

# Chesapeake Operating Inc.



**Project:** Weld County, Colorado NAD27  
**Site:** Sec 2-T9N-R67W  
**Well:** Hutchison 2-9-67 1H  
**Wellbore:** Original Hole  
**Plan:** Final Surveys  
**Rig:** SST 53

## SECTION DETAILS Plan 2

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
7097.02	0.00	0.00	7097.02	0.00	0.00	0.00	0.00	0.00	
7992.02	89.50	359.90	7669.95	567.96	-0.96	10.00	359.90	567.96	
11801.87	89.50	359.90	7703.20	4377.66	-7.39	0.00	0.00	4377.67	<b>PBHL</b>

**Surface Location:**  
 SHL 280° FLS & 2180° FEL Sec 2-T9N-R67W

US State Plane 1927 (Exact solution)  
 Colorado North 501

**Elevation:** 5420.8' GL + 22.2' KB @ 5443.00ft (SST 53)

Northing	Easting	Latitude	Longitude
523900.29	2178374.74	40° 46' 11.053 N	104° 51' 21.798 W

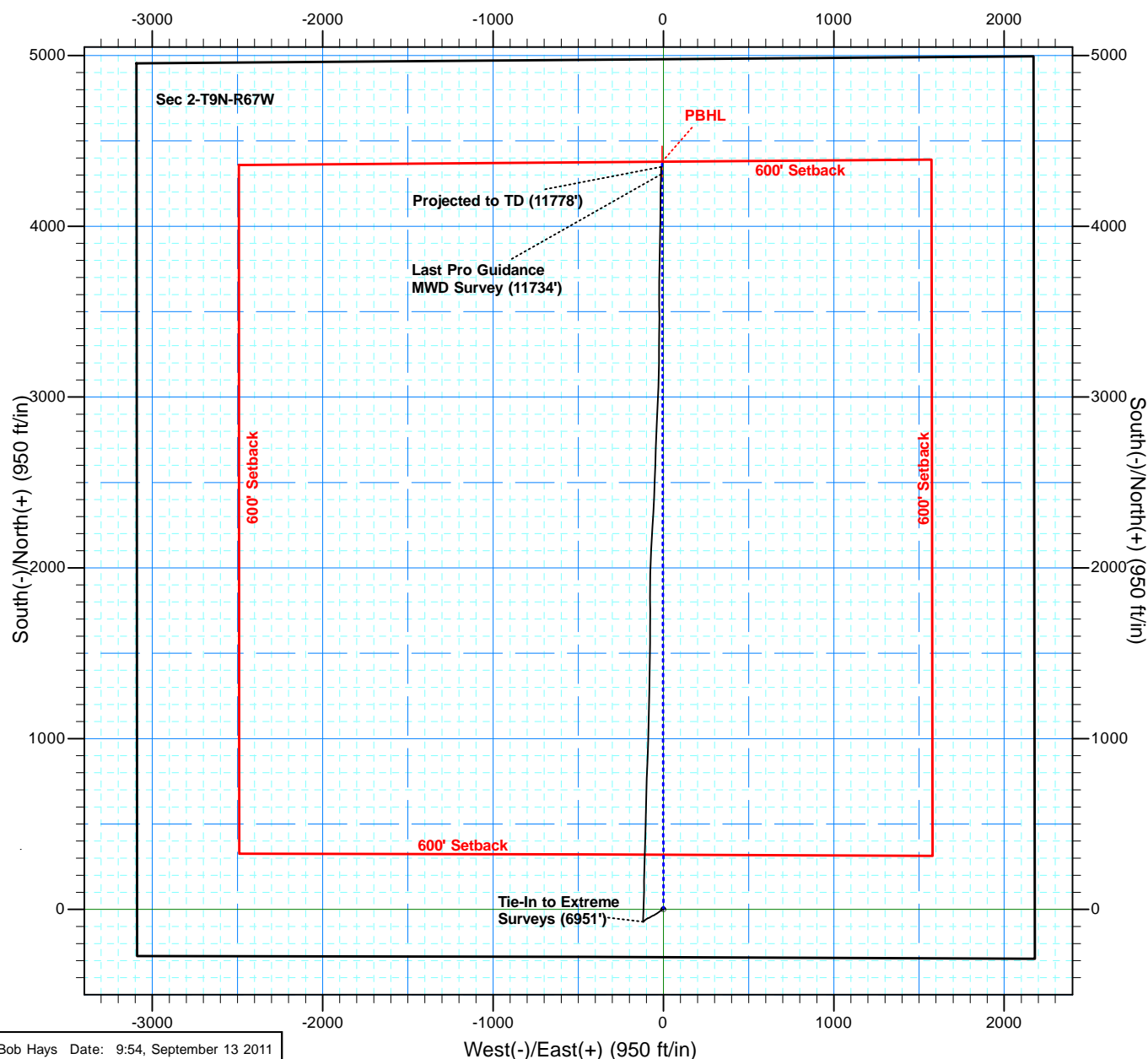
## WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
<b>PBHL</b>	7703.20	4377.66	-7.39	40° 46' 54.309 N	104° 51' 21.481 W



To convert a Magnetic Direction to a Grid Direction, Add 8.46°

Magnetic Model: IGRF200510 Date: 20-Aug-11  
 Azimuths & Coordinates to NAD27 Grid



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## SECTION DETAILS Plan 2

MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	Vsect	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
7097.02	0.00	0.00	7097.02	0.00	0.00	0.00	0.00	0.00	
7992.02	89.50	359.90	7669.95	567.96	-0.96	10.00	359.90	567.96	
11801.87	89.50	359.90	7703.20	4377.66	-7.39	0.00	0.00	4377.67	PBHL

Surface Location:  
 SHL 280' FLS & 2180' FEL Sec 2-T9N-R67W

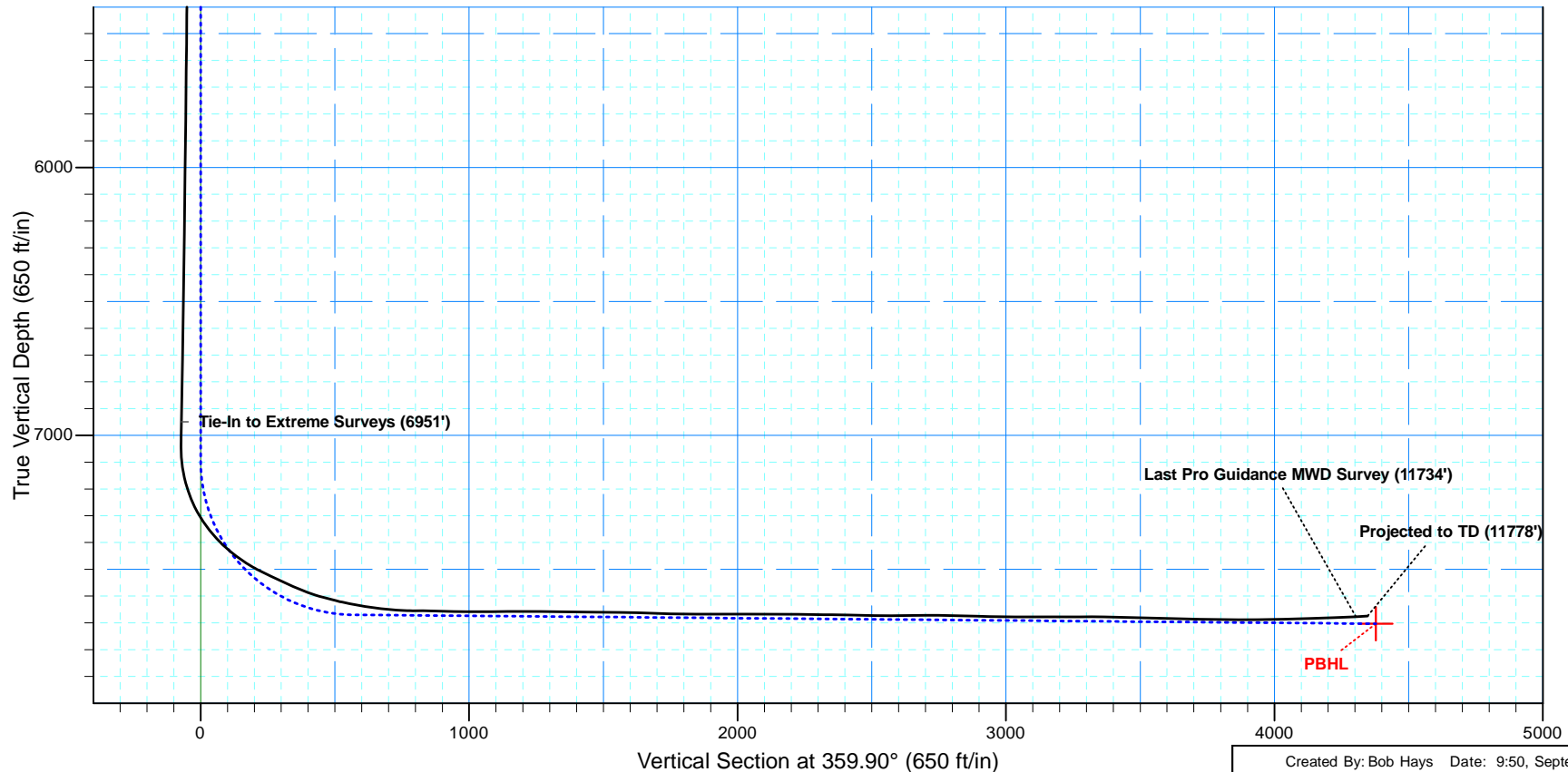
US State Plane 1927 (Exact solution)  
 Colorado North 501

Elevation: 5420.8' GL + 22.2' KB @ 5443.00ft (SST 53)

Northing	Easting	Latitude	Longitude
523900.29	2178374.74	40° 46' 11.053 N	104° 51' 21.798 W

## WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N-S	+E-W	Latitude	Longitude
PBHL	7703.20	4377.66	-7.39	40° 46' 54.309 N	104° 51' 21.481 W





## **Chesapeake Operating Inc.**

**Weld County, Colorado NAD27**

**Sec 2-T9N-R67W**

**Hutchison 2-9-67 1H**

**Original Hole**

**Design: Final Surveys**

## **Standard Survey Report**

**13 September, 2011**



<b>Company:</b>	Chesapeake Operating Inc.	<b>Local Co-ordinate Reference:</b>	Well Hutchison 2-9-67 1H
<b>Project:</b>	Weld County, Colorado NAD27	<b>TVD Reference:</b>	5420' GL + 22.2' KB @ 5443.00ft (SST 53)
<b>Site:</b>	Sec 2-T9N-R67W	<b>MD Reference:</b>	5420' GL + 22.2' KB @ 5443.00ft (SST 53)
<b>Well:</b>	Hutchison 2-9-67 1H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Final Surveys	<b>Database:</b>	EDM 5000.1 Single User Db

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

<b>Site</b>	Sec 2-T9N-R67W		
<b>Site Position:</b>		<b>Northing:</b>	523,900.29 ft
<b>From:</b>	Lat/Long	<b>Easting:</b>	2,178,374.74 ft
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	1.10000 ft
		<b>Latitude:</b>	40° 46' 11.053 N
		<b>Longitude:</b>	104° 51' 21.798 W
		<b>Grid Convergence:</b>	0.42 °

<b>Well</b>	Hutchison 2-9-67 1H		
<b>Well Position</b>	<b>+N/-S</b>	0.00 ft	<b>Northing:</b> 523,900.29 ft
	<b>+E/-W</b>	0.00 ft	<b>Easting:</b> 2,178,374.74 ft
<b>Position Uncertainty</b>	0.00 ft	<b>Wellhead Elevation:</b>	ft
		<b>Latitude:</b>	40° 46' 11.053 N
		<b>Longitude:</b>	104° 51' 21.798 W
		<b>Ground Level:</b>	5,420.80 ft

<b>Wellbore</b>	Original Hole				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF200510	08/20/11	8.88	67.34	53,313

<b>Design</b>	Final Surveys				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00		359.90

<b>Survey Program</b>	<b>Date</b>	09/13/11			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
1,429.00	6,951.00	Extreme Surveys (Original Hole)	MWD	MWD	
7,007.00	11,734.00	Pro Directional MWD Surveys (Original Ho	MWD	MWD	
11,778.00	11,778.00	Projected to TD (Original Hole)	Projection	Projection	

<b>Survey</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Turn Rate (°/100ft)</b>	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,429.00	0.00	0.00	1,429.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,439.10	0.44	191.55	1,439.10	-0.04	-0.01	-0.04	4.36	4.36	0.00	
1,629.70	0.53	229.26	1,629.69	-1.33	-0.82	-1.33	0.17	0.05	19.78	
1,738.10	0.79	248.59	1,738.09	-1.93	-1.90	-1.93	0.31	0.24	17.83	
1,852.20	0.70	251.76	1,852.18	-2.44	-3.29	-2.43	0.09	-0.08	2.78	
2,073.80	0.97	247.36	2,073.75	-3.58	-6.31	-3.57	0.13	0.12	-1.99	
2,264.40	1.20	254.77	2,264.32	-4.73	-9.72	-4.71	0.14	0.12	3.89	
2,454.60	1.23	240.77	2,454.48	-6.25	-13.43	-6.22	0.16	0.02	-7.36	

<b>Company:</b>	Chesapeake Operating Inc.	<b>Local Co-ordinate Reference:</b>	Well Hutchison 2-9-67 1H
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<b>Site:</b>	Sec 2-T9N-R67W	<b>MD Reference:</b>	5420' GL + 22.2' KB @ 5443.00ft (SST 53)
<b>Well:</b>	Hutchison 2-9-67 1H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Final Surveys	<b>Database:</b>	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)
2,643.20	2.02	237.78	2,643.00	-9.01	-18.01	-8.98	0.42	0.42	-1.59
2,802.00	2.11	234.27	2,801.70	-12.21	-22.75	-12.17	0.10	0.06	-2.21
2,962.20	2.11	233.26	2,961.79	-15.69	-27.50	-15.65	0.02	0.00	-0.63
3,150.60	2.02	232.55	3,150.07	-19.79	-32.92	-19.73	0.05	-0.05	-0.38
3,251.40	1.76	233.87	3,250.81	-21.78	-35.58	-21.72	0.26	-0.26	1.31
3,404.60	1.67	235.06	3,403.94	-24.45	-39.31	-24.38	0.06	-0.06	0.78
3,481.20	1.58	237.78	3,480.51	-25.65	-41.12	-25.58	0.15	-0.12	3.55
3,690.20	1.49	238.27	3,689.44	-28.61	-45.87	-28.54	0.04	-0.04	0.23
3,880.20	1.76	234.66	3,879.36	-31.60	-50.35	-31.51	0.15	0.14	-1.90
4,038.70	1.93	247.89	4,037.78	-34.01	-54.81	-33.92	0.29	0.11	8.35
4,196.60	1.49	250.60	4,195.61	-35.70	-59.21	-35.60	0.28	-0.28	1.72
4,402.60	1.49	241.87	4,401.54	-37.85	-64.09	-37.74	0.11	0.00	-4.24
4,593.10	2.02	240.16	4,591.95	-40.69	-69.19	-40.57	0.28	0.28	-0.90
4,783.50	2.90	239.98	4,782.17	-44.77	-76.27	-44.64	0.46	0.46	-0.09
4,973.00	2.29	241.17	4,971.48	-48.99	-83.74	-48.85	0.32	-0.32	0.63
5,177.90	0.97	252.37	5,176.29	-51.49	-88.98	-51.34	0.66	-0.64	5.47
5,430.50	0.88	263.05	5,428.86	-52.37	-92.94	-52.21	0.08	-0.04	4.23
5,541.60	0.79	232.99	5,539.94	-52.94	-94.40	-52.78	0.40	-0.08	-27.06
5,636.00	0.97	235.89	5,634.33	-53.77	-95.58	-53.61	0.20	0.19	3.07
5,827.00	1.41	227.85	5,825.29	-56.26	-98.66	-56.09	0.25	0.23	-4.21
6,018.00	1.14	243.28	6,016.24	-58.69	-102.10	-58.52	0.23	-0.14	8.08
6,207.00	1.14	234.18	6,205.21	-60.64	-105.31	-60.46	0.10	0.00	-4.81
6,397.00	1.23	227.28	6,395.17	-63.13	-108.34	-62.94	0.09	0.05	-3.63
6,592.00	1.32	224.47	6,590.12	-66.15	-111.45	-65.96	0.06	0.05	-1.44
6,777.00	1.41	226.36	6,775.07	-69.24	-114.59	-69.05	0.05	0.05	1.02
6,951.00	1.32	230.66	6,949.02	-71.99	-117.69	-71.79	0.08	-0.05	2.47
Tie-In to Extreme Surveys (6951')									
7,007.00	1.50	232.00	7,005.00	-72.85	-118.76	-72.65	0.33	0.32	2.39
7,023.00	1.50	235.60	7,020.99	-73.09	-119.10	-72.89	0.59	0.00	22.50
7,055.00	1.10	294.40	7,052.99	-73.20	-119.73	-73.00	4.13	-1.25	183.75
7,086.00	4.00	352.40	7,083.96	-72.01	-120.14	-71.81	11.43	9.35	187.10
7,118.00	7.70	3.50	7,115.79	-68.76	-120.16	-68.56	12.04	11.56	34.69
7,150.00	11.50	4.80	7,147.33	-63.44	-119.76	-63.24	11.89	11.88	4.06
7,182.00	15.30	4.00	7,178.45	-56.05	-119.20	-55.85	11.89	11.88	-2.50
7,213.00	18.90	2.00	7,208.08	-46.95	-118.74	-46.75	11.77	11.61	-6.45
7,245.00	22.30	1.20	7,238.03	-35.69	-118.43	-35.49	10.66	10.63	-2.50
7,277.00	26.00	1.90	7,267.22	-22.61	-118.07	-22.41	11.60	11.56	2.19
7,308.00	30.00	1.90	7,294.59	-8.07	-117.59	-7.87	12.90	12.90	0.00
7,340.00	34.30	1.40	7,321.68	8.95	-117.10	9.15	13.46	13.44	-1.56
7,372.00	37.50	3.30	7,347.59	27.69	-116.32	27.89	10.59	10.00	5.94
7,404.00	40.80	3.10	7,372.41	47.86	-115.19	48.06	10.32	10.31	-0.63
7,435.00	44.10	1.10	7,395.28	68.77	-114.44	68.96	11.50	10.65	-6.45
7,467.00	47.90	359.40	7,417.50	91.78	-114.35	91.97	12.47	11.88	-5.31

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<b>Site:</b>	Sec 2-T9N-R67W	<b>MD Reference:</b>	5420' GL + 22.2' KB @ 5443.00ft (SST 53)
<b>Well:</b>	Hutchison 2-9-67 1H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Final Surveys	<b>Database:</b>	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)	
7,499.00	51.20	0.00	7,438.26	116.13	-114.47	116.32	10.41	10.31	1.88	
7,531.00	53.90	1.10	7,457.72	141.53	-114.22	141.72	8.87	8.44	3.44	
7,562.00	57.00	0.90	7,475.30	167.05	-113.78	167.24	10.01	10.00	-0.65	
7,594.00	60.00	1.40	7,492.02	194.33	-113.23	194.52	9.47	9.38	1.56	
7,626.00	63.20	1.80	7,507.23	222.46	-112.44	222.65	10.06	10.00	1.25	
7,658.00	64.50	2.10	7,521.34	251.17	-111.47	251.36	4.15	4.06	0.94	
7,690.00	65.20	1.80	7,534.94	280.12	-110.48	280.30	2.35	2.19	-0.94	
7,721.00	65.50	1.40	7,547.87	308.28	-109.69	308.47	1.52	0.97	-1.29	
7,753.00	65.90	1.30	7,561.03	337.44	-109.01	337.62	1.28	1.25	-0.31	
7,785.00	66.70	1.10	7,573.90	366.73	-108.39	366.92	2.56	2.50	-0.63	
7,816.00	69.60	1.40	7,585.43	395.50	-107.76	395.68	9.40	9.35	0.97	
7,848.00	72.80	1.60	7,595.74	425.78	-106.97	425.96	10.02	10.00	0.63	
7,880.00	74.60	1.90	7,604.73	456.47	-106.03	456.65	5.70	5.63	0.94	
7,912.00	75.50	1.80	7,612.98	487.37	-105.03	487.55	2.83	2.81	-0.31	
7,943.00	76.50	1.30	7,620.48	517.44	-104.22	517.62	3.59	3.23	-1.61	
7,974.00	78.60	1.30	7,627.16	547.70	-103.53	547.88	6.77	6.77	0.00	
8,006.00	80.30	1.70	7,633.02	579.15	-102.71	579.32	5.45	5.31	1.25	
8,038.00	80.40	1.80	7,638.39	610.68	-101.75	610.85	0.44	0.31	0.31	
8,070.00	82.20	1.30	7,643.23	642.30	-100.89	642.47	5.83	5.63	-1.56	
8,101.00	83.90	1.20	7,646.98	673.07	-100.22	673.23	5.49	5.48	-0.32	
8,133.00	84.30	1.10	7,650.27	704.89	-99.58	705.06	1.29	1.25	-0.31	
8,165.00	86.20	1.30	7,652.92	736.77	-98.91	736.94	5.97	5.94	0.63	
8,197.00	88.10	2.20	7,654.51	768.71	-97.94	768.88	6.57	5.94	2.81	
8,228.00	90.30	3.50	7,654.94	799.67	-96.40	799.83	8.24	7.10	4.19	
8,323.00	88.20	1.80	7,656.18	894.55	-92.01	894.71	2.84	-2.21	-1.79	
8,419.00	89.30	1.70	7,658.28	990.48	-89.07	990.63	1.15	1.15	-0.10	
8,514.00	90.90	1.50	7,658.11	1,085.44	-86.42	1,085.59	1.70	1.68	-0.21	
8,609.00	89.40	1.00	7,657.86	1,180.42	-84.35	1,180.56	1.66	-1.58	-0.53	
8,704.00	90.40	0.60	7,658.03	1,275.41	-83.02	1,275.54	1.13	1.05	-0.42	
8,799.00	88.70	1.30	7,658.78	1,370.39	-81.45	1,370.52	1.94	-1.79	0.74	
8,894.00	89.30	1.20	7,660.43	1,465.35	-79.38	1,465.48	0.64	0.63	-0.11	
8,989.00	89.80	0.10	7,661.18	1,560.34	-78.30	1,560.47	1.27	0.53	-1.16	
9,084.00	87.80	0.50	7,663.17	1,655.31	-77.80	1,655.44	2.15	-2.11	0.42	
9,179.00	88.70	359.90	7,666.07	1,750.26	-77.47	1,750.39	1.14	0.95	-0.63	
9,274.00	89.90	359.30	7,667.23	1,845.25	-78.13	1,845.38	1.41	1.26	-0.63	
9,369.00	89.70	0.50	7,667.56	1,940.25	-78.30	1,940.38	1.28	-0.21	1.26	
9,464.00	90.00	2.90	7,667.81	2,035.20	-75.48	2,035.33	2.55	0.32	2.53	
9,559.00	90.10	2.80	7,667.73	2,130.08	-70.76	2,130.20	0.15	0.11	-0.11	
9,654.00	89.10	3.80	7,668.39	2,224.92	-65.29	2,225.03	1.49	-1.05	1.05	
9,749.00	89.70	3.70	7,669.39	2,319.71	-59.08	2,319.81	0.64	0.63	-0.11	
9,844.00	88.40	2.10	7,670.96	2,414.57	-54.27	2,414.66	2.17	-1.37	-1.68	
9,940.00	89.40	1.80	7,672.80	2,510.50	-51.00	2,510.58	1.09	1.04	-0.31	
10,035.00	90.80	1.80	7,672.64	2,605.45	-48.02	2,605.53	1.47	1.47	0.00	
10,130.00	90.20	1.80	7,671.81	2,700.40	-45.04	2,700.47	0.63	-0.63	0.00	

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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)
10,225.00	88.50	2.60	7,672.89	2,795.32	-41.39	2,795.38	1.98	-1.79	0.84
10,321.00	88.30	2.60	7,675.57	2,891.18	-37.04	2,891.24	0.21	-0.21	0.00
10,416.00	89.30	2.50	7,677.56	2,986.06	-32.81	2,986.12	1.06	1.05	-0.11
10,511.00	90.00	2.00	7,678.14	3,080.99	-29.08	3,081.03	0.91	0.74	-0.53
10,606.00	90.00	0.70	7,678.14	3,175.96	-26.84	3,176.00	1.37	0.00	-1.37
10,702.00	90.60	0.70	7,677.63	3,271.95	-25.67	3,271.99	0.63	0.63	0.00
10,797.00	88.90	0.70	7,678.05	3,366.94	-24.51	3,366.98	1.79	-1.79	0.00
10,892.00	88.60	359.60	7,680.12	3,461.92	-24.26	3,461.95	1.20	-0.32	-1.16
10,987.00	88.60	359.40	7,682.44	3,556.88	-25.09	3,556.92	0.21	0.00	-0.21
11,082.00	88.40	0.60	7,684.93	3,651.85	-25.09	3,651.89	1.28	-0.21	1.26
11,178.00	89.30	1.30	7,686.86	3,747.82	-23.50	3,747.85	1.19	0.94	0.73
11,273.00	89.30	1.10	7,688.02	3,842.79	-21.51	3,842.82	0.21	0.00	-0.21
11,368.00	90.40	0.90	7,688.27	3,937.77	-19.85	3,937.80	1.18	1.16	-0.21
11,463.00	91.80	0.50	7,686.44	4,032.74	-18.69	4,032.77	1.53	1.47	-0.42
11,558.00	91.40	0.80	7,683.79	4,127.70	-17.61	4,127.72	0.53	-0.42	0.32
11,654.00	92.20	0.90	7,680.77	4,223.64	-16.19	4,223.66	0.84	0.83	0.10
11,734.00	93.20	1.30	7,677.01	4,303.54	-14.66	4,303.56	1.35	1.25	0.50
Last Pro Guidance MWD Survey (11734')									
11,778.00	93.20	1.30	7,674.55	4,347.46	-13.66	4,347.47	0.00	0.00	0.00
Projected to TD (11778')									

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
6,951.00	6,949.02	-71.99	-117.69	Tie-In to Extreme Surveys (6951')
11,734.00	7,677.01	4,303.54	-14.66	Last Pro Guidance MWD Survey (11734')
11,778.00	7,674.55	4,347.46	-13.66	Projected to TD (11778')