	2.750
2	SRIG	12722372	Gamma	40.30	6.750	2.750
3	CS	12187052	-	73.67	4.843	2.569
3	BCPM	11904944	Telemetry	62.66	4.843	2.569
3	STAB	11863323	-	59.34	5.625	2.569
3	OTK	11805184	Directional	54.83	4.843	2.569
3	OTK	11805184	Resistivity	48.86	4.843	2.569
3	OTK	11805184	Gamma	41.67	4.843	2.569
3	OTK	11805184	Pressure	44.30	4.843	2.569
3	CS	12202693	-	36.54	4.843	2.569

Service and Tool Mnemonics

Mnemonic	Name	Description
BCPM	BCPM	Mud pulse telemetry and downhole tool power module
DIR	Directional	Wellbore directional survey
OTK	OnTrak	Propagation resistivity, propagation conductivity, gamma ray, directional, annular pressure, system memory and VSS
SRIG	Inclination and Gamma	Probe based gamma ray and inclination module
STAB	Stabilizer	Stabilizer assembly
CS	Closure Sub	BHA power ring isolator allowing insertion of inert sub into electrically powered BHA

Comments

1. Baker Hughes INTEQ run 1 utilized 6 3/4 inch NaviTrak and NaviGamma Services. Navitrak Services (VSS, Directional) were provided behind an 8 3/4 inch bit and steerable assembly from 931 to 7356 feet MD (930.91 to 7217.56 feet TVD.). NaviGamma Services (VSS, Directional, Gamma Ray) were provided behind an 8 3/4 inch bit and steerable assembly from 7356 to 8152 feet MD (7217.56 to 7795.72 feet TVD).

2. Baker Hughes INTEQ run 2 utilized 6 3/4 inch NaviGamma Services (VSS, Directional, Gamma Ray) behind an 8 3/4 inch bit and steerable assembly from 8152 to 8355 feet MD (7795.72 to 7830.52 feet TVD).

3. Depth Measurements were obtained from a depth tracking system not supplied or operated by Baker Hughes. Due to the lack of control by Baker Hughes LWD logging engineers, depth calibrations and measurements could not be independently verified and the unverified depths as supplied to Baker Hughes are being used to present logging data.

BAKER HUGHES

Company : Anadarko
Well : Ralph 34C-19HZ
Interval : 7155.00 - 7910.00 feet
Created : 19/Aug/2013 1:22:15 PM

Gamma Ray Apparent 0.5 ft Avg GRAX
0
150
API
TVD feet 1:240
Rate of Penetration 3.0 ft Avg ROP_AVG
200
0
ft/hr
Surface Weight On Bit 1.0 ft Avg WOB_AVG
0
100
klbf
Downhole Temperature TCDX
100
200
degF
GRAX
ROPA
WOBA
TCDX
7200
7300
7400
7500
7600
7700
7800
7900

ADVANTAGE Final Survey Listing

Operator	: Anadarko	Field	: Weld County
Well	: Ralph 34C-19HZ	Rig	: Xtreme 6
Wellbore	: Ralph 34C-19HZ Orig Hole		

API No : 05-123-36923-0
Job : 5460222

Well Origin

Latitude	40.0432 deg	Longitude	-104.9382 deg
North Reference	True	Drill Depth Zero	Rig Floor
Vertical Datum is	Ground Level	Vertical Datum to DDZ	17.00 ft
Vertical Section North	0.00 ft	Vertical Section East	0.00 ft
Vertical Section Azimuth	180.2500 deg	Vertical Section Depth	0.00ft
Grid Convergence	0.0000 deg	Magnetic Declination	8.6941 deg
Total Correction	8.6941 deg	TVD Calculation Method	Minimal Curvature
D-Raw Calculation	Magcorr1	Local Magnetic Field	52650 nT
Local Magnetic Dip Angle	66.6297 deg	Local Gravity Field	9.801 m/s^2

Tie	MD ft	Incl deg	Azim deg	North ft	East ft	TVD ft	VS ft	Incr VS ft	Crs Len ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft
	0.00	0.0000	0.0000	0.00	0.00	0.00	0.00	0.00				
U	846.00	0.4400	188.3500	-0.17	10.75	845.91	3.22	3.22	846.00	0.05	0.05	-20.29
	963.00	1.0000	47.1400	0.08	11.43	962.90	-0.13	3.94	117.00	1.17	0.48	-120.69
	1053.00	1.3700	355.1000	1.69	11.92	1052.89	-1.74	5.62	90.00	1.21	0.41	-57.82
	1144.00	1.9000	326.0300	4.02	10.98	1143.85	-4.07	8.14	91.00	1.06	0.58	-31.95
	1235.00	2.8900	286.2100	5.91	7.94	1234.78	-5.95	11.72	91.00	2.06	1.09	-43.76
	1326.00	4.5500	277.1900	7.01	2.15	1325.58	-7.01	17.61	91.00	1.93	1.82	-9.91
	1503.00	7.8200	282.0900	10.41	-16.59	1501.53	-10.33	36.66	177.00	1.87	1.85	2.77
	1672.00	10.7300	275.1100	14.22	-43.51	1668.31	-14.03	63.85	169.00	1.84	1.72	-4.13
	1843.00	13.0200	277.4500	18.13	-78.47	1835.64	-17.79	99.03	171.00	1.37	1.34	1.37
	2013.00	12.9500	277.2300	23.01	-116.36	2001.29	-22.51	137.22	170.00	0.05	-0.04	-0.13
	2183.00	14.6800	278.0700	28.44	-156.59	2166.37	-27.75	177.81	170.00	1.02	1.02	0.49
	2351.00	13.8300	280.1800	34.97	-197.43	2329.19	-34.11	219.18	168.00	0.59	-0.51	1.26
	2521.00	13.3400	277.3300	41.07	-236.88	2494.44	-40.03	259.09	170.00	0.49	-0.29	-1.68
	2691.00	14.2400	275.3900	45.53	-277.15	2659.54	-44.32	299.61	170.00	0.60	0.53	-1.14
	2861.00	14.7300	274.5500	49.21	-319.51	2824.13	-47.82	342.13	170.00	0.31	0.29	-0.49
	3031.00	13.9900	275.5300	52.91	-361.51	2988.82	-51.33	384.29	170.00	0.46	-0.44	0.58
	3202.00	13.5400	276.1300	57.04	-401.98	3154.91	-55.28	424.98	171.00	0.28	-0.26	0.35
	3372.00	14.9100	290.8800	66.96	-442.22	3319.75	-65.03	466.42	170.00	2.27	0.81	8.68
	3542.00	11.7600	285.9200	79.51	-479.32	3485.15	-77.42	505.59	170.00	1.97	-1.85	-2.92
	3710.00	13.0300	291.6100	91.18	-513.40	3649.24	-88.94	541.61	168.00	1.05	0.76	3.39
	3881.00	14.3400	289.9000	105.49	-551.23	3815.38	-103.08	582.06	171.00	0.80	0.77	-1.00
	4052.00	15.0800	287.6600	119.45	-592.34	3980.77	-116.86	625.47	171.00	0.55	0.43	-1.31
	4223.00	14.5600	282.8400	130.97	-634.50	4146.09	-128.20	669.17	171.00	0.78	-0.30	-2.82
	4393.00	14.5800	280.8500	139.75	-676.35	4310.63	-136.80	711.93	170.00	0.29	0.01	-1.17
	4564.00	16.0100	278.5800	147.32	-720.80	4475.57	-144.17	757.03	171.00	0.91	0.84	-1.33
	4735.00	14.0600	280.8900	154.76	-764.52	4640.71	-151.42	801.38	171.00	1.19	-1.14	1.35
	4906.00	16.0800	283.0100	164.02	-808.00	4805.82	-160.49	845.83	171.00	1.22	1.18	1.24
	5076.00	14.9000	283.2600	174.33	-852.21	4969.64	-170.61	891.23	170.00	0.70	-0.69	0.15
	5247.00	13.6400	276.1400	181.53	-893.66	5135.37	-177.63	933.30	171.00	1.26	-0.74	-4.16
	5417.00	15.1200	283.6200	188.90	-935.15	5300.06	-184.81	975.43	170.00	1.40	0.87	4.40
	5588.00	14.2200	278.9300	197.41	-977.57	5465.49	-193.14	1018.71	171.00	0.87	-0.53	-2.74
	5757.00	12.1900	277.1800	202.86	-1015.78	5630.01	-198.43	1057.30	169.00	1.22	-1.20	-1.04
	5928.00	12.2100	281.2300	208.64	-1051.43	5797.15	-204.05	1093.42	171.00	0.50	0.01	2.37
	6098.00	10.7100	282.0700	215.44	-1084.52	5963.76	-210.71	1127.19	170.00	0.89	-0.88	0.49
	6269.00	7.3000	281.5900	220.95	-1110.70	6132.63	-216.10	1153.95	171.00	1.99	-1.99	-0.28
	6440.00	4.4200	278.2600	224.08	-1127.87	6302.71	-219.16	1171.40	171.00	1.70	-1.68	-1.95
	6611.00	2.7400	286.4400	226.18	-1138.31	6473.38	-221.22	1182.06	171.00	1.02	-0.98	4.78
	6781.00	2.6900	315.2500	230.17	-1145.02	6643.19	-225.17	1189.86	170.00	0.79	-0.03	16.95
	6952.00	4.3300	349.7000	239.37	-1149.00	6813.88	-234.36	1199.88	171.00	1.52	0.96	20.15
	7123.00	0.6500	228.0500	245.08	-1150.88	6984.73	-240.05	1205.89	171.00	2.75	-2.15	-71.14
	7294.00	2.4200	190.2500	240.88	-1152.24	7155.66	-235.85	1210.31	171.00	1.14	1.04	-22.11
	7379.00	4.9900	182.5300	235.42	-1152.72	7240.48	-230.38	1215.79	85.00	3.07	3.02	-9.08
	7422.00	10.8200	179.8300	229.51	-1152.79	7283.05	-224.47	1221.70	43.00	13.58	13.56	-6.28
	7464.00	16.1400	177.9400	219.72	-1152.57	7323.88	-214.69	1231.48	42.00	12.71	12.67	-4.50
	7507.00	20.7000	181.7800	206.15	-1152.59	7364.67	-201.12	1245.06	43.00	10.97	10.60	8.93
	7550.00	22.4500	182.1600	190.34	-1153.14	7404.66	-185.31	1260.87	43.00	4.08	4.07	0.88
	7592.00	24.9700	183.6300	173.48	-1154.00	7443.11	-168.44	1277.76	42.00	6.16	6.00	3.50
	7635.00	28.8700	181.2500	154.04	-1154.80	7481.44	-149.00	1297.22	43.00	9.41	9.07	-5.53
	7676.00	33.1800	180.4400	131.88	-1155.12	7516.28	-126.84	1319.37	43.00	10.07	10.02	-1.88
	7721.00	36.3700	177.8200	107.37	-1154.73	7553.60	-102.33	1343.89	43.00	8.19	7.42	-6.09
	7763.00	39.9700	176.6900	81.45	-1153.47	7586.61	-76.41	1369.84	42.00	8.73	8.57	-2.69
	7806.00	42.7700	176.8800	53.08	-1151.88	7618.88	-48.05	1398.26	43.00	6.52	6.51	0.44
	7849.00	47.6100	177.5400	22.61	-1150.40	7649.18	-17.59	1428.76	43.00	11.31	11.26	1.53
	7891.00	52.1300	178.4600	-9.47	-1149.29	7676.24	14.48	1460.86	42.00	10.89	10.76	2.19
	7934.00	56.3700	180.1300	-44.36	-1148.88	7701.36	49.37	1495.75	43.00	10.35	9.86	3.88
	7977.00	60.2400	180.1900	-80.93	-1148.98	7723.95	85.95	1532.33	43.00	9.00	9.00	0.14
	8019.00	64.9800	180.6400	-118.21	-1149.25	7743.26	123.23	1569.61	42.00	11.33	11.29	1.07
	8062.00	65.8500	181.3700	-157.31	-1149.94	7761.15	162.33	1608.71	43.00	2.54	2.02	1.70
	8105.00	67.1000	181.3500	-196.72	-1150.87	7778.32	201.74	1648.13	43.00	2.91	2.91	-0.05
	8139.00	68.6800	181.6400	-228.21	-1151.70	7791.11	233.23	1679.63	34.00	4.71	4.65	0.85
	8182.00	72.2500	181.9600	-268.71	-1152.97	7805.49	273.74	1720.15	43.00	8.33	8.30	0.74
	8225.00	77.0800	183.5200	-310.12	-1154.96	7816.86	315.15	1761.61	43.00	11.76	11.23	3.63
	8267.00	82.1400	179.8600	-351.39	-1156.16	7824.43	356.43	1802.90	42.00	14.78	12.05	-8.71
	8310.00	86.5100	176.9300	-394.15	-1154.96	7828.68	399.18	1845.67	43.00	12.22	10.16	-6.81
	8389.00	90.5500	178.0800	-473.03	-1151.53	7830.71	478.05	1924.63	79.00	5.32	5.11	1.46
	8518.00	90.6400	179.6000	-601.99	-1148.91	7829.37	607.00	2053.62	129.00	1.18	0.07	1.18
	8688.00	89.2900	179.4300	-771.98	-1147.48	7829.47	776.98	2223.61	170.00	0.80	-0.79	-0.10
	8859.00	89.2900	179.2500	-942.96	-1145.51	7831.59	947.95	2394.60	171.00	0.11	0.00	-0.11
	9030.00	88.4600	178.7500	-1113.90	-1142.52	7834.95	1118.87	2565.56	171.00	0.57	-0.49	-0.29
	9201.00	87.3700	178.9300	-1284.75	-1139.06	7841.17	1289.70	2736.45	171.00	0.65	-0.64	0.11
	9371.00	88.6100	180.5100	-1454.63	-1138.23	7847.13	1459.58	2906.34	170.00	1.18	0.73	0.93
	9542.00	91.1100	181.7500	-1625.58	-1141.61	7847.55	1630.55	3077.32	171.00	1.63	1.46	0.73
	9712.00	91.6200	181.4100	-1795.47	-1146.29	7843.50	1800.45	3247.27	170.00	0.36	0.30	-0.20
	9884.00	88.3000	181.0700	-1967.40	-1150.01	7843.62	1972.40	3419.24	172.00	1.94	-1.93	-0.20
	10052.00	88.7000	181.2500	-2135.31	-1153.41	7848.02	2140.32	3587.19	168.00	0.26	0.24	0.11
	10223.00	88.8600	182.0400	-2306.20	-1158.32	7851.66	2311.23	3758.15	171.00	0.47	0.09	0.46
	10394.00	88.7000	180.5500	-2477.11	-1162.18	7855.30	2482.16	3929.10	171.00	0.88	-0.09	-0.87
	10564.00	88.5800	180.9300	-2647.05	-1164.38	7859.34	2652.10	4099.05	170.00	0.23	-0.07	0.22
	10735.00	91.8400	180.3500	-2818.01	-1166.29	7858.71	2823.07	4270.03	171.00	1.94	1.91	-0.34
	10906.00	91.1300	180.4900	-2988.95	-1167.54	7854.28	2994.02	4440.97	171.00	0.42	-0.42	0.08
	11077.00	88.6300	179.7100	-3159.93	-1167.84	7854.64	3165.00	4611.96	171.00	1.53	-1.46	-0.46
	11247.00	89.7800	180.3000	-3329.91	-1167.86	7857.00	3334.98	4781.94	170.00	0.76	0.68	0.35
	11418.00	89.7500	180.9600	-3500.90	-1169.74	7857.70	3505.97	4952.93	171.00	0.39	-0.02	0.39
	11589.00	89.7500	180.6600	-3671.88	-1172.15	7858.44	3676.96	5123.93	171.00	0.18	0.00	-0.18
	11759.00	89.8400	180.7700	-3841.87	-1174.27	7859.05	3846.96	5293.93	170.00	0.08	0.05	0.06
	11930.00	89.2900	181.0000	-4012.84	-1176.92	7860.35	4017.94	5464.92	171.00	0.35	-0.32	0.13
	12101.00	88.2400	180.0400	-4183.79	-1178.47	7864.04	4188.89	5635.88	171.00	0.83	-0.61	-0.56
	12272.00	89.5600	180.1900	-4354.76	-1178.81	7867.32	4359.86	5806.85	171.00	0.78	0.77	0.09
	12340.00	90.2400	180.3200	-4422.75	-1179.11	7867.44	4427.86	5874.84	68.00	1.02	1.00	0.19
Projection to TD:	12396.00	90.2400	180.3200	-4478.75	-1179.43	7867.20	4483.86	5930.84	56.00	0.00	0.00	0.00