

Chesapeake Operating Inc.



Project: Weld County, Colorado NAD27
Site: Sec 24-T8N-R67W
Well: Lindstrom 24-8-67 1H
Wellbore: Original Hole
Plan: Final Surveys
Rig: Cyclone 11

SECTION DETAILS Plan 1

MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	VSect	Target
6568.00	0.44	205.86	6566.89	21.54	-70.12	0.00	0.00	-19.48	
6625.12	0.44	205.86	6624.01	21.15	-70.31	0.00	0.00	-19.08	
7523.13	90.20	180.74	7192.97	-553.72	-79.60	10.00	-25.12	555.81	
11399.01	90.20	180.74	7179.53	-4429.26	-129.58	0.00	-139.40	4431.16	PBHL

Surface Location: SHL 280° FNL & 1979° FWL Sec 24-T8-R67W

US State Plane 1927 (Exact solution)
 Colorado North 501
Elevation: 5246' GL + 14' KB @ 5260.00ft (Cyclone 11)
 Northing Easting Latitude Longitude
 481619.25 2182638.58 40° 39' 12.961 N 104° 50' 30.464 W

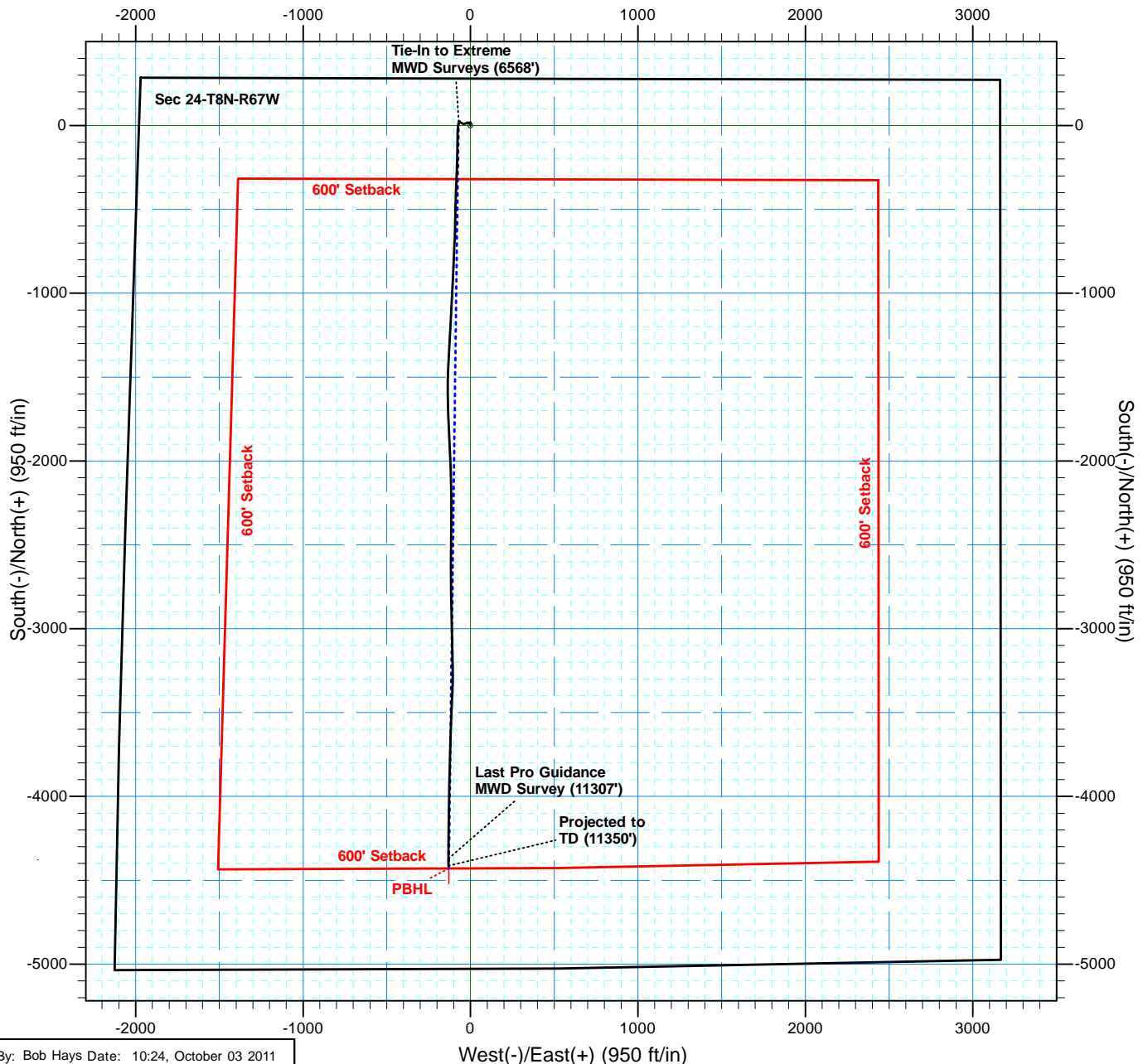
WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N-S	+E-W	Latitude	Longitude
PBHL	7179.53	-4429.26	-129.58	40° 38' 29.203 N	104° 50' 32.571 W



To convert a Magnetic Direction to a Grid Direction, Add 8.42°

Magnetic Model: IGRF200510 Date: 19-Sep-11
 Azimuths & Coordinates to NAD27 Grid



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MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	VSect	Target
6568.00	0.44	205.86	6566.89	21.54	-70.12	0.00	0.00	-19.48	
6625.12	0.44	205.86	6624.01	21.15	-70.31	0.00	0.00	-19.08	
7523.13	90.20	180.74	7192.97	-553.72	-79.60	10.00	-25.12	555.81	
11399.01	90.20	180.74	7179.53	-4429.26	-129.58	0.00	-139.40	4431.16	PBHL

Surface Location:
 SHL 280' FNL & 1979' FWL Sec 24-T8-R67W

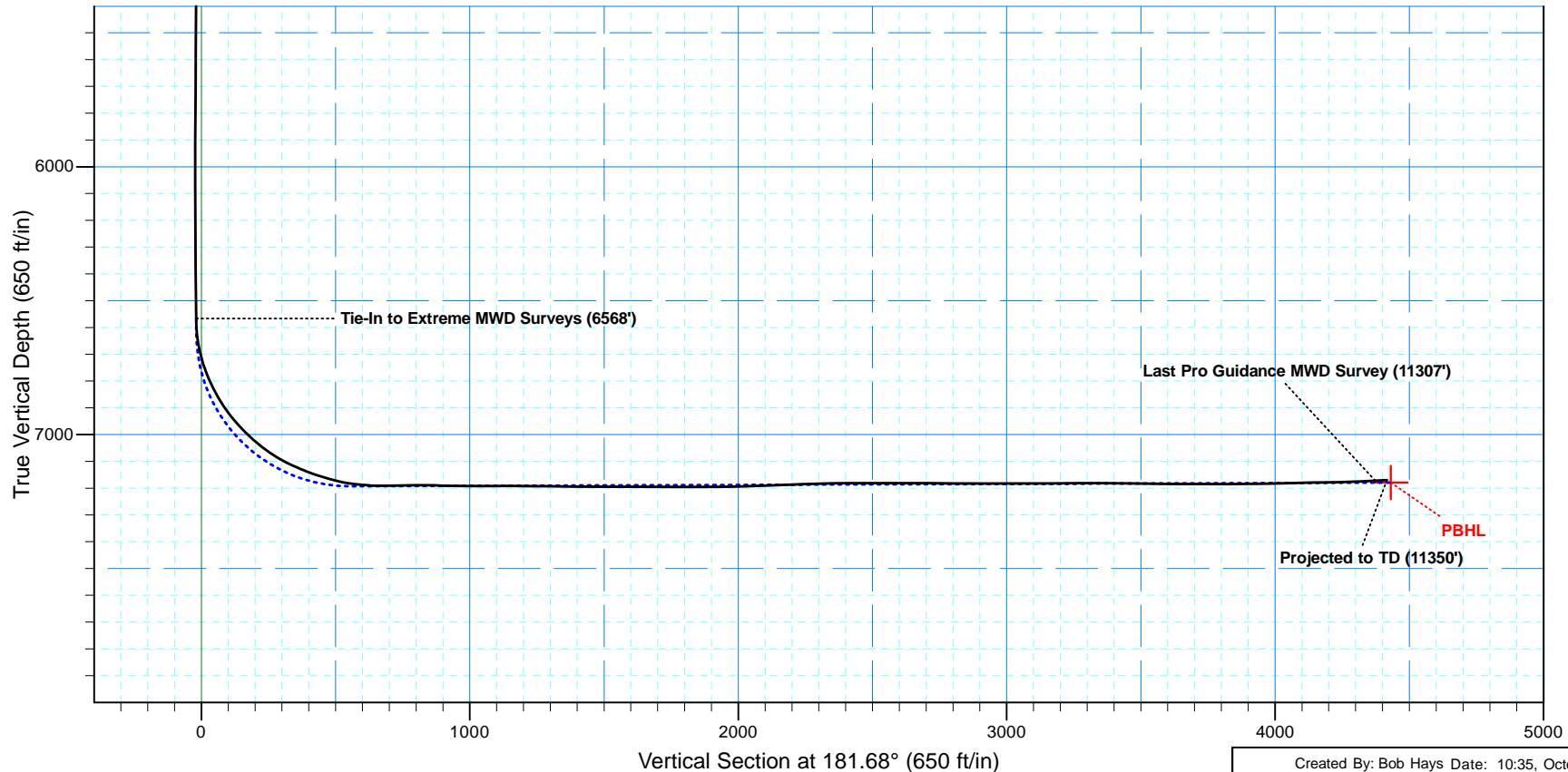
US State Plane 1927 (Exact solution)
 Colorado North 501

Elevation: 5246' GL + 14' KB @ 5260.00ft (Cyclone 11)

Northing	Easting	Latitude	Longitude
481619.25	2182638.58	40° 39' 12.961 N	104° 50' 30.464 W

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N-S	+E-W	Latitude	Longitude
PBHL	7179.53	-4429.26	-129.58	40° 38' 29.203 N	104° 50' 32.571 W



Created By: Bob Hays Date: 10:35, October 03 2011



Chesapeake Operating Inc.

Weld County, Colorado NAD27

Sec 24-T8N-R67W

Lindstrom 24-8-67 1H

Original Hole

Design: Final Surveys

Standard Survey Report

03 October, 2011





Professional Directional LTD

Survey Report



Company:	Chesapeake Operating Inc.	Local Co-ordinate Reference:	Well Lindstrom 24-8-67 1H
Project:	Weld County, Colorado NAD27	TVD Reference:	5246' GL + 14' KB @ 5260.00ft (Cyclone 11)
Site:	Sec 24-T8N-R67W	MD Reference:	5246' GL + 14' KB @ 5260.00ft (Cyclone 11)
Well:	Lindstrom 24-8-67 1H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Final Surveys	Database:	EDM 5000.1 Single User Db

Project	Weld County, Colorado NAD27		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	Colorado North 501		

Site	Sec 24-T8N-R67W		
Site Position:		Northing:	481,619.25 ft
From:	Map	Easting:	2,182,638.58 ft
Position Uncertainty:	0.00 ft	Slot Radius:	1.10000 ft
		Latitude:	40° 39' 12.961 N
		Longitude:	104° 50' 30.464 W
		Grid Convergence:	0.43 °

Well	Lindstrom 24-8-67 1H		
Well Position	+N/-S	0.00 ft	Northing:
	+E/-W	0.00 ft	Easting:
Position Uncertainty	0.00 ft		Wellhead Elevation:
			Latitude:
			Longitude:
			Ground Level:

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	2011/09/19	8.85	67.24	53,247

Design	Final Surveys				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00	181.68	

Survey Program	Date	2011/10/03			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
304.00	6,568.00	Extreme MWD Surveys (Original Hole)	MWD	MWD	
6,599.00	11,307.00	Pro Guidance MWD Surveys (Original Hol	MWD	MWD	
11,350.00	11,350.00	Projection to TD (Original Hole)	Projection	Projection	

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
6,568.00	0.44	205.86	6,566.88	21.54	-70.12	-19.48	0.25	-0.24	-5.26	
Tie-In to Extreme MWD Surveys (6568')										
6,599.00	2.90	188.30	6,597.87	20.66	-70.28	-18.59	8.01	7.94	-56.65	
6,631.00	6.70	190.00	6,629.75	18.02	-70.73	-15.94	11.88	11.88	5.31	
6,662.00	9.90	190.50	6,660.42	13.61	-71.52	-11.52	10.33	10.32	1.61	
6,694.00	12.80	190.70	6,691.79	7.42	-72.68	-5.30	9.06	9.06	0.63	
6,726.00	16.20	187.40	6,722.77	-0.49	-73.92	2.65	10.93	10.63	-10.31	
6,758.00	19.60	186.10	6,753.22	-10.25	-75.06	12.45	10.70	10.63	-4.06	

Company:	Chesapeake Operating Inc.	Local Co-ordinate Reference:	Well Lindstrom 24-8-67 1H
Project:	Weld County, Colorado NAD27	TVD Reference:	5246' GL + 14' KB @ 5260.00ft (Cyclone 11)
Site:	Sec 24-T8N-R67W	MD Reference:	5246' GL + 14' KB @ 5260.00ft (Cyclone 11)
Well:	Lindstrom 24-8-67 1H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Final Surveys	Database:	EDM 5000.1 Single User Db

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
6,789.00	22.30	184.40	6,782.17	-21.29	-76.07	23.51	8.93	8.71	-5.48
6,821.00	25.20	181.70	6,811.45	-34.16	-76.74	36.39	9.68	9.06	-8.44
6,853.00	28.00	180.70	6,840.06	-48.48	-77.03	50.71	8.86	8.75	-3.13
6,885.00	30.70	180.90	6,867.95	-64.16	-77.25	66.39	8.44	8.44	0.63
6,917.00	33.90	181.70	6,895.00	-81.25	-77.64	83.49	10.09	10.00	2.50
6,948.00	37.10	182.30	6,920.23	-99.24	-78.27	101.49	10.38	10.32	1.94
6,980.00	39.50	181.80	6,945.34	-119.06	-78.98	121.32	7.56	7.50	-1.56
7,012.00	42.40	181.00	6,969.51	-140.02	-79.49	142.29	9.21	9.06	-2.50
7,044.00	45.40	180.30	6,992.57	-162.21	-79.74	164.47	9.50	9.38	-2.19
7,075.00	48.30	180.10	7,013.76	-184.82	-79.82	187.08	9.37	9.35	-0.65
7,107.00	50.90	180.60	7,034.50	-209.19	-79.97	211.44	8.21	8.13	1.56
7,139.00	53.30	181.00	7,054.16	-234.44	-80.32	236.68	7.56	7.50	1.25
7,170.00	55.40	182.10	7,072.23	-259.62	-81.01	261.87	7.36	6.77	3.55
7,201.00	59.10	182.50	7,088.99	-285.66	-82.05	287.94	11.98	11.94	1.29
7,233.00	63.70	183.10	7,104.31	-313.72	-83.43	316.02	14.47	14.38	1.88
7,264.00	65.90	183.20	7,117.51	-341.72	-84.97	344.06	7.10	7.10	0.32
7,295.00	67.40	182.90	7,129.79	-370.14	-86.48	372.51	4.92	4.84	-0.97
7,327.00	69.50	181.60	7,141.55	-399.88	-87.65	402.27	7.57	6.56	-4.06
7,358.00	72.00	180.60	7,151.77	-429.14	-88.21	431.53	8.62	8.06	-3.23
7,390.00	73.00	180.50	7,161.39	-459.65	-88.50	462.05	3.14	3.13	-0.31
7,421.00	75.00	180.60	7,169.93	-489.45	-88.79	491.84	6.46	6.45	0.32
7,453.00	78.30	181.30	7,177.32	-520.58	-89.31	522.97	10.53	10.31	2.19
7,485.00	82.30	181.70	7,182.71	-552.10	-90.13	554.50	12.56	12.50	1.25
7,516.00	84.10	181.70	7,186.38	-582.87	-91.05	585.28	5.81	5.81	0.00
7,548.00	85.30	182.00	7,189.34	-614.72	-92.07	617.15	3.86	3.75	0.94
7,580.00	89.10	182.40	7,190.90	-646.65	-93.30	649.10	11.94	11.88	1.25
7,612.00	90.80	182.40	7,190.93	-678.62	-94.64	681.10	5.31	5.31	0.00
7,644.00	92.00	182.00	7,190.15	-710.59	-95.87	713.08	3.95	3.75	-1.25
7,739.00	89.10	182.70	7,189.23	-805.49	-99.76	808.06	3.14	-3.05	0.74
7,834.00	89.00	182.80	7,190.81	-900.37	-104.32	903.03	0.15	-0.11	0.11
7,929.00	89.40	182.80	7,192.14	-995.24	-108.96	998.01	0.42	0.42	0.00
8,024.00	90.60	183.50	7,192.14	-1,090.10	-114.18	1,092.97	1.46	1.26	0.74
8,120.00	89.00	182.60	7,192.47	-1,185.96	-119.29	1,188.94	1.91	-1.67	-0.94
8,215.00	90.00	183.70	7,193.30	-1,280.81	-124.51	1,283.90	1.56	1.05	1.16
8,310.00	89.20	182.60	7,193.96	-1,375.66	-129.73	1,378.87	1.43	-0.84	-1.16
8,405.00	89.50	182.70	7,195.04	-1,470.55	-134.12	1,473.85	0.33	0.32	0.11
8,501.00	90.60	180.90	7,194.96	-1,566.50	-137.14	1,569.84	2.20	1.15	-1.88
8,596.00	89.40	176.90	7,194.96	-1,661.46	-135.31	1,664.71	4.40	-1.26	-4.21
8,690.00	89.80	178.10	7,195.61	-1,755.37	-131.21	1,758.45	1.35	0.43	1.28
8,786.00	90.30	177.30	7,195.53	-1,851.29	-127.36	1,854.22	0.98	0.52	-0.83
8,880.00	90.70	177.70	7,194.71	-1,945.20	-123.26	1,947.97	0.60	0.43	0.43
8,975.00	91.70	178.00	7,192.72	-2,040.11	-119.70	2,042.73	1.10	1.05	0.32
9,070.00	92.70	178.00	7,189.07	-2,134.98	-116.38	2,137.47	1.05	1.05	0.00
9,165.00	91.40	179.50	7,185.67	-2,229.89	-114.31	2,232.28	2.09	-1.37	1.58

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Site:	Sec 24-T8N-R67W	MD Reference:	5246' GL + 14' KB @ 5260.00ft (Cyclone 11)
Well:	Lindstrom 24-8-67 1H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Final Surveys	Database:	EDM 5000.1 Single User Db

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
9,260.00	91.90	180.10	7,182.94	-2,324.85	-113.98	2,327.19	0.82	0.53	0.63	
9,355.00	90.30	180.90	7,181.11	-2,419.82	-114.81	2,422.15	1.88	-1.68	0.84	
9,450.00	89.70	180.60	7,181.11	-2,514.82	-116.06	2,517.13	0.71	-0.63	-0.32	
9,544.00	90.20	180.20	7,181.20	-2,608.81	-116.71	2,611.11	0.68	0.53	-0.43	
9,639.00	89.40	179.90	7,181.53	-2,703.81	-116.79	2,706.07	0.90	-0.84	-0.32	
9,734.00	89.30	179.10	7,182.61	-2,798.80	-115.97	2,800.99	0.85	-0.11	-0.84	
9,828.00	90.20	178.10	7,183.02	-2,892.77	-113.67	2,894.86	1.43	0.96	-1.06	
9,924.00	89.90	180.30	7,182.93	-2,988.75	-112.33	2,990.76	2.31	-0.31	2.29	
10,019.00	90.20	177.40	7,182.85	-3,083.72	-110.42	3,085.63	3.07	0.32	-3.05	
10,114.00	90.40	178.40	7,182.35	-3,178.66	-106.94	3,180.43	1.07	0.21	1.05	
10,208.00	90.50	180.30	7,181.61	-3,272.64	-105.87	3,274.34	2.02	0.11	2.02	
10,303.00	89.70	182.70	7,181.45	-3,367.60	-108.36	3,369.33	2.66	-0.84	2.53	
10,399.00	88.90	182.40	7,182.62	-3,463.50	-112.63	3,465.31	0.89	-0.83	-0.31	
10,494.00	89.50	182.30	7,183.95	-3,558.41	-116.53	3,560.30	0.64	0.63	-0.11	
10,589.00	89.80	181.70	7,184.53	-3,653.35	-119.84	3,655.29	0.71	0.32	-0.63	
10,684.00	90.00	181.30	7,184.69	-3,748.32	-122.33	3,750.29	0.47	0.21	-0.42	
10,780.00	90.30	181.40	7,184.44	-3,844.29	-124.59	3,846.29	0.33	0.31	0.10	
10,874.00	90.70	181.10	7,183.62	-3,938.27	-126.64	3,940.28	0.53	0.43	-0.32	
10,969.00	91.60	180.90	7,181.72	-4,033.23	-128.30	4,035.26	0.97	0.95	-0.21	
11,065.00	90.90	180.80	7,179.62	-4,129.20	-129.72	4,131.22	0.74	-0.73	-0.10	
11,160.00	91.30	180.70	7,177.80	-4,224.17	-130.97	4,226.19	0.43	0.42	-0.11	
11,255.00	92.30	180.40	7,174.81	-4,319.12	-131.88	4,321.13	1.10	1.05	-0.32	
11,307.00	92.70	180.40	7,172.55	-4,371.07	-132.24	4,373.07	0.77	0.77	0.00	
Last Pro Guidance MWD Survey (11307')										
11,350.00	92.70	180.40	7,170.52	-4,414.02	-132.54	4,416.01	0.00	0.00	0.00	
Projected to TD (11350')										

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
6,568.00	6,566.88	21.54	-70.12	Tie-In to Extreme MWD Surveys (6568')	
11,307.00	7,172.55	-4,371.07	-132.24	Last Pro Guidance MWD Survey (11307')	
11,350.00	7,170.52	-4,414.02	-132.54	Projected to TD (11350')	