



## Chief Oil & Gas - AP

Preston County, WV  
David & Sandra Smith  
Lanco #1H

Wellbore #1

Survey: MWD Surveys

## DDC Survey Report

28 July, 2010



7700503 P



DDC  
Survey Report



Company:	Chief Oil & Gas - AP	Local Co-ordinate Reference:	Well Lanco #1H
Project:	Preston County, WV	TVD Reference:	WELL @ 1997.2usft (Patterson #255)
Site:	David & Sandra Smith	MD Reference:	WELL @ 1997.2usft (Patterson #255)
Well:	Lanco #1H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Project:	Preston County, WV		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	West Virginia Northern Zone		

Site:	David & Sandra Smith				
Site Position:	Northing:	440,111.17 usft	Latitude:	39° 42' 30.000 N	
From:	Lat/Long	Easting:	1,968,500.00 usft	Longitude:	79° 30' 0.000 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.00 "

Well:	Lanco #1H					
Well Position	+N/-S	0.0 usft	Northing:	440,111.17 usft	Latitude:	39° 42' 30.000 N
	+E/-W	0.0 usft	Easting:	1,968,500.00 usft	Longitude:	79° 30' 0.000 W
Position Uncertainty	0.0 usft		Wellhead Elevation:	usft	Ground Level:	1,975.2 usft

Wellbore:	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/10/2010	-9.34	57.35	52,824

Design:	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	350.00	

Survey Program	Date 7/28/2010			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
200.0	5,600.0	Gyro (Wellbore #1)	Good_gyro	Good Gyro
5,645.0	9,766.0	MWD Surveys (Wellbore #1)	MWD default	MWD - Standard

Survey	Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Buid Rate (°/100usft)	Turn Rate (°/100usft)
Tie-In	5,600.0	4.99	118.91	5,592.7	-22.5	72.8	-34.8	0.00	0.00	0.00
	5,645.0	5.10	118.70	5,637.5	-24.4	76.3	-37.3	0.25	0.24	-0.47
	5,740.0	3.10	102.30	5,732.3	-27.0	82.5	-40.9	2.42	-2.11	-17.26
	5,835.0	4.30	100.40	5,827.1	-28.2	88.5	-43.2	1.27	1.26	-2.00
	5,930.0	6.20	106.30	5,921.7	-30.3	97.0	-46.7	2.08	2.00	6.21
	6,025.0	8.30	108.20	6,015.9	-33.9	108.4	-52.2	2.22	2.21	2.00
	6,120.0	6.90	114.00	6,110.1	-38.3	120.1	-58.6	1.68	-1.47	6.11
	6,215.0	4.30	111.60	6,204.6	-42.0	128.6	-63.7	2.75	-2.74	-2.53
	6,309.0	2.40	152.30	6,298.4	-45.0	132.3	-67.4	3.12	-2.02	43.30



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Site:	David & Sandra Smith	MD Reference:	WELL @ 1997.2usft (Patterson #255)
Well:	Lanco #1H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
6,404.0	3.50	131.20	6,393.3	-48.7	135.9	-71.6	1.61	1.16	-22.21
6,499.0	2.50	120.20	6,488.2	-51.6	139.8	-75.0	1.39	-1.26	-11.58
6,594.0	1.50	86.40	6,583.2	-52.4	142.7	-76.4	1.41	-0.84	-35.58
6,690.0	3.20	102.50	6,679.1	-52.9	146.5	-77.6	1.88	1.77	16.77
6,785.0	2.10	133.00	6,774.0	-54.7	150.4	-80.0	1.84	-1.16	32.11
6,880.0	1.80	136.00	6,868.9	-57.0	152.7	-82.6	0.33	-0.32	3.16
6,975.0	2.00	116.00	6,963.9	-58.8	155.2	-84.8	0.72	0.21	-21.05
7,070.0	3.40	118.10	7,058.8	-60.8	159.2	-87.5	1.48	1.47	2.21
7,165.0	3.50	117.80	7,153.6	-63.5	164.3	-91.0	0.11	0.11	-0.32
7,260.0	3.80	135.30	7,248.4	-67.1	169.0	-95.4	1.21	0.32	18.42
7,355.0	1.10	100.90	7,343.3	-69.5	172.1	-98.3	3.11	-2.84	-36.21
7,451.0	3.00	105.40	7,438.2	-70.3	175.5	-99.7	1.98	1.98	4.69
7,546.0	3.70	139.60	7,534.1	-73.3	179.9	-103.4	2.19	0.74	36.00
7,641.0	4.40	134.80	7,628.8	-78.2	184.4	-109.1	0.82	0.74	-5.05
7,673.0	5.00	129.90	7,660.7	-80.0	186.4	-111.1	2.25	1.88	-15.31
7,713.0	5.40	127.90	7,700.6	-82.3	189.2	-113.9	1.10	1.00	-5.00
7,745.0	3.60	92.10	7,732.5	-83.2	191.4	-115.2	10.16	-5.83	-111.88
7,777.0	4.90	24.40	7,764.4	-82.0	193.0	-114.3	15.17	4.06	-211.56
7,808.0	9.70	2.50	7,795.2	-78.2	193.6	-110.6	17.63	15.48	-70.65
7,840.0	14.80	355.20	7,826.4	-71.4	193.4	-103.9	16.63	15.94	-22.81
7,871.0	18.60	352.40	7,856.1	-62.6	192.4	-95.0	12.53	12.26	-9.03
7,902.0	19.30	351.10	7,885.4	-52.6	191.0	-85.0	2.64	2.26	-4.19
7,933.0	18.80	350.20	7,914.7	-42.6	189.3	-74.9	1.87	-1.61	-2.50
7,965.0	18.10	349.70	7,945.1	-32.7	187.6	-64.7	2.24	-2.19	-1.56
7,997.0	17.80	349.50	7,975.5	-23.0	185.8	-54.9	0.96	-0.94	-0.63
8,028.0	17.60	349.50	8,005.1	-13.7	184.1	-45.4	0.65	-0.65	0.00
8,060.0	17.10	348.40	8,035.6	-4.3	182.2	-35.9	1.87	-1.56	-3.44
8,092.0	19.40	347.40	8,066.0	5.5	180.1	-25.9	7.25	7.19	-3.13
8,123.0	24.40	347.90	8,094.7	16.8	177.7	-14.3	16.14	16.13	1.61
8,155.0	29.90	350.50	8,123.2	31.1	175.0	0.2	17.58	17.19	8.13
8,186.0	35.10	352.30	8,149.3	47.6	172.5	16.9	17.06	16.77	5.81
8,218.0	40.40	352.30	8,174.6	67.0	169.9	36.5	16.56	16.56	0.00
8,250.0	44.60	353.40	8,198.2	88.4	167.2	58.0	13.33	13.13	3.44
8,282.0	46.90	352.20	8,220.6	111.2	164.3	80.9	7.67	7.19	-3.75
8,313.0	49.20	352.00	8,241.3	134.0	161.1	104.0	7.43	7.42	-0.65
8,345.0	50.00	350.80	8,262.0	158.1	157.5	128.3	3.80	2.50	-3.75
8,377.0	52.00	349.40	8,282.2	182.6	153.2	153.2	7.11	6.25	-4.38
8,409.0	55.40	348.60	8,301.1	207.9	148.3	179.0	10.81	10.63	-2.50
8,440.0	57.00	348.60	8,318.3	233.1	143.2	204.7	5.16	5.16	0.00
8,472.0	59.40	348.10	8,335.2	259.8	137.7	231.9	7.62	7.50	-1.56
8,504.0	62.40	348.10	8,350.8	287.1	131.9	259.9	9.38	9.38	0.00
8,535.0	63.40	348.40	8,364.3	314.2	126.3	287.4	3.34	3.23	0.97
8,567.0	65.70	347.90	8,378.6	342.4	120.4	316.3	7.32	7.19	-1.56



DDC  
Survey Report



Company:	Chief Oil & Gas - AP	Local Co-ordinate Reference:	Well Lanco #1H
Project:	Preston County, WV	TVD Reference:	WELL @ 1997.2usft (Patterson #255)
Site:	David & Sandra Smith	MD Reference:	WELL @ 1997.2usft (Patterson #255)
Well:	Lanco #1H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,599.0	68.30	347.80	8,391.1	371.2	114.2	345.8	8.13	8.13	-0.31
8,630.0	71.40	347.20	8,401.8	399.6	107.9	374.8	10.16	10.00	-1.94
8,661.0	74.80	346.60	8,410.8	428.5	101.2	404.4	11.12	10.97	-1.94
8,693.0	75.60	346.70	8,419.0	458.6	94.0	435.3	2.52	2.50	0.31
8,725.0	75.90	346.50	8,426.9	488.8	86.8	466.3	1.12	0.94	-0.63
8,757.0	76.70	348.30	8,434.5	519.1	80.0	497.3	6.01	2.50	5.63
8,788.0	76.90	349.30	8,441.5	548.7	74.2	527.5	3.21	0.65	3.23
8,820.0	77.00	348.40	8,448.8	579.3	68.2	558.7	2.76	0.31	-2.81
8,852.0	76.90	348.60	8,456.0	609.9	61.9	589.8	0.68	-0.31	0.63
8,883.0	76.70	348.30	8,463.1	639.4	55.9	620.0	1.14	-0.65	-0.97
8,915.0	76.70	348.00	8,470.4	669.9	49.5	651.1	0.91	0.00	-0.94
8,947.0	76.60	347.70	8,477.8	700.4	42.9	682.3	0.96	-0.31	-0.94
8,978.0	76.70	347.80	8,485.0	729.8	36.5	712.4	0.45	0.32	0.32
9,010.0	76.70	347.60	8,492.3	760.3	29.9	743.5	0.61	0.00	-0.63
9,042.0	76.70	347.60	8,499.7	790.7	23.2	774.6	0.00	0.00	0.00
9,073.0	76.70	347.80	8,506.8	820.1	16.8	804.8	0.63	0.00	0.65
9,105.0	76.90	348.00	8,514.1	850.6	10.3	835.9	0.87	0.63	0.63
9,137.0	76.70	348.10	8,521.4	881.1	3.8	867.0	0.70	-0.63	0.31
9,168.0	76.90	347.90	8,528.5	910.6	-2.5	897.2	0.90	0.65	-0.65
9,200.0	77.10	348.50	8,535.7	941.1	-8.8	928.4	1.93	0.63	1.88
9,232.0	77.00	347.90	8,542.9	971.7	-15.2	959.5	1.85	-0.31	-1.88
9,264.0	75.80	348.30	8,550.4	1,002.1	-21.6	990.6	3.94	-3.75	1.25
9,295.0	75.90	347.90	8,558.0	1,031.5	-27.8	1,020.7	1.29	0.32	-1.29
9,327.0	75.70	347.60	8,565.8	1,061.8	-34.4	1,051.7	1.10	-0.63	-0.94
9,359.0	75.80	347.50	8,573.7	1,092.1	-41.1	1,082.7	0.44	0.31	-0.31
9,390.0	75.80	347.30	8,581.3	1,121.4	-47.6	1,112.7	0.63	0.00	-0.65
9,422.0	75.40	347.40	8,589.3	1,151.7	-54.4	1,143.6	1.29	-1.25	0.31
9,454.0	75.30	347.50	8,597.4	1,181.9	-61.2	1,174.6	0.43	-0.31	0.31
9,485.0	75.10	347.90	8,605.3	1,211.2	-67.5	1,204.5	1.40	-0.65	-1.29
9,517.0	75.10	347.20	8,613.5	1,241.4	-74.2	1,235.4	2.11	0.00	-2.19
9,548.0	74.80	346.90	8,621.5	1,270.6	-80.9	1,265.3	1.35	-0.97	-0.97
9,580.0	74.90	346.90	8,629.9	1,300.6	-87.9	1,296.1	0.31	0.31	0.00
9,612.0	77.30	346.50	8,637.6	1,330.9	-95.1	1,327.2	7.60	7.50	-1.25
9,643.0	78.60	346.30	8,644.1	1,360.3	-102.2	1,357.4	4.24	4.19	-0.65
9,675.0	78.60	346.00	8,650.4	1,390.8	-109.7	1,388.7	0.92	0.00	-0.94
9,707.0	80.60	346.80	8,656.2	1,421.4	-117.1	1,420.1	6.72	6.25	2.50
Bit Projection									
9,766.0	83.30	346.80	8,664.5	1,478.2	-130.4	1,478.4	4.58	4.58	0.00

7700503P



DDC  
Survey Report



Company:	Chief Oil & Gas - AP	Local Co-ordinate Reference:	Well Lanco #1H
Project:	Preston County, WV	TVD Reference:	WELL @ 1997.2usft (Patterson #255)
Site:	David & Sandra Smith	MD Reference:	WELL @ 1997.2usft (Patterson #255)
Well:	Lanco #1H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/S (usft)	+E/W (usft)	
5,600.0	5,592.7	-22.5	72.8	Tie-In
9,766.0	8,664.5	1,478.2	-130.4	Bit Projection

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_



## Chief Oil & Gas - AP

Preston County, WV  
David & Sandra Smith  
Lanco #1H

Side-Track #1

Survey: MWD Sidetrack #1

## DDC Survey Report

27 July, 2010





DDC  
Survey Report



Company:	Chief Oil & Gas - AP	Local Co-ordinate Reference:	Well Lanco #1H
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Site:	David & Sandra Smith	MD Reference:	WELL @ 1997.2usft (Patterson #255)
Well:	Lanco #1H	North Reference:	Grid
Wellbore:	Side-Track #1	Survey Calculation Method:	Minimum Curvature
Design:	Side-Track #1	Database:	EDM 5000.1 Single User Db

Project	Preston County, WV		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
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Site	David & Sandra Smith				
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Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.00 "

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	+E/-W	0.0 usft	Easting:	1,968,500.00 usft	Longitude:	79° 30' 0.000 W
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft	Ground Level:	1,975.2 usft	

Wellbore	Side-Track #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/20/2010	-9.34	67.34	52,821

Design	Side-Track #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	8,123.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	350.00
	0.0	0.0	0.0		

Survey Program	Date 7/27/2010				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
200.0	5,600.0	Gyro (Wellbore #1)	Good_gyro	Good Gyro	
5,645.0	8,123.0	MWD Surveys (Wellbore #1)	MWD default	MWD - Standard	
8,155.0	10,739.0	MWD Sidetrack #1 (Side-Track #1)	MWD default	MWD - Standard	

Survey	Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
Tie-In	8,123.0	24.40	347.90	8,094.7	16.8	177.7	-14.3	0.00	0.00	0.00
	8,155.0	25.70	349.30	8,123.7	30.0	175.0	-0.8	4.46	4.06	4.38
	8,187.0	26.10	349.10	8,152.5	43.8	172.4	13.2	1.28	1.25	-0.63
	8,218.0	26.30	348.70	8,180.3	57.2	169.7	26.9	0.86	0.65	-1.29
	8,250.0	25.60	343.30	8,209.1	70.8	166.4	40.8	7.70	-2.19	-16.88
	8,282.0	25.10	340.40	8,238.0	83.8	162.1	54.4	4.18	-1.56	-9.06
	8,313.0	27.50	336.90	8,265.8	96.7	157.3	67.9	8.03	7.74	-4.84
	8,345.0	31.60	337.00	8,293.6	111.3	151.4	83.3	13.14	12.81	-5.94



DDC  
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8,377.0	35.90	336.40	8,320.3	127.6	144.3	100.6	13.48	13.44	-1.88
8,408.0	40.20	335.80	8,344.7	145.1	136.6	119.1	13.92	13.87	-1.94
8,440.0	43.40	335.20	8,368.5	164.5	127.7	139.8	10.08	10.00	-1.88
8,472.0	44.20	337.80	8,391.6	184.8	118.9	161.3	6.15	2.50	8.13
8,503.0	46.80	339.70	8,413.3	205.4	110.9	183.0	9.46	8.39	6.13
8,535.0	49.80	340.20	8,434.6	227.8	102.7	206.5	9.45	9.38	1.56
8,567.0	51.70	339.80	8,454.9	251.1	94.2	230.9	6.02	5.94	-1.25
8,598.0	55.10	340.30	8,473.3	274.5	85.8	255.4	11.04	10.97	1.61
8,630.0	58.60	342.70	8,490.8	299.9	77.3	281.9	12.61	10.94	7.50
8,661.0	59.90	345.00	8,506.7	325.5	69.9	308.4	7.63	4.19	7.42
8,693.0	63.10	345.50	8,522.0	352.7	62.7	336.4	10.09	10.00	1.56
8,725.0	67.10	345.00	8,535.4	380.8	55.3	365.4	12.58	12.50	-1.56
8,756.0	70.90	344.30	8,546.5	408.7	47.7	394.2	12.44	12.26	-2.26
8,788.0	72.20	344.30	8,556.7	437.9	39.4	424.4	4.05	4.06	0.00
8,820.0	74.20	345.70	8,565.9	467.5	31.5	454.9	7.52	6.25	4.38
8,852.0	77.50	347.50	8,573.7	497.6	24.3	485.9	11.67	10.31	5.63
8,883.0	80.00	348.30	8,579.8	527.4	18.0	516.2	8.45	8.06	2.58
8,915.0	82.20	347.90	8,584.7	558.3	11.4	547.8	6.99	6.88	-1.26
8,947.0	83.20	347.90	8,588.8	589.3	4.8	579.6	3.13	3.13	0.00
8,978.0	83.60	347.80	8,592.4	619.4	-1.7	610.3	1.33	1.29	-0.32
9,010.0	83.10	347.90	8,596.1	650.5	-8.4	642.1	1.59	-1.56	0.31
9,042.0	82.20	347.00	8,600.2	681.5	-15.3	673.8	3.96	-2.81	-2.81
9,073.0	82.10	346.70	8,604.4	711.4	-22.3	704.5	1.01	-0.32	-0.97
9,105.0	83.90	348.60	8,608.3	742.4	-29.1	736.2	8.15	5.63	5.94
9,137.0	85.00	348.90	8,611.4	773.7	-35.3	768.0	3.56	3.44	0.94
9,168.0	87.70	349.50	8,613.4	804.0	-41.1	799.0	8.92	8.71	1.94
9,200.0	89.10	350.20	8,614.3	835.5	-46.7	831.0	4.89	4.38	2.19
9,263.0	92.10	351.10	8,613.6	897.7	-56.9	893.9	4.97	4.76	1.43
9,369.0	91.50	350.70	8,610.6	992.4	-72.1	989.9	0.75	-0.63	-0.42
9,453.0	91.60	350.10	8,608.0	1,085.1	-87.8	1,083.8	0.65	0.11	-0.64
9,548.0	88.90	347.20	8,607.6	1,178.2	-106.5	1,178.8	4.17	-2.84	-3.05
9,643.0	92.00	346.80	8,606.9	1,270.8	-127.8	1,273.6	3.29	3.26	-0.42
9,738.0	93.50	347.30	8,602.3	1,363.2	-149.1	1,368.4	1.66	1.58	0.53
9,833.0	92.10	348.40	8,597.7	1,456.0	-169.1	1,463.2	1.87	-1.47	1.16
9,928.0	92.00	348.30	8,594.3	1,549.0	-188.3	1,558.1	0.15	-0.11	-0.11
10,023.0	91.40	347.90	8,591.5	1,641.9	-207.8	1,653.0	0.76	-0.63	-0.42
10,118.0	92.90	349.40	8,587.9	1,735.0	-226.5	1,747.9	2.23	1.58	1.58
10,213.0	92.70	348.70	8,583.3	1,828.1	-244.5	1,842.8	0.77	-0.21	-0.74
10,308.0	93.60	348.80	8,578.0	1,921.1	-263.0	1,937.6	0.95	0.95	0.11
10,404.0	95.20	347.90	8,570.7	2,014.9	-282.4	2,039.3	1.91	1.67	-0.94
10,499.0	94.40	344.50	8,562.7	2,106.6	-305.0	2,127.8	3.68	-0.84	-3.58
10,594.0	94.60	345.00	8,555.3	2,198.2	-329.9	2,222.1	0.57	0.21	0.53
10,689.0	94.40	344.70	8,547.8	2,289.5	-354.6	2,316.4	0.38	-0.21	-0.32





DDC  
Survey Report



Company:	Chief Oil & Gas - AP	Local Co-ordinate Reference:	Well Lanco #1H
Project:	Proston County, WV	TVD Reference:	WELL @ 1997.2usft (Patterson #255)
Site:	David & Sandra Smith	MD Reference:	WELL @ 1997.2usft (Patterson #255)
Well:	Lanco #1H	North Reference:	Grid
Wellbore:	Side-Track #1	Survey Calculation Method:	Minimum Curvature
Design:	Side-Track #1	Database:	EDM 5000.1 Single User Db

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/S (usft)	+E/W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
TD									
10,739.0	94.40	344.70	8,544.0	2,337.7	-367.8	2,366.0	0.00	0.00	0.00

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/S (usft)	+E/W (usft)	
8,123.0	8,094.7	15.8	177.7	Tie-In
10,739.0	8,544.0	2,337.7	-367.8	TD

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_