

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Dalton 24Q-241**

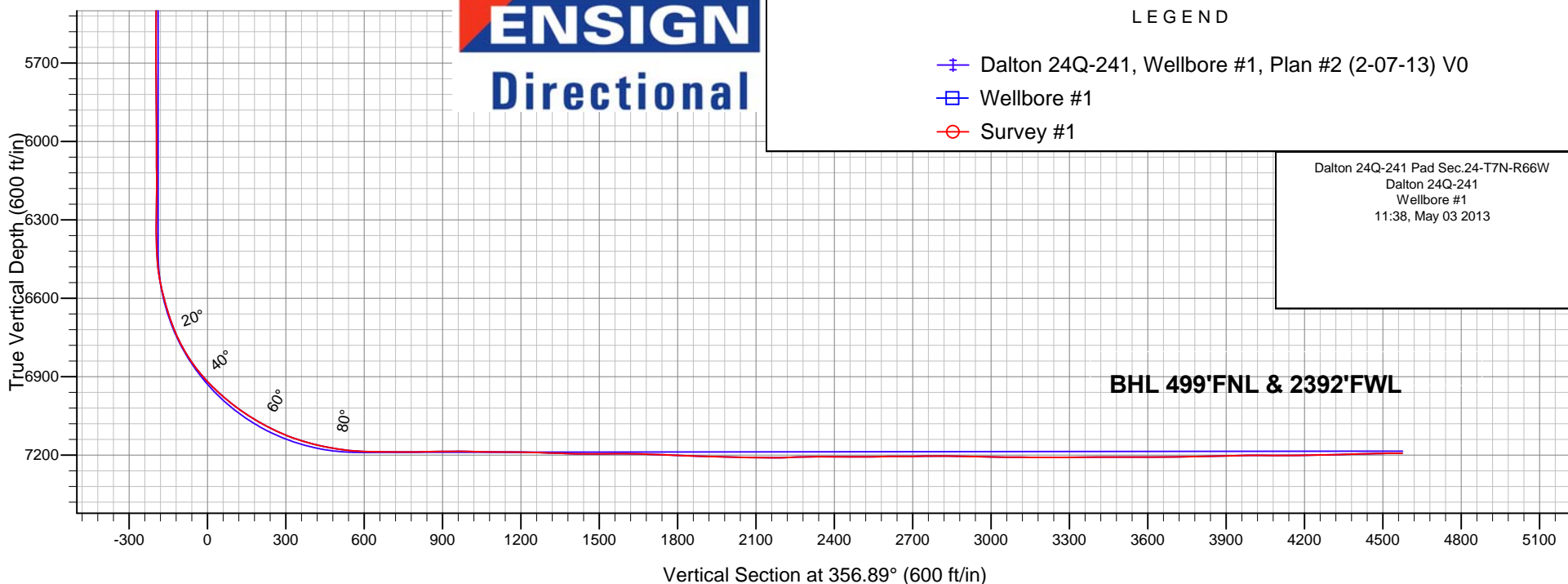
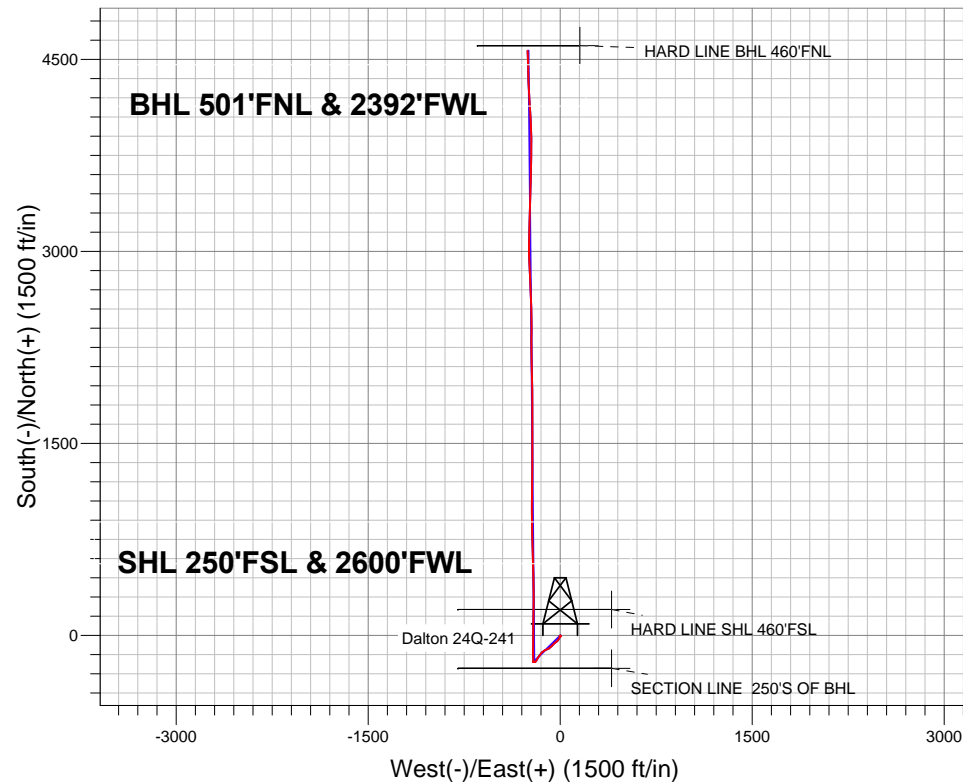
Surface Location: Dalton 24Q-241 Pad Sec.24-T7N-R66W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

Ground Elevation: 4865.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1445711.49	3215123.65	40.554300	-104.725820	
RKB Ensign 32 - 15' WELL @ 4880.0ft (RKB Ensign 32 - 15')						

SURVEY

Projected Bottom Hole Location
11637'MD 7193'TVD 4567'N & 256'W of SHL
90.3 degree Incl @ 357.90 degree AZM





PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.24-T7N-R66W

Dalton 24Q-241 Pad Sec.24-T7N-R66W

Dalton 24Q-241

Wellbore #1

Survey: Survey #1

Standard Survey Report

03 May, 2013

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Dalton 24Q-241
Project:	SEC.24-T7N-R66W	TVD Reference:	WELL @ 4880.0ft (RKB Ensign 32 - 15')
Site:	Dalton 24Q-241 Pad Sec.24-T7N-R66W	MD Reference:	WELL @ 4880.0ft (RKB Ensign 32 - 15')
Well:	Dalton 24Q-241	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	SEC.24-T7N-R66W, Weld County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site		Dalton 24Q-241 Pad Sec.24-T7N-R66W			
Site Position:		Northing:	1,445,711.50ft	Latitude:	40.554300
From:	Lat/Long	Easting:	3,215,123.65ft	Longitude:	-104.725820
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.50 °

Well	Dalton 24Q-241					
Well Position	+N/-S	0.0 ft	Northing:	1,445,711.49 ft	Latitude:	40.554300
	+E/-W	0.0 ft	Easting:	3,215,123.65 ft	Longitude:	-104.725820
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,865.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2/15/2013	8.63	67.12	53,040

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.0	0.0	0.0	356.89	

Survey Program	Date 5/3/2013				
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
100.0	11,637.0	Survey #1 (Wellbore #1)	MWD	MWD - Standard	

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)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
HARDLINE BHL 460'FNL - HARDLINE SHL 460'FSL										
0.5	0.00	118.30	0.5	0.0	0.0	0.0	0.60	0.60	0.00	
2690'FSL & 2700'FWL - 200'FNL & 2200'FWL - HARD LINE BHL 460'FNL										
1.1	0.01	118.30	1.1	0.0	0.0	0.0	0.60	0.60	0.00	
HARD LINE SHL 460'FSL										
9.5	0.06	118.30	9.5	0.0	0.0	0.0	0.60	0.60	0.00	
SECTION LINE 250'S OF BHL										
100.0	0.60	118.30	100.0	-0.2	0.5	-0.3	0.60	0.60	0.00	
191.0	0.50	113.00	191.0	-0.6	1.2	-0.7	0.12	-0.11	-5.82	
281.0	0.70	160.90	281.0	-1.3	1.8	-1.4	0.58	0.22	53.22	
374.0	1.10	167.00	374.0	-2.7	2.2	-2.8	0.44	0.43	6.56	

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Site:	Dalton 24Q-241 Pad Sec.24-T7N-R66W	MD Reference:	WELL @ 4880.0ft (RKB Ensign 32 - 15')
Well:	Dalton 24Q-241	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

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)
467.0	1.80	143.60	466.9	-4.8	3.2	-4.9	0.97	0.75	-25.16
560.0	1.30	205.30	559.9	-6.9	3.7	-7.1	1.77	-0.54	66.34
652.0	1.00	235.70	651.9	-8.3	2.5	-8.4	0.73	-0.33	33.04
746.0	1.60	262.30	745.9	-8.9	0.6	-8.9	0.89	0.64	28.30
840.0	1.20	267.70	839.8	-9.1	-1.7	-9.0	0.45	-0.43	5.74
911.0	0.90	310.10	910.8	-8.8	-2.9	-8.6	1.14	-0.42	59.72
994.0	1.40	309.40	993.8	-7.7	-4.2	-7.5	0.60	0.60	-0.84
1,089.0	1.60	314.80	1,088.8	-6.1	-6.0	-5.7	0.26	0.21	5.68
1,214.0	0.30	172.50	1,213.8	-5.2	-7.2	-4.8	1.48	-1.04	-113.84
1,338.0	0.30	64.70	1,337.8	-5.3	-6.9	-5.0	0.39	0.00	-86.94
1,461.0	0.70	90.00	1,460.8	-5.2	-5.8	-4.9	0.36	0.33	20.57
1,583.0	0.70	81.40	1,582.8	-5.1	-4.3	-4.9	0.09	0.00	-7.05
1,705.0	0.40	64.70	1,704.8	-4.8	-3.2	-4.6	0.28	-0.25	-13.69
1,828.0	0.50	113.00	1,827.8	-4.8	-2.3	-4.7	0.31	0.08	39.27
1,954.0	0.60	133.80	1,953.7	-5.5	-1.4	-5.4	0.18	0.08	16.51
2,081.0	1.10	111.60	2,080.7	-6.4	0.3	-6.4	0.46	0.39	-17.48
2,208.0	1.50	266.50	2,207.7	-7.0	-0.3	-6.9	2.00	0.31	121.97
2,336.0	2.50	216.40	2,335.6	-9.3	-3.6	-9.1	1.50	0.78	-39.14
2,463.0	4.70	197.10	2,462.4	-16.5	-6.8	-16.1	1.95	1.73	-15.20
2,589.0	5.50	203.60	2,587.9	-27.0	-10.7	-26.4	0.78	0.63	5.16
2,717.0	4.70	216.80	2,715.4	-36.8	-16.3	-35.9	1.11	-0.63	10.31
2,843.0	5.90	232.00	2,840.9	-44.9	-24.5	-43.5	1.46	0.95	12.06
2,970.0	6.70	233.10	2,967.1	-53.4	-35.6	-51.4	0.64	0.63	0.87
3,097.0	5.50	232.40	3,093.4	-61.6	-46.3	-59.0	0.95	-0.94	-0.55
3,224.0	5.50	220.40	3,219.8	-69.9	-55.1	-66.8	0.90	0.00	-9.45
3,351.0	6.50	222.40	3,346.1	-79.8	-63.9	-76.3	0.80	0.79	1.57
3,478.0	5.30	230.60	3,472.4	-88.9	-73.3	-84.8	1.15	-0.94	6.46
3,605.0	4.80	225.50	3,598.9	-96.3	-81.6	-91.8	0.53	-0.39	-4.02
3,732.0	4.30	241.40	3,725.5	-102.3	-89.5	-97.3	1.06	-0.39	12.52
3,859.0	5.00	250.90	3,852.1	-106.4	-99.0	-100.9	0.82	0.55	7.48
3,985.0	6.60	249.30	3,977.5	-110.8	-110.9	-104.6	1.28	1.27	-1.27
4,112.0	7.60	235.00	4,103.5	-118.2	-124.6	-111.2	1.59	0.79	-11.26
4,239.0	8.50	229.20	4,229.2	-129.1	-138.6	-121.4	0.95	0.71	-4.57
4,366.0	7.40	221.50	4,355.0	-141.4	-151.1	-133.0	1.20	-0.87	-6.06
4,493.0	7.40	222.00	4,481.0	-153.6	-162.0	-144.6	0.05	0.00	0.39
4,620.0	7.40	209.20	4,606.9	-166.8	-171.5	-157.3	1.30	0.00	-10.08
4,747.0	6.20	200.60	4,733.0	-180.4	-177.9	-170.4	1.24	-0.94	-6.77
4,874.0	4.00	203.00	4,859.5	-190.9	-182.0	-180.7	1.74	-1.73	1.89
5,001.0	5.00	221.90	4,986.1	-199.1	-187.5	-188.6	1.40	0.79	14.88
5,128.0	3.70	240.00	5,112.8	-205.2	-194.7	-194.4	1.48	-1.02	14.25
5,224.0	1.80	276.50	5,208.7	-206.6	-198.9	-195.5	2.60	-1.98	38.02
5,351.0	0.50	240.00	5,335.6	-206.7	-201.4	-195.4	1.13	-1.02	-28.74
5,478.0	0.50	150.10	5,462.6	-207.4	-201.6	-196.2	0.56	0.00	-70.79
5,605.0	0.10	143.10	5,589.6	-208.0	-201.2	-196.8	0.32	-0.31	-5.51
5,731.0	0.60	299.20	5,715.6	-207.7	-201.7	-196.5	0.55	0.40	123.89
5,859.0	1.10	286.50	5,843.6	-207.1	-203.5	-195.7	0.42	0.39	-9.92
5,986.0	1.10	279.20	5,970.6	-206.5	-205.9	-195.1	0.11	0.00	-5.75
6,113.0	0.90	270.90	6,097.6	-206.3	-208.1	-194.7	0.19	-0.16	-6.54
6,240.0	0.70	255.40	6,224.6	-206.5	-209.8	-194.8	0.23	-0.16	-12.20
6,367.0	0.60	244.00	6,351.5	-207.0	-211.2	-195.2	0.13	-0.08	-8.98
6,399.0	1.50	10.20	6,383.5	-206.6	-211.2	-194.9	5.99	2.81	394.38
6,430.0	1.80	17.80	6,414.5	-205.8	-211.0	-194.0	1.20	0.97	24.52
6,462.0	3.30	10.70	6,446.5	-204.4	-210.7	-192.7	4.78	4.69	-22.19

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Well:	Dalton 24Q-241	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

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)
6,493.0	6.60	359.80	6,477.4	-201.7	-210.5	-190.0	11.02	10.65	-35.16
6,525.0	9.10	358.10	6,509.1	-197.4	-210.6	-185.7	7.85	7.81	-5.31
6,557.0	10.80	357.20	6,540.6	-191.9	-210.8	-180.1	5.33	5.31	-2.81
6,588.0	12.90	356.10	6,570.9	-185.5	-211.2	-173.8	6.81	6.77	-3.55
6,620.0	15.40	356.50	6,602.0	-177.7	-211.7	-165.9	7.82	7.81	1.25
6,652.0	16.70	356.90	6,632.7	-168.9	-212.2	-157.1	4.08	4.06	1.25
6,683.0	17.70	357.20	6,662.3	-159.7	-212.7	-147.9	3.24	3.23	0.97
6,715.0	19.70	358.80	6,692.6	-149.5	-213.1	-137.7	6.45	6.25	5.00
6,747.0	22.20	359.80	6,722.5	-138.0	-213.2	-126.2	7.89	7.81	3.13
6,779.0	25.10	1.10	6,751.8	-125.2	-213.1	-113.4	9.21	9.06	4.06
6,810.0	28.00	2.00	6,779.6	-111.3	-212.7	-99.6	9.44	9.35	2.90
6,841.0	30.80	1.40	6,806.6	-96.1	-212.3	-84.5	9.08	9.03	-1.94
6,873.0	33.60	0.00	6,833.6	-79.1	-212.1	-67.5	9.05	8.75	-4.38
6,904.0	36.60	359.70	6,859.0	-61.2	-212.1	-49.7	9.69	9.68	-0.97
6,936.0	39.20	359.80	6,884.2	-41.6	-212.2	-30.0	8.13	8.13	0.31
6,968.0	42.00	359.70	6,908.5	-20.8	-212.3	-9.2	8.75	8.75	-0.31
7,000.0	44.80	359.80	6,931.8	1.2	-212.4	12.7	8.75	8.75	0.31
7,031.0	47.20	0.20	6,953.3	23.5	-212.4	35.0	7.80	7.74	1.29
7,063.0	48.60	2.10	6,974.8	47.2	-211.9	58.7	6.21	4.38	5.94
7,095.0	50.80	1.20	6,995.5	71.6	-211.2	83.0	7.20	6.88	-2.81
7,126.0	53.40	0.20	7,014.5	96.1	-210.9	107.4	8.76	8.39	-3.23
7,158.0	55.70	0.90	7,033.1	122.2	-210.6	133.4	7.41	7.19	2.19
7,190.0	57.60	1.20	7,050.7	148.9	-210.2	160.1	5.99	5.94	0.94
7,222.0	59.40	1.40	7,067.4	176.2	-209.5	187.3	5.65	5.63	0.63
7,253.0	60.90	0.90	7,082.8	203.0	-209.0	214.1	5.04	4.84	-1.61
7,285.0	63.30	0.50	7,097.8	231.3	-208.7	242.3	7.58	7.50	-1.25
7,317.0	65.80	0.00	7,111.5	260.2	-208.5	271.1	7.94	7.81	-1.56
7,350.0	68.20	359.80	7,124.4	290.6	-208.6	301.5	7.29	7.27	-0.61
7,382.0	70.40	359.10	7,135.7	320.5	-208.9	331.4	7.17	6.88	-2.19
7,413.0	72.50	359.00	7,145.6	349.9	-209.4	360.7	6.78	6.77	-0.32
7,445.0	74.80	359.00	7,154.6	380.6	-209.9	391.4	7.19	7.19	0.00
7,476.0	76.90	359.10	7,162.2	410.7	-210.4	421.5	6.78	6.77	0.32
7,508.0	79.00	359.10	7,168.9	441.9	-210.9	452.7	6.56	6.56	0.00
7,540.0	80.50	358.80	7,174.6	473.4	-211.5	484.2	4.78	4.69	-0.94
7,572.0	82.20	358.80	7,179.4	505.1	-212.1	515.8	5.31	5.31	0.00
7,604.0	84.40	359.10	7,183.1	536.8	-212.7	547.6	6.94	6.88	0.94
7,637.0	86.60	358.80	7,185.7	569.7	-213.3	580.5	6.73	6.67	-0.91
7,669.0	88.40	358.40	7,187.1	601.7	-214.1	612.4	5.76	5.63	-1.25
7,702.0	89.30	358.80	7,187.8	634.7	-214.9	645.4	2.98	2.73	1.21
7,734.0	89.40	359.00	7,188.1	666.7	-215.5	677.4	0.70	0.31	0.63
7,765.0	89.80	357.90	7,188.3	697.6	-216.3	708.3	3.78	1.29	-3.55
7,797.0	90.00	357.40	7,188.4	729.6	-217.7	740.3	1.68	0.63	-1.56
7,829.0	90.50	357.60	7,188.2	761.6	-219.1	772.3	1.68	1.56	0.63
7,860.0	90.60	357.60	7,187.9	792.6	-220.4	803.3	0.32	0.32	0.00
7,892.0	90.90	358.40	7,187.5	824.5	-221.5	835.3	2.67	0.94	2.50
7,923.0	90.90	359.30	7,187.0	855.5	-222.1	866.3	2.90	0.00	2.90
7,955.0	90.80	359.70	7,186.6	887.5	-222.4	898.3	1.29	-0.31	1.25
7,987.0	90.70	359.30	7,186.1	919.5	-222.7	930.2	1.29	-0.31	-1.25
8,018.0	90.00	359.50	7,186.0	950.5	-223.0	961.2	2.35	-2.26	0.65
8,050.0	89.20	0.90	7,186.2	982.5	-222.9	993.1	5.04	-2.50	4.38
8,082.0	89.20	0.50	7,186.6	1,014.5	-222.5	1,025.1	1.25	0.00	-1.25
8,114.0	88.40	0.40	7,187.3	1,046.5	-222.2	1,057.0	2.52	-2.50	-0.31
8,145.0	88.50	0.90	7,188.1	1,077.5	-221.9	1,087.9	1.64	0.32	1.61
8,177.0	89.30	0.70	7,188.8	1,109.5	-221.4	1,119.8	2.58	2.50	-0.63

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8,209.0	89.90	0.70	7,189.0	1,141.5	-221.0	1,151.8	1.88	1.88	0.00
8,240.0	90.20	0.50	7,188.9	1,172.5	-220.7	1,182.7	1.16	0.97	-0.65
8,272.0	89.30	1.20	7,189.1	1,204.5	-220.2	1,214.6	3.56	-2.81	2.19
8,304.0	88.10	0.50	7,189.8	1,236.4	-219.8	1,246.5	4.34	-3.75	-2.19
8,336.0	87.70	0.90	7,191.0	1,268.4	-219.4	1,278.5	1.77	-1.25	1.25
8,368.0	88.20	0.40	7,192.1	1,300.4	-219.0	1,310.4	2.21	1.56	-1.56
8,399.0	88.40	0.70	7,193.1	1,331.4	-218.7	1,341.3	1.16	0.65	0.97
8,431.0	88.60	0.70	7,193.9	1,363.4	-218.3	1,373.2	0.63	0.63	0.00
8,463.0	88.60	0.50	7,194.7	1,395.4	-218.0	1,405.1	0.62	0.00	-0.63
8,495.0	88.70	359.70	7,195.4	1,427.4	-217.9	1,437.1	2.52	0.31	-2.50
8,526.0	89.30	0.20	7,196.0	1,458.3	-218.0	1,468.0	2.52	1.94	1.61
8,558.0	90.00	0.40	7,196.2	1,490.3	-217.8	1,500.0	2.28	2.19	0.63
8,590.0	91.10	359.70	7,195.9	1,522.3	-217.8	1,531.9	4.07	3.44	-2.19
8,622.0	91.50	359.80	7,195.1	1,554.3	-217.9	1,563.9	1.29	1.25	0.31
8,653.0	90.00	0.50	7,194.7	1,585.3	-217.8	1,594.8	5.34	-4.84	2.26
8,685.0	89.00	359.70	7,195.0	1,617.3	-217.8	1,626.8	4.00	-3.13	-2.50
8,716.0	88.40	0.00	7,195.7	1,648.3	-217.8	1,657.7	2.16	-1.94	0.97
8,748.0	87.50	0.00	7,196.8	1,680.3	-217.8	1,689.6	2.81	-2.81	0.00
8,780.0	87.80	359.50	7,198.2	1,712.3	-218.0	1,721.6	1.82	0.94	-1.56
8,812.0	87.40	359.50	7,199.5	1,744.2	-218.3	1,753.5	1.25	-1.25	0.00
8,843.0	87.70	359.30	7,200.8	1,775.2	-218.6	1,784.5	1.16	0.97	-0.65
8,875.0	87.70	1.40	7,202.1	1,807.2	-218.4	1,816.4	6.56	0.00	6.56
8,906.0	87.80	359.10	7,203.3	1,838.2	-218.3	1,847.3	7.42	0.32	-7.42
8,938.0	87.90	358.80	7,204.5	1,870.1	-218.8	1,879.2	0.99	0.31	-0.94
8,970.0	88.10	359.50	7,205.6	1,902.1	-219.3	1,911.2	2.27	0.63	2.19
9,002.0	88.60	359.30	7,206.6	1,934.1	-219.6	1,943.2	1.68	1.56	-0.63
9,033.0	88.60	358.80	7,207.3	1,965.1	-220.2	1,974.1	1.61	0.00	-1.61
9,065.0	88.80	358.60	7,208.1	1,997.1	-220.9	2,006.1	0.88	0.63	-0.63
9,096.0	88.70	358.30	7,208.7	2,028.0	-221.7	2,037.1	1.02	-0.32	-0.97
9,128.0	89.30	359.00	7,209.3	2,060.0	-222.5	2,069.1	2.88	1.88	2.19
9,160.0	88.90	358.80	7,209.8	2,092.0	-223.1	2,101.0	1.40	-1.25	-0.63
9,191.0	89.30	359.00	7,210.3	2,123.0	-223.7	2,132.0	1.44	1.29	0.65
9,223.0	90.20	358.30	7,210.4	2,155.0	-224.4	2,164.0	3.56	2.81	-2.19
9,255.0	91.00	0.20	7,210.1	2,187.0	-224.9	2,196.0	6.44	2.50	5.94
9,287.0	92.30	359.70	7,209.2	2,219.0	-224.9	2,227.9	4.35	4.06	-1.56
9,318.0	91.90	359.00	7,208.0	2,250.0	-225.2	2,258.9	2.60	-1.29	-2.26
9,350.0	91.80	359.80	7,207.0	2,281.9	-225.6	2,290.8	2.52	-0.31	2.50
9,382.0	90.70	0.50	7,206.3	2,313.9	-225.5	2,322.8	4.07	-3.44	2.19
9,413.0	89.90	0.00	7,206.1	2,344.9	-225.4	2,353.7	3.04	-2.58	-1.61
9,445.0	89.60	359.80	7,206.3	2,376.9	-225.4	2,385.7	1.13	-0.94	-0.63
9,477.0	89.60	0.40	7,206.5	2,408.9	-225.4	2,417.6	1.87	0.00	1.88
9,508.0	89.80	359.50	7,206.7	2,439.9	-225.4	2,448.6	2.97	0.65	-2.90
9,540.0	90.20	0.40	7,206.7	2,471.9	-225.4	2,480.5	3.08	1.25	2.81
9,572.0	90.00	359.50	7,206.6	2,503.9	-225.4	2,512.5	2.88	-0.63	-2.81
9,603.0	90.30	359.10	7,206.5	2,534.9	-225.8	2,543.4	1.61	0.97	-1.29
9,635.0	91.00	359.50	7,206.2	2,566.9	-226.2	2,575.4	2.52	2.19	1.25
9,667.0	90.80	358.30	7,205.7	2,598.9	-226.8	2,607.4	3.80	-0.63	-3.75
9,699.0	89.70	356.70	7,205.5	2,630.9	-228.2	2,639.4	6.07	-3.44	-5.00
9,731.0	90.00	357.40	7,205.6	2,662.8	-229.9	2,671.4	2.38	0.94	2.19
9,762.0	90.30	356.90	7,205.5	2,693.8	-231.4	2,702.4	1.88	0.97	-1.61
9,794.0	90.70	356.30	7,205.2	2,725.7	-233.3	2,734.4	2.25	1.25	-1.88
9,826.0	91.40	356.90	7,204.6	2,757.7	-235.2	2,766.4	2.88	2.19	1.88
9,858.0	91.30	356.90	7,203.9	2,789.6	-236.9	2,798.4	0.31	-0.31	0.00

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Dalton 24Q-241
Project:	SEC.24-T7N-R66W	TVD Reference:	WELL @ 4880.0ft (RKB Ensign 32 - 15')
Site:	Dalton 24Q-241 Pad Sec.24-T7N-R66W	MD Reference:	WELL @ 4880.0ft (RKB Ensign 32 - 15')
Well:	Dalton 24Q-241	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

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)
9,890.0	89.60	357.70	7,203.6	2,821.6	-238.4	2,830.4	5.87	-5.31	2.50
9,922.0	88.90	357.60	7,204.1	2,853.6	-239.8	2,862.4	2.21	-2.19	-0.31
9,954.0	88.40	358.10	7,204.8	2,885.5	-241.0	2,894.3	2.21	-1.56	1.56
9,985.0	88.50	357.90	7,205.7	2,916.5	-242.0	2,925.3	0.72	0.32	-0.65
10,017.0	88.30	357.70	7,206.5	2,948.5	-243.3	2,957.3	0.88	-0.63	-0.63
10,049.0	88.60	358.30	7,207.4	2,980.4	-244.4	2,989.3	2.10	0.94	1.88
10,081.0	89.30	359.30	7,208.0	3,012.4	-245.0	3,021.3	3.81	2.19	3.13
10,112.0	89.60	0.90	7,208.3	3,043.4	-245.0	3,052.2	5.25	0.97	5.16
10,144.0	89.70	1.40	7,208.5	3,075.4	-244.4	3,084.1	1.59	0.31	1.56
10,175.0	89.50	1.80	7,208.7	3,106.4	-243.5	3,115.0	1.44	-0.65	1.29
10,207.0	89.70	1.10	7,208.9	3,138.4	-242.7	3,146.9	2.27	0.63	-2.19
10,238.0	89.60	1.20	7,209.1	3,169.4	-242.1	3,177.8	0.46	-0.32	0.32
10,270.0	89.80	1.20	7,209.3	3,201.4	-241.4	3,209.7	0.63	0.63	0.00
10,302.0	90.30	1.80	7,209.3	3,233.4	-240.5	3,241.6	2.44	1.56	1.88
10,334.0	90.70	1.40	7,209.0	3,265.3	-239.7	3,273.5	1.77	1.25	-1.25
10,366.0	90.30	2.00	7,208.7	3,297.3	-238.7	3,305.4	2.25	-1.25	1.88
10,398.0	90.00	1.60	7,208.6	3,329.3	-237.7	3,337.3	1.56	-0.94	-1.25
10,429.0	90.00	2.10	7,208.6	3,360.3	-236.7	3,368.2	1.61	0.00	1.61
10,461.0	90.40	1.20	7,208.5	3,392.3	-235.8	3,400.1	3.08	1.25	-2.81
10,493.0	90.50	1.20	7,208.3	3,424.3	-235.1	3,432.0	0.31	0.31	0.00
10,525.0	90.30	1.40	7,208.0	3,456.3	-234.4	3,463.9	0.88	-0.63	0.63
10,557.0	90.20	1.80	7,207.9	3,488.2	-233.5	3,495.8	1.29	-0.31	1.25
10,588.0	90.10	1.60	7,207.8	3,519.2	-232.6	3,526.7	0.72	-0.32	-0.65
10,620.0	90.10	1.80	7,207.8	3,551.2	-231.6	3,558.6	0.63	0.00	0.63
10,652.0	90.00	1.40	7,207.7	3,583.2	-230.7	3,590.4	1.29	-0.31	-1.25
10,684.0	89.80	1.80	7,207.8	3,615.2	-229.8	3,622.3	1.40	-0.63	1.25
10,716.0	90.70	1.80	7,207.6	3,647.2	-228.8	3,654.2	2.81	2.81	0.00
10,747.0	90.80	1.10	7,207.2	3,678.2	-228.0	3,685.1	2.28	0.32	-2.26
10,779.0	90.90	0.90	7,206.8	3,710.2	-227.5	3,717.0	0.70	0.31	-0.63
10,811.0	90.80	0.70	7,206.3	3,742.1	-227.0	3,749.0	0.70	-0.31	-0.63
10,842.0	90.80	0.20	7,205.9	3,773.1	-226.8	3,779.9	1.61	0.00	-1.61
10,874.0	90.80	359.70	7,205.4	3,805.1	-226.8	3,811.8	1.56	0.00	-1.56
10,905.0	91.00	359.30	7,204.9	3,836.1	-227.1	3,842.8	1.44	0.65	-1.29
10,936.0	91.30	359.50	7,204.3	3,867.1	-227.4	3,873.8	1.16	0.97	0.65
10,968.0	92.10	359.80	7,203.4	3,899.1	-227.6	3,905.7	2.67	2.50	0.94
10,999.0	92.00	359.70	7,202.2	3,930.1	-227.7	3,936.7	0.46	-0.32	-0.32
11,031.0	91.00	358.10	7,201.4	3,962.1	-228.4	3,968.6	5.89	-3.13	-5.00
11,063.0	90.00	356.90	7,201.1	3,994.0	-229.8	4,000.6	4.88	-3.13	-3.75
11,095.0	89.40	356.30	7,201.3	4,026.0	-231.7	4,032.6	2.65	-1.88	-1.88
11,126.0	89.40	356.90	7,201.6	4,056.9	-233.5	4,063.6	1.94	0.00	1.94
11,158.0	90.00	356.70	7,201.8	4,088.9	-235.3	4,095.6	1.98	1.88	-0.63
11,190.0	90.40	356.50	7,201.7	4,120.8	-237.2	4,127.6	1.40	1.25	-0.63
11,221.0	90.40	356.00	7,201.5	4,151.8	-239.2	4,158.6	1.61	0.00	-1.61
11,253.0	90.70	356.30	7,201.2	4,183.7	-241.4	4,190.6	1.33	0.94	0.94
11,285.0	90.90	356.70	7,200.7	4,215.6	-243.3	4,222.6	1.40	0.63	1.25
11,317.0	91.50	356.70	7,200.0	4,247.6	-245.1	4,254.6	1.88	1.88	0.00
11,348.0	91.20	358.30	7,199.3	4,278.5	-246.5	4,285.6	5.25	-0.97	5.16
11,380.0	91.50	358.10	7,198.5	4,310.5	-247.5	4,317.6	1.13	0.94	-0.63
11,412.0	91.20	358.60	7,197.8	4,342.5	-248.4	4,349.6	1.82	-0.94	1.56
11,444.0	91.90	358.30	7,196.9	4,374.4	-249.3	4,381.5	2.38	2.19	-0.94
11,476.0	91.50	357.70	7,196.0	4,406.4	-250.4	4,413.5	2.25	-1.25	-1.88
11,507.0	91.50	357.70	7,195.2	4,437.4	-251.7	4,444.5	0.00	0.00	0.00
11,539.0	91.50	358.40	7,194.3	4,469.3	-252.7	4,476.5	2.19	0.00	2.19

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Dalton 24Q-241
Project:	SEC.24-T7N-R66W	TVD Reference:	WELL @ 4880.0ft (RKB Ensign 32 - 15')
Site:	Dalton 24Q-241 Pad Sec.24-T7N-R66W	MD Reference:	WELL @ 4880.0ft (RKB Ensign 32 - 15')
Well:	Dalton 24Q-241	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

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)
11,582.0	90.30	357.90	7,193.7	4,512.3	-254.1	4,519.5	3.02	-2.79	-1.16
11,637.0	90.30	357.90	7,193.4	4,567.3	-256.1	4,574.5	0.00	0.00	0.00
BHL 500'FNL & 2400'FWL									

Design Targets									
Target Name	- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	
- Shape									Latitude Longitude
HARD LINE BHL 460'		0.00	0.00	1.0	4,608.3	151.9	1,450,320.80	3,215,235.31	40.566949 -104.725273
- survey misses target center by 4610.8ft at 0.8ft MD (0.8 TVD, 0.0 N, 0.0 E)									
- Polygon									
Point 1				1.0	0.0	0.0	1,450,320.80	3,215,235.31	
Point 2				1.0	0.0	-800.0	1,450,313.81	3,214,435.37	
HARD LINE SHL 460'		0.00	0.00	1.0	202.8	400.0	1,445,917.76	3,215,521.86	40.554857 -104.724381
- survey misses target center by 448.5ft at 1.0ft MD (1.0 TVD, 0.0 N, 0.0 E)									
- Polygon									
Point 1				1.0	0.0	0.0	1,445,917.76	3,215,521.86	
Point 2				1.0	0.0	-1,200.0	1,445,907.29	3,214,321.94	
SECTION LINE 250'		0.00	0.00	7.0	-257.2	400.0	1,445,457.80	3,215,525.87	40.553594 -104.724381
- survey misses target center by 475.6ft at 7.3ft MD (7.3 TVD, 0.0 N, 0.0 E)									
- Polygon									
Point 1				7.0	0.0	0.0	1,445,457.80	3,215,525.87	
Point 2				7.0	0.0	-1,200.0	1,445,447.32	3,214,325.95	

Checked By: _____ Approved By: _____ Date: _____