



Realtime Log

Natural Formation Evaluation
Gamma Ray

Scale:

1:1200
True Vertical Depth

Company: Kerr-McGee Oil & Gas Onshore LP
Well: Bella Federal 25C-7HZ
Field: Weld County (Kerr McGee)
Region: RMD
Country: United States

Status: Final Print

API Number: 05123374380000

Permanent Datum (P.D.): Ground Level

Log Measured From: Drill Floor

Depth Reference: Driller's Depth

Surface Location: Latitude: 40° 14' 16.602" N Longitude: 104° 48' 7.301" W

Elevation: 4878.00 ft. Above P.D.

Other Services: Directional VSS

Elevations: N/A

KB: 4878.00 ft. DF: 4865.00 ft. GL:

Section8 TWN: 3S Range66W

Interval Logged

Dates

Magnetic Field Reference

Top: 6683 ft. Date From: 16/Jul/13 Date To: 17/Jul/13 Dip Angle: 66.89 ° Az Reference North: True

Bottom: 7785 ft. Date To: 17/Jul/13 Spud Date: 13/Jul/13 Total Field Strength: 52671.0 nT North Correction: 8.53 °

Borehole Record

Casing Record

Hole Size	From	To	Size	Weight	From	To
13.500 in.	Surface	923 ft.	9.625 in.	36.00 lb/ft	Surface	910 ft.
8.750 in.	923 ft.	7846 ft.	7.000 in.	26.00 lb/ft	Surface	7835 ft.

Mud Record

Deviation Record

Type	From	To	Hole Size	Interval	Inc / Az (Start)	Inc / Az (End)
Water Based - Fresh	1720 ft.	7845 ft.	13.500 in.	923 ft.	0.0 ° / 359.6 °	0.2 / 303.6 °
			8.750 in.	6923 ft.	0.1 ° / 284.2 °	85.9 ° / 272.4 °
					/	/
					/	/
					/	/
					/	/
					/	/
					/	/
					/	/
					/	/

Acquisition System	Software Version	Other
Advantage	2.20U4	Rig / Contractor: Ensign 138 / Ensign Drilling
PATS	6.4.1.34	Job No.: 5569830 / 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	Bottom	From	To	Start	End	
							(ft.)	(ft.)	(ft.)	(ft.)			
1	1	1	8.750	PDC	2.500	Steerable	6683	7785	928	7845	16/Jul/2013 12:11	17/Jul/2013 05:47	42.21

Crew								
Name			Arrive	Depart	Name			Arrive
			Wellsite	Wellsite				Wellsite
David Campbell			July 13 2013	July 17 2013	Tyler Wall			July 13 2013
Bill Herbers			July 13 2013	July 17 2013				July 13 2013
								July 17 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+ (%)
15/Jul/2013 15:17	1	1720	Water Based - Fresh	8.4	29	9.5	21.0	0 / 99	Active Mud Pit	1600	0.0
16/Jul/2013 07:11	1	5771	Water Based - Fresh	8.4	28	9.1	25.0	0 / 99	Active Mud Pit	1300	0.0

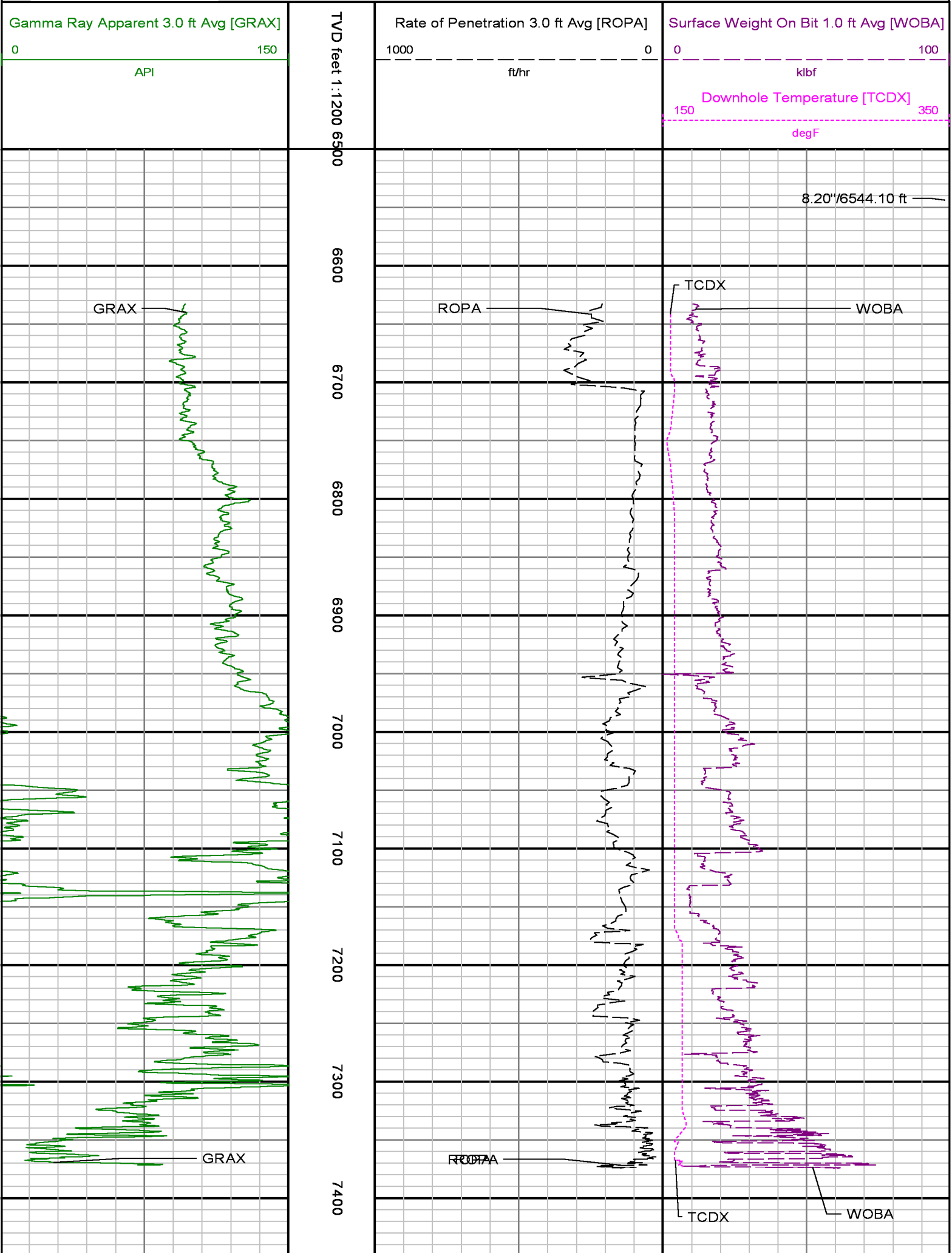
Mnemonics		
Curve	Description	Units
GRAX	Gamma Ray Apparent, 3.0 ft. Avg.	API
ROPA	Rate of Penetration, 3.0 ft. Avg.	ft/hr
TCDX	Downhole Temperature	degF
WOBA	Surface Weight on Bit, 1.0 ft. Avg.	klbf

Equipment and Service Data						
LWD Run No.	Tool	Serial Number	Measurement	Bit Offset (m.)	Max O.D. (in.)	Min I.D. (in.)
1	DIR	12373463	Directional	62.67	6.750	0.000
1	SRIG	12023992	Gamma	59.29	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	
<p>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.</p> <p>3.) Baker Hughes run 1 utilized 6 3/4 inch NaviGamma services (Gamma Ray and Directional) behind an 8 3/4 inch bit and steerable assembly from 923 to 7846 feet MD (923 to 7373 feet TVD).</p> <p>5.) The interval from 923 to 6742 feet MD (923 to 6702 feet TVD) was not logged due to directional only services being provided through the straight-hole and nudge section for Baker Hughes run 1.</p>	

Remarks			
Number	Measured Depth (m.)	Hole Section (in.)	LWD Run No.
1	6682	8.750	1
Begin Logging due to directional only service provided thru straight hole.			



Gamma Ray Apparent 3.0 ft Avg [GRAX]	7500VD feet 1:1200	Rate of Penetration 3.0 ft Avg [ROPA]	Surface Weight On Bit 1.0 ft Avg [WOBA]
0 150 API		1000 0 ft/hr	0 100 klbf Downhole Temperature [TCDX] 150 350 degF

ADVANTAGE Field Survey Listing												
<div>Operator : Kerr-McGee Oil & Gas Onshore LPField : Weld County (Kerr McGee)API No : 05123374380000</div> <div>Well : Bella Federal 25C-7HZRig : Ensign 138Job : 5589830</div> <div>Wellbore : Bella Federal 25C-7HZ Orig Hole</div>												
Well Origin												
Latitude		40.2379 deg				Longitude		-104.8020 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		268.7200 deg				Vertical Section Depth		0.00ft				
Grid Convergence		0.0000 deg				Magnetic Declination		8.5300 deg				
Total Correction		8.5300 deg				TVD Calculation Method		Minimal Curvature				
D-Row Calculation		None				Local Magnetic Field		52671 nT				
Local Magnetic Dip Angle		66.8900 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
U	0.00	0.0000	0.0000	0.00	0.00	0.00	0.00	0.00				
	13.00	0.0000	359.5900	0.00	0.00	13.00	0.00	0.00	13.00	0.00	0.00	-3.15
	113.00	0.0700	359.5900	0.06	-0.00	113.00	-0.00	0.06	100.00	0.07	0.07	0.00
	213.00	0.0900	261.2600	0.11	-0.08	213.00	0.08	0.15	100.00	0.12	0.02	-98.33
	313.00	0.1600	235.7200	0.02	-0.27	313.00	0.27	0.37	100.00	0.09	0.07	-25.54
	413.00	0.3000	256.9100	-0.12	-0.64	413.00	0.64	0.76	100.00	0.16	0.14	21.19
	513.00	0.0900	186.5300	-0.26	-0.91	513.00	0.91	1.06	100.00	0.28	-0.21	-70.38
	613.00	0.0900	124.6800	-0.38	-0.85	613.00	0.86	1.19	100.00	0.09	0.00	-61.85
	713.00	0.1600	58.4200	-0.35	-0.67	713.00	0.67	1.38	100.00	0.15	0.07	-66.26
760.00	0.2400	303.6200	-0.26	-0.69	760.00	0.70	1.47	47.00	0.72	0.17	-244.26	
	931.00	0.1000	284.2000	-0.03	-1.14	931.00	1.14	1.97	171.00	0.09	-0.08	-11.36
	1022.00	0.3000	263.0000	-0.04	-1.45	1022.00	1.45	2.29	91.00	0.23	0.22	-23.30
	1114.00	1.7000	47.7000	0.85	-0.68	1113.98	0.66	3.46	92.00	2.12	1.52	157.28
	1205.00	4.1000	39.0000	4.29	2.37	1204.86	-2.46	8.06	91.00	2.67	2.64	-9.56
	1296.00	6.4000	37.6000	10.84	7.51	1295.47	-7.75	16.38	91.00	2.53	2.53	-1.54
	1387.00	8.1000	39.4000	19.81	14.67	1385.74	-15.11	27.86	91.00	1.88	1.87	1.98
	1478.00	10.0000	40.9000	30.74	23.92	1475.61	-24.60	42.18	91.00	2.10	2.09	1.65
	1591.00	11.5000	38.1000	47.02	37.29	1586.62	-38.33	63.25	113.00	1.41	1.33	-2.48
	1682.00	11.4000	38.5000	61.20	48.49	1675.81	-49.84	81.31	91.00	0.14	-0.11	0.44
	1772.00	11.2000	38.6000	74.99	59.48	1764.07	-61.14	98.95	90.00	0.22	-0.22	0.11
	1864.00	12.0000	38.7000	89.43	71.03	1854.19	-73.01	117.45	92.00	0.87	0.87	0.11
	1963.00	11.5000	38.8000	105.16	83.65	1951.11	-85.98	137.61	99.00	0.51	-0.51	0.10
	2054.00	10.6000	38.2000	118.81	94.51	2040.42	-97.14	155.05	91.00	1.00	-0.99	-0.66
	2145.00	11.8000	37.9000	132.73	105.40	2129.69	-108.34	172.72	91.00	1.32	1.32	-0.33
	2235.00	11.0000	45.2000	146.04	117.15	2217.92	-120.38	190.48	90.00	1.83	-0.89	8.11
	2326.00	11.3000	46.0000	158.35	129.72	2307.20	-133.23	208.07	91.00	0.37	0.33	0.88
	2409.00	11.4000	41.9000	170.10	141.05	2388.58	-144.82	224.40	83.00	0.98	0.12	-4.94
	2500.00	11.8000	44.3000	183.46	153.56	2477.72	-157.62	242.69	91.00	0.69	0.44	2.64
	2590.00	11.7000	41.6000	196.87	166.04	2565.83	-170.40	261.01	90.00	0.62	-0.11	-3.00
	2682.00	12.7000	40.6000	211.52	178.82	2655.75	-183.50	280.46	92.00	1.11	1.09	-1.09
	2773.00	12.8000	39.7000	226.87	191.77	2744.51	-196.79	300.54	91.00	0.24	0.11	-0.99
	2865.00	11.7000	39.4000	241.92	204.20	2834.41	-209.55	320.06	92.00	1.20	-1.20	-0.33
	2956.00	11.6000	38.9000	256.17	215.80	2923.54	-221.47	338.43	91.00	0.16	-0.11	-0.55
	3047.00	10.2000	41.1000	269.36	226.84	3012.90	-232.80	355.64	91.00	1.60	-1.54	2.42
	3138.00	8.5000	42.6000	280.39	236.69	3102.68	-242.89	370.42	91.00	1.89	-1.87	1.65

	3230.00	7.9000	41.3000	290.14	245.47	3193.74	-251.89	383.54	92.00	0.68	-0.65	-1.41
	3325.00	7.0000	43.4000	299.25	253.75	3287.94	-260.37	395.86	95.00	0.99	-0.95	2.21
	3420.00	6.2000	44.3000	307.13	261.31	3382.31	-268.11	406.78	95.00	0.85	-0.84	0.95
	3514.00	5.8000	52.0000	313.69	268.60	3475.80	-275.54	416.58	94.00	0.96	-0.43	8.19
	3609.00	4.3000	38.0000	319.45	274.58	3570.43	-281.64	424.88	95.00	2.03	-1.58	-14.74
	3703.00	2.4000	46.9000	323.57	278.18	3664.26	-285.34	430.36	94.00	2.09	-2.02	9.47
	3798.00	1.1000	357.6000	325.84	279.60	3759.22	-286.81	433.03	95.00	1.98	-1.37	-51.89
	3894.00	0.4000	309.4000	326.98	279.30	3855.21	-286.53	434.20	96.00	0.92	-0.73	-50.21
	3989.00	0.5000	315.1000	327.48	278.75	3950.21	-286.00	434.95	95.00	0.12	0.11	6.00
	4083.00	1.1000	227.1000	327.16	277.80	4044.20	-285.04	435.95	94.00	1.27	0.64	-93.62
	4179.00	0.9000	224.6000	325.99	276.60	4140.19	-283.81	437.63	96.00	0.21	-0.21	-2.60
	4560.00	1.8000	175.7000	317.89	274.94	4521.09	-281.98	445.89	381.00	0.36	0.24	-12.83
	4656.00	0.8000	193.0000	315.74	274.91	4617.06	-281.89	448.05	96.00	1.11	-1.04	18.02
	5035.00	1.4000	286.7000	314.49	269.88	4996.02	-276.83	453.23	379.00	0.44	0.16	24.72
	5129.00	0.3000	24.8000	315.04	268.88	5090.01	-275.85	454.37	94.00	1.57	-1.17	104.36
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
	5508.00	0.3000	240.0000	315.45	268.44	5469.00	-275.42	454.97	379.00	0.15	0.00	-38.21
	5887.00	0.7000	196.7000	312.73	266.91	5847.99	-273.83	458.09	379.00	0.14	0.11	-11.42
	6266.00	0.1000	200.6000	310.21	266.13	6226.98	-272.99	460.73	379.00	0.16	-0.16	1.03
	6678.00	0.4000	276.1000	310.02	264.57	6638.98	-271.43	462.30	412.00	0.09	0.07	18.33
	6741.00	1.3000	257.8000	309.90	263.66	6701.97	-270.51	463.22	63.00	1.47	1.43	-29.05
	6835.00	10.8000	264.7000	308.85	253.82	6795.34	-260.66	473.11	94.00	10.12	10.11	7.34
	6930.00	20.0000	263.7000	306.24	228.76	6886.83	-235.54	498.31	95.00	9.69	9.68	-1.05
	7025.00	27.2000	261.4000	301.21	191.09	6973.83	-197.77	536.32	95.00	7.64	7.58	-2.42
	7119.00	37.2000	266.0000	296.00	141.37	7053.28	-147.95	586.31	94.00	10.95	10.64	4.89
	7213.00	45.6000	268.2000	292.96	79.34	7123.73	-85.87	648.41	94.00	9.07	8.94	2.34
	7309.00	48.5000	269.7000	291.69	9.10	7189.14	-15.61	718.67	96.00	3.23	3.02	1.56
	7404.00	52.6000	273.7000	293.94	-64.18	7249.50	57.60	791.98	95.00	5.40	4.32	4.21
	7451.00	57.5000	275.7000	297.12	-102.56	7276.42	95.90	830.49	47.00	10.99	10.43	4.26
	7499.00	62.8000	277.0000	301.73	-143.92	7300.30	137.14	872.10	48.00	11.29	11.04	2.71
	7546.00	68.3000	276.7000	306.83	-186.38	7319.75	179.48	914.87	47.00	11.72	11.70	-0.64
	7594.00	72.5000	275.9000	311.79	-231.32	7335.85	224.29	960.08	48.00	8.89	8.75	-1.67
	7641.00	74.4000	275.4000	316.22	-276.15	7349.24	269.02	1005.13	47.00	4.17	4.04	-1.06
	7688.00	79.7000	274.9000	320.33	-321.75	7359.77	314.52	1050.92	47.00	11.32	11.28	-1.06
	7735.00	83.2000	273.5000	323.73	-368.10	7366.75	360.77	1097.39	47.00	8.01	7.45	-2.98
	7783.00	85.9000	272.4000	326.19	-415.81	7371.31	408.42	1145.17	48.00	6.07	5.62	-2.29
	7885.00	90.3000	271.7000	329.83	-517.66	7374.69	510.17	1247.08	102.00	4.37	4.31	-0.69
	7979.00	90.0000	271.4000	332.38	-611.63	7374.45	604.05	1341.08	94.00	0.45	-0.32	-0.32
	8074.00	89.9000	270.3000	333.79	-706.62	7374.53	698.98	1436.08	95.00	1.16	-0.11	-1.16
	8170.00	90.2000	268.4000	332.70	-802.61	7374.44	794.97	1532.08	96.00	2.00	0.31	-1.98
	8265.00	90.5000	267.3000	329.13	-897.54	7373.86	889.96	1627.08	95.00	1.20	0.32	-1.16
	8360.00	90.7000	267.5000	324.82	-992.43	7372.87	984.93	1722.07	95.00	0.30	0.21	0.21
	8455.00	89.8000	267.1000	320.35	-1087.33	7372.45	1079.90	1817.07	95.00	1.04	-0.95	-0.42
	8551.00	89.0000	266.6000	315.07	-1183.17	7373.46	1175.84	1913.06	96.00	0.98	-0.83	-0.52
	8646.00	88.8000	266.3000	309.19	-1277.97	7375.28	1270.75	2008.04	95.00	0.38	-0.21	-0.32
	8741.00	89.9000	267.5000	304.06	-1372.83	7376.36	1365.69	2103.03	95.00	1.71	1.16	1.26
	8836.00	89.9000	267.4000	299.83	-1467.73	7376.53	1460.67	2198.03	95.00	0.11	0.00	-0.11
	8932.00	88.8000	266.6000	294.80	-1563.59	7377.62	1556.62	2294.03	96.00	1.42	-1.15	-0.83
	9027.00	89.8000	267.6000	290.00	-1658.46	7378.78	1651.57	2389.02	95.00	1.49	1.05	1.05
	9122.00	90.7000	268.2000	286.52	-1753.39	7378.36	1746.56	2484.01	95.00	1.14	0.95	0.63
	9217.00	91.2000	268.3000	283.62	-1848.34	7376.79	1841.54	2579.00	95.00	0.54	0.53	0.11
	9312.00	90.2000	267.6000	280.22	-1943.27	7375.63	1936.52	2673.99	95.00	1.28	-1.05	-0.74
	9406.00	90.6000	267.8000	276.45	-2037.19	7374.97	2030.50	2767.99	94.00	0.48	0.43	0.21
	9500.00	89.3000	267.1000	272.26	-2131.09	7375.05	2124.48	2861.99	94.00	1.57	-1.38	-0.74
	9594.00	89.4000	266.9000	267.35	-2224.96	7376.12	2218.43	2955.98	94.00	0.24	0.11	-0.21
	9690.00	89.4000	266.7000	261.99	-2320.80	7377.12	2314.37	3051.98	96.00	0.21	0.00	-0.21
	9784.00	89.5000	266.5000	256.41	-2414.63	7378.03	2408.30	3145.97	94.00	0.24	0.11	-0.21
	9879.00	89.4000	266.3000	250.45	-2509.44	7378.94	2503.22	3240.97	95.00	0.24	-0.11	-0.21
	9974.00	90.1000	267.6000	245.39	-2604.30	7379.35	2598.17	3335.96	95.00	1.55	0.74	1.37
	10069.00	90.9000	268.1000	241.83	-2699.23	7378.52	2693.16	3430.96	95.00	0.99	0.84	0.53
	10164.00	90.5000	268.0000	238.60	-2794.17	7377.36	2788.14	3525.95	95.00	0.43	-0.42	-0.11
	10259.00	89.0000	267.8000	235.12	-2889.10	7377.78	2883.13	3620.95	95.00	1.59	-1.58	-0.21
	10353.00	89.6000	268.4000	232.00	-2983.04	7378.93	2977.12	3714.94	94.00	0.90	0.64	0.64
	10447.00	90.3000	268.8000	229.70	-3077.01	7379.01	3071.11	3808.94	94.00	0.86	0.74	0.43
	10543.00	90.9000	269.1000	227.94	-3172.99	7378.00	3167.11	3904.93	96.00	0.70	0.63	0.31
	10637.00	91.0000	268.9000	226.30	-3266.96	7376.44	3261.09	3998.92	94.00	0.24	0.11	-0.21
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
	10732.00	90.5000	268.8000	224.27	-3361.93	7375.92	3356.02	4092.91	95.00	0.74	0.53	0.55

10732.00	90.5000	268.4000	224.07	-3361.93	7375.20	3356.08	4093.91	95.00	0.74	-0.53	-0.53
10827.00	88.6000	267.4000	220.58	-3456.86	7375.95	3451.07	4188.90	95.00	2.26	-2.00	-1.05
10923.00	88.7000	268.2000	216.90	-3552.76	7378.21	3547.03	4284.87	96.00	0.84	0.10	0.83
11018.00	89.5000	268.3000	214.00	-3647.70	7379.70	3642.01	4379.86	95.00	0.85	0.84	0.11
11112.00	89.2000	268.0000	210.97	-3741.65	7380.77	3736.00	4473.86	94.00	0.45	-0.32	-0.32
11207.00	89.8000	267.9000	207.57	-3836.58	7381.60	3830.99	4568.85	95.00	0.64	0.63	-0.11
11302.00	90.5000	267.8000	204.00	-3931.51	7381.35	3925.98	4663.85	95.00	0.74	0.74	-0.11
11397.00	89.6000	268.1000	200.61	-4026.45	7381.27	4020.97	4758.85	95.00	1.00	-0.95	0.32
11490.00	90.1000	268.2000	197.60	-4119.40	7381.51	4113.96	4851.85	93.00	0.55	0.54	0.11
11585.00	89.3000	268.9000	195.20	-4214.37	7382.01	4208.96	4946.85	95.00	1.12	-0.84	0.74
11680.00	89.2000	268.7000	193.21	-4309.34	7383.25	4303.95	5041.84	95.00	0.24	-0.11	-0.21
11775.00	90.2000	268.9000	191.22	-4404.32	7383.75	4398.95	5136.84	95.00	1.07	1.05	0.21
11893.00	90.5000	268.4000	188.44	-4522.28	7383.03	4516.94	5254.83	118.00	0.49	0.25	-0.42
Projection to TD:											
11957.00	90.5000	268.4000	186.65	-4586.25	7382.47	4580.94	5318.83	64.00	0.00	0.00	0.00