



Realtime Log

Natural Formation Evaluation
Gamma Ray

Scale: 1:240 True Vertical Depth

Company: Kerr-McGee oil & Gas Onshore LP

Well: Bella Federal 23N-7HZ

Field: Weld county (Kerr-McGee)

Region: RMA Country: United States

Status: Final Print Surface Location: Latitude: 40° 14' 16.181" N Longitude: 104° 48' 6.754" W

API Number: 051233744100

Section8 TWN: 3N Range66E

Other Services:
Directional
VSS

Permanent Datum (P.D.): Ground Level Elevation: 4876.00 ft.

Log Measured From: Drill Floor 13.00 ft. Above P.D.

Depth Reference: Driller's Depth Elevations: KB: N/A DF: 4876.00 ft. GL: 4863.00 ft.

Interval Logged

Dates

Magnetic Field Reference

Top: 6483 ft. Date From: 28/Jul/13 Date To: 30/Jul/14 Dip Angle: 66.88 ° Az Reference North: True

Bottom: 7549 ft. Date To: 30/Jul/14 Total Mag to Reference

Spud Date: 28/Jul/13 Field Strength: 52663.0 nT North Correction: 8.56 °

Borehole Record

Casing Record

Hole Size	From	To	Size	Weight	From	To
13.500 in.	Surface	922 ft.	9.625 in.	36.00 lb/ft	Surface	922 ft.
8.750 in.	922 ft.	7616 ft.	7.000 in.	26.00 lb/ft	Surface	7606 ft.

Mud Record

Deviation Record

Type	From	To	Hole Size	Interval	Inc / Az (Start)	Inc / Az (End)
Water Based - Fresh	922 ft.	7616 ft.	13.500 in.	922 ft.	0.1 ° / 243.1 °	0.4 ° / 11.0 °
			8.750 in.	6694 ft.	1.1 ° / 194.0 °	87.1 ° / 270.4 °
					/	/
					/	/
					/	/
					/	/
					/	/

Acquisition System Software Version

Other

Advantage	2.20U4	Rig: / Contractor:	Ensign 138	/ Ensign Drilling
PATS	6.4.1.34	Job No:	5589811	
		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		Bit Depth Interval		Date / Time				Circ. Time (hrs.)
							Top (ft.)	Bottom (ft.)	From (ft.)	To (ft.)	Start		End		
1	2	2	8.750	PDC	2.500	Steerable	3612	6548	922	3668	28/Jul/2013 21:51	29/Jul/2013 10:28		11.27	
2	2	2	8.750	PDC	2.500	Steerable	6548	7549	3668	7616	30/Jul/2013 06:38	31/Jul/2013 01:30		22.15	

Crew

Name	Arrive	Depart	Name	Arrive	Depart	Name	Arrive	Depart
	Wellsite	Wellsite		Wellsite	Wellsite		Wellsite	Wellsite
David Campbell	Jul 28 2013	Jul 31 2013	Dave Belek	Jul 28 2013	Jul 31 2013	Will Drake	Jul 28 2013	Jul 30 2013
Bill Herbers	Jul 28 2013	Jul 31 2013	Robert Bartlett	Jul 30 2013	Jul 31 2013			

Mud Properties Record

Date / Time		LWD Run No.	Measured Depth (ft.)	Mud Type	Density (sg)	Viscosity (cp)	pH	Fluid Loss (cc)	Oil / Water	Source	Total Chlorides (ppm)	K+ (%)
28/Jul/2013	23:39	1	896	Water Based - Fresh	8.4	28	9.5	26.0	0 / 99	Active Mud Pit	800	0.0
29/Jul/2013	09:00	2	2957	Water Based - Fresh	8.4	27	8.3	33.0	0 / 99	Active Mud Pit	800	0.0
29/Jul/2013	21:00	2	3939	Water Based - Fresh	8.4	27	8.3	34.0	0 / 99	Active Mud Pit	600	0.0

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.	klbf

Equipment and Service Data

LWD Run No.	Tool	Serial Number	Measurement	Bit Offset (m.)	Max O.D. (in.)	Min I.D. (in.)
1	DIR	12546374	Directional	63.15	6.750	0.000
1	SRIG	12595025	Gamma	59.78	6.750	0.000
2	DIR	10508935	Directional	63.81	6.750	0.000
2	SRIG	11703934	Gamma	60.44	6.750	0.000

Service and Tool Mnemonics

Mnemonic	Name	Description
DIR	Directional	Wellbore directional survey
SRIG	Inclination and Gamma	Probe based gamma ray and inclination module

Comments

1.) Depth measurements obtained from a depth control system not supplied or operated by Baker Hughes. Due to the lack of control by Baker Hughes logging engineers, depth calibrations and measurements could not be independently verified.
3.) Baker Hughes runs 1 & 2 utilized 6 3/4 inch NaviGamma services (Gamma Ray and Directional) behind an 8 3/4 inch bit and steerable assembly from 922 to 7616 feet MD (922 to 7144 feet TVD).
5.) The interval from 922 to 6548 feet MD (922 to 6483 feet TVD) was not logged due to directional only services being provided through the straight-hole and nudge section for Baker Hughes runs 1 and 2.

Remarks

Number	Measured Depth (m.)	Hole Section (in.)	LWD Run No.	Remark
1	6548	8.750	2	Begin logging due to directional only service provided thru vertical section.



Company : Kerr-McGee oil & Gas Onshore LP

Well : Bella Federal 23N-7HZ

Interval : 6440.00 - 7200.00 feet

Created : 30/Jul/2013 5:15:04 PM

Gamma Ray Apparent 0.5 ft Avg [GRAX]

0 150

API

TVD feet 1:240 6440

6460

6480

6500

6520

6540

6560

6580

6600

Rate of Penetration 3.0 ft Avg [ROPA]

1000 0

ft/hr

Surface Weight On Bit 1.0 ft Avg [WOBA]

0 100

klbf

Downhole Temperature [TCDX]

150 350

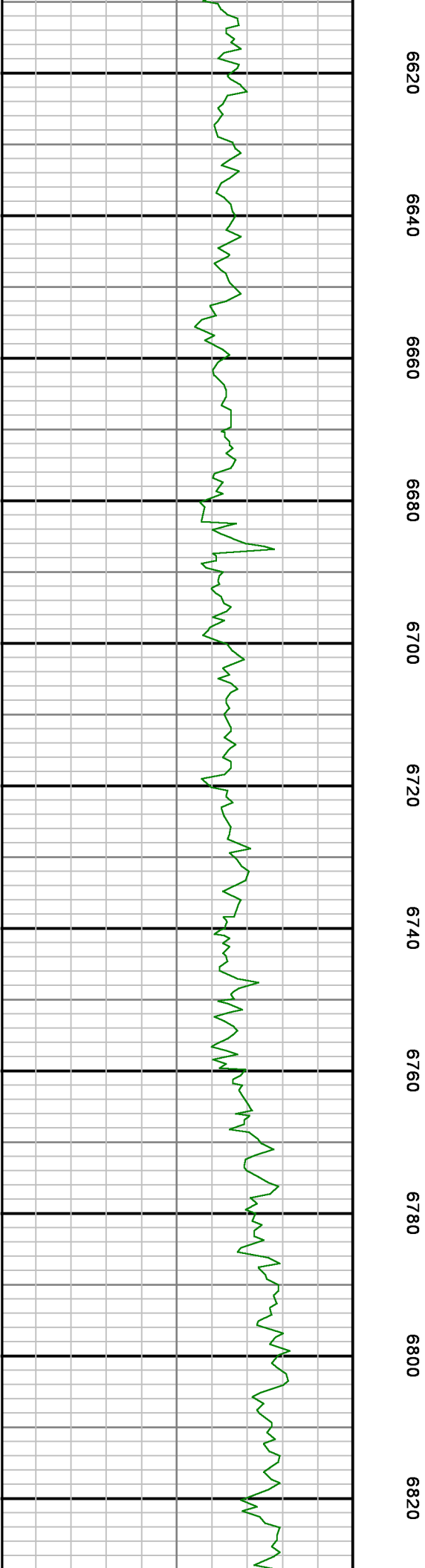
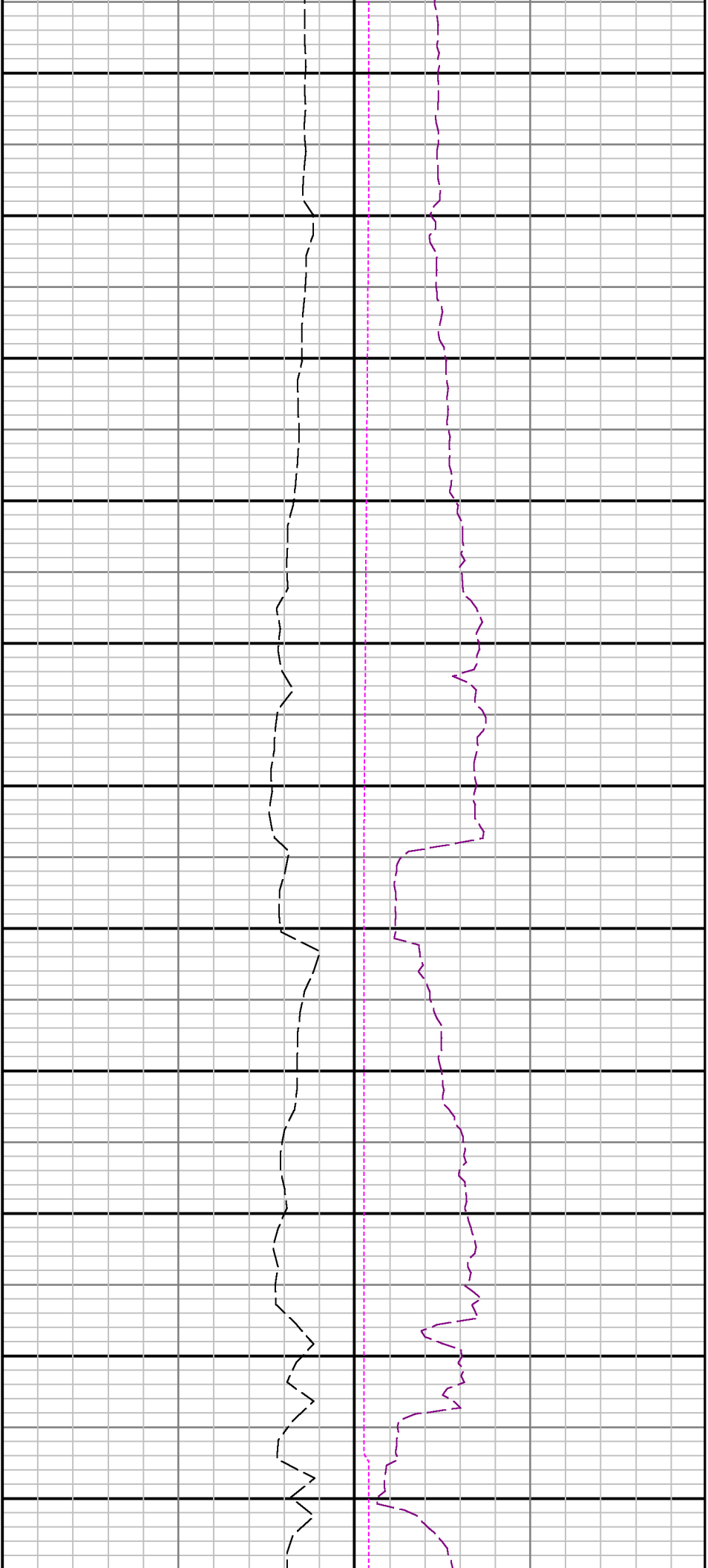
degF

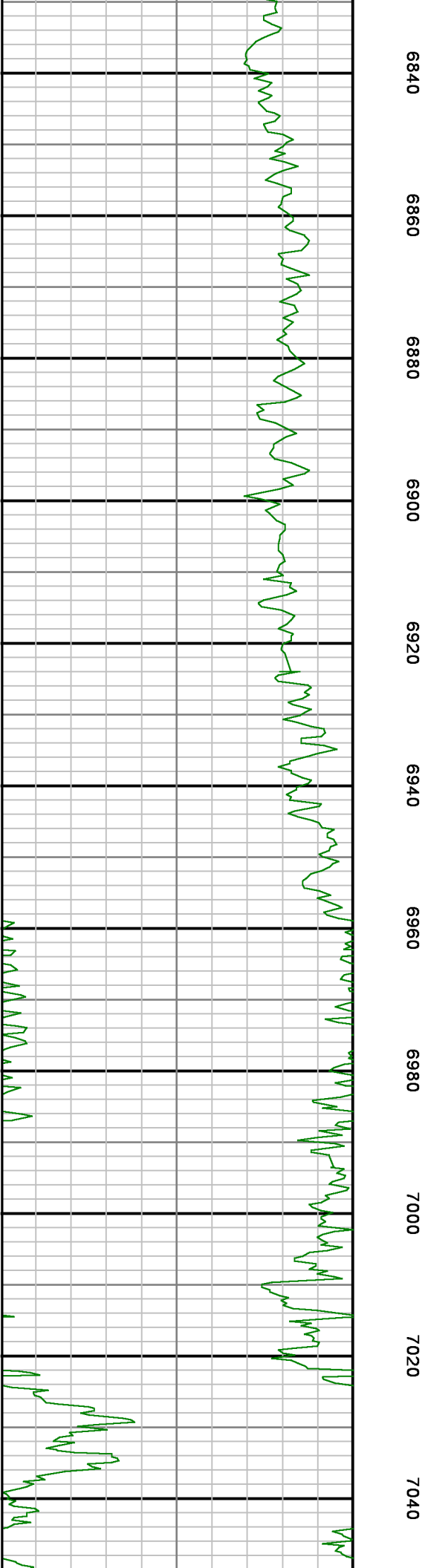
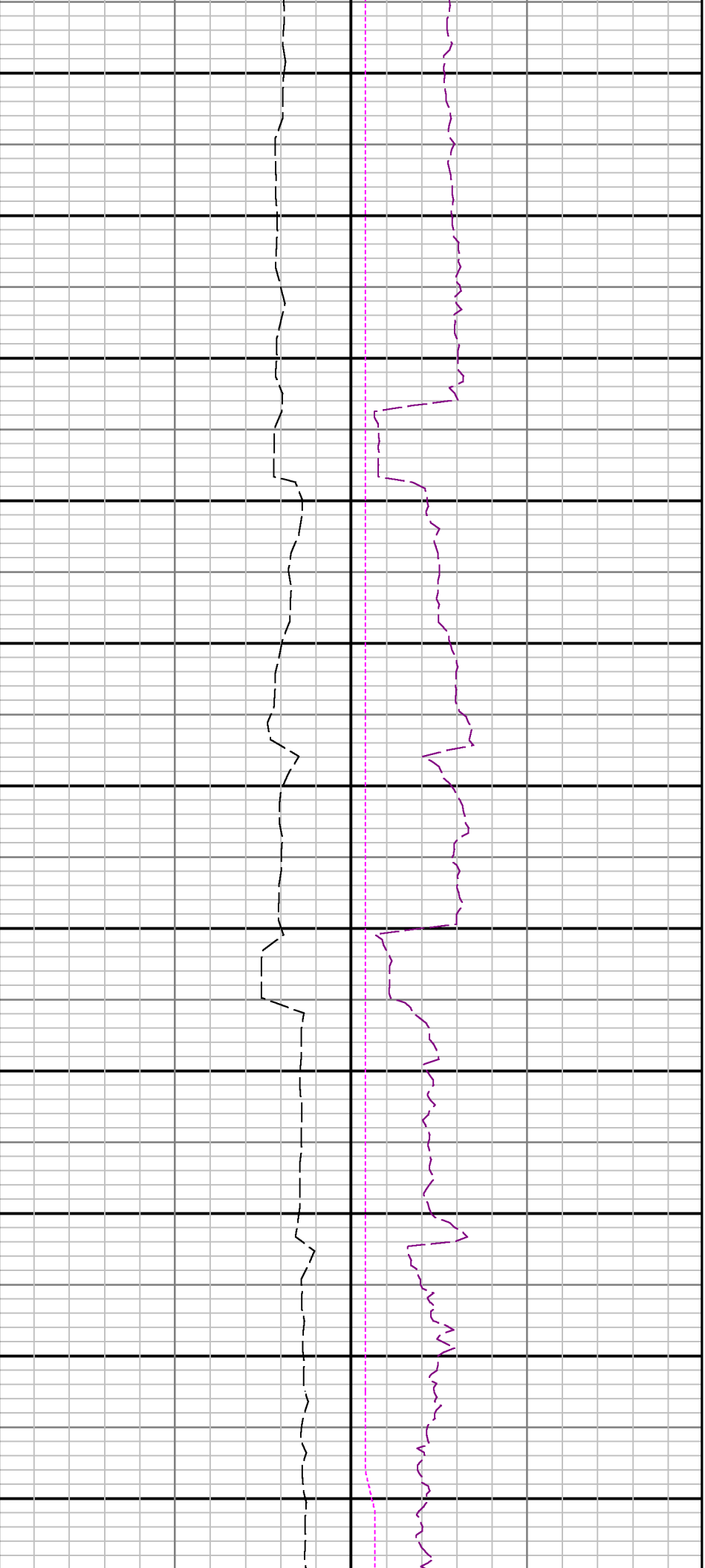
GRAX

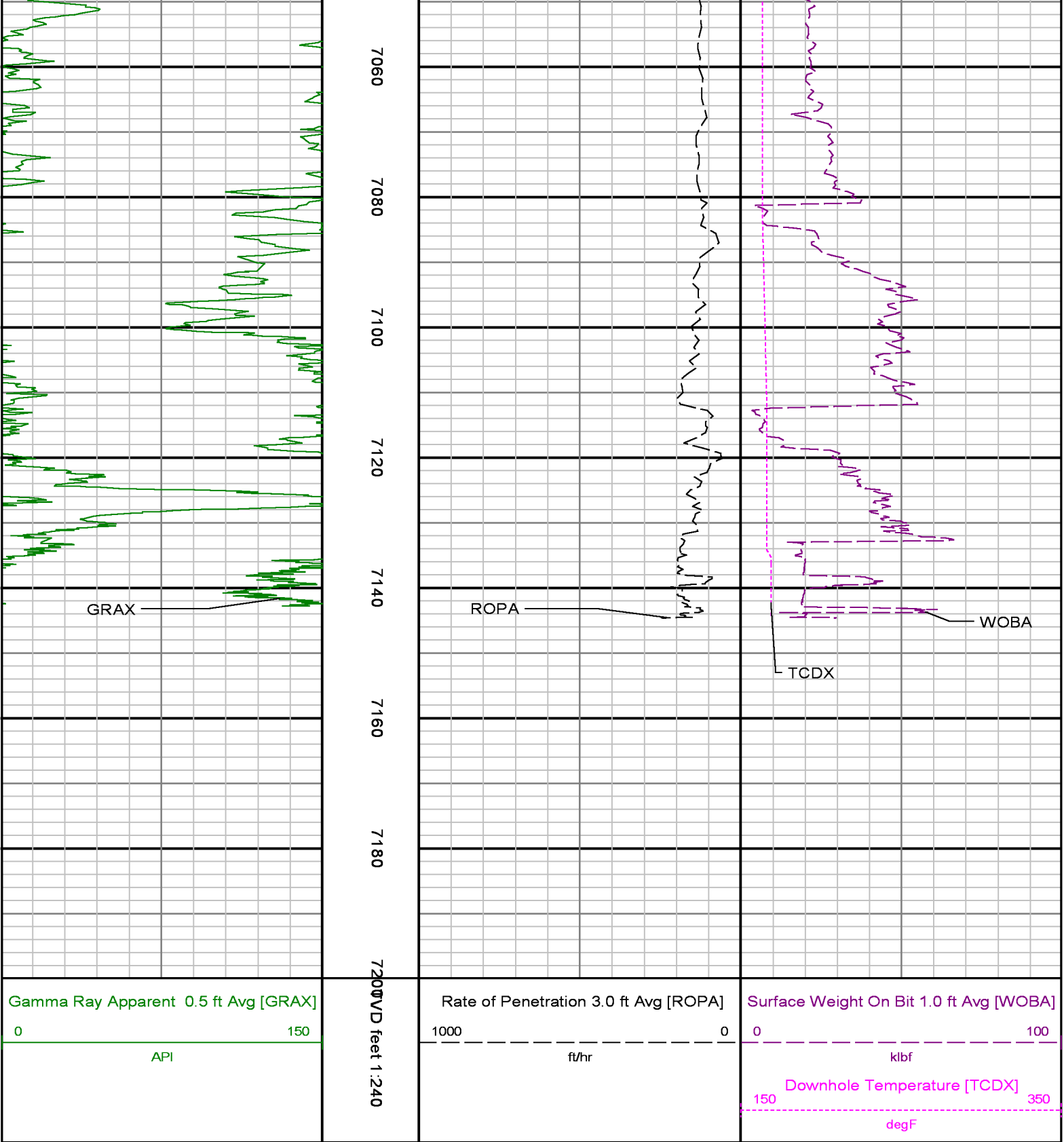
ROPA

TCDX

WOBA







ADVANTAGE Field Survey Listing

Operator	: Kerr-McGee oil & Gas Onshore LP Field	Field	: Weld county (Kerr-McGee)	API No	: 051233744100
Well	: Bella Federal 23N-7HZ	Rig	: Ensign 138	Job	: 5589811
Wellbore	: Bella Federal 23N-7HZ Orig Hole				

Well Origin

Latitude	40.24 deg	Longitude	-104.80 deg
North Reference	True	Drill Depth Zero	NULL

Vertical Datum is				Ground Level		Vertical Datum to DDZ				13.00 ft		
Vertical Section North				0.00 ft		Vertical Section East				0.00 ft		
Vertical Section Azimuth				271.15 deg		Vertical Section Depth				0.00ft		
Grid Convergence				0.00 deg		Magnetic Declination				8.54 deg		
Total Correction				8.54 deg		TVD Calculation Method				Minimal Curvature		
D-Raw Calculation				None		Local Magnetic Field				52665 nT		
Local Magnetic Dip Angle				66.89 deg		Local Gravity Field				9.798 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	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
	13.00	0.00	243.12	0.00	0.00	13.00	0.00	0.00	13.00	0.00	0.00	-899.08
	113.00	0.10	243.12	-0.04	-0.08	113.00	0.08	0.09	100.00	0.10	0.10	0.00
	213.00	0.19	333.65	0.07	-0.23	213.00	0.23	0.27	100.00	0.22	0.09	90.53
	313.00	0.40	63.34	0.37	0.01	313.00	-0.00	0.66	100.00	0.44	0.21	89.69
	413.00	0.29	130.50	0.37	0.51	413.00	-0.51	1.17	100.00	0.39	-0.11	67.16
	513.00	0.59	120.05	-0.06	1.15	512.99	-1.15	1.93	100.00	0.31	0.30	-10.45
	613.00	0.60	9.69	0.20	1.69	612.99	-1.68	2.52	100.00	0.98	0.01	-110.36
	713.00	0.44	358.46	1.10	1.76	712.99	-1.74	3.43	100.00	0.19	-0.16	-11.23
U	813.00	0.41	10.95	1.84	1.82	812.98	-1.78	-1.78	100.00	0.10	-0.03	12.49
	931.00	1.10	194.00	1.15	1.63	930.98	-1.60	-1.07	118.00	1.28	0.58	-149.96
	1022.00	1.80	166.30	-1.08	1.75	1021.95	-1.78	1.17	91.00	1.07	0.77	-30.44
	1114.00	3.80	158.30	-5.32	3.22	1113.84	-3.33	5.65	92.00	2.21	2.17	-8.69
	1205.00	5.30	156.20	-11.97	6.03	1204.55	-6.27	12.87	91.00	1.66	1.65	-2.31
	1296.00	6.90	151.30	-20.61	10.36	1295.03	-10.77	22.53	91.00	1.85	1.76	-5.38
	1387.00	7.20	163.10	-30.86	14.64	1385.35	-15.26	33.64	91.00	1.62	0.33	12.97
	1478.00	8.70	171.30	-43.13	17.34	1475.47	-18.20	46.20	91.00	2.06	1.64	9.01
	1568.00	9.90	170.40	-57.48	19.66	1564.29	-20.81	60.75	90.00	1.34	1.33	-1.00
	1659.00	10.60	165.80	-73.31	23.02	1653.83	-24.49	76.93	91.00	1.18	0.77	-5.05
	1773.00	11.40	161.00	-94.13	29.26	1765.74	-31.14	98.66	114.00	1.07	0.70	-4.21
	1865.00	11.70	155.50	-111.21	36.09	1855.88	-38.32	117.06	92.00	1.24	0.33	-5.98
	1956.00	11.90	151.40	-127.85	44.40	1944.96	-46.97	135.66	91.00	0.95	0.22	-4.51
	2047.00	10.80	150.70	-143.52	53.07	2034.18	-55.94	153.56	91.00	1.22	-1.21	-0.77
	2138.00	11.20	149.90	-158.60	61.67	2123.51	-64.85	170.93	91.00	0.47	0.44	-0.88
	2228.00	11.50	149.80	-173.92	70.57	2211.75	-74.05	188.64	90.00	0.33	0.33	-0.11
	2319.00	11.50	151.70	-189.75	79.43	2300.92	-83.23	206.78	91.00	0.42	0.00	2.09
	2410.00	10.90	156.10	-205.60	87.22	2390.19	-91.34	224.44	91.00	1.15	-0.66	4.84
	2500.00	10.80	160.10	-221.31	93.54	2478.58	-97.97	241.38	90.00	0.84	-0.11	4.44
	2591.00	10.90	157.10	-237.25	99.79	2567.95	-104.54	258.50	91.00	0.63	0.11	-3.30
	2682.00	12.60	159.50	-254.48	106.61	2657.04	-111.71	277.03	91.00	1.94	1.87	2.64
	2773.00	13.60	158.60	-273.73	113.99	2745.68	-119.47	297.65	91.00	1.12	1.10	-0.99
	2865.00	14.00	158.30	-294.15	122.05	2835.02	-127.94	319.60	92.00	0.44	0.43	-0.33
	2957.00	14.10	159.50	-314.98	130.09	2924.27	-136.40	341.93	92.00	0.33	0.11	1.30
	3048.00	13.00	154.90	-334.63	138.32	3012.74	-145.02	363.23	91.00	1.69	-1.21	-5.05
	3139.00	13.20	151.40	-353.03	147.63	3101.37	-154.70	383.85	91.00	0.90	0.22	-3.85
	3231.00	12.30	151.60	-370.87	157.32	3191.10	-164.75	404.15	92.00	0.98	-0.98	0.22
	3325.00	12.40	150.60	-388.47	167.04	3282.92	-174.82	424.26	94.00	0.25	0.11	-1.06
	3420.00	10.70	148.20	-404.85	176.69	3376.00	-184.80	443.27	95.00	1.86	-1.79	-2.53
	3510.00	10.30	154.60	-419.22	184.55	3464.49	-192.94	459.65	90.00	1.37	-0.44	7.11
	3608.00	8.50	156.20	-433.76	191.23	3561.17	-199.91	475.65	98.00	1.86	-1.84	1.63
	3704.00	8.30	153.10	-446.43	197.23	3656.14	-206.16	489.67	96.00	0.52	-0.21	-3.23
	3799.00	8.60	150.40	-458.73	203.84	3750.11	-213.02	503.63	95.00	0.52	0.32	-2.84
	3894.00	9.60	153.20	-471.97	210.92	3843.92	-220.37	518.65	95.00	1.15	1.05	2.95
	3989.00	11.80	156.90	-487.98	218.30	3937.26	-228.07	536.28	95.00	2.42	2.32	3.89
	4083.00	11.90	158.00	-505.81	225.70	4029.26	-235.83	555.58	94.00	0.26	0.11	1.17
	4178.00	11.70	157.40	-523.78	233.07	4122.25	-243.56	575.01	95.00	0.25	-0.21	-0.63
	4273.00	11.60	149.20	-540.88	241.67	4215.30	-252.49	594.14	95.00	1.74	-0.11	-8.63
	4368.00	10.10	146.90	-556.06	251.11	4308.60	-262.24	612.02	95.00	1.64	-1.58	-2.42
	4463.00	9.20	145.20	-569.28	259.99	4402.25	-271.38	627.94	95.00	0.99	-0.95	-1.79
	4558.00	8.20	144.50	-581.03	268.26	4496.16	-279.89	642.31	95.00	1.06	-1.05	-0.74
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
	4652.00	7.60	143.80	-591.50	275.82	4589.27	-287.66	655.23	94.00	0.65	-0.64	-0.74
	4747.00	7.10	145.20	-601.39	282.89	4683.49	-294.92	667.38	95.00	0.56	-0.53	1.47
	4841.00	5.30	148.60	-609.87	288.46	4776.93	-300.67	677.53	94.00	1.95	-1.91	3.62
	4936.00	3.60	155.70	-616.33	291.98	4871.64	-304.31	684.89	95.00	1.88	-1.79	7.47
	5030.00	2.00	144.00	-620.35	294.16	4965.53	-306.57	689.46	94.00	1.80	-1.70	-12.45
	5124.00	0.40	17.70	-621.37	295.22	5059.51	-307.65	690.93	94.00	2.40	-1.70	-134.36
	5503.00	0.20	48.50	-619.67	296.12	5438.51	-308.52	692.85	379.00	0.07	-0.05	8.13
	5882.00	0.20	32.20	-618.67	296.96	5817.50	-309.34	694.16	379.00	0.01	0.00	-4.30

6260.00	0.50	340.30	-616.56	296.76	6195.50	-309.10	696.28	378.00	0.11	0.08	-13.73	
6543.00	0.10	85.50	-615.38	296.58	6478.49	-308.90	697.48	283.00	0.19	-0.14	37.17	
6637.00	3.20	267.20	-615.50	294.04	6572.45	-306.36	700.02	94.00	3.51	3.30	-189.68	
6732.00	14.10	273.50	-614.92	279.80	6666.23	-292.11	714.27	95.00	11.50	11.47	6.63	
6826.00	22.50	271.70	-613.68	250.34	6755.39	-262.63	743.76	94.00	8.96	8.94	-1.91	
6922.00	28.30	271.00	-612.74	209.19	6842.08	-221.47	784.92	96.00	6.05	6.04	-0.73	
7017.00	37.40	270.50	-612.10	157.72	6921.80	-169.99	836.40	95.00	9.59	9.58	-0.53	
7111.00	46.20	267.40	-613.39	95.15	6991.81	-107.47	898.97	94.00	9.61	9.35	-3.30	
7206.00	57.00	268.40	-616.06	20.87	7050.74	-33.25	973.31	95.00	11.40	11.37	1.05	
7300.00	67.20	265.90	-620.27	-61.98	7094.67	49.50	1056.26	94.00	11.10	10.85	-2.66	
7396.00	77.20	267.40	-625.57	-153.11	7123.98	140.51	1147.55	96.00	10.52	10.42	1.56	
7490.00	84.90	270.50	-627.25	-245.87	7138.60	233.21	1240.32	94.00	8.81	8.19	3.30	
7535.00	86.30	270.60	-626.82	-290.74	7142.05	278.08	1285.19	45.00	3.12	3.11	0.22	
7553.00	87.10	270.40	-626.66	-308.71	7143.09	296.04	1303.16	18.00	4.58	4.44	-1.11	
7697.00	90.30	270.00	-626.16	-452.65	7146.35	439.97	1447.10	144.00	2.24	2.22	-0.28	
7793.00	90.90	269.60	-626.49	-548.64	7145.35	535.94	1543.10	96.00	0.75	0.63	-0.42	
7887.00	91.30	269.90	-626.90	-642.62	7143.54	629.89	1637.08	94.00	0.53	0.43	0.32	
7983.00	90.50	270.10	-626.90	-738.61	7142.04	725.86	1733.07	96.00	0.86	-0.83	0.21	
8078.00	90.40	270.30	-626.57	-833.61	7141.29	820.84	1828.06	95.00	0.23	-0.11	0.21	
8172.00	90.40	270.20	-626.17	-927.60	7140.63	914.83	1922.06	94.00	0.10	0.00	-0.10	
8268.00	90.30	270.70	-625.41	-1023.60	7140.05	1010.82	2018.06	96.00	0.53	-0.10	0.52	
8363.00	89.70	271.40	-623.67	-1118.58	7140.05	1105.82	2113.06	95.00	0.97	-0.63	0.74	
8552.00	89.90	272.00	-618.07	-1307.50	7140.71	1294.81	2302.06	189.00	0.33	0.11	0.32	
8647.00	89.50	271.60	-615.08	-1402.45	7141.21	1389.80	2397.06	95.00	0.60	-0.42	-0.42	
8836.00	90.50	271.30	-610.30	-1591.39	7141.21	1578.79	2586.05	189.00	0.55	0.53	-0.16	
8932.00	89.10	271.80	-607.70	-1687.35	7141.54	1674.79	2682.05	96.00	1.55	-1.46	0.52	
9121.00	88.10	272.70	-600.29	-1876.14	7146.16	1863.69	2870.99	189.00	0.71	-0.53	0.48	
9216.00	88.90	272.30	-596.15	-1971.02	7148.64	1958.63	2965.96	95.00	0.94	0.84	-0.42	
9310.00	88.80	271.60	-592.95	-2064.94	7150.53	2052.60	3059.94	94.00	0.75	-0.11	-0.74	
9406.00	88.90	271.20	-590.60	-2160.89	7152.46	2148.58	3155.92	96.00	0.43	0.10	-0.42	
9593.00	90.50	270.80	-587.34	-2347.86	7153.44	2335.57	3342.91	187.00	0.88	0.86	-0.21	
9690.00	89.10	270.90	-585.90	-2444.84	7153.78	2432.57	3439.90	97.00	1.45	-1.44	0.10	
9783.00	89.20	271.80	-583.71	-2537.81	7155.16	2525.56	3532.89	93.00	0.97	0.11	0.97	
9973.00	90.60	270.20	-580.39	-2727.77	7155.49	2715.55	3722.88	190.00	1.12	0.74	-0.84	
10067.00	90.50	271.20	-579.24	-2821.75	7154.58	2809.54	3816.88	94.00	1.07	-0.11	1.06	
10161.00	89.60	271.60	-576.95	-2915.72	7154.50	2903.54	3910.88	94.00	1.05	-0.96	0.42	
10256.00	90.30	272.60	-573.47	-3010.66	7154.59	2998.52	4005.87	95.00	1.29	0.74	1.06	
10351.00	89.30	272.80	-569.00	-3105.55	7154.92	3093.48	4100.87	95.00	1.07	-1.05	0.21	
10542.00	90.30	272.00	-561.00	-3296.38	7155.58	3284.43	4291.87	191.00	0.67	0.52	-0.42	
10637.00	90.30	272.50	-557.27	-3391.30	7155.09	3379.41	4386.86	95.00	0.53	0.00	0.53	
10733.00	90.10	272.60	-553.00	-3487.21	7154.75	3475.39	4482.86	96.00	0.23	-0.21	0.10	
10925.00	90.40	271.90	-545.46	-3679.06	7153.91	3667.35	4674.86	192.00	0.40	0.16	-0.36	
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
	11019.00	89.80	271.70	-542.51	-3773.01	7153.75	3761.34	4768.86	94.00	0.67	-0.64	-0.21
	11114.00	90.60	271.40	-539.94	-3867.97	7153.42	3856.34	4863.86	95.00	0.90	0.84	-0.32
	11208.00	89.80	271.70	-537.40	-3961.94	7153.09	3950.33	4957.86	94.00	0.91	-0.85	0.32
	11303.00	89.10	272.10	-534.25	-4056.88	7154.00	4045.32	5052.85	95.00	0.85	-0.74	0.42
	11398.00	89.90	271.90	-530.93	-4151.82	7154.83	4140.30	5147.85	95.00	0.87	0.84	-0.21
	11586.00	90.40	271.50	-525.35	-4339.73	7154.34	4328.29	5335.85	188.00	0.34	0.27	-0.21
	11814.00	90.90	271.30	-519.78	-4567.65	7151.75	4556.28	5563.83	228.00	0.24	0.22	-0.09
Projection to TD:												
	11876.00	90.90	271.30	-518.38	-4629.63	7150.78	4618.27	5625.82	62.00	0.00	0.00	0.00