

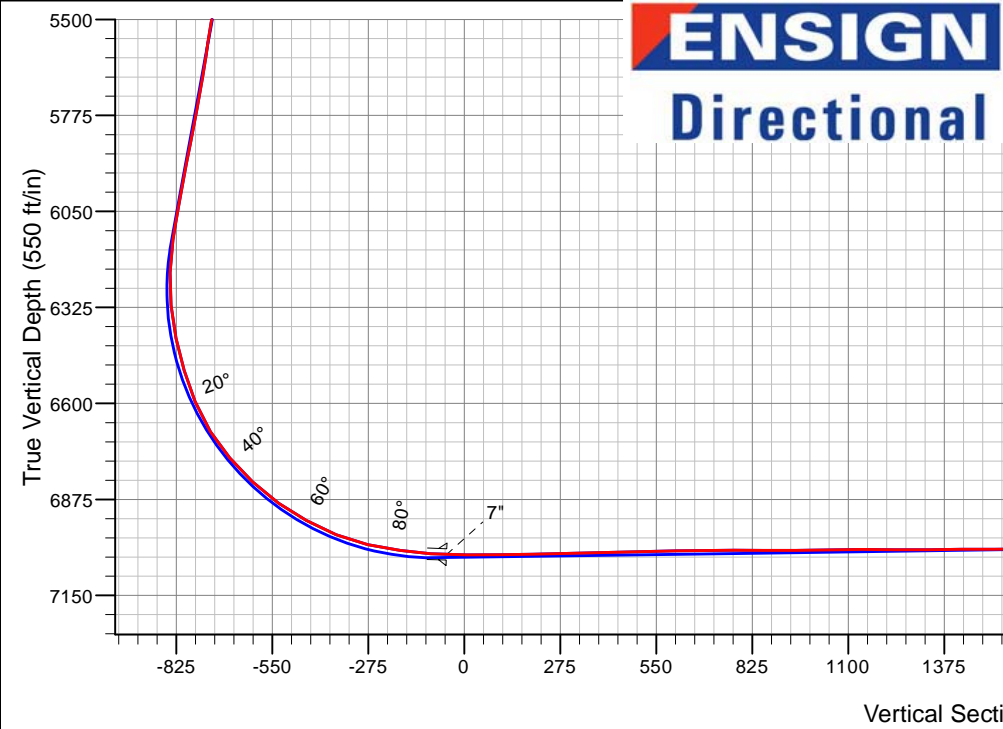
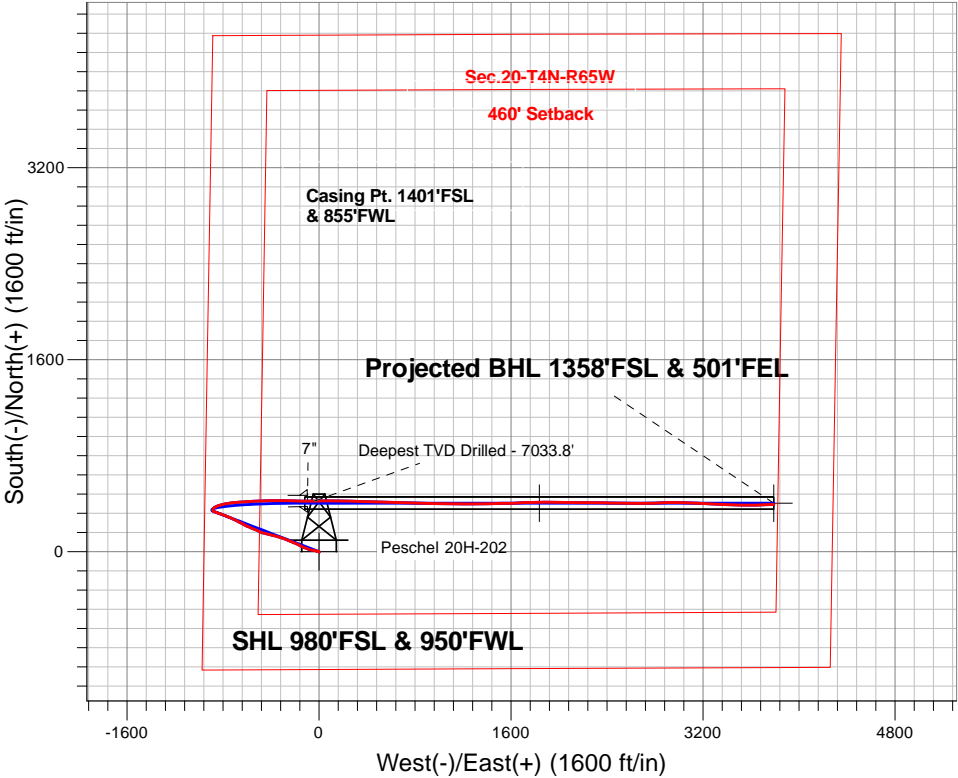
PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Peschel 20H-202**

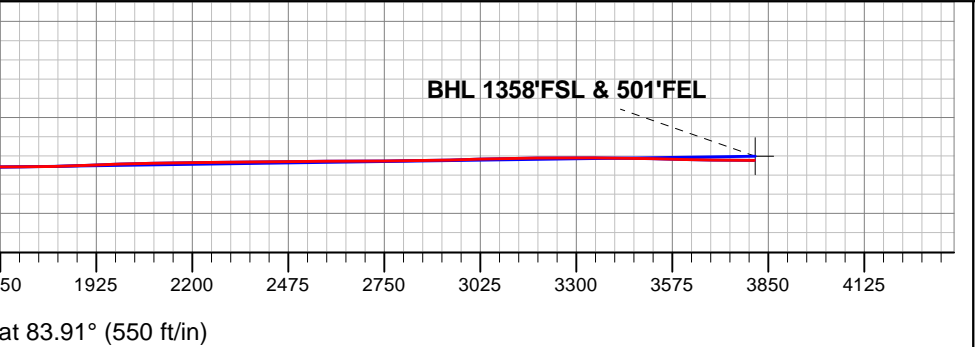
Surface Location: Peschel 4N65W20B Pad Sec.20-T4N-R65W
North American Datum 1983 , US State Plane 1983, Colorado Northern Zone
Ground Elevation: 4801.0
+N/-S +E/-W Northing Easting Latitude Longitude Slot
0.0 0.0 1350721.58 3225069.38 40.293320 -104.693140
Ensign Rig #134 RKB - 13'WELL @ 4814.0ft (Ensign Rig #134 RKB - 13')

FINAL SURVEY

Projected Bottom Hole Location
11486'MD 6998'TVD 393'N & 3790'E of SHL
89.6 degree Incl @ 88.2 degree AZM



Peschel 4N65W20B Pad Sec.20-T4N-R65W Peschel 20H-202 Wellbore #1 10:49, August 26 2015	ANNOTATIONS		
	TVD	MD	Annotation
	7033.8	7656.0	Deepest TVD Drilled - 7033.8'
LEGEND			
— Peschel 20H-202, Wellbore #1, Plan #2 (8-14-15)R V0			
— Wellbore #1			
— Survey #1			





PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.20-T4N-R65W

Peschel 4N65W20B Pad Sec.20-T4N-R65W

Peschel 20H-202

Wellbore #1

Survey: Survey #1

Standard Survey Report

26 August, 2015

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Peschel 20H-202
Project:	SEC.20-T4N-R65W	TVD Reference:	WELL @ 4814.0ft (Ensign Rig #134 RKB - 13')
Site:	Peschel 4N65W20B Pad Sec.20-T4N-R65W	MD Reference:	WELL @ 4814.0ft (Ensign Rig #134 RKB - 13')
Well:	Peschel 20H-202	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	US_EDM

Project	SEC.20-T4N-R65W, Weld, 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	Peschel 4N65W20B Pad Sec.20-T4N-R65W				
Site Position:		Northing:	1,350,841.81 usft	Latitude:	40.293650
From:	Lat/Long	Easting:	3,225,068.28 usft	Longitude:	-104.693140
Position Uncertainty:	0.0 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.52 °

Well	Peschel 20H-202					
Well Position	+N/-S	0.0 ft	Northing:	1,350,721.58 usft	Latitude:	40.293320
	+E/-W	0.0 ft	Easting:	3,225,069.38 usft	Longitude:	-104.693140
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,801.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	8/14/2015	8.26	66.83	52,644

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	83.91	

Survey Program	Date	8/26/2015			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
73.0	11,486.0	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	
73.0	0.40	163.30	73.0	-0.2	0.1	0.0	0.55	0.55	0.00	
165.0	0.50	166.10	165.0	-0.9	0.3	0.2	0.11	0.11	3.04	
258.0	0.70	160.00	258.0	-1.9	0.6	0.4	0.23	0.22	-6.56	
350.0	1.00	158.60	350.0	-3.1	1.0	0.7	0.33	0.33	-1.52	
442.0	0.30	357.70	442.0	-3.7	1.3	0.9	1.40	-0.76	-174.89	
535.0	0.90	319.20	535.0	-2.9	0.8	0.5	0.74	0.65	-41.40	
627.0	1.10	303.70	627.0	-1.8	-0.4	-0.6	0.36	0.22	-16.85	
720.0	1.20	295.50	719.9	-0.9	-2.0	-2.1	0.21	0.11	-8.82	
812.0	1.80	290.20	811.9	0.0	-4.2	-4.2	0.67	0.65	-5.76	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Peschel 20H-202
Project:	SEC.20-T4N-R65W	TVD Reference:	WELL @ 4814.0ft (Ensign Rig #134 RKB - 13')
Site:	Peschel 4N65W20B Pad Sec.20-T4N-R65W	MD Reference:	WELL @ 4814.0ft (Ensign Rig #134 RKB - 13')
Well:	Peschel 20H-202	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)
900.0	2.30	286.90	899.9	1.0	-7.2	-7.1	0.58	0.57	-3.75
1,013.0	2.50	285.80	1,012.8	2.3	-11.7	-11.4	0.18	0.18	-0.97
1,105.0	2.60	283.50	1,104.7	3.4	-15.7	-15.3	0.16	0.11	-2.50
1,197.0	2.30	294.40	1,196.6	4.6	-19.4	-18.8	0.60	-0.33	11.85
1,289.0	1.90	287.40	1,288.5	5.8	-22.6	-21.8	0.52	-0.43	-7.61
1,382.0	3.80	288.80	1,381.4	7.3	-26.9	-26.0	2.04	2.04	1.51
1,474.0	2.60	285.30	1,473.3	8.8	-31.8	-30.7	1.32	-1.30	-3.80
1,567.0	3.90	282.00	1,566.1	10.0	-37.0	-35.7	1.41	1.40	-3.55
1,659.0	3.30	273.00	1,657.9	10.8	-42.7	-41.3	0.89	-0.65	-9.78
1,752.0	4.60	280.50	1,750.7	11.6	-49.0	-47.5	1.50	1.40	8.06
1,844.0	5.00	277.00	1,842.4	12.8	-56.6	-54.9	0.54	0.43	-3.80
1,939.0	6.30	281.10	1,936.9	14.3	-65.8	-64.0	1.43	1.37	4.32
2,035.0	7.70	284.10	2,032.2	16.9	-77.3	-75.0	1.51	1.46	3.13
2,130.0	9.00	293.70	2,126.2	21.4	-90.2	-87.4	2.00	1.37	10.11
2,225.0	10.90	290.90	2,219.8	27.6	-105.4	-101.9	2.06	2.00	-2.95
2,321.0	12.80	290.70	2,313.7	34.6	-123.9	-119.5	1.98	1.98	-0.21
2,416.0	14.10	299.00	2,406.1	44.0	-143.8	-138.3	2.45	1.37	8.74
2,511.0	13.00	294.00	2,498.5	53.9	-163.7	-157.1	1.69	-1.16	-5.26
2,606.0	15.30	295.80	2,590.6	63.7	-184.8	-176.9	2.46	2.42	1.89
2,702.0	16.30	295.30	2,682.9	75.0	-208.3	-199.2	1.05	1.04	-0.52
2,797.0	16.20	292.50	2,774.2	85.7	-232.6	-222.2	0.83	-0.11	-2.95
2,892.0	16.40	292.10	2,865.3	95.9	-257.3	-245.7	0.24	0.21	-0.42
2,987.0	14.90	289.30	2,956.8	104.9	-281.3	-268.5	1.77	-1.58	-2.95
3,083.0	16.40	288.80	3,049.3	113.4	-305.7	-292.0	1.57	1.56	-0.52
3,178.0	15.50	286.00	3,140.6	121.2	-330.6	-315.9	1.25	-0.95	-2.95
3,273.0	13.50	282.50	3,232.6	127.1	-353.7	-338.2	2.30	-2.11	-3.68
3,368.0	13.80	288.50	3,324.9	133.1	-375.2	-359.0	1.52	0.32	6.32
3,464.0	12.30	283.40	3,418.4	139.1	-396.0	-379.0	1.97	-1.56	-5.31
3,559.0	12.30	285.00	3,511.2	144.1	-415.7	-398.0	0.36	0.00	1.68
3,654.0	10.70	281.40	3,604.3	148.4	-434.1	-415.9	1.85	-1.68	-3.79
3,749.0	10.70	284.90	3,697.7	152.5	-451.3	-432.5	0.68	0.00	3.68
3,844.0	9.90	284.90	3,791.1	156.8	-467.7	-448.4	0.84	-0.84	0.00
3,940.0	11.30	290.90	3,885.5	162.3	-484.4	-464.5	1.86	1.46	6.25
4,035.0	12.80	297.90	3,978.4	170.5	-502.4	-481.5	2.20	1.58	7.37
4,130.0	11.60	293.70	4,071.3	179.3	-520.5	-498.5	1.57	-1.26	-4.42
4,225.0	10.20	291.80	4,164.5	186.3	-537.0	-514.2	1.52	-1.47	-2.00
4,320.0	11.60	293.90	4,257.8	193.3	-553.6	-529.9	1.53	1.47	2.21
4,415.0	10.30	291.10	4,351.1	200.2	-570.2	-545.8	1.48	-1.37	-2.95
4,511.0	10.90	295.00	4,445.5	207.1	-586.5	-561.2	0.97	0.63	4.06
4,606.0	10.20	293.60	4,538.9	214.3	-602.3	-576.2	0.78	-0.74	-1.47
4,701.0	11.70	296.50	4,632.1	221.9	-618.6	-591.6	1.68	1.58	3.05
4,796.0	9.20	300.80	4,725.5	230.1	-633.8	-605.8	2.75	-2.63	4.53

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Peschel 20H-202
Project:	SEC.20-T4N-R65W	TVD Reference:	WELL @ 4814.0ft (Ensign Rig #134 RKB - 13')
Site:	Peschel 4N65W20B Pad Sec.20-T4N-R65W	MD Reference:	WELL @ 4814.0ft (Ensign Rig #134 RKB - 13')
Well:	Peschel 20H-202	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)
4,892.0	9.80	294.40	4,820.2	237.4	-647.8	-619.0	1.26	0.63	-6.67
4,987.0	11.10	300.10	4,913.7	245.4	-663.1	-633.3	1.75	1.37	6.00
5,082.0	9.80	297.90	5,007.1	253.7	-678.2	-647.4	1.43	-1.37	-2.32
5,177.0	11.40	298.80	5,100.5	262.0	-693.5	-661.8	1.69	1.68	0.95
5,273.0	9.10	298.70	5,194.9	270.3	-708.5	-675.8	2.40	-2.40	-0.10
5,368.0	9.10	289.50	5,288.7	276.4	-722.2	-688.8	1.53	0.00	-9.68
5,463.0	10.50	288.50	5,382.3	281.6	-737.5	-703.4	1.48	1.47	-1.05
5,559.0	11.70	295.70	5,476.5	288.6	-754.5	-719.6	1.91	1.25	7.50
5,654.0	9.20	291.40	5,570.0	295.6	-770.3	-734.6	2.75	-2.63	-4.53
5,749.0	11.30	296.50	5,663.4	302.5	-785.7	-749.1	2.41	2.21	5.37
5,844.0	11.40	288.60	5,756.6	309.7	-802.9	-765.5	1.64	0.11	-8.32
5,940.0	12.20	284.40	5,850.6	315.2	-821.7	-783.6	1.22	0.83	-4.38
6,035.0	11.10	288.60	5,943.6	320.6	-840.1	-801.3	1.46	-1.16	4.42
6,130.0	12.00	290.60	6,036.7	327.0	-858.0	-818.5	1.04	0.95	2.11
6,226.0	9.30	292.00	6,131.0	333.4	-874.6	-834.2	2.83	-2.81	1.46
6,321.0	8.90	341.70	6,225.0	343.3	-884.0	-842.6	8.03	-0.42	52.32
6,416.0	9.00	32.00	6,318.9	356.6	-882.4	-839.5	7.98	0.11	52.95
6,512.0	12.70	57.00	6,413.3	368.7	-869.5	-825.5	6.15	3.85	26.04
6,607.0	17.90	67.50	6,504.9	380.0	-847.3	-802.2	6.18	5.47	11.05
6,702.0	21.40	75.60	6,594.3	389.9	-817.0	-771.0	4.66	3.68	8.53
6,799.0	32.80	80.00	6,680.6	398.9	-773.8	-727.1	11.93	11.75	4.54
6,893.0	40.40	83.10	6,756.0	407.0	-718.4	-671.2	8.32	8.09	3.30
6,988.0	46.80	86.00	6,824.7	413.1	-653.2	-605.7	7.06	6.74	3.05
7,084.0	54.40	86.10	6,885.6	418.2	-579.3	-531.6	7.92	7.92	0.10
7,178.0	61.60	87.70	6,935.4	422.5	-499.7	-452.1	7.79	7.66	1.70
7,273.0	68.00	88.60	6,975.8	425.2	-413.9	-366.4	6.79	6.74	0.95
7,368.0	77.00	91.60	7,004.4	425.0	-323.4	-276.4	9.94	9.47	3.16
7,463.0	82.60	91.10	7,021.2	422.8	-229.9	-183.8	5.92	5.89	-0.53
7,552.0	85.90	90.70	7,030.1	421.4	-141.4	-95.9	3.73	3.71	-0.45
7,598.0	87.76	89.90	7,032.7	421.2	-95.5	-50.2	4.39	4.04	-1.73
7"									
7,656.0	90.10	88.90	7,033.8	421.8	-37.5	7.5	4.39	4.04	-1.73
Deepest TVD Drilled - 7033.8'									
7,751.0	90.80	89.80	7,033.0	422.9	57.5	102.0	1.20	0.74	0.95
7,846.0	90.40	90.50	7,032.0	422.6	152.5	196.5	0.85	-0.42	0.74
7,941.0	91.70	90.70	7,030.3	421.6	247.4	290.8	1.38	1.37	0.21
8,037.0	91.90	92.30	7,027.3	419.1	343.4	385.9	1.68	0.21	1.67
8,132.0	91.70	92.50	7,024.3	415.1	438.2	479.8	0.30	-0.21	0.21
8,227.0	90.70	90.50	7,022.3	412.7	533.2	574.0	2.35	-1.05	-2.11
8,322.0	90.20	92.30	7,021.5	410.3	628.1	668.1	1.97	-0.53	1.89
8,417.0	90.30	91.80	7,021.1	406.9	723.1	762.2	0.54	0.11	-0.53
8,512.0	89.50	91.20	7,021.3	404.4	818.0	856.4	1.05	-0.84	-0.63
8,607.0	90.80	91.40	7,021.0	402.3	913.0	950.6	1.38	1.37	0.21

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Site:	Peschel 4N65W20B Pad Sec.20-T4N-R65W	MD Reference:	WELL @ 4814.0ft (Ensign Rig #134 RKB - 13')
Well:	Peschel 20H-202	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)
8,703.0	91.10	91.80	7,019.4	399.6	1,009.0	1,045.7	0.52	0.31	0.42
8,798.0	90.10	90.00	7,018.5	398.1	1,103.9	1,140.0	2.17	-1.05	-1.89
8,893.0	89.30	89.50	7,018.9	398.5	1,198.9	1,234.5	0.99	-0.84	-0.53
8,988.0	91.00	89.80	7,018.7	399.1	1,293.9	1,329.0	1.82	1.79	0.32
9,083.0	90.00	89.80	7,017.9	399.4	1,388.9	1,423.5	1.05	-1.05	0.00
9,178.0	90.10	88.10	7,017.8	401.2	1,483.9	1,518.1	1.79	0.11	-1.79
9,273.0	91.40	90.90	7,016.5	402.0	1,578.9	1,612.6	3.25	1.37	2.95
9,369.0	89.10	85.60	7,016.1	404.9	1,674.8	1,708.3	6.02	-2.40	-5.52
9,464.0	91.60	87.20	7,015.5	410.9	1,769.6	1,803.2	3.12	2.63	1.68
9,559.0	92.50	90.20	7,012.1	413.1	1,864.5	1,897.8	3.29	0.95	3.16
9,654.0	92.00	91.80	7,008.4	411.4	1,959.4	1,992.0	1.76	-0.53	1.68
9,749.0	90.60	91.40	7,006.3	408.8	2,054.3	2,086.1	1.53	-1.47	-0.42
9,844.0	90.60	89.50	7,005.3	408.0	2,149.3	2,180.5	2.00	0.00	-2.00
9,940.0	91.10	89.30	7,003.8	409.0	2,245.3	2,276.1	0.56	0.52	-0.21
10,035.0	91.30	91.90	7,001.9	408.0	2,340.3	2,370.4	2.74	0.21	2.74
10,130.0	89.50	91.20	7,001.2	405.5	2,435.2	2,464.5	2.03	-1.89	-0.74
10,225.0	90.70	91.20	7,001.0	403.5	2,530.2	2,558.8	1.26	1.26	0.00
10,320.0	90.60	90.50	6,999.9	402.1	2,625.2	2,653.1	0.74	-0.11	-0.74
10,415.0	90.00	89.10	6,999.4	402.4	2,720.2	2,747.5	1.60	-0.63	-1.47
10,511.0	91.10	87.20	6,998.5	405.5	2,816.1	2,843.3	2.29	1.15	-1.98
10,606.0	90.70	88.40	6,997.0	409.1	2,911.1	2,938.0	1.33	-0.42	1.26
10,701.0	92.10	91.60	6,994.7	409.1	3,006.0	3,032.5	3.68	1.47	3.37
10,796.0	91.00	92.60	6,992.1	405.7	3,100.9	3,126.5	1.56	-1.16	1.05
10,891.0	90.70	92.30	6,990.7	401.6	3,195.8	3,220.4	0.45	-0.32	-0.32
10,986.0	89.30	92.80	6,990.7	397.4	3,290.7	3,314.3	1.56	-1.47	0.53
11,082.0	89.90	93.00	6,991.4	392.5	3,386.6	3,409.1	0.66	0.63	0.21
11,177.0	88.50	91.60	6,992.7	388.7	3,481.5	3,503.1	2.08	-1.47	-1.47
11,272.0	88.50	90.00	6,995.2	387.4	3,576.5	3,597.4	1.68	0.00	-1.68
11,367.0	89.30	88.10	6,997.0	388.9	3,671.4	3,692.0	2.17	0.84	-2.00
11,428.0	89.60	88.20	6,997.6	390.9	3,732.4	3,752.8	0.52	0.49	0.16
11,486.0	89.60	88.20	6,998.0	392.7	3,790.4	3,810.6	0.00	0.00	0.00

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
7,598.0	7,032.7	7"	7	8-3/4	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Peschel 20H-202
Project:	SEC.20-T4N-R65W	TVD Reference:	WELL @ 4814.0ft (Ensign Rig #134 RKB - 13')
Site:	Peschel 4N65W20B Pad Sec.20-T4N-R65W	MD Reference:	WELL @ 4814.0ft (Ensign Rig #134 RKB - 13')
Well:	Peschel 20H-202	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	US_EDM

Survey Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
7,656.0	7,033.8	421.8	-37.5	Deepest TVD Drilled - 7033.8'	

Checked By: _____	Approved By: _____	Date: _____
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