

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Suden 34R-343**

Surface Location: Suden 34R-HZ Pad Sec.34-T5N-R64W
 North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone
 Ground Elevation: 4668.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1376257.15	3269603.70	40.362190	-104.532500	

Ensign Rig #136 - RKB - 12.5' WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')

WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 327'FNL & 1717'FEL	-1.5	0.0	0.0	Point
BHL 500'FSL & 1714'FEL	6698.0	-4455.5	36.1	Point



Azimuths to True North
 Magnetic North: 8.31°

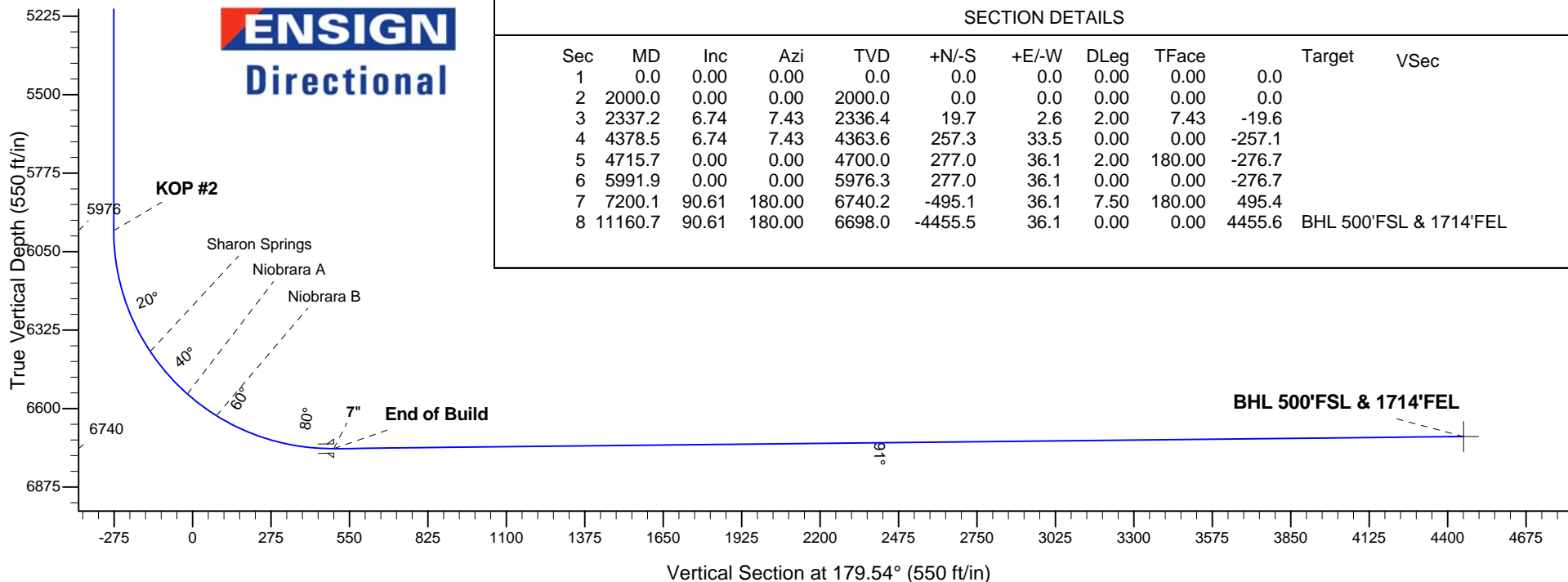
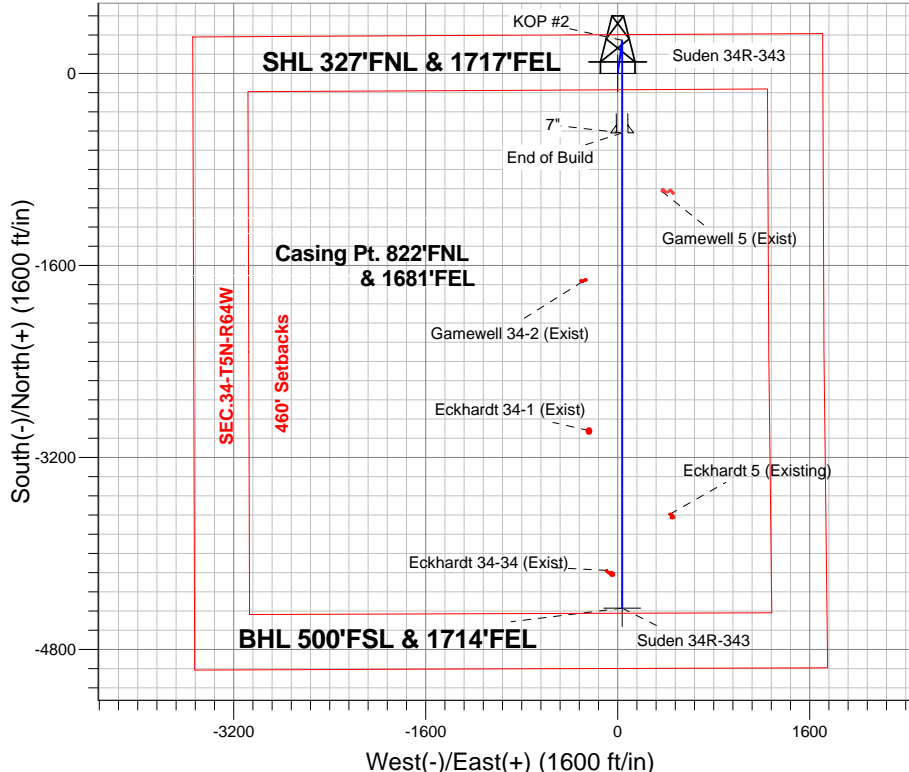
Magnetic Field
 Strength: 52807.6snT
 Dip Angle: 66.95°
 Date: 7/31/2014
 Model: IGRF2010

ANNOTATIONS

TVD	MD	Annotation
2000.0	2000.0	KOP #1
5976.2	5991.9	KOP #2
6740.2	7200.1	End of Build

Suden 34R-HZ Pad Sec.34-T5N-R64W
 Suden 34R-343
 Plan #2 (7-31-14)
 15:24, July 31 2014

South(-)/North(+) (1600 ft/in)



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	Target	VSec
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	2000.0	0.00	0.00	2000.0	0.0	0.0	0.00	0.00	0.0	
3	2337.2	6.74	7.43	2336.4	19.7	2.6	2.00	7.43	-19.6	
4	4378.5	6.74	7.43	4363.6	257.3	33.5	0.00	0.00	-257.1	
5	4715.7	0.00	0.00	4700.0	277.0	36.1	2.00	180.00	-276.7	
6	5991.9	0.00	0.00	5976.3	277.0	36.1	0.00	0.00	-276.7	
7	7200.1	90.61	180.00	6740.2	-495.1	36.1	7.50	180.00	495.4	
8	11160.7	90.61	180.00	6698.0	-4455.5	36.1	0.00	0.00	4455.6	BHL 500'FSL & 1714'FEL



PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.34-T5N-R64W

Suden 34R-HZ Pad Sec.34-T5N-R64W

Suden 34R-343

Wellbore #1

Plan: Plan #2 (7-31-14)

Standard Planning Report

31 July, 2014

Database:	Landmark	Local Co-ordinate Reference:	Well Suden 34R-343
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Project:	SEC.34-T5N-R64W	MD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Site:	Suden 34R-HZ Pad Sec.34-T5N-R64W	North Reference:	True
Well:	Suden 34R-343	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (7-31-14)		

Project	SEC.34-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						Suden 34R-HZ Pad Sec.34-T5N-R64W											
Site Position:						Northing:			1,376,256.50 ft			Latitude:			40.362190		
From:			Lat/Long			Easting:			3,269,542.40 ft			Longitude:			-104.532720		
Position Uncertainty:			0.0 ft			Slot Radius:			"			Grid Convergence:			0.62 °		

Well	Suden 34R-343					
Well Position	+N/-S	0.0 ft	Northing:	1,376,257.15 ft	Latitude:	40.362190
	+E/-W	61.3 ft	Easting:	3,269,603.70 ft	Longitude:	-104.532500
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,668.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/31/2014	8.31	66.95	52,808

Design	Plan #2 (7-31-14)			
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	179.54

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	
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,337.2	6.74	7.43	2,336.4	19.7	2.6	2.00	2.00	0.00	7.43	
4,378.5	6.74	7.43	4,363.6	257.3	33.5	0.00	0.00	0.00	0.00	
4,715.7	0.00	0.00	4,700.0	277.0	36.1	2.00	-2.00	0.00	180.00	
5,991.9	0.00	0.00	5,976.3	277.0	36.1	0.00	0.00	0.00	0.00	
7,200.1	90.61	180.00	6,740.2	-495.1	36.1	7.50	7.50	0.00	180.00	
11,160.7	90.61	180.00	6,698.0	-4,455.5	36.1	0.00	0.00	0.00	0.00	BHL 500'FSL & 171

Database:	Landmark	Local Co-ordinate Reference:	Well Suden 34R-343
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Project:	SEC.34-T5N-R64W	MD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Site:	Suden 34R-HZ Pad Sec.34-T5N-R64W	North Reference:	True
Well:	Suden 34R-343	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (7-31-14)		

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
SHL 327°FNL & 1717°FEL									
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
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP #1									
2,100.0	2.00	7.43	2,100.0	1.7	0.2	-1.7	2.00	2.00	0.00
2,200.0	4.00	7.43	2,199.8	6.9	0.9	-6.9	2.00	2.00	0.00
2,300.0	6.00	7.43	2,299.5	15.6	2.0	-15.5	2.00	2.00	0.00
2,337.2	6.74	7.43	2,336.4	19.7	2.6	-19.6	2.00	2.00	0.00
2,400.0	6.74	7.43	2,398.8	27.0	3.5	-26.9	0.00	0.00	0.00
2,500.0	6.74	7.43	2,498.1	38.6	5.0	-38.6	0.00	0.00	0.00
2,600.0	6.74	7.43	2,597.4	50.3	6.5	-50.2	0.00	0.00	0.00
2,700.0	6.74	7.43	2,696.7	61.9	8.1	-61.8	0.00	0.00	0.00
2,800.0	6.74	7.43	2,796.0	73.5	9.6	-73.5	0.00	0.00	0.00
2,900.0	6.74	7.43	2,895.3	85.2	11.1	-85.1	0.00	0.00	0.00
3,000.0	6.74	7.43	2,994.6	96.8	12.6	-96.7	0.00	0.00	0.00
3,100.0	6.74	7.43	3,093.9	108.5	14.1	-108.4	0.00	0.00	0.00
3,200.0	6.74	7.43	3,193.3	120.1	15.7	-120.0	0.00	0.00	0.00
3,300.0	6.74	7.43	3,292.6	131.8	17.2	-131.6	0.00	0.00	0.00
3,400.0	6.74	7.43	3,391.9	143.4	18.7	-143.3	0.00	0.00	0.00
3,500.0	6.74	7.43	3,491.2	155.1	20.2	-154.9	0.00	0.00	0.00
3,508.9	6.74	7.43	3,500.0	156.1	20.3	-155.9	0.00	0.00	0.00
Parkman									
3,600.0	6.74	7.43	3,590.5	166.7	21.7	-166.5	0.00	0.00	0.00
3,700.0	6.74	7.43	3,689.8	178.3	23.2	-178.1	0.00	0.00	0.00
3,800.0	6.74	7.43	3,789.1	190.0	24.8	-189.8	0.00	0.00	0.00
3,900.0	6.74	7.43	3,888.4	201.6	26.3	-201.4	0.00	0.00	0.00
4,000.0	6.74	7.43	3,987.7	213.3	27.8	-213.0	0.00	0.00	0.00
4,100.0	6.74	7.43	4,087.0	224.9	29.3	-224.7	0.00	0.00	0.00
4,200.0	6.74	7.43	4,186.3	236.6	30.8	-236.3	0.00	0.00	0.00
4,264.1	6.74	7.43	4,250.0	244.0	31.8	-243.8	0.00	0.00	0.00
Sussex									
4,300.0	6.74	7.43	4,285.6	248.2	32.3	-247.9	0.00	0.00	0.00
4,378.5	6.74	7.43	4,363.6	257.3	33.5	-257.1	0.00	0.00	0.00

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Well:	Suden 34R-343	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (7-31-14)		

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)
4,400.0	6.31	7.43	4,385.0	259.8	33.9	-259.5	2.00	-2.00	0.00
4,500.0	4.31	7.43	4,484.5	269.0	35.1	-268.7	2.00	-2.00	0.00
4,600.0	2.31	7.43	4,584.4	274.7	35.8	-274.4	2.00	-2.00	0.00
4,700.0	0.31	7.43	4,684.3	277.0	36.1	-276.7	2.00	-2.00	0.00
4,715.7	0.00	0.00	4,700.0	277.0	36.1	-276.7	2.00	-2.00	0.00
4,800.0	0.00	0.00	4,784.3	277.0	36.1	-276.7	0.00	0.00	0.00
4,900.0	0.00	0.00	4,884.3	277.0	36.1	-276.7	0.00	0.00	0.00
5,000.0	0.00	0.00	4,984.3	277.0	36.1	-276.7	0.00	0.00	0.00
5,100.0	0.00	0.00	5,084.3	277.0	36.1	-276.7	0.00	0.00	0.00
5,185.7	0.00	0.00	5,170.0	277.0	36.1	-276.7	0.00	0.00	0.00
Shannon									
5,200.0	0.00	0.00	5,184.3	277.0	36.1	-276.7	0.00	0.00	0.00
5,300.0	0.00	0.00	5,284.3	277.0	36.1	-276.7	0.00	0.00	0.00
5,400.0	0.00	0.00	5,384.3	277.0	36.1	-276.7	0.00	0.00	0.00
5,500.0	0.00	0.00	5,484.3	277.0	36.1	-276.7	0.00	0.00	0.00
5,600.0	0.00	0.00	5,584.3	277.0	36.1	-276.7	0.00	0.00	0.00
5,700.0	0.00	0.00	5,684.3	277.0	36.1	-276.7	0.00	0.00	0.00
5,800.0	0.00	0.00	5,784.3	277.0	36.1	-276.7	0.00	0.00	0.00
5,900.0	0.00	0.00	5,884.3	277.0	36.1	-276.7	0.00	0.00	0.00
5,991.9	0.00	0.00	5,976.2	277.0	36.1	-276.7	0.00	0.00	0.00
KOP #2									
6,000.0	0.60	180.00	5,984.3	277.0	36.1	-276.7	7.46	7.46	0.00
6,100.0	8.10	180.00	6,084.0	269.4	36.1	-269.1	7.50	7.50	0.00
6,200.0	15.60	180.00	6,181.8	248.8	36.1	-248.5	7.50	7.50	0.00
6,300.0	23.10	180.00	6,276.0	215.7	36.1	-215.4	7.50	7.50	0.00
6,400.0	30.60	180.00	6,365.2	170.6	36.1	-170.3	7.50	7.50	0.00
6,441.1	33.69	180.00	6,400.0	148.7	36.1	-148.4	7.50	7.50	0.00
Sharon Springs									
6,500.0	38.10	180.00	6,447.7	114.2	36.1	-113.9	7.50	7.50	0.00
6,600.0	45.60	180.00	6,522.1	47.5	36.1	-47.2	7.50	7.50	0.00
6,639.5	48.57	180.00	6,549.0	18.6	36.1	-18.3	7.50	7.50	0.00
Niobrara A									
6,700.0	53.10	180.00	6,587.2	-28.3	36.1	28.6	7.50	7.50	0.00
6,766.9	58.12	180.00	6,625.0	-83.5	36.1	83.8	7.50	7.50	0.00
Niobrara B									
6,800.0	60.60	180.00	6,641.9	-112.0	36.1	112.3	7.50	7.50	0.00
6,900.0	68.10	180.00	6,685.1	-202.1	36.1	202.3	7.50	7.50	0.00
7,000.0	75.60	180.00	6,716.2	-297.0	36.1	297.3	7.50	7.50	0.00
7,100.0	83.10	180.00	6,734.7	-395.2	36.1	395.5	7.50	7.50	0.00
7,200.0	90.60	180.00	6,740.2	-495.0	36.1	495.3	7.50	7.50	0.00
7,200.1	90.61	180.00	6,740.2	-495.1	36.1	495.4	5.86	5.86	0.00
End of Build - 7"									
7,300.0	90.61	180.00	6,739.1	-595.0	36.1	595.3	0.00	0.00	0.00
7,400.0	90.61	180.00	6,738.0	-695.0	36.1	695.3	0.00	0.00	0.00
7,500.0	90.61	180.00	6,737.0	-795.0	36.1	795.2	0.00	0.00	0.00
7,600.0	90.61	180.00	6,735.9	-895.0	36.1	895.2	0.00	0.00	0.00
7,700.0	90.61	180.00	6,734.8	-995.0	36.1	995.2	0.00	0.00	0.00
7,800.0	90.61	180.00	6,733.8	-1,095.0	36.1	1,095.2	0.00	0.00	0.00
7,900.0	90.61	180.00	6,732.7	-1,195.0	36.1	1,195.2	0.00	0.00	0.00
8,000.0	90.61	180.00	6,731.6	-1,295.0	36.1	1,295.2	0.00	0.00	0.00
8,100.0	90.61	180.00	6,730.6	-1,394.9	36.1	1,395.2	0.00	0.00	0.00

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Site:	Suden 34R-HZ Pad Sec.34-T5N-R64W	North Reference:	True
Well:	Suden 34R-343	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (7-31-14)		

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)
8,200.0	90.61	180.00	6,729.5	-1,494.9	36.1	1,495.2	0.00	0.00	0.00
8,300.0	90.61	180.00	6,728.5	-1,594.9	36.1	1,595.2	0.00	0.00	0.00
8,400.0	90.61	180.00	6,727.4	-1,694.9	36.1	1,695.2	0.00	0.00	0.00
8,500.0	90.61	180.00	6,726.3	-1,794.9	36.1	1,795.2	0.00	0.00	0.00
8,600.0	90.61	180.00	6,725.3	-1,894.9	36.1	1,895.2	0.00	0.00	0.00
8,700.0	90.61	180.00	6,724.2	-1,994.9	36.1	1,995.1	0.00	0.00	0.00
8,800.0	90.61	180.00	6,723.1	-2,094.9	36.1	2,095.1	0.00	0.00	0.00
8,900.0	90.61	180.00	6,722.1	-2,194.9	36.1	2,195.1	0.00	0.00	0.00
9,000.0	90.61	180.00	6,721.0	-2,294.9	36.1	2,295.1	0.00	0.00	0.00
9,100.0	90.61	180.00	6,719.9	-2,394.9	36.1	2,395.1	0.00	0.00	0.00
9,200.0	90.61	180.00	6,718.9	-2,494.9	36.1	2,495.1	0.00	0.00	0.00
9,300.0	90.61	180.00	6,717.8	-2,594.9	36.1	2,595.1	0.00	0.00	0.00
9,400.0	90.61	180.00	6,716.7	-2,694.9	36.1	2,695.1	0.00	0.00	0.00
9,500.0	90.61	180.00	6,715.7	-2,794.9	36.1	2,795.1	0.00	0.00	0.00
9,600.0	90.61	180.00	6,714.6	-2,894.9	36.1	2,895.1	0.00	0.00	0.00
9,700.0	90.61	180.00	6,713.6	-2,994.9	36.1	2,995.1	0.00	0.00	0.00
9,800.0	90.61	180.00	6,712.5	-3,094.9	36.1	3,095.0	0.00	0.00	0.00
9,900.0	90.61	180.00	6,711.4	-3,194.8	36.1	3,195.0	0.00	0.00	0.00
10,000.0	90.61	180.00	6,710.4	-3,294.8	36.1	3,295.0	0.00	0.00	0.00
10,100.0	90.61	180.00	6,709.3	-3,394.8	36.1	3,395.0	0.00	0.00	0.00
10,200.0	90.61	180.00	6,708.2	-3,494.8	36.1	3,495.0	0.00	0.00	0.00
10,300.0	90.61	180.00	6,707.2	-3,594.8	36.1	3,595.0	0.00	0.00	0.00
10,400.0	90.61	180.00	6,706.1	-3,694.8	36.1	3,695.0	0.00	0.00	0.00
10,500.0	90.61	180.00	6,705.0	-3,794.8	36.1	3,795.0	0.00	0.00	0.00
10,600.0	90.61	180.00	6,704.0	-3,894.8	36.1	3,895.0	0.00	0.00	0.00
10,700.0	90.61	180.00	6,702.9	-3,994.8	36.1	3,995.0	0.00	0.00	0.00
10,800.0	90.61	180.00	6,701.8	-4,094.8	36.1	4,095.0	0.00	0.00	0.00
10,900.0	90.61	180.00	6,700.8	-4,194.8	36.1	4,194.9	0.00	0.00	0.00
11,000.0	90.61	180.00	6,699.7	-4,294.8	36.1	4,294.9	0.00	0.00	0.00
11,100.0	90.61	180.00	6,698.6	-4,394.8	36.1	4,394.9	0.00	0.00	0.00
11,160.7	90.61	180.00	6,698.0	-4,455.5	36.1	4,455.6	0.00	0.00	0.00

BHL 500'FSL & 1714'FEL

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,200.1	6,740.2	7"	7	7-1/2

Database:	Landmark	Local Co-ordinate Reference:	Well Suden 34R-343
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Project:	SEC.34-T5N-R64W	MD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Site:	Suden 34R-HZ Pad Sec.34-T5N-R64W	North Reference:	True
Well:	Suden 34R-343	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (7-31-14)		

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
3,508.9	3,500.0	Parkman		0.00		
4,264.1	4,250.0	Sussex		0.00		
5,185.7	5,170.0	Shannon		0.00		
6,441.1	6,400.0	Sharon Springs		0.00		
6,639.5	6,549.0	Niobrara A		0.00		
6,766.9	6,625.0	Niobrara B		0.00		

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
2,000.0	2,000.0	0.0	0.0	KOP #1	
5,991.9	5,976.2	277.0	36.1	KOP #2	
7,200.1	6,740.2	-495.1	36.1	End of Build	



PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.34-T5N-R64W

Suden 34R-HZ Pad Sec.34-T5N-R64W

Suden 34R-343

Wellbore #1

Plan #2 (7-31-14)

Anticollision Report

31 July, 2014



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Suden 34R-343
Project:	SEC.34-T5N-R64W	TVD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Reference Site:	Suden 34R-HZ Pad Sec.34-T5N-R64W	MD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Suden 34R-343	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 #2 (7-31-14)	Offset TVD Reference:	Offset Datum

Reference	Plan #2 (7-31-14)		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.0ft	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 7/31/2014			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	11,160.7	Plan #2 (7-31-14) (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						
Suden (Existing) Pad Sec.34-T5N-R64W						
Eckhardt 34-1 (Exist) - Wellbore #1 - Wellbore #1	9,681.5	6,670.2	275.8	82.4	1.426	Level 3, CC, ES, SF
Eckhardt 34-34 (Exist) - Wellbore #1 - Wellbore #1	10,846.7	6,658.2	131.1	37.6	1.402	Level 3, CC, ES, SF
Eckhardt 5 (Existing) - Wellbore #1 - Wellbore #1	10,377.2	6,654.9	398.1	313.5	4.707	CC, ES
Eckhardt 5 (Existing) - Wellbore #1 - Wellbore #1	10,400.0	6,654.6	398.8	313.8	4.691	SF
Gamewell 34-2 (Exist) - Wellbore #1 - Wellbore #1	8,439.9	6,722.9	330.0	280.7	6.696	CC, ES
Gamewell 34-2 (Exist) - Wellbore #1 - Wellbore #1	8,500.0	6,721.8	335.5	285.1	6.663	SF
Gamewell 5 (Exist) - Wellbore #1 - Wellbore #1	7,684.8	6,715.4	332.7	294.9	8.799	CC, ES
Gamewell 5 (Exist) - Wellbore #1 - Wellbore #1	7,700.0	6,715.3	333.0	295.0	8.755	SF
Suden 34R-HZ Pad Sec.34-T5N-R64W						
Suden 34M-223 - Wellbore #1 - Plan #2 (7-31-14)	1,500.0	1,500.0	30.7	24.1	4.703	CC, ES
Suden 34M-223 - Wellbore #1 - Plan #2 (7-31-14)	11,160.7	11,097.0	413.3	239.9	2.383	SF
Suden 34M-423 - Wellbore #1 - Plan #2 (7-31-14)	966.3	967.3	61.3	57.2	14.876	CC
Suden 34M-423 - Wellbore #1 - Plan #2 (7-31-14)	1,000.0	1,001.0	61.3	57.0	14.349	ES
Suden 34M-423 - Wellbore #1 - Plan #2 (7-31-14)	11,160.7	11,260.5	681.0	507.7	3.930	SF
Suden 34R-203 - Wellbore #1 - Plan #2 (6-30-14)	1,500.0	1,500.0	30.7	24.1	4.703	CC, ES
Suden 34R-203 - Wellbore #1 - Plan #2 (6-30-14)	11,160.7	11,090.1	271.8	101.3	1.594	SF

Offset Design Suden (Existing) Pad Sec.34-T5N-R64W - Eckhardt 34-1 (Exist) - Wellbore #1 - Wellbore #1											
Survey Program: 6886-UNKNOWN											
Offset Site Error: 0.0ft											
Offset Well Error: 0.0ft											
Reference	Offset	Semi Major Axis		Distance		Minimum		Separation		Warning	
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)	Factor
8,800.0	6,723.1	6,679.6	6,679.6	43.8	133.6	91.95	-2,976.4	-239.7	923.6	746.3	177.28
8,900.0	6,722.1	6,678.6	6,678.6	45.6	133.6	91.73	-2,976.4	-239.7	828.7	649.6	179.09
9,000.0	6,721.0	6,677.5	6,677.5	47.4	133.6	91.51	-2,976.4	-239.7	735.2	554.3	180.91
9,100.0	6,719.9	6,676.4	6,676.4	49.3	133.5	91.29	-2,976.4	-239.7	643.6	460.9	182.74
9,200.0	6,718.9	6,675.4	6,675.4	51.1	133.5	91.06	-2,976.4	-239.7	554.9	370.3	184.56
9,300.0	6,717.8	6,674.3	6,674.3	52.9	133.5	90.84	-2,976.4	-239.7	470.8	284.4	186.40
9,400.0	6,716.7	6,673.2	6,673.2	54.8	133.5	90.62	-2,976.4	-239.7	394.1	205.9	188.23
9,500.0	6,715.7	6,672.2	6,672.2	56.6	133.4	90.40	-2,976.4	-239.7	330.2	140.1	190.07

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 Suden 34R-343
Project:	SEC.34-T5N-R64W	TVD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Reference Site:	Suden 34R-HZ Pad Sec.34-T5N-R64W	MD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Suden 34R-343	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 #2 (7-31-14)	Offset TVD Reference:	Offset Datum

Offset Design Suden (Existing) Pad Sec.34-T5N-R64W - Eckhardt 34-1 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 6886-UNKNOWN													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	
9,600.0	6,714.6	6,671.1	6,671.1	58.5	133.4	90.18	-2,976.4	-239.7	287.6	95.7	191.91	1.499	Level 3	
9,681.5	6,713.7	6,670.2	6,670.2	60.0	133.4	90.00	-2,976.4	-239.7	275.8	82.4	193.41	1.426	Level 3, CC, ES, SF	
9,700.0	6,713.6	6,670.1	6,670.1	60.3	133.4	89.96	-2,976.4	-239.7	276.4	82.7	193.75	1.427	Level 3	
9,800.0	6,712.5	6,669.0	6,669.0	62.2	133.4	89.74	-2,976.4	-239.7	300.2	104.6	195.59	1.535		
9,900.0	6,711.4	6,667.9	6,667.9	64.1	133.4	89.52	-2,976.4	-239.7	351.8	154.4	197.43	1.782		
10,000.0	6,710.4	6,666.9	6,666.9	66.0	133.3	89.30	-2,976.4	-239.7	421.3	222.0	199.27	2.114		
10,100.0	6,709.3	6,665.8	6,665.8	67.8	133.3	89.07	-2,976.4	-239.7	501.1	300.0	201.11	2.492		
10,200.0	6,708.2	6,664.7	6,664.7	69.7	133.3	88.85	-2,976.4	-239.7	587.2	384.3	202.95	2.893		
10,300.0	6,707.2	6,663.7	6,663.7	71.6	133.3	88.63	-2,976.4	-239.7	677.1	472.3	204.79	3.306		
10,400.0	6,706.1	6,662.6	6,662.6	73.5	133.3	88.41	-2,976.4	-239.7	769.5	562.9	206.63	3.724		
10,500.0	6,705.0	6,661.5	6,661.5	75.3	133.2	88.19	-2,976.4	-239.7	863.6	655.2	208.47	4.143		
10,600.0	6,704.0	6,660.5	6,660.5	77.2	133.2	87.97	-2,976.4	-239.7	958.9	748.6	210.30	4.560		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Suden 34R-343
Project:	SEC.34-T5N-R64W	TVD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Reference Site:	Suden 34R-HZ Pad Sec.34-T5N-R64W	MD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Suden 34R-343	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 #2 (7-31-14)	Offset TVD Reference:	Offset Datum

Offset Design		Suden (Existing) Pad Sec.34-T5N-R64W - Eckhardt 34-34 (Exist) - Wellbore #1 - Wellbore #1											Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS													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)			
9,900.0	6,711.4	6,669.7	6,668.0	64.1	11.7	95.29	-4,141.5	-94.9	955.6	880.2	75.47	12.663		
10,000.0	6,710.4	6,668.5	6,666.8	66.0	11.7	94.76	-4,141.5	-94.9	856.7	779.3	77.38	11.071		
10,100.0	6,709.3	6,667.3	6,665.5	67.8	11.7	94.23	-4,141.5	-95.0	758.0	678.7	79.30	9.560		
10,200.0	6,708.2	6,666.1	6,664.3	69.7	11.7	93.69	-4,141.5	-95.0	659.8	578.6	81.21	8.124		
10,300.0	6,707.2	6,664.8	6,663.1	71.6	11.7	93.16	-4,141.5	-95.0	562.1	479.0	83.12	6.763		
10,400.0	6,706.1	6,663.6	6,661.9	73.5	11.6	92.63	-4,141.5	-95.0	465.5	380.4	85.03	5.474		
10,500.0	6,705.0	6,662.4	6,660.6	75.3	11.6	92.10	-4,141.5	-95.0	370.6	283.7	86.94	4.263		
10,600.0	6,704.0	6,661.2	6,659.4	77.2	11.6	91.56	-4,141.5	-95.0	279.3	190.5	88.84	3.144		
10,700.0	6,702.9	6,660.0	6,658.2	79.1	11.6	91.03	-4,141.5	-95.0	196.7	106.0	90.74	2.168		
10,800.0	6,701.8	6,658.7	6,657.0	81.0	11.6	90.49	-4,141.5	-95.0	139.2	46.5	92.63	1.502		
10,846.7	6,701.3	6,658.2	6,656.4	81.9	11.6	90.24	-4,141.5	-95.0	131.1	37.6	93.52	1.402	Level 3, CC, ES, SF	
10,900.0	6,700.8	6,657.5	6,655.7	82.9	11.6	89.96	-4,141.5	-95.0	141.5	47.0	94.52	1.497	Level 3	
11,000.0	6,699.7	6,656.3	6,654.5	84.8	11.6	89.42	-4,141.5	-95.0	201.7	105.3	96.41	2.092		
11,100.0	6,698.6	6,655.1	6,653.3	86.7	11.6	88.89	-4,141.5	-95.0	285.2	186.9	98.28	2.902		
11,160.7	6,698.0	6,654.3	6,652.6	87.8	11.6	88.57	-4,141.5	-95.0	340.3	240.9	99.42	3.423		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Suden 34R-343
Project:	SEC.34-T5N-R64W	TVD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Reference Site:	Suden 34R-HZ Pad Sec.34-T5N-R64W	MD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Suden 34R-343	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 #2 (7-31-14)	Offset TVD Reference:	Offset Datum

Offset Design Suden (Existing) Pad Sec.34-T5N-R64W - Eckhardt 5 (Existing) - Wellbore #1 - Wellbore #1													Offset Site Error: 0.0 ft
Survey Program: 100-NS-GYRO-MS													Offset Well Error: 0.0 ft
Measured Depth (ft)	Vertical Reference Depth (ft)	Measured Depth (ft)	Vertical Offset Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
9,500.0	6,715.7	6,664.5	6,663.1	56.6	11.6	-91.48	-3,672.0	434.2	963.3	895.1	68.18	14.128	
9,600.0	6,714.6	6,663.4	6,662.1	58.5	11.6	-91.33	-3,672.0	434.2	873.2	803.1	70.04	12.467	
9,700.0	6,713.6	6,662.3	6,661.0	60.3	11.6	-91.17	-3,672.0	434.2	785.5	713.6	71.90	10.925	
9,800.0	6,712.5	6,661.2	6,659.9	62.2	11.6	-91.02	-3,672.0	434.2	701.1	627.4	73.77	9.505	
9,900.0	6,711.4	6,660.2	6,658.8	64.1	11.6	-90.86	-3,672.0	434.2	621.4	545.8	75.63	8.216	
10,000.0	6,710.4	6,659.1	6,657.7	66.0	11.6	-90.71	-3,672.0	434.2	548.4	470.9	77.51	7.076	
10,100.0	6,709.3	6,658.0	6,656.7	67.8	11.6	-90.55	-3,672.0	434.2	485.1	405.7	79.38	6.111	
10,200.0	6,708.2	6,656.9	6,655.5	69.7	11.6	-90.39	-3,672.0	434.2	435.8	354.5	81.26	5.363	
10,300.0	6,707.2	6,655.8	6,654.4	71.6	11.6	-90.23	-3,672.0	434.2	405.5	322.4	83.13	4.878	
10,377.2	6,706.3	6,654.9	6,653.6	73.0	11.6	-90.11	-3,672.0	434.2	398.1	313.5	84.58	4.707 CC, ES	
10,400.0	6,706.1	6,654.6	6,653.3	73.5	11.6	-90.07	-3,672.0	434.2	398.8	313.8	85.01	4.691 SF	
10,500.0	6,705.0	6,653.5	6,652.2	75.3	11.6	-89.91	-3,672.0	434.2	416.6	329.7	86.89	4.795	
10,600.0	6,704.0	6,652.4	6,651.1	77.2	11.6	-89.75	-3,672.0	434.2	456.2	367.4	88.78	5.139	
10,700.0	6,702.9	6,651.3	6,650.0	79.1	11.6	-89.58	-3,672.0	434.2	512.5	421.9	90.66	5.653	
10,800.0	6,701.8	6,650.1	6,648.8	81.0	11.5	-89.42	-3,672.0	434.2	580.7	488.2	92.54	6.275	
10,900.0	6,700.8	6,649.0	6,647.7	82.9	11.5	-89.26	-3,672.0	434.2	657.1	562.7	94.43	6.959	
11,000.0	6,699.7	6,647.8	6,646.5	84.8	11.5	-89.09	-3,672.0	434.2	739.1	642.8	96.31	7.674	
11,100.0	6,698.6	6,646.7	6,645.4	86.7	11.5	-88.93	-3,672.0	434.2	825.2	727.0	98.20	8.403	
11,160.7	6,698.0	6,646.0	6,644.7	87.8	11.5	-88.82	-3,672.0	434.2	878.8	779.5	99.34	8.846	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Suden 34R-343
Project:	SEC.34-T5N-R64W	TVD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Reference Site:	Suden 34R-HZ Pad Sec.34-T5N-R64W	MD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Suden 34R-343	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 #2 (7-31-14)	Offset TVD Reference:	Offset Datum

Offset Design Suden (Existing) Pad Sec.34-T5N-R64W - Gamewell 34-2 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error: 0.0 ft
Survey Program: 100-NS-GYRO-MS													Offset Well Error: 0.0 ft
Measured Depth (ft)	Vertical Reference Depth (ft)	Measured Offset Depth (ft)	Vertical Offset Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
7,500.0	6,737.0	6,740.3	6,739.3	21.9	12.0	93.61	-1,734.7	-293.7	996.0	962.1	33.83	29.437	
7,600.0	6,735.9	6,738.4	6,737.4	23.4	12.0	93.29	-1,734.7	-293.7	902.3	866.9	35.30	25.558	
7,700.0	6,734.8	6,736.6	6,735.6	24.9	12.0	92.97	-1,734.7	-293.8	810.0	773.2	36.83	21.993	
7,800.0	6,733.8	6,734.7	6,733.7	26.5	12.0	92.65	-1,734.7	-293.8	719.9	681.5	38.41	18.740	
7,900.0	6,732.7	6,732.9	6,731.9	28.1	12.0	92.33	-1,734.8	-293.8	632.7	592.6	40.04	15.803	
8,000.0	6,731.6	6,731.0	6,730.0	29.8	12.0	92.01	-1,734.8	-293.8	549.8	508.2	41.69	13.188	
8,100.0	6,730.6	6,729.2	6,728.2	31.4	12.0	91.69	-1,734.8	-293.8	473.7	430.3	43.38	10.919	
8,200.0	6,729.5	6,727.3	6,726.3	33.2	12.0	91.36	-1,734.8	-293.9	408.0	362.9	45.10	9.047	
8,300.0	6,728.5	6,725.5	6,724.5	34.9	12.0	91.04	-1,734.8	-293.9	358.4	311.6	46.83	7.654	
8,400.0	6,727.4	6,723.6	6,722.6	36.6	12.0	90.72	-1,734.8	-293.9	332.4	283.8	48.58	6.843	
8,439.9	6,727.0	6,722.9	6,721.9	37.3	11.9	90.59	-1,734.8	-293.9	330.0	280.7	49.29	6.696 CC, ES	
8,500.0	6,726.3	6,721.8	6,720.8	38.4	11.9	90.40	-1,734.8	-293.9	335.5	285.1	50.35	6.663 SF	
8,600.0	6,725.3	6,719.9	6,718.9	40.2	11.9	90.08	-1,734.9	-293.9	366.8	314.7	52.13	7.037	
8,700.0	6,724.2	6,718.0	6,717.1	42.0	11.9	89.75	-1,734.9	-294.0	420.2	366.3	53.92	7.793	
8,800.0	6,723.1	6,716.2	6,715.2	43.8	11.9	89.43	-1,734.9	-294.0	488.4	432.7	55.72	8.766	
8,900.0	6,722.1	6,714.3	6,713.3	45.6	11.9	89.11	-1,734.9	-294.0	566.2	508.7	57.52	9.842	
9,000.0	6,721.0	6,712.5	6,711.5	47.4	11.9	88.79	-1,734.9	-294.0	650.0	590.7	59.34	10.955	
9,100.0	6,719.9	6,710.6	6,709.6	49.3	11.9	88.47	-1,734.9	-294.0	737.9	676.8	61.16	12.066	
9,200.0	6,718.9	6,708.8	6,707.8	51.1	11.9	88.15	-1,734.9	-294.0	828.6	765.6	62.98	13.156	
9,300.0	6,717.8	6,706.9	6,705.9	52.9	11.9	87.82	-1,735.0	-294.1	921.1	856.3	64.81	14.213	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Suden 34R-343
Project:	SEC.34-T5N-R64W	TVD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Reference Site:	Suden 34R-HZ Pad Sec.34-T5N-R64W	MD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Suden 34R-343	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 #2 (7-31-14)	Offset TVD Reference:	Offset Datum

Offset Design Suden (Existing) Pad Sec.34-T5N-R64W - Gamewell 5 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error: 0.0 ft
Survey Program: 100-NS-GYRO-MS													Offset Well Error: 0.0 ft
Measured Depth (ft)	Vertical Reference Depth (ft)	Measured Depth (ft)	Vertical Offset Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis 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
6,800.0	6,641.9	6,617.7	6,615.1	14.8	12.9	-38.01	-979.3	369.7	929.2	908.1	21.16	43.922	
6,900.0	6,685.1	6,661.4	6,658.8	15.4	13.0	-48.90	-979.5	369.3	845.8	822.6	23.25	36.379	
7,000.0	6,716.2	6,693.0	6,690.4	16.1	13.1	-62.94	-979.7	369.0	759.5	732.9	26.56	28.600	
7,100.0	6,734.7	6,712.0	6,709.4	17.0	13.2	-78.12	-979.8	368.8	672.6	643.0	29.55	22.763	
7,200.1	6,740.2	6,718.0	6,715.4	18.1	13.2	-91.01	-979.8	368.7	587.9	556.7	31.19	18.849	
7,300.0	6,739.1	6,717.5	6,714.8	19.2	13.2	-90.92	-979.8	368.7	508.6	476.3	32.37	15.713	
7,400.0	6,738.0	6,716.9	6,714.3	20.5	13.2	-90.82	-979.8	368.7	437.9	404.2	33.66	13.008	
7,500.0	6,737.0	6,716.4	6,713.7	21.9	13.2	-90.73	-979.8	368.7	380.5	345.5	35.05	10.856	
7,600.0	6,735.9	6,715.8	6,713.2	23.4	13.2	-90.63	-979.8	368.7	343.3	306.8	36.51	9.402	
7,684.8	6,735.0	6,715.4	6,712.7	24.7	13.2	-90.56	-979.8	368.7	332.7	294.9	37.81	8.799 CC, ES	
7,700.0	6,734.8	6,715.3	6,712.6	24.9	13.2	-90.54	-979.8	368.7	333.0	295.0	38.04	8.755 SF	
7,800.0	6,733.8	6,714.7	6,712.1	26.5	13.2	-90.45	-979.8	368.7	352.1	312.4	39.61	8.887	
7,900.0	6,732.7	6,714.2	6,711.6	28.1	13.2	-90.35	-979.8	368.8	396.2	355.0	41.23	9.609	
8,000.0	6,731.6	6,713.6	6,711.0	29.8	13.2	-90.26	-979.8	368.8	458.3	415.4	42.89	10.686	
8,100.0	6,730.6	6,713.1	6,710.5	31.4	13.2	-90.17	-979.8	368.8	532.1	487.5	44.57	11.937	
8,200.0	6,729.5	6,712.6	6,709.9	33.2	13.2	-90.07	-979.8	368.8	613.3	567.0	46.28	13.252	
8,300.0	6,728.5	6,712.0	6,709.4	34.9	13.2	-89.98	-979.8	368.8	699.4	651.4	48.01	14.567	
8,400.0	6,727.4	6,711.5	6,708.8	36.6	13.2	-89.88	-979.7	368.8	788.8	739.0	49.76	15.851	
8,500.0	6,726.3	6,710.9	6,708.3	38.4	13.2	-89.79	-979.7	368.8	880.5	829.0	51.53	17.087	
8,600.0	6,725.3	6,710.4	6,707.7	40.2	13.1	-89.70	-979.7	368.8	973.8	920.5	53.31	18.267	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Suden 34R-343
Project:	SEC.34-T5N-R64W	TVD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Reference Site:	Suden 34R-HZ Pad Sec.34-T5N-R64W	MD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Suden 34R-343	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 #2 (7-31-14)	Offset TVD Reference:	Offset Datum

Offset Design Suden 34R-HZ Pad Sec.34-T5N-R64W - Suden 34M-223 - Wellbore #1 - Plan #2 (7-31-14)														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 (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	-90.01	0.0	-30.7	30.7	30.4	0.22	136.384			
100.0	100.0	100.0	100.0	0.1	0.1	-90.01	0.0	-30.7	30.7	30.0	0.67	45.461			
200.0	200.0	200.0	200.0	0.3	0.3	-90.01	0.0	-30.7	30.7	29.5	1.12	27.277			
300.0	300.0	300.0	300.0	0.6	0.6	-90.01	0.0	-30.7	30.7	29.1	1.57	19.483			
400.0	400.0	400.0	400.0	0.8	0.8	-90.01	0.0	-30.7	30.7	28.6	2.02	15.154			
500.0	500.0	500.0	500.0	1.0	1.0	-90.01	0.0	-30.7	30.7	28.2	2.47	12.399			
600.0	600.0	600.0	600.0	1.2	1.2	-90.01	0.0	-30.7	30.7	27.7	2.92	10.491			
700.0	700.0	700.0	700.0	1.5	1.5	-90.01	0.0	-30.7	30.7	27.3	3.37	9.092			
800.0	800.0	800.0	800.0	1.7	1.7	-90.01	0.0	-30.7	30.7	26.8	3.82	8.023			
900.0	900.0	900.0	900.0	1.9	1.9	-90.01	0.0	-30.7	30.7	26.4	4.27	7.178			
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	-90.01	0.0	-30.7	30.7	25.9	4.72	6.494			
1,100.0	1,100.0	1,100.0	1,100.0	2.4	2.4	-90.01	0.0	-30.7	30.7	25.5	5.17	5.930			
1,200.0	1,200.0	1,200.0	1,200.0	2.6	2.6	-90.01	0.0	-30.7	30.7	25.0	5.62	5.455			
1,300.0	1,300.0	1,300.0	1,300.0	2.8	2.8	-90.01	0.0	-30.7	30.7	24.6	6.07	5.051			
1,400.0	1,400.0	1,400.0	1,400.0	3.0	3.0	-90.01	0.0	-30.7	30.7	24.1	6.52	4.703 CC, ES			
1,500.0	1,500.0	1,500.0	1,500.0	3.3	3.3	-90.01	0.0	-30.7	30.7	24.1	6.52	4.703 CC, ES			
1,600.0	1,600.0	1,599.1	1,599.1	3.5	3.5	-88.07	1.1	-32.0	32.0	25.1	6.96	4.600			
1,700.0	1,700.0	1,698.0	1,697.9	3.7	3.7	-83.16	4.3	-36.0	36.3	28.9	7.40	4.904			
1,800.0	1,800.0	1,796.5	1,795.9	3.9	3.9	-77.19	9.7	-42.5	43.8	36.0	7.84	5.589			
1,900.0	1,900.0	1,894.2	1,893.0	4.2	4.2	-71.69	17.1	-51.7	54.9	46.6	8.28	6.624			
2,000.0	2,000.0	1,993.1	1,990.8	4.4	4.4	-67.50	25.8	-62.4	68.2	59.4	8.73	7.809			
2,100.0	2,100.0	2,092.2	2,089.0	4.6	4.7	-73.04	34.6	-73.2	81.2	72.0	9.17	8.855			
2,200.0	2,199.8	2,191.4	2,187.2	4.8	4.9	-73.67	43.4	-84.0	93.2	83.6	9.61	9.699			
2,300.0	2,299.5	2,290.7	2,285.5	5.1	5.2	-75.98	52.2	-94.8	104.4	94.4	10.07	10.375			
2,400.0	2,398.8	2,389.9	2,383.8	5.3	5.5	-79.30	61.0	-105.6	115.3	104.7	10.54	10.940			
2,500.0	2,498.1	2,489.1	2,482.0	5.5	5.8	-82.21	69.8	-116.4	126.4	115.3	11.02	11.469			
2,600.0	2,597.4	2,588.3	2,580.2	5.8	6.1	-84.66	78.6	-127.2	137.7	126.2	11.51	11.964			
2,700.0	2,696.7	2,687.5	2,678.4	6.0	6.4	-86.72	87.4	-137.9	149.3	137.3	12.02	12.425			
2,800.0	2,796.0	2,786.7	2,776.6	6.3	6.7	-88.49	96.1	-148.7	161.1	148.6	12.54	12.852			
2,900.0	2,895.3	2,885.9	2,874.8	6.5	7.0	-90.02	104.9	-159.5	173.0	159.9	13.06	13.246			
3,000.0	2,994.6	2,985.1	2,973.0	6.8	7.3	-91.35	113.7	-170.3	185.0	171.4	13.59	13.610			
3,100.0	3,093.9	3,084.2	3,071.2	7.1	7.7	-92.51	122.5	-181.1	197.1	182.9	14.13	13.947			
3,200.0	3,193.3	3,183.4	3,169.4	7.3	8.0	-93.55	131.3	-191.9	209.2	194.5	14.67	14.258			
3,300.0	3,292.6	3,282.6	3,267.7	7.6	8.3	-94.47	140.1	-202.7	221.4	206.2	15.22	14.546			
3,400.0	3,391.9	3,381.8	3,365.9	7.9	8.6	-95.29	148.9	-213.5	233.7	217.9	15.78	14.813			
3,500.0	3,491.2	3,481.0	3,464.1	8.2	9.0	-96.03	157.6	-224.3	246.0	229.7	16.33	15.061			
3,600.0	3,590.5	3,580.2	3,562.3	8.5	9.3	-96.70	166.4	-235.1	258.3	241.4	16.89	15.291			
3,700.0	3,689.8	3,679.4	3,660.5	8.7	9.6	-97.31	175.2	-245.9	270.7	253.3	17.46	15.505			
3,800.0	3,789.1	3,778.6	3,758.7	9.0	9.9	-97.86	184.0	-256.7	283.1	265.1	18.03	15.705			
3,900.0	3,888.4	3,877.8	3,856.9	9.3	10.3	-98.37	192.8	-267.4	295.5	276.9	18.60	15.892			
4,000.0	3,987.7	3,977.0	3,955.1	9.6	10.6	-98.84	201.6	-278.2	308.0	288.8	19.17	16.067			
4,100.0	4,087.0	4,076.2	4,053.3	9.9	10.9	-99.27	210.4	-289.0	320.4	300.7	19.74	16.230			
4,200.0	4,186.3	4,175.4	4,151.6	10.2	11.3	-99.67	219.2	-299.8	332.9	312.6	20.32	16.384			
4,300.0	4,285.6	4,274.6	4,249.8	10.5	11.6	-100.04	227.9	-310.6	345.4	324.5	20.90	16.529			
4,400.0	4,385.0	4,373.8	4,348.0	10.8	11.9	-100.43	236.7	-321.4	357.9	336.4	21.47	16.668			
4,500.0	4,484.5	4,473.0	4,446.3	11.0	12.3	-100.60	245.5	-332.2	370.0	348.0	21.98	16.830			
4,600.0	4,584.4	4,572.3	4,544.6	11.2	12.6	-100.26	254.3	-343.0	381.4	359.0	22.45	16.987			
4,700.0	4,684.3	4,676.6	4,647.9	11.4	12.9	-99.40	263.3	-354.0	392.0	369.2	22.88	17.134			
4,800.0	4,784.3	4,787.8	4,758.5	11.5	13.2	-90.93	270.6	-362.9	399.9	376.7	23.26	17.192			

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 Suden 34R-343
Project:	SEC.34-T5N-R64W	TVD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Reference Site:	Suden 34R-HZ Pad Sec.34-T5N-R64W	MD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Suden 34R-343	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 #2 (7-31-14)	Offset TVD Reference:	Offset Datum

Offset Design Suden 34R-HZ Pad Sec.34-T5N-R64W - Suden 34M-223 - Wellbore #1 - Plan #2 (7-31-14)													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	
4,900.0	4,884.3	4,899.7	4,870.1	11.7	13.4	-90.26	275.1	-368.6	404.9	381.3	23.65	17.118		
5,000.0	4,984.3	5,012.0	4,982.4	11.9	13.6	-90.01	277.0	-370.8	406.9	382.9	24.04	16.926		
5,100.0	5,084.3	5,113.9	5,084.3	12.1	13.8	-90.00	277.0	-370.9	407.0	382.5	24.43	16.661		
5,200.0	5,184.3	5,213.9	5,184.3	12.3	13.9	-90.00	277.0	-370.9	407.0	382.1	24.82	16.394		
5,300.0	5,284.3	5,313.9	5,284.3	12.5	14.1	-90.00	277.0	-370.9	407.0	381.7	25.22	16.134		
5,400.0	5,384.3	5,413.9	5,384.3	12.7	14.3	-90.00	277.0	-370.9	407.0	381.3	25.62	15.881		
5,500.0	5,484.3	5,513.9	5,484.3	12.9	14.5	-90.00	277.0	-370.9	407.0	380.9	26.03	15.635		
5,600.0	5,584.3	5,613.9	5,584.3	13.2	14.7	-90.00	277.0	-370.9	407.0	380.5	26.43	15.396		
5,700.0	5,684.3	5,713.9	5,684.3	13.4	14.8	-90.00	277.0	-370.9	407.0	380.1	26.84	15.163		
5,800.0	5,784.3	5,813.9	5,784.3	13.6	15.0	-90.00	277.0	-370.9	407.0	379.7	27.25	14.936		
5,900.0	5,884.3	5,913.9	5,884.3	13.8	15.2	-90.00	277.0	-370.9	407.0	379.3	27.65	14.716		
5,932.0	5,916.3	5,945.9	5,916.3	13.8	15.3	89.98	276.8	-370.9	407.0	379.2	27.78	14.649		
6,000.0	5,984.3	6,013.6	5,983.8	14.0	15.3	89.35	272.3	-370.9	407.0	379.0	28.03	14.522		
6,100.0	6,084.0	6,111.8	6,080.5	14.1	15.4	87.96	255.2	-370.9	407.2	379.0	28.26	14.412		
6,200.0	6,181.8	6,208.9	6,173.1	14.2	15.4	86.62	226.3	-370.9	407.7	379.3	28.36	14.377		
6,300.0	6,276.0	6,304.9	6,260.3	14.2	15.4	85.34	186.4	-370.9	408.3	379.9	28.37	14.393		
6,400.0	6,365.2	6,400.0	6,341.1	14.2	15.4	84.15	136.4	-370.9	409.1	380.8	28.35	14.431		
6,500.0	6,447.7	6,493.9	6,414.2	14.2	15.4	83.06	77.5	-370.9	410.0	381.6	28.38	14.448		
6,600.0	6,522.1	6,587.2	6,479.1	14.3	15.4	82.09	10.6	-370.9	410.9	382.3	28.53	14.400		
6,700.0	6,587.2	6,679.7	6,535.0	14.5	15.4	81.25	-63.1	-370.9	411.8	382.9	28.91	14.245		
6,800.0	6,641.9	6,771.7	6,581.3	14.8	15.5	80.55	-142.5	-370.9	412.6	383.0	29.57	13.951		
6,900.0	6,685.1	6,863.3	6,617.6	15.4	15.9	80.00	-226.5	-370.9	413.2	382.7	30.58	13.515		
7,000.0	6,716.2	6,954.5	6,643.5	16.1	16.6	79.61	-313.9	-370.9	413.7	381.8	31.94	12.953		
7,100.0	6,734.7	7,045.5	6,658.8	17.0	17.4	79.38	-403.6	-370.9	414.1	380.4	33.66	12.301		
7,200.1	6,740.2	7,136.4	6,663.3	18.1	18.4	79.31	-494.4	-370.9	414.1	378.5	35.68	11.607		
7,300.0	6,739.1	7,236.3	6,662.4	19.2	19.6	79.32	-594.3	-370.9	414.1	376.1	38.02	10.891		
7,400.0	6,738.0	7,336.3	6,661.4	20.5	20.9	79.34	-694.3	-370.9	414.1	373.5	40.57	10.206		
7,500.0	6,737.0	7,436.3	6,660.5	21.9	22.2	79.36	-794.3	-370.9	414.1	370.8	43.31	9.562		
7,600.0	6,735.9	7,536.3	6,659.6	23.4	23.7	79.37	-894.3	-370.9	414.1	367.9	46.19	8.965		
7,700.0	6,734.8	7,636.3	6,658.6	24.9	25.2	79.39	-994.3	-370.9	414.0	364.8	49.19	8.417		
7,800.0	6,733.8	7,736.3	6,657.7	26.5	26.7	79.41	-1,094.2	-370.9	414.0	361.7	52.30	7.916		
7,900.0	6,732.7	7,836.3	6,656.7	28.1	28.3	79.42	-1,194.2	-370.9	414.0	358.5	55.49	7.461		
8,000.0	6,731.6	7,936.3	6,655.8	29.8	30.0	79.44	-1,294.2	-370.9	414.0	355.2	58.75	7.046		
8,100.0	6,730.6	8,036.3	6,654.9	31.4	31.7	79.46	-1,394.2	-370.9	413.9	351.9	62.07	6.669		
8,200.0	6,729.5	8,136.3	6,653.9	33.2	33.4	79.47	-1,494.2	-370.9	413.9	348.5	65.45	6.325		
8,300.0	6,728.5	8,236.3	6,653.0	34.9	35.1	79.49	-1,594.2	-370.9	413.9	345.0	68.86	6.010		
8,400.0	6,727.4	8,336.3	6,652.0	36.6	36.8	79.51	-1,694.2	-370.9	413.9	341.6	72.32	5.723		
8,500.0	6,726.3	8,436.3	6,651.1	38.4	38.6	79.52	-1,794.2	-370.9	413.9	338.0	75.80	5.460		
8,600.0	6,725.3	8,536.3	6,650.1	40.2	40.3	79.54	-1,894.2	-370.9	413.8	334.5	79.32	5.217		
8,700.0	6,724.2	8,636.3	6,649.2	42.0	42.1	79.56	-1,994.2	-370.9	413.8	331.0	82.86	4.994		
8,800.0	6,723.1	8,736.3	6,648.3	43.8	43.9	79.57	-2,094.2	-370.9	413.8	327.4	86.42	4.788		
8,900.0	6,722.1	8,836.3	6,647.3	45.6	45.7	79.59	-2,194.2	-370.9	413.8	323.8	90.00	4.598		
9,000.0	6,721.0	8,936.3	6,646.4	47.4	47.5	79.61	-2,294.2	-370.9	413.7	320.2	93.59	4.421		
9,100.0	6,719.9	9,036.3	6,645.4	49.3	49.4	79.62	-2,394.2	-370.9	413.7	316.5	97.20	4.256		
9,200.0	6,718.9	9,136.3	6,644.5	51.1	51.2	79.64	-2,494.2	-370.9	413.7	312.9	100.83	4.103		
9,300.0	6,717.8	9,236.3	6,643.5	52.9	53.0	79.66	-2,594.2	-370.9	413.7	309.2	104.46	3.960		
9,400.0	6,716.7	9,336.3	6,642.6	54.8	54.9	79.67	-2,694.2	-370.9	413.7	305.5	108.11	3.826		
9,500.0	6,715.7	9,436.3	6,641.7	56.6	56.7	79.69	-2,794.2	-370.9	413.6	301.9	111.77	3.701		
9,600.0	6,714.6	9,536.3	6,640.7	58.5	58.6	79.71	-2,894.2	-370.9	413.6	298.2	115.44	3.583		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Suden 34R-343
Project:	SEC.34-T5N-R64W	TVD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Reference Site:	Suden 34R-HZ Pad Sec.34-T5N-R64W	MD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Suden 34R-343	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 #2 (7-31-14)	Offset TVD Reference:	Offset Datum

Offset Design Suden 34R-HZ Pad Sec.34-T5N-R64W - Suden 34M-223 - Wellbore #1 - Plan #2 (7-31-14)													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	
9,700.0	6,713.6	9,636.3	6,639.8	60.3	60.4	79.72	-2,994.2	-370.9	413.6	294.5	119.11	3.472		
9,800.0	6,712.5	9,736.3	6,638.8	62.2	62.3	79.74	-3,094.2	-370.9	413.6	290.8	122.79	3.368		
9,900.0	6,711.4	9,836.3	6,637.9	64.1	64.1	79.76	-3,194.2	-370.9	413.5	287.1	126.48	3.270		
10,000.0	6,710.4	9,936.3	6,636.9	66.0	66.0	79.77	-3,294.1	-370.9	413.5	283.3	130.18	3.177		
10,100.0	6,709.3	10,036.3	6,636.0	67.8	67.9	79.79	-3,394.1	-370.9	413.5	279.6	133.88	3.089		
10,200.0	6,708.2	10,136.3	6,635.1	69.7	69.7	79.81	-3,494.1	-370.9	413.5	275.9	137.58	3.005		
10,300.0	6,707.2	10,236.3	6,634.1	71.6	71.6	79.82	-3,594.1	-370.9	413.5	272.2	141.30	2.926		
10,400.0	6,706.1	10,336.3	6,633.2	73.5	73.5	79.84	-3,694.1	-370.9	413.4	268.4	145.01	2.851		
10,500.0	6,705.0	10,436.3	6,632.2	75.3	75.4	79.86	-3,794.1	-370.9	413.4	264.7	148.73	2.780		
10,600.0	6,704.0	10,536.3	6,631.3	77.2	77.3	79.87	-3,894.1	-370.9	413.4	260.9	152.46	2.712		
10,700.0	6,702.9	10,636.3	6,630.3	79.1	79.1	79.89	-3,994.1	-370.9	413.4	257.2	156.19	2.647		
10,800.0	6,701.8	10,736.3	6,629.4	81.0	81.0	79.91	-4,094.1	-370.9	413.4	253.4	159.92	2.585		
10,900.0	6,700.8	10,836.3	6,628.5	82.9	82.9	79.92	-4,194.1	-370.9	413.3	249.7	163.65	2.526		
11,000.0	6,699.7	10,936.3	6,627.5	84.8	84.8	79.94	-4,294.1	-370.9	413.3	245.9	167.39	2.469		
11,100.0	6,698.6	11,036.3	6,626.6	86.7	86.7	79.96	-4,394.1	-370.9	413.3	242.2	171.13	2.415		
11,160.7	6,698.0	11,097.0	6,626.0	87.8	87.8	79.97	-4,454.8	-370.9	413.3	239.9	173.40	2.383 SF		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Suden 34R-343
Project:	SEC.34-T5N-R64W	TVD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Reference Site:	Suden 34R-HZ Pad Sec.34-T5N-R64W	MD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Suden 34R-343	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 #2 (7-31-14)	Offset TVD Reference:	Offset Datum

Offset Design Suden 34R-HZ Pad Sec.34-T5N-R64W - Suden 34M-423 - Wellbore #1 - Plan #2 (7-31-14)													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 (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	1.0	1.0	0.0	0.0	-90.00	0.0	-61.3	61.3	61.3	0.00	N/A		
100.0	100.0	101.0	101.0	0.1	0.1	-90.00	0.0	-61.3	61.3	61.1	0.23	270.068		
200.0	200.0	201.0	201.0	0.3	0.3	-90.00	0.0	-61.3	61.3	60.6	0.68	90.621		
300.0	300.0	301.0	301.0	0.6	0.6	-90.00	0.0	-61.3	61.3	60.2	1.13	54.445		
400.0	400.0	401.0	401.0	0.8	0.8	-90.00	0.0	-61.3	61.3	59.7	1.58	38.911		
500.0	500.0	501.0	501.0	1.0	1.0	-90.00	0.0	-61.3	61.3	59.3	2.03	30.274		
600.0	600.0	601.0	601.0	1.2	1.2	-90.00	0.0	-61.3	61.3	58.8	2.47	24.775		
700.0	700.0	701.0	701.0	1.5	1.5	-90.00	0.0	-61.3	61.3	58.4	2.92	20.966		
800.0	800.0	801.0	801.0	1.7	1.7	-90.00	0.0	-61.3	61.3	57.9	3.37	18.172		
900.0	900.0	901.0	901.0	1.9	1.9	-90.00	0.0	-61.3	61.3	57.5	3.82	16.036		
966.3	966.3	967.3	967.3	2.1	2.1	-90.00	0.0	-61.3	61.3	57.2	4.12	14.876 CC		
1,000.0	1,000.0	1,001.0	1,001.0	2.1	2.1	-90.00	0.0	-61.3	61.3	57.0	4.27	14.349 ES		
1,100.0	1,100.0	1,100.0	1,100.0	2.4	2.4	-89.31	0.8	-62.9	62.9	58.2	4.71	13.346		
1,200.0	1,200.0	1,196.9	1,196.7	2.6	2.6	-87.51	2.9	-67.4	67.6	62.5	5.14	13.141		
1,300.0	1,300.0	1,294.3	1,293.8	2.8	2.8	-85.00	6.6	-74.9	75.5	70.0	5.58	13.534		
1,400.0	1,400.0	1,391.0	1,389.8	3.0	3.0	-82.28	11.6	-85.3	86.8	80.8	6.02	14.412		
1,500.0	1,500.0	1,489.3	1,487.1	3.3	3.3	-79.77	17.7	-98.0	100.5	94.0	6.47	15.531		
1,600.0	1,600.0	1,588.2	1,585.0	3.5	3.6	-77.84	23.9	-110.8	114.4	107.5	6.92	16.538		
1,700.0	1,700.0	1,687.2	1,682.9	3.7	3.9	-76.34	30.0	-123.6	128.5	121.1	7.37	17.432		
1,800.0	1,800.0	1,786.2	1,780.9	3.9	4.2	-75.13	36.2	-136.4	142.6	134.8	7.82	18.226		
1,900.0	1,900.0	1,885.1	1,878.8	4.2	4.5	-74.13	42.4	-149.2	156.7	148.5	8.28	18.936		
2,000.0	2,000.0	1,984.1	1,976.7	4.4	4.8	-73.31	48.6	-162.1	170.9	162.2	8.73	19.573		
2,100.0	2,100.0	2,083.1	2,074.7	4.6	5.1	-80.29	54.8	-174.9	184.9	175.7	9.17	20.163		
2,200.0	2,199.8	2,182.2	2,172.7	4.8	5.4	-80.89	61.0	-187.7	198.2	188.6	9.62	20.596		
2,300.0	2,299.5	2,281.1	2,270.7	5.1	5.7	-82.32	67.2	-200.5	211.2	201.1	10.09	20.933		
2,400.0	2,398.8	2,380.0	2,368.5	5.3	6.1	-84.44	73.3	-213.4	224.0	213.4	10.56	21.203		
2,500.0	2,498.1	2,478.8	2,466.2	5.5	6.4	-86.47	79.5	-226.2	237.1	226.0	11.05	21.452		
2,600.0	2,597.4	2,577.6	2,564.0	5.8	6.7	-88.28	85.7	-239.0	250.4	238.9	11.55	21.681		
2,700.0	2,696.7	2,676.4	2,661.8	6.0	7.1	-89.92	91.9	-251.8	264.0	251.9	12.06	21.893		
2,800.0	2,796.0	2,775.2	2,759.6	6.3	7.4	-91.39	98.0	-264.6	277.8	265.2	12.58	22.088		
2,900.0	2,895.3	2,874.0	2,857.4	6.5	7.7	-92.72	104.2	-277.4	291.7	278.6	13.10	22.267		
3,000.0	2,994.6	2,972.8	2,955.1	6.8	8.1	-93.93	110.4	-290.2	305.8	292.1	13.63	22.432		
3,100.0	3,093.9	3,071.6	3,052.9	7.1	8.4	-95.03	116.6	-303.0	320.0	305.8	14.17	22.584		
3,200.0	3,193.3	3,170.4	3,150.7	7.3	8.8	-96.04	122.8	-315.8	334.3	319.6	14.71	22.724		
3,300.0	3,292.6	3,269.2	3,248.5	7.6	9.1	-96.97	128.9	-328.6	348.7	333.4	15.26	22.854		
3,400.0	3,391.9	3,368.0	3,346.3	7.9	9.4	-97.82	135.1	-341.4	363.2	347.3	15.81	22.974		
3,500.0	3,491.2	3,466.8	3,444.0	8.2	9.8	-98.61	141.3	-354.2	377.7	361.3	16.36	23.085		
3,600.0	3,590.5	3,565.6	3,541.8	8.5	10.1	-99.34	147.5	-367.0	392.3	375.4	16.92	23.189		
3,700.0	3,689.8	3,664.4	3,639.6	8.7	10.5	-100.02	153.6	-379.8	407.0	389.5	17.48	23.286		
3,800.0	3,789.1	3,763.2	3,737.4	9.0	10.8	-100.65	159.8	-392.6	421.7	403.7	18.04	23.376		
3,900.0	3,888.4	3,862.0	3,835.2	9.3	11.1	-101.24	166.0	-405.4	436.5	417.9	18.61	23.460		
4,000.0	3,987.7	3,960.9	3,932.9	9.6	11.5	-101.79	172.2	-418.2	451.3	432.1	19.17	23.540		
4,100.0	4,087.0	4,059.7	4,030.7	9.9	11.8	-102.30	178.3	-431.0	466.2	446.4	19.74	23.614		
4,200.0	4,186.3	4,158.5	4,128.5	10.2	12.2	-102.78	184.5	-443.8	481.1	460.7	20.31	23.684		
4,300.0	4,285.6	4,257.3	4,226.3	10.5	12.5	-103.24	190.7	-456.6	496.0	475.1	20.88	23.750		
4,400.0	4,385.0	4,356.1	4,324.1	10.8	12.9	-103.72	196.9	-469.4	510.9	489.5	21.45	23.814		
4,500.0	4,484.5	4,455.0	4,422.0	11.0	13.2	-104.14	203.0	-482.2	525.3	503.3	21.97	23.913		
4,600.0	4,584.4	4,554.1	4,520.0	11.2	13.6	-104.17	209.2	-495.0	538.8	516.4	22.44	24.009		
4,700.0	4,684.3	4,653.1	4,618.0	11.4	13.9	-103.84	215.4	-507.9	551.5	528.7	22.88	24.106		

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 Suden 34R-343
Project:	SEC.34-T5N-R64W	TVD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Reference Site:	Suden 34R-HZ Pad Sec.34-T5N-R64W	MD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Suden 34R-343	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 #2 (7-31-14)	Offset TVD Reference:	Offset Datum

Offset Design Suden 34R-HZ Pad Sec.34-T5N-R64W - Suden 34M-423 - Wellbore #1 - Plan #2 (7-31-14)														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 (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			
4,800.0	4,784.3	4,752.1	4,715.9	11.5	14.2	-95.68	221.6	-520.7	563.8	540.5	23.30	24.203			
4,900.0	4,884.3	4,851.0	4,813.9	11.7	14.6	-94.94	227.8	-533.5	576.2	552.4	23.73	24.279			
5,000.0	4,984.3	4,950.0	4,911.8	11.9	14.9	-94.22	234.0	-546.3	588.6	564.5	24.17	24.357			
5,100.0	5,084.3	5,049.0	5,009.7	12.1	15.3	-93.54	240.2	-559.1	601.2	576.6	24.60	24.435			
5,200.0	5,184.3	5,147.9	5,107.7	12.3	15.6	-92.89	246.3	-572.0	613.8	588.7	25.04	24.513			
5,300.0	5,284.3	5,246.9	5,205.6	12.5	16.0	-92.26	252.5	-584.8	626.5	601.0	25.47	24.591			
5,400.0	5,384.3	5,345.8	5,303.5	12.7	16.3	-91.65	258.7	-597.6	639.2	613.3	25.91	24.669			
5,500.0	5,484.3	5,448.3	5,404.9	12.9	16.7	-91.05	265.1	-610.8	652.0	625.7	26.35	24.743			
5,600.0	5,584.3	5,573.3	5,529.1	13.2	17.0	-90.48	271.4	-623.9	662.4	635.6	26.80	24.721			
5,700.0	5,684.3	5,699.4	5,654.8	13.4	17.2	-90.14	275.4	-632.2	669.0	641.7	27.22	24.574			
5,800.0	5,784.3	5,826.0	5,781.4	13.6	17.4	-90.00	277.0	-635.4	671.5	643.9	27.64	24.297			
5,900.0	5,884.3	5,930.0	5,885.3	13.8	17.6	-90.00	277.0	-635.5	671.6	643.6	28.03	23.957			
5,965.4	5,949.7	5,995.4	5,950.7	13.9	17.7	90.02	277.0	-635.5	671.6	643.3	28.29	23.739			
6,000.0	5,984.3	6,030.0	5,985.3	14.0	17.8	90.00	277.0	-635.5	671.6	643.2	28.43	23.623			
6,100.0	6,084.0	6,130.0	6,085.3	14.1	17.9	90.57	276.1	-635.5	671.6	642.9	28.70	23.405			
6,200.0	6,181.8	6,231.0	6,185.6	14.2	18.0	91.34	264.4	-635.5	671.8	643.0	28.81	23.314			
6,300.0	6,276.0	6,333.4	6,284.7	14.2	18.0	92.10	239.2	-635.5	672.0	643.2	28.83	23.310			
6,400.0	6,365.2	6,436.9	6,380.7	14.2	18.0	92.82	200.4	-635.5	672.4	643.6	28.80	23.346			
6,500.0	6,447.7	6,541.7	6,471.5	14.2	18.0	93.50	148.4	-635.5	672.8	644.0	28.80	23.361			
6,600.0	6,522.1	6,647.7	6,555.3	14.3	18.0	94.11	83.7	-635.5	673.3	644.4	28.92	23.279			
6,700.0	6,587.2	6,754.7	6,630.0	14.5	18.0	94.66	7.1	-635.5	673.8	644.6	29.26	23.025			
6,800.0	6,641.9	6,862.7	6,693.8	14.8	18.0	95.12	-79.9	-635.5	674.3	644.4	29.91	22.545			
6,900.0	6,685.1	6,971.5	6,745.1	15.4	18.2	95.49	-175.8	-635.5	674.7	643.8	30.92	21.820			
7,000.0	6,716.2	7,080.9	6,782.3	16.1	18.6	95.75	-278.6	-635.5	675.0	642.7	32.32	20.884			
7,100.0	6,734.7	7,190.8	6,804.6	17.0	19.3	95.91	-386.0	-635.5	675.2	641.1	34.10	19.803			
7,200.1	6,740.2	7,300.1	6,811.3	18.1	20.2	95.96	-495.1	-635.5	675.2	639.1	36.19	18.659			
7,300.0	6,739.1	7,400.0	6,811.3	19.2	21.2	96.05	-595.0	-635.5	675.4	636.9	38.49	17.546			
7,400.0	6,738.0	7,500.0	6,811.3	20.5	22.4	96.14	-695.0	-635.5	675.5	634.4	41.02	16.467			
7,500.0	6,737.0	7,600.0	6,811.4	21.9	23.7	96.24	-795.0	-635.5	675.6	631.8	43.74	15.447			
7,600.0	6,735.9	7,700.0	6,811.4	23.4	25.0	96.33	-895.0	-635.5	675.7	629.1	46.61	14.498			
7,700.0	6,734.8	7,800.0	6,811.4	24.9	26.5	96.42	-995.0	-635.5	675.8	626.2	49.60	13.625			
7,800.0	6,733.8	7,900.0	6,811.4	26.5	28.0	96.51	-1,095.0	-635.5	675.9	623.2	52.70	12.826			
7,900.0	6,732.7	8,000.0	6,811.4	28.1	29.5	96.60	-1,194.9	-635.5	676.1	620.2	55.89	12.096			
8,000.0	6,731.6	8,100.0	6,811.4	29.8	31.1	96.69	-1,294.9	-635.5	676.2	617.0	59.15	11.432			
8,100.0	6,730.6	8,200.0	6,811.5	31.4	32.7	96.78	-1,394.9	-635.5	676.3	613.9	62.47	10.826			
8,200.0	6,729.5	8,300.0	6,811.5	33.2	34.3	96.87	-1,494.9	-635.5	676.5	610.6	65.84	10.274			
8,300.0	6,728.5	8,400.0	6,811.5	34.9	36.0	96.96	-1,594.9	-635.5	676.6	607.3	69.26	9.769			
8,400.0	6,727.4	8,500.0	6,811.5	36.6	37.7	97.06	-1,694.9	-635.5	676.7	604.0	72.71	9.307			
8,500.0	6,726.3	8,600.0	6,811.5	38.4	39.4	97.15	-1,794.9	-635.5	676.8	600.6	76.20	8.883			
8,600.0	6,725.3	8,700.0	6,811.6	40.2	41.2	97.24	-1,894.9	-635.5	677.0	597.3	79.71	8.493			
8,700.0	6,724.2	8,800.0	6,811.6	42.0	42.9	97.33	-1,994.9	-635.5	677.1	593.9	83.25	8.134			
8,800.0	6,723.1	8,900.0	6,811.6	43.8	44.7	97.42	-2,094.9	-635.5	677.3	590.5	86.81	7.802			
8,900.0	6,722.1	9,000.0	6,811.6	45.6	46.5	97.51	-2,194.9	-635.5	677.4	587.0	90.38	7.495			
9,000.0	6,721.0	9,099.9	6,811.6	47.4	48.2	97.60	-2,294.9	-635.5	677.5	583.6	93.97	7.210			
9,100.0	6,719.9	9,199.9	6,811.6	49.3	50.0	97.69	-2,394.9	-635.5	677.7	580.1	97.58	6.945			
9,200.0	6,718.9	9,299.9	6,811.7	51.1	51.8	97.78	-2,494.9	-635.5	677.8	576.6	101.20	6.698			
9,300.0	6,717.8	9,399.9	6,811.7	52.9	53.7	97.87	-2,594.9	-635.5	678.0	573.2	104.83	6.468			
9,400.0	6,716.7	9,499.9	6,811.7	54.8	55.5	97.96	-2,694.9	-635.5	678.1	569.7	108.46	6.252			
9,500.0	6,715.7	9,599.9	6,811.7	56.6	57.3	98.05	-2,794.9	-635.5	678.3	566.2	112.11	6.050			

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 Suden 34R-343
Project:	SEC.34-T5N-R64W	TVD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Reference Site:	Suden 34R-HZ Pad Sec.34-T5N-R64W	MD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Suden 34R-343	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 #2 (7-31-14)	Offset TVD Reference:	Offset Datum

Offset Design Suden 34R-HZ Pad Sec.34-T5N-R64W - Suden 34M-423 - Wellbore #1 - Plan #2 (7-31-14)													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 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	
9,600.0	6,714.6	9,699.9	6,811.7	58.5	59.1	98.14	-2,894.8	-635.5	678.4	562.7	115.76	5.860		
9,700.0	6,713.6	9,799.9	6,811.7	60.3	61.0	98.23	-2,994.8	-635.5	678.6	559.2	119.42	5.682		
9,800.0	6,712.5	9,899.9	6,811.8	62.2	62.8	98.32	-3,094.8	-635.5	678.7	555.7	123.09	5.514		
9,900.0	6,711.4	9,999.9	6,811.8	64.1	64.7	98.42	-3,194.8	-635.5	678.9	552.1	126.76	5.356		
10,000.0	6,710.4	10,099.9	6,811.8	66.0	66.5	98.51	-3,294.8	-635.5	679.1	548.6	130.44	5.206		
10,100.0	6,709.3	10,199.9	6,811.8	67.8	68.4	98.60	-3,394.8	-635.5	679.2	545.1	134.12	5.064		
10,200.0	6,708.2	10,299.9	6,811.8	69.7	70.2	98.69	-3,494.8	-635.5	679.4	541.6	137.80	4.930		
10,300.0	6,707.2	10,399.9	6,811.8	71.6	72.1	98.78	-3,594.8	-635.5	679.5	538.1	141.49	4.803		
10,400.0	6,706.1	10,499.9	6,811.9	73.5	74.0	98.87	-3,694.8	-635.5	679.7	534.5	145.17	4.682		
10,500.0	6,705.0	10,599.9	6,811.9	75.3	75.8	98.96	-3,794.8	-635.5	679.9	531.0	148.87	4.567		
10,600.0	6,704.0	10,699.9	6,811.9	77.2	77.7	99.05	-3,894.8	-635.5	680.0	527.5	152.56	4.458		
10,700.0	6,702.9	10,799.8	6,811.9	79.1	79.6	99.14	-3,994.8	-635.5	680.2	524.0	156.25	4.353		
10,800.0	6,701.8	10,899.8	6,811.9	81.0	81.4	99.23	-4,094.8	-635.5	680.4	520.4	159.95	4.254		
10,900.0	6,700.8	10,999.8	6,812.0	82.9	83.3	99.32	-4,194.8	-635.5	680.6	516.9	163.65	4.159		
11,000.0	6,699.7	11,099.8	6,812.0	84.8	85.2	99.41	-4,294.8	-635.5	680.7	513.4	167.35	4.068		
11,100.0	6,698.6	11,199.8	6,812.0	86.7	87.1	99.50	-4,394.8	-635.5	680.9	509.9	171.04	3.981		
11,160.7	6,698.0	11,260.5	6,812.0	87.8	88.2	99.55	-4,455.5	-635.5	681.0	507.7	173.29	3.930 SF		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Suden 34R-343
Project:	SEC.34-T5N-R64W	TVD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Reference Site:	Suden 34R-HZ Pad Sec.34-T5N-R64W	MD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Suden 34R-343	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 #2 (7-31-14)	Offset TVD Reference:	Offset Datum

Offset Design Suden 34R-HZ Pad Sec.34-T5N-R64W - Suden 34R-203 - Wellbore #1 - Plan #2 (6-30-14)														Offset Site Error:	0.0 ft
Survey Program: 0-MWD														Offset Well Error:	0.0 ft
Reference	Offset	Semi Major Axis		Distance		Minimum Separation		Separation Factor		Warning					
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	89.99	0.0	30.7	30.7						
100.0	100.0	100.0	100.0	0.1	0.1	89.99	0.0	30.7	30.7	30.4	0.22	136.384			
200.0	200.0	200.0	200.0	0.3	0.3	89.99	0.0	30.7	30.7	30.0	0.67	45.461			
300.0	300.0	300.0	300.0	0.6	0.6	89.99	0.0	30.7	30.7	29.5	1.12	27.277			
400.0	400.0	400.0	400.0	0.8	0.8	89.99	0.0	30.7	30.7	29.1	1.57	19.483			
500.0	500.0	500.0	500.0	1.0	1.0	89.99	0.0	30.7	30.7	28.6	2.02	15.154			
600.0	600.0	600.0	600.0	1.2	1.2	89.99	0.0	30.7	30.7	28.2	2.47	12.399			
700.0	700.0	700.0	700.0	1.5	1.5	89.99	0.0	30.7	30.7	27.7	2.92	10.491			
800.0	800.0	800.0	800.0	1.7	1.7	89.99	0.0	30.7	30.7	27.3	3.37	9.092			
900.0	900.0	900.0	900.0	1.9	1.9	89.99	0.0	30.7	30.7	26.8	3.82	8.023			
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	89.99	0.0	30.7	30.7	26.4	4.27	7.178			
1,100.0	1,100.0	1,100.0	1,100.0	2.4	2.4	89.99	0.0	30.7	30.7	25.9	4.72	6.494			
1,200.0	1,200.0	1,200.0	1,200.0	2.6	2.6	89.99	0.0	30.7	30.7	25.5	5.17	5.930			
1,300.0	1,300.0	1,300.0	1,300.0	2.8	2.8	89.99	0.0	30.7	30.7	25.0	5.62	5.455			
1,400.0	1,400.0	1,400.0	1,400.0	3.0	3.0	89.99	0.0	30.7	30.7	24.6	6.07	5.051			
1,500.0	1,500.0	1,500.0	1,500.0	3.3	3.3	89.99	0.0	30.7	30.7	24.1	6.52	4.703 CC, ES			
1,600.0	1,600.0	1,599.2	1,599.2	3.5	3.5	87.77	1.2	31.8	31.9	24.9	6.96	4.580			
1,700.0	1,700.0	1,698.2	1,698.0	3.7	3.7	82.07	4.9	35.4	35.8	28.4	7.40	4.838			
1,800.0	1,800.0	1,796.7	1,796.2	3.9	3.9	75.04	11.0	41.3	42.9	35.1	7.84	5.475			
1,900.0	1,900.0	1,895.3	1,894.1	4.2	4.2	68.62	19.3	49.3	53.3	45.0	8.29	6.429			
2,000.0	2,000.0	1,994.6	1,992.6	4.4	4.4	64.14	28.0	57.7	64.5	55.8	8.73	7.390			
2,100.0	2,100.0	2,094.0	2,091.3	4.6	4.6	54.48	36.6	66.1	75.0	65.9	9.18	8.177			
2,200.0	2,199.8	2,193.6	2,190.2	4.8	4.9	54.70	45.3	74.5	83.6	74.0	9.62	8.686			
2,300.0	2,299.5	2,293.3	2,289.2	5.1	5.2	56.70	54.0	82.9	90.2	80.1	10.07	8.953			
2,400.0	2,398.8	2,393.1	2,388.2	5.3	5.4	59.93	62.7	91.3	95.4	84.9	10.54	9.057			
2,500.0	2,498.1	2,492.8	2,487.2	5.5	5.7	62.96	71.4	99.7	100.8	89.8	11.02	9.154			
2,600.0	2,597.4	2,592.5	2,586.1	5.8	6.0	65.68	80.1	108.2	106.5	95.0	11.51	9.255			
2,700.0	2,696.7	2,692.2	2,685.1	6.0	6.3	68.12	88.8	116.6	112.4	100.4	12.01	9.358			
2,800.0	2,796.0	2,791.9	2,784.1	6.3	6.6	70.31	97.5	125.0	118.5	106.0	12.53	9.459			
2,900.0	2,895.3	2,891.7	2,883.1	6.5	6.9	72.28	106.2	133.4	124.7	111.7	13.05	9.557			
3,000.0	2,994.6	2,991.4	2,982.1	6.8	7.2	74.07	114.9	141.8	131.1	117.5	13.58	9.652			
3,100.0	3,093.9	3,091.1	3,081.0	7.1	7.5	75.69	123.7	150.2	137.6	123.4	14.12	9.743			
3,200.0	3,193.3	3,190.8	3,180.0	7.3	7.8	77.16	132.4	158.7	144.1	129.5	14.66	9.829			
3,300.0	3,292.6	3,290.5	3,279.0	7.6	8.0	78.51	141.1	167.1	150.8	135.6	15.21	9.911			
3,400.0	3,391.9	3,390.2	3,378.0	7.9	8.3	79.74	149.8	175.5	157.5	141.8	15.77	9.989			
3,500.0	3,491.2	3,490.0	3,477.0	8.2	8.6	80.87	158.5	183.9	164.3	148.0	16.33	10.063			
3,600.0	3,590.5	3,589.7	3,575.9	8.5	8.9	81.90	167.2	192.3	171.2	154.3	16.90	10.132			
3,700.0	3,689.8	3,689.4	3,674.9	8.7	9.3	82.86	175.9	200.7	178.1	160.7	17.47	10.199			
3,800.0	3,789.1	3,789.1	3,773.9	9.0	9.6	83.75	184.6	209.1	185.1	167.1	18.04	10.261			
3,900.0	3,888.4	3,888.8	3,872.9	9.3	9.9	84.57	193.3	217.6	192.1	173.5	18.61	10.321			
4,000.0	3,987.7	3,988.5	3,971.9	9.6	10.2	85.33	202.0	226.0	199.1	179.9	19.19	10.377			
4,100.0	4,087.0	4,088.3	4,070.8	9.9	10.5	86.05	210.7	234.4	206.2	186.4	19.77	10.430			
4,200.0	4,186.3	4,188.0	4,169.8	10.2	10.8	86.71	219.4	242.8	213.3	193.0	20.35	10.481			
4,300.0	4,285.6	4,287.7	4,268.8	10.5	11.1	87.33	228.1	251.2	220.4	199.5	20.94	10.529			
4,400.0	4,385.0	4,387.4	4,367.8	10.8	11.4	87.92	236.8	259.6	227.6	206.1	21.52	10.578			
4,500.0	4,484.5	4,487.2	4,466.8	11.0	11.7	88.01	245.5	268.1	234.9	212.8	22.02	10.668			
4,600.0	4,584.4	4,586.8	4,565.7	11.2	12.0	87.27	254.2	276.5	242.3	219.8	22.47	10.782			
4,700.0	4,684.3	4,687.0	4,665.2	11.4	12.3	85.79	262.9	284.9	249.9	227.1	22.87	10.927			
4,800.0	4,784.3	4,792.8	4,770.4	11.5	12.6	91.48	270.4	292.1	256.5	233.3	23.22	11.046			

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 Suden 34R-343
Project:	SEC.34-T5N-R64W	TVD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Reference Site:	Suden 34R-HZ Pad Sec.34-T5N-R64W	MD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Suden 34R-343	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 #2 (7-31-14)	Offset TVD Reference:	Offset Datum

Offset Design Suden 34R-HZ Pad Sec.34-T5N-R64W - Suden 34R-203 - Wellbore #1 - Plan #2 (6-30-14)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference	Offset	Semi Major Axis		Distance		Minimum Separation		Separation Factor		Warning				
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		
4,900.0	4,884.3	4,899.1	4,876.6	11.7	12.8	90.42	275.1	296.7	260.7	237.1	23.59	11.052		
5,000.0	4,984.3	5,005.9	4,983.3	11.9	12.9	90.01	277.0	298.5	262.4	238.5	23.96	10.951		
5,100.0	5,084.3	5,106.9	5,084.3	12.1	13.1	90.00	277.0	298.6	262.5	238.1	24.35	10.780		
5,200.0	5,184.3	5,206.9	5,184.3	12.3	13.3	90.00	277.0	298.6	262.5	237.7	24.75	10.606		
5,300.0	5,284.3	5,306.9	5,284.3	12.5	13.5	90.00	277.0	298.6	262.5	237.3	25.15	10.437		
5,400.0	5,384.3	5,406.9	5,384.3	12.7	13.7	90.00	277.0	298.6	262.5	236.9	25.55	10.272		
5,500.0	5,484.3	5,506.9	5,484.3	12.9	13.9	90.00	277.0	298.6	262.5	236.5	25.96	10.112		
5,600.0	5,584.3	5,606.9	5,584.3	13.2	14.1	90.00	277.0	298.6	262.5	236.1	26.36	9.956		
5,700.0	5,684.3	5,706.9	5,684.3	13.4	14.2	90.00	277.0	298.6	262.5	235.7	26.77	9.804		
5,800.0	5,784.3	5,806.9	5,784.3	13.6	14.4	90.00	277.0	298.6	262.5	235.3	27.18	9.656		
5,900.0	5,884.3	5,906.9	5,884.3	13.8	14.6	90.00	277.0	298.6	262.5	234.9	27.59	9.513		
5,932.2	5,916.6	5,939.2	5,916.6	13.8	14.7	-89.97	276.8	298.6	262.5	234.7	27.72	9.469		
6,000.0	5,984.3	6,006.6	5,983.8	14.0	14.8	-88.99	272.3	298.6	262.5	234.5	27.97	9.384		
6,100.0	6,084.0	6,104.9	6,080.5	14.1	14.8	-86.84	255.2	298.6	262.9	234.6	28.22	9.313		
6,200.0	6,181.8	6,202.0	6,173.1	14.2	14.9	-84.77	226.3	298.6	263.6	235.2	28.34	9.301		
6,300.0	6,276.0	6,297.9	6,260.3	14.2	14.9	-82.80	186.4	298.5	264.6	236.2	28.34	9.334		
6,400.0	6,365.2	6,392.9	6,341.0	14.2	14.8	-80.97	136.4	298.5	265.8	237.5	28.30	9.390		
6,500.0	6,447.7	6,486.9	6,414.2	14.2	14.8	-79.31	77.5	298.5	267.1	238.8	28.28	9.444		
6,600.0	6,522.1	6,580.2	6,479.1	14.3	14.8	-77.84	10.6	298.5	268.5	240.1	28.37	9.464		
6,700.0	6,587.2	6,672.8	6,535.0	14.5	14.9	-76.58	-63.1	298.5	269.8	241.2	28.67	9.413		
6,800.0	6,641.9	6,764.8	6,581.3	14.8	15.1	-75.53	-142.5	298.5	271.0	241.8	29.23	9.274		
6,900.0	6,685.1	6,856.3	6,617.6	15.4	15.7	-74.71	-226.5	298.5	272.1	241.9	30.14	9.026		
7,000.0	6,716.2	6,947.5	6,643.5	16.1	16.4	-74.13	-313.9	298.5	272.8	241.4	31.44	8.679		
7,100.0	6,734.7	7,038.5	6,658.8	17.0	17.2	-73.78	-403.6	298.5	273.3	240.2	33.11	8.255		
7,200.1	6,740.2	7,129.5	6,663.3	18.1	18.2	-73.68	-494.4	298.5	273.4	238.3	35.11	7.788		
7,300.0	6,739.1	7,229.4	6,662.4	19.2	19.4	-73.70	-594.3	298.5	273.4	236.0	37.41	7.308		
7,400.0	6,738.0	7,329.4	6,661.4	20.5	20.7	-73.73	-694.3	298.5	273.3	233.4	39.92	6.848		
7,500.0	6,737.0	7,429.4	6,660.5	21.9	22.1	-73.75	-794.3	298.5	273.3	230.7	42.60	6.415		
7,600.0	6,735.9	7,529.4	6,659.6	23.4	23.5	-73.78	-894.3	298.5	273.3	227.8	45.43	6.015		
7,700.0	6,734.8	7,629.4	6,658.6	24.9	25.0	-73.80	-994.3	298.5	273.2	224.8	48.38	5.647		
7,800.0	6,733.8	7,729.4	6,657.7	26.5	26.6	-73.82	-1,094.3	298.5	273.2	221.7	51.43	5.311		
7,900.0	6,732.7	7,829.4	6,656.7	28.1	28.2	-73.85	-1,194.3	298.5	273.1	218.6	54.57	5.005		
8,000.0	6,731.6	7,929.4	6,655.8	29.8	29.8	-73.87	-1,294.3	298.4	273.1	215.3	57.77	4.727		
8,100.0	6,730.6	8,029.4	6,654.9	31.4	31.5	-73.90	-1,394.3	298.4	273.1	212.0	61.03	4.474		
8,200.0	6,729.5	8,129.4	6,653.9	33.2	33.2	-73.92	-1,494.2	298.4	273.0	208.7	64.35	4.243		
8,300.0	6,728.5	8,229.4	6,653.0	34.9	35.0	-73.95	-1,594.2	298.4	273.0	205.3	67.70	4.032		
8,400.0	6,727.4	8,329.4	6,652.0	36.6	36.7	-73.97	-1,694.2	298.4	272.9	201.8	71.09	3.839		
8,500.0	6,726.3	8,429.4	6,651.1	38.4	38.5	-73.99	-1,794.2	298.4	272.9	198.4	74.52	3.662		
8,600.0	6,725.3	8,529.4	6,650.1	40.2	40.2	-74.02	-1,894.2	298.4	272.9	194.9	77.97	3.499		
8,700.0	6,724.2	8,629.4	6,649.2	42.0	42.0	-74.04	-1,994.2	298.4	272.8	191.4	81.45	3.350		
8,800.0	6,723.1	8,729.4	6,648.3	43.8	43.8	-74.07	-2,094.2	298.4	272.8	187.8	84.95	3.211		
8,900.0	6,722.1	8,829.4	6,647.3	45.6	45.6	-74.09	-2,194.2	298.4	272.7	184.3	88.46	3.083		
9,000.0	6,721.0	8,929.4	6,646.4	47.4	47.4	-74.12	-2,294.2	298.4	272.7	180.7	92.00	2.964		
9,100.0	6,719.9	9,029.4	6,645.4	49.3	49.3	-74.14	-2,394.2	298.4	272.7	177.1	95.55	2.854		
9,200.0	6,718.9	9,129.4	6,644.5	51.1	51.1	-74.16	-2,494.2	298.4	272.6	173.5	99.11	2.751		
9,300.0	6,717.8	9,229.4	6,643.5	52.9	52.9	-74.19	-2,594.2	298.4	272.6	169.9	102.68	2.654		
9,400.0	6,716.7	9,329.4	6,642.6	54.8	54.8	-74.21	-2,694.2	298.4	272.5	166.3	106.27	2.565		
9,500.0	6,715.7	9,429.4	6,641.7	56.6	56.6	-74.24	-2,794.2	298.3	272.5	162.6	109.87	2.480		
9,600.0	6,714.6	9,529.4	6,640.7	58.5	58.5	-74.26	-2,894.2	298.3	272.5	159.0	113.47	2.401		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Suden 34R-343
Project:	SEC.34-T5N-R64W	TVD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Reference Site:	Suden 34R-HZ Pad Sec.34-T5N-R64W	MD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Suden 34R-343	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 #2 (7-31-14)	Offset TVD Reference:	Offset Datum

Offset Design Suden 34R-HZ Pad Sec.34-T5N-R64W - Suden 34R-203 - Wellbore #1 - Plan #2 (6-30-14)													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 Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Distance Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
9,700.0	6,713.6	9,629.4	6,639.8	60.3	60.3	-74.29	-2,994.2	298.3	272.4	155.3	117.09	2.327		
9,800.0	6,712.5	9,729.4	6,638.8	62.2	62.2	-74.31	-3,094.2	298.3	272.4	151.7	120.71	2.256		
9,900.0	6,711.4	9,829.4	6,637.9	64.1	64.1	-74.33	-3,194.2	298.3	272.3	148.0	124.34	2.190		
10,000.0	6,710.4	9,929.4	6,636.9	66.0	65.9	-74.36	-3,294.2	298.3	272.3	144.3	127.97	2.128		
10,100.0	6,709.3	10,029.4	6,636.0	67.8	67.8	-74.38	-3,394.2	298.3	272.3	140.6	131.62	2.069		
10,200.0	6,708.2	10,129.4	6,635.1	69.7	69.7	-74.41	-3,494.2	298.3	272.2	137.0	135.26	2.013		
10,300.0	6,707.2	10,229.4	6,634.1	71.6	71.6	-74.43	-3,594.2	298.3	272.2	133.3	138.92	1.959		
10,400.0	6,706.1	10,329.4	6,633.2	73.5	73.4	-74.46	-3,694.1	298.3	272.1	129.6	142.57	1.909		
10,500.0	6,705.0	10,429.4	6,632.2	75.3	75.3	-74.48	-3,794.1	298.3	272.1	125.9	146.23	1.861		
10,600.0	6,704.0	10,529.4	6,631.3	77.2	77.2	-74.51	-3,894.1	298.3	272.1	122.2	149.90	1.815		
10,700.0	6,702.9	10,629.4	6,630.3	79.1	79.1	-74.53	-3,994.1	298.3	272.0	118.4	153.57	1.771		
10,800.0	6,701.8	10,729.4	6,629.4	81.0	81.0	-74.55	-4,094.1	298.3	272.0	114.7	157.25	1.730		
10,900.0	6,700.8	10,829.4	6,628.5	82.9	82.9	-74.58	-4,194.1	298.3	271.9	111.0	160.92	1.690		
11,000.0	6,699.7	10,929.4	6,627.5	84.8	84.8	-74.60	-4,294.1	298.2	271.9	107.3	164.61	1.652		
11,100.0	6,698.6	11,029.4	6,626.6	86.7	86.6	-74.63	-4,394.1	298.2	271.9	103.6	168.29	1.615		
11,160.7	6,698.0	11,090.1	6,626.0	87.8	87.8	-74.64	-4,454.8	298.2	271.8	101.3	170.53	1.594 SF		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Suden 34R-343
Project:	SEC.34-T5N-R64W	TVD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Reference Site:	Suden 34R-HZ Pad Sec.34-T5N-R64W	MD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Suden 34R-343	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 #2 (7-31-14)	Offset TVD Reference:	Offset Datum

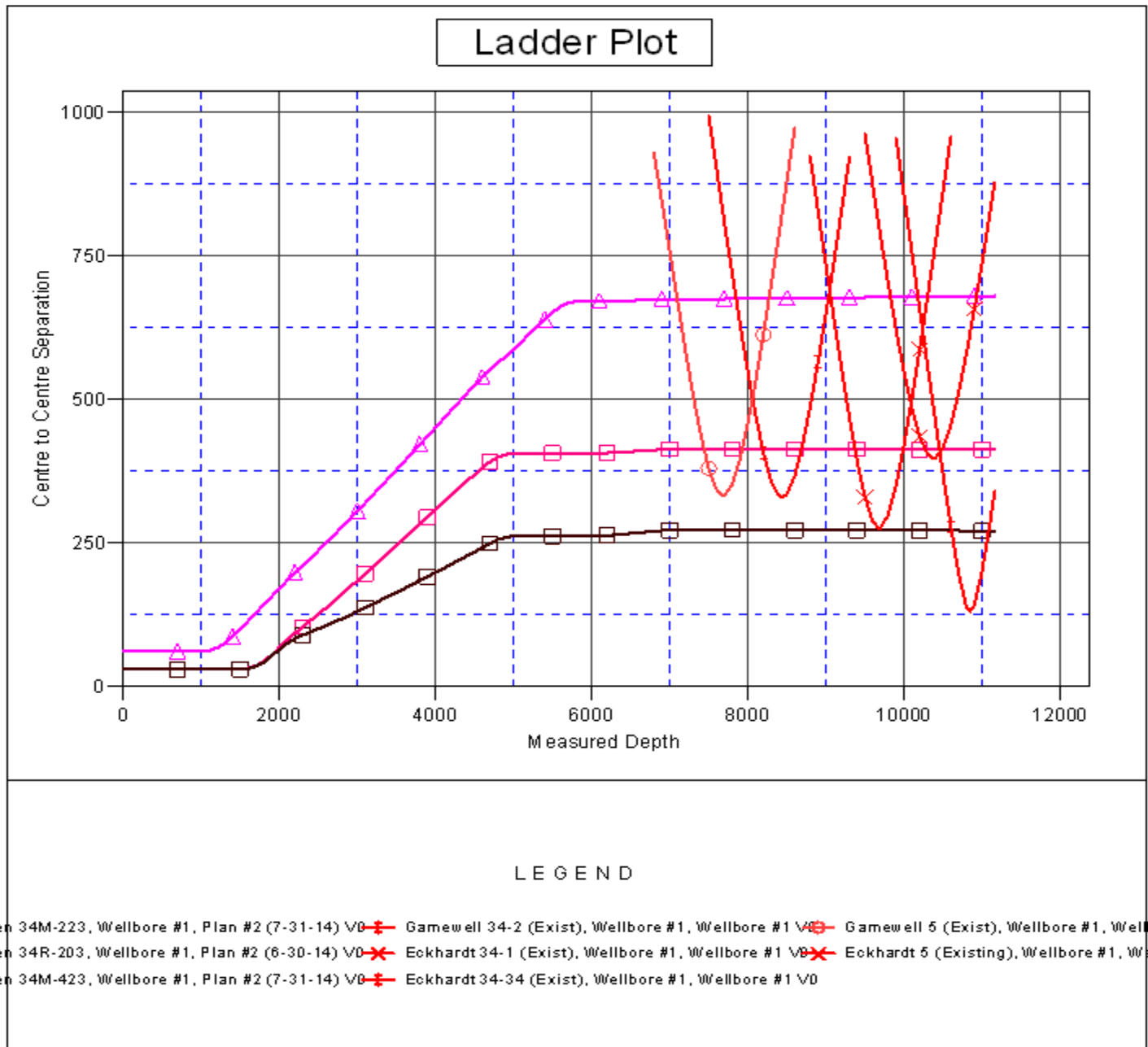
Reference Depths are relative to WELL @ 4680.5ft (Ensign Rig #136 - Coordinates are relative to: Suden 34R-343

Offset Depths are relative to Offset Datum

Central Meridian is -105.500000 °

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.63°



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Suden 34R-343
Project:	SEC.34-T5N-R64W	TVD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Reference Site:	Suden 34R-HZ Pad Sec.34-T5N-R64W	MD Reference:	WELL @ 4680.5ft (Ensign Rig #136 - RKB - 12.5')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Suden 34R-343	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 #2 (7-31-14)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4680.5ft (Ensign Rig #136 - Coordinates are relative to: Suden 34R-343
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.63°

