

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Chestnut 28M-203**

Surface Location: Chestnut 28M-HZ Pad Sec.28-T5N-R64W

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

Ground Elevation: 4619.0

+N/-S

+E/-W

Northing

Easting

Latitude

Longitude

Slot

0.0

0.0

1381423.02

3264534.90

40.376520

-104.550490

RKB - 15' WELL @ 4634.0ft (RKB - 15')

WELLBORE TARGET DETAILS				
Name	TVD	+N/-S	+E/-W	Shape
SHL 380'FNL, 1460'FEL, SEC.28	1.0	0.0	0.0	Point
BHL 2136'FNL, 2585'FEL, SEC.33	6624.0	-7049.4	-1098.1	Point

T

M

Azimuths to True North
Magnetic North: 8.41°

Magnetic Field
Strength: 52879.0snT

Dip Angle: 66.98°

Date: 12/17/2013

Model: IGRF2010

ANNOTATIONS

TVD

MD

Annotation

200.0

200.0

KOP #1

5892.3

6020.5

KOP #2

6656.3

7224.3

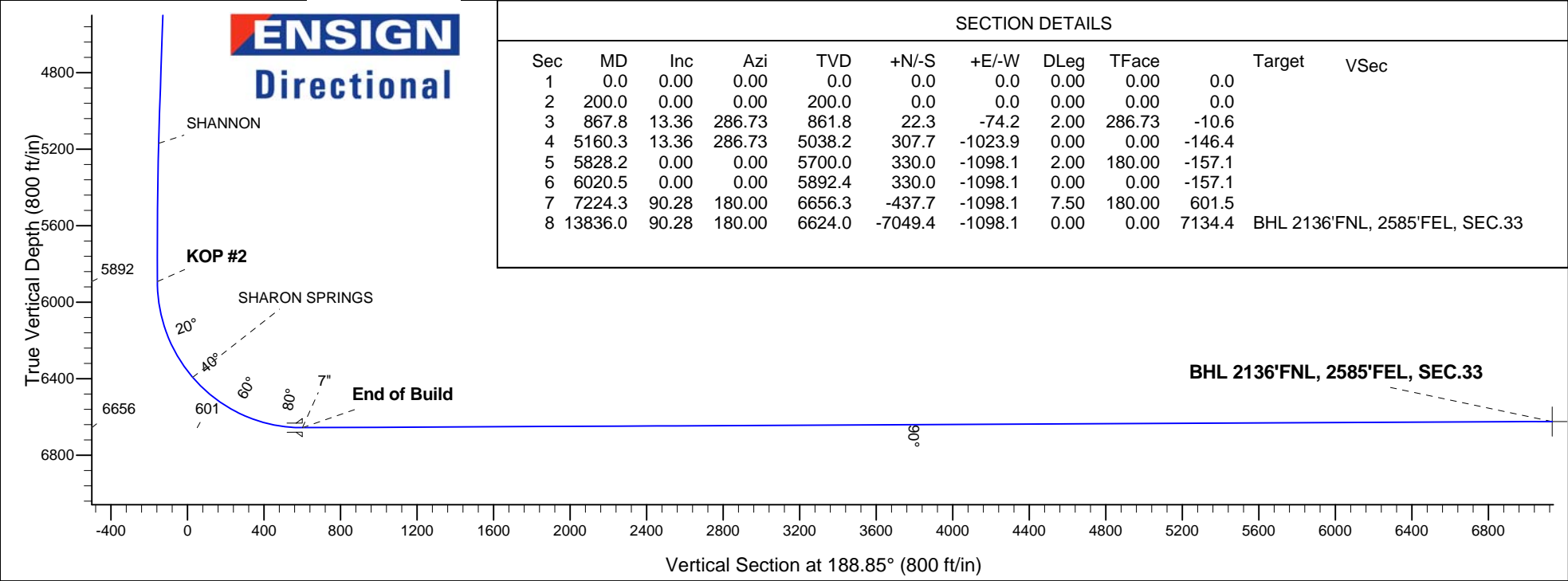
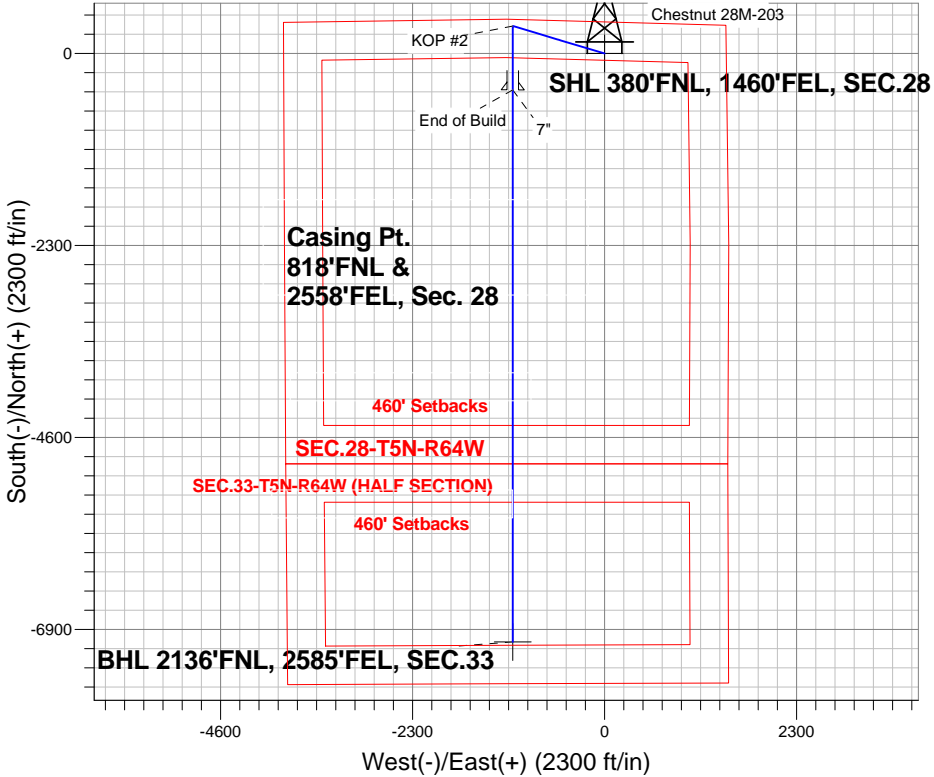
End of Build

Chestnut 28M-HZ Pad Sec.28-T5N-R64W

Chestnut 28M-203

Plan #1 (12-17-13)

9:39, December 19 2013





PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.28-T5N-R64W

Chestnut 28M-HZ Pad Sec.28-T5N-R64W

Chestnut 28M-203

Wellbore #1

Plan: Plan #1 (12-17-13)

Standard Planning Report

19 December, 2013

Database:	Landmark	Local Co-ordinate Reference:	Well Chestnut 28M-203
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4634.0ft (RKB - 15')
Project:	SEC.28-T5N-R64W	MD Reference:	WELL @ 4634.0ft (RKB - 15')
Site:	Chestnut 28M-HZ Pad Sec.28-T5N-R64W	North Reference:	True
Well:	Chestnut 28M-203	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (12-17-13)		

Project	SEC.28-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						Chestnut 28M-HZ Pad Sec.28-T5N-R64W											
Site Position:						Northing:			1,381,423.03ft			Latitude:			40.376520		
From:			Lat/Long			Easting:			3,264,534.90ft			Longitude:			-104.550490		
Position Uncertainty:			0.0 ft			Slot Radius:			"			Grid Convergence:			0.61 °		

Well	Chestnut 28M-203					
Well Position	+N/-S	0.0 ft	Northing:	1,381,423.02 ft	Latitude:	40.376520
	+E/-W	0.0 ft	Easting:	3,264,534.90 ft	Longitude:	-104.550490
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,619.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/17/2013	8.41	66.98	52,879

Design	Plan #1 (12-17-13)			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	188.85

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.00	0.00	
867.8	13.36	286.73	861.8	22.3	-74.2	2.00	2.00	0.00	286.73	
5,160.3	13.36	286.73	5,038.2	307.7	-1,023.9	0.00	0.00	0.00	0.00	
5,828.2	0.00	0.00	5,700.0	330.0	-1,098.1	2.00	-2.00	0.00	180.00	
6,020.5	0.00	0.00	5,892.4	330.0	-1,098.1	0.00	0.00	0.00	0.00	
7,224.3	90.28	180.00	6,656.3	-437.7	-1,098.1	7.50	7.50	0.00	180.00	
13,836.0	90.28	180.00	6,624.0	-7,049.4	-1,098.1	0.00	0.00	0.00	0.00	BHL 2136'FNL, 258

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Project:	SEC.28-T5N-R64W	MD Reference:	WELL @ 4634.0ft (RKB - 15')
Site:	Chestnut 28M-HZ Pad Sec.28-T5N-R64W	North Reference:	True
Well:	Chestnut 28M-203	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (12-17-13)		

Planned 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
1.0	0.00	0.00	1.0	0.0	0.0	0.0	0.00	0.00	0.00
SHL 380'FNL, 1460'FEL, SEC.28									
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP #1									
300.0	2.00	286.73	300.0	0.5	-1.7	-0.2	2.00	2.00	0.00
400.0	4.00	286.73	399.8	2.0	-6.7	-1.0	2.00	2.00	0.00
500.0	6.00	286.73	499.5	4.5	-15.0	-2.1	2.00	2.00	0.00
600.0	8.00	286.73	598.7	8.0	-26.7	-3.8	2.00	2.00	0.00
700.0	10.00	286.73	697.5	12.5	-41.7	-6.0	2.00	2.00	0.00
800.0	12.00	286.73	795.6	18.0	-60.0	-8.6	2.00	2.00	0.00
867.8	13.36	286.73	861.8	22.3	-74.2	-10.6	2.00	2.00	0.00
900.0	13.36	286.73	893.1	24.4	-81.3	-11.6	0.00	0.00	0.00
1,000.0	13.36	286.73	990.4	31.1	-103.5	-14.8	0.00	0.00	0.00
1,100.0	13.36	286.73	1,087.7	37.7	-125.6	-18.0	0.00	0.00	0.00
1,200.0	13.36	286.73	1,185.0	44.4	-147.7	-21.1	0.00	0.00	0.00
1,300.0	13.36	286.73	1,282.3	51.0	-169.8	-24.3	0.00	0.00	0.00
1,400.0	13.36	286.73	1,379.6	57.7	-191.9	-27.5	0.00	0.00	0.00
1,500.0	13.36	286.73	1,476.9	64.3	-214.1	-30.6	0.00	0.00	0.00
1,600.0	13.36	286.73	1,574.2	71.0	-236.2	-33.8	0.00	0.00	0.00
1,700.0	13.36	286.73	1,671.5	77.6	-258.3	-36.9	0.00	0.00	0.00
1,800.0	13.36	286.73	1,768.8	84.3	-280.4	-40.1	0.00	0.00	0.00
1,900.0	13.36	286.73	1,866.0	90.9	-302.6	-43.3	0.00	0.00	0.00
2,000.0	13.36	286.73	1,963.3	97.6	-324.7	-46.4	0.00	0.00	0.00
2,100.0	13.36	286.73	2,060.6	104.2	-346.8	-49.6	0.00	0.00	0.00
2,200.0	13.36	286.73	2,157.9	110.9	-368.9	-52.8	0.00	0.00	0.00
2,300.0	13.36	286.73	2,255.2	117.5	-391.1	-55.9	0.00	0.00	0.00
2,400.0	13.36	286.73	2,352.5	124.2	-413.2	-59.1	0.00	0.00	0.00
2,500.0	13.36	286.73	2,449.8	130.8	-435.3	-62.3	0.00	0.00	0.00
2,600.0	13.36	286.73	2,547.1	137.5	-457.4	-65.4	0.00	0.00	0.00
2,700.0	13.36	286.73	2,644.4	144.1	-479.5	-68.6	0.00	0.00	0.00
2,800.0	13.36	286.73	2,741.7	150.8	-501.7	-71.8	0.00	0.00	0.00
2,900.0	13.36	286.73	2,839.0	157.4	-523.8	-74.9	0.00	0.00	0.00
3,000.0	13.36	286.73	2,936.3	164.1	-545.9	-78.1	0.00	0.00	0.00
3,100.0	13.36	286.73	3,033.6	170.7	-568.0	-81.2	0.00	0.00	0.00
3,200.0	13.36	286.73	3,130.9	177.4	-590.2	-84.4	0.00	0.00	0.00
3,300.0	13.36	286.73	3,228.2	184.0	-612.3	-87.6	0.00	0.00	0.00
3,400.0	13.36	286.73	3,325.5	190.7	-634.4	-90.7	0.00	0.00	0.00
3,500.0	13.36	286.73	3,422.8	197.3	-656.5	-93.9	0.00	0.00	0.00
3,600.0	13.36	286.73	3,520.1	204.0	-678.7	-97.1	0.00	0.00	0.00
3,630.8	13.36	286.73	3,550.0	206.0	-685.5	-98.0	0.00	0.00	0.00
PARKMAN									
3,700.0	13.36	286.73	3,617.4	210.6	-700.8	-100.2	0.00	0.00	0.00
3,800.0	13.36	286.73	3,714.7	217.3	-722.9	-103.4	0.00	0.00	0.00
3,900.0	13.36	286.73	3,812.0	223.9	-745.0	-106.6	0.00	0.00	0.00
4,000.0	13.36	286.73	3,909.2	230.6	-767.2	-109.7	0.00	0.00	0.00
4,100.0	13.36	286.73	4,006.5	237.2	-789.3	-112.9	0.00	0.00	0.00
4,200.0	13.36	286.73	4,103.8	243.8	-811.4	-116.1	0.00	0.00	0.00
4,262.9	13.36	286.73	4,165.0	248.0	-825.3	-118.0	0.00	0.00	0.00
SUSSEX									
4,300.0	13.36	286.73	4,201.1	250.5	-833.5	-119.2	0.00	0.00	0.00
4,400.0	13.36	286.73	4,298.4	257.1	-855.6	-122.4	0.00	0.00	0.00

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Site:	Chestnut 28M-HZ Pad Sec.28-T5N-R64W	North Reference:	True
Well:	Chestnut 28M-203	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (12-17-13)		

Planned 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)
4,500.0	13.36	286.73	4,395.7	263.8	-877.8	-125.6	0.00	0.00	0.00
4,600.0	13.36	286.73	4,493.0	270.4	-899.9	-128.7	0.00	0.00	0.00
4,700.0	13.36	286.73	4,590.3	277.1	-922.0	-131.9	0.00	0.00	0.00
4,800.0	13.36	286.73	4,687.6	283.7	-944.1	-135.0	0.00	0.00	0.00
4,900.0	13.36	286.73	4,784.9	290.4	-966.3	-138.2	0.00	0.00	0.00
5,000.0	13.36	286.73	4,882.2	297.0	-988.4	-141.4	0.00	0.00	0.00
5,100.0	13.36	286.73	4,979.5	303.7	-1,010.5	-144.5	0.00	0.00	0.00
5,160.3	13.36	286.73	5,038.2	307.7	-1,023.9	-146.4	0.00	0.00	0.00
5,200.0	12.56	286.73	5,076.9	310.3	-1,032.4	-147.7	2.00	-2.00	0.00
5,295.1	10.66	286.73	5,170.0	315.8	-1,050.7	-150.3	2.00	-2.00	0.00
SHANNON									
5,300.0	10.56	286.73	5,174.8	316.0	-1,051.6	-150.4	2.00	-2.00	0.00
5,400.0	8.56	286.73	5,273.4	320.8	-1,067.5	-152.7	2.00	-2.00	0.00
5,500.0	6.56	286.73	5,372.5	324.6	-1,080.1	-154.5	2.00	-2.00	0.00
5,600.0	4.56	286.73	5,472.1	327.4	-1,089.4	-155.8	2.00	-2.00	0.00
5,700.0	2.56	286.73	5,571.9	329.2	-1,095.3	-156.7	2.00	-2.00	0.00
5,800.0	0.56	286.73	5,671.8	330.0	-1,097.9	-157.0	2.00	-2.00	0.00
5,828.2	0.00	0.00	5,700.0	330.0	-1,098.1	-157.1	2.00	-2.00	0.00
5,900.0	0.00	0.00	5,771.8	330.0	-1,098.1	-157.1	0.00	0.00	0.00
6,000.0	0.00	0.00	5,871.8	330.0	-1,098.1	-157.1	0.00	0.00	0.00
6,020.5	0.00	0.00	5,892.3	330.0	-1,098.1	-157.1	0.00	0.00	0.00
KOP #2									
6,100.0	5.96	180.00	5,971.7	325.9	-1,098.1	-153.0	7.50	7.50	0.00
6,200.0	13.46	180.00	6,070.2	309.0	-1,098.1	-136.3	7.50	7.50	0.00
6,300.0	20.96	180.00	6,165.6	279.5	-1,098.1	-107.1	7.50	7.50	0.00
6,400.0	28.46	180.00	6,256.4	237.7	-1,098.1	-65.8	7.50	7.50	0.00
6,500.0	35.96	180.00	6,341.0	184.4	-1,098.1	-13.2	7.50	7.50	0.00
6,566.5	40.94	180.00	6,393.0	143.1	-1,098.1	27.6	7.50	7.50	0.00
SHARON SPRINGS									
6,600.0	43.46	180.00	6,417.8	120.6	-1,098.1	49.9	7.50	7.50	0.00
6,700.0	50.96	180.00	6,485.7	47.2	-1,098.1	122.3	7.50	7.50	0.00
6,800.0	58.46	180.00	6,543.5	-34.3	-1,098.1	202.9	7.50	7.50	0.00
6,900.0	65.96	180.00	6,590.1	-122.7	-1,098.1	290.3	7.50	7.50	0.00
7,000.0	73.46	180.00	6,624.7	-216.4	-1,098.1	382.9	7.50	7.50	0.00
7,100.0	80.96	180.00	6,646.8	-313.9	-1,098.1	479.2	7.50	7.50	0.00
7,200.0	88.46	180.00	6,656.0	-413.4	-1,098.1	577.5	7.50	7.50	0.00
7,224.3	90.28	180.00	6,656.3	-437.7	-1,098.1	601.5	7.49	7.49	0.00
End of Build - 7"									
7,300.0	90.28	180.00	6,655.9	-513.4	-1,098.1	676.3	0.00	0.00	0.00
7,400.0	90.28	180.00	6,655.5	-613.4	-1,098.1	775.1	0.00	0.00	0.00
7,500.0	90.28	180.00	6,655.0	-713.4	-1,098.1	873.9	0.00	0.00	0.00
7,600.0	90.28	180.00	6,654.5	-813.4	-1,098.1	972.7	0.00	0.00	0.00
7,700.0	90.28	180.00	6,654.0	-913.4	-1,098.1	1,071.5	0.00	0.00	0.00
7,800.0	90.28	180.00	6,653.5	-1,013.4	-1,098.1	1,170.3	0.00	0.00	0.00
7,900.0	90.28	180.00	6,653.0	-1,113.4	-1,098.1	1,269.1	0.00	0.00	0.00
8,000.0	90.28	180.00	6,652.5	-1,213.4	-1,098.1	1,367.9	0.00	0.00	0.00
8,100.0	90.28	180.00	6,652.0	-1,313.4	-1,098.1	1,466.7	0.00	0.00	0.00
8,200.0	90.28	180.00	6,651.5	-1,413.4	-1,098.1	1,565.6	0.00	0.00	0.00
8,300.0	90.28	180.00	6,651.1	-1,513.4	-1,098.1	1,664.4	0.00	0.00	0.00
8,400.0	90.28	180.00	6,650.6	-1,613.4	-1,098.1	1,763.2	0.00	0.00	0.00
8,500.0	90.28	180.00	6,650.1	-1,713.4	-1,098.1	1,862.0	0.00	0.00	0.00
8,600.0	90.28	180.00	6,649.6	-1,813.4	-1,098.1	1,960.8	0.00	0.00	0.00

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Site:	Chestnut 28M-HZ Pad Sec.28-T5N-R64W	North Reference:	True
Well:	Chestnut 28M-203	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (12-17-13)		

Planned 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)
8,700.0	90.28	180.00	6,649.1	-1,913.4	-1,098.1	2,059.6	0.00	0.00	0.00
8,800.0	90.28	180.00	6,648.6	-2,013.4	-1,098.1	2,158.4	0.00	0.00	0.00
8,900.0	90.28	180.00	6,648.1	-2,113.4	-1,098.1	2,257.2	0.00	0.00	0.00
9,000.0	90.28	180.00	6,647.6	-2,213.4	-1,098.1	2,356.0	0.00	0.00	0.00
9,100.0	90.28	180.00	6,647.1	-2,313.4	-1,098.1	2,454.8	0.00	0.00	0.00
9,200.0	90.28	180.00	6,646.7	-2,413.4	-1,098.1	2,553.6	0.00	0.00	0.00
9,300.0	90.28	180.00	6,646.2	-2,513.4	-1,098.1	2,652.4	0.00	0.00	0.00
9,400.0	90.28	180.00	6,645.7	-2,613.4	-1,098.1	2,751.2	0.00	0.00	0.00
9,500.0	90.28	180.00	6,645.2	-2,713.4	-1,098.1	2,850.0	0.00	0.00	0.00
9,600.0	90.28	180.00	6,644.7	-2,813.4	-1,098.1	2,948.9	0.00	0.00	0.00
9,700.0	90.28	180.00	6,644.2	-2,913.4	-1,098.1	3,047.7	0.00	0.00	0.00
9,800.0	90.28	180.00	6,643.7	-3,013.4	-1,098.1	3,146.5	0.00	0.00	0.00
9,900.0	90.28	180.00	6,643.2	-3,113.4	-1,098.1	3,245.3	0.00	0.00	0.00
10,000.0	90.28	180.00	6,642.7	-3,213.4	-1,098.1	3,344.1	0.00	0.00	0.00
10,100.0	90.28	180.00	6,642.3	-3,313.4	-1,098.1	3,442.9	0.00	0.00	0.00
10,200.0	90.28	180.00	6,641.8	-3,413.4	-1,098.1	3,541.7	0.00	0.00	0.00
10,300.0	90.28	180.00	6,641.3	-3,513.4	-1,098.1	3,640.5	0.00	0.00	0.00
10,400.0	90.28	180.00	6,640.8	-3,613.4	-1,098.1	3,739.3	0.00	0.00	0.00
10,500.0	90.28	180.00	6,640.3	-3,713.4	-1,098.1	3,838.1	0.00	0.00	0.00
10,600.0	90.28	180.00	6,639.8	-3,813.4	-1,098.1	3,936.9	0.00	0.00	0.00
10,700.0	90.28	180.00	6,639.3	-3,913.4	-1,098.1	4,035.7	0.00	0.00	0.00
10,800.0	90.28	180.00	6,638.8	-4,013.4	-1,098.1	4,134.5	0.00	0.00	0.00
10,900.0	90.28	180.00	6,638.3	-4,113.4	-1,098.1	4,233.3	0.00	0.00	0.00
11,000.0	90.28	180.00	6,637.9	-4,213.4	-1,098.1	4,332.2	0.00	0.00	0.00
11,100.0	90.28	180.00	6,637.4	-4,313.4	-1,098.1	4,431.0	0.00	0.00	0.00
11,200.0	90.28	180.00	6,636.9	-4,413.4	-1,098.1	4,529.8	0.00	0.00	0.00
11,300.0	90.28	180.00	6,636.4	-4,513.3	-1,098.1	4,628.6	0.00	0.00	0.00
11,400.0	90.28	180.00	6,635.9	-4,613.3	-1,098.1	4,727.4	0.00	0.00	0.00
11,500.0	90.28	180.00	6,635.4	-4,713.3	-1,098.1	4,826.2	0.00	0.00	0.00
11,600.0	90.28	180.00	6,634.9	-4,813.3	-1,098.1	4,925.0	0.00	0.00	0.00
11,700.0	90.28	180.00	6,634.4	-4,913.3	-1,098.1	5,023.8	0.00	0.00	0.00
11,800.0	90.28	180.00	6,633.9	-5,013.3	-1,098.1	5,122.6	0.00	0.00	0.00
11,900.0	90.28	180.00	6,633.5	-5,113.3	-1,098.1	5,221.4	0.00	0.00	0.00
12,000.0	90.28	180.00	6,633.0	-5,213.3	-1,098.1	5,320.2	0.00	0.00	0.00
12,100.0	90.28	180.00	6,632.5	-5,313.3	-1,098.1	5,419.0	0.00	0.00	0.00
12,200.0	90.28	180.00	6,632.0	-5,413.3	-1,098.1	5,517.8	0.00	0.00	0.00
12,300.0	90.28	180.00	6,631.5	-5,513.3	-1,098.1	5,616.7	0.00	0.00	0.00
12,400.0	90.28	180.00	6,631.0	-5,613.3	-1,098.1	5,715.5	0.00	0.00	0.00
12,500.0	90.28	180.00	6,630.5	-5,713.3	-1,098.1	5,814.3	0.00	0.00	0.00
12,600.0	90.28	180.00	6,630.0	-5,813.3	-1,098.1	5,913.1	0.00	0.00	0.00
12,700.0	90.28	180.00	6,629.6	-5,913.3	-1,098.1	6,011.9	0.00	0.00	0.00
12,800.0	90.28	180.00	6,629.1	-6,013.3	-1,098.1	6,110.7	0.00	0.00	0.00
12,900.0	90.28	180.00	6,628.6	-6,113.3	-1,098.1	6,209.5	0.00	0.00	0.00
13,000.0	90.28	180.00	6,628.1	-6,213.3	-1,098.1	6,308.3	0.00	0.00	0.00
13,100.0	90.28	180.00	6,627.6	-6,313.3	-1,098.1	6,407.1	0.00	0.00	0.00
13,200.0	90.28	180.00	6,627.1	-6,413.3	-1,098.1	6,505.9	0.00	0.00	0.00
13,300.0	90.28	180.00	6,626.6	-6,513.3	-1,098.1	6,604.7	0.00	0.00	0.00
13,400.0	90.28	180.00	6,626.1	-6,613.3	-1,098.1	6,703.5	0.00	0.00	0.00
13,500.0	90.28	180.00	6,625.6	-6,713.3	-1,098.1	6,802.3	0.00	0.00	0.00
13,600.0	90.28	180.00	6,625.2	-6,813.3	-1,098.1	6,901.1	0.00	0.00	0.00
13,700.0	90.28	180.00	6,624.7	-6,913.3	-1,098.1	7,000.0	0.00	0.00	0.00
13,800.0	90.28	180.00	6,624.2	-7,013.3	-1,098.1	7,098.8	0.00	0.00	0.00
13,836.0	90.28	180.00	6,624.0	-7,049.4	-1,098.1	7,134.4	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Chestnut 28M-203
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4634.0ft (RKB - 15')
Project:	SEC.28-T5N-R64W	MD Reference:	WELL @ 4634.0ft (RKB - 15')
Site:	Chestnut 28M-HZ Pad Sec.28-T5N-R64W	North Reference:	True
Well:	Chestnut 28M-203	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (12-17-13)		

Planned 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)
BHL 2136'FNL, 2585'FEL, SEC.33									

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
7,224.3	6,656.3	7"	7	7-1/2	

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
3,630.8	3,550.0	PARKMAN				
4,262.9	4,165.0	SUSSEX				
5,295.1	5,170.0	SHANNON				
6,566.5	6,393.0	SHARON SPRINGS				

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
200.0	200.0	0.0	0.0	KOP #1
6,020.5	5,892.3	330.0	-1,098.1	KOP #2
7,224.3	6,656.3	-437.7	-1,098.1	End of Build



Directional

PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.28-T5N-R64W

Chestnut 28M-HZ Pad Sec.28-T5N-R64W

Chestnut 28M-203

Wellbore #1

Plan #1 (12-17-13)

Anticollision Report

22 January, 2014



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Chestnut 28M-203
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4634.0ft (RKB - 15')
Reference Site:	Chestnut 28M-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4634.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Chestnut 28M-203	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (12-17-13)	Offset TVD Reference:	Offset Datum

Reference	Plan #1 (12-17-13)		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 1,000.0ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma		

Survey Tool Program	Date	12/18/2013		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	13,836.0	Plan #1 (12-17-13) (Wellbore #1)	MWD	MWD - Standard

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Chestnut 28M-HZ Pad Sec.28-T5N-R64W						
Chestnut 28M-323 - Wellbore #1 - Plan #1 (12-17-13)	200.0	200.0	58.6	57.9	86.940	CC, ES
Chestnut 28M-323 - Wellbore #1 - Plan #1 (12-17-13)	13,836.0	13,844.5	535.1	261.8	1.958	SF
Chestnut 28M-423 - Wellbore #1 - Plan #1 (12-17-13)	200.0	200.0	30.6	30.0	45.452	CC, ES
Chestnut 28M-423 - Wellbore #1 - Plan #1 (12-17-13)	13,836.0	13,944.3	330.0	96.4	1.413	Level 3, SF
Chestnut 28R-203 - Wellbore #1 - Plan #1 (12-17-13)	200.0	201.0	119.9	119.2	177.167	CC, ES
Chestnut 28R-203 - Wellbore #1 - Plan #1 (12-17-13)	5,160.3	5,109.0	998.4	971.4	37.029	SF
Chestnut 28R-443 - Wellbore #1 - Plan #1 (12-17-13)	200.0	201.0	89.2	88.6	131.895	CC, ES
Chestnut 28R-443 - Wellbore #1 - Plan #1 (12-17-13)	13,836.0	13,893.4	818.1	548.8	3.038	SF
Existing Wells - Churchill 28J-HZ Sec.28-T5N-R64W						
Churchill 2-7I (Exist) - Wellbore #1 - Wellbore #1	7,682.2	6,721.7	132.2	90.0	3.132	CC, ES, SF

Offset Design												
Chestnut 28M-HZ Pad Sec.28-T5N-R64W - Chestnut 28M-323 - Wellbore #1 - Plan #1 (12-17-13)												
Survey Program: 0-MWD												
Reference		Offset		Semi Major Axis		Distance						
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor
0.0	0.0	0.0	0.0	0.0	0.0	93.57	-3.6	58.5	58.6			
100.0	100.0	100.0	100.0	0.1	0.1	93.57	-3.6	58.5	58.6	58.4	0.22	260.820
200.0	200.0	200.0	200.0	0.3	0.3	93.57	-3.6	58.5	58.6	57.9	0.67	86.940 CC, ES
300.0	300.0	300.0	300.0	0.6	0.6	167.21	-3.6	58.5	60.3	59.2	1.12	53.720
400.0	399.8	399.8	399.8	0.8	0.8	168.20	-3.6	58.5	65.4	63.9	1.57	41.559
500.0	499.5	499.5	499.5	1.0	1.0	169.55	-3.6	58.5	74.0	72.0	2.03	36.435
600.0	598.7	598.7	598.7	1.3	1.2	170.99	-3.6	58.5	86.0	83.5	2.49	34.545
700.0	697.5	697.5	697.5	1.7	1.5	172.33	-3.6	58.5	101.5	98.5	2.95	34.395
800.0	795.6	795.6	795.6	2.0	1.7	173.50	-3.6	58.5	120.4	117.0	3.41	35.279
867.8	861.8	861.8	861.8	2.3	1.8	174.18	-3.6	58.5	135.2	131.5	3.73	36.268
900.0	893.1	893.1	893.1	2.5	1.9	174.48	-3.6	58.5	142.6	138.8	3.88	36.780
1,000.0	990.4	990.4	990.4	3.0	2.1	175.25	-3.6	58.5	165.6	161.3	4.35	38.114
1,100.0	1,087.7	1,093.6	1,093.6	3.4	2.3	175.74	-2.9	57.2	187.3	182.5	4.82	38.871
1,200.0	1,185.0	1,198.9	1,198.7	3.9	2.6	175.85	-0.4	52.4	205.5	200.2	5.29	38.861
1,300.0	1,282.3	1,305.5	1,304.9	4.4	2.8	175.68	3.9	44.1	220.2	214.4	5.77	38.145
1,400.0	1,379.6	1,413.0	1,411.6	4.9	3.1	175.26	10.2	32.2	231.4	225.1	6.27	36.882

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Chestnut 28M-203
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4634.0ft (RKB - 15')
Reference Site:	Chestnut 28M-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4634.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Chestnut 28M-203	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (12-17-13)	Offset TVD Reference:	Offset Datum

Offset Design Chestnut 28M-HZ Pad Sec.28-T5N-R64W - Chestnut 28M-323 - Wellbore #1 - Plan #1 (12-17-13)												Offset Site Error:	0.0 ft
Survey Program: 0-MWD												Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
1,500.0	1,476.9	1,519.8	1,516.9	5.4	3.4	174.63	18.2	16.9	238.9	232.2	6.78	35.218	
1,600.0	1,574.2	1,619.5	1,615.2	5.9	3.7	173.98	26.3	1.5	245.3	238.0	7.29	33.632	
1,700.0	1,671.5	1,719.3	1,713.4	6.4	4.0	173.37	34.5	-13.9	251.7	243.9	7.81	32.217	
1,800.0	1,768.8	1,819.0	1,811.6	6.9	4.4	172.79	42.6	-29.3	258.2	249.8	8.34	30.953	
1,900.0	1,866.0	1,918.8	1,909.8	7.4	4.7	172.24	50.7	-44.7	264.6	255.7	8.87	29.830	
2,000.0	1,963.3	2,018.6	2,008.1	7.9	5.1	171.71	58.8	-60.1	271.1	261.7	9.41	28.810	
2,100.0	2,060.6	2,118.3	2,106.3	8.4	5.4	171.21	66.9	-75.5	277.6	267.6	9.95	27.888	
2,200.0	2,157.9	2,218.1	2,204.5	8.9	5.8	170.73	75.0	-91.0	284.1	273.6	10.50	27.051	
2,300.0	2,255.2	2,317.8	2,302.7	9.4	6.2	170.28	83.1	-106.4	290.7	279.6	11.06	26.287	
2,400.0	2,352.5	2,417.6	2,401.0	9.9	6.5	169.84	91.2	-121.8	297.2	285.6	11.62	25.587	
2,500.0	2,449.8	2,517.4	2,499.2	10.4	6.9	169.42	99.3	-137.2	303.8	291.6	12.18	24.945	
2,600.0	2,547.1	2,617.1	2,597.4	10.9	7.3	169.02	107.5	-152.6	310.4	297.6	12.75	24.353	
2,700.0	2,644.4	2,716.9	2,695.7	11.4	7.7	168.64	115.6	-168.0	317.0	303.7	13.32	23.806	
2,800.0	2,741.7	2,816.6	2,793.9	11.9	8.0	168.27	123.7	-183.4	323.6	309.7	13.89	23.299	
2,900.0	2,839.0	2,916.4	2,892.1	12.4	8.4	167.92	131.8	-198.9	330.2	315.8	14.47	22.827	
3,000.0	2,936.3	3,016.2	2,990.3	12.9	8.8	167.58	139.9	-214.3	336.9	321.8	15.05	22.389	
3,100.0	3,033.6	3,115.9	3,088.6	13.4	9.2	167.25	148.0	-229.7	343.5	327.9	15.63	21.979	
3,200.0	3,130.9	3,215.7	3,186.8	13.9	9.6	166.94	156.1	-245.1	350.2	334.0	16.22	21.596	
3,300.0	3,228.2	3,315.4	3,285.0	14.4	10.0	166.63	164.2	-260.5	356.9	340.1	16.80	21.237	
3,400.0	3,325.5	3,415.2	3,383.2	14.9	10.4	166.34	172.4	-275.9	363.6	346.2	17.40	20.899	
3,500.0	3,422.8	3,515.0	3,481.5	15.4	10.8	166.06	180.5	-291.3	370.3	352.3	17.99	20.582	
3,600.0	3,520.1	3,614.7	3,579.7	15.9	11.2	165.79	188.6	-306.8	377.0	358.4	18.58	20.283	
3,700.0	3,617.4	3,714.5	3,677.9	16.4	11.6	165.53	196.7	-322.2	383.7	364.5	19.18	20.001	
3,800.0	3,714.7	3,814.2	3,776.2	16.9	11.9	165.28	204.8	-337.6	390.4	370.6	19.78	19.734	
3,900.0	3,812.0	3,914.0	3,874.4	17.4	12.3	165.04	212.9	-353.0	397.1	376.7	20.38	19.481	
4,000.0	3,909.2	4,013.8	3,972.6	17.9	12.7	164.80	221.0	-368.4	403.8	382.9	20.99	19.242	
4,100.0	4,006.5	4,113.5	4,070.8	18.4	13.1	164.57	229.1	-383.8	410.6	389.0	21.59	19.014	
4,200.0	4,103.8	4,213.3	4,169.1	18.9	13.5	164.35	237.3	-399.3	417.3	395.1	22.20	18.798	
4,300.0	4,201.1	4,313.0	4,267.3	19.4	13.9	164.14	245.4	-414.7	424.1	401.3	22.81	18.593	
4,400.0	4,298.4	4,412.8	4,365.5	19.9	14.3	163.93	253.5	-430.1	430.8	407.4	23.42	18.397	
4,500.0	4,395.7	4,512.6	4,463.7	20.4	14.7	163.73	261.6	-445.5	437.6	413.6	24.03	18.210	
4,600.0	4,493.0	4,612.3	4,562.0	20.9	15.1	163.54	269.7	-460.9	444.4	419.7	24.64	18.032	
4,700.0	4,590.3	4,712.1	4,660.2	21.4	15.5	163.35	277.8	-476.3	451.1	425.9	25.26	17.861	
4,800.0	4,687.6	4,811.8	4,758.4	21.9	15.9	163.17	285.9	-491.7	457.9	432.0	25.87	17.698	
4,900.0	4,784.9	4,911.6	4,856.7	22.4	16.3	162.99	294.0	-507.2	464.7	438.2	26.49	17.542	
5,000.0	4,882.2	5,011.4	4,954.9	23.0	16.7	162.82	302.1	-522.6	471.5	444.4	27.11	17.392	
5,100.0	4,979.5	5,100.0	5,042.2	23.5	17.0	162.69	309.2	-536.0	478.7	451.0	27.68	17.295	
5,160.3	5,038.2	5,156.5	5,098.1	23.8	17.2	162.67	313.2	-543.5	484.1	456.1	27.99	17.297	
5,200.0	5,076.9	5,190.8	5,132.1	23.9	17.3	162.71	315.3	-547.6	488.0	459.8	28.18	17.314	
5,300.0	5,174.8	5,277.3	5,218.0	24.3	17.5	162.82	319.9	-556.2	497.2	468.6	28.61	17.381	
5,400.0	5,273.4	5,363.6	5,304.0	24.6	17.6	162.97	323.2	-562.6	505.8	476.8	28.97	17.460	
5,500.0	5,372.5	5,449.7	5,390.0	24.8	17.8	163.15	325.4	-566.7	513.7	484.4	29.27	17.550	
5,600.0	5,472.1	5,535.7	5,475.9	25.0	17.9	163.35	326.3	-568.5	520.9	491.4	29.51	17.651	
5,700.0	5,571.9	5,631.6	5,571.9	25.2	18.1	163.56	326.4	-568.6	526.8	497.0	29.73	17.719	
5,800.0	5,671.8	5,731.6	5,671.8	25.3	18.2	163.66	326.4	-568.6	529.4	499.4	29.94	17.679	
5,828.2	5,700.0	5,759.8	5,700.0	25.3	18.2	90.39	326.4	-568.6	529.5	499.5	30.00	17.649	
5,900.0	5,771.8	5,831.6	5,771.8	25.4	18.4	90.39	326.4	-568.6	529.5	499.3	30.25	17.507	
6,000.0	5,871.8	5,931.6	5,871.8	25.5	18.5	90.39	326.4	-568.6	529.5	498.9	30.59	17.309	
6,020.5	5,892.4	5,952.1	5,892.4	25.5	18.5	90.39	326.4	-568.6	529.5	498.9	30.66	17.268	
6,050.0	5,921.8	5,981.6	5,921.8	25.6	18.6	-89.67	326.4	-568.6	529.5	498.7	30.77	17.207	
6,095.2	5,966.9	6,026.7	5,966.9	25.6	18.7	-90.00	326.4	-568.6	529.5	498.5	30.97	17.098	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Chestnut 28M-203
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4634.0ft (RKB - 15')
Reference Site:	Chestnut 28M-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4634.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Chestnut 28M-203	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (12-17-13)	Offset TVD Reference:	Offset Datum

Offset Design Chestnut 28M-HZ Pad Sec.28-T5N-R64W - Chestnut 28M-323 - Wellbore #1 - Plan #1 (12-17-13)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
6,100.0	5,971.7	6,031.4	5,971.7	25.6	18.7	-90.05		326.4	-568.6	529.5	498.5	30.99	17.084	
6,150.0	6,021.2	6,081.4	6,021.6	25.6	18.7	-90.62		324.8	-568.6	529.5	498.3	31.21	16.966	
6,200.0	6,070.2	6,131.6	6,071.6	25.6	18.8	-91.18		319.9	-568.6	529.6	498.2	31.39	16.873	
6,250.0	6,118.4	6,182.3	6,121.6	25.6	18.8	-91.75		311.7	-568.6	529.8	498.2	31.53	16.804	
6,300.0	6,165.6	6,233.3	6,171.2	25.6	18.8	-92.30		300.1	-568.6	529.9	498.3	31.62	16.758	
6,350.0	6,211.7	6,284.6	6,220.3	25.6	18.8	-92.85		285.2	-568.6	530.2	498.5	31.68	16.733	
6,400.0	6,256.4	6,336.3	6,268.6	25.6	18.8	-93.39		266.8	-568.6	530.4	498.7	31.71	16.727	
6,450.0	6,299.6	6,388.4	6,315.9	25.6	18.8	-93.92		245.0	-568.6	530.8	499.0	31.71	16.737	
6,500.0	6,341.0	6,440.8	6,361.9	25.5	18.7	-94.42		219.8	-568.6	531.1	499.4	31.69	16.757	
6,550.0	6,380.5	6,493.6	6,406.4	25.5	18.7	-94.91		191.4	-568.6	531.5	499.8	31.67	16.781	
6,600.0	6,417.8	6,546.8	6,449.1	25.5	18.6	-95.38		159.7	-568.6	531.9	500.2	31.65	16.803	
6,650.0	6,453.0	6,600.3	6,489.7	25.5	18.6	-95.83		125.0	-568.6	532.3	500.6	31.65	16.815	
6,700.0	6,485.7	6,654.1	6,528.0	25.4	18.6	-96.25		87.2	-568.6	532.7	501.0	31.70	16.807	
6,750.0	6,515.9	6,708.2	6,563.7	25.4	18.5	-96.64		46.6	-568.6	533.1	501.3	31.79	16.770	
6,800.0	6,543.5	6,762.6	6,596.7	25.4	18.5	-97.00		3.3	-568.6	533.5	501.6	31.95	16.696	
6,850.0	6,568.2	6,817.3	6,626.6	25.4	18.5	-97.33		-42.4	-568.6	533.9	501.7	32.20	16.581	
6,900.0	6,590.1	6,872.2	6,653.3	25.5	18.6	-97.63		-90.4	-568.6	534.3	501.7	32.56	16.407	
6,950.0	6,608.9	6,927.4	6,676.6	25.5	18.6	-97.89		-140.4	-568.6	534.6	501.6	33.02	16.189	
7,000.0	6,624.7	6,982.7	6,696.3	25.6	18.7	-98.12		-192.2	-568.6	534.9	501.3	33.60	15.918	
7,050.0	6,637.4	7,038.3	6,712.2	25.7	18.9	-98.30		-245.4	-568.6	535.1	500.8	34.31	15.599	
7,100.0	6,646.8	7,093.9	6,724.2	25.8	19.1	-98.45		-299.7	-568.6	535.3	500.2	35.13	15.238	
7,150.0	6,653.1	7,149.7	6,732.3	26.0	19.4	-98.56		-354.9	-568.6	535.5	499.4	36.07	14.845	
7,200.0	6,656.0	7,205.5	6,736.3	26.2	19.8	-98.62		-410.6	-568.6	535.6	498.4	37.12	14.427	
7,224.3	6,656.3	7,232.7	6,736.8	26.3	20.0	-98.64		-437.7	-568.6	535.6	497.9	37.67	14.219	
7,300.0	6,655.9	7,308.8	6,736.4	26.6	20.7	-98.64		-513.8	-568.6	535.6	496.3	39.26	13.642	
7,400.0	6,655.5	7,408.8	6,735.8	27.3	21.8	-98.63		-613.8	-568.6	535.6	494.0	41.56	12.886	
7,500.0	6,655.0	7,508.8	6,735.3	28.1	22.9	-98.62		-713.8	-568.6	535.6	491.5	44.08	12.151	
7,600.0	6,654.5	7,608.8	6,734.7	29.0	24.2	-98.62		-813.8	-568.6	535.6	488.8	46.76	11.452	
7,700.0	6,654.0	7,708.8	6,734.2	30.1	25.6	-98.61		-913.8	-568.6	535.6	486.0	49.60	10.798	
7,800.0	6,653.5	7,808.8	6,733.7	31.2	27.1	-98.61		-1,013.8	-568.6	535.5	483.0	52.55	10.190	
7,900.0	6,653.0	7,908.8	6,733.1	32.5	28.6	-98.60		-1,113.8	-568.6	535.5	479.9	55.61	9.629	
8,000.0	6,652.5	8,008.8	6,732.6	33.8	30.1	-98.60		-1,213.8	-568.6	535.5	476.8	58.76	9.113	
8,100.0	6,652.0	8,108.8	6,732.0	35.2	31.7	-98.59		-1,313.8	-568.6	535.5	473.5	61.98	8.640	
8,200.0	6,651.5	8,208.8	6,731.5	36.6	33.3	-98.59		-1,413.8	-568.6	535.5	470.2	65.27	8.205	
8,300.0	6,651.1	8,308.8	6,731.0	38.1	35.0	-98.58		-1,513.8	-568.6	535.5	466.9	68.60	7.806	
8,400.0	6,650.6	8,408.8	6,730.4	39.6	36.6	-98.58		-1,613.8	-568.6	535.5	463.5	71.99	7.439	
8,500.0	6,650.1	8,508.8	6,729.9	41.2	38.3	-98.57		-1,713.8	-568.6	535.5	460.1	75.41	7.101	
8,600.0	6,649.6	8,608.8	6,729.3	42.8	40.1	-98.56		-1,813.8	-568.6	535.5	456.6	78.87	6.789	
8,700.0	6,649.1	8,708.8	6,728.8	44.4	41.8	-98.56		-1,913.8	-568.6	535.5	453.1	82.36	6.501	
8,800.0	6,648.6	8,808.8	6,728.2	46.1	43.5	-98.55		-2,013.8	-568.6	535.5	449.6	85.88	6.235	
8,900.0	6,648.1	8,908.8	6,727.7	47.8	45.3	-98.55		-2,113.8	-568.6	535.5	446.0	89.42	5.988	
9,000.0	6,647.6	9,008.8	6,727.2	49.5	47.1	-98.54		-2,213.8	-568.6	535.4	442.5	92.98	5.759	
9,100.0	6,647.1	9,108.8	6,726.6	51.2	48.9	-98.54		-2,313.8	-568.6	535.4	438.9	96.56	5.545	
9,200.0	6,646.7	9,208.8	6,726.1	52.9	50.7	-98.53		-2,413.8	-568.6	535.4	435.3	100.16	5.346	
9,300.0	6,646.2	9,308.8	6,725.5	54.6	52.5	-98.53		-2,513.8	-568.6	535.4	431.7	103.77	5.160	
9,400.0	6,645.7	9,408.8	6,725.0	56.4	54.3	-98.52		-2,613.8	-568.6	535.4	428.0	107.40	4.985	
9,500.0	6,645.2	9,508.8	6,724.5	58.1	56.1	-98.51		-2,713.8	-568.6	535.4	424.4	111.03	4.822	
9,600.0	6,644.7	9,608.8	6,723.9	59.9	57.9	-98.51		-2,813.8	-568.6	535.4	420.7	114.68	4.669	
9,700.0	6,644.2	9,708.8	6,723.4	61.7	59.8	-98.50		-2,913.8	-568.6	535.4	417.1	118.34	4.524	
9,800.0	6,643.7	9,808.8	6,722.8	63.5	61.6	-98.50		-3,013.8	-568.6	535.4	413.4	122.01	4.388	
9,900.0	6,643.2	9,908.8	6,722.3	65.3	63.5	-98.49		-3,113.8	-568.6	535.4	409.7	125.69	4.260	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Chestnut 28M-203
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4634.0ft (RKB - 15')
Reference Site:	Chestnut 28M-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4634.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Chestnut 28M-203	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (12-17-13)	Offset TVD Reference:	Offset Datum

Offset Design Chestnut 28M-HZ Pad Sec.28-T5N-R64W - Chestnut 28M-323 - Wellbore #1 - Plan #1 (12-17-13)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
10,000.0	6,642.7	10,008.8	6,721.8	67.1	65.3	-98.49	-98.49	-3,213.8	-568.6	535.4	406.0	129.37	4.138	
10,100.0	6,642.3	10,108.8	6,721.2	68.9	67.2	-98.48	-98.48	-3,313.8	-568.6	535.4	402.3	133.06	4.023	
10,200.0	6,641.8	10,208.8	6,720.7	70.7	69.0	-98.48	-98.48	-3,413.8	-568.6	535.4	398.6	136.76	3.915	
10,300.0	6,641.3	10,308.8	6,720.1	72.5	70.9	-98.47	-98.47	-3,513.8	-568.6	535.3	394.9	140.46	3.811	
10,400.0	6,640.8	10,408.8	6,719.6	74.3	72.7	-98.46	-98.46	-3,613.8	-568.6	535.3	391.2	144.17	3.713	
10,500.0	6,640.3	10,508.8	6,719.0	76.2	74.6	-98.46	-98.46	-3,713.8	-568.6	535.3	387.4	147.88	3.620	
10,600.0	6,639.8	10,608.8	6,718.5	78.0	76.5	-98.45	-98.45	-3,813.8	-568.6	535.3	383.7	151.60	3.531	
10,700.0	6,639.3	10,708.8	6,718.0	79.8	78.3	-98.45	-98.45	-3,913.8	-568.6	535.3	380.0	155.32	3.446	
10,800.0	6,638.8	10,808.8	6,717.4	81.7	80.2	-98.44	-98.44	-4,013.8	-568.6	535.3	376.3	159.05	3.366	
10,900.0	6,638.3	10,908.8	6,716.9	83.5	82.1	-98.44	-98.44	-4,113.8	-568.6	535.3	372.5	162.78	3.288	
11,000.0	6,637.9	11,008.8	6,716.3	85.4	84.0	-98.43	-98.43	-4,213.8	-568.6	535.3	368.8	166.52	3.215	
11,100.0	6,637.4	11,108.8	6,715.8	87.2	85.8	-98.43	-98.43	-4,313.8	-568.6	535.3	365.0	170.25	3.144	
11,200.0	6,636.9	11,208.8	6,715.3	89.1	87.7	-98.42	-98.42	-4,413.8	-568.6	535.3	361.3	173.99	3.076	
11,300.0	6,636.4	11,308.8	6,714.7	90.9	89.6	-98.41	-98.41	-4,513.8	-568.6	535.3	357.5	177.74	3.012	
11,400.0	6,635.9	11,408.8	6,714.2	92.8	91.5	-98.41	-98.41	-4,613.8	-568.6	535.3	353.8	181.49	2.949	
11,500.0	6,635.4	11,508.8	6,713.6	94.6	93.4	-98.40	-98.40	-4,713.8	-568.6	535.3	350.0	185.23	2.890	
11,600.0	6,634.9	11,608.8	6,713.1	96.5	95.3	-98.40	-98.40	-4,813.8	-568.6	535.2	346.3	188.99	2.832	
11,700.0	6,634.4	11,708.8	6,712.6	98.4	97.1	-98.39	-98.39	-4,913.8	-568.6	535.2	342.5	192.74	2.777	
11,800.0	6,633.9	11,808.8	6,712.0	100.2	99.0	-98.39	-98.39	-5,013.8	-568.6	535.2	338.7	196.50	2.724	
11,900.0	6,633.5	11,908.8	6,711.5	102.1	100.9	-98.38	-98.38	-5,113.8	-568.6	535.2	335.0	200.25	2.673	
12,000.0	6,633.0	12,008.8	6,710.9	104.0	102.8	-98.38	-98.38	-5,213.8	-568.6	535.2	331.2	204.01	2.623	
12,100.0	6,632.5	12,108.8	6,710.4	105.9	104.7	-98.37	-98.37	-5,313.8	-568.6	535.2	327.4	207.78	2.576	
12,200.0	6,632.0	12,208.8	6,709.8	107.7	106.6	-98.36	-98.36	-5,413.8	-568.6	535.2	323.7	211.54	2.530	
12,300.0	6,631.5	12,308.8	6,709.3	109.6	108.5	-98.36	-98.36	-5,513.8	-568.6	535.2	319.9	215.30	2.486	
12,400.0	6,631.0	12,408.8	6,708.8	111.5	110.4	-98.35	-98.35	-5,613.8	-568.6	535.2	316.1	219.07	2.443	
12,500.0	6,630.5	12,508.8	6,708.2	113.4	112.3	-98.35	-98.35	-5,713.8	-568.6	535.2	312.3	222.84	2.402	
12,600.0	6,630.0	12,608.8	6,707.7	115.3	114.2	-98.34	-98.34	-5,813.8	-568.6	535.2	308.6	226.61	2.362	
12,700.0	6,629.6	12,708.8	6,707.1	117.1	116.1	-98.34	-98.34	-5,913.8	-568.6	535.2	304.8	230.38	2.323	
12,800.0	6,629.1	12,808.8	6,706.6	119.0	118.0	-98.33	-98.33	-6,013.8	-568.6	535.2	301.0	234.15	2.285	
12,900.0	6,628.6	12,908.8	6,706.1	120.9	119.9	-98.33	-98.33	-6,113.7	-568.6	535.1	297.2	237.93	2.249	
13,000.0	6,628.1	13,008.8	6,705.5	122.8	121.8	-98.32	-98.32	-6,213.7	-568.6	535.1	293.4	241.70	2.214	
13,100.0	6,627.6	13,108.8	6,705.0	124.7	123.7	-98.31	-98.31	-6,313.7	-568.6	535.1	289.7	245.48	2.180	
13,200.0	6,627.1	13,208.8	6,704.4	126.6	125.6	-98.31	-98.31	-6,413.7	-568.6	535.1	285.9	249.26	2.147	
13,300.0	6,626.6	13,308.8	6,703.9	128.5	127.5	-98.30	-98.30	-6,513.7	-568.6	535.1	282.1	253.03	2.115	
13,400.0	6,626.1	13,408.8	6,703.4	130.3	129.4	-98.30	-98.30	-6,613.7	-568.6	535.1	278.3	256.81	2.084	
13,500.0	6,625.6	13,508.8	6,702.8	132.2	131.3	-98.29	-98.29	-6,713.7	-568.6	535.1	274.5	260.59	2.053	
13,600.0	6,625.2	13,608.8	6,702.3	134.1	133.2	-98.29	-98.29	-6,813.7	-568.6	535.1	270.7	264.37	2.024	
13,700.0	6,624.7	13,708.8	6,701.7	136.0	135.1	-98.28	-98.28	-6,913.7	-568.6	535.1	266.9	268.16	1.995	
13,800.0	6,624.2	13,808.8	6,701.2	137.9	137.0	-98.28	-98.28	-7,013.7	-568.6	535.1	263.1	271.94	1.968	
13,825.6	6,624.1	13,834.4	6,701.1	138.4	137.5	-98.27	-98.27	-7,039.4	-568.6	535.1	262.2	272.91	1.961	
13,836.0	6,624.0	13,844.5	6,701.0	138.6	137.7	-98.27	-98.27	-7,049.4	-568.6	535.1	261.8	273.30	1.958 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Chestnut 28M-203
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4634.0ft (RKB - 15')
Reference Site:	Chestnut 28M-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4634.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Chestnut 28M-203	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (12-17-13)	Offset TVD Reference:	Offset Datum

Offset Design		Chestnut 28M-HZ Pad Sec.28-T5N-R64W - Chestnut 28M-423 - Wellbore #1 - Plan #1 (12-17-13)											Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Distance								Warning
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor		
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
0.0	0.0	0.0	0.0	0.0	0.0	90.01	0.0	30.6	30.6					45.452 CC, ES
100.0	100.0	100.0	100.0	0.1	0.1	90.01	0.0	30.6	30.6	30.4	0.22	136.355		
200.0	200.0	200.0	200.0	0.3	0.3	90.01	0.0	30.6	30.6	30.0	0.67	45.452		
300.0	300.0	300.0	300.0	0.6	0.6	164.16	0.0	30.6	32.3	31.2	1.12	28.790		
400.0	399.8	399.8	399.8	0.8	0.8	166.33	0.0	30.6	37.4	35.8	1.57	23.746		
500.0	499.5	501.0	501.0	1.0	1.0	168.30	0.6	29.0	44.2	42.2	2.02	21.904		
600.0	598.7	602.4	602.2	1.3	1.2	169.44	2.5	24.0	51.1	48.6	2.46	20.781		
700.0	697.5	704.0	703.4	1.7	1.5	170.05	5.7	15.6	58.0	55.1	2.91	19.922		
800.0	795.6	805.9	804.5	2.0	1.8	170.30	10.2	3.8	64.9	61.5	3.38	19.212		
867.8	861.8	875.1	872.9	2.3	2.0	170.31	14.0	-6.1	69.5	65.8	3.70	18.775		
900.0	893.1	908.0	905.4	2.5	2.1	170.26	16.0	-11.3	71.6	67.7	3.86	18.528		
1,000.0	990.4	1,008.3	1,004.0	3.0	2.4	169.91	22.6	-28.4	76.7	72.4	4.37	17.549		
1,100.0	1,087.7	1,108.2	1,102.2	3.4	2.8	169.60	29.1	-45.5	81.9	77.0	4.90	16.720		
1,200.0	1,185.0	1,208.1	1,200.4	3.9	3.2	169.33	35.6	-62.5	87.0	81.6	5.43	16.029		
1,300.0	1,282.3	1,307.9	1,298.6	4.4	3.6	169.09	42.1	-79.6	92.1	86.2	5.97	15.442		
1,400.0	1,379.6	1,407.8	1,396.7	4.9	4.0	168.87	48.6	-96.7	97.2	90.7	6.51	14.949		
1,500.0	1,476.9	1,507.7	1,494.9	5.4	4.4	168.68	55.1	-113.7	102.4	95.3	7.05	14.519		
1,600.0	1,574.2	1,607.5	1,593.1	5.9	4.8	168.50	61.7	-130.8	107.5	99.9	7.60	14.145		
1,700.0	1,671.5	1,707.4	1,691.3	6.4	5.2	168.34	68.2	-147.8	112.6	104.5	8.15	13.818		
1,800.0	1,768.8	1,807.3	1,789.5	6.9	5.6	168.19	74.7	-164.9	117.8	109.1	8.70	13.529		
1,900.0	1,866.0	1,907.2	1,887.7	7.4	6.0	168.06	81.2	-182.0	122.9	113.6	9.26	13.272		
2,000.0	1,963.3	2,007.0	1,985.8	7.9	6.4	167.93	87.7	-199.0	128.0	118.2	9.82	13.042		
2,100.0	2,060.6	2,106.9	2,084.0	8.4	6.8	167.82	94.2	-216.1	133.2	122.8	10.38	12.835		
2,200.0	2,157.9	2,206.8	2,182.2	8.9	7.2	167.71	100.8	-233.2	138.3	127.4	10.93	12.648		
2,300.0	2,255.2	2,306.6	2,280.4	9.4	7.6	167.62	107.3	-250.2	143.4	131.9	11.50	12.478		
2,400.0	2,352.5	2,406.5	2,378.6	9.9	8.0	167.53	113.8	-267.3	148.6	136.5	12.06	12.323		
2,500.0	2,449.8	2,506.4	2,476.8	10.4	8.5	167.44	120.3	-284.3	153.7	141.1	12.62	12.181		
2,600.0	2,547.1	2,606.2	2,574.9	10.9	8.9	167.36	126.8	-301.4	158.8	145.7	13.18	12.051		
2,700.0	2,644.4	2,706.1	2,673.1	11.4	9.3	167.29	133.3	-318.5	164.0	150.2	13.74	11.930		
2,800.0	2,741.7	2,806.0	2,771.3	11.9	9.7	167.22	139.9	-335.5	169.1	154.8	14.31	11.819		
2,900.0	2,839.0	2,905.8	2,869.5	12.4	10.1	167.15	146.4	-352.6	174.3	159.4	14.87	11.716		
3,000.0	2,936.3	3,005.7	2,967.7	12.9	10.5	167.09	152.9	-369.6	179.4	164.0	15.44	11.620		
3,100.0	3,033.6	3,105.6	3,065.9	13.4	10.9	167.03	159.4	-386.7	184.5	168.5	16.00	11.530		
3,200.0	3,130.9	3,205.4	3,164.0	13.9	11.4	166.97	165.9	-403.8	189.7	173.1	16.57	11.446		
3,300.0	3,228.2	3,305.3	3,262.2	14.4	11.8	166.92	172.4	-420.8	194.8	177.7	17.14	11.368		
3,400.0	3,325.5	3,405.2	3,360.4	14.9	12.2	166.87	179.0	-437.9	199.9	182.2	17.70	11.294		
3,500.0	3,422.8	3,505.0	3,458.6	15.4	12.6	166.82	185.5	-455.0	205.1	186.8	18.27	11.225		
3,600.0	3,520.1	3,604.9	3,556.8	15.9	13.0	166.78	192.0	-472.0	210.2	191.4	18.84	11.160		
3,700.0	3,617.4	3,704.8	3,655.0	16.4	13.4	166.73	198.5	-489.1	215.3	195.9	19.40	11.098		
3,800.0	3,714.7	3,804.6	3,753.1	16.9	13.8	166.69	205.0	-506.1	220.5	200.5	19.97	11.040		
3,900.0	3,812.0	3,904.5	3,851.3	17.4	14.3	166.65	211.5	-523.2	225.6	205.1	20.54	10.985		
4,000.0	3,909.2	4,004.4	3,949.5	17.9	14.7	166.62	218.1	-540.3	230.8	209.7	21.11	10.933		
4,100.0	4,006.5	4,104.2	4,047.7	18.4	15.1	166.58	224.6	-557.3	235.9	214.2	21.68	10.883		
4,200.0	4,103.8	4,204.1	4,145.9	18.9	15.5	166.55	231.1	-574.4	241.0	218.8	22.24	10.836		
4,300.0	4,201.1	4,304.0	4,244.1	19.4	15.9	166.51	237.6	-591.5	246.2	223.4	22.81	10.791		
4,400.0	4,298.4	4,403.8	4,342.2	19.9	16.3	166.48	244.1	-608.5	251.3	227.9	23.38	10.749		
4,500.0	4,395.7	4,503.7	4,440.4	20.4	16.7	166.45	250.7	-625.6	256.5	232.5	23.95	10.708		
4,600.0	4,493.0	4,603.6	4,538.6	20.9	17.2	166.42	257.2	-642.6	261.6	237.1	24.52	10.669		
4,700.0	4,590.3	4,703.4	4,636.8	21.4	17.6	166.40	263.7	-659.7	266.7	241.6	25.09	10.632		
4,800.0	4,687.6	4,803.3	4,735.0	21.9	18.0	166.37	270.2	-676.8	271.9	246.2	25.66	10.596		
4,900.0	4,784.9	4,903.2	4,833.2	22.4	18.4	166.34	276.7	-693.8	277.0	250.8	26.23	10.562		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Chestnut 28M-203
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4634.0ft (RKB - 15')
Reference Site:	Chestnut 28M-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4634.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Chestnut 28M-203	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (12-17-13)	Offset TVD Reference:	Offset Datum

Offset Design		Chestnut 28M-HZ Pad Sec.28-T5N-R64W - Chestnut 28M-423 - Wellbore #1 - Plan #1 (12-17-13)										Offset Site Error:		0.0 ft
Survey Program: 0-MWD												Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (ft)	Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset (ft)		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)				
5,000.0	4,882.2	5,003.1	4,931.3	23.0	18.8	166.32	283.2	-710.9	282.1	255.4	26.80	10.529		
5,100.0	4,979.5	5,102.9	5,029.5	23.5	19.2	166.29	289.8	-728.0	287.3	259.9	27.37	10.498		
5,160.3	5,038.2	5,163.2	5,088.8	23.8	19.5	166.28	293.7	-738.3	290.4	262.7	27.71	10.480		
5,200.0	5,076.9	5,202.8	5,127.7	23.9	19.6	166.27	296.3	-745.0	292.2	264.2	27.94	10.457		
5,300.0	5,174.8	5,302.8	5,226.0	24.3	20.1	166.11	302.8	-762.1	294.3	265.8	28.49	10.330		
5,400.0	5,273.4	5,402.7	5,324.3	24.6	20.5	165.77	309.3	-779.2	293.0	264.0	29.03	10.093		
5,500.0	5,372.5	5,500.0	5,420.0	24.8	20.9	165.28	315.5	-795.5	288.7	259.1	29.54	9.773		
5,600.0	5,472.1	5,589.7	5,508.6	25.0	21.1	164.80	320.4	-808.2	283.6	253.7	29.95	9.470		
5,700.0	5,571.9	5,681.1	5,599.3	25.2	21.3	164.33	324.4	-818.5	278.2	247.9	30.31	9.179		
5,800.0	5,671.8	5,772.6	5,690.5	25.3	21.5	163.85	327.3	-826.2	272.4	241.8	30.61	8.900		
5,828.2	5,700.0	5,800.0	5,717.8	25.3	21.6	90.44	327.9	-827.9	270.8	240.1	30.70	8.821		
5,900.0	5,771.8	5,864.4	5,782.1	25.4	21.7	90.19	329.1	-831.0	267.2	236.2	30.97	8.628		
6,000.0	5,871.8	5,956.4	5,874.1	25.5	21.8	90.01	330.0	-833.2	264.9	233.6	31.32	8.456		
6,020.5	5,892.4	5,975.3	5,893.0	25.5	21.8	90.00	330.0	-833.3	264.8	233.4	31.39	8.435		
6,028.2	5,900.0	5,982.3	5,900.0	25.5	21.8	-90.01	330.0	-833.3	264.8	233.3	31.41	8.428		
6,050.0	5,921.8	6,004.1	5,921.8	25.6	21.8	-90.12	330.0	-833.3	264.8	233.2	31.51	8.404		
6,100.0	5,971.7	6,054.0	5,971.7	25.6	21.9	-90.89	330.0	-833.3	264.8	233.0	31.82	8.322		
6,150.0	6,021.2	6,103.5	6,021.2	25.6	22.0	-92.33	330.0	-833.3	265.0	232.7	32.28	8.210		
6,200.0	6,070.2	6,153.2	6,070.9	25.6	22.0	-94.36	329.6	-833.3	265.6	232.7	32.86	8.081		
6,250.0	6,118.4	6,203.8	6,121.4	25.6	22.1	-96.47	326.3	-833.3	266.5	233.1	33.43	7.972		
6,300.0	6,165.6	6,255.2	6,172.3	25.6	22.1	-98.55	319.5	-833.3	267.8	233.9	33.93	7.894		
6,350.0	6,211.7	6,307.4	6,223.4	25.6	22.1	-100.59	309.1	-833.3	269.5	235.2	34.34	7.848		
6,400.0	6,256.4	6,360.2	6,274.4	25.6	22.1	-102.57	295.1	-833.3	271.5	236.9	34.64	7.837		
6,450.0	6,299.6	6,413.9	6,325.0	25.6	22.1	-104.49	277.3	-833.3	273.8	238.9	34.83	7.860		
6,500.0	6,341.0	6,468.3	6,374.9	25.5	22.1	-106.33	255.6	-833.3	276.3	241.4	34.90	7.916		
6,550.0	6,380.5	6,523.6	6,423.9	25.5	22.1	-108.08	230.1	-833.3	278.9	244.1	34.85	8.004		
6,600.0	6,417.8	6,579.6	6,471.5	25.5	22.0	-109.74	200.6	-833.3	281.7	247.0	34.69	8.121		
6,650.0	6,453.0	6,636.4	6,517.5	25.5	22.0	-111.29	167.2	-833.3	284.6	250.2	34.46	8.260		
6,700.0	6,485.7	6,693.9	6,561.4	25.4	22.0	-112.73	130.0	-833.3	287.5	253.4	34.16	8.416		
6,750.0	6,515.9	6,752.3	6,602.9	25.4	21.9	-114.06	89.1	-833.3	290.4	256.6	33.85	8.579		
6,800.0	6,543.5	6,811.3	6,641.6	25.4	21.9	-115.26	44.6	-833.3	293.2	259.6	33.55	8.737		
6,850.0	6,568.2	6,871.0	6,677.2	25.4	21.9	-116.34	-3.4	-833.3	295.8	262.5	33.32	8.878		
6,900.0	6,590.1	6,931.4	6,709.2	25.5	21.9	-117.28	-54.6	-833.3	298.2	265.0	33.19	8.984		
6,950.0	6,608.9	6,992.3	6,737.3	25.5	22.0	-118.10	-108.6	-833.3	300.4	267.1	33.23	9.038		
7,000.0	6,624.7	7,053.7	6,761.2	25.6	22.0	-118.78	-165.1	-833.3	302.2	268.8	33.45	9.036		
7,050.0	6,637.4	7,115.6	6,780.6	25.7	22.2	-119.33	-223.8	-833.3	303.8	269.9	33.89	8.964		
7,100.0	6,646.8	7,177.7	6,795.2	25.8	22.3	-119.73	-284.2	-833.3	305.0	270.4	34.57	8.822		
7,150.0	6,653.1	7,240.1	6,804.9	26.0	22.6	-120.00	-345.9	-833.3	305.7	270.2	35.48	8.616		
7,200.0	6,656.0	7,291.7	6,810.4	26.2	22.8	-120.30	-397.2	-833.3	306.9	270.4	36.51	8.405		
7,224.3	6,656.3	7,315.9	6,812.9	26.3	23.0	-120.59	-421.2	-833.3	308.0	271.0	37.05	8.315		
7,300.0	6,655.9	7,402.7	6,819.2	26.6	23.5	-121.65	-507.7	-833.3	311.1	272.7	38.41	8.098		
7,400.0	6,655.5	7,508.3	6,819.9	27.3	24.4	-121.84	-613.4	-833.3	311.7	271.2	40.51	7.694		
7,500.0	6,655.0	7,608.3	6,819.9	28.1	25.4	-121.92	-713.4	-833.3	311.9	269.2	42.72	7.302		
7,600.0	6,654.5	7,708.3	6,819.9	29.0	26.5	-122.00	-813.4	-833.3	312.2	267.1	45.07	6.927		
7,700.0	6,654.0	7,808.3	6,819.9	30.1	27.7	-122.08	-913.4	-833.3	312.5	264.9	47.53	6.573		
7,800.0	6,653.5	7,908.3	6,819.9	31.2	29.0	-122.16	-1,013.4	-833.3	312.7	262.6	50.10	6.243		
7,900.0	6,653.0	8,008.3	6,820.0	32.5	30.4	-122.24	-1,113.4	-833.3	313.0	260.3	52.74	5.935		
8,000.0	6,652.5	8,108.3	6,820.0	33.8	31.9	-122.31	-1,213.4	-833.3	313.3	257.8	55.45	5.649		
8,100.0	6,652.0	8,208.3	6,820.0	35.2	33.4	-122.39	-1,313.4	-833.3	313.5	255.3	58.23	5.385		
8,200.0	6,651.5	8,308.3	6,820.0	36.6	34.9	-122.47	-1,413.4	-833.3	313.8	252.8	61.05	5.140		
8,300.0	6,651.1	8,408.3	6,820.0	38.1	36.5	-122.55	-1,513.4	-833.3	314.1	250.2	63.91	4.914		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Chestnut 28M-203
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4634.0ft (RKB - 15')
Reference Site:	Chestnut 28M-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4634.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Chestnut 28M-203	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (12-17-13)	Offset TVD Reference:	Offset Datum

Offset Design Chestnut 28M-HZ Pad Sec.28-T5N-R64W - Chestnut 28M-423 - Wellbore #1 - Plan #1 (12-17-13)												Offset Site Error: 0.0 ft	
Survey Program: 0-MWD												Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (ft)	Separation Factor	Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)			
8,400.0	6,650.6	8,508.3	6,820.1	39.6	38.1	-122.63	-1,613.4	-833.3	314.4	247.5	66.82	4.705	
8,500.0	6,650.1	8,608.3	6,820.1	41.2	39.7	-122.70	-1,713.4	-833.3	314.6	244.9	69.75	4.511	
8,600.0	6,649.6	8,708.3	6,820.1	42.8	41.4	-122.78	-1,813.4	-833.3	314.9	242.2	72.71	4.331	
8,700.0	6,649.1	8,808.3	6,820.1	44.4	43.1	-122.86	-1,913.4	-833.3	315.2	239.5	75.69	4.164	
8,800.0	6,648.6	8,908.3	6,820.1	46.1	44.8	-122.94	-2,013.3	-833.3	315.5	236.8	78.70	4.008	
8,900.0	6,648.1	9,008.3	6,820.1	47.8	46.5	-123.01	-2,113.3	-833.3	315.7	234.0	81.72	3.864	
9,000.0	6,647.6	9,108.3	6,820.2	49.5	48.3	-123.09	-2,213.3	-833.3	316.0	231.3	84.75	3.729	
9,100.0	6,647.1	9,208.3	6,820.2	51.2	50.0	-123.17	-2,313.3	-833.3	316.3	228.5	87.80	3.602	
9,200.0	6,646.7	9,308.3	6,820.2	52.9	51.8	-123.24	-2,413.3	-833.3	316.6	225.7	90.86	3.484	
9,300.0	6,646.2	9,408.3	6,820.2	54.6	53.5	-123.32	-2,513.3	-833.3	316.8	222.9	93.93	3.373	
9,400.0	6,645.7	9,508.3	6,820.2	56.4	55.3	-123.40	-2,613.3	-833.3	317.1	220.1	97.00	3.269	
9,500.0	6,645.2	9,608.3	6,820.2	58.1	57.1	-123.47	-2,713.3	-833.3	317.4	217.3	100.09	3.171	
9,600.0	6,644.7	9,708.3	6,820.3	59.9	58.9	-123.55	-2,813.3	-833.3	317.7	214.5	103.17	3.079	
9,700.0	6,644.2	9,808.3	6,820.3	61.7	60.7	-123.62	-2,913.3	-833.3	318.0	211.7	106.27	2.992	
9,800.0	6,643.7	9,908.3	6,820.3	63.5	62.5	-123.70	-3,013.3	-833.3	318.2	208.9	109.37	2.910	
9,900.0	6,643.2	10,008.3	6,820.3	65.3	64.3	-123.78	-3,113.3	-833.3	318.5	206.0	112.47	2.832	
10,000.0	6,642.7	10,108.3	6,820.3	67.1	66.2	-123.85	-3,213.3	-833.3	318.8	203.2	115.57	2.758	
10,100.0	6,642.3	10,208.3	6,820.3	68.9	68.0	-123.93	-3,313.3	-833.3	319.1	200.4	118.67	2.689	
10,200.0	6,641.8	10,308.3	6,820.4	70.7	69.8	-124.00	-3,413.3	-833.3	319.4	197.6	121.78	2.622	
10,300.0	6,641.3	10,408.3	6,820.4	72.5	71.7	-124.08	-3,513.3	-833.3	319.6	194.8	124.89	2.559	
10,400.0	6,640.8	10,508.3	6,820.4	74.3	73.5	-124.15	-3,613.3	-833.3	319.9	191.9	128.00	2.499	
10,500.0	6,640.3	10,608.3	6,820.4	76.2	75.4	-124.23	-3,713.3	-833.3	320.2	189.1	131.11	2.442	
10,600.0	6,639.8	10,708.3	6,820.4	78.0	77.2	-124.30	-3,813.3	-833.3	320.5	186.3	134.22	2.388	
10,700.0	6,639.3	10,808.3	6,820.5	79.8	79.1	-124.38	-3,913.3	-833.3	320.8	183.5	137.32	2.336	
10,800.0	6,638.8	10,908.3	6,820.5	81.7	80.9	-124.45	-4,013.3	-833.3	321.1	180.6	140.43	2.286	
10,900.0	6,638.3	11,008.3	6,820.5	83.5	82.8	-124.53	-4,113.3	-833.3	321.4	177.8	143.54	2.239	
11,000.0	6,637.9	11,108.3	6,820.5	85.4	84.7	-124.60	-4,213.3	-833.3	321.6	175.0	146.64	2.193	
11,100.0	6,637.4	11,208.3	6,820.5	87.2	86.5	-124.67	-4,313.3	-833.3	321.9	172.2	149.75	2.150	
11,200.0	6,636.9	11,308.3	6,820.5	89.1	88.4	-124.75	-4,413.3	-833.3	322.2	169.4	152.85	2.108	
11,300.0	6,636.4	11,408.3	6,820.6	90.9	90.3	-124.82	-4,513.3	-833.3	322.5	166.6	155.95	2.068	
11,400.0	6,635.9	11,508.2	6,820.6	92.8	92.1	-124.90	-4,613.3	-833.3	322.8	163.7	159.05	2.030	
11,500.0	6,635.4	11,608.2	6,820.6	94.6	94.0	-124.97	-4,713.3	-833.3	323.1	160.9	162.14	1.993	
11,600.0	6,634.9	11,708.2	6,820.6	96.5	95.9	-125.04	-4,813.3	-833.3	323.4	158.1	165.24	1.957	
11,700.0	6,634.4	11,808.2	6,820.6	98.4	97.8	-125.12	-4,913.3	-833.3	323.7	155.3	168.33	1.923	
11,800.0	6,633.9	11,908.2	6,820.6	100.2	99.6	-125.19	-5,013.3	-833.3	324.0	152.5	171.42	1.890	
11,900.0	6,633.5	12,008.2	6,820.7	102.1	101.5	-125.26	-5,113.3	-833.3	324.3	149.7	174.50	1.858	
12,000.0	6,633.0	12,108.2	6,820.7	104.0	103.4	-125.34	-5,213.3	-833.3	324.5	147.0	177.59	1.828	
12,100.0	6,632.5	12,208.2	6,820.7	105.9	105.3	-125.41	-5,313.3	-833.3	324.8	144.2	180.67	1.798	
12,200.0	6,632.0	12,308.2	6,820.7	107.7	107.2	-125.48	-5,413.3	-833.3	325.1	141.4	183.74	1.769	
12,300.0	6,631.5	12,408.2	6,820.7	109.6	109.1	-125.55	-5,513.3	-833.3	325.4	138.6	186.82	1.742	
12,400.0	6,631.0	12,508.2	6,820.7	111.5	110.9	-125.63	-5,613.3	-833.3	325.7	135.8	189.89	1.715	
12,500.0	6,630.5	12,608.2	6,820.8	113.4	112.8	-125.70	-5,713.3	-833.3	326.0	133.1	192.96	1.690	
12,600.0	6,630.0	12,708.2	6,820.8	115.3	114.7	-125.77	-5,813.3	-833.3	326.3	130.3	196.02	1.665	
12,700.0	6,629.6	12,808.2	6,820.8	117.1	116.6	-125.84	-5,913.3	-833.3	326.6	127.5	199.08	1.641	
12,800.0	6,629.1	12,908.2	6,820.8	119.0	118.5	-125.91	-6,013.3	-833.3	326.9	124.8	202.14	1.617	
12,900.0	6,628.6	13,008.2	6,820.8	120.9	120.4	-125.99	-6,113.3	-833.3	327.2	122.0	205.20	1.595	
13,000.0	6,628.1	13,108.2	6,820.9	122.8	122.3	-126.06	-6,213.3	-833.3	327.5	119.3	208.25	1.573	
13,100.0	6,627.6	13,208.2	6,820.9	124.7	124.2	-126.13	-6,313.3	-833.3	327.8	116.5	211.29	1.551	
13,200.0	6,627.1	13,308.2	6,820.9	126.6	126.1	-126.20	-6,413.3	-833.3	328.1	113.8	214.34	1.531	
13,300.0	6,626.6	13,408.2	6,820.9	128.5	128.0	-126.27	-6,513.3	-833.3	328.4	111.0	217.38	1.511	
13,400.0	6,626.1	13,508.2	6,820.9	130.3	129.9	-126.34	-6,613.3	-833.3	328.7	108.3	220.41	1.491 Level 3	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Chestnut 28M-203
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4634.0ft (RKB - 15')
Reference Site:	Chestnut 28M-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4634.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Chestnut 28M-203	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (12-17-13)	Offset TVD Reference:	Offset Datum

Offset Design Chestnut 28M-HZ Pad Sec.28-T5N-R64W - Chestnut 28M-423 - Wellbore #1 - Plan #1 (12-17-13)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (ft)	Separation Factor	Warning	
Reference	Offset	Reference	Offset	Reference	Offset		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)				
13,500.0	6,625.6	13,608.2	6,820.9	132.2	131.8	-126.41	-6,713.3	-833.3	329.0	105.5	223.45	1.472	Level 3	
13,600.0	6,625.2	13,708.2	6,821.0	134.1	133.7	-126.49	-6,813.3	-833.3	329.3	102.8	226.48	1.454	Level 3	
13,700.0	6,624.7	13,808.2	6,821.0	136.0	135.6	-126.56	-6,913.3	-833.3	329.6	100.1	229.50	1.436	Level 3	
13,800.0	6,624.2	13,908.2	6,821.0	137.9	137.5	-126.63	-7,013.3	-833.3	329.9	97.4	232.52	1.419	Level 3	
13,836.0	6,624.0	13,944.3	6,821.0	138.6	138.1	-126.65	-7,049.3	-833.3	330.0	96.4	233.61	1.413	Level 3, SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Chestnut 28M-203
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4634.0ft (RKB - 15')
Reference Site:	Chestnut 28M-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4634.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Chestnut 28M-203	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (12-17-13)	Offset TVD Reference:	Offset Datum

Offset Design Chestnut 28M-HZ Pad Sec.28-T5N-R64W - Chestnut 28R-203 - Wellbore #1 - Plan #1 (12-17-13)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
0.0	0.0	1.0	1.0	0.0	0.0	91.74	-3.6	119.8	119.9	119.9	0.00	N/A		
100.0	100.0	101.0	101.0	0.1	0.1	91.74	-3.6	119.8	119.9	119.6	0.23	527.993		
200.0	200.0	201.0	201.0	0.3	0.3	91.74	-3.6	119.8	119.9	119.2	0.68	177.167 CC, ES		
300.0	300.0	301.0	301.0	0.6	0.6	165.22	-3.6	119.8	121.5	120.4	1.13	108.039		
400.0	399.8	400.8	400.8	0.8	0.8	165.80	-3.6	119.8	126.6	125.0	1.58	80.314		
500.0	499.5	500.5	500.5	1.0	1.0	166.67	-3.6	119.8	135.1	133.0	2.03	66.450		
600.0	598.7	599.7	599.7	1.3	1.2	167.71	-3.6	119.8	147.0	144.5	2.49	58.967		
700.0	697.5	698.5	698.5	1.7	1.5	168.83	-3.6	119.8	162.3	159.3	2.95	54.928		
800.0	795.6	796.6	796.6	2.0	1.7	169.93	-3.6	119.8	181.1	177.6	3.42	52.950		
867.8	861.8	862.8	862.8	2.3	1.8	170.64	-3.6	119.8	195.7	192.0	3.74	52.396		
900.0	893.1	894.1	894.1	2.5	1.9	170.98	-3.6	119.8	203.1	199.2	3.89	52.264		
1,000.0	990.4	991.4	991.4	3.0	2.1	171.90	-3.6	119.8	225.9	221.6	4.36	51.878		
1,100.0	1,087.7	1,088.7	1,088.7	3.4	2.3	172.65	-3.6	119.8	248.8	244.0	4.83	51.532		
1,200.0	1,185.0	1,186.0	1,186.0	3.9	2.6	173.27	-3.6	119.8	271.8	266.5	5.31	51.226		
1,300.0	1,282.3	1,283.3	1,283.3	4.4	2.8	173.80	-3.6	119.8	294.7	289.0	5.78	50.954		
1,400.0	1,379.6	1,380.6	1,380.6	4.9	3.0	174.25	-3.6	119.8	317.7	311.5	6.27	50.713		
1,500.0	1,476.9	1,477.9	1,477.9	5.4	3.2	174.64	-3.6	119.8	340.7	334.0	6.75	50.498		
1,600.0	1,574.2	1,575.2	1,575.2	5.9	3.4	174.98	-3.6	119.8	363.7	356.5	7.23	50.305		
1,700.0	1,671.5	1,672.5	1,672.5	6.4	3.6	175.28	-3.6	119.8	386.8	379.0	7.71	50.131		
1,800.0	1,768.8	1,769.8	1,769.8	6.9	3.9	175.54	-3.6	119.8	409.8	401.6	8.20	49.975		
1,900.0	1,866.0	1,867.0	1,867.0	7.4	4.1	175.78	-3.6	119.8	432.8	424.1	8.69	49.832		
2,000.0	1,963.3	1,964.3	1,964.3	7.9	4.3	175.99	-3.6	119.8	455.9	446.7	9.17	49.702		
2,100.0	2,060.6	2,068.8	2,068.8	8.4	4.5	176.12	-2.9	119.4	478.5	468.8	9.67	49.466		
2,200.0	2,157.9	2,178.4	2,178.2	8.9	4.8	175.89	1.4	117.4	498.9	488.7	10.18	49.000		
2,300.0	2,255.2	2,288.7	2,288.2	9.4	5.0	175.30	9.4	113.5	517.0	506.3	10.70	48.327		
2,400.0	2,352.5	2,391.7	2,390.5	9.9	5.3	174.52	19.8	108.5	533.3	522.1	11.21	47.575		
2,500.0	2,449.8	2,490.1	2,488.3	10.4	5.5	173.80	30.0	103.6	549.5	537.8	11.72	46.877		
2,600.0	2,547.1	2,588.5	2,586.1	10.9	5.7	173.12	40.2	98.7	565.8	553.6	12.24	46.216		
2,700.0	2,644.4	2,687.0	2,683.9	11.4	6.0	172.47	50.4	93.8	582.2	569.5	12.77	45.593		
2,800.0	2,741.7	2,785.4	2,781.7	11.9	6.2	171.86	60.6	88.9	598.7	585.4	13.30	45.001		
2,900.0	2,839.0	2,883.9	2,879.5	12.4	6.5	171.29	70.7	84.0	615.2	601.4	13.84	44.441		
3,000.0	2,936.3	2,982.3	2,977.3	12.9	6.8	170.74	80.9	79.1	631.8	617.4	14.39	43.910		
3,100.0	3,033.6	3,080.8	3,075.1	13.4	7.0	170.22	91.1	74.2	648.4	633.5	14.94	43.407		
3,200.0	3,130.9	3,179.2	3,172.9	13.9	7.3	169.73	101.3	69.3	665.1	649.6	15.49	42.930		
3,300.0	3,228.2	3,277.6	3,270.6	14.4	7.6	169.26	111.5	64.4	681.8	665.8	16.05	42.477		
3,400.0	3,325.5	3,376.1	3,368.4	14.9	7.8	168.81	121.6	59.5	698.6	682.0	16.61	42.047		
3,500.0	3,422.8	3,474.5	3,466.2	15.4	8.1	168.39	131.8	54.6	715.4	698.2	17.18	41.638		
3,600.0	3,520.1	3,573.0	3,564.0	15.9	8.4	167.98	142.0	49.7	732.2	714.5	17.75	41.250		
3,700.0	3,617.4	3,671.4	3,661.8	16.4	8.7	167.59	152.2	44.8	749.1	730.8	18.33	40.880		
3,800.0	3,714.7	3,769.8	3,759.6	16.9	9.0	167.22	162.4	39.9	766.0	747.1	18.90	40.528		
3,900.0	3,812.0	3,868.3	3,857.4	17.4	9.2	166.87	172.5	35.0	783.0	763.5	19.48	40.192		
4,000.0	3,909.2	3,966.7	3,955.2	17.9	9.5	166.53	182.7	30.1	799.9	779.9	20.06	39.872		
4,100.0	4,006.5	4,065.2	4,053.0	18.4	9.8	166.20	192.9	25.2	816.9	796.3	20.65	39.566		
4,200.0	4,103.8	4,163.6	4,150.8	18.9	10.1	165.89	203.1	20.3	834.0	812.7	21.23	39.275		
4,300.0	4,201.1	4,262.0	4,248.6	19.4	10.4	165.59	213.3	15.4	851.0	829.2	21.82	38.996		
4,400.0	4,298.4	4,360.5	4,346.3	19.9	10.7	165.30	223.4	10.5	868.1	845.7	22.41	38.729		
4,500.0	4,395.7	4,458.9	4,444.1	20.4	10.9	165.03	233.6	5.6	885.2	862.1	23.01	38.473		
4,600.0	4,493.0	4,557.4	4,541.9	20.9	11.2	164.76	243.8	0.7	902.3	878.7	23.60	38.229		
4,700.0	4,590.3	4,655.8	4,639.7	21.4	11.5	164.50	254.0	-4.2	919.4	895.2	24.20	37.994		
4,800.0	4,687.6	4,754.3	4,737.5	21.9	11.8	164.26	264.1	-9.1	936.5	911.7	24.80	37.769		
4,900.0	4,784.9	4,852.7	4,835.3	22.4	12.1	164.02	274.3	-14.0	953.7	928.3	25.40	37.553		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Chestnut 28M-203
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4634.0ft (RKB - 15')
Reference Site:	Chestnut 28M-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4634.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Chestnut 28M-203	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (12-17-13)	Offset TVD Reference:	Offset Datum

Offset Design Chestnut 28M-HZ Pad Sec.28-T5N-R64W - Chestnut 28R-203 - Wellbore #1 - Plan #1 (12-17-13)												Offset Site Error:	0.0 ft
Survey Program: 0-MWD												Offset Well Error:	0.0 ft
Reference	Offset	Semi Major Axis		Distance									
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,000.0	4,882.2	4,951.1	4,933.1	23.0	12.4	163.79	284.5	-18.9	970.8	944.8	26.00	37.345	
5,100.0	4,979.5	5,049.6	5,030.9	23.5	12.7	163.57	294.7	-23.8	988.0	961.4	26.60	37.146	
5,160.3	5,038.2	5,109.0	5,089.9	23.8	12.9	163.44	300.8	-26.8	998.4	971.4	26.96	37.029 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Chestnut 28M-203
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4634.0ft (RKB - 15')
Reference Site:	Chestnut 28M-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4634.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Chestnut 28M-203	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (12-17-13)	Offset TVD Reference:	Offset Datum

Offset Design Chestnut 28M-HZ Pad Sec.28-T5N-R64W - Chestnut 28R-443 - Wellbore #1 - Plan #1 (12-17-13)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	1.0	1.0	0.0	0.0	92.35	92.35	-3.7	89.2	89.2	89.2	0.00	N/A	
100.0	100.0	101.0	101.0	0.1	0.1	92.35	92.35	-3.7	89.2	89.2	89.0	0.23	393.073	
200.0	200.0	201.0	201.0	0.3	0.3	92.35	92.35	-3.7	89.2	89.2	88.6	0.68	131.895 CC, ES	
300.0	300.0	301.0	301.0	0.6	0.6	165.89	165.89	-3.7	89.2	90.9	89.8	1.13	80.816	
400.0	399.8	400.8	400.8	0.8	0.8	166.62	166.62	-3.7	89.2	96.0	94.4	1.58	60.896	
500.0	499.5	500.5	500.5	1.0	1.0	167.69	167.69	-3.7	89.2	104.5	102.5	2.03	51.409	
600.0	598.7	599.7	599.7	1.3	1.2	168.92	168.92	-3.7	89.2	116.4	114.0	2.49	46.725	
700.0	697.5	698.5	698.5	1.7	1.5	170.18	170.18	-3.7	89.2	131.8	128.9	2.95	44.632	
800.0	795.6	796.6	796.6	2.0	1.7	171.36	171.36	-3.7	89.2	150.7	147.3	3.42	44.088	
867.8	861.8	862.8	862.8	2.3	1.8	172.09	172.09	-3.7	89.2	165.4	161.7	3.73	44.308	
900.0	893.1	894.1	894.1	2.5	1.9	172.43	172.43	-3.7	89.2	172.8	168.9	3.88	44.499	
1,000.0	990.4	991.4	991.4	3.0	2.1	173.32	173.32	-3.7	89.2	195.7	191.4	4.35	44.976	
1,100.0	1,087.7	1,088.7	1,088.7	3.4	2.3	174.02	174.02	-3.7	89.2	218.7	213.9	4.82	45.327	
1,200.0	1,185.0	1,186.0	1,186.0	3.9	2.6	174.59	174.59	-3.7	89.2	241.7	236.4	5.30	45.592	
1,300.0	1,282.3	1,283.3	1,283.3	4.4	2.8	175.06	175.06	-3.7	89.2	264.7	258.9	5.78	45.798	
1,400.0	1,379.6	1,380.6	1,380.6	4.9	3.0	175.46	175.46	-3.7	89.2	287.7	281.5	6.26	45.960	
1,500.0	1,476.9	1,477.9	1,477.9	5.4	3.2	175.80	175.80	-3.7	89.2	310.8	304.0	6.74	46.090	
1,600.0	1,574.2	1,583.8	1,583.8	5.9	3.4	176.01	176.01	-2.9	88.2	332.8	325.6	7.24	45.988	
1,700.0	1,671.5	1,693.7	1,693.6	6.4	3.7	175.90	175.90	0.6	84.1	351.7	343.9	7.73	45.473	
1,800.0	1,768.8	1,804.9	1,804.3	6.9	3.9	175.49	175.49	6.8	76.7	367.1	358.9	8.24	44.555	
1,900.0	1,866.0	1,915.7	1,914.3	7.4	4.2	174.82	174.82	15.7	66.1	379.2	370.5	8.76	43.300	
2,000.0	1,963.3	2,015.1	2,012.6	7.9	4.5	174.13	174.13	24.7	55.4	390.0	380.7	9.26	42.098	
2,100.0	2,060.6	2,114.4	2,110.9	8.4	4.7	173.49	173.49	33.8	44.6	400.7	391.0	9.78	40.986	
2,200.0	2,157.9	2,213.7	2,209.2	8.9	5.0	172.88	172.88	42.8	33.8	411.6	401.3	10.30	39.964	
2,300.0	2,255.2	2,313.0	2,307.6	9.4	5.3	172.30	172.30	51.8	23.1	422.5	411.6	10.83	39.025	
2,400.0	2,352.5	2,412.3	2,405.9	9.9	5.6	171.75	171.75	60.9	12.3	433.4	422.0	11.36	38.153	
2,500.0	2,449.8	2,511.6	2,504.2	10.4	5.9	171.22	171.22	69.9	1.6	444.3	432.4	11.90	37.345	
2,600.0	2,547.1	2,611.0	2,602.5	10.9	6.2	170.73	170.73	78.9	-9.2	455.3	442.9	12.44	36.595	
2,700.0	2,644.4	2,710.3	2,700.8	11.4	6.5	170.25	170.25	87.9	-19.9	466.4	453.4	12.99	35.897	
2,800.0	2,741.7	2,809.6	2,799.2	11.9	6.8	169.80	169.80	97.0	-30.7	477.4	463.9	13.54	35.247	
2,900.0	2,839.0	2,908.9	2,897.5	12.4	7.1	169.36	169.36	106.0	-41.4	488.5	474.4	14.10	34.638	
3,000.0	2,936.3	3,008.2	2,995.8	12.9	7.4	168.95	168.95	115.0	-52.2	499.6	484.9	14.66	34.069	
3,100.0	3,033.6	3,107.5	3,094.1	13.4	7.8	168.56	168.56	124.1	-62.9	510.7	495.5	15.23	33.535	
3,200.0	3,130.9	3,206.9	3,192.4	13.9	8.1	168.18	168.18	133.1	-73.7	521.9	506.1	15.80	33.033	
3,300.0	3,228.2	3,306.2	3,290.8	14.4	8.4	167.81	167.81	142.1	-84.4	533.1	516.7	16.37	32.562	
3,400.0	3,325.5	3,405.5	3,389.1	14.9	8.7	167.47	167.47	151.2	-95.2	544.3	527.3	16.95	32.117	
3,500.0	3,422.8	3,504.8	3,487.4	15.4	9.0	167.13	167.13	160.2	-105.9	555.5	538.0	17.53	31.697	
3,600.0	3,520.1	3,604.1	3,585.7	15.9	9.4	166.81	166.81	169.2	-116.7	566.7	548.6	18.11	31.301	
3,700.0	3,617.4	3,703.5	3,684.0	16.4	9.7	166.50	166.50	178.2	-127.5	578.0	559.3	18.69	30.925	
3,800.0	3,714.7	3,802.8	3,782.4	16.9	10.0	166.21	166.21	187.3	-138.2	589.3	570.0	19.28	30.570	
3,900.0	3,812.0	3,902.1	3,880.7	17.4	10.4	165.92	165.92	196.3	-149.0	600.5	580.7	19.86	30.232	
4,000.0	3,909.2	4,001.4	3,979.0	17.9	10.7	165.65	165.65	205.3	-159.7	611.8	591.4	20.45	29.912	
4,100.0	4,006.5	4,100.7	4,077.3	18.4	11.0	165.38	165.38	214.4	-170.5	623.2	602.1	21.05	29.607	
4,200.0	4,103.8	4,200.0	4,175.6	18.9	11.4	165.13	165.13	223.4	-181.2	634.5	612.8	21.64	29.317	
4,300.0	4,201.1	4,299.4	4,274.0	19.4	11.7	164.88	164.88	232.4	-192.0	645.8	623.6	22.24	29.041	
4,400.0	4,298.4	4,398.7	4,372.3	19.9	12.0	164.64	164.64	241.5	-202.7	657.2	634.3	22.84	28.777	
4,500.0	4,395.7	4,498.0	4,470.6	20.4	12.4	164.41	164.41	250.5	-213.5	668.5	645.1	23.44	28.525	
4,600.0	4,493.0	4,597.3	4,568.9	20.9	12.7	164.19	164.19	259.5	-224.2	679.9	655.8	24.04	28.285	
4,700.0	4,590.3	4,696.6	4,667.2	21.4	13.0	163.98	163.98	268.6	-235.0	691.3	666.6	24.64	28.054	
4,800.0	4,687.6	4,795.9	4,765.6	21.9	13.4	163.77	163.77	277.6	-245.7	702.7	677.4	25.24	27.834	
4,900.0	4,784.9	4,895.3	4,863.9	22.4	13.7	163.57	163.57	286.6	-256.5	714.1	688.2	25.85	27.623	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Chestnut 28M-203
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4634.0ft (RKB - 15')
Reference Site:	Chestnut 28M-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4634.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Chestnut 28M-203	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (12-17-13)	Offset TVD Reference:	Offset Datum

Offset Design		Chestnut 28M-HZ Pad Sec.28-T5N-R64W - Chestnut 28R-443 - Wellbore #1 - Plan #1 (12-17-13)											Offset Site Error:		0.0 ft
Survey Program: 0-MWD													Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance								
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning		
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
5,000.0	4,882.2	4,994.6	4,962.2	23.0	14.1	163.37	295.6	-267.2	725.5	699.0	26.46	27.420			
5,100.0	4,979.5	5,093.9	5,060.5	23.5	14.4	163.18	304.7	-278.0	736.9	709.8	27.07	27.226			
5,160.3	5,038.2	5,149.7	5,115.7	23.8	14.6	163.09	309.7	-284.0	743.8	716.4	27.41	27.135			
5,200.0	5,076.9	5,182.5	5,148.3	23.9	14.7	163.07	312.4	-287.2	748.5	720.9	27.63	27.091			
5,300.0	5,174.8	5,265.2	5,230.5	24.3	14.9	163.06	318.2	-294.1	759.5	731.4	28.09	27.035			
5,400.0	5,273.4	5,347.8	5,312.9	24.6	15.0	163.10	322.4	-299.1	769.3	740.8	28.49	27.003			
5,500.0	5,372.5	5,430.4	5,395.3	24.8	15.2	163.18	325.1	-302.3	778.1	749.2	28.83	26.991			
5,600.0	5,472.1	5,512.8	5,477.7	25.0	15.3	163.31	326.3	-303.7	785.6	756.5	29.10	26.998			
5,700.0	5,571.9	5,608.0	5,572.9	25.2	15.5	163.46	326.3	-303.8	791.5	762.2	29.35	26.967			
5,800.0	5,671.8	5,707.9	5,672.8	25.3	15.6	163.53	326.3	-303.8	794.1	764.5	29.60	26.829			
5,828.2	5,700.0	5,736.1	5,701.0	25.3	15.7	90.26	326.3	-303.8	794.3	764.6	29.67	26.773			
5,900.0	5,771.8	5,807.9	5,772.8	25.4	15.8	90.26	326.3	-303.8	794.3	764.4	29.92	26.549			
6,000.0	5,871.8	5,907.9	5,872.8	25.5	16.0	90.26	326.3	-303.8	794.3	764.0	30.27	26.237			
6,020.5	5,892.4	5,928.5	5,893.4	25.5	16.0	90.26	326.3	-303.8	794.3	763.9	30.35	26.174			
6,050.0	5,921.8	5,957.9	5,922.8	25.6	16.1	-89.78	326.3	-303.8	794.3	763.8	30.45	26.082			
6,095.3	5,967.0	6,003.1	5,968.0	25.6	16.2	-90.00	326.3	-303.8	794.3	763.6	30.63	25.934			
6,100.0	5,971.7	6,007.8	5,972.7	25.6	16.2	-90.03	326.3	-303.8	794.3	763.6	30.65	25.917			
6,150.0	6,021.2	6,057.3	6,022.2	25.6	16.3	-90.52	326.3	-303.8	794.3	763.4	30.86	25.739			
6,200.0	6,070.2	6,106.9	6,071.8	25.6	16.3	-91.19	325.9	-303.8	794.4	763.4	31.08	25.561			
6,250.0	6,118.4	6,157.3	6,122.1	25.6	16.4	-91.90	322.6	-303.8	794.7	763.5	31.26	25.425			
6,300.0	6,165.6	6,208.4	6,172.7	25.6	16.4	-92.60	315.8	-303.8	795.1	763.7	31.39	25.327			
6,350.0	6,211.7	6,260.3	6,223.6	25.6	16.5	-93.30	305.4	-303.8	795.6	764.1	31.49	25.267			
6,400.0	6,256.4	6,312.9	6,274.3	25.6	16.5	-93.98	291.5	-303.8	796.3	764.7	31.55	25.242			
6,450.0	6,299.6	6,366.2	6,324.6	25.6	16.5	-94.66	273.8	-303.8	797.0	765.4	31.57	25.247			
6,500.0	6,341.0	6,420.4	6,374.2	25.5	16.4	-95.31	252.3	-303.8	797.8	766.2	31.56	25.278			
6,550.0	6,380.5	6,475.3	6,422.9	25.5	16.4	-95.95	226.9	-303.8	798.7	767.2	31.54	25.325			
6,600.0	6,417.8	6,531.0	6,470.4	25.5	16.4	-96.57	197.7	-303.8	799.7	768.2	31.51	25.378			
6,650.0	6,453.0	6,587.5	6,516.1	25.5	16.3	-97.15	164.6	-303.8	800.7	769.2	31.49	25.426			
6,700.0	6,485.7	6,644.7	6,559.9	25.4	16.3	-97.71	127.8	-303.8	801.7	770.2	31.50	25.453			
6,750.0	6,515.9	6,702.7	6,601.3	25.4	16.2	-98.23	87.1	-303.8	802.7	771.2	31.55	25.443			
6,800.0	6,543.5	6,761.5	6,640.0	25.4	16.2	-98.72	43.0	-303.8	803.7	772.0	31.67	25.378			
6,850.0	6,568.2	6,820.9	6,675.5	25.4	16.2	-99.16	-4.6	-303.8	804.7	772.8	31.88	25.244			
6,900.0	6,590.1	6,880.9	6,707.6	25.5	16.2	-99.56	-55.4	-303.8	805.6	773.4	32.18	25.030			
6,950.0	6,608.9	6,941.6	6,735.8	25.5	16.2	-99.92	-109.1	-303.8	806.4	773.8	32.62	24.722			
7,000.0	6,624.7	7,002.7	6,759.8	25.6	16.3	-100.22	-165.3	-303.8	807.1	774.0	33.18	24.327			
7,050.0	6,637.4	7,064.3	6,779.5	25.7	16.6	-100.47	-223.6	-303.8	807.8	773.9	33.89	23.836			
7,100.0	6,646.8	7,126.3	6,794.4	25.8	17.0	-100.66	-283.8	-303.8	808.2	773.5	34.74	23.268			
7,150.0	6,653.1	7,188.5	6,804.4	26.0	17.5	-100.79	-345.2	-303.8	808.6	772.9	35.72	22.638			
7,200.0	6,656.0	7,241.0	6,810.0	26.2	18.0	-100.93	-397.3	-303.8	809.0	772.3	36.74	22.022			
7,224.3	6,656.3	7,265.2	6,812.5	26.3	18.3	-101.05	-421.4	-303.8	809.5	772.2	37.25	21.732			
7,300.0	6,655.9	7,351.2	6,819.0	26.6	19.2	-101.53	-507.2	-303.8	810.7	771.7	38.94	20.820			
7,400.0	6,655.5	7,457.4	6,819.9	27.3	20.4	-101.63	-613.4	-303.8	810.9	769.6	41.30	19.632			
7,500.0	6,655.0	7,557.4	6,819.9	28.1	21.7	-101.66	-713.4	-303.8	811.0	767.2	43.80	18.514			
7,600.0	6,654.5	7,657.4	6,819.9	29.0	23.1	-101.70	-813.4	-303.8	811.1	764.6	46.48	17.452			
7,700.0	6,654.0	7,757.4	6,819.9	30.1	24.5	-101.73	-913.4	-303.8	811.2	761.9	49.29	16.457			
7,800.0	6,653.5	7,857.4	6,819.9	31.2	26.0	-101.77	-1,013.4	-303.8	811.3	759.1	52.23	15.534			
7,900.0	6,653.0	7,957.4	6,820.0	32.5	27.6	-101.80	-1,113.4	-303.8	811.4	756.2	55.27	14.682			
8,000.0	6,652.5	8,057.4	6,820.0	33.8	29.2	-101.84	-1,213.4	-303.8	811.5	753.1	58.39	13.899			
8,100.0	6,652.0	8,157.4	6,820.0	35.2	30.8	-101.87	-1,313.4	-303.8	811.6	750.0	61.58	13.180			
8,200.0	6,651.5	8,257.4	6,820.0	36.6	32.5	-101.91	-1,413.4	-303.8	811.7	746.9	64.84	12.520			
8,300.0	6,651.1	8,357.4	6,820.0	38.1	34.2	-101.94	-1,513.4	-303.8	811.8	743.7	68.14	11.914			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Chestnut 28M-203
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4634.0ft (RKB - 15')
Reference Site:	Chestnut 28M-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4634.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Chestnut 28M-203	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (12-17-13)	Offset TVD Reference:	Offset Datum

Offset Design		Chestnut 28M-HZ Pad Sec.28-T5N-R64W - Chestnut 28R-443 - Wellbore #1 - Plan #1 (12-17-13)											Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre	Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
8,400.0	6,650.6	8,457.4	6,820.1	39.6	35.9	-101.98	-1,613.4	-303.8	811.9	740.4	71.50	11.357		
8,500.0	6,650.1	8,557.4	6,820.1	41.2	37.6	-102.01	-1,713.4	-303.8	812.0	737.2	74.89	10.844		
8,600.0	6,649.6	8,657.4	6,820.1	42.8	39.4	-102.05	-1,813.4	-303.8	812.1	733.8	78.31	10.371		
8,700.0	6,649.1	8,757.4	6,820.1	44.4	41.1	-102.08	-1,913.4	-303.8	812.3	730.5	81.76	9.934		
8,800.0	6,648.6	8,857.4	6,820.1	46.1	42.9	-102.12	-2,013.3	-303.8	812.4	727.1	85.24	9.530		
8,900.0	6,648.1	8,957.4	6,820.1	47.8	44.7	-102.15	-2,113.3	-303.8	812.5	723.7	88.74	9.155		
9,000.0	6,647.6	9,057.4	6,820.2	49.5	46.5	-102.19	-2,213.3	-303.8	812.6	720.3	92.26	8.807		
9,100.0	6,647.1	9,157.4	6,820.2	51.2	48.3	-102.22	-2,313.3	-303.8	812.7	716.9	95.80	8.483		
9,200.0	6,646.7	9,257.4	6,820.2	52.9	50.1	-102.26	-2,413.3	-303.8	812.8	713.4	99.35	8.181		
9,300.0	6,646.2	9,357.4	6,820.2	54.6	51.9	-102.29	-2,513.3	-303.8	812.9	710.0	102.92	7.898		
9,400.0	6,645.7	9,457.4	6,820.2	56.4	53.8	-102.33	-2,613.3	-303.8	813.0	706.5	106.50	7.634		
9,500.0	6,645.2	9,557.4	6,820.2	58.1	55.6	-102.36	-2,713.3	-303.8	813.1	703.0	110.09	7.386		
9,600.0	6,644.7	9,657.4	6,820.3	59.9	57.5	-102.39	-2,813.3	-303.8	813.2	699.5	113.69	7.153		
9,700.0	6,644.2	9,757.4	6,820.3	61.7	59.3	-102.43	-2,913.3	-303.8	813.3	696.0	117.30	6.934		
9,800.0	6,643.7	9,857.4	6,820.3	63.5	61.2	-102.46	-3,013.3	-303.8	813.4	692.5	120.92	6.727		
9,900.0	6,643.2	9,957.4	6,820.3	65.3	63.0	-102.50	-3,113.3	-303.8	813.5	689.0	124.54	6.532		
10,000.0	6,642.7	10,057.4	6,820.3	67.1	64.9	-102.53	-3,213.3	-303.8	813.7	685.5	128.18	6.348		
10,100.0	6,642.3	10,157.4	6,820.3	68.9	66.7	-102.57	-3,313.3	-303.8	813.8	682.0	131.81	6.174		
10,200.0	6,641.8	10,257.4	6,820.4	70.7	68.6	-102.60	-3,413.3	-303.8	813.9	678.4	135.46	6.008		
10,300.0	6,641.3	10,357.4	6,820.4	72.5	70.5	-102.64	-3,513.3	-303.8	814.0	674.9	139.10	5.852		
10,400.0	6,640.8	10,457.4	6,820.4	74.3	72.3	-102.67	-3,613.3	-303.8	814.1	671.3	142.75	5.703		
10,500.0	6,640.3	10,557.4	6,820.4	76.2	74.2	-102.71	-3,713.3	-303.8	814.2	667.8	146.41	5.561		
10,600.0	6,639.8	10,657.4	6,820.4	78.0	76.1	-102.74	-3,813.3	-303.8	814.3	664.3	150.07	5.426		
10,700.0	6,639.3	10,757.4	6,820.5	79.8	78.0	-102.78	-3,913.3	-303.8	814.4	660.7	153.73	5.298		
10,800.0	6,638.8	10,857.4	6,820.5	81.7	79.8	-102.81	-4,013.3	-303.8	814.5	657.1	157.40	5.175		
10,900.0	6,638.3	10,957.4	6,820.5	83.5	81.7	-102.85	-4,113.3	-303.8	814.7	653.6	161.07	5.058		
11,000.0	6,637.9	11,057.4	6,820.5	85.4	83.6	-102.88	-4,213.3	-303.8	814.8	650.0	164.74	4.946		
11,100.0	6,637.4	11,157.4	6,820.5	87.2	85.5	-102.92	-4,313.3	-303.8	814.9	646.5	168.41	4.839		
11,200.0	6,636.9	11,257.4	6,820.5	89.1	87.4	-102.95	-4,413.3	-303.8	815.0	642.9	172.09	4.736		
11,300.0	6,636.4	11,357.4	6,820.6	90.9	89.3	-102.99	-4,513.3	-303.8	815.1	639.3	175.76	4.638		
11,400.0	6,635.9	11,457.4	6,820.6	92.8	91.2	-103.02	-4,613.3	-303.8	815.2	635.8	179.44	4.543		
11,500.0	6,635.4	11,557.4	6,820.6	94.6	93.1	-103.06	-4,713.3	-303.8	815.3	632.2	183.12	4.452		
11,600.0	6,634.9	11,657.4	6,820.6	96.5	95.0	-103.09	-4,813.3	-303.8	815.5	628.6	186.81	4.365		
11,700.0	6,634.4	11,757.4	6,820.6	98.4	96.8	-103.12	-4,913.3	-303.8	815.6	625.1	190.49	4.281		
11,800.0	6,633.9	11,857.4	6,820.6	100.2	98.7	-103.16	-5,013.3	-303.8	815.7	621.5	194.17	4.201		
11,900.0	6,633.5	11,957.4	6,820.7	102.1	100.6	-103.19	-5,113.3	-303.8	815.8	617.9	197.86	4.123		
12,000.0	6,633.0	12,057.4	6,820.7	104.0	102.5	-103.23	-5,213.3	-303.8	815.9	614.4	201.54	4.048		
12,100.0	6,632.5	12,157.4	6,820.7	105.9	104.4	-103.26	-5,313.3	-303.8	816.0	610.8	205.23	3.976		
12,200.0	6,632.0	12,257.4	6,820.7	107.7	106.3	-103.30	-5,413.3	-303.8	816.1	607.2	208.92	3.907		
12,300.0	6,631.5	12,357.4	6,820.7	109.6	108.2	-103.33	-5,513.3	-303.8	816.3	603.7	212.61	3.839		
12,400.0	6,631.0	12,457.4	6,820.7	111.5	110.1	-103.37	-5,613.3	-303.8	816.4	600.1	216.29	3.774		
12,500.0	6,630.5	12,557.4	6,820.8	113.4	112.0	-103.40	-5,713.3	-303.8	816.5	596.5	219.98	3.712		
12,600.0	6,630.0	12,657.4	6,820.8	115.3	113.9	-103.44	-5,813.3	-303.8	816.6	592.9	223.67	3.651		
12,700.0	6,629.6	12,757.4	6,820.8	117.1	115.8	-103.47	-5,913.3	-303.8	816.7	589.4	227.36	3.592		
12,800.0	6,629.1	12,857.4	6,820.8	119.0	117.7	-103.50	-6,013.3	-303.8	816.9	585.8	231.05	3.535		
12,900.0	6,628.6	12,957.4	6,820.8	120.9	119.6	-103.54	-6,113.3	-303.8	817.0	582.2	234.74	3.480		
13,000.0	6,628.1	13,057.4	6,820.9	122.8	121.5	-103.57	-6,213.3	-303.8	817.1	578.7	238.43	3.427		
13,100.0	6,627.6	13,157.4	6,820.9	124.7	123.4	-103.61	-6,313.3	-303.8	817.2	575.1	242.12	3.375		
13,200.0	6,627.1	13,257.4	6,820.9	126.6	125.3	-103.64	-6,413.3	-303.8	817.3	571.5	245.81	3.325		
13,300.0	6,626.6	13,357.4	6,820.9	128.5	127.3	-103.68	-6,513.3	-303.8	817.4	567.9	249.50	3.276		
13,400.0	6,626.1	13,457.4	6,820.9	130.3	129.2	-103.71	-6,613.3	-303.8	817.6	564.4	253.19	3.229		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Chestnut 28M-203
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4634.0ft (RKB - 15')
Reference Site:	Chestnut 28M-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4634.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Chestnut 28M-203	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (12-17-13)	Offset TVD Reference:	Offset Datum

Offset Design Chestnut 28M-HZ Pad Sec.28-T5N-R64W - Chestnut 28R-443 - Wellbore #1 - Plan #1 (12-17-13)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
13,500.0	6,625.6	13,557.4	6,820.9	132.2	131.1	-103.75	-6,713.3	-303.8	817.7	560.8	256.88	3.183		
13,600.0	6,625.2	13,657.4	6,821.0	134.1	133.0	-103.78	-6,813.3	-303.8	817.8	557.2	260.57	3.138		
13,700.0	6,624.7	13,757.4	6,821.0	136.0	134.9	-103.81	-6,913.3	-303.8	817.9	553.7	264.26	3.095		
13,800.0	6,624.2	13,857.4	6,821.0	137.9	136.8	-103.85	-7,013.3	-303.8	818.0	550.1	267.95	3.053		
13,836.0	6,624.0	13,893.4	6,821.0	138.6	137.5	-103.86	-7,049.3	-303.8	818.1	548.8	269.28	3.038 SF		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Chestnut 28M-203
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4634.0ft (RKB - 15')
Reference Site:	Chestnut 28M-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4634.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Chestnut 28M-203	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (12-17-13)	Offset TVD Reference:	Offset Datum

Offset Design		Existing Wells - Churchill 28J-HZ Sec.28-T5N-R64W - Churchill 2-7I (Exist) - Wellbore #1 - Wellbore #1										Offset Site Error:		0.0 ft			
Survey Program: 514-MWD														Offset Well Error:		0.0 ft	
Reference		Offset		Semi Major Axis			Distance							Warning			
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor					
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)						
6,650.0	6,453.0	6,505.9	6,436.5	25.5	19.8	11.60	-892.6	-1,236.1	987.4	954.7	32.72	30.182					
6,700.0	6,485.7	6,538.2	6,468.8	25.4	19.8	12.84	-893.2	-1,235.2	950.4	919.1	31.29	30.372					
6,750.0	6,515.9	6,569.5	6,500.1	25.4	19.9	14.43	-893.7	-1,234.3	911.4	881.5	29.90	30.479					
6,800.0	6,543.5	6,598.7	6,529.3	25.4	19.9	16.48	-894.2	-1,233.5	870.5	841.9	28.62	30.416					
6,850.0	6,568.2	6,625.0	6,555.6	25.4	20.0	19.16	-894.5	-1,232.7	827.8	800.3	27.55	30.052					
6,900.0	6,590.1	6,648.2	6,578.8	25.5	20.0	22.71	-894.9	-1,232.1	783.7	756.8	26.85	29.187					
6,950.0	6,608.9	6,668.3	6,598.9	25.5	20.0	27.49	-895.1	-1,231.6	738.3	711.5	26.77	27.581					
7,000.0	6,624.7	6,685.1	6,615.7	25.6	20.1	34.02	-895.3	-1,231.1	691.8	664.2	27.58	25.080					
7,050.0	6,637.4	6,698.6	6,629.2	25.7	20.1	42.93	-895.4	-1,230.8	644.4	614.9	29.51	21.835					
7,100.0	6,646.8	6,708.8	6,639.4	25.8	20.1	54.70	-895.5	-1,230.6	596.5	564.2	32.37	18.430					
7,150.0	6,653.1	6,715.7	6,646.2	26.0	20.1	68.97	-895.6	-1,230.4	548.3	513.1	35.17	15.591					
7,200.0	6,656.0	6,719.2	6,649.8	26.2	20.1	83.85	-895.6	-1,230.3	500.0	463.4	36.59	13.666					
7,224.3	6,656.3	6,719.7	6,650.3	26.3	20.1	90.52	-895.6	-1,230.3	476.7	440.0	36.63	13.011					
7,300.0	6,655.9	6,720.1	6,650.6	26.6	20.1	90.66	-895.6	-1,230.3	404.5	367.1	37.40	10.815					
7,400.0	6,655.5	6,720.5	6,651.1	27.3	20.1	90.86	-895.6	-1,230.3	311.7	273.2	38.52	8.091					
7,500.0	6,655.0	6,720.9	6,651.5	28.1	20.1	91.05	-895.6	-1,230.3	225.1	185.4	39.75	5.664					
7,600.0	6,654.5	6,721.4	6,651.9	29.0	20.1	91.24	-895.6	-1,230.3	155.7	114.6	41.07	3.791					
7,682.2	6,654.1	6,721.7	6,652.3	29.9	20.1	91.39	-895.7	-1,230.2	132.2	90.0	42.22	3.132	CC, ES, SF				
7,700.0	6,654.0	6,721.8	6,652.4	30.1	20.1	91.42	-895.7	-1,230.2	133.4	90.9	42.47	3.141					
7,800.0	6,653.5	6,722.2	6,652.8	31.2	20.1	91.61	-895.7	-1,230.2	177.1	133.1	43.93	4.030					
7,900.0	6,653.0	6,722.7	6,653.2	32.5	20.1	91.80	-895.7	-1,230.2	254.8	209.3	45.45	5.606					
8,000.0	6,652.5	6,723.1	6,653.6	33.8	20.1	91.98	-895.7	-1,230.2	344.2	297.2	47.01	7.322					
8,100.0	6,652.0	6,723.5	6,654.1	35.2	20.1	92.16	-895.7	-1,230.2	438.2	389.6	48.61	9.015					
8,200.0	6,651.5	6,723.9	6,654.5	36.6	20.1	92.34	-895.7	-1,230.2	534.4	484.1	50.24	10.636					
8,300.0	6,651.1	6,724.3	6,654.9	38.1	20.1	92.52	-895.7	-1,230.2	631.7	579.8	51.90	12.172					
8,400.0	6,650.6	6,724.7	6,655.3	39.6	20.1	92.70	-895.7	-1,230.2	729.8	676.2	53.58	13.620					
8,500.0	6,650.1	6,725.2	6,655.7	41.2	20.1	92.87	-895.7	-1,230.2	828.4	773.1	55.29	14.982					
8,600.0	6,649.6	6,725.6	6,656.1	42.8	20.1	93.05	-895.7	-1,230.2	927.2	870.2	57.01	16.263					

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Chestnut 28M-203
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4634.0ft (RKB - 15')
Reference Site:	Chestnut 28M-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4634.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Chestnut 28M-203	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (12-17-13)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4634.0ft (RKB - 15')

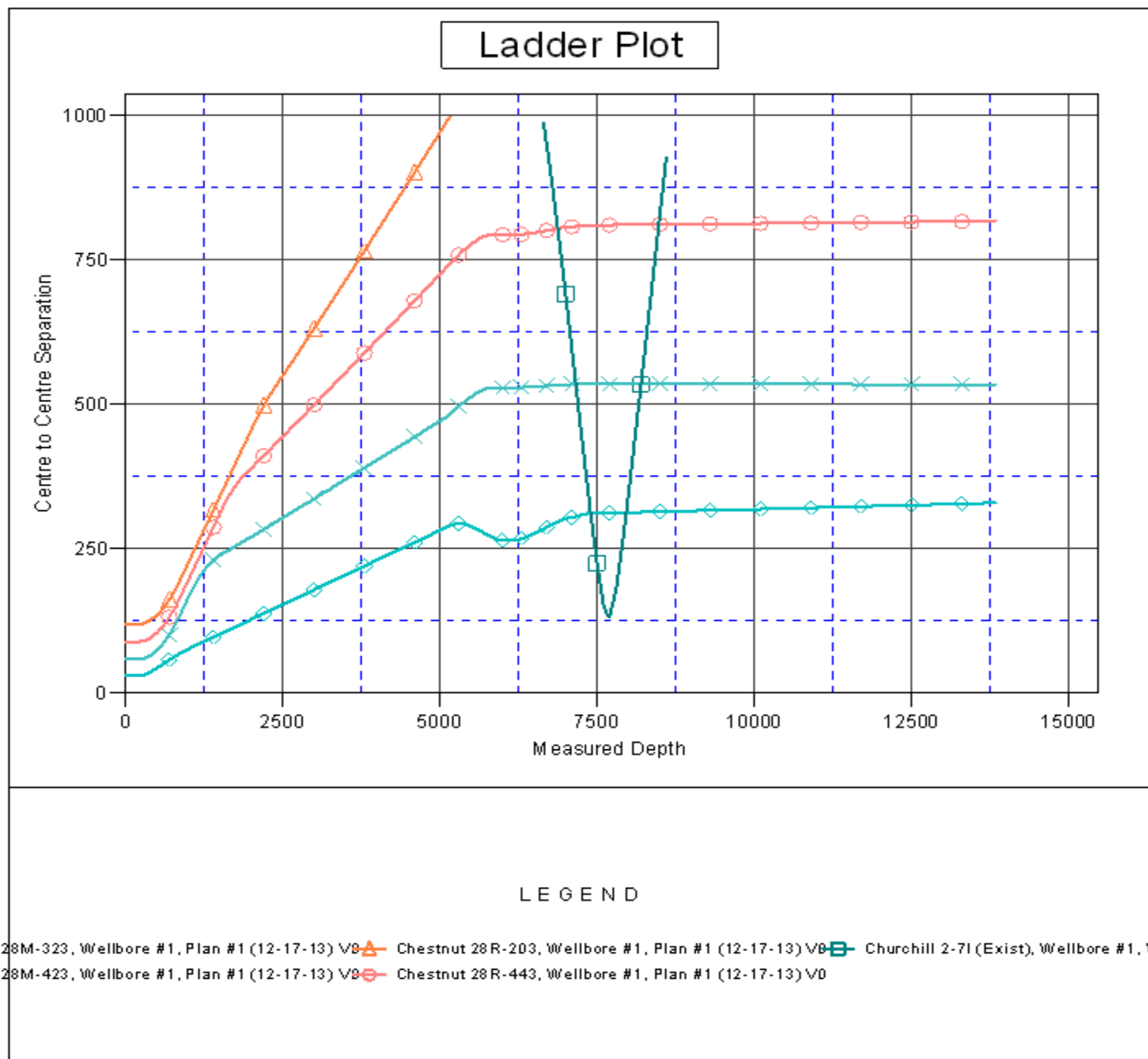
Offset Depths are relative to Offset Datum

Central Meridian is -105.500000 °

Coordinates are relative to: Chestnut 28M-203

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.61°



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Chestnut 28M-203
Project:	SEC.28-T5N-R64W	TVD Reference:	WELL @ 4634.0ft (RKB - 15')
Reference Site:	Chestnut 28M-HZ Pad Sec.28-T5N-R64W	MD Reference:	WELL @ 4634.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Chestnut 28M-203	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (12-17-13)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4634.0ft (RKB - 15')
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °

Coordinates are relative to: Chestnut 28M-203
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.61°

