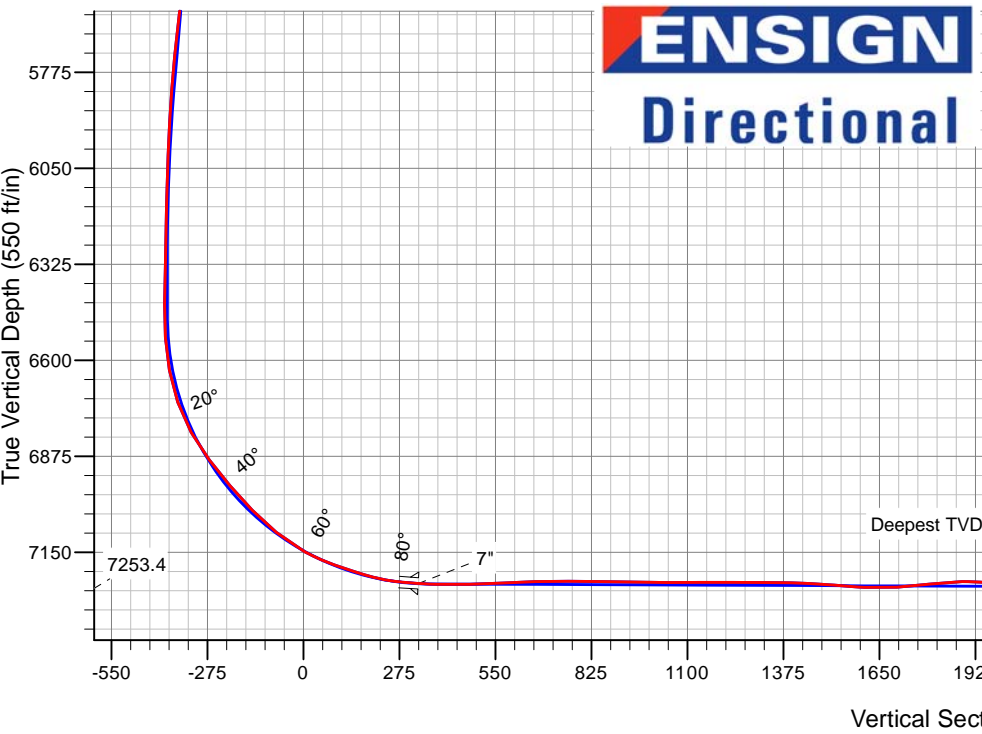
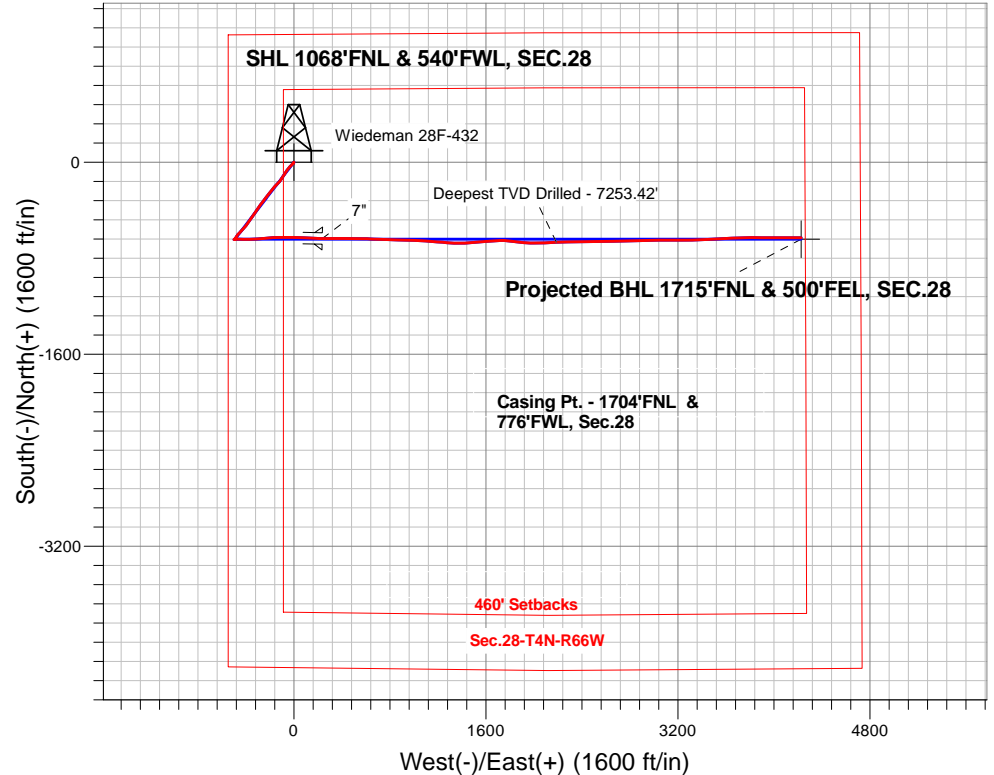


PETROLEUM DEVELOPMENT CORP DJ Basin

Well Name: **Wiedeman 28F-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 0.0 348159.13 198078.44 40.286920 -104.789970
Ensign Rig #134 RKB - 13' WELL @ 4775.0ft (Ensign Rig #134 RKB - 13')

FINAL SURVEY

Projected Bottom Hole Location
11706'MD 7252'TVD 631'S & 4227'E of SHL
90.7 degree Incl @ 91.1degree AZM



Wiedeman 4N66W28F - East Pad Sec.28-T4N-R66W
Wiedeman 28F-432
Wellbore #1
4:59, November 09 2015

ANNOTATIONS		
TVD	MD	Annotation
7253.4	9666.0	Deepest TVD Drilled - 7253.42'

LEGEND	
△	Wiedeman 28F-432, Wellbore #1, Plan #1 (10-30-15)R V0
□	Wellbore #1
○	Survey #1



PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.28-T4N-R66W

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

Wiedeman 28F-432

Wellbore #1

Survey: Survey #1

Standard Survey Report

09 November, 2015

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Wiedeman 28F-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 28F-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 28F-432					
Well Position	+N/-S	0.0 ft	Northing:	1,348,159.19 usft	Latitude:	40.286920
	+E/-W	0.0 ft	Easting:	3,198,078.44 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	10/30/2015	8.28	66.80	52,609

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	98.62	

Survey Program	Date	11/9/2015			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
73.0	11,706.0	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	0.01	224.30	1.0	0.0	0.0	0.0	0.82	0.82	0.00	
SHL 1068'FNL & 540'FWL, SEC.28										
73.0	0.60	224.30	73.0	-0.3	-0.3	-0.2	0.82	0.82	0.00	
165.0	0.70	210.60	165.0	-1.1	-0.9	-0.7	0.20	0.11	-14.89	
258.0	0.70	196.20	258.0	-2.1	-1.3	-1.0	0.19	0.00	-15.48	
350.0	0.60	205.70	350.0	-3.1	-1.7	-1.2	0.16	-0.11	10.33	
442.0	0.70	221.50	442.0	-4.0	-2.3	-1.7	0.22	0.11	17.17	
534.0	0.90	207.80	534.0	-5.0	-3.0	-2.2	0.30	0.22	-14.89	
627.0	0.70	203.70	627.0	-6.2	-3.6	-2.6	0.22	-0.22	-4.41	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Wiedeman 28F-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 28F-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)	
719.0	0.70	204.10	718.9	-7.2	-4.0	-2.9	0.01	0.00	0.43	
812.0	0.90	206.30	811.9	-8.4	-4.6	-3.3	0.22	0.22	2.37	
897.0	0.70	221.20	896.9	-9.4	-5.2	-3.7	0.34	-0.24	17.53	
1,009.0	0.80	210.10	1,008.9	-10.6	-6.1	-4.4	0.16	0.09	-9.91	
1,101.0	1.70	229.80	1,100.9	-12.0	-7.4	-5.5	1.07	0.98	21.41	
1,192.0	2.90	229.10	1,191.8	-14.4	-10.2	-7.9	1.32	1.32	-0.77	
1,284.0	3.90	229.60	1,283.7	-17.9	-14.3	-11.5	1.09	1.09	0.54	
1,376.0	5.20	223.80	1,375.4	-23.0	-19.6	-15.9	1.50	1.41	-6.30	
1,469.0	6.40	224.10	1,467.9	-29.7	-26.1	-21.4	1.29	1.29	0.32	
1,561.0	8.20	221.90	1,559.1	-38.3	-34.1	-27.9	1.98	1.96	-2.39	
1,654.0	9.00	219.00	1,651.1	-48.9	-43.1	-35.3	0.98	0.86	-3.12	
1,746.0	8.70	216.90	1,742.0	-60.1	-51.8	-42.2	0.48	-0.33	-2.28	
1,838.0	9.80	219.90	1,832.8	-71.6	-61.0	-49.6	1.31	1.20	3.26	
1,934.0	9.50	213.60	1,927.4	-84.5	-70.6	-57.2	1.14	-0.31	-6.56	
2,029.0	9.40	211.10	2,021.2	-97.7	-79.0	-63.4	0.44	-0.11	-2.63	
2,124.0	9.10	209.90	2,114.9	-110.8	-86.7	-69.1	0.38	-0.32	-1.26	
2,219.0	8.70	207.30	2,208.8	-123.7	-93.8	-74.1	0.60	-0.42	-2.74	
2,314.0	9.10	215.70	2,302.6	-136.2	-101.4	-79.9	1.43	0.42	8.84	
2,409.0	8.50	216.40	2,396.5	-148.0	-110.0	-86.6	0.64	-0.63	0.74	
2,505.0	8.50	222.90	2,491.5	-158.9	-119.0	-93.9	1.00	0.00	6.77	
2,600.0	9.10	223.40	2,585.4	-169.5	-129.0	-102.1	0.64	0.63	0.53	
2,695.0	9.50	222.40	2,679.1	-180.7	-139.4	-110.7	0.45	0.42	-1.05	
2,790.0	9.90	222.40	2,772.7	-192.5	-150.2	-119.6	0.42	0.42	0.00	
2,885.0	9.40	220.80	2,866.4	-204.4	-160.8	-128.3	0.60	-0.53	-1.68	
2,980.0	9.30	219.90	2,960.1	-216.2	-170.8	-136.4	0.19	-0.11	-0.95	
3,075.0	9.00	219.20	3,053.9	-227.8	-180.4	-144.2	0.34	-0.32	-0.74	
3,170.0	7.70	220.30	3,147.9	-238.5	-189.2	-151.3	1.38	-1.37	1.16	
3,266.0	9.10	219.70	3,242.9	-249.2	-198.2	-158.6	1.46	1.46	-0.63	
3,361.0	8.00	218.30	3,336.8	-260.2	-207.1	-165.8	1.18	-1.16	-1.47	
3,462.0	8.30	214.30	3,436.8	-271.7	-215.6	-172.4	0.63	0.30	-3.96	
3,557.0	9.20	218.00	3,530.7	-283.4	-224.1	-179.1	1.12	0.95	3.89	
3,652.0	9.80	219.40	3,624.4	-295.6	-233.9	-187.0	0.68	0.63	1.47	
3,748.0	9.10	214.80	3,719.1	-308.1	-243.4	-194.5	1.07	-0.73	-4.79	
3,843.0	11.60	218.00	3,812.5	-321.8	-253.6	-202.5	2.70	2.63	3.37	
3,938.0	11.80	217.10	3,905.6	-337.1	-265.4	-211.8	0.29	0.21	-0.95	
4,033.0	11.10	216.90	3,998.7	-352.2	-276.7	-220.8	0.74	-0.74	-0.21	
4,128.0	9.70	214.50	4,092.1	-366.1	-286.7	-228.6	1.54	-1.47	-2.53	
4,223.0	9.80	216.20	4,185.7	-379.2	-296.0	-235.9	0.32	0.11	1.79	
4,318.0	11.30	215.50	4,279.1	-393.3	-306.2	-243.8	1.58	1.58	-0.74	
4,414.0	11.00	214.50	4,373.3	-408.5	-316.9	-252.1	0.37	-0.31	-1.04	
4,509.0	10.70	214.30	4,466.6	-423.3	-327.0	-259.8	0.32	-0.32	-0.21	
4,604.0	10.00	213.90	4,560.1	-437.4	-336.5	-267.2	0.74	-0.74	-0.42	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Wiedeman 28F-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 28F-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)
4,699.0	8.60	213.40	4,653.8	-450.2	-345.0	-273.7	1.48	-1.47	-0.53
4,794.0	9.20	214.50	4,747.7	-462.4	-353.3	-280.0	0.66	0.63	1.16
4,889.0	10.30	215.20	4,841.3	-475.6	-362.5	-287.1	1.16	1.16	0.74
4,984.0	9.80	216.10	4,934.9	-489.0	-372.1	-294.6	0.55	-0.53	0.95
5,079.0	10.90	215.70	5,028.3	-502.9	-382.1	-302.4	1.16	1.16	-0.42
5,174.0	9.70	214.50	5,121.8	-516.8	-391.9	-310.0	1.28	-1.26	-1.26
5,270.0	10.70	218.50	5,216.3	-530.4	-402.0	-318.0	1.28	1.04	4.17
5,364.0	9.90	219.40	5,308.7	-543.5	-412.6	-326.5	0.87	-0.85	0.96
5,459.0	10.90	220.40	5,402.2	-556.6	-423.6	-335.4	1.07	1.05	1.05
5,554.0	9.80	221.20	5,495.6	-569.5	-434.7	-344.5	1.17	-1.16	0.84
5,649.0	10.30	225.20	5,589.2	-581.6	-446.1	-353.9	0.90	0.53	4.21
5,744.0	9.70	230.10	5,682.7	-592.7	-458.3	-364.2	1.10	-0.63	5.16
5,839.0	10.60	216.80	5,776.3	-604.9	-469.6	-373.7	2.64	0.95	-14.00
5,935.0	9.00	210.40	5,870.9	-618.4	-478.7	-380.6	2.01	-1.67	-6.67
6,030.0	7.10	212.20	5,964.9	-629.8	-485.6	-385.7	2.02	-2.00	1.89
6,125.0	4.40	216.60	6,059.4	-637.7	-490.9	-389.8	2.88	-2.84	4.63
6,220.0	1.60	222.70	6,154.3	-641.6	-494.0	-392.2	2.96	-2.95	6.42
6,315.0	1.60	237.30	6,249.3	-643.3	-496.0	-394.0	0.43	0.00	15.37
6,410.0	1.30	253.80	6,344.2	-644.3	-498.2	-396.0	0.54	-0.32	17.37
6,505.0	1.20	277.40	6,439.2	-644.5	-500.2	-397.9	0.55	-0.11	24.84
6,600.0	4.00	76.70	6,534.1	-643.6	-497.9	-395.8	5.41	2.95	167.68
6,695.0	10.70	85.30	6,628.3	-642.1	-485.9	-384.2	7.13	7.05	9.05
6,790.0	18.90	91.80	6,720.1	-641.8	-461.7	-360.3	8.79	8.63	6.84
6,885.0	29.40	91.10	6,806.7	-642.8	-422.9	-321.8	11.06	11.05	-0.74
6,980.0	37.50	88.80	6,885.9	-642.6	-370.6	-270.1	8.63	8.53	-2.42
7,075.0	41.20	86.20	6,959.3	-639.9	-310.4	-211.0	4.26	3.89	-2.74
7,171.0	44.90	84.40	7,029.5	-634.5	-245.1	-147.3	4.06	3.85	-1.88
7,266.0	51.30	86.70	7,092.9	-629.1	-174.7	-78.4	6.97	6.74	2.42
7,361.0	60.70	89.30	7,145.9	-626.5	-96.1	-1.1	10.15	9.89	2.74
7,456.0	70.70	91.80	7,185.0	-627.4	-9.6	84.5	10.80	10.53	2.63
7,551.0	73.10	92.50	7,214.5	-630.8	80.6	174.3	2.62	2.53	0.74
7,663.0	84.70	92.00	7,236.0	-635.1	190.3	283.3	10.37	10.36	-0.45
7,708.7	86.39	91.18	7,239.6	-636.3	235.8	328.5	4.11	3.70	-1.80
7"									
7,763.0	88.40	90.20	7,242.0	-637.0	290.0	382.2	4.11	3.70	-1.80
7,858.0	91.30	89.50	7,242.3	-636.7	385.0	476.1	3.14	3.05	-0.74
7,954.0	93.40	90.20	7,238.4	-636.5	480.9	570.9	2.31	2.19	0.73
8,049.0	91.60	91.20	7,234.2	-637.6	575.8	664.9	2.17	-1.89	1.05
8,144.0	89.30	92.70	7,233.5	-640.9	670.8	759.2	2.89	-2.42	1.58
8,239.0	89.50	91.80	7,234.5	-644.6	765.7	853.7	0.97	0.21	-0.95
8,334.0	89.10	91.40	7,235.6	-647.3	860.6	947.9	0.60	-0.42	-0.42
8,429.0	89.30	91.20	7,236.9	-649.4	955.6	1,042.2	0.30	0.21	-0.21
8,524.0	91.00	93.70	7,236.7	-653.5	1,050.5	1,136.6	3.18	1.79	2.63

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Wiedeman 28F-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 28F-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)
8,619.0	89.40	94.80	7,236.4	-660.5	1,145.2	1,231.3	2.04	-1.68	1.16
8,714.0	89.70	93.50	7,237.1	-667.4	1,240.0	1,326.0	1.40	0.32	-1.37
8,809.0	88.50	93.70	7,238.6	-673.4	1,334.8	1,420.6	1.28	-1.26	0.21
8,905.0	84.90	88.10	7,244.1	-674.9	1,430.6	1,515.6	6.93	-3.75	-5.83
9,000.0	87.10	83.70	7,250.8	-668.1	1,525.1	1,608.0	5.17	2.32	-4.63
9,095.0	93.50	83.50	7,250.3	-657.5	1,619.4	1,699.7	6.74	6.74	-0.21
9,190.0	97.40	89.80	7,241.2	-652.0	1,713.8	1,792.1	7.77	4.11	6.63
9,285.0	90.70	97.60	7,234.5	-658.1	1,808.2	1,886.4	10.80	-7.05	8.21
9,380.0	83.90	95.60	7,239.0	-669.0	1,902.4	1,981.2	7.46	-7.16	-2.11
9,476.0	86.30	89.80	7,247.2	-673.5	1,997.9	2,076.3	6.52	2.50	-6.04
9,571.0	88.80	87.90	7,251.3	-671.6	2,092.8	2,169.8	3.30	2.63	-2.00
9,666.0	88.60	86.90	7,253.4	-667.3	2,187.7	2,263.0	1.07	-0.21	-1.05
Deepest TVD Drilled - 7253.42'									
9,761.0	92.30	88.60	7,252.7	-663.6	2,282.6	2,356.2	4.29	3.89	1.79
9,856.0	91.00	89.00	7,249.9	-661.6	2,377.5	2,449.8	1.43	-1.37	0.42
9,951.0	90.50	90.40	7,248.7	-661.1	2,472.5	2,543.6	1.56	-0.53	1.47
10,046.0	89.30	89.80	7,248.9	-661.2	2,567.5	2,637.6	1.41	-1.26	-0.63
10,142.0	89.40	88.10	7,249.9	-659.5	2,663.5	2,732.2	1.77	0.10	-1.77
10,237.0	90.00	88.40	7,250.4	-656.6	2,758.4	2,825.7	0.71	0.63	0.32
10,332.0	89.40	88.10	7,250.9	-653.7	2,853.4	2,919.1	0.71	-0.63	-0.32
10,427.0	90.00	89.00	7,251.4	-651.3	2,948.3	3,012.6	1.14	0.63	0.95
10,522.0	89.30	89.30	7,252.0	-649.9	3,043.3	3,106.3	0.80	-0.74	0.32
10,617.0	91.10	89.80	7,251.7	-649.1	3,138.3	3,200.1	1.97	1.89	0.53
10,713.0	91.40	90.70	7,249.6	-649.5	3,234.3	3,295.1	0.99	0.31	0.94
10,808.0	89.40	88.40	7,248.9	-648.8	3,329.3	3,388.9	3.21	-2.11	-2.42
10,903.0	89.30	87.20	7,250.0	-645.1	3,424.2	3,482.2	1.27	-0.11	-1.26
10,998.0	88.80	86.20	7,251.6	-639.7	3,519.0	3,575.1	1.18	-0.53	-1.05
11,093.0	88.70	87.20	7,253.7	-634.2	3,613.8	3,668.1	1.06	-0.11	1.05
11,188.0	89.90	87.90	7,254.8	-630.1	3,708.7	3,761.3	1.46	1.26	0.74
11,283.0	91.30	91.20	7,253.8	-629.4	3,803.7	3,855.1	3.77	1.47	3.47
11,379.0	90.20	90.00	7,252.6	-630.4	3,899.7	3,950.1	1.70	-1.15	-1.25
11,474.0	89.70	89.80	7,252.6	-630.2	3,994.7	4,044.0	0.57	-0.53	-0.21
11,569.0	90.00	89.10	7,252.9	-629.3	4,089.7	4,137.8	0.80	0.32	-0.74
11,648.0	90.70	91.10	7,252.4	-629.5	4,168.7	4,215.9	2.68	0.89	2.53
11,706.0	90.70	91.10	7,251.7	-630.6	4,226.7	4,273.4	0.00	0.00	0.00
BHL 1725'FNL & 500'FEL, SEC.28									

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Wiedeman 28F-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 28F-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 1068'FNL & 540'FM - survey hits target center - Point	0.00	0.00	1.0	0.0	0.0	1,348,159.21	3,198,078.44	40.286920	-104.789970
BHL 1725'FNL & 500'FE - survey misses target center by 11.5ft at 11706.0ft MD (7251.7 TVD, -630.6 N, 4226.7 E) - Point	0.00	0.00	7,257.0	-640.8	4,226.8	1,347,552.28	3,202,310.02	40.285160	-104.774820

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
7,708.7	7,239.6	7"	7	8-3/4	

Survey Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	+E/-W (ft)	Comment
9,666.0	7,253.4	-667.3	2,187.7	Deepest TVD Drilled - 7253.42'

Checked By: _____	Approved By: _____	Date: _____
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