

Well Name: **Doughman 22RD**

Surface Location: Doughman 22VD Pad Sec.22-T5N-R64W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

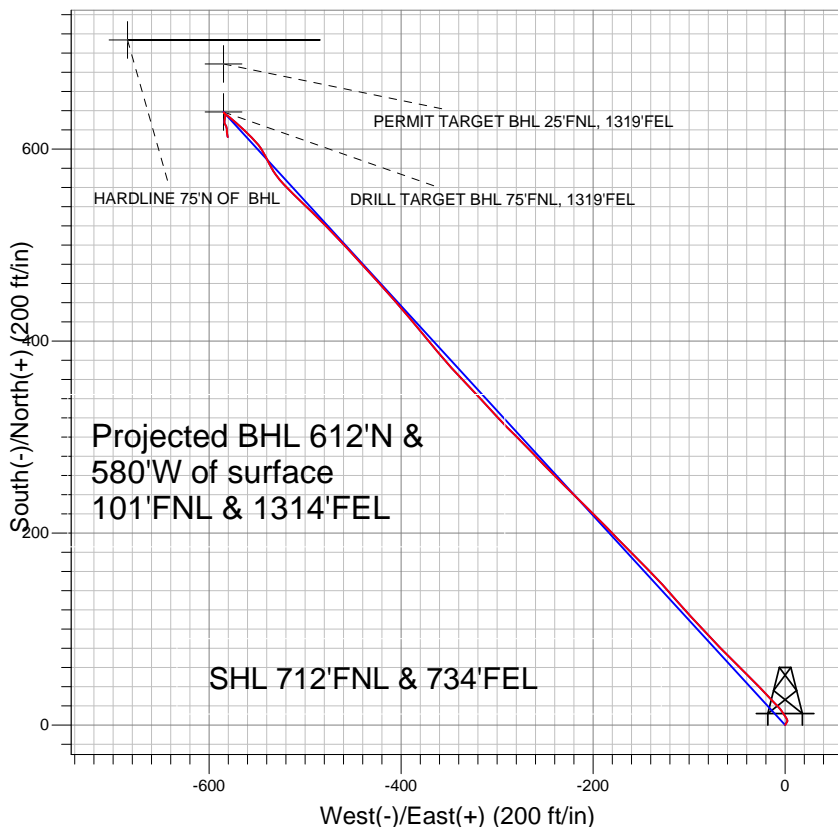
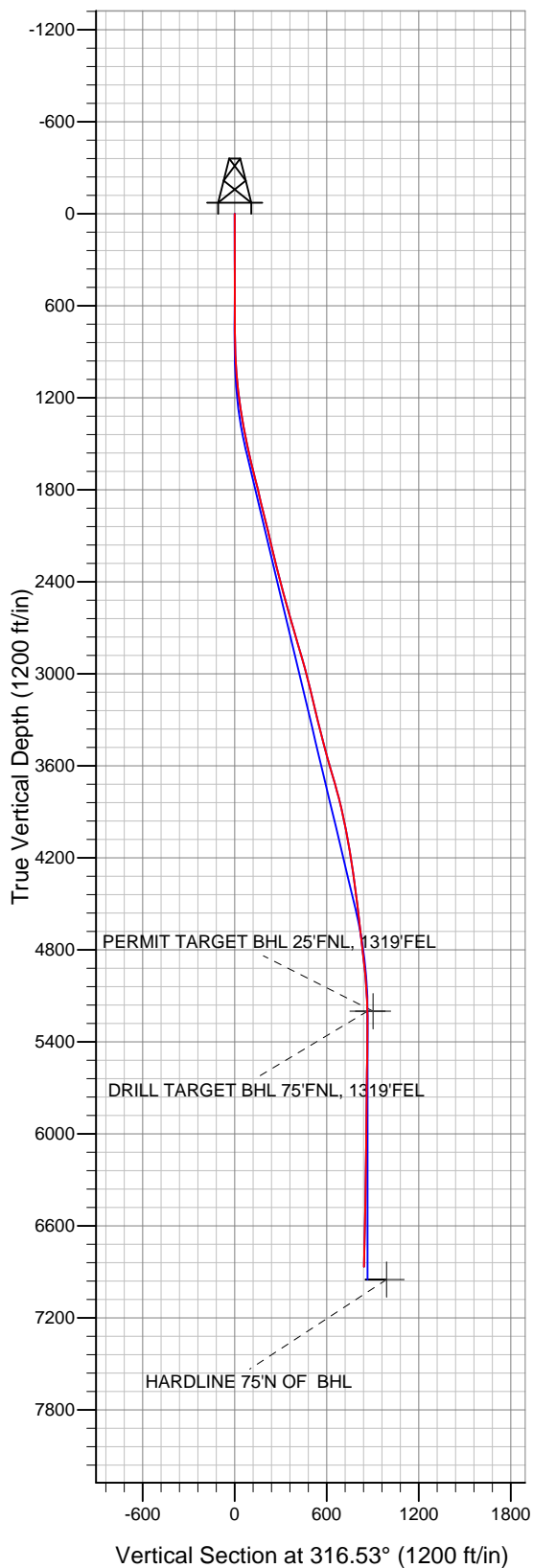
Ground Elevation: 4572.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.0	0.0	1386441.82	3270453.64	40° 23' 24.432 N	104° 31' 44.580 W

Original Well Elev WELL @ 4585.0ft (Original Well Elev)

Slot

PETROLEUM DEVELOPMENT CORP Weld County CO



LEGEND

- △ Doughman 22RD, Wellbore #1, Plan #2 (8-11-10) V0
- Wellbore #1
- Survey #1

Final Survey Plot

Projected Final Survey -
6964'MD & 6867'TVD @ 844' VS
0.8 deg Inc 151.1 deg AZ

Project: SEC.22-T5N-R64W
Site: Doughman 22VD Pad Sec.22-T5N-R64W
Well: Doughman 22RD
Plan: Wellbore #1



Directional

PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.22-T5N-R64W

Doughman 22VD Pad Sec.22-T5N-R64W

Doughman 22RD

Wellbore #1

Survey: Survey #1

Standard Survey Report

03 December, 2010

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Doughman 22RD
Project:	SEC.22-T5N-R64W	TVD Reference:	WELL @ 4585.0ft (Original Well Elev)
Site:	Doughman 22VD Pad Sec.22-T5N-R64W	MD Reference:	WELL @ 4585.0ft (Original Well Elev)
Well:	Doughman 22RD	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	SEC.22-T5N-R64W, 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		Doughman 22VD Pad Sec.22-T5N-R64W			
Site Position:		Northing:	1,386,420.16ft	Latitude:	40° 23' 24.216 N
From:	Lat/Long	Easting:	3,270,470.59ft	Longitude:	104° 31' 44.364 W
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.63 °

Well	Doughman 22RD					
Well Position	+N-S	0.0 ft	Northing:	1,386,441.82 ft	Latitude:	40° 23' 24.432 N
	+E-W	0.0 ft	Easting:	3,270,453.64 ft	Longitude:	104° 31' 44.580 W
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,572.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	10/26/2010	8.82	67.10	53,221

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	316.53	

Survey Program	Date	12/3/2010			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
765.0	6,964.0	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	
765.0	0.70	32.00	765.0	4.0	2.5	1.2	0.09	0.09	0.00	
860.0	1.70	332.30	860.0	5.7	2.1	2.7	1.55	1.05	-62.84	
955.0	3.40	327.70	954.9	9.3	0.0	6.8	1.80	1.79	-4.84	
1,049.0	4.30	324.90	1,048.7	14.6	-3.5	13.0	0.98	0.96	-2.98	
1,145.0	6.20	314.80	1,144.2	21.2	-9.3	21.8	2.19	1.98	-10.52	
1,239.0	7.30	317.60	1,237.6	29.2	-16.9	32.8	1.22	1.17	2.98	
1,334.0	10.10	315.50	1,331.5	39.6	-26.8	47.2	2.97	2.95	-2.21	
1,429.0	11.10	315.10	1,424.9	52.0	-39.1	64.6	1.06	1.05	-0.42	
1,525.0	12.10	314.70	1,518.9	65.6	-52.8	83.9	1.05	1.04	-0.42	
1,619.0	13.50	315.90	1,610.6	80.4	-67.4	104.8	1.52	1.49	1.28	
1,714.0	14.00	316.90	1,702.8	96.8	-83.0	127.3	0.58	0.53	1.05	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Doughman 22RD
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Site:	Doughman 22VD Pad Sec.22-T5N-R64W	MD Reference:	WELL @ 4585.0ft (Original Well Elev)
Well:	Doughman 22RD	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)
1,807.0	13.50	317.40	1,793.2	113.0	-98.0	149.4	0.55	-0.54	0.54
1,902.0	13.50	318.70	1,885.6	129.5	-112.9	171.6	0.32	0.00	1.37
1,996.0	14.00	317.70	1,976.9	146.1	-127.8	193.9	0.59	0.53	-1.06
2,091.0	13.60	315.30	2,069.1	162.6	-143.4	216.6	0.74	-0.42	-2.53
2,186.0	13.20	315.20	2,161.5	178.2	-158.9	238.6	0.42	-0.42	-0.11
2,281.0	13.80	316.10	2,253.9	194.0	-174.4	260.8	0.67	0.63	0.95
2,377.0	14.50	315.60	2,347.0	210.9	-190.7	284.2	0.74	0.73	-0.52
2,472.0	14.90	314.10	2,438.9	227.9	-207.8	308.3	0.58	0.42	-1.58
2,567.0	15.40	314.40	2,530.6	245.2	-225.6	333.1	0.53	0.53	0.32
2,661.0	15.90	315.80	2,621.1	263.2	-243.5	358.5	0.67	0.53	1.49
2,756.0	16.00	316.60	2,712.4	282.0	-261.5	384.6	0.25	0.11	0.84
2,851.0	16.40	313.80	2,803.7	300.8	-280.2	411.1	0.92	0.42	-2.95
2,946.0	16.40	317.60	2,894.8	320.0	-298.9	437.9	1.13	0.00	4.00
3,040.0	14.90	317.00	2,985.3	338.6	-316.1	463.2	1.60	-1.60	-0.64
3,134.0	13.60	316.30	3,076.4	355.5	-332.0	486.4	1.40	-1.38	-0.74
3,229.0	13.90	318.10	3,168.7	372.0	-347.3	509.0	0.55	0.32	1.89
3,324.0	13.50	319.90	3,261.0	389.0	-362.1	531.4	0.62	-0.42	1.89
3,419.0	13.80	321.00	3,353.3	406.3	-376.4	553.8	0.42	0.32	1.16
3,513.0	14.70	319.60	3,444.4	424.1	-391.2	576.9	1.03	0.96	-1.49
3,608.0	15.20	318.60	3,536.2	442.6	-407.2	601.4	0.59	0.53	-1.05
3,703.0	16.00	318.10	3,627.7	461.7	-424.2	626.9	0.85	0.84	-0.53
3,797.0	16.30	317.60	3,718.0	481.1	-441.7	653.0	0.35	0.32	-0.53
3,892.0	14.50	316.70	3,809.6	499.6	-458.9	678.3	1.91	-1.89	-0.95
3,986.0	12.80	315.90	3,900.9	515.6	-474.2	700.5	1.82	-1.81	-0.85
4,081.0	11.40	314.70	3,993.8	529.8	-488.2	720.4	1.50	-1.47	-1.26
4,174.0	10.00	314.10	4,085.2	541.9	-500.5	737.6	1.51	-1.51	-0.65
4,269.0	8.90	313.40	4,178.9	552.7	-511.8	753.2	1.16	-1.16	-0.74
4,363.0	8.60	317.60	4,271.8	562.9	-521.8	767.5	0.75	-0.32	4.47
4,457.0	8.20	323.90	4,364.8	573.5	-530.5	781.2	1.07	-0.43	6.70
4,551.0	7.30	334.00	4,458.0	584.2	-537.1	793.5	1.73	-0.96	10.74
4,645.0	7.40	331.90	4,551.2	594.9	-542.6	805.0	0.30	0.11	-2.23
4,740.0	6.10	321.50	4,645.5	604.3	-548.6	816.0	1.87	-1.37	-10.95
4,835.0	6.40	314.80	4,740.0	612.0	-555.5	826.3	0.83	0.32	-7.05
4,931.0	7.30	313.00	4,835.3	619.9	-563.7	837.7	0.96	0.94	-1.88
5,026.0	5.50	310.90	4,929.7	627.0	-571.6	848.3	1.91	-1.89	-2.21
5,121.0	4.10	309.10	5,024.3	632.1	-577.7	856.2	1.48	-1.47	-1.89
5,216.0	3.00	306.50	5,119.2	635.7	-582.3	862.0	1.17	-1.16	-2.74
5,296.9	0.92	324.03	5,200.0	637.5	-584.4	864.7	2.65	-2.57	21.66
DRILL TARGET BHL 75'FNL, 1319'FEL									
5,298.0	0.89	324.76	5,201.1	637.5	-584.4	864.7	2.65	-2.39	71.66
PERMIT TARGET BHL 25'FNL, 1319'FEL									
5,311.0	0.60	339.20	5,214.1	637.7	-584.5	864.9	2.65	-2.24	110.68
5,406.0	0.10	128.70	5,309.1	638.1	-584.6	865.3	0.72	-0.53	157.37
5,501.0	0.50	144.70	5,404.1	637.7	-584.3	864.8	0.43	0.42	16.84
5,597.0	0.70	145.30	5,500.1	636.9	-583.7	863.8	0.21	0.21	0.63
5,691.0	0.80	166.00	5,594.1	635.8	-583.2	862.7	0.31	0.11	22.02
5,786.0	1.10	182.60	5,689.1	634.2	-583.1	861.4	0.43	0.32	17.47
5,880.0	1.30	190.60	5,783.1	632.3	-583.3	860.2	0.28	0.21	8.51
5,974.0	1.20	190.70	5,877.0	630.3	-583.7	859.0	0.11	-0.11	0.11
6,068.0	0.70	187.70	5,971.0	628.7	-584.0	858.1	0.53	-0.53	-3.19
6,162.0	0.80	167.10	6,065.0	627.5	-583.9	857.1	0.30	0.11	-21.91
6,259.0	0.80	157.70	6,162.0	626.2	-583.5	855.9	0.14	0.00	-9.69
6,355.0	0.90	155.10	6,258.0	624.9	-582.9	854.6	0.11	0.10	-2.71

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6,449.0	1.00	151.10	6,352.0	623.5	-582.2	853.1	0.13	0.11	-4.26
6,544.0	1.10	166.20	6,447.0	621.9	-581.6	851.5	0.31	0.11	15.89
6,638.0	1.40	178.40	6,540.9	619.9	-581.4	849.8	0.42	0.32	12.98
6,731.0	1.70	181.50	6,633.9	617.4	-581.4	848.0	0.33	0.32	3.33
6,912.0	1.10	157.50	6,814.9	613.1	-580.8	844.5	0.46	-0.33	-13.26
6,964.0	0.80	151.10	6,866.8	612.3	-580.4	843.7	0.61	-0.58	-12.31
HARDLINE 75'N OF BHL									

Checked By: _____	Approved By: _____	Date: _____
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