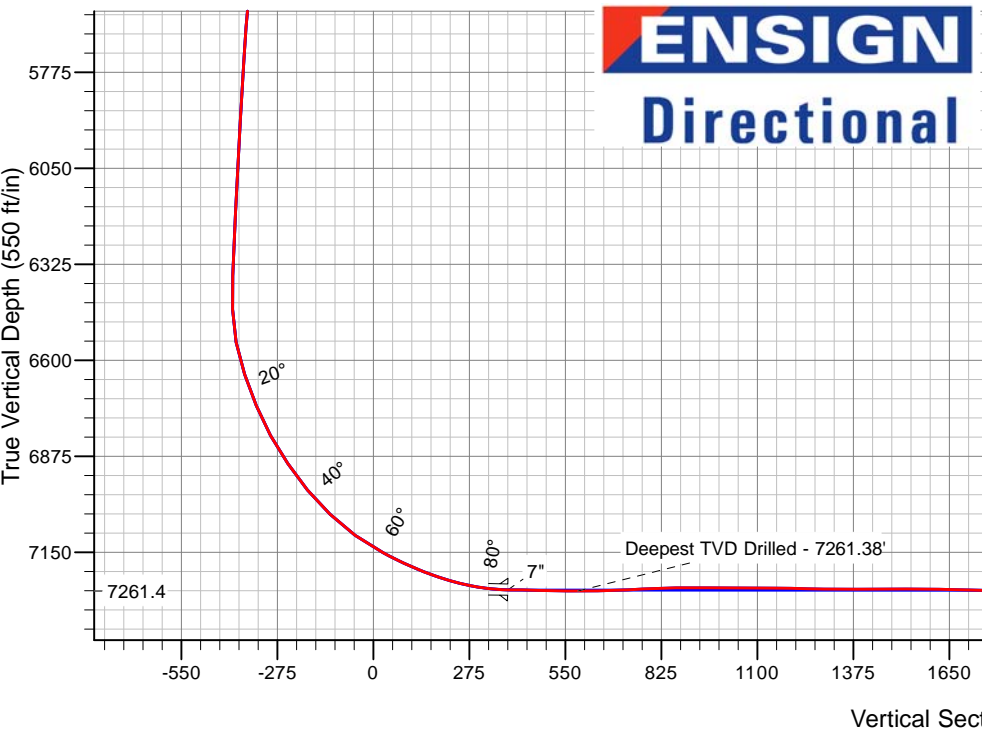
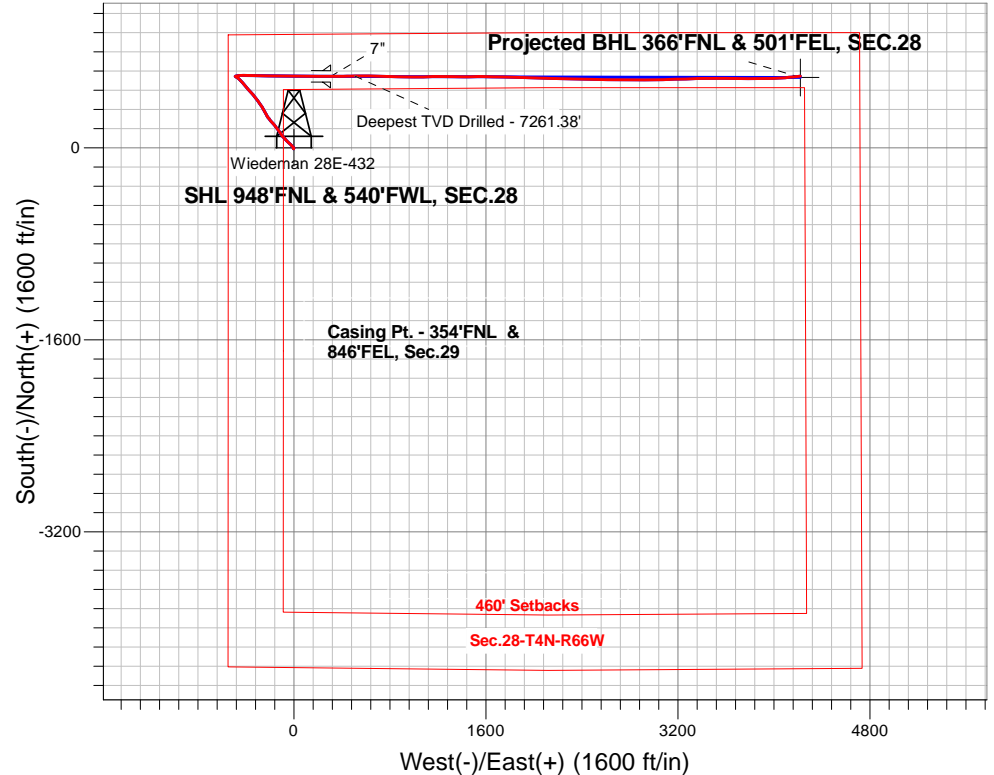


PETROLEUM DEVELOPMENT CORP DJ Basin

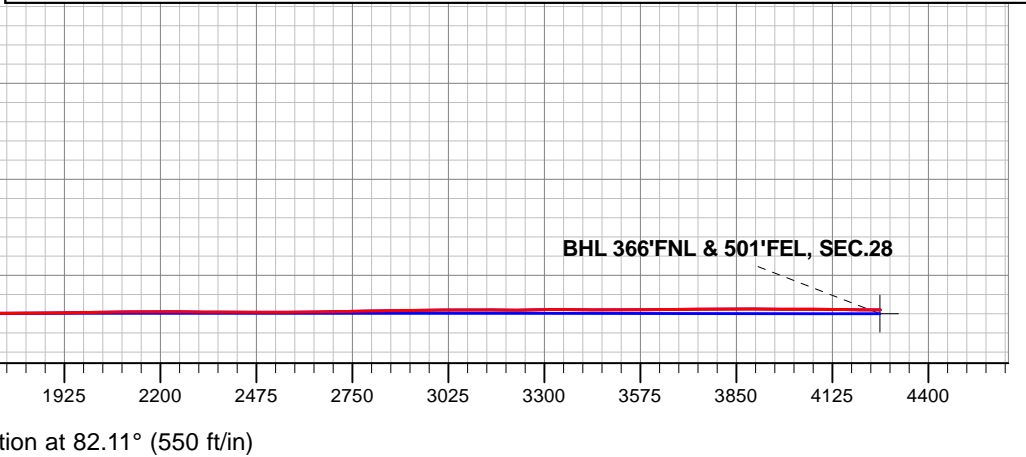
Well Name: **Wiedeman 28E-432**
Surface Location: Wiedeman 4N66W28F - East Pad Sec.28-T4N-R66W
North American Datum 1983 , US State Plane 1983, Colorado Northern Zone
Ground Elevation: 4762.0
+N/-S+E/-W Northing Easting Latitude Longitude Slot
0.0 0.01348279.40 3198077.48 40.287250 -104.789970
Ensign Rig #134 RKB - 13' WELL @ 4775.0ft (Ensign Rig #134 RKB - 13')

FINAL SURVEY

Projected Bottom Hole Location
11669'MD 7249'TVD 596'N & 4220'E of SHL
89.7 degree Incl @ 84.4 degree AZM



Wiedeman 4N66W28F - East Pad Sec.28-T4N-R66W Wiedeman 28E-432 Wellbore #1 9:20, October 20 2015	ANNOTATIONS		
	TVD	MD	Annotation
	7261.4	7955.0	Deepest TVD Drilled - 7261.38'
LEGEND			
Wiedeman 28E-432, Wellbore #1, Plan #2 (10-17-15) V0			
Wellbore #1			
Survey #1			





PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.28-T4N-R66W

Wiedeman 4N66W28F - East Pad Sec.28-T4N-R66W

Wiedeman 28E-432

Wellbore #1

Survey: Survey #1

Standard Survey Report

20 October, 2015

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Wiedeman 28E-432
Project:	SEC.28-T4N-R66W	TVD Reference:	WELL @ 4775.0ft (Ensign Rig #134 RKB - 13')
Site:	Wiedeman 4N66W28F - East Pad Sec.28-T4N-R66W	MD Reference:	WELL @ 4775.0ft (Ensign Rig #134 RKB - 13')
Well:	Wiedeman 28E-432	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	US_EDM

Project	SEC.28-T4N-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		Wiedeman 4N66W28F - East Pad Sec.28-T4N-R66W			
Site Position:		Northing:	1,348,308.56 usft	Latitude:	40.287330
From:	Lat/Long	Easting:	3,198,077.24 usft	Longitude:	-104.789970
Position Uncertainty:	0.0 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.46 °

Well	Wiedeman 28E-432					
Well Position	+N/-S	0.0 ft	Northing:	1,348,279.40 usft	Latitude:	40.287250
	+E/-W	0.0 ft	Easting:	3,198,077.48 usft	Longitude:	-104.789970
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,762.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	10/17/2015	8.28	66.81	52,613

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	82.11	

Survey Program	Date	10/20/2015			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
105.0	11,669.0	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 (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
1.0	0.00	225.00	1.0	0.0	0.0	0.0	0.38	0.38	0.00	
SHL 948'FNL & 540'FWL, SEC.28										
105.0	0.40	225.00	105.0	-0.3	-0.3	-0.3	0.38	0.38	0.00	
166.0	0.40	210.40	166.0	-0.6	-0.5	-0.6	0.17	0.00	-23.93	
259.0	0.50	210.60	259.0	-1.2	-0.9	-1.0	0.11	0.11	0.22	
351.0	0.60	207.10	351.0	-2.0	-1.3	-1.6	0.11	0.11	-3.80	
443.0	0.40	212.60	443.0	-2.7	-1.7	-2.1	0.22	-0.22	5.98	
535.0	0.40	196.20	535.0	-3.3	-2.0	-2.4	0.12	0.00	-17.83	
628.0	0.50	233.70	628.0	-3.8	-2.4	-2.9	0.33	0.11	40.32	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Wiedeman 28E-432
Project:	SEC.28-T4N-R66W	TVD Reference:	WELL @ 4775.0ft (Ensign Rig #134 RKB - 13')
Site:	Wiedeman 4N66W28F - East Pad Sec.28-T4N-R66W	MD Reference:	WELL @ 4775.0ft (Ensign Rig #134 RKB - 13')
Well:	Wiedeman 28E-432	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	US_EDM

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
720.0	0.50	171.60	720.0	-4.5	-2.6	-3.2	0.56	0.00	-67.50	
813.0	0.60	175.80	813.0	-5.3	-2.6	-3.3	0.12	0.11	4.52	
905.0	0.70	191.80	905.0	-6.4	-2.6	-3.5	0.22	0.11	17.39	
1,017.0	0.80	230.70	1,017.0	-7.5	-3.4	-4.4	0.45	0.09	34.73	
1,109.0	0.80	238.10	1,109.0	-8.3	-4.4	-5.5	0.11	0.00	8.04	
1,202.0	2.40	3.60	1,201.9	-6.7	-4.9	-5.7	3.16	1.72	134.95	
1,294.0	5.00	339.60	1,293.7	-1.0	-6.1	-6.2	3.23	2.83	-26.09	
1,387.0	4.60	336.30	1,386.4	6.2	-9.0	-8.1	0.52	-0.43	-3.55	
1,479.0	5.10	319.60	1,478.1	12.7	-13.2	-11.3	1.62	0.54	-18.15	
1,571.0	8.30	315.90	1,569.4	20.6	-20.4	-17.4	3.51	3.48	-4.02	
1,664.0	7.90	312.90	1,661.5	29.8	-29.8	-25.4	0.63	-0.43	-3.23	
1,756.0	7.70	312.60	1,752.7	38.2	-39.0	-33.3	0.22	-0.22	-0.33	
1,849.0	7.50	308.90	1,844.8	46.3	-48.3	-41.5	0.57	-0.22	-3.98	
1,944.0	8.60	315.90	1,938.9	55.3	-58.0	-49.9	1.55	1.16	7.37	
2,040.0	10.30	321.20	2,033.6	67.1	-68.4	-58.6	1.99	1.77	5.52	
2,135.0	10.00	318.20	2,127.1	79.9	-79.2	-67.5	0.64	-0.32	-3.16	
2,230.0	9.40	314.00	2,220.8	91.4	-90.3	-76.9	0.98	-0.63	-4.42	
2,325.0	9.30	326.50	2,314.5	103.2	-100.1	-85.0	2.14	-0.11	13.16	
2,421.0	9.10	327.20	2,409.3	116.0	-108.5	-91.6	0.24	-0.21	0.73	
2,516.0	8.80	325.60	2,503.1	128.4	-116.7	-98.0	0.41	-0.32	-1.68	
2,611.0	8.70	323.70	2,597.0	140.1	-125.1	-104.6	0.32	-0.11	-2.00	
2,707.0	8.80	323.70	2,691.9	151.9	-133.7	-111.6	0.10	0.10	0.00	
2,802.0	8.80	323.50	2,785.8	163.6	-142.3	-118.5	0.03	0.00	-0.21	
2,897.0	8.40	321.50	2,879.7	174.9	-151.0	-125.5	0.53	-0.42	-2.11	
2,992.0	8.50	320.50	2,973.7	185.7	-159.8	-132.7	0.19	0.11	-1.05	
3,088.0	8.40	320.00	3,068.6	196.6	-168.8	-140.2	0.13	-0.10	-0.52	
3,183.0	8.10	317.80	3,162.7	206.8	-177.7	-147.6	0.46	-0.32	-2.32	
3,278.0	7.70	316.60	3,256.8	216.4	-186.6	-155.1	0.46	-0.42	-1.26	
3,373.0	10.20	322.80	3,350.6	227.8	-196.1	-162.9	2.82	2.63	6.53	
3,468.0	9.80	321.40	3,444.1	240.8	-206.2	-171.2	0.49	-0.42	-1.47	
3,564.0	8.70	319.30	3,538.9	252.7	-216.0	-179.3	1.20	-1.15	-2.19	
3,659.0	11.60	332.60	3,632.4	266.6	-225.1	-186.4	3.91	3.05	14.00	
3,754.0	11.10	332.40	3,725.6	283.2	-233.7	-192.6	0.53	-0.53	-0.21	
3,849.0	11.10	331.90	3,818.8	299.4	-242.3	-198.9	0.10	0.00	-0.53	
3,945.0	10.90	330.50	3,913.0	315.4	-251.1	-205.4	0.35	-0.21	-1.46	
4,040.0	10.60	330.20	4,006.3	330.8	-259.9	-212.0	0.32	-0.32	-0.32	
4,135.0	9.20	328.20	4,099.9	344.8	-268.2	-218.3	1.52	-1.47	-2.11	
4,230.0	11.70	325.20	4,193.3	359.2	-277.7	-225.8	2.69	2.63	-3.16	
4,325.0	11.30	323.30	4,286.4	374.6	-288.8	-234.6	0.58	-0.42	-2.00	
4,420.0	10.60	322.40	4,379.7	389.0	-299.7	-243.4	0.76	-0.74	-0.95	
4,516.0	10.70	322.10	4,474.1	403.0	-310.5	-252.3	0.12	0.10	-0.31	
4,611.0	10.10	322.40	4,567.5	416.6	-321.0	-260.8	0.63	-0.63	0.32	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Wiedeman 28E-432
Project:	SEC.28-T4N-R66W	TVD Reference:	WELL @ 4775.0ft (Ensign Rig #134 RKB - 13')
Site:	Wiedeman 4N66W28F - East Pad Sec.28-T4N-R66W	MD Reference:	WELL @ 4775.0ft (Ensign Rig #134 RKB - 13')
Well:	Wiedeman 28E-432	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	US_EDM

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,706.0	10.00	322.20	4,661.0	429.7	-331.2	-269.0	0.11	-0.11	-0.21
4,801.0	9.60	322.40	4,754.7	442.5	-341.1	-277.1	0.42	-0.42	0.21
4,897.0	11.60	317.30	4,849.0	455.9	-352.5	-286.5	2.30	2.08	-5.31
4,992.0	11.00	317.50	4,942.2	469.6	-365.1	-297.1	0.63	-0.63	0.21
5,087.0	10.20	319.10	5,035.5	482.6	-376.7	-306.9	0.90	-0.84	1.68
5,182.0	9.50	319.30	5,129.1	494.9	-387.3	-315.7	0.74	-0.74	0.21
5,278.0	12.00	318.60	5,223.5	508.4	-399.1	-325.5	2.61	2.60	-0.73
5,373.0	10.60	317.70	5,316.6	522.3	-411.5	-335.9	1.49	-1.47	-0.95
5,468.0	9.80	318.90	5,410.1	534.9	-422.7	-345.3	0.87	-0.84	1.26
5,563.0	8.50	319.30	5,503.9	546.3	-432.6	-353.5	1.37	-1.37	0.42
5,659.0	8.10	319.10	5,598.9	556.8	-441.7	-361.0	0.42	-0.42	-0.21
5,754.0	6.70	317.90	5,693.1	565.9	-449.8	-367.8	1.48	-1.47	-1.26
5,849.0	5.50	311.70	5,787.6	573.1	-456.9	-373.9	1.44	-1.26	-6.53
5,945.0	4.70	310.50	5,883.2	578.7	-463.3	-379.4	0.84	-0.83	-1.25
6,040.0	4.10	304.30	5,977.9	583.1	-469.1	-384.5	0.81	-0.63	-6.53
6,135.0	3.60	298.00	6,072.7	586.5	-474.5	-389.5	0.69	-0.53	-6.63
6,231.0	3.50	295.50	6,168.5	589.1	-479.8	-394.4	0.19	-0.10	-2.60
6,326.0	3.20	298.30	6,263.3	591.6	-484.8	-398.9	0.36	-0.32	2.95
6,421.0	2.60	296.90	6,358.2	593.9	-489.0	-402.8	0.64	-0.63	-1.47
6,517.0	1.80	66.70	6,454.2	595.4	-489.6	-403.2	4.17	-0.83	135.21
6,612.0	10.20	73.30	6,548.6	598.5	-480.1	-393.4	8.86	8.84	6.95
6,707.0	19.50	86.70	6,640.3	601.8	-456.2	-369.2	10.37	9.79	14.11
6,803.0	22.10	90.20	6,730.1	602.7	-422.1	-335.4	3.00	2.71	3.65
6,898.0	29.10	89.70	6,815.7	602.7	-381.1	-294.7	7.37	7.37	-0.53
6,993.0	34.90	94.80	6,896.2	600.6	-330.9	-245.3	6.73	6.11	5.37
7,088.0	39.80	88.10	6,971.8	599.3	-273.3	-188.5	6.70	5.16	-7.05
7,183.0	45.60	89.30	7,041.5	600.7	-209.0	-124.5	6.16	6.11	1.26
7,278.0	55.30	92.50	7,102.0	599.4	-135.8	-52.2	10.53	10.21	3.37
7,373.0	61.80	90.60	7,151.5	597.3	-54.9	27.7	7.05	6.84	-2.00
7,468.0	66.70	90.20	7,192.8	596.7	30.7	112.3	5.17	5.16	-0.42
7,563.0	72.70	89.90	7,225.7	596.6	119.7	200.5	6.32	6.32	-0.32
7,658.0	79.70	91.40	7,248.4	595.6	211.9	291.7	7.53	7.37	1.58
7,753.0	88.84	90.32	7,257.8	594.1	306.3	385.0	9.69	9.62	-1.13
7"									
7,764.0	89.90	90.20	7,258.0	594.1	317.3	395.9	9.69	9.62	-1.12
7,859.0	88.00	87.90	7,259.7	595.7	412.3	490.2	3.14	-2.00	-2.42
7,955.0	90.00	89.50	7,261.4	597.8	508.2	585.5	2.67	2.08	1.67
Deepest TVD Drilled - 7261.38'									
8,050.0	92.30	90.20	7,259.5	598.1	603.2	679.6	2.53	2.42	0.74
8,145.0	92.90	91.80	7,255.2	596.4	698.1	773.4	1.80	0.63	1.68
8,240.0	90.80	90.90	7,252.1	594.2	793.0	867.1	2.40	-2.21	-0.95
8,335.0	89.70	91.60	7,251.7	592.1	888.0	960.9	1.37	-1.16	0.74
8,430.0	89.30	90.20	7,252.5	590.6	983.0	1,054.8	1.53	-0.42	-1.47

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Wiedeman 28E-432
Project:	SEC.28-T4N-R66W	TVD Reference:	WELL @ 4775.0ft (Ensign Rig #134 RKB - 13')
Site:	Wiedeman 4N66W28F - East Pad Sec.28-T4N-R66W	MD Reference:	WELL @ 4775.0ft (Ensign Rig #134 RKB - 13')
Well:	Wiedeman 28E-432	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	US_EDM

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,525.0	89.80	89.20	7,253.3	591.1	1,078.0	1,148.9	1.18	0.53	-1.05
8,621.0	88.50	88.10	7,254.7	593.4	1,173.9	1,244.3	1.77	-1.35	-1.15
8,716.0	89.80	91.80	7,256.1	593.5	1,268.9	1,338.4	4.13	1.37	3.89
8,811.0	90.30	90.20	7,256.0	591.8	1,363.9	1,432.2	1.76	0.53	-1.68
8,906.0	90.00	89.20	7,255.8	592.3	1,458.9	1,526.4	1.10	-0.32	-1.05
9,001.0	89.10	90.00	7,256.5	593.0	1,553.9	1,620.6	1.27	-0.95	0.84
9,096.0	88.20	91.30	7,258.7	591.9	1,648.8	1,714.5	1.66	-0.95	1.37
9,191.0	90.70	91.40	7,259.7	589.7	1,743.8	1,808.3	2.63	2.63	0.11
9,287.0	91.30	92.30	7,258.0	586.6	1,839.7	1,902.9	1.13	0.63	0.94
9,382.0	90.40	90.00	7,256.6	584.7	1,934.7	1,996.7	2.60	-0.95	-2.42
9,477.0	91.10	92.70	7,255.3	582.4	2,029.7	2,090.4	2.94	0.74	2.84
9,572.0	89.80	91.40	7,254.6	579.0	2,124.6	2,184.0	1.94	-1.37	-1.37
9,667.0	89.20	92.50	7,255.4	575.8	2,219.5	2,277.6	1.32	-0.63	1.16
9,762.0	90.20	91.30	7,255.9	572.6	2,314.5	2,371.2	1.64	1.05	-1.26
9,858.0	89.50	90.90	7,256.2	570.8	2,410.5	2,466.0	0.84	-0.73	-0.42
9,953.0	90.50	90.20	7,256.2	569.9	2,505.4	2,560.0	1.28	1.05	-0.74
10,048.0	90.40	91.30	7,255.4	568.6	2,600.4	2,653.9	1.16	-0.11	1.16
10,143.0	91.70	91.10	7,253.7	566.7	2,695.4	2,747.7	1.38	1.37	-0.21
10,238.0	90.20	90.20	7,252.1	565.6	2,790.4	2,841.6	1.84	-1.58	-0.95
10,333.0	91.20	89.70	7,250.9	565.7	2,885.4	2,935.7	1.18	1.05	-0.53
10,429.0	90.60	89.30	7,249.4	566.5	2,981.3	3,030.9	0.75	-0.63	-0.42
10,524.0	89.00	88.10	7,249.8	568.7	3,076.3	3,125.3	2.11	-1.68	-1.26
10,619.0	90.70	89.00	7,250.0	571.1	3,171.3	3,219.7	2.02	1.79	0.95
10,714.0	90.70	88.80	7,248.9	572.9	3,266.3	3,314.0	0.21	0.00	-0.21
10,809.0	88.90	88.30	7,249.2	575.3	3,361.2	3,408.4	1.97	-1.89	-0.53
10,904.0	90.40	88.60	7,249.8	577.9	3,456.2	3,502.8	1.61	1.58	0.32
11,000.0	90.70	89.90	7,248.8	579.1	3,552.2	3,598.0	1.39	0.31	1.35
11,095.0	90.60	91.10	7,247.8	578.3	3,647.2	3,692.0	1.27	-0.11	1.26
11,190.0	90.20	91.10	7,247.1	576.5	3,742.1	3,785.8	0.42	-0.42	0.00
11,285.0	89.40	89.90	7,247.4	575.6	3,837.1	3,879.8	1.52	-0.84	-1.26
11,380.0	90.40	87.90	7,247.6	577.5	3,932.1	3,974.2	2.35	1.05	-2.11
11,475.0	89.60	88.10	7,247.6	580.8	4,027.0	4,068.6	0.87	-0.84	0.21
11,570.0	89.20	84.90	7,248.6	586.6	4,121.9	4,163.4	3.39	-0.42	-3.37
11,611.0	89.70	84.40	7,249.0	590.4	4,162.7	4,204.3	1.72	1.22	-1.22
11,668.6	89.70	84.40	7,249.3	596.0	4,220.0	4,261.8	0.00	0.00	0.00
BHL 377'FNL & 500'FEL, SEC.28									
11,669.0	89.70	84.40	7,249.3	596.0	4,220.4	4,262.3	0.00	0.00	0.00

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Wiedeman 28E-432
Project:	SEC.28-T4N-R66W	TVD Reference:	WELL @ 4775.0ft (Ensign Rig #134 RKB - 13')
Site:	Wiedeman 4N66W28F - East Pad Sec.28-T4N-R66W	MD Reference:	WELL @ 4775.0ft (Ensign Rig #134 RKB - 13')
Well:	Wiedeman 28E-432	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	US_EDM

Design Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
SHL 948'FNL & 540'FWI - survey hits target center - Point	0.00	0.00	1.0	0.0	0.0	1,348,279.42	3,198,077.48	40.287250	-104.789970
BHL 377'FNL & 500'FEL - survey misses target center by 15.2ft at 11668.6ft MD (7249.3 TVD, 596.0 N, 4220.0 E) - Point	0.00	0.00	7,260.0	585.2	4,221.0	1,348,898.36	3,202,293.43	40.288855	-104.774840

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name		Casing Diameter (")	Hole Diameter (")
7,753.0	7,257.8	7"		7	8-3/4

Survey Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
7,955.0	7,261.4	597.8	508.2	Deepest TVD Drilled - 7261.38'	

Checked By: _____	Approved By: _____	Date: _____
-------------------	--------------------	-------------