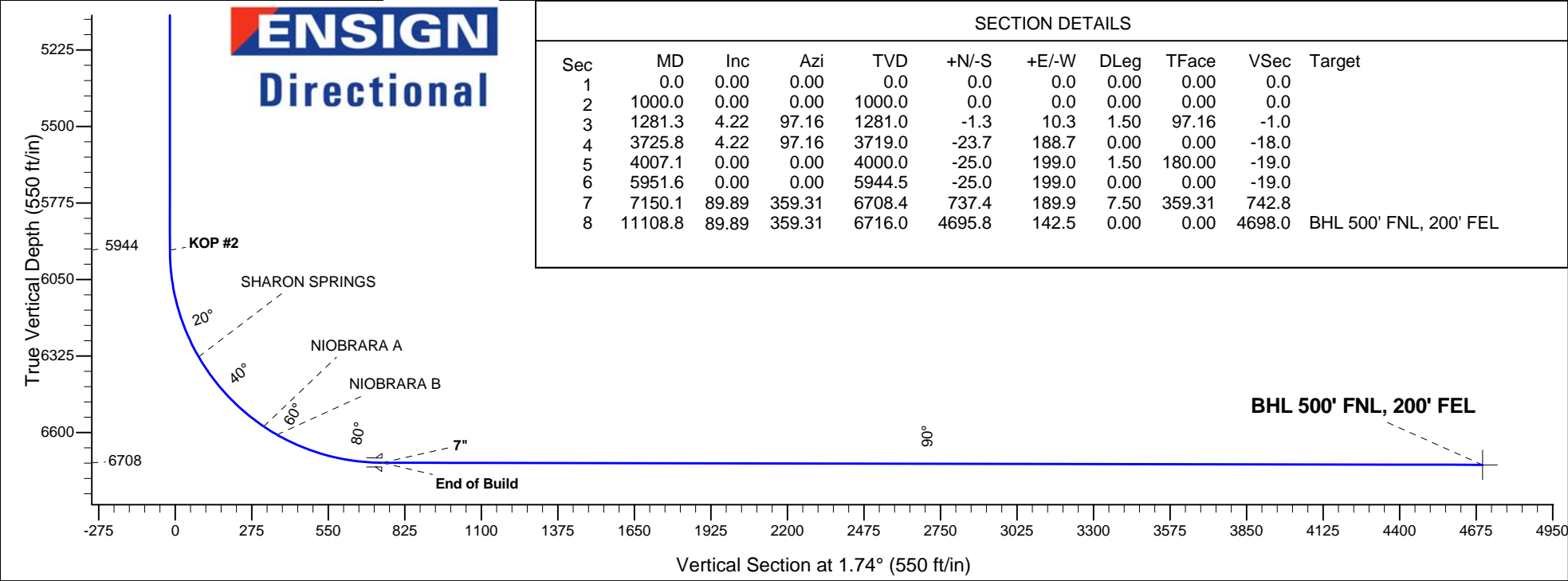
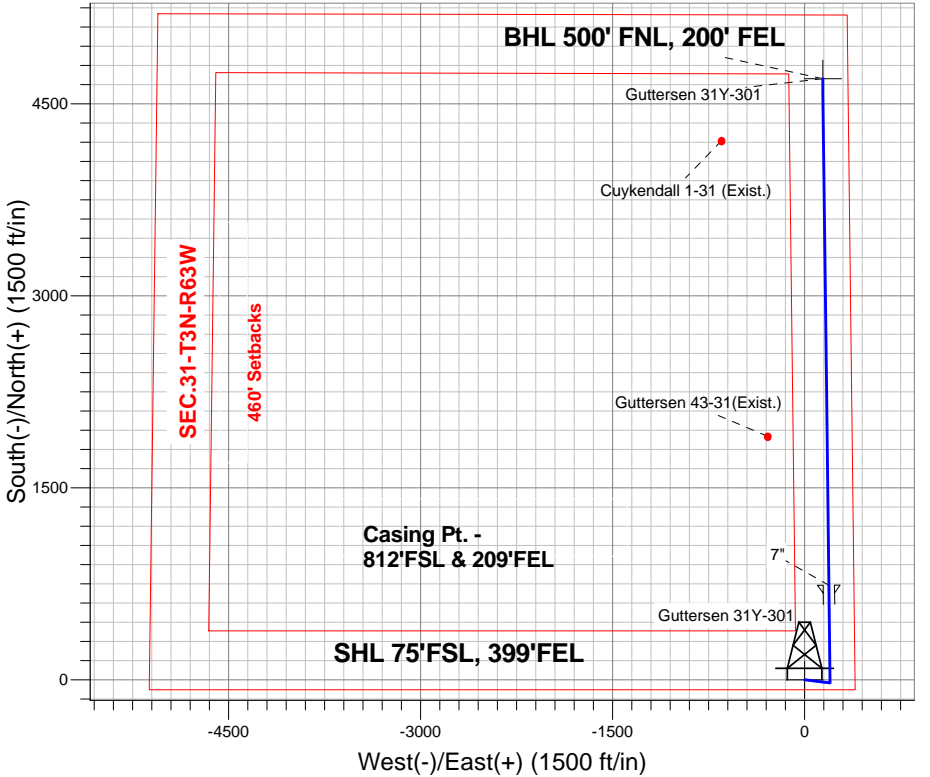


PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: Guttersen 31Y-301					
Surface Location: Guttersen 31Y-201 Pad Sec.31-T3N-R63W					
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone					
Ground Elevation: 4836.0					
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.0	0.0	1308211.96	3287155.18	40.174870	-104.472350
RKB - 15' WELL @ 4851.0ft (RKB - 15')					

WELLBORE TARGET DETAILS					
Name	TVD	+N/-S	+E/-W	Shape	
SHL 75'FSL, 399'FEL		0.0	0.0	Point	
BHL 500' FNL, 200' FEL	6716.0	4695.8	142.5	Point	

	ANNOTATIONS		
	TVD	MD	Annotation
	1000.0	1000.0	KOP #1
	5944.5	5951.6	KOP #2
End of Build			
Guttersen 31Y-201 Pad Sec.31-T3N-R63W			
Guttersen 31Y-301			
Plan #2 (11-11-13)			
13:27, November 14 2013			



SECTION DETAILS										
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	1000.0	0.00	0.00	1000.0	0.0	0.0	0.00	0.00	0.0	
3	1281.3	4.22	97.16	1281.0	-1.3	10.3	1.50	97.16	-1.0	
4	3725.8	4.22	97.16	3719.0	-23.7	188.7	0.00	0.00	-18.0	
5	4007.1	0.00	0.00	4000.0	-25.0	199.0	1.50	180.00	-19.0	
6	5951.6	0.00	0.00	5944.5	-25.0	199.0	0.00	0.00	-19.0	
7	7150.1	89.89	359.31	6708.4	737.4	189.9	7.50	359.31	742.8	
8	11108.8	89.89	359.31	6716.0	4695.8	142.5	0.00	0.00	4698.0	BHL 500' FNL, 200' FEL



Directional

PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.31-T3N-R63W

Guttersen 31Y-201 Pad Sec.31-T3N-R63W

Guttersen 31Y-301

Wellbore #1

Plan: Plan #2 (11-11-13)

Standard Planning Report

14 November, 2013

Database:	Landmark	Local Co-ordinate Reference:	Well Gutteresen 31Y-301
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4851.0ft (RKB - 15')
Project:	SEC.31-T3N-R63W	MD Reference:	WELL @ 4851.0ft (RKB - 15')
Site:	Gutteresen 31Y-201 Pad Sec.31-T3N-R63W	North Reference:	True
Well:	Gutteresen 31Y-301	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (11-11-13)		

Project	SEC.31-T3N-R63W, 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						Guttersen 31Y-201 Pad Sec.31-T3N-R63W											
Site Position:						Northing:			1,308,211.98ft			Latitude:			40.174870		
From:			Lat/Long			Easting:			3,287,155.18ft			Longitude:			-104.472350		
Position Uncertainty:			0.0 ft			Slot Radius:			"			Grid Convergence:			0.66 °		

Well	Guttersen 31Y-301					
Well Position	+N-S	0.0 ft	Northing:	1,308,211.96 ft	Latitude:	40.174870
	+E-W	0.0 ft	Easting:	3,287,155.18 ft	Longitude:	-104.472350
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,836.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	11/14/2013	8.36	66.83	52,789

Design	Plan #2 (11-11-13)			
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	1.74

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	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,281.3	4.22	97.16	1,281.0	-1.3	10.3	1.50	1.50	0.00	97.16	
3,725.8	4.22	97.16	3,719.0	-23.7	188.7	0.00	0.00	0.00	0.00	
4,007.1	0.00	0.00	4,000.0	-25.0	199.0	1.50	-1.50	0.00	180.00	
5,951.6	0.00	0.00	5,944.5	-25.0	199.0	0.00	0.00	0.00	0.00	
7,150.1	89.89	359.31	6,708.4	737.4	189.9	7.50	7.50	0.00	359.31	
11,108.8	89.89	359.31	6,716.0	4,695.8	142.5	0.00	0.00	0.00	0.00	BHL 500' FNL, 200'

Database:	Landmark	Local Co-ordinate Reference:	Well Guttersen 31Y-301
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4851.0ft (RKB - 15')
Project:	SEC.31-T3N-R63W	MD Reference:	WELL @ 4851.0ft (RKB - 15')
Site:	Guttersen 31Y-201 Pad Sec.31-T3N-R63W	North Reference:	True
Well:	Guttersen 31Y-301	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (11-11-13)		

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 75'FSL, 399'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
KOP #1									
1,100.0	1.50	97.16	1,100.0	-0.2	1.3	-0.1	1.50	1.50	0.00
1,200.0	3.00	97.16	1,199.9	-0.7	5.2	-0.5	1.50	1.50	0.00
1,281.3	4.22	97.16	1,281.0	-1.3	10.3	-1.0	1.50	1.50	0.00
1,300.0	4.22	97.16	1,299.7	-1.5	11.6	-1.1	0.00	0.00	0.00
1,400.0	4.22	97.16	1,399.4	-2.4	18.9	-1.8	0.00	0.00	0.00
1,500.0	4.22	97.16	1,499.2	-3.3	26.2	-2.5	0.00	0.00	0.00
1,600.0	4.22	97.16	1,598.9	-4.2	33.5	-3.2	0.00	0.00	0.00
1,700.0	4.22	97.16	1,698.6	-5.1	40.8	-3.9	0.00	0.00	0.00
1,800.0	4.22	97.16	1,798.3	-6.0	48.1	-4.6	0.00	0.00	0.00
1,900.0	4.22	97.16	1,898.1	-7.0	55.4	-5.3	0.00	0.00	0.00
2,000.0	4.22	97.16	1,997.8	-7.9	62.7	-6.0	0.00	0.00	0.00
2,100.0	4.22	97.16	2,097.5	-8.8	70.0	-6.7	0.00	0.00	0.00
2,200.0	4.22	97.16	2,197.3	-9.7	77.3	-7.4	0.00	0.00	0.00
2,300.0	4.22	97.16	2,297.0	-10.6	84.6	-8.1	0.00	0.00	0.00
2,400.0	4.22	97.16	2,396.7	-11.6	91.9	-8.8	0.00	0.00	0.00
2,500.0	4.22	97.16	2,496.4	-12.5	99.2	-9.5	0.00	0.00	0.00
2,600.0	4.22	97.16	2,596.2	-13.4	106.5	-10.1	0.00	0.00	0.00
2,700.0	4.22	97.16	2,695.9	-14.3	113.8	-10.8	0.00	0.00	0.00
2,800.0	4.22	97.16	2,795.6	-15.2	121.1	-11.5	0.00	0.00	0.00
2,900.0	4.22	97.16	2,895.4	-16.1	128.4	-12.2	0.00	0.00	0.00
3,000.0	4.22	97.16	2,995.1	-17.1	135.7	-12.9	0.00	0.00	0.00
3,100.0	4.22	97.16	3,094.8	-18.0	143.0	-13.6	0.00	0.00	0.00
3,200.0	4.22	97.16	3,194.5	-18.9	150.3	-14.3	0.00	0.00	0.00
3,300.0	4.22	97.16	3,294.3	-19.8	157.6	-15.0	0.00	0.00	0.00
3,400.0	4.22	97.16	3,394.0	-20.7	164.9	-15.7	0.00	0.00	0.00
3,500.0	4.22	97.16	3,493.7	-21.6	172.2	-16.4	0.00	0.00	0.00
3,600.0	4.22	97.16	3,593.5	-22.6	179.5	-17.1	0.00	0.00	0.00
3,666.7	4.22	97.16	3,660.0	-23.2	184.4	-17.6	0.00	0.00	0.00
PARKMAN									
3,700.0	4.22	97.16	3,693.2	-23.5	186.8	-17.8	0.00	0.00	0.00
3,725.8	4.22	97.16	3,719.0	-23.7	188.7	-18.0	0.00	0.00	0.00
3,800.0	3.11	97.16	3,793.0	-24.3	193.4	-18.4	1.50	-1.50	0.00
3,900.0	1.61	97.16	3,892.9	-24.8	197.5	-18.8	1.50	-1.50	0.00
4,000.0	0.11	97.16	3,992.9	-25.0	199.0	-19.0	1.50	-1.50	0.00
4,007.1	0.00	0.00	4,000.0	-25.0	199.0	-19.0	1.50	-1.50	0.00
4,100.0	0.00	0.00	4,092.9	-25.0	199.0	-19.0	0.00	0.00	0.00
4,200.0	0.00	0.00	4,192.9	-25.0	199.0	-19.0	0.00	0.00	0.00
4,217.1	0.00	0.00	4,210.0	-25.0	199.0	-19.0	0.00	0.00	0.00
SUSSEX									

Database:	Landmark	Local Co-ordinate Reference:	Well Guttersen 31Y-301
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4851.0ft (RKB - 15')
Project:	SEC.31-T3N-R63W	MD Reference:	WELL @ 4851.0ft (RKB - 15')
Site:	Guttersen 31Y-201 Pad Sec.31-T3N-R63W	North Reference:	True
Well:	Guttersen 31Y-301	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (11-11-13)		

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)
4,300.0	0.00	0.00	4,292.9	-25.0	199.0	-19.0	0.00	0.00	0.00
4,400.0	0.00	0.00	4,392.9	-25.0	199.0	-19.0	0.00	0.00	0.00
4,407.1	0.00	0.00	4,400.0	-25.0	199.0	-19.0	0.00	0.00	0.00
SHANNON									
4,500.0	0.00	0.00	4,492.9	-25.0	199.0	-19.0	0.00	0.00	0.00
4,600.0	0.00	0.00	4,592.9	-25.0	199.0	-19.0	0.00	0.00	0.00
4,700.0	0.00	0.00	4,692.9	-25.0	199.0	-19.0	0.00	0.00	0.00
4,800.0	0.00	0.00	4,792.9	-25.0	199.0	-19.0	0.00	0.00	0.00
4,900.0	0.00	0.00	4,892.9	-25.0	199.0	-19.0	0.00	0.00	0.00
5,000.0	0.00	0.00	4,992.9	-25.0	199.0	-19.0	0.00	0.00	0.00
5,100.0	0.00	0.00	5,092.9	-25.0	199.0	-19.0	0.00	0.00	0.00
5,200.0	0.00	0.00	5,192.9	-25.0	199.0	-19.0	0.00	0.00	0.00
5,300.0	0.00	0.00	5,292.9	-25.0	199.0	-19.0	0.00	0.00	0.00
5,400.0	0.00	0.00	5,392.9	-25.0	199.0	-19.0	0.00	0.00	0.00
5,500.0	0.00	0.00	5,492.9	-25.0	199.0	-19.0	0.00	0.00	0.00
5,600.0	0.00	0.00	5,592.9	-25.0	199.0	-19.0	0.00	0.00	0.00
5,700.0	0.00	0.00	5,692.9	-25.0	199.0	-19.0	0.00	0.00	0.00
5,800.0	0.00	0.00	5,792.9	-25.0	199.0	-19.0	0.00	0.00	0.00
5,900.0	0.00	0.00	5,892.9	-25.0	199.0	-19.0	0.00	0.00	0.00
5,951.6	0.00	0.00	5,944.5	-25.0	199.0	-19.0	0.00	0.00	0.00
KOP #2									
6,000.0	3.63	359.31	5,992.8	-23.5	199.0	-17.4	7.50	7.50	0.00
6,100.0	11.13	359.31	6,091.9	-10.6	198.8	-4.6	7.50	7.50	0.00
6,200.0	18.63	359.31	6,188.5	15.0	198.5	21.0	7.50	7.50	0.00
6,300.0	26.13	359.31	6,280.9	53.1	198.1	59.1	7.50	7.50	0.00
6,353.4	30.14	359.31	6,328.0	78.3	197.8	84.2	7.50	7.50	0.00
SHARON SPRINGS									
6,400.0	33.63	359.31	6,367.6	102.9	197.5	108.8	7.50	7.50	0.00
6,500.0	41.13	359.31	6,447.0	163.5	196.7	169.4	7.50	7.50	0.00
6,600.0	48.63	359.31	6,517.8	234.0	195.9	239.9	7.50	7.50	0.00
6,698.6	56.03	359.31	6,578.0	312.0	195.0	317.8	7.50	7.50	0.00
NIOBRARA A									
6,700.0	56.13	359.31	6,578.8	313.2	195.0	318.9	7.50	7.50	0.00
6,755.5	60.29	359.31	6,608.0	360.3	194.4	366.1	7.50	7.50	0.00
NIOBRARA B									
6,800.0	63.63	359.31	6,628.9	399.6	193.9	405.3	7.50	7.50	0.00
6,900.0	71.13	359.31	6,667.3	491.8	192.8	497.5	7.50	7.50	0.00
7,000.0	78.63	359.31	6,693.4	588.3	191.7	593.8	7.50	7.50	0.00
7,100.0	86.13	359.31	6,706.7	687.3	190.5	692.8	7.50	7.50	0.00
7,150.1	89.89	359.31	6,708.4	737.4	189.9	742.8	7.50	7.50	0.00
End of Build - 7"									
7,200.0	89.89	359.31	6,708.5	787.3	189.3	792.7	0.00	0.00	0.00
7,300.0	89.89	359.31	6,708.7	887.3	188.1	892.6	0.00	0.00	0.00
7,400.0	89.89	359.31	6,708.9	987.3	186.9	992.5	0.00	0.00	0.00
7,500.0	89.89	359.31	6,709.1	1,087.3	185.7	1,092.4	0.00	0.00	0.00
7,600.0	89.89	359.31	6,709.3	1,187.3	184.5	1,192.3	0.00	0.00	0.00
7,700.0	89.89	359.31	6,709.5	1,287.3	183.3	1,292.2	0.00	0.00	0.00
7,800.0	89.89	359.31	6,709.6	1,387.3	182.1	1,392.1	0.00	0.00	0.00
7,900.0	89.89	359.31	6,709.8	1,487.2	180.9	1,492.0	0.00	0.00	0.00
8,000.0	89.89	359.31	6,710.0	1,587.2	179.7	1,592.0	0.00	0.00	0.00
8,100.0	89.89	359.31	6,710.2	1,687.2	178.5	1,691.9	0.00	0.00	0.00
8,200.0	89.89	359.31	6,710.4	1,787.2	177.3	1,791.8	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Guttersen 31Y-301
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4851.0ft (RKB - 15')
Project:	SEC.31-T3N-R63W	MD Reference:	WELL @ 4851.0ft (RKB - 15')
Site:	Guttersen 31Y-201 Pad Sec.31-T3N-R63W	North Reference:	True
Well:	Guttersen 31Y-301	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (11-11-13)		

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)
8,300.0	89.89	359.31	6,710.6	1,887.2	176.1	1,891.7	0.00	0.00	0.00
8,400.0	89.89	359.31	6,710.8	1,987.2	174.9	1,991.6	0.00	0.00	0.00
8,500.0	89.89	359.31	6,711.0	2,087.2	173.7	2,091.5	0.00	0.00	0.00
8,600.0	89.89	359.31	6,711.2	2,187.2	172.5	2,191.4	0.00	0.00	0.00
8,700.0	89.89	359.31	6,711.4	2,287.2	171.3	2,291.3	0.00	0.00	0.00
8,800.0	89.89	359.31	6,711.6	2,387.2	170.1	2,391.2	0.00	0.00	0.00
8,900.0	89.89	359.31	6,711.8	2,487.2	168.9	2,491.1	0.00	0.00	0.00
9,000.0	89.89	359.31	6,712.0	2,587.2	167.7	2,591.1	0.00	0.00	0.00
9,100.0	89.89	359.31	6,712.1	2,687.2	166.5	2,691.0	0.00	0.00	0.00
9,200.0	89.89	359.31	6,712.3	2,787.1	165.3	2,790.9	0.00	0.00	0.00
9,300.0	89.89	359.31	6,712.5	2,887.1	164.1	2,890.8	0.00	0.00	0.00
9,400.0	89.89	359.31	6,712.7	2,987.1	162.9	2,990.7	0.00	0.00	0.00
9,500.0	89.89	359.31	6,712.9	3,087.1	161.7	3,090.6	0.00	0.00	0.00
9,600.0	89.89	359.31	6,713.1	3,187.1	160.6	3,190.5	0.00	0.00	0.00
9,700.0	89.89	359.31	6,713.3	3,287.1	159.4	3,290.4	0.00	0.00	0.00
9,800.0	89.89	359.31	6,713.5	3,387.1	158.2	3,390.3	0.00	0.00	0.00
9,900.0	89.89	359.31	6,713.7	3,487.1	157.0	3,490.3	0.00	0.00	0.00
10,000.0	89.89	359.31	6,713.9	3,587.1	155.8	3,590.2	0.00	0.00	0.00
10,100.0	89.89	359.31	6,714.1	3,687.1	154.6	3,690.1	0.00	0.00	0.00
10,200.0	89.89	359.31	6,714.3	3,787.1	153.4	3,790.0	0.00	0.00	0.00
10,300.0	89.89	359.31	6,714.4	3,887.1	152.2	3,889.9	0.00	0.00	0.00
10,400.0	89.89	359.31	6,714.6	3,987.1	151.0	3,989.8	0.00	0.00	0.00
10,500.0	89.89	359.31	6,714.8	4,087.1	149.8	4,089.7	0.00	0.00	0.00
10,600.0	89.89	359.31	6,715.0	4,187.0	148.6	4,189.6	0.00	0.00	0.00
10,700.0	89.89	359.31	6,715.2	4,287.0	147.4	4,289.5	0.00	0.00	0.00
10,800.0	89.89	359.31	6,715.4	4,387.0	146.2	4,389.4	0.00	0.00	0.00
10,900.0	89.89	359.31	6,715.6	4,487.0	145.0	4,489.4	0.00	0.00	0.00
11,000.0	89.89	359.31	6,715.8	4,587.0	143.8	4,589.3	0.00	0.00	0.00
11,100.0	89.89	359.31	6,716.0	4,687.0	142.6	4,689.2	0.00	0.00	0.00
11,108.8	89.89	359.31	6,716.0	4,695.8	142.5	4,698.0	0.00	0.00	0.00
BHL 500' FNL, 200' FEL									

Targets

Target Name	- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
SHL 75'FSL, 399'FEL	- plan hits target center	0.00	0.00	1.0	0.0	0.0	1,308,211.98	3,287,155.18	40.174870	-104.472350
	- Point									
BHL 500' FNL, 200' FI	- plan hits target center	0.00	0.00	6,716.0	4,695.8	142.5	1,312,908.91	3,287,243.24	40.187760	-104.471840
	- Point									

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,150.1	6,708.4	7"	7	8-3/4

Database:	Landmark	Local Co-ordinate Reference:	Well Guttersen 31Y-301
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4851.0ft (RKB - 15')
Project:	SEC.31-T3N-R63W	MD Reference:	WELL @ 4851.0ft (RKB - 15')
Site:	Guttersen 31Y-201 Pad Sec.31-T3N-R63W	North Reference:	True
Well:	Guttersen 31Y-301	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (11-11-13)		

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,666.7	3,660.0	PARKMAN			
4,217.1	4,210.0	SUSSEX			
4,407.1	4,400.0	SHANNON			
6,353.4	6,328.0	SHARON SPRINGS			
6,698.6	6,578.0	NIOBRARA A			
6,755.5	6,608.0	NIOBRARA B			

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,000.0	1,000.0	0.0	0.0	KOP #1
5,951.6	5,944.5	-25.0	199.0	KOP #2
7,150.1	6,708.4	737.4	189.9	End of Build



Directional

PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.31-T3N-R63W

Guttersen 31Y-201 Pad Sec.31-T3N-R63W

Guttersen 31Y-301

Wellbore #1

Plan #2 (11-11-13)

Anticollision Report

14 November, 2013



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Guttersten 31Y-301
Project:	SEC.31-T3N-R63W	TVD Reference:	WELL @ 4851.0ft (RKB - 15')
Reference Site:	Guttersten 31Y-201 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4851.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Guttersten 31Y-301	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 (11-11-13)	Offset TVD Reference:	Offset Datum

Reference	Plan #2 (11-11-13)
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria
Interpolation Method:	Stations
Depth Range:	Unlimited
Results Limited by:	Maximum center-center distance of 1,000.0ft
Warning Levels Evaluated at:	2.00 Sigma
Error Model:	ISCWSA
Scan Method:	Closest Approach 3D
Error Surface:	Elliptical Conic

Survey Tool Program		Date	11/11/2013		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.0	11,108.8	Plan #2 (11-11-13) (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						
Guttersten 31Q-401 Pad Sec.31-T3N-R63W						
Cuykendall 1-31 (Exist.) - Wellbore #1 - Wellbore #1	10,633.8	6,702.1	796.4	580.3	3.685	CC, ES
Cuykendall 1-31 (Exist.) - Wellbore #1 - Wellbore #1	10,700.0	6,702.2	799.2	581.8	3.676	SF
Guttersten 31Y-201 Pad Sec.31-T3N-R63W						
Guttersten 31T-221 - Wellbore #1 - Plan #1 (5-31-13)	1,000.0	1,000.0	58.7	54.4	13.742	CC, ES
Guttersten 31T-221 - Wellbore #1 - Plan #1 (5-31-13)	11,108.8	11,045.9	635.2	454.5	3.515	SF
Guttersten 31T-401 - Wellbore #1 - Plan #1 (5-31-13)	200.0	200.0	89.4	88.7	132.617	CC, ES
Guttersten 31T-401 - Wellbore #1 - Plan #1 (5-31-13)	11,108.8	11,250.9	945.6	764.4	5.219	SF
Guttersten 31Y-441 - Wellbore #1 - Plan #1 (5-31-13)	1,000.0	1,000.0	30.7	26.5	7.198	CC, ES
Guttersten 31Y-441 - Wellbore #1 - Plan #1 (5-31-13)	11,108.8	11,221.1	335.7	162.7	1.940	SF
Guttersten 43-31(Exist.) - Wellbore #1 - Wellbore #1	8,320.0	6,710.6	463.7	290.4	2.675	CC, ES, SF

Offset Design												
Guttersten 31Q-401 Pad Sec.31-T3N-R63W - Cuykendall 1-31 (Exist.) - Wellbore #1 - Wellbore #1												
Survey Program: 7300-UNKNOWN												
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)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor
Warning												
10,100.0	6,714.1	6,701.1	6,701.1	72.1	134.0	-89.93	4,211.3	-648.2	958.8	752.7	206.05	4.653
10,200.0	6,714.3	6,701.3	6,701.3	74.0	134.0	-89.94	4,211.3	-648.2	906.9	699.0	207.94	4.361
10,300.0	6,714.4	6,701.4	6,701.4	75.9	134.0	-89.95	4,211.3	-648.2	863.6	653.7	209.83	4.115
10,400.0	6,714.6	6,701.6	6,701.6	77.7	134.0	-89.97	4,211.3	-648.2	830.0	618.3	211.72	3.920
10,500.0	6,714.8	6,701.8	6,701.8	79.6	134.0	-89.98	4,211.3	-648.2	807.6	594.0	213.62	3.781
10,600.0	6,715.0	6,702.0	6,702.0	81.5	134.0	-90.00	4,211.3	-648.2	797.2	581.6	215.51	3.699
10,633.8	6,715.1	6,702.1	6,702.1	82.2	134.0	-90.00	4,211.3	-648.2	796.4	580.3	216.15	3.685 CC, ES
10,700.0	6,715.2	6,702.2	6,702.2	83.4	134.0	-90.01	4,211.3	-648.2	799.2	581.8	217.41	3.676 SF
10,800.0	6,715.4	6,702.4	6,702.4	85.3	134.0	-90.02	4,211.3	-648.2	813.6	594.3	219.31	3.710
10,900.0	6,715.6	6,702.6	6,702.6	87.2	134.1	-90.04	4,211.3	-648.2	839.8	618.5	221.21	3.796
11,000.0	6,715.8	6,702.8	6,702.8	89.1	134.1	-90.05	4,211.3	-648.2	876.6	653.5	223.11	3.929
11,108.8	6,716.0	6,703.0	6,703.0	91.2	134.1	-90.07	4,211.3	-648.2	927.3	702.2	225.17	4.118

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Guttersen 31Y-301
Project:	SEC.31-T3N-R63W	TVD Reference:	WELL @ 4851.0ft (RKB - 15')
Reference Site:	Guttersen 31Y-201 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4851.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Guttersen 31Y-301	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 (11-11-13)	Offset TVD Reference:	Offset Datum

Offset Design Guttersen 31Y-201 Pad Sec.31-T3N-R63W - Guttersen 31T-221 - Wellbore #1 - Plan #1 (5-31-13)													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)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-90.00	-90.00	0.0	-58.7	58.7				
100.0	100.0	100.0	100.0	0.1	0.1	-90.00	-90.00	0.0	-58.7	58.7	58.5	0.22	261.089	
200.0	200.0	200.0	200.0	0.3	0.3	-90.00	-90.00	0.0	-58.7	58.7	58.0	0.67	87.030	
300.0	300.0	300.0	300.0	0.6	0.6	-90.00	-90.00	0.0	-58.7	58.7	57.6	1.12	52.218	
400.0	400.0	400.0	400.0	0.8	0.8	-90.00	-90.00	0.0	-58.7	58.7	57.1	1.57	37.298	
500.0	500.0	500.0	500.0	1.0	1.0	-90.00	-90.00	0.0	-58.7	58.7	56.7	2.02	29.010	
600.0	600.0	600.0	600.0	1.2	1.2	-90.00	-90.00	0.0	-58.7	58.7	56.2	2.47	23.735	
700.0	700.0	700.0	700.0	1.5	1.5	-90.00	-90.00	0.0	-58.7	58.7	55.8	2.92	20.084	
800.0	800.0	800.0	800.0	1.7	1.7	-90.00	-90.00	0.0	-58.7	58.7	55.3	3.37	17.406	
900.0	900.0	900.0	900.0	1.9	1.9	-90.00	-90.00	0.0	-58.7	58.7	54.9	3.82	15.358	
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	-90.00	-90.00	0.0	-58.7	58.7	54.4	4.27	13.742 CC, ES	
1,100.0	1,100.0	1,097.9	1,097.9	2.3	2.3	172.88	172.88	-0.1	-60.4	61.7	57.0	4.69	13.165	
1,200.0	1,199.9	1,195.3	1,195.1	2.5	2.5	172.97	172.97	-0.4	-65.3	70.7	65.6	5.08	13.909	
1,281.3	1,281.0	1,273.6	1,273.2	2.7	2.7	173.06	173.06	-0.9	-71.7	82.4	76.9	5.41	15.227	
1,300.0	1,299.7	1,291.5	1,291.0	2.8	2.8	173.08	173.08	-1.0	-73.5	85.6	80.1	5.48	15.598	
1,400.0	1,399.4	1,389.6	1,388.6	3.0	3.0	173.15	173.15	-1.7	-83.8	103.3	97.4	5.90	17.516	
1,500.0	1,499.2	1,488.0	1,486.4	3.2	3.2	173.20	173.20	-2.4	-94.1	121.0	114.7	6.31	19.180	
1,600.0	1,598.9	1,586.4	1,584.3	3.4	3.5	173.24	173.24	-3.1	-104.5	138.8	132.1	6.73	20.621	
1,700.0	1,698.6	1,684.8	1,682.2	3.7	3.7	173.26	173.26	-3.8	-114.8	156.5	149.4	7.16	21.876	
1,800.0	1,798.3	1,783.3	1,780.0	3.9	4.0	173.28	173.28	-4.5	-125.2	174.3	166.7	7.59	22.978	
1,900.0	1,898.1	1,881.7	1,877.9	4.2	4.3	173.30	173.30	-5.2	-135.5	192.1	184.0	8.02	23.949	
2,000.0	1,997.8	1,980.1	1,975.7	4.4	4.5	173.32	173.32	-5.9	-145.9	209.8	201.4	8.46	24.814	
2,100.0	2,097.5	2,078.5	2,073.6	4.7	4.8	173.33	173.33	-6.6	-156.2	227.6	218.7	8.89	25.585	
2,200.0	2,197.3	2,176.9	2,171.5	4.9	5.1	173.34	173.34	-7.3	-166.6	245.3	236.0	9.34	26.277	
2,300.0	2,297.0	2,275.3	2,269.3	5.2	5.4	173.35	173.35	-8.0	-177.0	263.1	253.3	9.78	26.901	
2,400.0	2,396.7	2,373.7	2,367.2	5.4	5.6	173.36	173.36	-8.7	-187.3	280.8	270.6	10.22	27.467	
2,500.0	2,496.4	2,472.1	2,465.1	5.7	5.9	173.36	173.36	-9.4	-197.7	298.6	287.9	10.67	27.981	
2,600.0	2,596.2	2,570.5	2,562.9	5.9	6.2	173.37	173.37	-10.1	-208.0	316.3	305.2	11.12	28.451	
2,700.0	2,695.9	2,669.0	2,660.8	6.2	6.5	173.38	173.38	-10.8	-218.4	334.1	322.5	11.57	28.881	
2,800.0	2,795.6	2,767.4	2,758.6	6.4	6.8	173.38	173.38	-11.5	-228.7	351.8	339.8	12.02	29.276	
2,900.0	2,895.4	2,865.8	2,856.5	6.7	7.1	173.39	173.39	-12.2	-239.1	369.6	357.1	12.47	29.641	
3,000.0	2,995.1	2,964.2	2,954.4	6.9	7.4	173.39	173.39	-12.9	-249.4	387.3	374.4	12.92	29.979	
3,100.0	3,094.8	3,062.6	3,052.2	7.2	7.6	173.39	173.39	-13.6	-259.8	405.1	391.7	13.37	30.291	
3,200.0	3,194.5	3,161.0	3,150.1	7.5	7.9	173.40	173.40	-14.3	-270.1	422.9	409.0	13.83	30.582	
3,300.0	3,294.3	3,259.4	3,248.0	7.7	8.2	173.40	173.40	-15.0	-280.5	440.6	426.3	14.28	30.853	
3,400.0	3,394.0	3,357.8	3,345.8	8.0	8.5	173.40	173.40	-15.7	-290.9	458.4	443.6	14.74	31.106	
3,500.0	3,493.7	3,456.2	3,443.7	8.2	8.8	173.41	173.41	-16.4	-301.2	476.1	460.9	15.19	31.343	
3,600.0	3,593.5	3,554.7	3,541.5	8.5	9.1	173.41	173.41	-17.1	-311.6	493.9	478.2	15.65	31.565	
3,700.0	3,693.2	3,653.1	3,639.4	8.7	9.4	173.41	173.41	-17.8	-321.9	511.6	495.5	16.10	31.774	
3,725.8	3,719.0	3,678.5	3,664.7	8.8	9.5	173.41	173.41	-18.0	-324.6	516.2	500.0	16.22	31.825	
3,800.0	3,793.0	3,751.6	3,737.4	9.0	9.7	173.43	173.43	-18.5	-332.3	528.7	512.1	16.56	31.921	
3,900.0	3,892.9	3,850.5	3,835.8	9.2	10.0	173.41	173.41	-19.2	-342.7	543.2	526.2	16.99	31.967	
4,007.1	4,000.0	3,956.9	3,941.5	9.4	10.3	-89.48	-89.48	-19.9	-353.9	556.0	538.5	17.46	31.851	
4,100.0	4,092.9	4,049.2	4,033.4	9.5	10.6	-89.55	-89.55	-20.6	-363.6	565.8	547.9	17.86	31.681	
4,200.0	4,192.9	4,148.7	4,132.3	9.7	10.9	-89.63	-89.63	-21.3	-374.1	576.3	558.0	18.30	31.498	
4,300.0	4,292.9	4,248.1	4,231.1	9.9	11.2	-89.71	-89.71	-22.0	-384.5	586.8	568.1	18.73	31.322	
4,400.0	4,392.9	4,347.6	4,330.0	10.1	11.5	-89.78	-89.78	-22.7	-395.0	597.3	578.1	19.17	31.152	
4,500.0	4,492.9	4,447.0	4,428.9	10.3	11.8	-89.85	-89.85	-23.4	-405.4	607.8	588.2	19.61	30.988	
4,600.0	4,592.9	4,554.7	4,536.0	10.5	12.1	-89.92	-89.92	-24.2	-416.5	618.1	598.1	20.07	30.806	
4,700.0	4,692.9	4,682.0	4,663.1	10.7	12.3	-89.98	-89.98	-24.8	-425.4	625.1	604.6	20.52	30.467	
4,800.0	4,792.9	4,809.9	4,790.9	10.9	12.5	-90.00	-90.00	-25.0	-428.7	627.7	606.7	20.96	29.952	

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 Guttersen 31Y-301
Project:	SEC.31-T3N-R63W	TVD Reference:	WELL @ 4851.0ft (RKB - 15')
Reference Site:	Guttersen 31Y-201 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4851.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Guttersen 31Y-301	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 (11-11-13)	Offset TVD Reference:	Offset Datum

Offset Design Guttersen 31Y-201 Pad Sec.31-T3N-R63W - Guttersen 31T-221 - Wellbore #1 - Plan #1 (5-31-13)													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
4,900.0	4,892.9	4,911.9	4,892.9	11.1	12.7	-90.00	-90.00	-25.0	-428.7	627.7	606.3	21.36	29.379	
5,000.0	4,992.9	5,011.9	4,992.9	11.3	12.9	-90.00	-90.00	-25.0	-428.7	627.7	605.9	21.78	28.824	
5,100.0	5,092.9	5,111.9	5,092.9	11.5	13.1	-90.00	-90.00	-25.0	-428.7	627.7	605.5	22.19	28.288	
5,200.0	5,192.9	5,211.9	5,192.9	11.7	13.2	-90.00	-90.00	-25.0	-428.7	627.7	605.1	22.60	27.770	
5,300.0	5,292.9	5,311.9	5,292.9	11.9	13.4	-90.00	-90.00	-25.0	-428.7	627.7	604.7	23.02	27.269	
5,400.0	5,392.9	5,411.9	5,392.9	12.1	13.6	-90.00	-90.00	-25.0	-428.7	627.7	604.2	23.44	26.784	
5,500.0	5,492.9	5,511.9	5,492.9	12.3	13.8	-90.00	-90.00	-25.0	-428.7	627.7	603.8	23.85	26.314	
5,600.0	5,592.9	5,611.9	5,592.9	12.6	14.0	-90.00	-90.00	-25.0	-428.7	627.7	603.4	24.27	25.860	
5,700.0	5,692.9	5,711.9	5,692.9	12.8	14.2	-90.00	-90.00	-25.0	-428.7	627.7	603.0	24.69	25.420	
5,800.0	5,792.9	5,811.9	5,792.9	13.0	14.3	-90.00	-90.00	-25.0	-428.7	627.7	602.6	25.11	24.994	
5,860.7	5,853.6	5,872.7	5,853.6	13.1	14.5	-90.00	-90.00	-25.0	-428.7	627.7	602.3	25.37	24.741	
5,900.0	5,892.9	5,911.8	5,892.7	13.2	14.5	-89.99	-89.99	-24.8	-428.7	627.7	602.2	25.53	24.581	
5,951.6	5,944.5	5,962.7	5,943.5	13.3	14.6	-89.74	-89.74	-22.1	-428.7	627.7	602.0	25.75	24.378	
6,000.0	5,992.8	6,010.1	5,990.7	13.4	14.7	-88.68	-88.68	-16.6	-428.8	627.8	601.9	25.95	24.197	
6,050.0	6,042.6	6,058.9	6,038.6	13.5	14.8	-88.29	-88.29	-7.8	-428.9	627.9	601.8	26.15	24.016	
6,100.0	6,091.9	6,107.4	6,085.7	13.6	14.9	-87.92	-87.92	3.9	-429.0	628.1	601.7	26.34	23.841	
6,150.0	6,140.6	6,155.6	6,131.7	13.7	15.0	-87.55	-87.55	18.5	-429.2	628.2	601.7	26.54	23.668	
6,200.0	6,188.5	6,203.7	6,176.4	13.8	15.1	-87.20	-87.20	35.9	-429.4	628.4	601.7	26.75	23.493	
6,250.0	6,235.3	6,251.5	6,219.8	13.9	15.2	-86.86	-86.86	55.9	-429.7	628.6	601.6	26.97	23.311	
6,300.0	6,280.9	6,300.0	6,262.5	14.0	15.3	-86.52	-86.52	79.0	-430.0	628.8	601.6	27.20	23.115	
6,350.0	6,325.1	6,346.5	6,301.9	14.1	15.4	-86.21	-86.21	103.6	-430.2	629.0	601.6	27.47	22.903	
6,400.0	6,367.6	6,393.7	6,340.3	14.2	15.5	-85.92	-85.92	131.0	-430.6	629.3	601.5	27.76	22.665	
6,450.0	6,408.3	6,440.7	6,376.8	14.3	15.6	-85.64	-85.64	160.7	-430.9	629.5	601.4	28.11	22.398	
6,500.0	6,447.0	6,487.6	6,411.3	14.5	15.8	-85.37	-85.37	192.4	-431.3	629.7	601.2	28.50	22.097	
6,550.0	6,483.5	6,534.3	6,443.8	14.7	15.9	-85.13	-85.13	226.0	-431.7	630.0	601.0	28.95	21.762	
6,600.0	6,517.8	6,580.9	6,474.0	14.9	16.1	-84.91	-84.91	261.5	-432.2	630.2	600.7	29.46	21.389	
6,650.0	6,549.6	6,627.4	6,501.9	15.2	16.4	-84.70	-84.70	298.6	-432.6	630.4	600.4	30.05	20.980	
6,700.0	6,578.8	6,673.7	6,527.4	15.5	16.6	-84.52	-84.52	337.3	-433.1	630.6	599.9	30.71	20.536	
6,750.0	6,605.3	6,720.0	6,550.6	15.9	16.9	-84.36	-84.36	377.3	-433.6	630.8	599.3	31.44	20.062	
6,800.0	6,628.9	6,766.2	6,571.2	16.3	17.3	-84.22	-84.22	418.6	-434.1	630.9	598.7	32.25	19.561	
6,850.0	6,649.6	6,812.3	6,589.2	16.7	17.7	-84.11	-84.11	461.0	-434.6	631.1	597.9	33.14	19.040	
6,900.0	6,667.3	6,858.3	6,604.7	17.2	18.1	-84.02	-84.02	504.4	-435.1	631.2	597.1	34.11	18.505	
6,950.0	6,682.0	6,904.3	6,617.5	17.7	18.6	-83.95	-83.95	548.6	-435.7	631.3	596.1	35.15	17.962	
7,000.0	6,693.4	6,950.0	6,627.5	18.3	19.1	-83.91	-83.91	593.1	-436.2	631.3	595.1	36.24	17.419	
7,050.0	6,701.7	6,996.3	6,635.0	18.9	19.6	-83.89	-83.89	638.8	-436.8	631.4	594.0	37.41	16.875	
7,100.0	6,706.7	7,042.2	6,639.6	19.5	20.2	-83.89	-83.89	684.5	-437.3	631.4	592.7	38.63	16.342	
7,150.1	6,708.4	7,088.3	6,641.5	20.2	20.8	-83.92	-83.92	730.5	-437.9	631.3	591.4	39.90	15.822	
7,156.1	6,708.4	7,093.7	6,641.6	20.3	20.8	-83.92	-83.92	736.0	-437.9	631.3	591.3	40.06	15.762	
7,200.0	6,708.5	7,137.2	6,641.4	20.9	21.4	-83.90	-83.90	779.4	-438.5	631.4	590.1	41.24	15.309	
7,300.0	6,708.7	7,237.2	6,641.0	22.3	22.8	-83.85	-83.85	879.4	-439.7	631.5	587.4	44.06	14.332	
7,400.0	6,708.9	7,337.1	6,640.6	23.8	24.2	-83.79	-83.79	979.4	-440.9	631.5	584.5	47.02	13.432	
7,500.0	6,709.1	7,437.1	6,640.1	25.3	25.7	-83.74	-83.74	1,079.3	-442.1	631.6	581.5	50.10	12.609	
7,600.0	6,709.3	7,537.1	6,639.7	26.9	27.3	-83.68	-83.68	1,179.3	-443.3	631.7	578.5	53.27	11.859	
7,700.0	6,709.5	7,637.1	6,639.3	28.5	28.9	-83.63	-83.63	1,279.3	-444.6	631.8	575.3	56.52	11.179	
7,800.0	6,709.6	7,737.1	6,638.9	30.2	30.5	-83.57	-83.57	1,379.3	-445.8	631.9	572.1	59.84	10.560	
7,900.0	6,709.8	7,837.1	6,638.5	31.9	32.2	-83.52	-83.52	1,479.3	-447.0	632.0	568.8	63.21	9.998	
8,000.0	6,710.0	7,937.1	6,638.1	33.6	33.9	-83.46	-83.46	1,579.3	-448.2	632.1	565.4	66.63	9.486	
8,100.0	6,710.2	8,037.1	6,637.6	35.3	35.6	-83.41	-83.41	1,679.3	-449.4	632.2	562.1	70.10	9.019	
8,200.0	6,710.4	8,137.1	6,637.2	37.1	37.4	-83.35	-83.35	1,779.3	-450.7	632.3	558.7	73.59	8.591	
8,300.0	6,710.6	8,237.1	6,636.8	38.9	39.1	-83.30	-83.30	1,879.3	-451.9	632.4	555.2	77.12	8.200	
8,400.0	6,710.8	8,337.1	6,636.4	40.6	40.9	-83.24	-83.24	1,979.2	-453.1	632.4	551.8	80.67	7.840	

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 Guttersen 31Y-301
Project:	SEC.31-T3N-R63W	TVD Reference:	WELL @ 4851.0ft (RKB - 15')
Reference Site:	Guttersen 31Y-201 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4851.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Guttersen 31Y-301	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 (11-11-13)	Offset TVD Reference:	Offset Datum

Offset Design Guttersen 31Y-201 Pad Sec.31-T3N-R63W - Guttersen 31T-221 - Wellbore #1 - Plan #1 (5-31-13)													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)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,500.0	6,711.0	8,437.1	6,636.0	42.4	42.7	-83.19	-83.19	2,079.2	-454.3	632.5	548.3	84.24	7.508	
8,600.0	6,711.2	8,537.1	6,635.5	44.3	44.5	-83.13	-83.13	2,179.2	-455.5	632.6	544.8	87.84	7.202	
8,700.0	6,711.4	8,637.1	6,635.1	46.1	46.3	-83.08	-83.08	2,279.2	-456.7	632.7	541.3	91.45	6.919	
8,800.0	6,711.6	8,737.1	6,634.7	47.9	48.1	-83.02	-83.02	2,379.2	-458.0	632.8	537.7	95.07	6.656	
8,900.0	6,711.8	8,837.1	6,634.3	49.7	50.0	-82.97	-82.97	2,479.2	-459.2	632.9	534.2	98.71	6.412	
9,000.0	6,712.0	8,937.1	6,633.9	51.6	51.8	-82.91	-82.91	2,579.2	-460.4	633.0	530.6	102.36	6.184	
9,100.0	6,712.1	9,037.1	6,633.4	53.4	53.6	-82.86	-82.86	2,679.2	-461.6	633.1	527.1	106.02	5.971	
9,200.0	6,712.3	9,137.1	6,633.0	55.3	55.5	-82.81	-82.81	2,779.2	-462.8	633.2	523.5	109.69	5.772	
9,300.0	6,712.5	9,237.1	6,632.6	57.1	57.3	-82.75	-82.75	2,879.2	-464.0	633.3	519.9	113.37	5.586	
9,400.0	6,712.7	9,337.1	6,632.2	59.0	59.2	-82.70	-82.70	2,979.1	-465.3	633.4	516.3	117.06	5.411	
9,500.0	6,712.9	9,437.1	6,631.8	60.8	61.0	-82.64	-82.64	3,079.1	-466.5	633.5	512.7	120.75	5.246	
9,600.0	6,713.1	9,537.1	6,631.4	62.7	62.9	-82.59	-82.59	3,179.1	-467.7	633.6	509.1	124.45	5.091	
9,700.0	6,713.3	9,637.1	6,630.9	64.6	64.8	-82.53	-82.53	3,279.1	-468.9	633.7	505.5	128.15	4.945	
9,800.0	6,713.5	9,737.1	6,630.5	66.5	66.6	-82.48	-82.48	3,379.1	-470.1	633.8	501.9	131.86	4.807	
9,900.0	6,713.7	9,837.1	6,630.1	68.3	68.5	-82.42	-82.42	3,479.1	-471.3	633.9	498.3	135.57	4.676	
10,000.0	6,713.9	9,937.1	6,629.7	70.2	70.4	-82.37	-82.37	3,579.1	-472.6	634.0	494.7	139.29	4.552	
10,100.0	6,714.1	10,037.1	6,629.3	72.1	72.2	-82.31	-82.31	3,679.1	-473.8	634.1	491.1	143.01	4.434	
10,200.0	6,714.3	10,137.1	6,628.8	74.0	74.1	-82.26	-82.26	3,779.1	-475.0	634.2	487.5	146.73	4.322	
10,300.0	6,714.4	10,237.1	6,628.4	75.9	76.0	-82.21	-82.21	3,879.1	-476.2	634.3	483.8	150.46	4.216	
10,400.0	6,714.6	10,337.1	6,628.0	77.7	77.9	-82.15	-82.15	3,979.0	-477.4	634.4	480.2	154.19	4.114	
10,500.0	6,714.8	10,437.1	6,627.6	79.6	79.8	-82.10	-82.10	4,079.0	-478.6	634.5	476.6	157.92	4.018	
10,600.0	6,715.0	10,537.1	6,627.2	81.5	81.7	-82.04	-82.04	4,179.0	-479.9	634.6	473.0	161.65	3.926	
10,700.0	6,715.2	10,637.1	6,626.7	83.4	83.6	-81.99	-81.99	4,279.0	-481.1	634.7	469.3	165.39	3.838	
10,800.0	6,715.4	10,737.1	6,626.3	85.3	85.4	-81.93	-81.93	4,379.0	-482.3	634.8	465.7	169.12	3.754	
10,900.0	6,715.6	10,837.1	6,625.9	87.2	87.3	-81.88	-81.88	4,479.0	-483.5	634.9	462.1	172.86	3.673	
11,000.0	6,715.8	10,937.1	6,625.5	89.1	89.2	-81.82	-81.82	4,579.0	-484.7	635.0	458.4	176.60	3.596	
11,108.8	6,716.0	11,045.9	6,625.0	91.2	91.3	-81.77	-81.77	4,687.8	-486.1	635.2	454.5	180.67	3.515 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Guttersen 31Y-301
Project:	SEC.31-T3N-R63W	TVD Reference:	WELL @ 4851.0ft (RKB - 15')
Reference Site:	Guttersen 31Y-201 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4851.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Guttersen 31Y-301	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 (11-11-13)	Offset TVD Reference:	Offset Datum

Offset Design Guttersen 31Y-201 Pad Sec.31-T3N-R63W - Guttersen 31T-401 - Wellbore #1 - Plan #1 (5-31-13)													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	0.0	0.0	0.0	0.0	-89.99	-89.99	0.0	-89.4	89.4				
100.0	100.0	100.0	100.0	0.1	0.1	-89.99	-89.99	0.0	-89.4	89.4	89.2	0.22	397.850	
200.0	200.0	200.0	200.0	0.3	0.3	-89.99	-89.99	0.0	-89.4	89.4	88.7	0.67	132.617 CC, ES	
300.0	300.0	296.9	296.9	0.6	0.5	-90.03	-90.03	-0.1	-91.1	91.1	90.0	1.11	82.323	
400.0	400.0	393.7	393.5	0.8	0.8	-90.14	-90.14	-0.2	-96.0	96.2	94.6	1.55	62.183	
500.0	500.0	489.9	489.4	1.0	1.0	-90.31	-90.31	-0.6	-104.1	104.6	102.6	2.01	51.986	
600.0	600.0	585.9	584.7	1.2	1.3	-90.49	-90.49	-1.0	-115.3	116.4	113.8	2.51	46.383	
700.0	700.0	685.0	683.0	1.5	1.6	-90.66	-90.66	-1.5	-128.3	129.5	126.4	3.04	42.581	
800.0	800.0	784.2	781.3	1.7	1.9	-90.80	-90.80	-2.0	-141.3	142.6	139.0	3.58	39.816	
900.0	900.0	883.3	879.6	1.9	2.2	-90.92	-90.92	-2.5	-154.3	155.7	151.6	4.13	37.727	
1,000.0	1,000.0	982.4	977.9	2.1	2.5	-91.02	-91.02	-3.0	-167.3	168.8	164.1	4.68	36.100	
1,100.0	1,100.0	1,081.4	1,076.0	2.3	2.9	171.76	171.76	-3.5	-180.3	183.2	178.5	4.71	38.867	
1,200.0	1,199.9	1,180.0	1,173.7	2.5	3.2	171.81	171.81	-4.0	-193.2	200.2	195.0	5.14	38.933	
1,281.3	1,281.0	1,259.7	1,252.7	2.7	3.5	171.91	171.91	-4.4	-203.7	215.8	210.4	5.49	39.318	
1,300.0	1,299.7	1,278.0	1,270.9	2.8	3.5	171.95	171.95	-4.5	-206.1	219.6	214.1	5.57	39.429	
1,400.0	1,399.4	1,375.9	1,368.0	3.0	3.8	172.12	172.12	-5.0	-218.9	239.9	233.9	6.01	39.954	
1,500.0	1,499.2	1,473.9	1,465.0	3.2	4.2	172.26	172.26	-5.5	-231.8	260.3	253.8	6.45	40.378	
1,600.0	1,598.9	1,571.8	1,562.1	3.4	4.5	172.39	172.39	-6.0	-244.6	280.6	273.7	6.89	40.727	
1,700.0	1,698.6	1,669.7	1,659.2	3.7	4.8	172.49	172.49	-6.4	-257.4	300.9	293.5	7.34	41.018	
1,800.0	1,798.3	1,767.6	1,756.2	3.9	5.2	172.59	172.59	-6.9	-270.3	321.2	313.4	7.78	41.264	
1,900.0	1,898.1	1,865.5	1,853.3	4.2	5.5	172.67	172.67	-7.4	-283.1	341.5	333.3	8.23	41.472	
2,000.0	1,997.8	1,963.4	1,950.4	4.4	5.8	172.74	172.74	-7.9	-295.9	361.8	353.1	8.69	41.651	
2,100.0	2,097.5	2,061.3	2,047.4	4.7	6.1	172.81	172.81	-8.4	-308.8	382.1	373.0	9.14	41.806	
2,200.0	2,197.3	2,159.3	2,144.5	4.9	6.5	172.87	172.87	-8.9	-321.6	402.4	392.8	9.60	41.940	
2,300.0	2,297.0	2,257.2	2,241.6	5.2	6.8	172.92	172.92	-9.4	-334.5	422.7	412.7	10.05	42.058	
2,400.0	2,396.7	2,355.1	2,338.6	5.4	7.1	172.97	172.97	-9.9	-347.3	443.1	432.6	10.51	42.162	
2,500.0	2,496.4	2,453.0	2,435.7	5.7	7.5	173.01	173.01	-10.4	-360.1	463.4	452.4	10.97	42.255	
2,600.0	2,596.2	2,550.9	2,532.8	5.9	7.8	173.05	173.05	-10.9	-373.0	483.7	472.3	11.42	42.337	
2,700.0	2,695.9	2,648.8	2,629.8	6.2	8.1	173.09	173.09	-11.4	-385.8	504.0	492.1	11.88	42.411	
2,800.0	2,795.6	2,746.7	2,726.9	6.4	8.5	173.12	173.12	-11.9	-398.6	524.3	512.0	12.34	42.477	
2,900.0	2,895.4	2,844.7	2,824.0	6.7	8.8	173.16	173.16	-12.4	-411.5	544.6	531.8	12.80	42.536	
3,000.0	2,995.1	2,942.6	2,921.0	6.9	9.1	173.18	173.18	-12.9	-424.3	564.9	551.7	13.26	42.591	
3,100.0	3,094.8	3,040.5	3,018.1	7.2	9.4	173.21	173.21	-13.3	-437.2	585.3	571.5	13.73	42.640	
3,200.0	3,194.5	3,138.4	3,115.2	7.5	9.8	173.24	173.24	-13.8	-450.0	605.6	591.4	14.19	42.684	
3,300.0	3,294.3	3,236.3	3,212.2	7.7	10.1	173.26	173.26	-14.3	-462.8	625.9	611.2	14.65	42.725	
3,400.0	3,394.0	3,334.2	3,309.3	8.0	10.4	173.28	173.28	-14.8	-475.7	646.2	631.1	15.11	42.763	
3,500.0	3,493.7	3,432.1	3,406.4	8.2	10.8	173.30	173.30	-15.3	-488.5	666.5	651.0	15.57	42.798	
3,600.0	3,593.5	3,530.1	3,503.4	8.5	11.1	173.32	173.32	-15.8	-501.3	686.8	670.8	16.04	42.829	
3,700.0	3,693.2	3,628.0	3,600.5	8.7	11.4	173.34	173.34	-16.3	-514.2	707.2	690.7	16.50	42.859	
3,725.8	3,719.0	3,653.3	3,625.6	8.8	11.5	173.35	173.35	-16.4	-517.5	712.4	695.8	16.62	42.866	
3,800.0	3,793.0	3,726.0	3,697.7	9.0	11.8	173.38	173.38	-16.8	-527.0	726.8	709.8	16.97	42.816	
3,900.0	3,892.9	3,824.5	3,795.4	9.2	12.1	173.40	173.40	-17.3	-540.0	743.9	726.5	17.42	42.695	
4,007.1	4,000.0	3,930.5	3,900.5	9.4	12.4	-89.45	-89.45	-17.8	-553.8	759.4	741.5	17.91	42.406	
4,100.0	4,092.9	4,022.6	3,991.7	9.5	12.8	-89.50	-89.50	-18.3	-565.9	771.6	753.3	18.32	42.125	
4,200.0	4,192.9	4,121.7	4,090.0	9.7	13.1	-89.54	-89.54	-18.8	-578.9	784.7	765.9	18.76	41.825	
4,300.0	4,292.9	4,220.9	4,188.3	9.9	13.4	-89.59	-89.59	-19.3	-591.9	797.8	778.6	19.21	41.536	
4,400.0	4,392.9	4,320.0	4,286.6	10.1	13.8	-89.63	-89.63	-19.8	-604.9	810.9	791.3	19.65	41.259	
4,500.0	4,492.9	4,419.2	4,384.9	10.3	14.1	-89.67	-89.67	-20.3	-617.9	824.0	803.9	20.10	40.993	
4,600.0	4,592.9	4,518.3	4,483.1	10.5	14.4	-89.71	-89.71	-20.8	-630.9	837.1	816.6	20.55	40.736	
4,700.0	4,692.9	4,617.4	4,581.4	10.7	14.8	-89.75	-89.75	-21.3	-643.9	850.2	829.2	21.00	40.489	
4,800.0	4,792.9	4,716.6	4,679.7	10.9	15.1	-89.78	-89.78	-21.8	-656.9	863.4	841.9	21.45	40.252	

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 Guttersen 31Y-301
Project:	SEC.31-T3N-R63W	TVD Reference:	WELL @ 4851.0ft (RKB - 15')
Reference Site:	Guttersen 31Y-201 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4851.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Guttersen 31Y-301	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 (11-11-13)	Offset TVD Reference:	Offset Datum

Offset Design Guttersen 31Y-201 Pad Sec.31-T3N-R63W - Guttersen 31T-401 - Wellbore #1 - Plan #1 (5-31-13)													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
4,900.0	4,892.9	4,815.7	4,778.0	11.1	15.4	-89.82	-89.82	-22.3	-669.9	876.5	854.6	21.90	40.023	
5,000.0	4,992.9	4,914.8	4,876.2	11.3	15.8	-89.86	-89.86	-22.8	-682.9	889.6	867.2	22.35	39.802	
5,100.0	5,092.9	5,014.0	4,974.5	11.5	16.1	-89.89	-89.89	-23.3	-695.9	902.7	879.9	22.80	39.589	
5,200.0	5,192.9	5,113.1	5,072.8	11.7	16.4	-89.92	-89.92	-23.8	-708.9	915.8	892.5	23.25	39.383	
5,300.0	5,292.9	5,234.9	5,193.7	11.9	16.8	-89.96	-89.96	-24.4	-724.0	928.3	904.6	23.73	39.121	
5,400.0	5,392.9	5,382.6	5,340.9	12.1	17.1	-89.99	-89.99	-24.8	-736.0	936.4	912.2	24.20	38.688	
5,500.0	5,492.9	5,531.2	5,489.4	12.3	17.3	-90.00	-90.00	-25.0	-740.4	939.4	914.7	24.67	38.079	
5,600.0	5,592.9	5,634.7	5,592.9	12.6	17.4	-90.00	-90.00	-25.0	-740.4	939.4	914.3	25.07	37.466	
5,700.0	5,692.9	5,734.7	5,692.9	12.8	17.6	-90.00	-90.00	-25.0	-740.4	939.4	913.9	25.47	36.878	
5,800.0	5,792.9	5,834.7	5,792.9	13.0	17.7	-90.00	-90.00	-25.0	-740.4	939.4	913.5	25.87	36.307	
5,900.0	5,892.9	5,934.7	5,892.9	13.2	17.9	-90.00	-90.00	-25.0	-740.4	939.4	913.1	26.28	35.750	
5,951.6	5,944.5	5,986.3	5,944.5	13.3	18.0	-90.00	-90.00	-25.0	-740.4	939.4	912.9	26.49	35.469	
6,000.0	5,992.8	6,034.7	5,992.8	13.4	18.0	-89.41	-89.41	-25.0	-740.4	939.4	912.7	26.67	35.219	
6,050.0	6,042.6	6,084.4	6,042.6	13.5	18.1	-89.70	-89.70	-25.0	-740.4	939.4	912.5	26.87	34.961	
6,083.6	6,075.8	6,117.7	6,075.9	13.6	18.2	-90.00	-90.00	-24.9	-740.4	939.4	912.4	27.00	34.795	
6,100.0	6,091.9	6,133.9	6,092.0	13.6	18.2	-90.15	-90.15	-24.4	-740.4	939.4	912.3	27.06	34.715	
6,150.0	6,140.6	6,183.7	6,141.7	13.7	18.3	-90.62	-90.62	-20.8	-740.5	939.4	912.2	27.25	34.475	
6,200.0	6,188.5	6,234.0	6,191.6	13.8	18.3	-91.09	-91.09	-14.0	-740.6	939.5	912.1	27.44	34.238	
6,250.0	6,235.3	6,284.9	6,241.4	13.9	18.4	-91.55	-91.55	-3.7	-740.7	939.7	912.1	27.64	33.999	
6,300.0	6,280.9	6,336.3	6,290.9	14.0	18.5	-92.01	-92.01	10.0	-740.8	939.9	912.1	27.85	33.749	
6,350.0	6,325.1	6,388.3	6,339.9	14.1	18.6	-92.46	-92.46	27.3	-741.0	940.2	912.2	28.08	33.482	
6,400.0	6,367.6	6,440.8	6,388.2	14.2	18.7	-92.91	-92.91	48.0	-741.3	940.6	912.2	28.34	33.192	
6,450.0	6,408.3	6,493.9	6,435.4	14.3	18.7	-93.34	-93.34	72.3	-741.6	941.0	912.3	28.63	32.862	
6,500.0	6,447.0	6,547.5	6,481.2	14.5	18.8	-93.77	-93.77	100.1	-741.9	941.4	912.4	28.97	32.492	
6,550.0	6,483.5	6,601.8	6,525.5	14.7	18.9	-94.17	-94.17	131.4	-742.3	941.9	912.5	29.37	32.072	
6,600.0	6,517.8	6,656.5	6,567.8	14.9	19.1	-94.56	-94.56	166.2	-742.7	942.4	912.5	29.83	31.595	
6,650.0	6,549.6	6,711.9	6,607.9	15.2	19.2	-94.93	-94.93	204.3	-743.1	942.9	912.5	30.36	31.059	
6,700.0	6,578.8	6,767.7	6,645.5	15.5	19.4	-95.28	-95.28	245.6	-743.6	943.4	912.4	30.97	30.463	
6,750.0	6,605.3	6,824.1	6,680.3	15.9	19.6	-95.61	-95.61	289.9	-744.2	943.9	912.2	31.66	29.811	
6,800.0	6,628.9	6,880.9	6,712.0	16.3	19.8	-95.91	-95.91	337.1	-744.7	944.4	911.9	32.45	29.107	
6,850.0	6,649.6	6,938.2	6,740.3	16.7	20.1	-96.18	-96.18	386.9	-745.3	944.8	911.5	33.32	28.358	
6,900.0	6,667.3	6,996.0	6,764.9	17.2	20.5	-96.42	-96.42	439.1	-745.9	945.3	911.0	34.28	27.574	
6,950.0	6,682.0	7,054.0	6,785.6	17.7	20.9	-96.63	-96.63	493.3	-746.6	945.7	910.3	35.33	26.763	
7,000.0	6,693.4	7,112.4	6,802.3	18.3	21.3	-96.81	-96.81	549.3	-747.2	946.0	909.5	36.47	25.936	
7,050.0	6,701.7	7,171.1	6,814.7	18.9	21.9	-96.96	-96.96	606.6	-747.9	946.3	908.6	37.69	25.106	
7,100.0	6,706.7	7,229.1	6,822.5	19.5	22.4	-97.07	-97.07	664.0	-748.6	946.5	907.5	38.96	24.291	
7,150.1	6,708.4	7,279.1	6,827.8	20.2	23.0	-97.24	-97.24	713.7	-749.2	946.9	906.7	40.19	23.560	
7,200.0	6,708.5	7,332.5	6,832.8	20.9	23.6	-97.54	-97.54	766.8	-749.8	947.5	906.0	41.53	22.816	
7,300.0	6,708.7	7,442.1	6,836.0	22.3	24.9	-97.72	-97.72	876.4	-751.1	947.9	903.4	44.41	21.345	
7,400.0	6,708.9	7,542.1	6,835.8	23.8	26.2	-97.70	-97.70	976.4	-752.3	947.8	900.5	47.33	20.026	
7,500.0	6,709.1	7,642.1	6,835.7	25.3	27.6	-97.68	-97.68	1,076.4	-753.5	947.7	897.4	50.37	18.816	
7,600.0	6,709.3	7,742.1	6,835.5	26.9	29.1	-97.66	-97.66	1,176.4	-754.7	947.7	894.2	53.51	17.712	
7,700.0	6,709.5	7,842.1	6,835.4	28.5	30.6	-97.64	-97.64	1,276.3	-755.8	947.6	890.9	56.73	16.704	
7,800.0	6,709.6	7,942.1	6,835.2	30.2	32.2	-97.62	-97.62	1,376.3	-757.0	947.5	887.5	60.02	15.787	
7,900.0	6,709.8	8,042.1	6,835.1	31.9	33.8	-97.59	-97.59	1,476.3	-758.2	947.5	884.1	63.37	14.951	
8,000.0	6,710.0	8,142.1	6,834.9	33.6	35.4	-97.57	-97.57	1,576.3	-759.4	947.4	880.7	66.78	14.188	
8,100.0	6,710.2	8,242.1	6,834.7	35.3	37.1	-97.55	-97.55	1,676.3	-760.6	947.4	877.1	70.22	13.491	
8,200.0	6,710.4	8,342.1	6,834.6	37.1	38.7	-97.53	-97.53	1,776.3	-761.8	947.3	873.6	73.70	12.853	
8,300.0	6,710.6	8,442.1	6,834.4	38.9	40.4	-97.51	-97.51	1,876.3	-762.9	947.2	870.0	77.22	12.267	
8,400.0	6,710.8	8,542.1	6,834.3	40.6	42.2	-97.49	-97.49	1,976.3	-764.1	947.2	866.4	80.76	11.728	
8,500.0	6,711.0	8,642.1	6,834.1	42.4	43.9	-97.47	-97.47	2,076.3	-765.3	947.1	862.8	84.33	11.231	

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 Guttersen 31Y-301
Project:	SEC.31-T3N-R63W	TVD Reference:	WELL @ 4851.0ft (RKB - 15')
Reference Site:	Guttersen 31Y-201 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4851.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Guttersen 31Y-301	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 (11-11-13)	Offset TVD Reference:	Offset Datum

Offset Design Guttersen 31Y-201 Pad Sec.31-T3N-R63W - Guttersen 31T-401 - Wellbore #1 - Plan #1 (5-31-13)													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)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,600.0	6,711.2	8,742.1	6,834.0	44.3	45.7	-97.45	-97.45	2,176.3	-766.5	947.1	859.1	87.92	10.772	
8,700.0	6,711.4	8,842.1	6,833.8	46.1	47.4	-97.43	-97.43	2,276.3	-767.7	947.0	855.5	91.53	10.347	
8,800.0	6,711.6	8,942.1	6,833.6	47.9	49.2	-97.41	-97.41	2,376.3	-768.9	946.9	851.8	95.15	9.952	
8,900.0	6,711.8	9,042.1	6,833.5	49.7	51.0	-97.39	-97.39	2,476.3	-770.0	946.9	848.1	98.79	9.585	
9,000.0	6,712.0	9,142.1	6,833.3	51.6	52.8	-97.37	-97.37	2,576.2	-771.2	946.8	844.4	102.45	9.242	
9,100.0	6,712.1	9,242.1	6,833.2	53.4	54.6	-97.34	-97.34	2,676.2	-772.4	946.8	840.7	106.11	8.922	
9,200.0	6,712.3	9,342.1	6,833.0	55.3	56.4	-97.32	-97.32	2,776.2	-773.6	946.7	836.9	109.79	8.623	
9,300.0	6,712.5	9,442.1	6,832.9	57.1	58.2	-97.30	-97.30	2,876.2	-774.8	946.7	833.2	113.48	8.342	
9,400.0	6,712.7	9,542.1	6,832.7	59.0	60.1	-97.28	-97.28	2,976.2	-776.0	946.6	829.4	117.17	8.079	
9,500.0	6,712.9	9,642.1	6,832.5	60.8	61.9	-97.26	-97.26	3,076.2	-777.1	946.5	825.7	120.88	7.831	
9,600.0	6,713.1	9,742.1	6,832.4	62.7	63.7	-97.24	-97.24	3,176.2	-778.3	946.5	821.9	124.59	7.597	
9,700.0	6,713.3	9,842.1	6,832.2	64.6	65.6	-97.22	-97.22	3,276.2	-779.5	946.4	818.1	128.31	7.376	
9,800.0	6,713.5	9,942.1	6,832.1	66.5	67.4	-97.20	-97.20	3,376.2	-780.7	946.4	814.3	132.03	7.168	
9,900.0	6,713.7	10,042.1	6,831.9	68.3	69.3	-97.18	-97.18	3,476.2	-781.9	946.3	810.5	135.76	6.970	
10,000.0	6,713.9	10,142.1	6,831.8	70.2	71.1	-97.16	-97.16	3,576.2	-783.0	946.2	806.8	139.50	6.783	
10,100.0	6,714.1	10,242.1	6,831.6	72.1	73.0	-97.14	-97.14	3,676.2	-784.2	946.2	803.0	143.24	6.606	
10,200.0	6,714.3	10,342.1	6,831.4	74.0	74.9	-97.12	-97.12	3,776.2	-785.4	946.1	799.2	146.98	6.437	
10,300.0	6,714.4	10,442.1	6,831.3	75.9	76.7	-97.09	-97.09	3,876.1	-786.6	946.1	795.3	150.73	6.277	
10,400.0	6,714.6	10,542.1	6,831.1	77.7	78.6	-97.07	-97.07	3,976.1	-787.8	946.0	791.5	154.49	6.124	
10,500.0	6,714.8	10,642.1	6,831.0	79.6	80.5	-97.05	-97.05	4,076.1	-789.0	946.0	787.7	158.24	5.978	
10,600.0	6,715.0	10,742.0	6,830.8	81.5	82.3	-97.03	-97.03	4,176.1	-790.1	945.9	783.9	162.00	5.839	
10,700.0	6,715.2	10,842.0	6,830.7	83.4	84.2	-97.01	-97.01	4,276.1	-791.3	945.8	780.1	165.77	5.706	
10,800.0	6,715.4	10,942.0	6,830.5	85.3	86.1	-96.99	-96.99	4,376.1	-792.5	945.8	776.3	169.54	5.579	
10,900.0	6,715.6	11,042.0	6,830.3	87.2	88.0	-96.97	-96.97	4,476.1	-793.7	945.7	772.4	173.31	5.457	
11,000.0	6,715.8	11,142.0	6,830.2	89.1	89.9	-96.95	-96.95	4,576.1	-794.9	945.7	768.6	177.08	5.340	
11,108.8	6,716.0	11,250.9	6,830.0	91.2	91.9	-96.93	-96.93	4,684.9	-796.2	945.6	764.4	181.19	5.219 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Guttersen 31Y-301
Project:	SEC.31-T3N-R63W	TVD Reference:	WELL @ 4851.0ft (RKB - 15')
Reference Site:	Guttersen 31Y-201 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4851.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Guttersen 31Y-301	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 (11-11-13)	Offset TVD Reference:	Offset Datum

Offset Design Guttersen 31Y-201 Pad Sec.31-T3N-R63W - Guttersen 31Y-441 - Wellbore #1 - Plan #1 (5-31-13)													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 (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-89.98	-89.98	0.0	-30.7	30.7				
100.0	100.0	100.0	100.0	0.1	0.1	-89.98	-89.98	0.0	-30.7	30.7	30.5	0.22	136.761	
200.0	200.0	200.0	200.0	0.3	0.3	-89.98	-89.98	0.0	-30.7	30.7	30.1	0.67	45.587	
300.0	300.0	300.0	300.0	0.6	0.6	-89.98	-89.98	0.0	-30.7	30.7	29.6	1.12	27.352	
400.0	400.0	400.0	400.0	0.8	0.8	-89.98	-89.98	0.0	-30.7	30.7	29.2	1.57	19.537	
500.0	500.0	500.0	500.0	1.0	1.0	-89.98	-89.98	0.0	-30.7	30.7	28.7	2.02	15.196	
600.0	600.0	600.0	600.0	1.2	1.2	-89.98	-89.98	0.0	-30.7	30.7	28.3	2.47	12.433	
700.0	700.0	700.0	700.0	1.5	1.5	-89.98	-89.98	0.0	-30.7	30.7	27.8	2.92	10.520	
800.0	800.0	800.0	800.0	1.7	1.7	-89.98	-89.98	0.0	-30.7	30.7	27.4	3.37	9.117	
900.0	900.0	900.0	900.0	1.9	1.9	-89.98	-89.98	0.0	-30.7	30.7	26.9	3.82	8.045	
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	-89.98	-89.98	0.0	-30.7	30.7	26.5	4.27	7.198 CC, ES	
1,100.0	1,100.0	1,100.0	1,100.0	2.3	2.4	173.14	173.14	0.0	-30.7	32.0	27.3	4.70	6.811	
1,200.0	1,199.9	1,199.9	1,199.9	2.5	2.6	173.88	173.88	0.0	-30.7	35.9	30.8	5.12	7.015	
1,281.3	1,281.0	1,281.0	1,281.0	2.7	2.8	174.64	174.64	0.0	-30.7	41.0	35.6	5.47	7.507	
1,300.0	1,299.7	1,299.7	1,299.7	2.8	2.8	174.81	174.81	0.0	-30.7	42.4	36.9	5.55	7.646	
1,400.0	1,399.4	1,399.4	1,399.4	3.0	3.0	175.58	175.58	0.0	-30.7	49.7	43.8	5.97	8.324	
1,500.0	1,499.2	1,499.2	1,499.2	3.2	3.3	176.15	176.15	0.0	-30.7	57.1	50.7	6.41	8.907	
1,600.0	1,598.9	1,598.9	1,598.9	3.4	3.5	176.59	176.59	0.0	-30.7	64.4	57.6	6.84	9.413	
1,700.0	1,698.6	1,698.6	1,698.6	3.7	3.7	176.94	176.94	0.0	-30.7	71.8	64.5	7.28	9.856	
1,800.0	1,798.3	1,798.3	1,798.3	3.9	3.9	177.22	177.22	0.0	-30.7	79.1	71.4	7.72	10.246	
1,900.0	1,898.1	1,898.1	1,898.1	4.2	4.2	177.46	177.46	0.0	-30.7	86.5	78.3	8.16	10.592	
2,000.0	1,997.8	1,997.8	1,997.8	4.4	4.4	177.66	177.66	0.0	-30.7	93.8	85.2	8.61	10.901	
2,100.0	2,097.5	2,097.5	2,097.5	4.7	4.6	177.83	177.83	0.0	-30.7	101.2	92.1	9.05	11.179	
2,200.0	2,197.3	2,197.3	2,197.3	4.9	4.8	177.98	177.98	0.0	-30.7	108.5	99.0	9.49	11.429	
2,300.0	2,297.0	2,297.0	2,297.0	5.2	5.1	178.10	178.10	0.0	-30.7	115.9	105.9	9.94	11.656	
2,400.0	2,396.7	2,396.7	2,396.7	5.4	5.3	178.22	178.22	0.0	-30.7	123.2	112.8	10.39	11.863	
2,500.0	2,496.4	2,496.4	2,496.4	5.7	5.5	178.32	178.32	0.0	-30.7	130.6	119.7	10.83	12.052	
2,600.0	2,596.2	2,596.2	2,596.2	5.9	5.7	178.41	178.41	0.0	-30.7	137.9	126.6	11.28	12.225	
2,700.0	2,695.9	2,695.9	2,695.9	6.2	5.9	178.49	178.49	0.0	-30.7	145.3	133.6	11.73	12.385	
2,800.0	2,795.6	2,795.6	2,795.6	6.4	6.2	178.56	178.56	0.0	-30.7	152.6	140.5	12.18	12.532	
2,900.0	2,895.4	2,895.4	2,895.4	6.7	6.4	178.63	178.63	0.0	-30.7	160.0	147.4	12.63	12.669	
3,000.0	2,995.1	2,995.1	2,995.1	6.9	6.6	178.69	178.69	0.0	-30.7	167.4	154.3	13.08	12.796	
3,100.0	3,094.8	3,089.7	3,089.7	7.2	6.8	178.57	178.57	-0.4	-32.1	176.1	162.6	13.50	13.042	
3,200.0	3,194.5	3,183.5	3,183.3	7.5	7.0	178.12	178.12	-1.6	-36.4	187.9	174.0	13.91	13.506	
3,300.0	3,294.3	3,276.4	3,276.0	7.7	7.2	177.41	177.41	-3.6	-43.6	202.7	188.4	14.32	14.156	
3,400.0	3,394.0	3,370.0	3,369.0	8.0	7.4	176.53	176.53	-6.5	-53.6	220.4	205.7	14.73	14.965	
3,500.0	3,493.7	3,468.2	3,466.4	8.2	7.6	175.67	175.67	-9.7	-65.0	239.1	223.9	15.15	15.781	
3,600.0	3,593.5	3,566.3	3,563.9	8.5	7.8	174.93	174.93	-13.0	-76.4	257.8	242.2	15.57	16.554	
3,700.0	3,693.2	3,664.5	3,661.4	8.7	8.0	174.30	174.30	-16.2	-87.7	276.5	260.5	16.00	17.284	
3,725.8	3,719.0	3,689.9	3,686.5	8.8	8.1	174.14	174.14	-17.0	-90.7	281.4	265.3	16.11	17.467	
3,800.0	3,793.0	3,763.3	3,759.4	9.0	8.3	173.74	173.74	-19.4	-99.2	294.6	278.2	16.42	17.939	
3,900.0	3,892.9	3,873.5	3,869.0	9.2	8.5	173.26	173.26	-22.4	-109.8	308.2	291.4	16.84	18.305	
4,007.1	4,000.0	3,992.8	3,988.1	9.4	8.8	-89.89	-89.89	-24.4	-116.6	315.9	298.6	17.28	18.279	
4,100.0	4,092.9	4,096.7	4,092.0	9.5	9.0	-90.00	-90.00	-25.0	-118.7	317.7	300.1	17.67	17.985	
4,200.0	4,192.9	4,197.6	4,192.9	9.7	9.2	-90.00	-90.00	-25.0	-118.7	317.7	299.7	18.07	17.581	
4,300.0	4,292.9	4,297.6	4,292.9	9.9	9.4	-90.00	-90.00	-25.0	-118.7	317.7	299.2	18.50	17.174	
4,400.0	4,392.9	4,397.6	4,392.9	10.1	9.6	-90.00	-90.00	-25.0	-118.7	317.7	298.8	18.93	16.785	
4,500.0	4,492.9	4,497.6	4,492.9	10.3	9.8	-90.00	-90.00	-25.0	-118.7	317.7	298.4	19.36	16.412	
4,600.0	4,592.9	4,597.6	4,592.9	10.5	10.0	-90.00	-90.00	-25.0	-118.7	317.7	297.9	19.79	16.054	
4,700.0	4,692.9	4,697.6	4,692.9	10.7	10.3	-90.00	-90.00	-25.0	-118.7	317.7	297.5	20.22	15.712	
4,800.0	4,792.9	4,797.6	4,792.9	10.9	10.5	-90.00	-90.00	-25.0	-118.7	317.7	297.1	20.66	15.383	

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 Guttersen 31Y-301
Project:	SEC.31-T3N-R63W	TVD Reference:	WELL @ 4851.0ft (RKB - 15')
Reference Site:	Guttersen 31Y-201 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4851.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Guttersen 31Y-301	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 (11-11-13)	Offset TVD Reference:	Offset Datum

Offset Design Guttersen 31Y-201 Pad Sec.31-T3N-R63W - Guttersen 31Y-441 - Wellbore #1 - Plan #1 (5-31-13)													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
4,900.0	4,892.9	4,897.6	4,892.9	11.1	10.7	-90.00	-90.00	-25.0	-118.7	317.7	296.7	21.09	15.067	
5,000.0	4,992.9	4,997.6	4,992.9	11.3	10.9	-90.00	-90.00	-25.0	-118.7	317.7	296.2	21.52	14.763	
5,100.0	5,092.9	5,097.6	5,092.9	11.5	11.1	-90.00	-90.00	-25.0	-118.7	317.7	295.8	21.96	14.471	
5,200.0	5,192.9	5,197.6	5,192.9	11.7	11.4	-90.00	-90.00	-25.0	-118.7	317.7	295.3	22.39	14.189	
5,300.0	5,292.9	5,297.6	5,292.9	11.9	11.6	-90.00	-90.00	-25.0	-118.7	317.7	294.9	22.83	13.919	
5,400.0	5,392.9	5,397.6	5,392.9	12.1	11.8	-90.00	-90.00	-25.0	-118.7	317.7	294.5	23.26	13.658	
5,500.0	5,492.9	5,497.6	5,492.9	12.3	12.0	-90.00	-90.00	-25.0	-118.7	317.7	294.0	23.70	13.406	
5,600.0	5,592.9	5,597.6	5,592.9	12.6	12.3	-90.00	-90.00	-25.0	-118.7	317.7	293.6	24.14	13.163	
5,700.0	5,692.9	5,697.6	5,692.9	12.8	12.5	-90.00	-90.00	-25.0	-118.7	317.7	293.2	24.58	12.929	
5,800.0	5,792.9	5,797.6	5,792.9	13.0	12.7	-90.00	-90.00	-25.0	-118.7	317.7	292.7	25.01	12.702	
5,900.0	5,892.9	5,897.6	5,892.9	13.2	12.9	-90.00	-90.00	-25.0	-118.7	317.7	292.3	25.45	12.484	
5,951.6	5,944.5	5,949.1	5,944.5	13.3	13.0	-90.00	-90.00	-25.0	-118.7	317.7	292.1	25.68	12.374	
6,000.0	5,992.8	5,997.5	5,992.8	13.4	13.1	-89.59	-89.59	-25.0	-118.7	317.7	291.8	25.89	12.271	
6,027.9	6,020.6	6,025.3	6,020.6	13.4	13.2	-90.00	-90.00	-25.0	-118.7	317.7	291.7	26.01	12.214	
6,050.0	6,042.6	6,047.3	6,042.6	13.5	13.3	-90.45	-90.45	-25.0	-118.7	317.7	291.6	26.11	12.169	
6,100.0	6,091.9	6,097.0	6,092.3	13.6	13.4	-91.78	-91.78	-24.4	-118.7	317.9	291.5	26.32	12.075	
6,150.0	6,140.6	6,147.4	6,142.5	13.7	13.5	-93.15	-93.15	-20.8	-118.8	318.2	291.7	26.54	11.992	
6,200.0	6,188.5	6,198.2	6,192.9	13.8	13.6	-94.51	-94.51	-13.7	-118.9	318.7	292.0	26.74	11.918	
6,250.0	6,235.3	6,249.6	6,243.2	13.9	13.7	-95.85	-95.85	-3.3	-119.0	319.4	292.5	26.95	11.852	
6,300.0	6,280.9	6,301.5	6,293.2	14.0	13.8	-97.17	-97.17	10.8	-119.2	320.3	293.1	27.16	11.792	
6,350.0	6,325.1	6,354.0	6,342.6	14.1	13.9	-98.46	-98.46	28.3	-119.4	321.3	293.9	27.38	11.735	
6,400.0	6,367.6	6,407.1	6,391.3	14.2	14.0	-99.72	-99.72	49.5	-119.6	322.4	294.8	27.61	11.678	
6,450.0	6,408.3	6,460.7	6,438.8	14.3	14.2	-100.92	-100.92	74.3	-119.9	323.6	295.8	27.86	11.618	
6,500.0	6,447.0	6,514.9	6,485.0	14.5	14.3	-102.08	-102.08	102.6	-120.2	325.0	296.8	28.14	11.550	
6,550.0	6,483.5	6,569.7	6,529.5	14.7	14.5	-103.18	-103.18	134.5	-120.6	326.4	297.9	28.46	11.469	
6,600.0	6,517.8	6,624.9	6,571.9	14.9	14.7	-104.22	-104.22	169.9	-121.0	327.8	299.0	28.82	11.373	
6,650.0	6,549.6	6,680.8	6,612.1	15.2	14.9	-105.20	-105.20	208.6	-121.4	329.3	300.0	29.25	11.257	
6,700.0	6,578.8	6,737.1	6,649.7	15.5	15.2	-106.10	-106.10	250.6	-121.9	330.7	300.9	29.74	11.117	
6,750.0	6,605.3	6,793.9	6,684.3	15.9	15.5	-106.92	-106.92	295.6	-122.4	332.1	301.7	30.32	10.953	
6,800.0	6,628.9	6,851.1	6,715.8	16.3	15.9	-107.66	-107.66	343.4	-123.0	333.4	302.4	30.98	10.762	
6,850.0	6,649.6	6,908.8	6,743.7	16.7	16.4	-108.32	-108.32	393.8	-123.6	334.6	302.8	31.73	10.544	
6,900.0	6,667.3	6,966.8	6,768.0	17.2	16.9	-108.89	-108.89	446.5	-124.2	335.6	303.1	32.58	10.302	
6,950.0	6,682.0	7,025.2	6,788.2	17.7	17.5	-109.37	-109.37	501.2	-124.8	336.6	303.1	33.53	10.038	
7,000.0	6,693.4	7,083.8	6,804.3	18.3	18.1	-109.76	-109.76	557.5	-125.4	337.3	302.8	34.58	9.757	
7,050.0	6,701.7	7,142.6	6,816.1	18.9	18.8	-110.05	-110.05	615.2	-126.1	337.9	302.2	35.72	9.462	
7,100.0	6,706.7	7,199.3	6,823.3	19.5	19.4	-110.26	-110.26	671.4	-126.8	338.4	301.4	36.92	9.166	
7,150.1	6,708.4	7,249.3	6,828.5	20.2	20.1	-110.73	-110.73	721.1	-127.3	339.6	301.5	38.05	8.925	
7,200.0	6,708.5	7,303.6	6,833.4	20.9	20.8	-111.48	-111.48	775.2	-128.0	341.1	301.9	39.20	8.702	
7,300.0	6,708.7	7,412.3	6,835.9	22.3	22.3	-111.85	-111.85	883.8	-129.2	341.9	300.0	41.86	8.166	
7,400.0	6,708.9	7,512.3	6,835.8	23.8	23.8	-111.80	-111.80	983.8	-130.4	341.7	297.1	44.64	7.655	
7,500.0	6,709.1	7,612.3	6,835.6	25.3	25.3	-111.75	-111.75	1,083.8	-131.5	341.5	294.0	47.53	7.186	
7,600.0	6,709.3	7,712.3	6,835.5	26.9	26.9	-111.70	-111.70	1,183.8	-132.7	341.4	290.8	50.52	6.757	
7,700.0	6,709.5	7,812.3	6,835.3	28.5	28.5	-111.65	-111.65	1,283.8	-133.8	341.2	287.6	53.59	6.367	
7,800.0	6,709.6	7,912.3	6,835.2	30.2	30.1	-111.59	-111.59	1,383.8	-135.0	341.0	284.3	56.72	6.012	
7,900.0	6,709.8	8,012.3	6,835.0	31.9	31.8	-111.54	-111.54	1,483.8	-136.1	340.9	280.9	59.92	5.689	
8,000.0	6,710.0	8,112.3	6,834.8	33.6	33.5	-111.49	-111.49	1,583.8	-137.3	340.7	277.5	63.16	5.394	
8,100.0	6,710.2	8,212.3	6,834.7	35.3	35.3	-111.44	-111.44	1,683.8	-138.4	340.5	274.1	66.45	5.125	
8,200.0	6,710.4	8,312.3	6,834.5	37.1	37.0	-111.39	-111.39	1,783.8	-139.6	340.4	270.6	69.77	4.878	
8,300.0	6,710.6	8,412.3	6,834.4	38.9	38.8	-111.33	-111.33	1,883.7	-140.8	340.2	267.1	73.13	4.652	
8,400.0	6,710.8	8,512.3	6,834.2	40.6	40.6	-111.28	-111.28	1,983.7	-141.9	340.0	263.5	76.51	4.444	
8,500.0	6,711.0	8,612.3	6,834.1	42.4	42.3	-111.23	-111.23	2,083.7	-143.1	339.9	260.0	79.92	4.253	

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 Guttersen 31Y-301
Project:	SEC.31-T3N-R63W	TVD Reference:	WELL @ 4851.0ft (RKB - 15')
Reference Site:	Guttersen 31Y-201 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4851.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Guttersen 31Y-301	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 (11-11-13)	Offset TVD Reference:	Offset Datum

Offset Design Guttersen 31Y-201 Pad Sec.31-T3N-R63W - Guttersen 31Y-441 - Wellbore #1 - Plan #1 (5-31-13)													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)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,600.0	6,711.2	8,712.3	6,833.9	44.3	44.1	-111.18		2,183.7	-144.2	339.7	256.4	83.34	4.076	
8,700.0	6,711.4	8,812.3	6,833.8	46.1	46.0	-111.13		2,283.7	-145.4	339.5	252.7	86.79	3.912	
8,800.0	6,711.6	8,912.3	6,833.6	47.9	47.8	-111.07		2,383.7	-146.5	339.4	249.1	90.26	3.760	
8,900.0	6,711.8	9,012.3	6,833.4	49.7	49.6	-111.02		2,483.7	-147.7	339.2	245.5	93.74	3.618	
9,000.0	6,712.0	9,112.3	6,833.3	51.6	51.4	-110.97		2,583.7	-148.8	339.0	241.8	97.24	3.487	
9,100.0	6,712.1	9,212.3	6,833.1	53.4	53.3	-110.92		2,683.7	-150.0	338.9	238.1	100.75	3.364	
9,200.0	6,712.3	9,312.3	6,833.0	55.3	55.1	-110.87		2,783.7	-151.1	338.7	234.4	104.27	3.248	
9,300.0	6,712.5	9,412.3	6,832.8	57.1	57.0	-110.81		2,883.7	-152.3	338.6	230.7	107.81	3.140	
9,400.0	6,712.7	9,512.3	6,832.7	59.0	58.8	-110.76		2,983.7	-153.5	338.4	227.0	111.35	3.039	
9,500.0	6,712.9	9,612.3	6,832.5	60.8	60.7	-110.71		3,083.7	-154.6	338.2	223.3	114.91	2.944	
9,600.0	6,713.1	9,712.3	6,832.4	62.7	62.6	-110.65		3,183.7	-155.8	338.1	219.6	118.47	2.854	
9,700.0	6,713.3	9,812.3	6,832.2	64.6	64.4	-110.60		3,283.6	-156.9	337.9	215.9	122.04	2.769	
9,800.0	6,713.5	9,912.3	6,832.0	66.5	66.3	-110.55		3,383.6	-158.1	337.7	212.1	125.62	2.689	
9,900.0	6,713.7	10,012.3	6,831.9	68.3	68.2	-110.50		3,483.6	-159.2	337.6	208.4	129.20	2.613	
10,000.0	6,713.9	10,112.3	6,831.7	70.2	70.1	-110.44		3,583.6	-160.4	337.4	204.6	132.80	2.541	
10,100.0	6,714.1	10,212.3	6,831.6	72.1	71.9	-110.39		3,683.6	-161.5	337.3	200.9	136.39	2.473	
10,200.0	6,714.3	10,312.3	6,831.4	74.0	73.8	-110.34		3,783.6	-162.7	337.1	197.1	140.00	2.408	
10,300.0	6,714.4	10,412.3	6,831.3	75.9	75.7	-110.29		3,883.6	-163.9	336.9	193.3	143.61	2.346	
10,400.0	6,714.6	10,512.3	6,831.1	77.7	77.6	-110.23		3,983.6	-165.0	336.8	189.6	147.23	2.288	
10,500.0	6,714.8	10,612.3	6,831.0	79.6	79.5	-110.18		4,083.6	-166.2	336.6	185.8	150.85	2.232	
10,600.0	6,715.0	10,712.3	6,830.8	81.5	81.4	-110.13		4,183.6	-167.3	336.5	182.0	154.47	2.178	
10,700.0	6,715.2	10,812.3	6,830.6	83.4	83.3	-110.07		4,283.6	-168.5	336.3	178.2	158.10	2.127	
10,800.0	6,715.4	10,912.3	6,830.5	85.3	85.1	-110.02		4,383.6	-169.6	336.1	174.4	161.74	2.078	
10,900.0	6,715.6	11,012.3	6,830.3	87.2	87.0	-109.97		4,483.6	-170.8	336.0	170.6	165.38	2.032	
11,000.0	6,715.8	11,112.3	6,830.2	89.1	88.9	-109.91		4,583.5	-171.9	335.8	166.8	169.03	1.987	
11,108.8	6,716.0	11,221.1	6,830.0	91.2	91.0	-109.86		4,692.4	-173.2	335.7	162.7	173.00	1.940 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Guttersen 31Y-301
Project:	SEC.31-T3N-R63W	TVD Reference:	WELL @ 4851.0ft (RKB - 15')
Reference Site:	Guttersen 31Y-201 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4851.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Guttersen 31Y-301	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 (11-11-13)	Offset TVD Reference:	Offset Datum

Offset Design Guttersen 31Y-201 Pad Sec.31-T3N-R63W - Guttersen 43-31(Exist.) - Wellbore #1 - Wellbore #1												Offset Site Error:	0.0 ft
Survey Program: 7300-UNKNOWN												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	
7,500.0	6,709.1	6,709.1	6,709.1	25.3	134.2	-89.81	1,901.6	-287.8	942.0	782.7	159.33	5.912	
7,600.0	6,709.3	6,709.3	6,709.3	26.9	134.2	-89.83	1,901.6	-287.8	856.4	695.5	160.93	5.322	
7,700.0	6,709.5	6,709.5	6,709.5	28.5	134.2	-89.85	1,901.6	-287.8	774.2	611.6	162.57	4.762	
7,800.0	6,709.6	6,709.6	6,709.6	30.2	134.2	-89.88	1,901.6	-287.8	696.7	532.5	164.25	4.242	
7,900.0	6,709.8	6,709.8	6,709.8	31.9	134.2	-89.90	1,901.6	-287.8	625.6	459.7	165.95	3.770	
8,000.0	6,710.0	6,710.0	6,710.0	33.6	134.2	-89.92	1,901.6	-287.8	563.4	395.7	167.68	3.360	
8,100.0	6,710.2	6,710.2	6,710.2	35.3	134.2	-89.95	1,901.6	-287.8	513.2	343.8	169.42	3.029	
8,200.0	6,710.4	6,710.4	6,710.4	37.1	134.2	-89.97	1,901.6	-287.8	479.0	307.8	171.19	2.798	
8,300.0	6,710.6	6,710.6	6,710.6	38.9	134.2	-90.00	1,901.6	-287.8	464.1	291.2	172.97	2.683	
8,320.0	6,710.6	6,710.6	6,710.6	39.2	134.2	-90.00	1,901.6	-287.8	463.7	290.4	173.33	2.675 CC, ES, SF	
8,400.0	6,710.8	6,710.8	6,710.8	40.6	134.2	-90.02	1,901.6	-287.8	470.6	295.8	174.77	2.693	
8,500.0	6,711.0	6,711.0	6,711.0	42.4	134.2	-90.04	1,901.6	-287.8	497.4	320.9	176.57	2.817	
8,600.0	6,711.2	6,711.2	6,711.2	44.3	134.2	-90.07	1,901.6	-287.8	541.7	363.3	178.39	3.037	
8,700.0	6,711.4	6,711.4	6,711.4	46.1	134.2	-90.09	1,901.6	-287.8	599.5	419.3	180.21	3.327	
8,800.0	6,711.6	6,711.6	6,711.6	47.9	134.2	-90.11	1,901.6	-287.8	667.4	485.4	182.05	3.666	
8,900.0	6,711.8	6,711.8	6,711.8	49.7	134.2	-90.14	1,901.6	-287.8	742.6	558.7	183.89	4.038	
9,000.0	6,712.0	6,712.0	6,712.0	51.6	134.2	-90.16	1,901.6	-287.8	823.1	637.3	185.73	4.431	
9,100.0	6,712.1	6,712.1	6,712.1	53.4	134.2	-90.19	1,901.6	-287.8	907.4	719.9	187.58	4.838	
9,200.0	6,712.3	6,712.3	6,712.3	55.3	134.2	-90.21	1,901.6	-287.8	994.7	805.3	189.44	5.251	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Guttersen 31Y-301
Project:	SEC.31-T3N-R63W	TVD Reference:	WELL @ 4851.0ft (RKB - 15')
Reference Site:	Guttersen 31Y-201 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4851.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Guttersen 31Y-301	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 (11-11-13)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4851.0ft (RKB - 15')
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °

Coordinates are relative to: Guttersen 31Y-301
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.66°



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Guttersen 31Y-301
Project:	SEC.31-T3N-R63W	TVD Reference:	WELL @ 4851.0ft (RKB - 15')
Reference Site:	Guttersen 31Y-201 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4851.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Guttersen 31Y-301	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 (11-11-13)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4851.0ft (RKB - 15')

Offset Depths are relative to Offset Datum

Central Meridian is -105.500000 °

Coordinates are relative to: Guttersen 31Y-301

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.66°

