

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Danielson 15G-412**

Surface Location: Danielson Pad Sec.15-T7N-R66W

North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

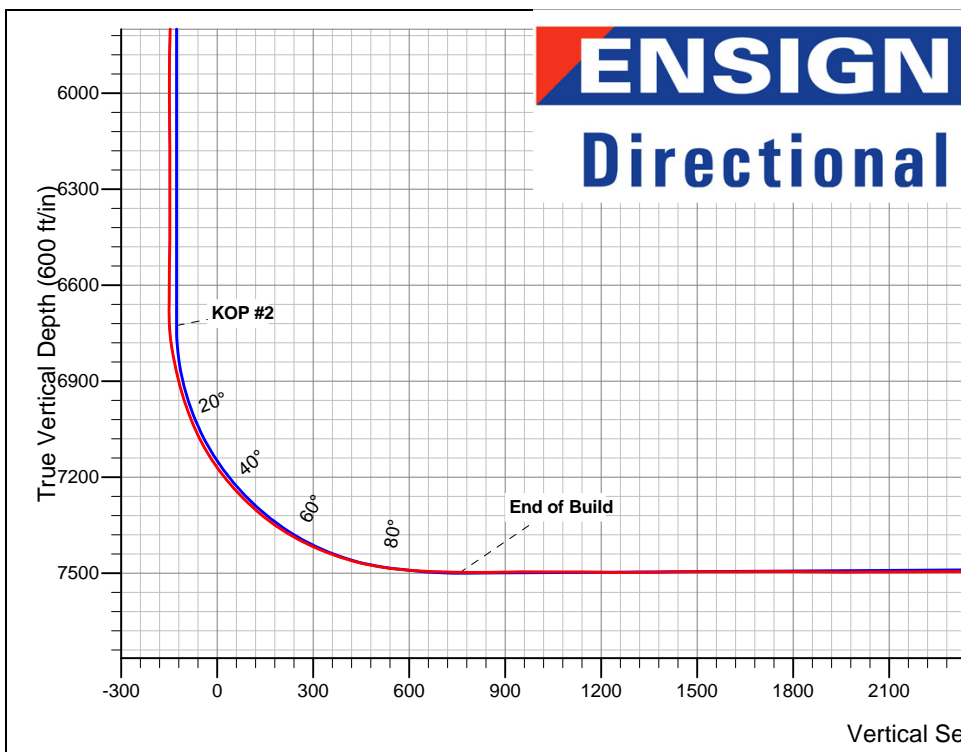
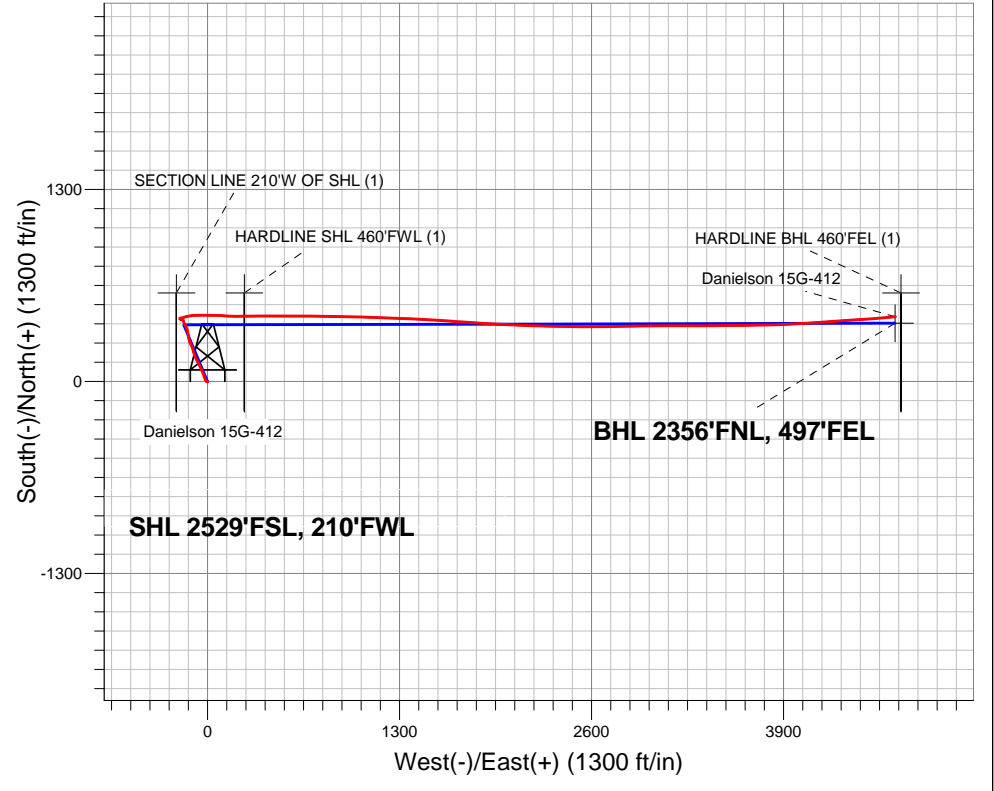
Ground Elevation: 4950.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1453087.44	3202021.98	40.574850	-104.772750	

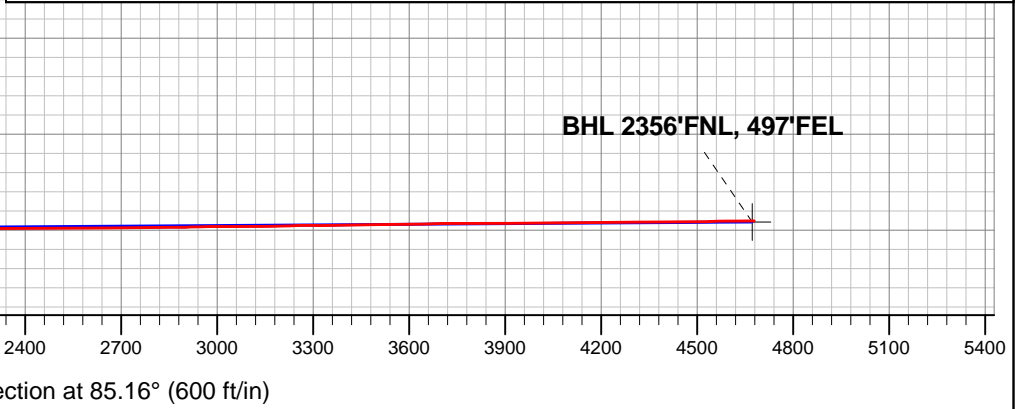
Original Well Elev WELL @ 4965.0ft (Original Well Elev)

FINAL SURVEY

Projected Bottom Hole Location
 12034' MD 7471' TVD 438' N & 4658' E of
 SHL
 90.4 degree Incl @ 85.2 degree AZM



Danielson Pad Sec.15-T7N-R66W Danielson 15G-412 Wellbore #1	ANNOTATIONS No annotation data is available.
	LEGEND <ul style="list-style-type: none"> + Danielson 15G-412, Wellbore #1, Plan #1 (6-01-12) V0 □ Wellbore #1 ○ Survey #1





Directional

PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.15-T7N-R66W

Danielson Pad Sec.15-T7N-R66W

Danielson 15G-412

Wellbore #1

Survey: Survey #1

Standard Survey Report

27 February, 2013



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Danielson 15G-412
Project:	SEC.15-T7N-R66W	TVD Reference:	WELL @ 4965.0ft (Original Well Elev)
Site:	Danielson Pad Sec.15-T7N-R66W	MD Reference:	WELL @ 4965.0ft (Original Well Elev)
Well:	Danielson 15G-412	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	SEC.15-T7N-R66W, Weld County, Colorado		
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	Danielson Pad Sec.15-T7N-R66W				
Site Position:		Northing:	1,453,044.10ft	Latitude:	40.574730
From:	Lat/Long	Easting:	3,202,066.78ft	Longitude:	-104.772590
Position Uncertainty:	0.0ft	Slot Radius:	"	Grid Convergence:	0.47 °

Well	Danielson 15G-412					
Well Position	+N/-S	0.0ft	Northing:	1,453,087.44ft	Latitude:	40.574850
	+E/-W	0.0ft	Easting:	3,202,021.98ft	Longitude:	-104.772750
Position Uncertainty		0.0ft	Wellhead Elevation:	ft	Ground Level:	4,950.0ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	6/1/2012	8.75	67.16	53,119

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	85.16	

Survey Program	Date	2/27/2013			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
120.0	12,034.0	Survey #1 (Wellbore #1)	MWD	MWD - Standard	

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'FEL (1)										
1.0	0.00	255.60	1.0	0.0	0.0	0.0	0.25	0.25	0.00	
HARDLINE SHL 460'FWL (1)										
1.1	0.00	255.60	1.1	0.0	0.0	0.0	0.25	0.25	0.00	
SECTION LINE 210'W OF SHL (1)										
120.0	0.30	255.60	120.0	-0.1	-0.3	-0.3	0.25	0.25	0.00	
212.0	0.10	249.80	212.0	-0.2	-0.6	-0.6	0.22	-0.22	-6.30	
304.0	0.30	216.30	304.0	-0.4	-0.8	-0.9	0.24	0.22	-36.41	
396.0	0.30	216.60	396.0	-0.8	-1.1	-1.2	0.00	0.00	0.33	
487.0	0.30	215.90	487.0	-1.2	-1.4	-1.5	0.00	0.00	-0.77	
579.0	0.20	166.40	579.0	-1.5	-1.5	-1.6	0.25	-0.11	-53.80	

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Site:	Danielson Pad Sec.15-T7N-R66W	MD Reference:	WELL @ 4965.0ft (Original Well Elev)
Well:	Danielson 15G-412	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)
671.0	0.30	182.00	671.0	-1.9	-1.5	-1.6	0.13	0.11	16.96
762.0	0.20	237.40	762.0	-2.2	-1.6	-1.8	0.27	-0.11	60.88
870.0	0.50	279.90	870.0	-2.3	-2.2	-2.4	0.35	0.28	39.35
970.0	0.60	314.90	970.0	-1.8	-3.0	-3.2	0.34	0.10	35.00
1,062.0	1.30	309.90	1,062.0	-0.8	-4.2	-4.2	0.77	0.76	-5.43
1,154.0	2.50	310.10	1,153.9	1.2	-6.5	-6.4	1.30	1.30	0.22
1,248.0	3.30	324.50	1,247.8	4.7	-9.7	-9.2	1.14	0.85	15.32
1,343.0	4.00	329.60	1,342.6	9.8	-12.9	-12.1	0.81	0.74	5.37
1,441.0	5.00	337.00	1,440.3	16.7	-16.3	-14.9	1.18	1.02	7.55
1,536.0	6.20	339.80	1,534.9	25.3	-19.7	-17.5	1.30	1.26	2.95
1,631.0	7.50	342.40	1,629.2	36.0	-23.4	-20.2	1.41	1.37	2.74
1,726.0	7.70	340.00	1,723.3	47.9	-27.4	-23.3	0.39	0.21	-2.53
1,822.0	7.80	338.10	1,818.5	60.0	-32.0	-26.9	0.29	0.10	-1.98
1,917.0	7.70	337.50	1,912.6	71.8	-36.9	-30.7	0.14	-0.11	-0.63
2,012.0	7.60	337.00	2,006.7	83.5	-41.8	-34.6	0.13	-0.11	-0.53
2,107.0	7.60	333.70	2,100.9	94.9	-47.0	-38.8	0.46	0.00	-3.47
2,202.0	7.60	334.80	2,195.1	106.2	-52.5	-43.3	0.15	0.00	1.16
2,296.0	7.30	331.40	2,288.3	117.1	-58.0	-47.9	0.57	-0.32	-3.62
2,391.0	6.90	329.40	2,382.6	127.3	-63.8	-52.8	0.49	-0.42	-2.11
2,486.0	7.10	332.40	2,476.8	137.4	-69.4	-57.6	0.44	0.21	3.16
2,582.0	7.20	332.90	2,572.1	148.0	-74.9	-62.1	0.12	0.10	0.52
2,677.0	7.30	335.30	2,666.3	158.8	-80.1	-66.4	0.34	0.11	2.53
2,772.0	7.30	341.90	2,760.6	170.0	-84.5	-69.9	0.88	0.00	6.95
2,867.0	7.80	341.60	2,854.8	181.9	-88.4	-72.8	0.53	0.53	-0.32
2,963.0	8.20	346.00	2,949.8	194.7	-92.1	-75.4	0.76	0.42	4.58
3,058.0	8.90	344.10	3,043.8	208.4	-95.8	-77.9	0.79	0.74	-2.00
3,153.0	8.30	339.40	3,137.7	221.9	-100.2	-81.1	0.97	-0.63	-4.95
3,248.0	7.90	336.10	3,231.7	234.2	-105.3	-85.1	0.65	-0.42	-3.47
3,344.0	7.30	333.70	3,326.9	245.7	-110.6	-89.5	0.71	-0.63	-2.50
3,439.0	7.50	336.80	3,421.1	256.8	-115.8	-93.7	0.47	0.21	3.26
3,534.0	6.70	336.80	3,515.4	267.6	-120.4	-97.4	0.84	-0.84	0.00
3,629.0	5.80	345.10	3,609.8	277.4	-123.8	-100.0	1.34	-0.95	8.74
3,724.0	6.10	352.80	3,704.3	287.0	-125.7	-101.0	0.90	0.32	8.11
3,819.0	6.80	354.70	3,798.7	297.6	-126.8	-101.3	0.77	0.74	2.00
3,914.0	6.80	349.70	3,893.0	308.8	-128.3	-101.9	0.62	0.00	-5.26
4,009.0	7.80	348.80	3,987.3	320.6	-130.6	-103.1	1.06	1.05	-0.95
4,105.0	9.20	347.10	4,082.2	334.5	-133.6	-104.9	1.48	1.46	-1.77
4,200.0	10.20	341.50	4,175.9	349.9	-137.9	-108.0	1.45	1.05	-5.89
4,294.0	10.10	338.90	4,268.4	365.5	-143.6	-112.2	0.50	-0.11	-2.77
4,389.0	8.60	333.70	4,362.1	379.6	-149.7	-117.2	1.81	-1.58	-5.47
4,485.0	6.70	333.70	4,457.3	391.0	-155.4	-121.8	1.98	-1.98	0.00
4,580.0	5.40	335.90	4,551.7	400.1	-159.6	-125.3	1.39	-1.37	2.32
4,675.0	4.60	341.60	4,646.4	407.8	-162.7	-127.7	0.99	-0.84	6.00
4,770.0	3.60	340.90	4,741.1	414.2	-164.8	-129.3	1.05	-1.05	-0.74
4,867.0	2.50	350.90	4,838.0	419.2	-166.2	-130.2	1.26	-1.13	10.31
4,963.0	1.00	306.40	4,933.9	421.8	-167.2	-131.0	2.00	-1.56	-46.35
5,058.0	1.00	283.40	5,028.9	422.4	-168.7	-132.4	0.42	0.00	-24.21
5,153.0	1.10	276.00	5,123.9	422.7	-170.4	-134.1	0.18	0.11	-7.79
5,249.0	1.10	269.50	5,219.9	422.8	-172.2	-136.0	0.13	0.00	-6.77
5,344.0	1.10	263.50	5,314.9	422.7	-174.0	-137.8	0.12	0.00	-6.32
5,439.0	1.00	272.00	5,409.9	422.6	-175.8	-139.5	0.19	-0.11	8.95
5,534.0	1.00	283.00	5,504.8	422.8	-177.4	-141.1	0.20	0.00	11.58
5,629.0	1.10	284.90	5,599.8	423.3	-179.1	-142.8	0.11	0.11	2.00

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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)
5,725.0	1.20	287.10	5,695.8	423.8	-180.9	-144.6	0.11	0.10	2.29
5,820.0	1.40	237.50	5,790.8	423.5	-182.9	-146.5	1.16	0.21	-52.21
5,916.0	1.20	226.90	5,886.8	422.2	-184.6	-148.3	0.32	-0.21	-11.04
6,011.0	0.60	151.10	5,981.8	421.0	-185.1	-148.9	1.27	-0.63	-79.79
6,107.0	0.50	141.90	6,077.8	420.3	-184.6	-148.5	0.14	-0.10	-9.58
6,202.0	0.20	64.10	6,172.7	420.0	-184.2	-148.1	0.52	-0.32	-81.89
6,297.0	0.70	9.40	6,267.7	420.7	-183.9	-147.8	0.64	0.53	-57.58
6,393.0	0.80	348.00	6,363.7	421.9	-184.0	-147.7	0.31	0.10	-22.29
6,488.0	1.00	330.50	6,458.7	423.3	-184.5	-148.2	0.36	0.21	-18.42
6,584.0	0.90	322.90	6,554.7	424.6	-185.4	-148.9	0.17	-0.10	-7.92
6,679.0	1.00	316.20	6,649.7	425.8	-186.4	-149.8	0.16	0.11	-7.05
6,711.0	0.90	356.60	6,681.7	426.2	-186.6	-150.0	2.07	-0.31	126.25
6,743.0	2.30	52.60	6,713.7	426.9	-186.1	-149.5	6.08	4.38	175.00
6,775.0	5.20	65.10	6,745.6	427.9	-184.3	-147.6	9.36	9.06	39.06
6,807.0	7.80	70.80	6,777.4	429.2	-180.9	-144.1	8.36	8.13	17.81
6,838.0	10.20	75.10	6,808.0	430.6	-176.3	-139.4	8.03	7.74	13.87
6,870.0	12.00	76.30	6,839.4	432.1	-170.3	-133.3	5.67	5.63	3.75
6,902.0	12.40	76.10	6,870.7	433.7	-163.8	-126.6	1.26	1.25	-0.63
6,934.0	13.50	75.10	6,901.9	435.5	-156.8	-119.5	3.51	3.44	-3.13
6,965.0	16.20	74.40	6,931.8	437.6	-149.1	-111.7	8.73	8.71	-2.26
6,997.0	18.60	75.70	6,962.4	440.1	-139.9	-102.3	7.60	7.50	4.06
7,029.0	20.50	79.80	6,992.5	442.3	-129.4	-91.7	7.32	5.94	12.81
7,061.0	22.30	81.50	7,022.3	444.2	-117.9	-80.0	5.95	5.63	5.31
7,092.0	24.40	83.00	7,050.8	445.9	-105.7	-67.8	7.04	6.77	4.84
7,124.0	26.40	84.80	7,079.7	447.3	-92.1	-54.1	6.70	6.25	5.63
7,155.0	28.30	88.20	7,107.2	448.2	-77.9	-39.8	7.93	6.13	10.97
7,187.0	31.70	90.40	7,134.9	448.4	-61.9	-23.9	11.17	10.63	6.88
7,219.0	35.00	90.60	7,161.7	448.2	-44.3	-6.4	10.32	10.31	0.63
7,250.0	37.90	88.40	7,186.6	448.4	-25.9	12.0	10.26	9.35	-7.10
7,282.0	40.40	89.60	7,211.4	448.7	-5.7	32.2	8.16	7.81	3.75
7,314.0	42.50	90.40	7,235.4	448.7	15.5	53.3	6.77	6.56	2.50
7,346.0	44.10	91.90	7,258.7	448.3	37.4	75.1	5.94	5.00	4.69
7,378.0	46.20	92.70	7,281.3	447.4	60.1	97.6	6.80	6.56	2.50
7,410.0	48.70	93.40	7,302.9	446.1	83.6	120.9	7.98	7.81	2.19
7,442.0	51.30	93.20	7,323.5	444.7	108.1	145.2	8.14	8.13	-0.63
7,474.0	54.00	93.30	7,342.9	443.2	133.5	170.4	8.44	8.44	0.31
7,505.0	56.80	92.00	7,360.5	442.1	159.0	195.7	9.67	9.03	-4.19
7,537.0	59.60	91.10	7,377.3	441.3	186.2	222.7	9.07	8.75	-2.81
7,569.0	62.00	90.10	7,392.9	441.1	214.1	250.5	7.98	7.50	-3.13
7,601.0	64.40	89.60	7,407.4	441.1	242.7	279.0	7.63	7.50	-1.56
7,633.0	66.30	89.50	7,420.7	441.4	271.7	308.0	5.94	5.94	-0.31
7,664.0	68.10	89.20	7,432.7	441.7	300.3	336.5	5.87	5.81	-0.97
7,696.0	70.00	89.20	7,444.2	442.1	330.2	366.3	5.94	5.94	0.00
7,727.0	72.40	89.10	7,454.2	442.5	359.5	395.6	7.75	7.74	-0.32
7,759.0	75.30	89.00	7,463.1	443.0	390.3	426.2	9.07	9.06	-0.31
7,791.0	77.60	89.30	7,470.6	443.5	421.4	457.3	7.25	7.19	0.94
7,823.0	79.40	89.60	7,476.9	443.8	452.7	488.5	5.70	5.63	0.94
7,854.0	81.10	89.90	7,482.2	443.9	483.3	519.0	5.57	5.48	0.97
7,874.0	82.60	89.60	7,485.0	444.0	503.1	538.7	7.65	7.50	-1.50
7,961.0	86.80	90.00	7,493.1	444.3	589.7	625.0	4.85	4.83	0.46
7,991.0	87.40	90.40	7,494.6	444.2	619.6	654.9	2.40	2.00	1.33
8,022.0	88.00	90.90	7,495.8	443.9	650.6	685.7	2.52	1.94	1.61
8,053.0	88.40	90.80	7,496.8	443.4	681.6	716.6	1.33	1.29	-0.32

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8,083.0	89.10	91.30	7,497.4	442.9	711.6	746.4	2.87	2.33	1.67
8,114.0	89.90	91.10	7,497.7	442.2	742.6	777.2	2.66	2.58	-0.65
8,146.0	90.10	91.10	7,497.7	441.6	774.6	809.0	0.63	0.63	0.00
8,178.0	90.20	90.70	7,497.6	441.1	806.6	840.9	1.29	0.31	-1.25
8,209.0	90.80	90.90	7,497.4	440.7	837.6	871.7	2.04	1.94	0.65
8,241.0	91.10	90.60	7,496.8	440.2	869.6	903.6	1.33	0.94	-0.94
8,272.0	91.10	90.30	7,496.2	440.0	900.5	934.4	0.97	0.00	-0.97
8,304.0	90.50	90.80	7,495.8	439.7	932.5	966.3	2.44	-1.88	1.56
8,336.0	89.50	91.90	7,495.8	438.9	964.5	998.1	4.65	-3.13	3.44
8,367.0	89.50	92.20	7,496.1	437.8	995.5	1,028.9	0.97	0.00	0.97
8,399.0	89.90	92.40	7,496.2	436.5	1,027.5	1,060.6	1.40	1.25	0.63
8,431.0	90.20	92.30	7,496.2	435.2	1,059.5	1,092.4	0.99	0.94	-0.31
8,463.0	89.90	91.40	7,496.2	434.2	1,091.4	1,124.2	2.96	-0.94	-2.81
8,494.0	89.00	91.70	7,496.5	433.4	1,122.4	1,155.0	3.06	-2.90	0.97
8,526.0	88.50	91.50	7,497.2	432.5	1,154.4	1,186.8	1.68	-1.56	-0.63
8,558.0	88.50	91.30	7,498.0	431.7	1,186.4	1,218.6	0.62	0.00	-0.63
8,589.0	90.40	91.80	7,498.3	430.8	1,217.4	1,249.4	6.34	6.13	1.61
8,621.0	91.50	92.10	7,497.8	429.8	1,249.4	1,281.1	3.56	3.44	0.94
8,653.0	90.20	91.80	7,497.3	428.7	1,281.3	1,312.9	4.17	-4.06	-0.94
8,684.0	89.80	92.70	7,497.3	427.5	1,312.3	1,343.7	3.18	-1.29	2.90
8,716.0	91.00	93.30	7,497.1	425.8	1,344.3	1,375.4	4.19	3.75	1.88
8,748.0	91.30	93.10	7,496.4	424.0	1,376.2	1,407.0	1.13	0.94	-0.63
8,780.0	90.00	91.80	7,496.1	422.6	1,408.2	1,438.8	5.75	-4.06	-4.06
8,811.0	89.80	92.50	7,496.1	421.5	1,439.1	1,469.6	2.35	-0.65	2.26
8,843.0	90.40	93.00	7,496.1	419.9	1,471.1	1,501.3	2.44	1.88	1.56
8,875.0	90.70	93.50	7,495.8	418.1	1,503.1	1,533.0	1.82	0.94	1.56
8,906.0	89.60	93.40	7,495.7	416.2	1,534.0	1,563.6	3.56	-3.55	-0.32
8,938.0	89.60	93.40	7,495.9	414.4	1,565.9	1,595.3	0.00	0.00	0.00
8,969.0	90.60	93.90	7,495.8	412.4	1,596.9	1,626.0	3.61	3.23	1.61
9,002.0	91.20	94.20	7,495.3	410.0	1,629.8	1,658.6	2.03	1.82	0.91
9,033.0	90.00	94.30	7,495.0	407.7	1,660.7	1,689.2	3.88	-3.87	0.32
9,065.0	90.20	94.70	7,494.9	405.2	1,692.6	1,720.7	1.40	0.63	1.25
9,097.0	90.40	93.80	7,494.8	402.9	1,724.5	1,752.3	2.88	0.63	-2.81
9,128.0	88.80	93.50	7,495.0	400.9	1,755.5	1,783.0	5.25	-5.16	-0.97
9,160.0	89.20	93.70	7,495.6	398.9	1,787.4	1,814.7	1.40	1.25	0.63
9,192.0	89.20	93.60	7,496.0	396.8	1,819.3	1,846.3	0.31	0.00	-0.31
9,224.0	89.30	93.80	7,496.4	394.8	1,851.2	1,877.9	0.70	0.31	0.63
9,255.0	90.80	93.80	7,496.4	392.7	1,882.2	1,908.6	4.84	4.84	0.00
9,287.0	89.90	92.90	7,496.2	390.9	1,914.1	1,940.3	3.98	-2.81	-2.81
9,319.0	88.60	92.60	7,496.6	389.3	1,946.1	1,972.0	4.17	-4.06	-0.94
9,350.0	90.10	93.40	7,497.0	387.7	1,977.0	2,002.7	5.48	4.84	2.58
9,382.0	91.10	93.30	7,496.6	385.8	2,009.0	2,034.4	3.14	3.13	-0.31
9,414.0	89.90	92.80	7,496.4	384.1	2,040.9	2,066.1	4.06	-3.75	-1.56
9,445.0	89.90	92.50	7,496.4	382.7	2,071.9	2,096.8	0.97	0.00	-0.97
9,477.0	89.80	92.50	7,496.5	381.3	2,103.9	2,128.5	0.31	-0.31	0.00
9,508.0	90.90	92.60	7,496.3	379.9	2,134.8	2,159.3	3.56	3.55	0.32
9,540.0	91.20	92.60	7,495.7	378.5	2,166.8	2,191.0	0.94	0.94	0.00
9,572.0	91.20	92.00	7,495.0	377.2	2,198.8	2,222.7	1.87	0.00	-1.88
9,603.0	89.80	91.70	7,494.8	376.2	2,229.7	2,253.5	4.62	-4.52	-0.97
9,635.0	90.50	91.10	7,494.7	375.4	2,261.7	2,285.3	2.88	2.19	-1.88
9,667.0	89.00	90.60	7,494.8	374.9	2,293.7	2,317.2	4.94	-4.69	-1.56
9,699.0	89.40	91.00	7,495.3	374.5	2,325.7	2,349.0	1.77	1.25	1.25
9,730.0	90.70	91.10	7,495.3	373.9	2,356.7	2,379.9	4.21	4.19	0.32
9,762.0	90.60	90.80	7,494.9	373.4	2,388.7	2,411.7	0.99	-0.31	-0.94

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Danielson 15G-412
Project:	SEC.15-T7N-R66W	TVD Reference:	WELL @ 4965.0ft (Original Well Elev)
Site:	Danielson Pad Sec.15-T7N-R66W	MD Reference:	WELL @ 4965.0ft (Original Well Elev)
Well:	Danielson 15G-412	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)
9,794.0	89.60	90.40	7,494.8	373.0	2,420.7	2,443.5	3.37	-3.13	-1.25
9,825.0	90.30	90.80	7,494.9	372.7	2,451.7	2,474.4	2.60	2.26	1.29
9,857.0	90.60	90.90	7,494.6	372.2	2,483.7	2,506.2	0.99	0.94	0.31
9,889.0	90.90	90.80	7,494.2	371.8	2,515.7	2,538.1	0.99	0.94	-0.31
9,921.0	90.40	90.40	7,493.8	371.4	2,547.7	2,569.9	2.00	-1.56	-1.25
9,953.0	90.10	89.90	7,493.7	371.4	2,579.7	2,601.8	1.82	-0.94	-1.56
9,984.0	90.50	90.10	7,493.5	371.4	2,610.7	2,632.7	1.44	1.29	0.65
10,016.0	90.80	90.10	7,493.2	371.3	2,642.7	2,664.6	0.94	0.94	0.00
10,048.0	91.00	89.30	7,492.7	371.5	2,674.7	2,696.5	2.58	0.63	-2.50
10,079.0	89.90	89.40	7,492.4	371.8	2,705.7	2,727.4	3.56	-3.55	0.32
10,111.0	90.10	89.50	7,492.4	372.1	2,737.7	2,759.3	0.70	0.63	0.31
10,141.0	91.20	89.00	7,492.1	372.5	2,767.7	2,789.2	4.03	3.67	-1.67
10,173.0	90.90	88.70	7,491.5	373.2	2,799.7	2,821.2	1.33	-0.94	-0.94
10,204.0	89.90	88.40	7,491.3	373.9	2,830.7	2,852.1	3.37	-3.23	-0.97
10,236.0	90.10	88.90	7,491.3	374.7	2,862.6	2,884.0	1.68	0.63	1.56
10,268.0	91.60	89.50	7,490.8	375.1	2,894.6	2,916.0	5.05	4.69	1.88
10,299.0	92.00	89.70	7,489.8	375.4	2,925.6	2,946.9	1.44	1.29	0.65
10,331.0	92.10	89.40	7,488.7	375.6	2,957.6	2,978.7	0.99	0.31	-0.94
10,363.0	90.20	89.20	7,488.0	376.0	2,989.6	3,010.6	5.97	-5.94	-0.63
10,394.0	89.60	89.20	7,488.1	376.4	3,020.6	3,041.6	1.94	-1.94	0.00
10,426.0	89.20	88.90	7,488.4	377.0	3,052.6	3,073.5	1.56	-1.25	-0.94
10,458.0	89.20	88.70	7,488.9	377.6	3,084.6	3,105.4	0.62	0.00	-0.63
10,489.0	90.10	89.80	7,489.1	378.0	3,115.6	3,136.3	4.58	2.90	3.55
10,521.0	92.40	91.00	7,488.4	377.8	3,147.6	3,168.2	8.11	7.19	3.75
10,552.0	92.70	90.70	7,487.0	377.4	3,178.5	3,199.0	1.37	0.97	-0.97
10,584.0	92.40	90.70	7,485.6	377.0	3,210.5	3,230.8	0.94	-0.94	0.00
10,616.0	89.80	89.70	7,484.9	376.9	3,242.5	3,262.7	8.70	-8.13	-3.13
10,648.0	89.10	89.50	7,485.3	377.1	3,274.5	3,294.6	2.28	-2.19	-0.63
10,679.0	89.00	89.60	7,485.8	377.3	3,305.5	3,325.5	0.46	-0.32	0.32
10,711.0	90.90	90.30	7,485.8	377.4	3,337.5	3,357.4	6.33	5.94	2.19
10,743.0	91.90	90.20	7,485.0	377.2	3,369.5	3,389.3	3.14	3.13	-0.31
10,775.0	91.40	90.00	7,484.1	377.2	3,401.4	3,421.1	1.68	-1.56	-0.63
10,807.0	91.20	89.40	7,483.4	377.3	3,433.4	3,453.0	1.98	-0.63	-1.88
10,839.0	91.10	89.30	7,482.7	377.7	3,465.4	3,484.9	0.44	-0.31	-0.31
10,870.0	90.30	89.00	7,482.3	378.1	3,496.4	3,515.9	2.76	-2.58	-0.97
10,902.0	90.30	88.90	7,482.2	378.7	3,528.4	3,547.8	0.31	0.00	-0.31
10,934.0	89.60	88.50	7,482.2	379.5	3,560.4	3,579.7	2.52	-2.19	-1.25
10,965.0	90.90	89.30	7,482.1	380.1	3,591.4	3,610.7	4.92	4.19	2.58
10,997.0	92.20	89.60	7,481.2	380.4	3,623.4	3,642.6	4.17	4.06	0.94
11,029.0	92.00	89.20	7,480.0	380.7	3,655.4	3,674.4	1.40	-0.63	-1.25
11,060.0	90.40	89.60	7,479.4	381.0	3,686.4	3,705.4	5.32	-5.16	1.29
11,092.0	90.20	89.30	7,479.2	381.3	3,718.4	3,737.3	1.13	-0.63	-0.94
11,124.0	90.00	89.10	7,479.2	381.8	3,750.3	3,769.2	0.88	-0.63	-0.63
11,156.0	90.00	88.60	7,479.2	382.4	3,782.3	3,801.1	1.56	0.00	-1.56
11,187.0	90.50	88.30	7,479.0	383.3	3,813.3	3,832.1	1.88	1.61	-0.97
11,219.0	90.10	87.70	7,478.9	384.4	3,845.3	3,864.0	2.25	-1.25	-1.88
11,251.0	89.60	87.50	7,478.9	385.7	3,877.3	3,896.0	1.68	-1.56	-0.63
11,282.0	90.40	87.90	7,478.9	387.0	3,908.3	3,927.0	2.89	2.58	1.29
11,314.0	90.90	87.80	7,478.6	388.2	3,940.2	3,958.9	1.59	1.56	-0.31
11,346.0	91.30	87.50	7,478.0	389.5	3,972.2	3,990.9	1.56	1.25	-0.94
11,377.0	90.40	86.50	7,477.5	391.1	4,003.2	4,021.9	4.34	-2.90	-3.23
11,409.0	90.00	86.50	7,477.4	393.0	4,035.1	4,053.9	1.25	-1.25	0.00
11,441.0	90.00	86.00	7,477.4	395.1	4,067.0	4,085.9	1.56	0.00	-1.56

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Danielson 15G-412
Project:	SEC.15-T7N-R66W	TVD Reference:	WELL @ 4965.0ft (Original Well Elev)
Site:	Danielson Pad Sec.15-T7N-R66W	MD Reference:	WELL @ 4965.0ft (Original Well Elev)
Well:	Danielson 15G-412	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

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)
11,473.0	90.60	86.10	7,477.2	397.3	4,098.9	4,117.9	1.90	1.88	0.31
11,504.0	91.00	85.80	7,476.8	399.5	4,129.9	4,148.8	1.61	1.29	-0.97
11,536.0	90.70	85.70	7,476.3	401.9	4,161.8	4,180.8	0.99	-0.94	-0.31
11,568.0	89.90	85.90	7,476.2	404.2	4,193.7	4,212.8	2.58	-2.50	0.63
11,599.0	90.80	86.50	7,476.0	406.3	4,224.6	4,243.8	3.49	2.90	1.94
11,631.0	91.50	86.30	7,475.3	408.3	4,256.5	4,275.8	2.28	2.19	-0.63
11,663.0	90.30	85.70	7,474.8	410.5	4,288.5	4,307.8	4.19	-3.75	-1.88
11,695.0	89.20	85.80	7,475.0	412.9	4,320.4	4,339.8	3.45	-3.44	0.31
11,726.0	90.70	86.70	7,475.0	414.9	4,351.3	4,370.8	5.64	4.84	2.90
11,758.0	90.50	86.20	7,474.6	416.9	4,383.2	4,402.8	1.68	-0.63	-1.56
11,790.0	89.30	85.70	7,474.7	419.2	4,415.2	4,434.8	4.06	-3.75	-1.56
11,821.0	90.50	86.00	7,474.8	421.4	4,446.1	4,465.8	3.99	3.87	0.97
11,852.0	91.60	85.80	7,474.2	423.6	4,477.0	4,496.8	3.61	3.55	-0.65
11,884.0	91.20	85.90	7,473.4	426.0	4,508.9	4,528.8	1.29	-1.25	0.31
11,916.0	91.30	85.60	7,472.7	428.3	4,540.8	4,560.8	0.99	0.31	-0.94
11,947.0	90.90	85.20	7,472.1	430.8	4,571.7	4,591.7	1.82	-1.29	-1.29
11,978.0	90.40	85.20	7,471.8	433.4	4,602.6	4,622.7	1.61	-1.61	0.00
12,027.7	90.40	85.20	7,471.4	437.6	4,652.2	4,672.5	0.00	0.00	0.00
BHL 2400'FNL, 500'FEL									
12,034.0	90.40	85.20	7,471.4	438.1	4,658.4	4,678.7	0.00	0.00	0.00

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
HARDLINE BHL 460'F	0.00	0.00	1.0	600.0	4,695.9	1,453,725.91	3,206,712.66	40.576496	-104.755846
- hit/miss target - survey misses target center by 4734.1ft at 0.9ft MD (0.9 TVD, 0.0 N, 0.0 E)									
- Polygon									
Point 1			1.0	0.0	0.0	1,453,725.91	3,206,712.66		
Point 2			1.0	-800.0	0.0	1,452,925.96	3,206,719.23		
SECTION LINE 210'W	0.00	0.00	1.0	600.0	-210.0	1,453,685.68	3,201,807.07	40.576497	-104.773506
- survey misses target center by 635.7ft at 1.0ft MD (1.0 TVD, 0.0 N, 0.0 E)									
- Polygon									
Point 1			1.0	0.0	0.0	1,453,685.68	3,201,807.07		
Point 2			1.0	-800.0	0.0	1,452,885.73	3,201,813.63		
HARDLINE SHL 460'F	0.00	0.00	1.0	600.0	250.0	1,453,689.45	3,202,267.04	40.576497	-104.771850
- survey misses target center by 650.0ft at 1.0ft MD (1.0 TVD, 0.0 N, 0.0 E)									
- Polygon									
Point 1			1.0	0.0	0.0	1,453,689.45	3,202,267.04		
Point 2			1.0	-800.0	0.0	1,452,889.50	3,202,273.60		
BHL 2400'FNL, 500'FI	0.00	0.00	7,475.0	393.9	4,655.9	1,453,519.51	3,206,674.31	40.575930	-104.755990
- survey misses target center by 44.0ft at 12027.7ft MD (7471.4 TVD, 437.6 N, 4652.2 E)									
- Point									

Checked By: _____ Approved By: _____ Date: _____