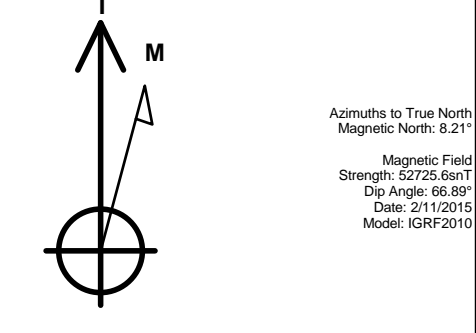


PETROLEUM DEVELOPMENT CORP Weld County CO

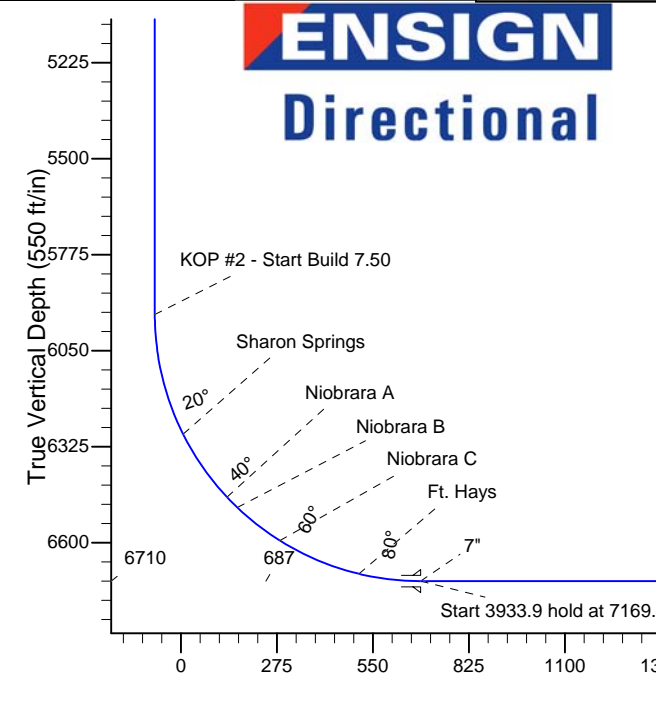
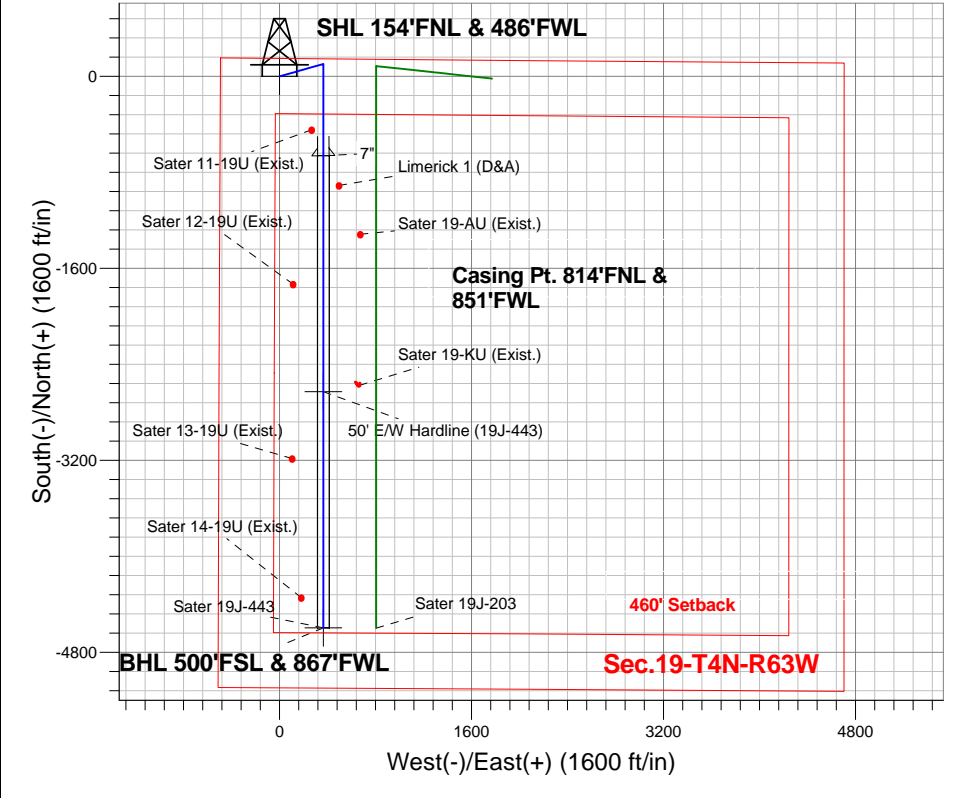
Well Name: **Sater 19J-443**
Surface Location: Sater 4N63W19E Pad Sec.19-T4N-R63W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone
Ground Elevation: 4660.0
+N/-S +E/-W Northing Easting Latitude Longitude Slot
0.0 0.0 1355373.85 3282260.21 40.304480 -104.487940
RKB - 13' WELL @ 4673.0ft (RKB - 13')

WELLBORE TARGET DETAILS				
Name	TVD	+N/-S	+E/-W	Shape
50' E/W Hardline (19J-443)	1.0	-2626.9	365.4	Rectangle (Sides: L3934.0 W100.0)
SHL 154'FNL & 486'FWL	1.0	0.0	0.0	Point
BHL 500'FSL & 867'FWL	6710.0	-4593.9	365.4	Point

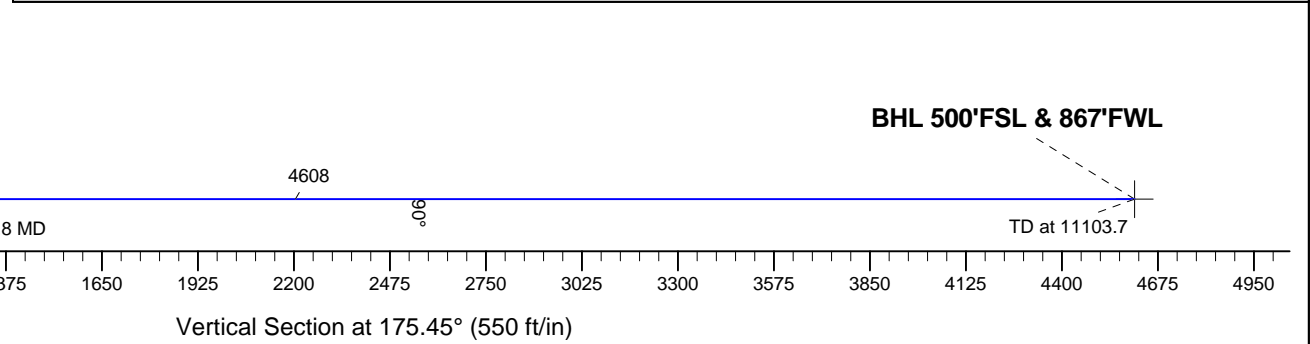


Sater 4N63W19E Pad Sec.19-T4N-R63W
Sater 19J-443
Plan #1 (2-11-15)
10:56, February 12 2015

ANNOTATIONS		
TVD	MD	Annotation
1600.0	1600.0	KOP - Start Build 1.00
4618.1	4640.7	Start Drop -2.00
5946.1	5969.8	KOP #2 - Start Build 7.50
6710.0	7169.8	Start 3933.9 hold at 7169.8 MD
6710.0	11103.7	TD at 11103.7



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	1600.0	0.00	0.00	1600.0	0.0	0.0	0.00	0.00	0.0	
3	2366.1	7.66	74.11	2363.9	14.0	49.2	1.00	74.11	-10.1	
4	4640.7	7.66	74.11	4618.1	97.0	340.8	0.00	0.00	-69.7	
5	5023.7	0.00	0.00	5000.0	104.0	365.4	2.00	180.00	-74.7	
6	5969.8	0.00	0.00	5946.1	104.0	365.4	0.00	0.00	-74.7	
7	7169.8	90.00	180.00	6710.0	-659.9	365.4	7.50	180.00	686.8	
8	11103.7	90.00	180.00	6710.0	-4593.9	365.4	0.00	0.00	4608.4	BHL 500'FSL & 867'FWL





PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.19-T4N-R63W

Sater 4N63W19E Pad Sec.19-T4N-R63W

Sater 19J-443

Wellbore #1

Plan: Plan #1 (2-11-15)

Standard Planning Report

12 February, 2015

Database:	Landmark	Local Co-ordinate Reference:	Well Sater 19J-443
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4673.0ft (RKB - 13')
Project:	SEC.19-T4N-R63W	MD Reference:	WELL @ 4673.0ft (RKB - 13')
Site:	Sater 4N63W19E Pad Sec.19-T4N-R63W	North Reference:	True
Well:	Sater 19J-443	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (2-11-15)		

Project	SEC.19-T4N-R63W, Weld County, CO		
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	Sater 4N63W19E Pad Sec.19-T4N-R63W		
Site Position:		Northing:	1,355,372.81 ft
From:	Lat/Long	Easting:	3,282,168.18 ft
Position Uncertainty:	0.0 ft	Slot Radius:	"
		Latitude:	40.304480
		Longitude:	-104.488270
		Grid Convergence:	0.65 °

Well	Sater 19J-443		
Well Position	+N/-S	0.0 ft	Northing:
	+E/-W	92.0 ft	Easting:
Position Uncertainty		0.0 ft	Wellhead Elevation:
			Latitude:
			Longitude:
			Ground Level:

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2/11/2015	8.21	66.89	52,726

Design	Plan #1 (2-11-15)			
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	175.45

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	
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,366.1	7.66	74.11	2,363.9	14.0	49.2	1.00	1.00	0.00	74.11	
4,640.7	7.66	74.11	4,618.1	97.0	340.8	0.00	0.00	0.00	0.00	
5,023.7	0.00	0.00	5,000.0	104.0	365.4	2.00	-2.00	0.00	180.00	
5,969.8	0.00	0.00	5,946.1	104.0	365.4	0.00	0.00	0.00	0.00	
7,169.8	90.00	180.00	6,710.0	-659.9	365.4	7.50	7.50	0.00	180.00	
11,103.7	90.00	180.00	6,710.0	-4,593.9	365.4	0.00	0.00	0.00	0.00	BHL 500'FSL & 867

Database:	Landmark	Local Co-ordinate Reference:	Well Sater 19J-443
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4673.0ft (RKB - 13')
Project:	SEC.19-T4N-R63W	MD Reference:	WELL @ 4673.0ft (RKB - 13')
Site:	Sater 4N63W19E Pad Sec.19-T4N-R63W	North Reference:	True
Well:	Sater 19J-443	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (2-11-15)		

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
50' E/W Hardline (19J-443) - SHL 154'FNL & 486'FWL									
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
KOP - Start Build 1.00									
1,700.0	1.00	74.11	1,700.0	0.2	0.8	-0.2	1.00	1.00	0.00
1,800.0	2.00	74.11	1,800.0	1.0	3.4	-0.7	1.00	1.00	0.00
1,900.0	3.00	74.11	1,899.9	2.1	7.6	-1.5	1.00	1.00	0.00
2,000.0	4.00	74.11	1,999.7	3.8	13.4	-2.7	1.00	1.00	0.00
2,100.0	5.00	74.11	2,099.4	6.0	21.0	-4.3	1.00	1.00	0.00
2,200.0	6.00	74.11	2,198.9	8.6	30.2	-6.2	1.00	1.00	0.00
2,300.0	7.00	74.11	2,298.3	11.7	41.1	-8.4	1.00	1.00	0.00
2,366.1	7.66	74.11	2,363.9	14.0	49.2	-10.1	1.00	1.00	0.00
2,400.0	7.66	74.11	2,397.4	15.2	53.5	-10.9	0.00	0.00	0.00
2,500.0	7.66	74.11	2,496.5	18.9	66.4	-13.6	0.00	0.00	0.00
2,600.0	7.66	74.11	2,595.6	22.5	79.2	-16.2	0.00	0.00	0.00
2,700.0	7.66	74.11	2,694.7	26.2	92.0	-18.8	0.00	0.00	0.00
2,800.0	7.66	74.11	2,793.8	29.8	104.8	-21.4	0.00	0.00	0.00
2,900.0	7.66	74.11	2,893.0	33.5	117.6	-24.0	0.00	0.00	0.00
3,000.0	7.66	74.11	2,992.1	37.1	130.5	-26.7	0.00	0.00	0.00
3,100.0	7.66	74.11	3,091.2	40.8	143.3	-29.3	0.00	0.00	0.00
3,200.0	7.66	74.11	3,190.3	44.4	156.1	-31.9	0.00	0.00	0.00
3,300.0	7.66	74.11	3,289.4	48.1	168.9	-34.5	0.00	0.00	0.00
3,400.0	7.66	74.11	3,388.5	51.7	181.8	-37.1	0.00	0.00	0.00
3,461.1	7.66	74.11	3,449.0	54.0	189.6	-38.8	0.00	0.00	0.00
Parkman									
3,500.0	7.66	74.11	3,487.6	55.4	194.6	-39.8	0.00	0.00	0.00
3,600.0	7.66	74.11	3,586.7	59.0	207.4	-42.4	0.00	0.00	0.00
3,700.0	7.66	74.11	3,685.8	62.7	220.2	-45.0	0.00	0.00	0.00
3,800.0	7.66	74.11	3,784.9	66.3	233.1	-47.6	0.00	0.00	0.00
3,900.0	7.66	74.11	3,884.0	70.0	245.9	-50.3	0.00	0.00	0.00
4,000.0	7.66	74.11	3,983.1	73.6	258.7	-52.9	0.00	0.00	0.00
4,100.0	7.66	74.11	4,082.2	77.3	271.5	-55.5	0.00	0.00	0.00
4,116.9	7.66	74.11	4,099.0	77.9	273.7	-55.9	0.00	0.00	0.00
Sussex									
4,200.0	7.66	74.11	4,181.3	80.9	284.3	-58.1	0.00	0.00	0.00
4,300.0	7.66	74.11	4,280.5	84.6	297.2	-60.7	0.00	0.00	0.00
4,400.0	7.66	74.11	4,379.6	88.2	310.0	-63.4	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Sater 19J-443
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4673.0ft (RKB - 13')
Project:	SEC.19-T4N-R63W	MD Reference:	WELL @ 4673.0ft (RKB - 13')
Site:	Sater 4N63W19E Pad Sec.19-T4N-R63W	North Reference:	True
Well:	Sater 19J-443	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (2-11-15)		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N-S (ft)	+E-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,500.0	7.66	74.11	4,478.7	91.9	322.8	-66.0	0.00	0.00	0.00
4,600.0	7.66	74.11	4,577.8	95.5	335.6	-68.6	0.00	0.00	0.00
4,640.7	7.66	74.11	4,618.1	97.0	340.9	-69.7	0.00	0.00	0.00
Start Drop -2.00									
4,700.0	6.47	74.11	4,677.0	99.0	347.9	-71.1	2.00	-2.00	0.00
4,800.0	4.47	74.11	4,776.5	101.6	357.0	-73.0	2.00	-2.00	0.00
4,887.7	2.72	74.11	4,864.0	103.1	362.3	-74.1	2.00	-2.00	0.00
Shannon									
4,900.0	2.47	74.11	4,876.3	103.3	362.9	-74.2	2.00	-2.00	0.00
5,000.0	0.47	74.11	4,976.3	104.0	365.4	-74.7	2.00	-2.00	0.00
5,023.7	0.00	0.00	5,000.0	104.0	365.4	-74.7	2.00	-2.00	0.00
5,100.0	0.00	0.00	5,076.3	104.0	365.4	-74.7	0.00	0.00	0.00
5,200.0	0.00	0.00	5,176.3	104.0	365.4	-74.7	0.00	0.00	0.00
5,300.0	0.00	0.00	5,276.3	104.0	365.4	-74.7	0.00	0.00	0.00
5,400.0	0.00	0.00	5,376.3	104.0	365.4	-74.7	0.00	0.00	0.00
5,500.0	0.00	0.00	5,476.3	104.0	365.4	-74.7	0.00	0.00	0.00
5,600.0	0.00	0.00	5,576.3	104.0	365.4	-74.7	0.00	0.00	0.00
5,700.0	0.00	0.00	5,676.3	104.0	365.4	-74.7	0.00	0.00	0.00
5,800.0	0.00	0.00	5,776.3	104.0	365.4	-74.7	0.00	0.00	0.00
5,900.0	0.00	0.00	5,876.3	104.0	365.4	-74.7	0.00	0.00	0.00
5,969.8	0.00	0.00	5,946.1	104.0	365.4	-74.7	0.00	0.00	0.00
KOP #2 - Start Build 7.50									
6,000.0	2.27	180.00	5,976.3	103.4	365.4	-74.1	7.50	7.50	0.00
6,100.0	9.77	180.00	6,075.6	92.9	365.4	-63.7	7.50	7.50	0.00
6,200.0	17.27	180.00	6,172.8	69.6	365.4	-40.4	7.50	7.50	0.00
6,300.0	24.77	180.00	6,266.1	33.7	365.4	-4.6	7.50	7.50	0.00
6,325.4	26.67	180.00	6,289.0	22.7	365.4	6.4	7.50	7.50	0.00
Sharon Springs									
6,400.0	32.27	180.00	6,353.9	-14.0	365.4	42.9	7.50	7.50	0.00
6,500.0	39.77	180.00	6,434.7	-72.7	365.4	101.5	7.50	7.50	0.00
6,545.8	43.20	180.00	6,469.0	-103.0	365.4	131.7	7.50	7.50	0.00
Niobrara A									
6,588.0	46.37	180.00	6,499.0	-132.8	365.4	161.4	7.50	7.50	0.00
Niobrara B									
6,600.0	47.27	180.00	6,507.2	-141.5	365.4	170.1	7.50	7.50	0.00
6,700.0	54.77	180.00	6,570.0	-219.2	365.4	247.5	7.50	7.50	0.00
6,743.3	58.01	180.00	6,594.0	-255.2	365.4	283.4	7.50	7.50	0.00
Niobrara C									
6,800.0	62.27	180.00	6,622.2	-304.4	365.4	332.5	7.50	7.50	0.00
6,900.0	69.77	180.00	6,662.9	-395.7	365.4	423.5	7.50	7.50	0.00
6,990.2	76.53	180.00	6,689.0	-482.1	365.4	509.5	7.50	7.50	0.00
Ft. Hays									
7,000.0	77.27	180.00	6,691.2	-491.6	365.4	519.0	7.50	7.50	0.00
7,100.0	84.77	180.00	6,706.8	-590.3	365.4	617.4	7.50	7.50	0.00
7,130.7	87.07	180.00	6,709.0	-620.9	365.4	647.9	7.50	7.50	0.00
Codell									
7,169.8	90.00	180.00	6,710.0	-660.0	365.4	686.9	7.50	7.50	0.00
Start 3933.9 hold at 7169.8 MD - 7"									
7,200.0	90.00	180.00	6,710.0	-690.2	365.4	717.0	0.00	0.00	0.00
7,300.0	90.00	180.00	6,710.0	-790.2	365.4	816.7	0.00	0.00	0.00
7,400.0	90.00	180.00	6,710.0	-890.2	365.4	916.3	0.00	0.00	0.00
7,500.0	90.00	180.00	6,710.0	-990.2	365.4	1,016.0	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Sater 19J-443
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4673.0ft (RKB - 13')
Project:	SEC.19-T4N-R63W	MD Reference:	WELL @ 4673.0ft (RKB - 13')
Site:	Sater 4N63W19E Pad Sec.19-T4N-R63W	North Reference:	True
Well:	Sater 19J-443	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (2-11-15)		

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)
7,600.0	90.00	180.00	6,710.0	-1,090.2	365.4	1,115.7	0.00	0.00	0.00
7,700.0	90.00	180.00	6,710.0	-1,190.2	365.4	1,215.4	0.00	0.00	0.00
7,800.0	90.00	180.00	6,710.0	-1,290.2	365.4	1,315.1	0.00	0.00	0.00
7,900.0	90.00	180.00	6,710.0	-1,390.2	365.4	1,414.8	0.00	0.00	0.00
8,000.0	90.00	180.00	6,710.0	-1,490.2	365.4	1,514.4	0.00	0.00	0.00
8,100.0	90.00	180.00	6,710.0	-1,590.2	365.4	1,614.1	0.00	0.00	0.00
8,200.0	90.00	180.00	6,710.0	-1,690.2	365.4	1,713.8	0.00	0.00	0.00
8,300.0	90.00	180.00	6,710.0	-1,790.2	365.4	1,813.5	0.00	0.00	0.00
8,400.0	90.00	180.00	6,710.0	-1,890.2	365.4	1,913.2	0.00	0.00	0.00
8,500.0	90.00	180.00	6,710.0	-1,990.2	365.4	2,012.9	0.00	0.00	0.00
8,600.0	90.00	180.00	6,710.0	-2,090.2	365.4	2,112.6	0.00	0.00	0.00
8,700.0	90.00	180.00	6,710.0	-2,190.2	365.4	2,212.2	0.00	0.00	0.00
8,800.0	90.00	180.00	6,710.0	-2,290.2	365.4	2,311.9	0.00	0.00	0.00
8,900.0	90.00	180.00	6,710.0	-2,390.2	365.4	2,411.6	0.00	0.00	0.00
9,000.0	90.00	180.00	6,710.0	-2,490.2	365.4	2,511.3	0.00	0.00	0.00
9,100.0	90.00	180.00	6,710.0	-2,590.2	365.4	2,611.0	0.00	0.00	0.00
9,200.0	90.00	180.00	6,710.0	-2,690.2	365.4	2,710.7	0.00	0.00	0.00
9,300.0	90.00	180.00	6,710.0	-2,790.2	365.4	2,810.4	0.00	0.00	0.00
9,400.0	90.00	180.00	6,710.0	-2,890.2	365.4	2,910.0	0.00	0.00	0.00
9,500.0	90.00	180.00	6,710.0	-2,990.2	365.4	3,009.7	0.00	0.00	0.00
9,600.0	90.00	180.00	6,710.0	-3,090.2	365.4	3,109.4	0.00	0.00	0.00
9,700.0	90.00	180.00	6,710.0	-3,190.2	365.4	3,209.1	0.00	0.00	0.00
9,800.0	90.00	180.00	6,710.0	-3,290.2	365.4	3,308.8	0.00	0.00	0.00
9,900.0	90.00	180.00	6,710.0	-3,390.2	365.4	3,408.5	0.00	0.00	0.00
10,000.0	90.00	180.00	6,710.0	-3,490.2	365.4	3,508.2	0.00	0.00	0.00
10,100.0	90.00	180.00	6,710.0	-3,590.2	365.4	3,607.8	0.00	0.00	0.00
10,200.0	90.00	180.00	6,710.0	-3,690.2	365.4	3,707.5	0.00	0.00	0.00
10,300.0	90.00	180.00	6,710.0	-3,790.2	365.4	3,807.2	0.00	0.00	0.00
10,400.0	90.00	180.00	6,710.0	-3,890.2	365.4	3,906.9	0.00	0.00	0.00
10,500.0	90.00	180.00	6,710.0	-3,990.2	365.4	4,006.6	0.00	0.00	0.00
10,600.0	90.00	180.00	6,710.0	-4,090.2	365.4	4,106.3	0.00	0.00	0.00
10,700.0	90.00	180.00	6,710.0	-4,190.2	365.4	4,205.9	0.00	0.00	0.00
10,800.0	90.00	180.00	6,710.0	-4,290.2	365.4	4,305.6	0.00	0.00	0.00
10,900.0	90.00	180.00	6,710.0	-4,390.2	365.4	4,405.3	0.00	0.00	0.00
11,000.0	90.00	180.00	6,710.0	-4,490.2	365.4	4,505.0	0.00	0.00	0.00
11,100.0	90.00	180.00	6,710.0	-4,590.2	365.4	4,604.7	0.00	0.00	0.00
11,103.7	90.00	180.00	6,710.0	-4,593.9	365.4	4,608.4	0.00	0.00	0.00

TD at 11103.7 - BHL 500'FSL & 867'FWL

Database:	Landmark	Local Co-ordinate Reference:	Well Sater 19J-443
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4673.0ft (RKB - 13')
Project:	SEC.19-T4N-R63W	MD Reference:	WELL @ 4673.0ft (RKB - 13')
Site:	Sater 4N63W19E Pad Sec.19-T4N-R63W	North Reference:	True
Well:	Sater 19J-443	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (2-11-15)		

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
50' E/W Hardline (19J - plan misses target center by 2652.2ft at 1.0ft MD (1.0 TVD, 0.0 N, 0.0 E) - Rectangle (sides W3,934.0 H100.0 D0.0)	0.00	0.00	1.0	-2,626.9	365.4	1,352,751.41	3,282,655.55	40.297269	-104.486630
SHL 154'FNL & 486'F - plan hits target center - Point	0.00	0.00	1.0	0.0	0.0	1,355,373.86	3,282,260.21	40.304480	-104.487940
BHL 500'FSL & 867'F - plan hits target center - Point	0.00	0.00	6,710.0	-4,593.9	365.4	1,350,784.64	3,282,678.04	40.291870	-104.486630

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
7,169.8	6,710.0	7"	7	7-1/2	

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
3,461.1	3,449.0	Parkman		0.00		
4,116.9	4,099.0	Sussex		0.00		
4,887.7	4,864.0	Shannon		0.00		
6,325.4	6,289.0	Sharon Springs		0.00		
6,545.8	6,469.0	Niobrara A		0.00		
6,588.0	6,499.0	Niobrara B		0.00		
6,743.3	6,594.0	Niobrara C		0.00		
6,990.2	6,689.0	Ft. Hays		0.00		
7,130.7	6,709.0	Codell		0.00		

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Comment	
1,600.0	1,600.0	0.0	0.0	KOP - Start Build 1.00	
4,640.7	4,618.1	97.0	340.9	Start Drop -2.00	
5,969.8	5,946.1	104.0	365.4	KOP #2 - Start Build 7.50	
7,169.8	6,710.0	-660.0	365.4	Start 3933.9 hold at 7169.8 MD	
11,103.7	6,710.0	-4,593.9	365.4	TD at 11103.7	



PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.19-T4N-R63W

Sater 4N63W19E Pad Sec.19-T4N-R63W

Sater 19J-443

Wellbore #1

Plan #1 (2-11-15)

Anticollision Report

12 February, 2015



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sater 19J-443
Project:	SEC.19-T4N-R63W	TVD Reference:	WELL @ 4673.0ft (RKB - 13')
Reference Site:	Sater 4N63W19E Pad Sec.19-T4N-R63W	MD Reference:	WELL @ 4673.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sater 19J-443	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (2-11-15)	Offset TVD Reference:	Offset Datum

Reference	Plan #1 (2-11-15)
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria
Interpolation Method:	MD Interval 100.0ft
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	2/12/2015		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.0	11,103.7	Plan #1 (2-11-15) (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						
Existing Wells Sec.19-T4N-R63W						
Limerick 1 (D&A) - Wellbore #1 - Wellbore #1	7,418.1	6,720.0	130.5	-26.6	0.830	Level 1, CC, ES, SF
Sater 11-19U (Exist.) - Wellbore #1 - Wellbore #1	6,951.3	6,681.0	97.7	-52.7	0.649	Level 1, CC, ES, SF
Sater 12-19U (Exist.) - Wellbore #1 - Wellbore #1	8,240.3	6,723.0	251.1	80.3	1.470	Level 3, CC, ES, SF
Sater 13-19U (Exist.) - Wellbore #1 - Wellbore #1	9,693.8	6,779.0	259.4	61.0	1.307	Level 3, CC
Sater 13-19U (Exist.) - Wellbore #1 - Wellbore #1	9,700.0	6,779.0	259.5	60.9	1.307	Level 3, ES, SF
Sater 14-19U (Exist.) - Wellbore #1 - Wellbore #1	10,852.4	6,772.0	184.1	-36.0	0.836	Level 1, CC, ES, SF
Sater 19-AU (Exist.) - Wellbore #1 - Wellbore #1	7,825.0	6,724.0	309.6	145.9	1.892	CC, ES, SF
Sater 19-KU (Exist.) - Wellbore #1 - Wellbore #1	9,081.7	6,726.6	299.1	235.8	4.725	CC, ES
Sater 19-KU (Exist.) - Wellbore #1 - Wellbore #1	9,100.0	6,726.8	299.7	236.0	4.709	SF
Sater 4N63W19E Pad Sec.19-T4N-R63W						
Sater 19E-203 - Wellbore #1 - Plan #1 (2-10-15)	1,366.3	1,367.3	92.0	86.1	15.549	CC
Sater 19E-203 - Wellbore #1 - Plan #1 (2-10-15)	1,400.0	1,401.0	92.0	86.0	15.161	ES
Sater 19E-203 - Wellbore #1 - Plan #1 (2-10-15)	11,103.7	10,941.6	857.1	681.9	4.893	SF
Sater 19E-223 - Wellbore #1 - Plan #1 (2-11-15)	1,600.0	1,600.0	30.7	23.7	4.403	CC, ES
Sater 19E-223 - Wellbore #1 - Plan #1 (2-11-15)	11,103.7	10,918.2	433.6	274.4	2.723	SF
Sater 19E-323 - Wellbore #1 - Plan #1 (2-11-15)	1,600.0	1,601.0	61.4	54.4	8.804	CC, ES
Sater 19E-323 - Wellbore #1 - Plan #1 (2-11-15)	11,103.7	10,998.5	632.8	457.1	3.602	SF
Sater 4N63W19M Pad Sec.19-T4N-R63W						
Sater 19J-203 - Wellbore #1 - Plan #1 (2-10-15)	5,762.9	5,839.5	440.8	413.9	16.377	CC
Sater 19J-203 - Wellbore #1 - Plan #1 (2-10-15)	11,103.7	10,981.7	487.9	324.5	2.985	ES, SF

Offset Design											
Existing Wells Sec.19-T4N-R63W - Limerick 1 (D&A) - Wellbore #1 - Wellbore #1											
Survey Program: 7354-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)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)
6,200.0	6,172.8	6,182.8	6,182.8	15.0	123.7	-7.96	-908.2	495.9	986.5	853.8	132.62
6,300.0	6,266.1	6,276.1	6,276.1	15.1	125.5	-8.67	-908.2	495.9	950.9	822.7	128.22
6,400.0	6,353.9	6,363.9	6,363.9	15.3	127.3	-9.79	-908.2	495.9	903.7	782.1	121.58
6,500.0	6,434.7	6,444.7	6,444.7	15.4	128.9	-11.49	-908.2	495.9	845.6	732.6	113.00
6,600.0	6,507.2	6,517.2	6,517.2	15.7	130.3	-14.08	-908.2	495.9	777.7	674.5	103.24
6,700.0	6,570.0	6,580.0	6,580.0	16.0	131.6	-18.17	-908.2	495.9	701.2	607.1	94.10
											7.438
											7.416
											7.433
											7.483
											7.533
											7.452

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 Sater 19J-443
Project:	SEC.19-T4N-R63W	TVD Reference:	WELL @ 4673.0ft (RKB - 13')
Reference Site:	Sater 4N63W19E Pad Sec.19-T4N-R63W	MD Reference:	WELL @ 4673.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sater 19J-443	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (2-11-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.19-T4N-R63W - Limerick 1 (D&A) - Wellbore #1 - Wellbore #1												Offset Site Error:	0.0 ft
Survey Program: 7354-UNKNOWN												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)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
6,800.0	6,622.2	6,632.2	6,632.2	16.6	132.6	-24.91	-908.2	495.9	617.7	527.7	90.06	6.859	
6,900.0	6,662.9	6,672.9	6,672.9	17.3	133.5	-36.36	-908.2	495.9	528.8	429.3	99.57	5.311	
7,000.0	6,691.2	6,701.2	6,701.2	18.2	134.0	-54.86	-908.2	495.9	436.6	310.5	126.08	3.463	
7,100.0	6,706.8	6,716.8	6,716.8	19.3	134.3	-77.47	-908.2	495.9	343.7	194.3	149.41	2.300	
7,200.0	6,710.0	6,720.0	6,720.0	20.5	134.4	-90.00	-908.2	495.9	254.1	100.0	154.07	1.649	
7,300.0	6,710.0	6,720.0	6,720.0	21.8	134.4	-90.00	-908.2	495.9	176.0	20.5	155.42	1.132	Level 2
7,400.0	6,710.0	6,720.0	6,720.0	23.2	134.4	-90.00	-908.2	495.9	131.7	-25.1	156.85	0.840	Level 1
7,418.1	6,710.0	6,720.0	6,720.0	23.4	134.4	-90.00	-908.2	495.9	130.5	-26.6	157.12	0.830	Level 1, CC, ES, SF
7,500.0	6,710.0	6,720.0	6,720.0	24.6	134.4	-90.00	-908.2	495.9	154.1	-4.3	158.35	0.973	Level 1
7,600.0	6,710.0	6,720.0	6,720.0	26.1	134.4	-90.00	-908.2	495.9	223.9	64.0	159.91	1.400	Level 3
7,700.0	6,710.0	6,720.0	6,720.0	27.7	134.4	-90.00	-908.2	495.9	310.7	149.2	161.51	1.924	
7,800.0	6,710.0	6,720.0	6,720.0	29.3	134.4	-90.00	-908.2	495.9	403.6	240.5	163.15	2.474	
7,900.0	6,710.0	6,720.0	6,720.0	31.0	134.4	-90.00	-908.2	495.9	499.3	334.5	164.83	3.029	
8,000.0	6,710.0	6,720.0	6,720.0	32.6	134.4	-90.00	-908.2	495.9	596.4	429.9	166.53	3.581	
8,100.0	6,710.0	6,720.0	6,720.0	34.3	134.4	-90.00	-908.2	495.9	694.3	526.1	168.25	4.127	
8,200.0	6,710.0	6,720.0	6,720.0	36.1	134.4	-90.00	-908.2	495.9	792.8	622.8	170.00	4.663	
8,300.0	6,710.0	6,720.0	6,720.0	37.8	134.4	-90.00	-908.2	495.9	891.6	719.8	171.76	5.191	
8,400.0	6,710.0	6,720.0	6,720.0	39.6	134.4	-90.00	-908.2	495.9	990.6	817.0	173.53	5.708	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sater 19J-443
Project:	SEC.19-T4N-R63W	TVD Reference:	WELL @ 4673.0ft (RKB - 13')
Reference Site:	Sater 4N63W19E Pad Sec.19-T4N-R63W	MD Reference:	WELL @ 4673.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sater 19J-443	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (2-11-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.19-T4N-R63W - Sater 11-19U (Exist.) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 7340-UNKNOWN													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	2.0	2.0	0.0	0.0	148.93	148.93	-444.5	267.8	518.9	518.8	0.04	N/A	
100.0	100.0	102.0	102.0	0.1	2.0	148.93	148.93	-444.5	267.8	518.9	516.7	2.15	241.049	
200.0	200.0	202.0	202.0	0.3	4.0	148.93	148.93	-444.5	267.8	518.9	514.5	4.38	118.537	
300.0	300.0	302.0	302.0	0.6	6.0	148.93	148.93	-444.5	267.8	518.9	512.3	6.60	78.593	
400.0	400.0	402.0	402.0	0.8	8.0	148.93	148.93	-444.5	267.8	518.9	510.1	8.83	58.784	
500.0	500.0	502.0	502.0	1.0	10.0	148.93	148.93	-444.5	267.8	518.9	507.8	11.05	46.950	
600.0	600.0	602.0	602.0	1.2	12.0	148.93	148.93	-444.5	267.8	518.9	505.6	13.28	39.083	
700.0	700.0	702.0	702.0	1.5	14.0	148.93	148.93	-444.5	267.8	518.9	503.4	15.50	33.474	
800.0	800.0	802.0	802.0	1.7	16.0	148.93	148.93	-444.5	267.8	518.9	501.2	17.73	29.272	
900.0	900.0	902.0	902.0	1.9	18.0	148.93	148.93	-444.5	267.8	518.9	498.9	19.95	26.008	
1,000.0	1,000.0	1,002.0	1,002.0	2.1	20.0	148.93	148.93	-444.5	267.8	518.9	496.7	22.18	23.399	
1,100.0	1,100.0	1,102.0	1,102.0	2.4	22.0	148.93	148.93	-444.5	267.8	518.9	494.5	24.40	21.265	
1,200.0	1,200.0	1,202.0	1,202.0	2.6	24.0	148.93	148.93	-444.5	267.8	518.9	492.3	26.62	19.488	
1,300.0	1,300.0	1,302.0	1,302.0	2.8	26.0	148.93	148.93	-444.5	267.8	518.9	490.0	28.85	17.986	
1,400.0	1,400.0	1,402.0	1,402.0	3.0	28.0	148.93	148.93	-444.5	267.8	518.9	487.8	31.07	16.698	
1,500.0	1,500.0	1,502.0	1,502.0	3.3	30.0	148.93	148.93	-444.5	267.8	518.9	485.6	33.30	15.582	
1,600.0	1,600.0	1,602.0	1,602.0	3.5	32.0	148.93	148.93	-444.5	267.8	518.9	483.4	35.52	14.606	
1,700.0	1,700.0	1,702.0	1,702.0	3.7	34.0	74.91	74.91	-444.5	267.8	518.7	480.9	37.74	13.743	
1,800.0	1,800.0	1,802.0	1,802.0	3.9	36.0	75.20	75.20	-444.5	267.8	518.0	478.0	39.94	12.968	
1,900.0	1,899.9	1,901.9	1,901.9	4.1	38.0	75.68	75.68	-444.5	267.8	516.9	474.7	42.15	12.263	
2,000.0	1,999.7	2,001.7	2,001.7	4.3	40.0	76.35	76.35	-444.5	267.8	515.4	471.0	44.36	11.619	
2,100.0	2,099.4	2,101.4	2,101.4	4.6	42.0	77.21	77.21	-444.5	267.8	513.6	467.0	46.57	11.028	
2,200.0	2,198.9	2,200.9	2,200.9	4.8	44.0	78.28	78.28	-444.5	267.8	511.6	462.8	48.79	10.485	
2,300.0	2,298.3	2,300.3	2,300.3	5.0	46.0	79.54	79.54	-444.5	267.8	509.4	458.3	51.02	9.984	
2,400.0	2,397.4	2,399.4	2,399.4	5.3	48.0	80.98	80.98	-444.5	267.8	507.2	453.9	53.26	9.522	
2,500.0	2,496.5	2,498.5	2,498.5	5.6	50.0	82.46	82.46	-444.5	267.8	505.2	449.7	55.51	9.101	
2,600.0	2,595.6	2,597.6	2,597.6	5.8	52.0	83.95	83.95	-444.5	267.8	503.6	445.9	57.77	8.718	
2,700.0	2,694.7	2,696.7	2,696.7	6.1	53.9	85.45	85.45	-444.5	267.8	502.4	442.3	60.03	8.368	
2,800.0	2,793.8	2,795.8	2,795.8	6.4	55.9	86.95	86.95	-444.5	267.8	501.5	439.2	62.30	8.049	
2,900.0	2,893.0	2,895.0	2,895.0	6.7	57.9	88.46	88.46	-444.5	267.8	501.0	436.4	64.58	7.757	
3,000.0	2,992.1	2,994.1	2,994.1	7.0	59.9	89.97	89.97	-444.5	267.8	500.8	433.9	66.86	7.490	
3,001.7	2,993.8	2,995.8	2,995.8	7.0	59.9	90.00	90.00	-444.5	267.8	500.8	433.9	66.90	7.486	
3,100.0	3,091.2	3,093.2	3,093.2	7.3	61.9	91.49	91.49	-444.5	267.8	500.9	431.8	69.14	7.245	
3,200.0	3,190.3	3,192.3	3,192.3	7.6	63.8	92.99	92.99	-444.5	267.8	501.5	430.0	71.42	7.021	
3,300.0	3,289.4	3,291.4	3,291.4	7.9	65.8	94.50	94.50	-444.5	267.8	502.3	428.6	73.71	6.815	
3,400.0	3,388.5	3,390.5	3,390.5	8.2	67.8	96.00	96.00	-444.5	267.8	503.6	427.6	75.99	6.627	
3,500.0	3,487.6	3,489.6	3,489.6	8.5	69.8	97.49	97.49	-444.5	267.8	505.2	426.9	78.28	6.453	
3,600.0	3,586.7	3,588.7	3,588.7	8.8	71.8	98.97	98.97	-444.5	267.8	507.1	426.5	80.56	6.294	
3,700.0	3,685.8	3,687.8	3,687.8	9.1	73.8	100.44	100.44	-444.5	267.8	509.3	426.5	82.84	6.148	
3,800.0	3,784.9	3,786.9	3,786.9	9.4	75.7	101.89	101.89	-444.5	267.8	512.0	426.8	85.12	6.014	
3,900.0	3,884.0	3,886.0	3,886.0	9.8	77.7	103.33	103.33	-444.5	267.8	514.9	427.5	87.40	5.891	
4,000.0	3,983.1	3,985.1	3,985.1	10.1	79.7	104.76	104.76	-444.5	267.8	518.2	428.5	89.68	5.778	
4,100.0	4,082.2	4,084.2	4,084.2	10.4	81.7	106.16	106.16	-444.5	267.8	521.7	429.8	91.96	5.674	
4,200.0	4,181.3	4,183.3	4,183.3	10.7	83.7	107.55	107.55	-444.5	267.8	525.6	431.4	94.23	5.578	
4,300.0	4,280.5	4,282.5	4,282.5	11.0	85.6	108.91	108.91	-444.5	267.8	529.8	433.3	96.50	5.491	
4,400.0	4,379.6	4,381.6	4,381.6	11.4	87.6	110.25	110.25	-444.5	267.8	534.3	435.6	98.76	5.410	
4,500.0	4,478.7	4,480.7	4,480.7	11.7	89.6	111.57	111.57	-444.5	267.8	539.1	438.1	101.02	5.337	
4,600.0	4,577.8	4,579.8	4,579.8	12.0	91.6	112.87	112.87	-444.5	267.8	544.2	440.9	103.28	5.269	
4,700.0	4,677.0	4,679.0	4,679.0	12.3	93.6	114.13	114.13	-444.5	267.8	549.3	443.8	105.55	5.204	
4,800.0	4,776.5	4,778.5	4,778.5	12.5	95.6	115.10	115.10	-444.5	267.8	553.3	445.5	107.79	5.133	
4,900.0	4,876.3	4,878.3	4,878.3	12.7	97.6	115.72	115.72	-444.5	267.8	555.9	445.9	110.00	5.054	

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 Sater 19J-443
Project:	SEC.19-T4N-R63W	TVD Reference:	WELL @ 4673.0ft (RKB - 13')
Reference Site:	Sater 4N63W19E Pad Sec.19-T4N-R63W	MD Reference:	WELL @ 4673.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sater 19J-443	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (2-11-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.19-T4N-R63W - Sater 11-19U (Exist.) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 7340-UNKNOWN													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)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
5,000.0	4,976.3	4,978.3	4,978.3	12.9	99.6	115.97	-444.5	267.8	557.0	444.9	112.17	4.966		
5,100.0	5,076.3	5,078.3	5,078.3	13.1	101.6	-169.90	-444.5	267.8	557.1	442.7	114.34	4.872		
5,200.0	5,176.3	5,178.3	5,178.3	13.2	103.6	-169.90	-444.5	267.8	557.1	440.6	116.53	4.781		
5,300.0	5,276.3	5,278.3	5,278.3	13.4	105.6	-169.90	-444.5	267.8	557.1	438.4	118.72	4.692		
5,400.0	5,376.3	5,378.3	5,378.3	13.6	107.6	-169.90	-444.5	267.8	557.1	436.2	120.91	4.607		
5,500.0	5,476.3	5,478.3	5,478.3	13.8	109.6	-169.90	-444.5	267.8	557.1	434.0	123.10	4.525		
5,600.0	5,576.3	5,578.3	5,578.3	14.0	111.6	-169.90	-444.5	267.8	557.1	431.8	125.30	4.446		
5,700.0	5,676.3	5,678.3	5,678.3	14.2	113.6	-169.90	-444.5	267.8	557.1	429.6	127.49	4.370		
5,800.0	5,776.3	5,778.3	5,778.3	14.4	115.6	-169.90	-444.5	267.8	557.1	427.4	129.68	4.296		
5,900.0	5,876.3	5,878.3	5,878.3	14.6	117.6	-169.90	-444.5	267.8	557.1	425.2	131.88	4.224		
6,000.0	5,976.3	5,978.3	5,978.3	14.7	119.6	10.12	-444.5	267.8	556.5	422.5	133.96	4.154		
6,100.0	6,075.6	6,077.6	6,077.6	14.9	121.6	10.45	-444.5	267.8	546.2	411.9	134.29	4.067		
6,200.0	6,172.8	6,174.8	6,174.8	15.0	123.5	11.26	-444.5	267.8	523.2	390.9	132.34	3.954		
6,300.0	6,266.1	6,268.1	6,268.1	15.1	125.4	12.68	-444.5	267.8	488.1	359.9	128.19	3.807		
6,400.0	6,353.9	6,355.9	6,355.9	15.3	127.1	15.02	-444.5	267.8	441.4	319.3	122.13	3.614		
6,500.0	6,434.7	6,436.7	6,436.7	15.4	128.7	18.87	-444.5	267.8	384.3	269.3	115.08	3.340		
6,600.0	6,507.2	6,509.2	6,509.2	15.7	130.2	25.42	-444.5	267.8	318.3	208.7	109.57	2.905		
6,700.0	6,570.0	6,572.0	6,572.0	16.0	131.4	36.93	-444.5	267.8	245.5	133.6	111.94	2.193		
6,800.0	6,622.2	6,624.2	6,624.2	16.6	132.5	56.29	-444.5	267.8	170.7	41.3	129.39	1.319 Level 3		
6,900.0	6,662.9	6,664.9	6,664.9	17.3	133.3	80.21	-444.5	267.8	109.2	-38.5	147.70	0.739 Level 1		
6,951.3	6,679.0	6,681.0	6,681.0	17.7	133.6	89.99	-444.5	267.8	97.7	-52.7	150.42	0.649 Level 1, CC, ES, SF		
7,000.0	6,691.2	6,693.2	6,693.2	18.2	133.9	96.07	-444.5	267.8	108.4	-42.0	150.41	0.721 Level 1		
7,100.0	6,706.8	6,708.8	6,708.8	19.3	134.2	97.75	-444.5	267.8	175.5	24.1	151.36	1.160 Level 2		
7,200.0	6,710.0	6,712.0	6,712.0	20.5	134.2	90.00	-444.5	267.8	264.4	110.5	153.91	1.718		
7,300.0	6,710.0	6,712.0	6,712.0	21.8	134.2	90.00	-444.5	267.8	359.2	204.0	155.26	2.314		
7,400.0	6,710.0	6,712.0	6,712.0	23.2	134.2	90.00	-444.5	267.8	456.3	299.6	156.69	2.912		
7,500.0	6,710.0	6,712.0	6,712.0	24.6	134.2	90.00	-444.5	267.8	554.4	396.2	158.19	3.505		
7,600.0	6,710.0	6,712.0	6,712.0	26.1	134.2	90.00	-444.5	267.8	653.1	493.3	159.75	4.088		
7,700.0	6,710.0	6,712.0	6,712.0	27.7	134.2	90.00	-444.5	267.8	752.1	590.7	161.35	4.661		
7,800.0	6,710.0	6,712.0	6,712.0	29.3	134.2	90.00	-444.5	267.8	851.3	688.3	162.99	5.223		
7,900.0	6,710.0	6,712.0	6,712.0	31.0	134.2	90.00	-444.5	267.8	950.7	786.1	164.67	5.774		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sater 19J-443
Project:	SEC.19-T4N-R63W	TVD Reference:	WELL @ 4673.0ft (RKB - 13')
Reference Site:	Sater 4N63W19E Pad Sec.19-T4N-R63W	MD Reference:	WELL @ 4673.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sater 19J-443	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (2-11-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.19-T4N-R63W - Sater 12-19U (Exist.) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 7372-UNKNOWN													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)	Distance Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
7,300.0	6,710.0	6,723.0	6,723.0	21.8	134.5	90.00	90.00	-1,730.5	114.4	973.2	817.8	155.48	6.260	
7,400.0	6,710.0	6,723.0	6,723.0	23.2	134.5	90.00	90.00	-1,730.5	114.4	877.0	720.1	156.91	5.589	
7,500.0	6,710.0	6,723.0	6,723.0	24.6	134.5	90.00	90.00	-1,730.5	114.4	781.7	623.3	158.41	4.935	
7,600.0	6,710.0	6,723.0	6,723.0	26.1	134.5	90.00	90.00	-1,730.5	114.4	687.8	527.8	159.97	4.299	
7,700.0	6,710.0	6,723.0	6,723.0	27.7	134.5	90.00	90.00	-1,730.5	114.4	595.8	434.2	161.57	3.687	
7,800.0	6,710.0	6,723.0	6,723.0	29.3	134.5	90.00	90.00	-1,730.5	114.4	506.9	343.6	163.21	3.105	
7,900.0	6,710.0	6,723.0	6,723.0	31.0	134.5	90.00	90.00	-1,730.5	114.4	422.9	258.0	164.89	2.565	
8,000.0	6,710.0	6,723.0	6,723.0	32.6	134.5	90.00	90.00	-1,730.5	114.4	347.5	181.0	166.59	2.086	
8,100.0	6,710.0	6,723.0	6,723.0	34.3	134.5	90.00	90.00	-1,730.5	114.4	287.6	119.3	168.31	1.709	
8,200.0	6,710.0	6,723.0	6,723.0	36.1	134.5	90.00	90.00	-1,730.5	114.4	254.3	84.2	170.06	1.495 Level 3	
8,240.3	6,710.0	6,723.0	6,723.0	36.8	134.5	90.00	90.00	-1,730.5	114.4	251.1	80.3	170.77	1.470 Level 3, CC, ES, SF	
8,300.0	6,710.0	6,723.0	6,723.0	37.8	134.5	90.00	90.00	-1,730.5	114.4	258.1	86.3	171.82	1.502	
8,400.0	6,710.0	6,723.0	6,723.0	39.6	134.5	90.00	90.00	-1,730.5	114.4	297.6	124.0	173.59	1.714	
8,500.0	6,710.0	6,723.0	6,723.0	41.3	134.5	90.00	90.00	-1,730.5	114.4	361.2	185.9	175.38	2.060	
8,600.0	6,710.0	6,723.0	6,723.0	43.1	134.5	90.00	90.00	-1,730.5	114.4	438.7	261.5	177.18	2.476	
8,700.0	6,710.0	6,723.0	6,723.0	44.9	134.5	90.00	90.00	-1,730.5	114.4	523.8	344.8	179.00	2.926	
8,800.0	6,710.0	6,723.0	6,723.0	46.7	134.5	90.00	90.00	-1,730.5	114.4	613.4	432.6	180.81	3.393	
8,900.0	6,710.0	6,723.0	6,723.0	48.5	134.5	90.00	90.00	-1,730.5	114.4	705.9	523.2	182.64	3.865	
9,000.0	6,710.0	6,723.0	6,723.0	50.3	134.5	90.00	90.00	-1,730.5	114.4	800.1	615.6	184.48	4.337	
9,100.0	6,710.0	6,723.0	6,723.0	52.2	134.5	90.00	90.00	-1,730.5	114.4	895.6	709.3	186.32	4.807	
9,200.0	6,710.0	6,723.0	6,723.0	54.0	134.5	90.00	90.00	-1,730.5	114.4	992.0	803.8	188.16	5.272	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sater 19J-443
Project:	SEC.19-T4N-R63W	TVD Reference:	WELL @ 4673.0ft (RKB - 13')
Reference Site:	Sater 4N63W19E Pad Sec.19-T4N-R63W	MD Reference:	WELL @ 4673.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sater 19J-443	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (2-11-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.19-T4N-R63W - Sater 13-19U (Exist.) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 7394-UNKNOWN													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
8,800.0	6,710.0	6,779.0	6,779.0	46.7	135.6	90.00	90.00	-3,184.0	106.0	930.8	748.8	181.93	5.116	
8,900.0	6,710.0	6,779.0	6,779.0	48.5	135.6	90.00	90.00	-3,184.0	106.0	835.2	651.4	183.76	4.545	
9,000.0	6,710.0	6,779.0	6,779.0	50.3	135.6	90.00	90.00	-3,184.0	106.0	740.8	555.2	185.60	3.991	
9,100.0	6,710.0	6,779.0	6,779.0	52.2	135.6	90.00	90.00	-3,184.0	106.0	648.1	460.6	187.44	3.458	
9,200.0	6,710.0	6,779.0	6,779.0	54.0	135.6	90.00	90.00	-3,184.0	106.0	557.9	368.6	189.28	2.947	
9,300.0	6,710.0	6,779.0	6,779.0	55.9	135.6	90.00	90.00	-3,184.0	106.0	471.6	280.5	191.13	2.468	
9,400.0	6,710.0	6,779.0	6,779.0	57.7	135.6	90.00	90.00	-3,184.0	106.0	392.0	199.0	192.99	2.031	
9,500.0	6,710.0	6,779.0	6,779.0	59.5	135.6	90.00	90.00	-3,184.0	106.0	323.9	129.0	194.85	1.662	
9,600.0	6,710.0	6,779.0	6,779.0	61.4	135.6	90.00	90.00	-3,184.0	106.0	275.9	79.2	196.71	1.403	Level 3
9,693.8	6,710.0	6,779.0	6,779.0	63.1	135.6	90.00	90.00	-3,184.0	106.0	259.4	61.0	198.46	1.307	Level 3, CC
9,700.0	6,710.0	6,779.0	6,779.0	63.3	135.6	90.00	90.00	-3,184.0	106.0	259.5	60.9	198.58	1.307	Level 3, ES, SF
9,800.0	6,710.0	6,779.0	6,779.0	65.1	135.6	90.00	90.00	-3,184.0	106.0	280.3	79.9	200.45	1.398	Level 3
9,900.0	6,710.0	6,779.0	6,779.0	67.0	135.6	90.00	90.00	-3,184.0	106.0	331.4	129.0	202.32	1.638	
10,000.0	6,710.0	6,779.0	6,779.0	68.9	135.6	90.00	90.00	-3,184.0	106.0	401.3	197.1	204.19	1.965	
10,100.0	6,710.0	6,779.0	6,779.0	70.7	135.6	90.00	90.00	-3,184.0	106.0	481.9	275.9	206.07	2.339	
10,200.0	6,710.0	6,779.0	6,779.0	72.6	135.6	90.00	90.00	-3,184.0	106.0	568.8	360.8	207.95	2.735	
10,300.0	6,710.0	6,779.0	6,779.0	74.5	135.6	90.00	90.00	-3,184.0	106.0	659.3	449.5	209.83	3.142	
10,400.0	6,710.0	6,779.0	6,779.0	76.4	135.6	90.00	90.00	-3,184.0	106.0	752.3	540.6	211.72	3.553	
10,500.0	6,710.0	6,779.0	6,779.0	78.2	135.6	90.00	90.00	-3,184.0	106.0	846.9	633.3	213.60	3.965	
10,600.0	6,710.0	6,779.0	6,779.0	80.1	135.6	90.00	90.00	-3,184.0	106.0	942.5	727.1	215.49	4.374	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sater 19J-443
Project:	SEC.19-T4N-R63W	TVD Reference:	WELL @ 4673.0ft (RKB - 13')
Reference Site:	Sater 4N63W19E Pad Sec.19-T4N-R63W	MD Reference:	WELL @ 4673.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sater 19J-443	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (2-11-15)	Offset TVD Reference:	Offset Datum

Offset Design		Existing Wells Sec.19-T4N-R63W - Sater 14-19U (Exist.) - Wellbore #1 - Wellbore #1										Offset Site Error:	0.0 ft	
Survey Program: 7424-UNKNOWN													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (ft)	Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)				
9,900.0	6,710.0	6,772.0	6,772.0	67.0	135.4	90.00	-4,342.5	181.3	970.0	767.8	202.18	4.798		
10,000.0	6,710.0	6,772.0	6,772.0	68.9	135.4	90.00	-4,342.5	181.3	872.0	668.0	204.05	4.274		
10,100.0	6,710.0	6,772.0	6,772.0	70.7	135.4	90.00	-4,342.5	181.3	774.6	568.6	205.93	3.761		
10,200.0	6,710.0	6,772.0	6,772.0	72.6	135.4	90.00	-4,342.5	181.3	677.8	470.0	207.81	3.262		
10,300.0	6,710.0	6,772.0	6,772.0	74.5	135.4	90.00	-4,342.5	181.3	582.2	372.6	209.69	2.777		
10,400.0	6,710.0	6,772.0	6,772.0	76.4	135.4	90.00	-4,342.5	181.3	488.4	276.8	211.58	2.308		
10,500.0	6,710.0	6,772.0	6,772.0	78.2	135.4	90.00	-4,342.5	181.3	397.6	184.1	213.46	1.862		
10,600.0	6,710.0	6,772.0	6,772.0	80.1	135.4	90.00	-4,342.5	181.3	312.4	97.0	215.35	1.451 Level 3		
10,700.0	6,710.0	6,772.0	6,772.0	82.0	135.4	90.00	-4,342.5	181.3	239.0	21.8	217.24	1.100 Level 2		
10,800.0	6,710.0	6,772.0	6,772.0	83.9	135.4	90.00	-4,342.5	181.3	191.4	-27.7	219.13	0.874 Level 1		
10,852.4	6,710.0	6,772.0	6,772.0	84.9	135.4	90.00	-4,342.5	181.3	184.1	-36.0	220.12	0.836 Level 1, CC, ES, SF		
10,900.0	6,710.0	6,772.0	6,772.0	85.8	135.4	90.00	-4,342.5	181.3	190.2	-30.8	221.02	0.860 Level 1		
11,000.0	6,710.0	6,772.0	6,772.0	87.7	135.4	90.00	-4,342.5	181.3	236.0	13.1	222.91	1.059 Level 2		
11,100.0	6,710.0	6,772.0	6,772.0	89.6	135.4	90.00	-4,342.5	181.3	308.6	83.8	224.80	1.373 Level 3		
11,103.7	6,710.0	6,772.0	6,772.0	89.6	135.4	90.00	-4,342.5	181.3	311.6	86.7	224.87	1.386 Level 3		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sater 19J-443
Project:	SEC.19-T4N-R63W	TVD Reference:	WELL @ 4673.0ft (RKB - 13')
Reference Site:	Sater 4N63W19E Pad Sec.19-T4N-R63W	MD Reference:	WELL @ 4673.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sater 19J-443	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (2-11-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.19-T4N-R63W - Sater 19-AU (Exist.) - Wellbore #1 - Wellbore #1												Offset Site Error:	0.0 ft
Survey Program: 6926-UNKNOWN												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
6,900.0	6,662.9	6,676.9	6,676.9	17.3	133.5	-44.23	-1,315.1	675.0	970.1	858.1	111.99	8.662	
7,000.0	6,691.2	6,705.2	6,705.2	18.2	134.1	-59.61	-1,315.1	675.0	879.8	747.5	132.36	6.647	
7,100.0	6,706.8	6,720.8	6,720.8	19.3	134.4	-77.94	-1,315.1	675.0	788.2	638.5	149.74	5.264	
7,200.0	6,710.0	6,724.0	6,724.0	20.5	134.5	-90.00	-1,315.1	675.0	697.4	543.3	154.15	4.524	
7,300.0	6,710.0	6,724.0	6,724.0	21.8	134.5	-90.00	-1,315.1	675.0	609.4	453.9	155.50	3.919	
7,400.0	6,710.0	6,724.0	6,724.0	23.2	134.5	-90.00	-1,315.1	675.0	525.8	368.8	156.93	3.350	
7,500.0	6,710.0	6,724.0	6,724.0	24.6	134.5	-90.00	-1,315.1	675.0	448.8	290.4	158.43	2.833	
7,600.0	6,710.0	6,724.0	6,724.0	26.1	134.5	-90.00	-1,315.1	675.0	382.7	222.7	159.99	2.392	
7,700.0	6,710.0	6,724.0	6,724.0	27.7	134.5	-90.00	-1,315.1	675.0	333.8	172.2	161.59	2.066	
7,800.0	6,710.0	6,724.0	6,724.0	29.3	134.5	-90.00	-1,315.1	675.0	310.6	147.3	163.23	1.903	
7,825.0	6,710.0	6,724.0	6,724.0	29.7	134.5	-90.00	-1,315.1	675.0	309.6	145.9	163.65	1.892 CC, ES, SF	
7,900.0	6,710.0	6,724.0	6,724.0	31.0	134.5	-90.00	-1,315.1	675.0	318.5	153.6	164.91	1.932	
8,000.0	6,710.0	6,724.0	6,724.0	32.6	134.5	-90.00	-1,315.1	675.0	355.6	189.0	166.61	2.134	
8,100.0	6,710.0	6,724.0	6,724.0	34.3	134.5	-90.00	-1,315.1	675.0	414.1	245.8	168.33	2.460	
8,200.0	6,710.0	6,724.0	6,724.0	36.1	134.5	-90.00	-1,315.1	675.0	486.3	316.2	170.08	2.859	
8,300.0	6,710.0	6,724.0	6,724.0	37.8	134.5	-90.00	-1,315.1	675.0	567.0	395.2	171.84	3.300	
8,400.0	6,710.0	6,724.0	6,724.0	39.6	134.5	-90.00	-1,315.1	675.0	653.1	479.4	173.61	3.762	
8,500.0	6,710.0	6,724.0	6,724.0	41.3	134.5	-90.00	-1,315.1	675.0	742.6	567.2	175.40	4.234	
8,600.0	6,710.0	6,724.0	6,724.0	43.1	134.5	-90.00	-1,315.1	675.0	834.6	657.4	177.20	4.710	
8,700.0	6,710.0	6,724.0	6,724.0	44.9	134.5	-90.00	-1,315.1	675.0	928.2	749.2	179.02	5.185	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sater 19J-443
Project:	SEC.19-T4N-R63W	TVD Reference:	WELL @ 4673.0ft (RKB - 13')
Reference Site:	Sater 4N63W19E Pad Sec.19-T4N-R63W	MD Reference:	WELL @ 4673.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sater 19J-443	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (2-11-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.19-T4N-R63W - Sater 19-KU (Exist.) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 600-NS-GYRO-MS													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
8,200.0	6,710.0	6,715.9	6,714.4	36.1	11.8	-86.63	-2,571.7	664.2	931.0	883.6	47.35	19.663		
8,300.0	6,710.0	6,717.2	6,715.7	37.8	11.8	-86.87	-2,571.7	664.3	836.9	787.8	49.11	17.041		
8,400.0	6,710.0	6,718.4	6,716.9	39.6	11.8	-87.11	-2,571.7	664.3	744.4	693.5	50.89	14.626		
8,500.0	6,710.0	6,719.7	6,718.1	41.3	11.8	-87.35	-2,571.8	664.3	654.0	601.4	52.69	12.414		
8,600.0	6,710.0	6,720.9	6,719.4	43.1	11.8	-87.58	-2,571.8	664.3	567.0	512.5	54.49	10.405		
8,700.0	6,710.0	6,722.1	6,720.6	44.9	11.8	-87.81	-2,571.8	664.4	484.9	428.6	56.31	8.612		
8,800.0	6,710.0	6,723.3	6,721.8	46.7	11.8	-88.04	-2,571.8	664.4	410.9	352.7	58.13	7.068		
8,900.0	6,710.0	6,724.5	6,723.0	48.5	11.8	-88.27	-2,571.8	664.4	350.0	290.0	59.96	5.837		
9,000.0	6,710.0	6,725.7	6,724.2	50.3	11.8	-88.50	-2,571.8	664.5	310.1	248.3	61.80	5.018		
9,081.7	6,710.0	6,726.6	6,725.1	51.8	11.8	-88.68	-2,571.8	664.5	299.1	235.8	63.30	4.725 CC, ES		
9,100.0	6,710.0	6,726.8	6,725.3	52.2	11.8	-88.72	-2,571.8	664.5	299.7	236.0	63.64	4.709 SF		
9,200.0	6,710.0	6,728.0	6,726.5	54.0	11.8	-88.94	-2,571.9	664.5	321.7	256.2	65.49	4.912		
9,300.0	6,710.0	6,729.2	6,727.6	55.9	11.8	-89.17	-2,571.9	664.5	370.3	303.0	67.34	5.499		
9,400.0	6,710.0	6,730.3	6,728.8	57.7	11.8	-89.39	-2,571.9	664.6	436.8	367.6	69.19	6.313		
9,500.0	6,710.0	6,731.5	6,729.9	59.5	11.8	-89.60	-2,571.9	664.6	514.2	443.2	71.05	7.237		
9,600.0	6,710.0	6,732.6	6,731.1	61.4	11.8	-89.82	-2,571.9	664.6	598.4	525.5	72.91	8.207		
9,700.0	6,710.0	6,733.7	6,732.2	63.3	11.8	-90.04	-2,571.9	664.6	686.8	612.1	74.78	9.185		
9,800.0	6,710.0	6,734.8	6,733.3	65.1	11.8	-90.25	-2,571.9	664.7	778.1	701.4	76.65	10.151		
9,900.0	6,710.0	6,735.9	6,734.4	67.0	11.8	-90.46	-2,571.9	664.7	871.2	792.7	78.51	11.096		
10,000.0	6,710.0	6,737.0	6,735.5	68.9	11.8	-90.67	-2,572.0	664.7	965.8	885.4	80.38	12.014		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sater 19J-443
Project:	SEC.19-T4N-R63W	TVD Reference:	WELL @ 4673.0ft (RKB - 13')
Reference Site:	Sater 4N63W19E Pad Sec.19-T4N-R63W	MD Reference:	WELL @ 4673.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sater 19J-443	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (2-11-15)	Offset TVD Reference:	Offset Datum

Offset Design Sater 4N63W19E Pad Sec.19-T4N-R63W - Sater 19E-203 - Wellbore #1 - Plan #1 (2-10-15)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	1.0	1.0	0.0	0.0	-90.00	-90.00	0.0	-92.0	92.0	92.0	0.00	N/A	
100.0	100.0	101.0	101.0	0.1	0.1	-90.00	-90.00	0.0	-92.0	92.0	91.8	0.23	405.447	
200.0	200.0	201.0	201.0	0.3	0.3	-90.00	-90.00	0.0	-92.0	92.0	91.4	0.68	136.047	
300.0	300.0	301.0	301.0	0.6	0.6	-90.00	-90.00	0.0	-92.0	92.0	90.9	1.13	81.737	
400.0	400.0	401.0	401.0	0.8	0.8	-90.00	-90.00	0.0	-92.0	92.0	90.5	1.58	58.417	
500.0	500.0	501.0	501.0	1.0	1.0	-90.00	-90.00	0.0	-92.0	92.0	90.0	2.03	45.450	
600.0	600.0	601.0	601.0	1.2	1.2	-90.00	-90.00	0.0	-92.0	92.0	89.6	2.47	37.194	
700.0	700.0	701.0	701.0	1.5	1.5	-90.00	-90.00	0.0	-92.0	92.0	89.1	2.92	31.476	
800.0	800.0	801.0	801.0	1.7	1.7	-90.00	-90.00	0.0	-92.0	92.0	88.7	3.37	27.282	
900.0	900.0	901.0	901.0	1.9	1.9	-90.00	-90.00	0.0	-92.0	92.0	88.2	3.82	24.074	
1,000.0	1,000.0	1,001.0	1,001.0	2.1	2.1	-90.00	-90.00	0.0	-92.0	92.0	87.8	4.27	21.541	
1,100.0	1,100.0	1,101.0	1,101.0	2.4	2.4	-90.00	-90.00	0.0	-92.0	92.0	87.3	4.72	19.491	
1,200.0	1,200.0	1,201.0	1,201.0	2.6	2.6	-90.00	-90.00	0.0	-92.0	92.0	86.9	5.17	17.797	
1,300.0	1,300.0	1,301.0	1,301.0	2.8	2.8	-90.00	-90.00	0.0	-92.0	92.0	86.4	5.62	16.374	
1,366.3	1,366.3	1,367.3	1,367.3	3.0	3.0	-90.00	-90.00	0.0	-92.0	92.0	86.1	5.92	15.549 CC	
1,400.0	1,400.0	1,401.0	1,401.0	3.0	3.0	-90.00	-90.00	0.0	-92.0	92.0	86.0	6.07	15.161 ES	
1,500.0	1,500.0	1,500.0	1,500.0	3.3	3.2	-89.86	-89.86	0.2	-92.9	92.9	86.4	6.51	14.273	
1,600.0	1,600.0	1,597.9	1,597.8	3.5	3.5	-89.46	-89.46	0.9	-95.3	95.4	88.5	6.94	13.753	
1,700.0	1,700.0	1,696.1	1,696.0	3.7	3.7	-163.08	-163.08	2.0	-99.4	100.4	93.0	7.35	13.653	
1,800.0	1,800.0	1,794.0	1,793.7	3.9	3.9	-162.68	-162.68	3.6	-105.1	108.7	101.0	7.76	14.004	
1,900.0	1,899.9	1,891.4	1,890.8	4.1	4.1	-162.38	-162.38	5.6	-112.4	120.4	112.2	8.18	14.722	
2,000.0	1,999.7	1,988.2	1,987.2	4.3	4.3	-162.18	-162.18	8.0	-121.1	135.3	126.7	8.59	15.752	
2,100.0	2,099.4	2,084.2	2,082.6	4.6	4.6	-162.06	-162.06	10.8	-131.4	153.5	144.5	9.00	17.049	
2,200.0	2,198.9	2,180.5	2,178.2	4.8	4.8	-162.01	-162.01	14.0	-143.1	174.7	165.3	9.42	18.552	
2,300.0	2,298.3	2,277.8	2,274.6	5.0	5.1	-162.09	-162.09	17.3	-155.1	197.8	187.9	9.83	20.117	
2,400.0	2,397.4	2,374.8	2,370.8	5.3	5.3	-162.29	-162.29	20.6	-167.0	222.4	212.1	10.25	21.689	
2,500.0	2,496.5	2,471.6	2,466.8	5.6	5.6	-162.52	-162.52	23.8	-179.0	247.3	236.6	10.69	23.143	
2,600.0	2,595.6	2,568.4	2,562.8	5.8	5.9	-162.71	-162.71	27.1	-191.0	272.3	261.2	11.13	24.473	
2,700.0	2,694.7	2,665.3	2,658.9	6.1	6.2	-162.87	-162.87	30.4	-202.9	297.2	285.7	11.57	25.694	
2,800.0	2,793.8	2,762.1	2,754.9	6.4	6.4	-163.00	-163.00	33.7	-214.9	322.2	310.2	12.01	26.819	
2,900.0	2,893.0	2,858.9	2,851.0	6.7	6.7	-163.12	-163.12	36.9	-226.8	347.2	334.7	12.46	27.857	
3,000.0	2,992.1	2,955.8	2,947.0	7.0	7.0	-163.22	-163.22	40.2	-238.8	372.1	359.2	12.91	28.817	
3,100.0	3,091.2	3,052.6	3,043.0	7.3	7.3	-163.30	-163.30	43.5	-250.7	397.1	383.7	13.37	29.707	
3,200.0	3,190.3	3,149.4	3,139.1	7.6	7.6	-163.38	-163.38	46.8	-262.7	422.1	408.2	13.82	30.534	
3,300.0	3,289.4	3,246.3	3,235.1	7.9	7.9	-163.45	-163.45	50.1	-274.6	447.0	432.7	14.28	31.305	
3,400.0	3,388.5	3,343.1	3,331.1	8.2	8.2	-163.51	-163.51	53.3	-286.6	472.0	457.3	14.74	32.024	
3,500.0	3,487.6	3,439.9	3,427.2	8.5	8.5	-163.56	-163.56	56.6	-298.6	497.0	481.8	15.20	32.696	
3,600.0	3,586.7	3,536.7	3,523.2	8.8	8.8	-163.61	-163.61	59.9	-310.5	521.9	506.3	15.66	33.325	
3,700.0	3,685.8	3,633.6	3,619.2	9.1	9.1	-163.66	-163.66	63.2	-322.5	546.9	530.8	16.12	33.916	
3,800.0	3,784.9	3,730.4	3,715.3	9.4	9.4	-163.70	-163.70	66.4	-334.4	571.9	555.3	16.59	34.472	
3,900.0	3,884.0	3,827.2	3,811.3	9.8	9.7	-163.73	-163.73	69.7	-346.4	596.8	579.8	17.05	34.994	
4,000.0	3,983.1	3,924.1	3,907.3	10.1	10.0	-163.77	-163.77	73.0	-358.3	621.8	604.3	17.52	35.487	
4,100.0	4,082.2	4,020.9	4,003.4	10.4	10.3	-163.80	-163.80	76.3	-370.3	646.8	628.8	17.99	35.953	
4,200.0	4,181.3	4,117.7	4,099.4	10.7	10.6	-163.83	-163.83	79.6	-382.2	671.7	653.3	18.46	36.393	
4,300.0	4,280.5	4,214.6	4,195.4	11.0	11.0	-163.86	-163.86	82.8	-394.2	696.7	677.8	18.93	36.810	
4,400.0	4,379.6	4,311.4	4,291.5	11.4	11.3	-163.88	-163.88	86.1	-406.2	721.7	702.3	19.40	37.205	
4,500.0	4,478.7	4,408.2	4,387.5	11.7	11.6	-163.91	-163.91	89.4	-418.1	746.6	726.8	19.87	37.580	
4,600.0	4,577.8	4,505.1	4,483.6	12.0	11.9	-163.93	-163.93	92.7	-430.1	771.6	751.3	20.34	37.937	
4,700.0	4,677.0	4,602.0	4,579.7	12.3	12.2	-164.02	-164.02	95.9	-442.0	796.0	775.2	20.84	38.196	
4,800.0	4,776.5	4,716.3	4,693.1	12.5	12.5	-164.08	-164.08	99.6	-455.5	817.0	795.6	21.34	38.275	
4,900.0	4,876.3	4,853.3	4,829.7	12.7	12.8	-164.10	-164.10	102.7	-466.6	830.8	809.0	21.83	38.061	

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 Sater 19J-443
Project:	SEC.19-T4N-R63W	TVD Reference:	WELL @ 4673.0ft (RKB - 13')
Reference Site:	Sater 4N63W19E Pad Sec.19-T4N-R63W	MD Reference:	WELL @ 4673.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sater 19J-443	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (2-11-15)	Offset TVD Reference:	Offset Datum

Offset Design Sater 4N63W19E Pad Sec.19-T4N-R63W - Sater 19E-203 - Wellbore #1 - Plan #1 (2-10-15)													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
5,000.0	4,976.3	4,992.1	4,968.4	12.9	13.1	-164.11		104.0	-471.3	836.7	814.4	22.28	37.556	
5,100.0	5,076.3	5,101.0	5,077.3	13.1	13.2	-90.00		104.0	-471.4	836.9	814.2	22.67	36.908	
5,200.0	5,176.3	5,201.0	5,177.3	13.2	13.4	-90.00		104.0	-471.4	836.9	813.8	23.09	36.247	
5,300.0	5,276.3	5,301.0	5,277.3	13.4	13.6	-90.00		104.0	-471.4	836.9	813.4	23.50	35.607	
5,400.0	5,376.3	5,401.0	5,377.3	13.6	13.8	-90.00		104.0	-471.4	836.9	813.0	23.92	34.988	
5,500.0	5,476.3	5,501.0	5,477.3	13.8	14.0	-90.00		104.0	-471.4	836.9	812.5	24.34	34.388	
5,600.0	5,576.3	5,601.0	5,577.3	14.0	14.2	-90.00		104.0	-471.4	836.9	812.1	24.75	33.807	
5,700.0	5,676.3	5,701.0	5,677.3	14.2	14.4	-90.00		104.0	-471.4	836.9	811.7	25.17	33.243	
5,800.0	5,776.3	5,801.0	5,777.3	14.4	14.5	-90.00		104.0	-471.4	836.9	811.3	25.59	32.697	
5,833.8	5,810.0	5,834.8	5,811.0	14.4	14.6	-90.02		103.6	-471.4	836.9	811.2	25.73	32.523	
5,900.0	5,876.3	5,900.6	5,876.7	14.6	14.7	-90.36		98.8	-471.4	836.9	810.9	25.98	32.212	
6,000.0	5,976.3	5,997.4	5,971.8	14.7	14.8	88.48		81.4	-471.4	837.2	810.9	26.32	31.810	
6,100.0	6,075.6	6,091.4	6,061.4	14.9	14.9	87.14		53.2	-471.4	838.0	811.4	26.59	31.517	
6,200.0	6,172.8	6,183.3	6,145.0	15.0	15.0	85.86		15.2	-471.4	839.1	812.3	26.84	31.266	
6,300.0	6,266.1	6,273.4	6,221.9	15.1	15.2	84.66		-31.6	-471.4	840.6	813.5	27.12	30.995	
6,400.0	6,353.9	6,361.8	6,291.6	15.3	15.3	83.54		-86.0	-471.4	842.4	814.9	27.48	30.649	
6,500.0	6,434.7	6,450.0	6,354.3	15.4	15.5	82.52		-147.9	-471.4	844.2	816.2	27.99	30.158	
6,600.0	6,507.2	6,534.9	6,407.6	15.7	15.8	81.64		-213.9	-471.4	846.0	817.3	28.70	29.477	
6,700.0	6,570.0	6,619.8	6,453.3	16.0	16.2	80.88		-285.5	-471.4	847.7	818.1	29.66	28.586	
6,800.0	6,622.2	6,700.0	6,488.9	16.6	16.8	80.27		-357.3	-471.4	849.3	818.4	30.85	27.528	
6,900.0	6,662.9	6,787.5	6,518.9	17.3	17.5	79.76		-439.4	-471.4	850.5	818.1	32.41	26.244	
7,000.0	6,691.2	6,870.6	6,538.5	18.2	18.3	79.42		-520.2	-471.4	851.4	817.2	34.20	24.890	
7,100.0	6,706.8	6,950.0	6,548.9	19.3	19.2	79.24		-598.8	-471.4	851.9	815.7	36.21	23.528	
7,200.0	6,710.0	7,040.4	6,551.2	20.5	20.3	79.19		-689.1	-471.4	852.0	813.4	38.56	22.094	
7,300.0	6,710.0	7,140.4	6,550.5	21.8	21.6	79.15		-789.1	-471.4	852.1	810.9	41.23	20.668	
7,400.0	6,710.0	7,240.4	6,549.9	23.2	23.0	79.10		-889.1	-471.4	852.2	808.2	44.05	19.345	
7,500.0	6,710.0	7,340.4	6,549.3	24.6	24.5	79.06		-989.1	-471.4	852.4	805.4	47.01	18.131	
7,600.0	6,710.0	7,440.4	6,548.6	26.1	26.0	79.02		-1,089.1	-471.4	852.5	802.4	50.08	17.023	
7,700.0	6,710.0	7,540.4	6,548.0	27.7	27.6	78.98		-1,189.1	-471.4	852.6	799.4	53.24	16.016	
7,800.0	6,710.0	7,640.4	6,547.3	29.3	29.2	78.93		-1,289.1	-471.4	852.7	796.3	56.47	15.101	
7,900.0	6,710.0	7,740.4	6,546.7	31.0	30.8	78.89		-1,389.1	-471.4	852.9	793.1	59.76	14.271	
8,000.0	6,710.0	7,840.4	6,546.0	32.6	32.5	78.85		-1,489.1	-471.4	853.0	789.9	63.11	13.516	
8,100.0	6,710.0	7,940.4	6,545.4	34.3	34.2	78.81		-1,589.1	-471.4	853.1	786.6	66.50	12.828	
8,200.0	6,710.0	8,040.4	6,544.7	36.1	36.0	78.76		-1,689.1	-471.4	853.2	783.3	69.93	12.201	
8,300.0	6,710.0	8,140.4	6,544.1	37.8	37.7	78.72		-1,789.1	-471.4	853.4	780.0	73.39	11.627	
8,400.0	6,710.0	8,240.4	6,543.4	39.6	39.5	78.68		-1,889.1	-471.4	853.5	776.6	76.88	11.101	
8,500.0	6,710.0	8,340.3	6,542.8	41.3	41.3	78.64		-1,989.1	-471.4	853.6	773.2	80.39	10.618	
8,600.0	6,710.0	8,440.3	6,542.2	43.1	43.0	78.59		-2,089.1	-471.4	853.7	769.8	83.93	10.172	
8,700.0	6,710.0	8,540.3	6,541.5	44.9	44.8	78.55		-2,189.1	-471.4	853.9	766.4	87.48	9.761	
8,800.0	6,710.0	8,640.3	6,540.9	46.7	46.6	78.51		-2,289.1	-471.4	854.0	763.0	91.05	9.380	
8,900.0	6,710.0	8,740.3	6,540.2	48.5	48.5	78.47		-2,389.1	-471.4	854.1	759.5	94.63	9.026	
9,000.0	6,710.0	8,840.3	6,539.6	50.3	50.3	78.42		-2,489.1	-471.4	854.3	756.0	98.23	8.697	
9,100.0	6,710.0	8,940.3	6,538.9	52.2	52.1	78.38		-2,589.1	-471.4	854.4	752.6	101.83	8.390	
9,200.0	6,710.0	9,040.3	6,538.3	54.0	54.0	78.34		-2,689.0	-471.4	854.5	749.1	105.45	8.104	
9,300.0	6,710.0	9,140.3	6,537.6	55.9	55.8	78.30		-2,789.0	-471.4	854.7	745.6	109.07	7.836	
9,400.0	6,710.0	9,240.3	6,537.0	57.7	57.7	78.25		-2,889.0	-471.4	854.8	742.1	112.70	7.584	
9,500.0	6,710.0	9,340.3	6,536.3	59.5	59.5	78.21		-2,989.0	-471.4	854.9	738.6	116.34	7.348	
9,600.0	6,710.0	9,440.3	6,535.7	61.4	61.4	78.17		-3,089.0	-471.4	855.0	735.1	119.99	7.126	
9,700.0	6,710.0	9,540.3	6,535.0	63.3	63.2	78.13		-3,189.0	-471.4	855.2	731.5	123.64	6.917	
9,800.0	6,710.0	9,640.3	6,534.4	65.1	65.1	78.08		-3,289.0	-471.4	855.3	728.0	127.29	6.719	
9,900.0	6,710.0	9,740.3	6,533.8	67.0	67.0	78.04		-3,389.0	-471.4	855.4	724.5	130.95	6.532	

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 Sater 19J-443
Project:	SEC.19-T4N-R63W	TVD Reference:	WELL @ 4673.0ft (RKB - 13')
Reference Site:	Sater 4N63W19E Pad Sec.19-T4N-R63W	MD Reference:	WELL @ 4673.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sater 19J-443	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (2-11-15)	Offset TVD Reference:	Offset Datum

Offset Design Sater 4N63W19E Pad Sec.19-T4N-R63W - Sater 19E-203 - Wellbore #1 - Plan #1 (2-10-15)												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
10,000.0	6,710.0	9,840.3	6,533.1	68.9	68.8	78.00	-3,489.0	-471.4	855.6	721.0	134.62	6.356	
10,100.0	6,710.0	9,940.3	6,532.5	70.7	70.7	77.96	-3,589.0	-471.4	855.7	717.4	138.28	6.188	
10,200.0	6,710.0	10,040.3	6,531.8	72.6	72.6	77.92	-3,689.0	-471.4	855.9	713.9	141.95	6.029	
10,300.0	6,710.0	10,140.3	6,531.2	74.5	74.4	77.87	-3,789.0	-471.4	856.0	710.4	145.63	5.878	
10,400.0	6,710.0	10,240.3	6,530.5	76.4	76.3	77.83	-3,889.0	-471.4	856.1	706.8	149.30	5.734	
10,500.0	6,710.0	10,340.3	6,529.9	78.2	78.2	77.79	-3,989.0	-471.4	856.3	703.3	152.98	5.597	
10,600.0	6,710.0	10,440.3	6,529.2	80.1	80.1	77.75	-4,089.0	-471.4	856.4	699.7	156.66	5.467	
10,700.0	6,710.0	10,540.3	6,528.6	82.0	82.0	77.70	-4,189.0	-471.4	856.5	696.2	160.34	5.342	
10,800.0	6,710.0	10,640.3	6,527.9	83.9	83.9	77.66	-4,289.0	-471.4	856.7	692.6	164.03	5.223	
10,900.0	6,710.0	10,740.3	6,527.3	85.8	85.7	77.62	-4,389.0	-471.4	856.8	689.1	167.71	5.109	
11,000.0	6,710.0	10,840.3	6,526.7	87.7	87.6	77.58	-4,489.0	-471.4	856.9	685.5	171.40	5.000	
11,100.0	6,710.0	10,940.3	6,526.0	89.6	89.5	77.54	-4,589.0	-471.4	857.1	682.0	175.09	4.895	
11,103.7	6,710.0	10,941.6	6,526.0	89.6	89.6	77.53	-4,590.2	-471.4	857.1	681.9	175.18	4.893 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sater 19J-443
Project:	SEC.19-T4N-R63W	TVD Reference:	WELL @ 4673.0ft (RKB - 13')
Reference Site:	Sater 4N63W19E Pad Sec.19-T4N-R63W	MD Reference:	WELL @ 4673.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sater 19J-443	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (2-11-15)	Offset TVD Reference:	Offset Datum

Offset Design Sater 4N63W19E Pad Sec.19-T4N-R63W - Sater 19E-223 - Wellbore #1 - Plan #1 (2-11-15)													Offset Site Error:	0.0 ft
Survey Program: 0-MWDD													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	-90.00	-90.00	0.0	-30.7	30.7				
100.0	100.0	100.0	100.0	0.1	0.1	-90.00	-90.00	0.0	-30.7	30.7	30.5	0.22	136.501	
200.0	200.0	200.0	200.0	0.3	0.3	-90.00	-90.00	0.0	-30.7	30.7	30.0	0.67	45.500	
300.0	300.0	300.0	300.0	0.6	0.6	-90.00	-90.00	0.0	-30.7	30.7	29.6	1.12	27.300	
400.0	400.0	400.0	400.0	0.8	0.8	-90.00	-90.00	0.0	-30.7	30.7	29.1	1.57	19.500	
500.0	500.0	500.0	500.0	1.0	1.0	-90.00	-90.00	0.0	-30.7	30.7	28.7	2.02	15.167	
600.0	600.0	600.0	600.0	1.2	1.2	-90.00	-90.00	0.0	-30.7	30.7	28.2	2.47	12.409	
700.0	700.0	700.0	700.0	1.5	1.5	-90.00	-90.00	0.0	-30.7	30.7	27.8	2.92	10.500	
800.0	800.0	800.0	800.0	1.7	1.7	-90.00	-90.00	0.0	-30.7	30.7	27.3	3.37	9.100	
900.0	900.0	900.0	900.0	1.9	1.9	-90.00	-90.00	0.0	-30.7	30.7	26.9	3.82	8.029	
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	-90.00	-90.00	0.0	-30.7	30.7	26.4	4.27	7.184	
1,100.0	1,100.0	1,100.0	1,100.0	2.4	2.4	-90.00	-90.00	0.0	-30.7	30.7	26.0	4.72	6.500	
1,200.0	1,200.0	1,200.0	1,200.0	2.6	2.6	-90.00	-90.00	0.0	-30.7	30.7	25.5	5.17	5.935	
1,300.0	1,300.0	1,300.0	1,300.0	2.8	2.8	-90.00	-90.00	0.0	-30.7	30.7	25.1	5.62	5.460	
1,400.0	1,400.0	1,400.0	1,400.0	3.0	3.0	-90.00	-90.00	0.0	-30.7	30.7	24.6	6.07	5.056	
1,500.0	1,500.0	1,500.0	1,500.0	3.3	3.3	-90.00	-90.00	0.0	-30.7	30.7	24.2	6.52	4.707	
1,600.0	1,600.0	1,600.0	1,600.0	3.5	3.5	-90.00	-90.00	0.0	-30.7	30.7	23.7	6.97	4.403 CC, ES	
1,700.0	1,700.0	1,700.0	1,700.0	3.7	3.7	-164.55	-164.55	0.0	-30.7	31.5	24.1	7.41	4.256	
1,800.0	1,800.0	1,800.0	1,800.0	3.9	3.9	-165.71	-165.71	0.0	-30.7	34.1	26.2	7.83	4.347	
1,900.0	1,899.9	1,899.9	1,899.9	4.1	4.2	-167.32	-167.32	0.0	-30.7	38.3	30.0	8.26	4.635	
2,000.0	1,999.7	1,999.7	1,999.7	4.3	4.4	-169.04	-169.04	0.0	-30.7	44.3	35.6	8.69	5.095	
2,100.0	2,099.4	2,099.4	2,099.4	4.6	4.6	-170.67	-170.67	0.0	-30.7	52.0	42.9	9.11	5.705	
2,200.0	2,198.9	2,198.9	2,198.9	4.8	4.8	-172.11	-172.11	0.0	-30.7	61.5	51.9	9.54	6.445	
2,300.0	2,298.3	2,298.3	2,298.3	5.0	5.1	-173.32	-173.32	0.0	-30.7	72.7	62.7	9.96	7.298	
2,400.0	2,397.4	2,397.4	2,397.4	5.3	5.3	-174.32	-174.32	0.0	-30.7	85.6	75.2	10.39	8.237	
2,500.0	2,496.5	2,496.5	2,496.5	5.6	5.5	-175.08	-175.08	0.0	-30.7	98.9	88.0	10.83	9.127	
2,600.0	2,595.6	2,595.6	2,595.6	5.8	5.7	-175.67	-175.67	0.0	-30.7	112.1	100.9	11.27	9.947	
2,700.0	2,694.7	2,694.7	2,694.7	6.1	5.9	-176.13	-176.13	0.0	-30.7	125.4	113.7	11.72	10.704	
2,800.0	2,793.8	2,793.8	2,793.8	6.4	6.2	-176.50	-176.50	0.0	-30.7	138.8	126.6	12.17	11.405	
2,900.0	2,893.0	2,893.0	2,893.0	6.7	6.4	-176.81	-176.81	0.0	-30.7	152.1	139.4	12.61	12.055	
3,000.0	2,992.1	2,992.1	2,992.1	7.0	6.6	-177.06	-177.06	0.0	-30.7	165.4	152.3	13.06	12.659	
3,100.0	3,091.2	3,092.3	3,092.2	7.3	6.8	-177.06	-177.06	0.7	-30.6	178.4	164.9	13.52	13.201	
3,200.0	3,190.3	3,192.7	3,192.6	7.6	7.1	-176.57	-176.57	3.2	-30.2	190.8	176.8	13.97	13.661	
3,300.0	3,289.4	3,293.2	3,293.1	7.9	7.3	-175.67	-175.67	7.4	-29.5	202.6	188.2	14.42	14.049	
3,400.0	3,388.5	3,393.7	3,393.4	8.2	7.5	-174.42	-174.42	13.3	-28.5	213.8	198.9	14.88	14.374	
3,500.0	3,487.6	3,494.2	3,493.6	8.5	7.7	-172.88	-172.88	21.0	-27.3	224.6	209.3	15.34	14.646	
3,600.0	3,586.7	3,594.1	3,593.1	8.8	8.0	-171.10	-171.10	30.3	-25.8	235.1	219.3	15.80	14.878	
3,700.0	3,685.8	3,693.3	3,691.8	9.1	8.2	-169.42	-169.42	39.7	-24.3	245.7	229.4	16.27	15.099	
3,800.0	3,784.9	3,792.5	3,790.5	9.4	8.4	-167.87	-167.87	49.2	-22.8	256.4	239.7	16.75	15.314	
3,900.0	3,884.0	3,891.7	3,889.2	9.8	8.7	-166.45	-166.45	58.7	-21.2	267.4	250.2	17.23	15.521	
4,000.0	3,983.1	3,990.9	3,988.0	10.1	8.9	-165.14	-165.14	68.2	-19.7	278.5	260.8	17.72	15.721	
4,100.0	4,082.2	4,090.1	4,086.7	10.4	9.1	-163.93	-163.93	77.7	-18.2	289.7	271.5	18.21	15.913	
4,200.0	4,181.3	4,189.2	4,185.4	10.7	9.4	-162.82	-162.82	87.1	-16.7	301.1	282.4	18.70	16.098	
4,300.0	4,280.5	4,287.6	4,283.4	11.0	9.6	-161.91	-161.91	95.9	-15.2	312.6	293.4	19.18	16.297	
4,400.0	4,379.6	4,385.6	4,381.2	11.4	9.8	-161.62	-161.62	101.6	-14.3	324.6	305.0	19.62	16.547	
4,500.0	4,478.7	4,483.4	4,479.0	11.7	10.0	-161.92	-161.92	103.9	-14.0	337.0	317.0	20.03	16.825	
4,600.0	4,577.8	4,582.2	4,577.8	12.0	10.2	-162.58	-162.58	104.0	-13.9	349.7	329.2	20.45	17.099	
4,700.0	4,677.0	4,681.4	4,677.0	12.3	10.4	-163.22	-163.22	104.0	-13.9	361.9	340.9	20.91	17.304	
4,800.0	4,776.5	4,781.0	4,776.5	12.5	10.6	-163.70	-163.70	104.0	-13.9	371.0	349.6	21.35	17.378	
4,900.0	4,876.3	4,880.8	4,876.3	12.7	10.8	-163.99	-163.99	104.0	-13.9	376.8	355.1	21.76	17.313	
5,000.0	4,976.3	4,980.7	4,976.3	12.9	11.0	-164.11	-164.11	104.0	-13.9	379.3	357.1	22.16	17.119	

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 Sater 19J-443
Project:	SEC.19-T4N-R63W	TVD Reference:	WELL @ 4673.0ft (RKB - 13')
Reference Site:	Sater 4N63W19E Pad Sec.19-T4N-R63W	MD Reference:	WELL @ 4673.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sater 19J-443	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (2-11-15)	Offset TVD Reference:	Offset Datum

Offset Design Sater 4N63W19E Pad Sec.19-T4N-R63W - Sater 19E-223 - Wellbore #1 - Plan #1 (2-11-15)													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
5,100.0	5,076.3	5,080.7	5,076.3	13.1	11.2	-90.00	-90.00	104.0	-13.9	379.4	356.8	22.56	16.815	
5,200.0	5,176.3	5,180.7	5,176.3	13.2	11.5	-90.00	-90.00	104.0	-13.9	379.4	356.4	22.99	16.501	
5,300.0	5,276.3	5,280.7	5,276.3	13.4	11.7	-90.00	-90.00	104.0	-13.9	379.4	356.0	23.42	16.199	
5,400.0	5,376.3	5,380.7	5,376.3	13.6	11.9	-90.00	-90.00	104.0	-13.9	379.4	355.5	23.85	15.907	
5,500.0	5,476.3	5,480.7	5,476.3	13.8	12.1	-90.00	-90.00	104.0	-13.9	379.4	355.1	24.28	15.625	
5,600.0	5,576.3	5,580.7	5,576.3	14.0	12.4	-90.00	-90.00	104.0	-13.9	379.4	354.7	24.71	15.352	
5,700.0	5,676.3	5,680.7	5,676.3	14.2	12.6	-90.00	-90.00	104.0	-13.9	379.4	354.2	25.15	15.088	
5,800.0	5,776.3	5,780.7	5,776.3	14.4	12.8	-90.00	-90.00	104.0	-13.9	379.4	353.8	25.58	14.833	
5,831.2	5,807.5	5,811.9	5,807.4	14.4	12.9	-90.06	-90.06	103.6	-13.9	379.4	353.7	25.70	14.762	
5,900.0	5,876.3	5,880.3	5,875.6	14.6	13.0	-90.87	-90.87	98.2	-13.9	379.4	353.5	25.94	14.629	
6,000.0	5,976.3	5,976.8	5,970.4	14.7	13.1	86.50	86.50	80.4	-13.9	380.1	353.9	26.23	14.490	
6,100.0	6,075.6	6,070.6	6,059.6	14.9	13.2	83.49	83.49	51.8	-13.9	382.0	355.5	26.47	14.432	
6,200.0	6,172.8	6,162.2	6,142.7	15.0	13.4	80.64	80.64	13.5	-13.9	384.7	358.0	26.69	14.413	
6,300.0	6,266.1	6,250.0	6,217.6	15.1	13.5	78.05	78.05	-32.4	-13.9	388.1	361.2	26.94	14.408	
6,400.0	6,353.9	6,340.0	6,288.4	15.3	13.7	75.58	75.58	-87.9	-13.9	392.0	364.8	27.25	14.385	
6,500.0	6,434.7	6,426.8	6,349.9	15.4	14.0	73.43	73.43	-149.0	-13.9	396.2	368.5	27.66	14.323	
6,600.0	6,507.2	6,512.3	6,403.5	15.7	14.4	71.56	71.56	-215.7	-13.9	400.2	372.0	28.19	14.197	
6,700.0	6,570.0	6,600.0	6,450.3	16.0	15.0	69.94	69.94	-289.8	-13.9	404.1	375.2	28.90	13.981	
6,800.0	6,622.2	6,680.7	6,485.6	16.6	15.6	68.70	68.70	-362.3	-13.9	407.4	377.6	29.79	13.676	
6,900.0	6,662.9	6,763.8	6,513.7	17.3	16.4	67.73	67.73	-440.5	-13.9	410.1	379.2	30.92	13.263	
7,000.0	6,691.2	6,850.0	6,533.8	18.2	17.3	67.04	67.04	-524.2	-13.9	412.0	379.7	32.33	12.744	
7,100.0	6,706.8	6,929.0	6,543.8	19.3	18.3	66.69	66.69	-602.5	-13.9	413.1	379.2	33.94	12.172	
7,200.0	6,710.0	7,014.8	6,545.7	20.5	19.4	66.58	66.58	-688.2	-13.9	413.5	377.5	35.92	11.510	
7,300.0	6,710.0	7,114.8	6,544.5	21.8	20.7	66.43	66.43	-788.2	-13.9	413.9	375.5	38.39	10.782	
7,400.0	6,710.0	7,214.7	6,543.3	23.2	22.2	66.28	66.28	-888.2	-13.9	414.4	373.4	41.01	10.105	
7,500.0	6,710.0	7,314.7	6,542.2	24.6	23.7	66.14	66.14	-988.2	-13.9	414.9	371.1	43.75	9.482	
7,600.0	6,710.0	7,414.7	6,541.0	26.1	25.3	65.99	65.99	-1,088.2	-13.9	415.3	368.7	46.59	8.914	
7,700.0	6,710.0	7,514.7	6,539.8	27.7	26.9	65.84	65.84	-1,188.2	-13.9	415.8	366.3	49.52	8.397	
7,800.0	6,710.0	7,614.7	6,538.7	29.3	28.5	65.69	65.69	-1,288.2	-13.9	416.3	363.8	52.51	7.928	
7,900.0	6,710.0	7,714.7	6,537.5	31.0	30.2	65.55	65.55	-1,388.1	-13.9	416.8	361.2	55.55	7.502	
8,000.0	6,710.0	7,814.7	6,536.3	32.6	31.9	65.40	65.40	-1,488.1	-13.9	417.3	358.6	58.64	7.115	
8,100.0	6,710.0	7,914.7	6,535.2	34.3	33.7	65.26	65.26	-1,588.1	-13.9	417.7	356.0	61.77	6.763	
8,200.0	6,710.0	8,014.7	6,534.0	36.1	35.4	65.11	65.11	-1,688.1	-13.9	418.2	353.3	64.92	6.442	
8,300.0	6,710.0	8,114.7	6,532.8	37.8	37.2	64.97	64.97	-1,788.1	-13.9	418.7	350.6	68.10	6.149	
8,400.0	6,710.0	8,214.7	6,531.6	39.6	39.0	64.82	64.82	-1,888.1	-13.9	419.2	347.9	71.30	5.879	
8,500.0	6,710.0	8,314.7	6,530.5	41.3	40.8	64.68	64.68	-1,988.1	-13.9	419.7	345.2	74.52	5.632	
8,600.0	6,710.0	8,414.7	6,529.3	43.1	42.6	64.53	64.53	-2,088.0	-13.9	420.2	342.5	77.75	5.405	
8,700.0	6,710.0	8,514.7	6,528.1	44.9	44.4	64.39	64.39	-2,188.0	-13.9	420.7	339.7	80.99	5.195	
8,800.0	6,710.0	8,614.7	6,527.0	46.7	46.2	64.25	64.25	-2,288.0	-13.9	421.2	337.0	84.25	5.000	
8,900.0	6,710.0	8,714.6	6,525.8	48.5	48.0	64.10	64.10	-2,388.0	-13.9	421.7	334.2	87.51	4.820	
9,000.0	6,710.0	8,814.6	6,524.6	50.3	49.9	63.96	63.96	-2,488.0	-13.9	422.3	331.5	90.77	4.652	
9,100.0	6,710.0	8,914.6	6,523.5	52.2	51.7	63.82	63.82	-2,588.0	-13.9	422.8	328.7	94.04	4.496	
9,200.0	6,710.0	9,014.6	6,522.3	54.0	53.6	63.68	63.68	-2,688.0	-13.9	423.3	326.0	97.31	4.350	
9,300.0	6,710.0	9,114.6	6,521.1	55.9	55.4	63.53	63.53	-2,788.0	-13.9	423.8	323.2	100.58	4.214	
9,400.0	6,710.0	9,214.6	6,519.9	57.7	57.3	63.39	63.39	-2,887.9	-13.9	424.3	320.5	103.86	4.086	
9,500.0	6,710.0	9,314.6	6,518.8	59.5	59.1	63.25	63.25	-2,987.9	-13.9	424.9	317.7	107.13	3.966	
9,600.0	6,710.0	9,414.6	6,517.6	61.4	61.0	63.11	63.11	-3,087.9	-13.9	425.4	315.0	110.40	3.853	
9,700.0	6,710.0	9,514.6	6,516.4	63.3	62.9	62.97	62.97	-3,187.9	-13.9	425.9	312.2	113.68	3.747	
9,800.0	6,710.0	9,614.6	6,515.3	65.1	64.7	62.83	62.83	-3,287.9	-13.9	426.5	309.5	116.95	3.647	
9,900.0	6,710.0	9,714.6	6,514.1	67.0	66.6	62.69	62.69	-3,387.9	-13.9	427.0	306.8	120.21	3.552	
10,000.0	6,710.0	9,814.6	6,512.9	68.9	68.5	62.55	62.55	-3,487.9	-13.9	427.5	304.0	123.48	3.462	

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 Sater 19J-443
Project:	SEC.19-T4N-R63W	TVD Reference:	WELL @ 4673.0ft (RKB - 13')
Reference Site:	Sater 4N63W19E Pad Sec.19-T4N-R63W	MD Reference:	WELL @ 4673.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sater 19J-443	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (2-11-15)	Offset TVD Reference:	Offset Datum

Offset Design Sater 4N63W19E Pad Sec.19-T4N-R63W - Sater 19E-223 - Wellbore #1 - Plan #1 (2-11-15)												Offset Site Error:	0.0 ft
Survey Program: 0-MWD												Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (ft)	Separation Factor	Warning
Reference	Offset	Reference	Offset	Reference	Offset		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)			
10,100.0	6,710.0	9,914.6	6,511.8	70.7	70.4	62.41	-3,587.8	-13.9	428.1	301.3	126.74	3.377	
10,200.0	6,710.0	10,014.6	6,510.6	72.6	72.3	62.27	-3,687.8	-13.9	428.6	298.6	130.00	3.297	
10,300.0	6,710.0	10,114.6	6,509.4	74.5	74.1	62.14	-3,787.8	-13.9	429.2	295.9	133.26	3.220	
10,400.0	6,710.0	10,214.5	6,508.3	76.4	76.0	62.00	-3,887.8	-13.9	429.7	293.2	136.51	3.148	
10,500.0	6,710.0	10,314.5	6,507.1	78.2	77.9	61.86	-3,987.8	-13.9	430.3	290.5	139.76	3.079	
10,600.0	6,710.0	10,414.5	6,505.9	80.1	79.8	61.72	-4,087.8	-13.9	430.8	287.8	143.00	3.013	
10,700.0	6,710.0	10,514.5	6,504.7	82.0	81.7	61.59	-4,187.8	-13.9	431.4	285.1	146.24	2.950	
10,800.0	6,710.0	10,614.5	6,503.6	83.9	83.6	61.45	-4,287.7	-13.9	431.9	282.4	149.47	2.890	
10,900.0	6,710.0	10,714.5	6,502.4	85.8	85.5	61.31	-4,387.7	-13.9	432.5	279.8	152.70	2.832	
11,000.0	6,710.0	10,814.5	6,501.2	87.7	87.4	61.18	-4,487.7	-13.9	433.0	277.1	155.92	2.777	
11,100.0	6,710.0	10,914.5	6,500.1	89.6	89.3	61.04	-4,587.7	-13.9	433.6	274.5	159.14	2.725	
11,103.7	6,710.0	10,918.2	6,500.0	89.6	89.3	61.04	-4,591.4	-13.9	433.6	274.4	159.26	2.723 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sater 19J-443
Project:	SEC.19-T4N-R63W	TVD Reference:	WELL @ 4673.0ft (RKB - 13')
Reference Site:	Sater 4N63W19E Pad Sec.19-T4N-R63W	MD Reference:	WELL @ 4673.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sater 19J-443	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (2-11-15)	Offset TVD Reference:	Offset Datum

Offset Design Sater 4N63W19E Pad Sec.19-T4N-R63W - Sater 19E-323 - Wellbore #1 - Plan #1 (2-11-15)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	1.0	1.0	0.0	0.0	-90.00	-90.00	0.0	-61.4	61.4	61.4	0.00	N/A	
100.0	100.0	101.0	101.0	0.1	0.1	-90.00	-90.00	0.0	-61.4	61.4	61.1	0.23	270.298	
200.0	200.0	201.0	201.0	0.3	0.3	-90.00	-90.00	0.0	-61.4	61.4	60.7	0.68	90.698	
300.0	300.0	301.0	301.0	0.6	0.6	-90.00	-90.00	0.0	-61.4	61.4	60.2	1.13	54.491	
400.0	400.0	401.0	401.0	0.8	0.8	-90.00	-90.00	0.0	-61.4	61.4	59.8	1.58	38.945	
500.0	500.0	501.0	501.0	1.0	1.0	-90.00	-90.00	0.0	-61.4	61.4	59.3	2.03	30.300	
600.0	600.0	601.0	601.0	1.2	1.2	-90.00	-90.00	0.0	-61.4	61.4	58.9	2.47	24.796	
700.0	700.0	701.0	701.0	1.5	1.5	-90.00	-90.00	0.0	-61.4	61.4	58.4	2.92	20.984	
800.0	800.0	801.0	801.0	1.7	1.7	-90.00	-90.00	0.0	-61.4	61.4	58.0	3.37	18.188	
900.0	900.0	901.0	901.0	1.9	1.9	-90.00	-90.00	0.0	-61.4	61.4	57.5	3.82	16.049	
1,000.0	1,000.0	1,001.0	1,001.0	2.1	2.1	-90.00	-90.00	0.0	-61.4	61.4	57.1	4.27	14.361	
1,100.0	1,100.0	1,101.0	1,101.0	2.4	2.4	-90.00	-90.00	0.0	-61.4	61.4	56.6	4.72	12.994	
1,200.0	1,200.0	1,201.0	1,201.0	2.6	2.6	-90.00	-90.00	0.0	-61.4	61.4	56.2	5.17	11.864	
1,300.0	1,300.0	1,301.0	1,301.0	2.8	2.8	-90.00	-90.00	0.0	-61.4	61.4	55.7	5.62	10.916	
1,400.0	1,400.0	1,401.0	1,401.0	3.0	3.0	-90.00	-90.00	0.0	-61.4	61.4	55.3	6.07	10.107	
1,500.0	1,500.0	1,501.0	1,501.0	3.3	3.3	-90.00	-90.00	0.0	-61.4	61.4	54.8	6.52	9.411	
1,600.0	1,600.0	1,601.0	1,601.0	3.5	3.5	-90.00	-90.00	0.0	-61.4	61.4	54.4	6.97	8.804 CC, ES	
1,700.0	1,700.0	1,701.0	1,701.0	3.7	3.7	-164.33	-164.33	0.0	-61.4	62.2	54.8	7.41	8.396	
1,800.0	1,800.0	1,800.9	1,800.9	3.9	3.9	-164.95	-164.95	0.0	-61.4	64.7	56.9	7.84	8.260	
1,900.0	1,899.9	1,900.0	1,900.0	4.1	4.2	-165.52	-165.52	0.4	-62.1	69.7	61.5	8.25	8.445	
2,000.0	1,999.7	1,998.4	1,998.3	4.3	4.4	-165.68	-165.68	1.6	-64.4	77.9	69.2	8.67	8.988	
2,100.0	2,099.4	2,096.5	2,096.4	4.6	4.6	-165.52	-165.52	3.6	-68.1	89.2	80.1	9.08	9.829	
2,200.0	2,198.9	2,194.0	2,193.7	4.8	4.8	-165.18	-165.18	6.4	-73.3	103.7	94.2	9.49	10.930	
2,300.0	2,298.3	2,290.8	2,290.2	5.0	5.0	-164.73	-164.73	9.9	-79.9	121.3	111.4	9.90	12.255	
2,400.0	2,397.4	2,386.7	2,385.6	5.3	5.2	-164.25	-164.25	14.1	-87.8	142.0	131.6	10.32	13.759	
2,500.0	2,496.5	2,482.3	2,480.7	5.6	5.5	-163.69	-163.69	19.1	-97.2	164.4	153.6	10.75	15.290	
2,600.0	2,595.6	2,579.7	2,577.4	5.8	5.7	-163.19	-163.19	24.3	-107.1	187.3	176.1	11.19	16.738	
2,700.0	2,694.7	2,677.0	2,674.1	6.1	5.9	-162.79	-162.79	29.6	-117.0	210.2	198.5	11.63	18.071	
2,800.0	2,793.8	2,774.3	2,770.8	6.4	6.2	-162.47	-162.47	34.9	-126.9	233.1	221.0	12.07	19.302	
2,900.0	2,893.0	2,871.7	2,867.5	6.7	6.5	-162.21	-162.21	40.2	-136.9	256.0	243.5	12.52	20.440	
3,000.0	2,992.1	2,969.0	2,964.1	7.0	6.7	-161.99	-161.99	45.5	-146.8	278.9	265.9	12.98	21.494	
3,100.0	3,091.2	3,066.3	3,060.8	7.3	7.0	-161.80	-161.80	50.8	-156.7	301.8	288.4	13.43	22.473	
3,200.0	3,190.3	3,163.7	3,157.5	7.6	7.3	-161.64	-161.64	56.1	-166.6	324.7	310.8	13.89	23.384	
3,300.0	3,289.4	3,261.0	3,254.2	7.9	7.5	-161.51	-161.51	61.4	-176.6	347.7	333.3	14.35	24.232	
3,400.0	3,388.5	3,358.3	3,350.9	8.2	7.8	-161.38	-161.38	66.6	-186.5	370.6	355.8	14.81	25.025	
3,500.0	3,487.6	3,455.7	3,447.5	8.5	8.1	-161.28	-161.28	71.9	-196.4	393.5	378.2	15.27	25.766	
3,600.0	3,586.7	3,553.0	3,544.2	8.8	8.4	-161.18	-161.18	77.2	-206.4	416.4	400.7	15.74	26.461	
3,700.0	3,685.8	3,650.3	3,640.9	9.1	8.6	-161.10	-161.10	82.5	-216.3	439.4	423.2	16.21	27.113	
3,800.0	3,784.9	3,747.7	3,737.6	9.4	8.9	-161.02	-161.02	87.8	-226.2	462.3	445.6	16.67	27.726	
3,900.0	3,884.0	3,845.0	3,834.3	9.8	9.2	-160.95	-160.95	93.1	-236.1	485.2	468.1	17.14	28.303	
4,000.0	3,983.1	3,954.3	3,942.9	10.1	9.5	-160.93	-160.93	98.6	-246.4	507.4	489.8	17.61	28.808	
4,100.0	4,082.2	4,071.6	4,060.0	10.4	9.7	-161.11	-161.11	102.4	-253.6	526.3	508.2	18.08	29.115	
4,200.0	4,181.3	4,190.4	4,178.7	10.7	9.9	-161.50	-161.50	104.0	-256.6	541.4	522.9	18.53	29.217	
4,300.0	4,280.5	4,293.2	4,281.5	11.0	10.1	-161.95	-161.95	104.0	-256.6	554.1	535.2	18.97	29.214	
4,400.0	4,379.6	4,392.3	4,380.6	11.4	10.3	-162.37	-162.37	104.0	-256.6	566.8	547.4	19.42	29.188	
4,500.0	4,478.7	4,491.4	4,479.7	11.7	10.5	-162.77	-162.77	104.0	-256.6	579.6	559.7	19.87	29.163	
4,600.0	4,577.8	4,590.5	4,578.8	12.0	10.7	-163.15	-163.15	104.0	-256.6	592.3	572.0	20.33	29.139	
4,700.0	4,677.0	4,689.7	4,678.0	12.3	10.9	-163.54	-163.54	104.0	-256.6	604.5	583.7	20.80	29.059	
4,800.0	4,776.5	4,789.2	4,777.5	12.5	11.1	-163.84	-163.84	104.0	-256.6	613.7	592.4	21.26	28.872	
4,900.0	4,876.3	4,889.0	4,877.3	12.7	11.3	-164.03	-164.03	104.0	-256.6	619.5	597.8	21.68	28.571	
5,000.0	4,976.3	4,989.0	4,977.3	12.9	11.5	-164.11	-164.11	104.0	-256.6	622.0	599.9	22.08	28.164	

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 Sater 19J-443
Project:	SEC.19-T4N-R63W	TVD Reference:	WELL @ 4673.0ft (RKB - 13')
Reference Site:	Sater 4N63W19E Pad Sec.19-T4N-R63W	MD Reference:	WELL @ 4673.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sater 19J-443	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (2-11-15)	Offset TVD Reference:	Offset Datum

Offset Design Sater 4N63W19E Pad Sec.19-T4N-R63W - Sater 19E-323 - Wellbore #1 - Plan #1 (2-11-15)													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
5,100.0	5,076.3	5,089.0	5,077.3	13.1	11.7	-90.00	-90.00	104.0	-256.6	622.1	599.6	22.49	27.661	
5,200.0	5,176.3	5,189.0	5,177.3	13.2	12.0	-90.00	-90.00	104.0	-256.6	622.1	599.2	22.91	27.149	
5,300.0	5,276.3	5,289.0	5,277.3	13.4	12.2	-90.00	-90.00	104.0	-256.6	622.1	598.7	23.34	26.654	
5,400.0	5,376.3	5,389.0	5,377.3	13.6	12.4	-90.00	-90.00	104.0	-256.6	622.1	598.3	23.77	26.176	
5,500.0	5,476.3	5,489.0	5,477.3	13.8	12.6	-90.00	-90.00	104.0	-256.6	622.1	597.9	24.19	25.714	
5,600.0	5,576.3	5,589.0	5,577.3	14.0	12.8	-90.00	-90.00	104.0	-256.6	622.1	597.5	24.62	25.267	
5,700.0	5,676.3	5,689.0	5,677.3	14.2	13.0	-90.00	-90.00	104.0	-256.6	622.1	597.0	25.05	24.835	
5,800.0	5,776.3	5,789.0	5,777.3	14.4	13.2	-90.00	-90.00	104.0	-256.6	622.1	596.6	25.48	24.416	
5,862.8	5,839.1	5,851.8	5,840.1	14.5	13.4	-90.00	-90.00	104.0	-256.6	622.1	596.3	25.75	24.160	
5,900.0	5,876.3	5,889.0	5,877.3	14.6	13.4	-90.03	-90.03	103.7	-256.6	622.1	596.2	25.90	24.017	
6,000.0	5,976.3	5,988.1	5,975.9	14.7	13.6	89.19	89.19	94.6	-256.6	622.1	595.9	26.26	23.696	
6,100.0	6,075.6	6,085.5	6,070.9	14.9	13.7	88.13	88.13	73.3	-256.6	622.4	595.9	26.53	23.464	
6,200.0	6,172.8	6,181.6	6,161.2	15.0	13.8	87.11	87.11	40.6	-256.6	622.9	596.1	26.77	23.269	
6,300.0	6,266.1	6,276.5	6,245.6	15.1	14.0	86.14	86.14	-2.6	-256.6	623.5	596.5	27.03	23.067	
6,400.0	6,353.9	6,370.2	6,323.1	15.3	14.1	85.24	85.24	-55.1	-256.6	624.3	596.9	27.38	22.803	
6,500.0	6,434.7	6,463.0	6,392.9	15.4	14.3	84.43	84.43	-116.1	-256.6	625.1	597.2	27.87	22.431	
6,600.0	6,507.2	6,554.8	6,454.3	15.7	14.6	83.70	83.70	-184.4	-256.6	625.9	597.3	28.57	21.911	
6,700.0	6,570.0	6,646.0	6,506.7	16.0	15.1	83.08	83.08	-258.9	-256.6	626.7	597.1	29.53	21.223	
6,800.0	6,622.2	6,736.5	6,549.5	16.6	15.7	82.57	82.57	-338.6	-256.6	627.4	596.6	30.79	20.378	
6,900.0	6,662.9	6,826.5	6,582.5	17.3	16.5	82.17	82.17	-422.4	-256.6	627.9	595.6	32.35	19.411	
7,000.0	6,691.2	6,916.3	6,605.3	18.2	17.4	81.89	81.89	-509.1	-256.6	628.4	594.2	34.20	18.373	
7,100.0	6,706.8	7,005.7	6,617.8	19.3	18.5	81.74	81.74	-597.6	-256.6	628.6	592.3	36.31	17.314	
7,200.0	6,710.0	7,097.8	6,620.2	20.5	19.6	81.69	81.69	-689.6	-256.6	628.7	590.0	38.67	16.259	
7,300.0	6,710.0	7,197.8	6,619.5	21.8	21.0	81.64	81.64	-789.6	-256.6	628.8	587.4	41.34	15.208	
7,400.0	6,710.0	7,297.8	6,618.9	23.2	22.4	81.58	81.58	-889.6	-256.6	628.9	584.7	44.19	14.232	
7,500.0	6,710.0	7,397.8	6,618.3	24.6	23.9	81.52	81.52	-989.6	-256.6	629.0	581.8	47.16	13.337	
7,600.0	6,710.0	7,497.8	6,617.6	26.1	25.5	81.46	81.46	-1,089.6	-256.6	629.1	578.8	50.25	12.520	
7,700.0	6,710.0	7,597.8	6,617.0	27.7	27.1	81.40	81.40	-1,189.6	-256.6	629.2	575.7	53.42	11.777	
7,800.0	6,710.0	7,697.8	6,616.3	29.3	28.7	81.35	81.35	-1,289.6	-256.6	629.2	572.6	56.67	11.103	
7,900.0	6,710.0	7,797.8	6,615.7	31.0	30.4	81.29	81.29	-1,389.5	-256.6	629.3	569.4	59.99	10.491	
8,000.0	6,710.0	7,897.7	6,615.0	32.6	32.1	81.23	81.23	-1,489.5	-256.6	629.4	566.1	63.35	9.935	
8,100.0	6,710.0	7,997.7	6,614.4	34.3	33.8	81.17	81.17	-1,589.5	-256.6	629.5	562.8	66.77	9.429	
8,200.0	6,710.0	8,097.7	6,613.7	36.1	35.6	81.11	81.11	-1,689.5	-256.6	629.6	559.4	70.22	8.967	
8,300.0	6,710.0	8,197.7	6,613.1	37.8	37.3	81.06	81.06	-1,789.5	-256.6	629.7	556.0	73.70	8.545	
8,400.0	6,710.0	8,297.7	6,612.4	39.6	39.1	81.00	81.00	-1,889.5	-256.6	629.8	552.6	77.21	8.158	
8,500.0	6,710.0	8,397.7	6,611.8	41.3	40.9	80.94	80.94	-1,989.5	-256.6	629.9	549.2	80.74	7.802	
8,600.0	6,710.0	8,497.7	6,611.1	43.1	42.7	80.88	80.88	-2,089.5	-256.6	630.0	545.8	84.30	7.474	
8,700.0	6,710.0	8,597.7	6,610.5	44.9	44.5	80.82	80.82	-2,189.5	-256.6	630.2	542.3	87.87	7.171	
8,800.0	6,710.0	8,697.7	6,609.9	46.7	46.3	80.77	80.77	-2,289.5	-256.6	630.3	538.8	91.46	6.891	
8,900.0	6,710.0	8,797.7	6,609.2	48.5	48.1	80.71	80.71	-2,389.5	-256.6	630.4	535.3	95.06	6.631	
9,000.0	6,710.0	8,897.7	6,608.6	50.3	50.0	80.65	80.65	-2,489.5	-256.6	630.5	531.8	98.68	6.389	
9,100.0	6,710.0	8,997.7	6,607.9	52.2	51.8	80.59	80.59	-2,589.5	-256.6	630.6	528.3	102.30	6.164	
9,200.0	6,710.0	9,097.7	6,607.3	54.0	53.7	80.53	80.53	-2,689.5	-256.6	630.7	524.7	105.94	5.953	
9,300.0	6,710.0	9,197.7	6,606.6	55.9	55.5	80.48	80.48	-2,789.5	-256.6	630.8	521.2	109.58	5.756	
9,400.0	6,710.0	9,297.7	6,606.0	57.7	57.4	80.42	80.42	-2,889.5	-256.6	630.9	517.7	113.24	5.571	
9,500.0	6,710.0	9,397.7	6,605.3	59.5	59.2	80.36	80.36	-2,989.5	-256.6	631.0	514.1	116.89	5.398	
9,600.0	6,710.0	9,497.7	6,604.7	61.4	61.1	80.30	80.30	-3,089.5	-256.6	631.1	510.5	120.56	5.235	
9,700.0	6,710.0	9,597.7	6,604.0	63.3	63.0	80.24	80.24	-3,189.5	-256.6	631.2	507.0	124.23	5.081	
9,800.0	6,710.0	9,697.7	6,603.4	65.1	64.8	80.19	80.19	-3,289.5	-256.6	631.3	503.4	127.90	4.936	
9,900.0	6,710.0	9,797.7	6,602.8	67.0	66.7	80.13	80.13	-3,389.5	-256.6	631.4	499.8	131.58	4.799	
10,000.0	6,710.0	9,897.7	6,602.1	68.9	68.6	80.07	80.07	-3,489.5	-256.6	631.5	496.3	135.27	4.669	

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 Sater 19J-443
Project:	SEC.19-T4N-R63W	TVD Reference:	WELL @ 4673.0ft (RKB - 13')
Reference Site:	Sater 4N63W19E Pad Sec.19-T4N-R63W	MD Reference:	WELL @ 4673.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sater 19J-443	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (2-11-15)	Offset TVD Reference:	Offset Datum

Offset Design Sater 4N63W19E Pad Sec.19-T4N-R63W - Sater 19E-323 - Wellbore #1 - Plan #1 (2-11-15)												Offset Site Error:	0.0 ft
Survey Program: 0-MWD												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre +N/-S	Offset Wellbore Centre +E/-W	Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
10,100.0	6,710.0	9,997.7	6,601.5	70.7	70.5	80.01	-3,589.5	-256.6	631.7	492.7	138.95	4.546	
10,200.0	6,710.0	10,097.7	6,600.8	72.6	72.3	79.96	-3,689.5	-256.6	631.8	489.1	142.64	4.429	
10,300.0	6,710.0	10,197.7	6,600.2	74.5	74.2	79.90	-3,789.4	-256.6	631.9	485.5	146.33	4.318	
10,400.0	6,710.0	10,297.7	6,599.5	76.4	76.1	79.84	-3,889.4	-256.6	632.0	482.0	150.03	4.212	
10,500.0	6,710.0	10,397.7	6,598.9	78.2	78.0	79.78	-3,989.4	-256.6	632.1	478.4	153.73	4.112	
10,600.0	6,710.0	10,497.7	6,598.2	80.1	79.9	79.73	-4,089.4	-256.6	632.2	474.8	157.42	4.016	
10,700.0	6,710.0	10,597.7	6,597.6	82.0	81.8	79.67	-4,189.4	-256.6	632.3	471.2	161.12	3.925	
10,800.0	6,710.0	10,697.7	6,596.9	83.9	83.6	79.61	-4,289.4	-256.6	632.5	467.6	164.83	3.837	
10,900.0	6,710.0	10,797.7	6,596.3	85.8	85.5	79.55	-4,389.4	-256.6	632.6	464.0	168.53	3.753	
11,000.0	6,710.0	10,897.7	6,595.7	87.7	87.4	79.50	-4,489.4	-256.6	632.7	460.5	172.23	3.673	
11,100.0	6,710.0	10,997.7	6,595.0	89.6	89.0	79.44	-4,589.4	-256.6	632.8	457.2	175.59	3.604	
11,103.7	6,710.0	10,998.5	6,595.0	89.6	89.0	79.44	-4,590.2	-256.6	632.8	457.1	175.67	3.602 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sater 19J-443
Project:	SEC.19-T4N-R63W	TVD Reference:	WELL @ 4673.0ft (RKB - 13')
Reference Site:	Sater 4N63W19E Pad Sec.19-T4N-R63W	MD Reference:	WELL @ 4673.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sater 19J-443	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (2-11-15)	Offset TVD Reference:	Offset Datum

Offset Design Sater 4N63W19M Pad Sec.19-T4N-R63W - Sater 19J-203 - Wellbore #1 - Plan #1 (2-10-15)													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
3,400.0	3,388.5	3,657.1	3,594.1	8.2	14.7	16.57	16.57	50.2	1,142.9	982.1	965.7	16.32	60.190	
3,500.0	3,487.6	3,751.6	3,686.5	8.5	15.1	16.68	16.68	52.3	1,123.5	949.2	932.4	16.79	56.521	
3,600.0	3,586.7	3,846.0	3,778.9	8.8	15.5	16.79	16.79	54.4	1,104.2	916.3	899.0	17.27	53.051	
3,700.0	3,685.8	3,940.4	3,871.3	9.1	16.0	16.90	16.90	56.5	1,084.8	883.4	865.7	17.75	49.767	
3,800.0	3,784.9	4,034.8	3,963.6	9.4	16.4	17.03	17.03	58.6	1,065.4	850.5	832.3	18.23	46.653	
3,900.0	3,884.0	4,129.3	4,056.0	9.8	16.8	17.17	17.17	60.7	1,046.0	817.6	798.9	18.71	43.697	
4,000.0	3,983.1	4,223.7	4,148.4	10.1	17.3	17.31	17.31	62.8	1,026.7	784.8	765.6	19.19	40.887	
4,100.0	4,082.2	4,318.1	4,240.8	10.4	17.7	17.47	17.47	64.9	1,007.3	751.9	732.2	19.68	38.214	
4,200.0	4,181.3	4,412.5	4,333.2	10.7	18.2	17.65	17.65	67.0	987.9	719.1	698.9	20.16	35.667	
4,300.0	4,280.5	4,507.0	4,425.6	11.0	18.6	17.84	17.84	69.2	968.5	686.2	665.6	20.64	33.239	
4,400.0	4,379.6	4,601.4	4,518.0	11.4	19.0	18.05	18.05	71.3	949.1	653.4	632.2	21.13	30.921	
4,500.0	4,478.7	4,695.8	4,610.4	11.7	19.5	18.29	18.29	73.4	929.8	620.5	598.9	21.62	28.706	
4,600.0	4,577.8	4,790.2	4,702.8	12.0	19.9	18.55	18.55	75.5	910.4	587.7	565.6	22.10	26.587	
4,700.0	4,677.0	4,884.8	4,795.3	12.3	20.3	18.69	18.69	77.6	891.0	555.4	532.8	22.65	24.521	
4,800.0	4,776.5	4,980.4	4,888.9	12.5	20.8	18.68	18.68	79.7	871.4	526.1	502.9	23.20	22.675	
4,900.0	4,876.3	5,065.6	4,972.4	12.7	21.1	18.58	18.58	81.5	854.6	500.7	477.1	23.68	21.148	
5,000.0	4,976.3	5,149.4	5,054.9	12.9	21.4	18.43	18.43	83.1	840.5	481.4	457.3	24.10	19.973	
5,100.0	5,076.3	5,234.3	5,139.0	13.1	21.6	92.43	92.43	84.4	828.6	467.3	442.8	24.47	19.094	
5,200.0	5,176.3	5,319.9	5,224.1	13.2	21.8	92.35	92.35	85.4	819.1	456.2	431.3	24.84	18.365	
5,300.0	5,276.3	5,400.0	5,303.9	13.4	21.9	92.29	92.29	86.1	812.6	448.1	422.9	25.19	17.788	
5,400.0	5,376.3	5,492.5	5,396.3	13.6	22.1	92.25	92.25	86.6	807.8	442.9	417.4	25.56	17.333	
5,500.0	5,476.3	5,579.2	5,482.9	13.8	22.2	92.23	92.23	86.8	805.9	440.8	414.9	25.91	17.016	
5,541.5	5,517.8	5,618.1	5,521.8	13.9	22.2	92.23	92.23	86.8	805.9	440.8	414.7	26.06	16.914	
5,600.0	5,576.3	5,676.5	5,580.3	14.0	22.3	92.23	92.23	86.8	805.9	440.8	414.5	26.28	16.769	
5,700.0	5,676.3	5,776.5	5,680.3	14.2	22.4	92.23	92.23	86.8	805.9	440.8	414.1	26.67	16.527	
5,762.9	5,739.2	5,839.5	5,743.2	14.3	22.5	92.23	92.23	86.8	805.9	440.8	413.9	26.91	16.377 CC	
5,800.0	5,776.3	5,876.3	5,780.1	14.4	22.5	92.24	92.24	86.8	805.9	440.8	413.7	27.06	16.291	
5,900.0	5,876.3	5,973.4	5,876.8	14.6	22.6	93.20	93.20	79.4	805.9	441.1	413.7	27.42	16.086	
6,000.0	5,976.3	6,067.3	5,968.7	14.7	22.7	-84.39	-84.39	60.6	805.9	442.7	414.9	27.81	15.915	
6,100.0	6,075.6	6,158.4	6,055.0	14.9	22.8	-81.67	-81.67	31.7	805.9	445.4	417.2	28.20	15.792	
6,200.0	6,172.8	6,247.4	6,135.5	15.0	22.9	-79.13	-79.13	-6.2	805.9	448.8	420.2	28.59	15.698	
6,300.0	6,266.1	6,334.7	6,209.6	15.1	22.9	-76.79	-76.79	-52.2	805.9	452.8	423.8	28.96	15.633	
6,400.0	6,353.9	6,420.4	6,276.9	15.3	23.0	-74.69	-74.69	-105.4	805.9	457.1	427.7	29.33	15.583	
6,500.0	6,434.7	6,504.9	6,336.9	15.4	23.2	-72.85	-72.85	-164.8	805.9	461.3	431.7	29.69	15.536	
6,600.0	6,507.2	6,588.3	6,389.3	15.7	23.3	-71.28	-71.28	-229.6	805.9	465.4	435.3	30.10	15.461	
6,700.0	6,570.0	6,670.9	6,434.0	16.0	23.6	-69.98	-69.98	-299.0	805.9	469.0	438.4	30.61	15.321	
6,800.0	6,622.2	6,750.0	6,469.5	16.6	23.8	-69.00	-69.00	-369.7	805.9	472.0	440.8	31.27	15.094	
6,900.0	6,662.9	6,834.1	6,499.0	17.3	24.2	-68.26	-68.26	-448.4	805.9	474.3	442.0	32.22	14.719	
7,000.0	6,691.2	6,915.2	6,519.2	18.2	24.7	-67.83	-67.83	-526.9	805.9	475.6	442.2	33.43	14.229	
7,100.0	6,706.8	7,000.0	6,531.2	19.3	25.3	-67.69	-67.69	-610.8	805.9	476.1	441.1	34.97	13.615	
7,176.6	6,711.1	7,058.0	6,534.0	20.2	25.7	-67.65	-67.65	-668.7	805.9	476.2	439.9	36.32	13.111	
7,200.0	6,710.0	7,078.1	6,534.0	20.5	25.9	-67.77	-67.77	-688.8	805.9	475.8	439.0	36.81	12.927	
7,300.0	6,710.0	7,178.1	6,533.2	21.8	26.8	-67.69	-67.69	-788.8	805.9	476.1	436.8	39.25	12.129	
7,400.0	6,710.0	7,278.1	6,532.5	23.2	27.9	-67.60	-67.60	-888.8	805.9	476.4	434.5	41.85	11.383	
7,500.0	6,710.0	7,378.1	6,531.7	24.6	29.0	-67.52	-67.52	-988.8	805.9	476.7	432.1	44.58	10.692	
7,600.0	6,710.0	7,478.1	6,530.9	26.1	30.2	-67.43	-67.43	-1,088.8	805.9	477.0	429.5	47.42	10.057	
7,700.0	6,710.0	7,578.1	6,530.2	27.7	31.5	-67.35	-67.35	-1,188.8	805.9	477.3	426.9	50.36	9.478	
7,800.0	6,710.0	7,678.1	6,529.4	29.3	32.9	-67.26	-67.26	-1,288.7	805.9	477.6	424.2	53.36	8.950	
7,900.0	6,710.0	7,778.1	6,528.6	31.0	34.4	-67.18	-67.18	-1,388.7	805.9	477.9	421.4	56.43	8.468	
8,000.0	6,710.0	7,878.1	6,527.9	32.6	35.9	-67.09	-67.09	-1,488.7	805.9	478.2	418.6	59.55	8.030	
8,100.0	6,710.0	7,978.1	6,527.1	34.3	37.4	-67.01	-67.01	-1,588.7	805.9	478.5	415.7	62.71	7.630	

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 Sater 19J-443
Project:	SEC.19-T4N-R63W	TVD Reference:	WELL @ 4673.0ft (RKB - 13')
Reference Site:	Sater 4N63W19E Pad Sec.19-T4N-R63W	MD Reference:	WELL @ 4673.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sater 19J-443	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (2-11-15)	Offset TVD Reference:	Offset Datum

Offset Design Sater 4N63W19M Pad Sec.19-T4N-R63W - Sater 19J-203 - Wellbore #1 - Plan #1 (2-10-15)												Offset Site Error: 0.0 ft	
Survey Program: 0-MWD												Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance						
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)		
8,200.0	6,710.0	8,078.1	6,526.3	36.1	39.0	-66.92	-1,688.7	805.9	478.8	412.8	65.91	7.264	
8,300.0	6,710.0	8,178.1	6,525.6	37.8	40.6	-66.84	-1,788.7	805.9	479.1	409.9	69.14	6.929	
8,400.0	6,710.0	8,278.1	6,524.8	39.6	42.2	-66.75	-1,888.7	805.9	479.4	407.0	72.39	6.622	
8,500.0	6,710.0	8,378.1	6,524.0	41.3	43.8	-66.67	-1,988.7	805.9	479.7	404.0	75.67	6.339	
8,600.0	6,710.0	8,478.0	6,523.3	43.1	45.5	-66.58	-2,088.7	805.9	480.0	401.0	78.96	6.078	
8,700.0	6,710.0	8,578.0	6,522.5	44.9	47.2	-66.50	-2,188.7	805.9	480.3	398.0	82.28	5.837	
8,800.0	6,710.0	8,678.0	6,521.7	46.7	48.9	-66.42	-2,288.7	805.9	480.6	395.0	85.60	5.614	
8,900.0	6,710.0	8,778.0	6,521.0	48.5	50.6	-66.33	-2,388.7	805.9	480.9	392.0	88.94	5.407	
9,000.0	6,710.0	8,878.0	6,520.2	50.3	52.4	-66.25	-2,488.7	805.9	481.2	388.9	92.28	5.214	
9,100.0	6,710.0	8,978.0	6,519.4	52.2	54.1	-66.17	-2,588.7	805.9	481.5	385.9	95.64	5.035	
9,200.0	6,710.0	9,078.0	6,518.7	54.0	55.9	-66.08	-2,688.7	805.9	481.8	382.8	99.00	4.867	
9,300.0	6,710.0	9,178.0	6,517.9	55.9	57.7	-66.00	-2,788.7	805.9	482.1	379.8	102.37	4.710	
9,400.0	6,710.0	9,278.0	6,517.1	57.7	59.5	-65.92	-2,888.7	805.9	482.4	376.7	105.74	4.562	
9,500.0	6,710.0	9,378.0	6,516.4	59.5	61.2	-65.83	-2,988.6	805.9	482.8	373.6	109.12	4.424	
9,600.0	6,710.0	9,478.0	6,515.6	61.4	63.0	-65.75	-3,088.6	805.9	483.1	370.6	112.50	4.294	
9,700.0	6,710.0	9,578.0	6,514.8	63.3	64.9	-65.67	-3,188.6	805.9	483.4	367.5	115.89	4.171	
9,800.0	6,710.0	9,678.0	6,514.1	65.1	66.7	-65.58	-3,288.6	805.9	483.7	364.4	119.27	4.055	
9,900.0	6,710.0	9,778.0	6,513.3	67.0	68.5	-65.50	-3,388.6	805.9	484.0	361.4	122.66	3.946	
10,000.0	6,710.0	9,878.0	6,512.5	68.9	70.3	-65.42	-3,488.6	805.9	484.3	358.3	126.05	3.842	
10,100.0	6,710.0	9,978.0	6,511.7	70.7	72.1	-65.34	-3,588.6	805.9	484.7	355.2	129.44	3.744	
10,200.0	6,710.0	10,078.0	6,511.0	72.6	74.0	-65.25	-3,688.6	805.9	485.0	352.1	132.83	3.651	
10,300.0	6,710.0	10,178.0	6,510.2	74.5	75.8	-65.17	-3,788.6	805.9	485.3	349.1	136.22	3.563	
10,400.0	6,710.0	10,278.0	6,509.4	76.4	77.6	-65.09	-3,888.6	805.9	485.6	346.0	139.61	3.478	
10,500.0	6,710.0	10,378.0	6,508.7	78.2	79.5	-65.01	-3,988.6	805.9	486.0	342.9	143.00	3.398	
10,600.0	6,710.0	10,478.0	6,507.9	80.1	81.3	-64.92	-4,088.6	805.9	486.3	339.9	146.39	3.322	
10,700.0	6,710.0	10,578.0	6,507.1	82.0	83.2	-64.84	-4,188.6	805.9	486.6	336.8	149.78	3.249	
10,800.0	6,710.0	10,678.0	6,506.4	83.9	85.0	-64.76	-4,288.6	805.9	486.9	333.8	153.17	3.179	
10,900.0	6,710.0	10,778.0	6,505.6	85.8	86.9	-64.68	-4,388.6	805.9	487.3	330.7	156.55	3.112	
11,000.0	6,710.0	10,878.0	6,504.8	87.7	88.8	-64.60	-4,488.6	805.9	487.6	327.7	159.93	3.049	
11,100.0	6,710.0	10,978.0	6,504.1	89.6	90.6	-64.52	-4,588.5	805.9	487.9	324.6	163.32	2.988	
11,103.7	6,710.0	10,981.7	6,504.0	89.6	90.7	-64.51	-4,592.3	805.9	487.9	324.5	163.44	2.985 ES, SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sater 19J-443
Project:	SEC.19-T4N-R63W	TVD Reference:	WELL @ 4673.0ft (RKB - 13')
Reference Site:	Sater 4N63W19E Pad Sec.19-T4N-R63W	MD Reference:	WELL @ 4673.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sater 19J-443	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (2-11-15)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4673.0ft (RKB - 13')

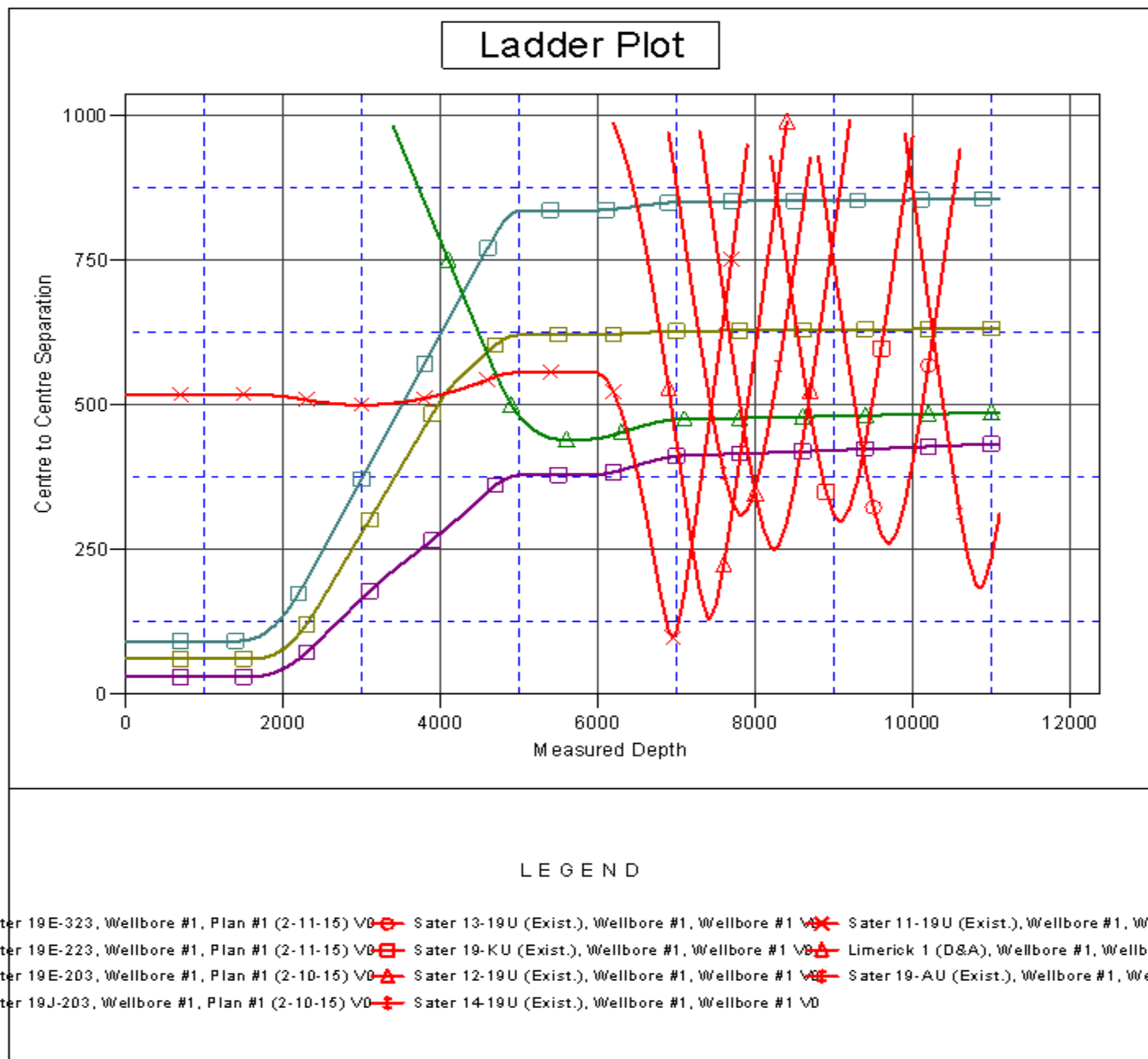
Offset Depths are relative to Offset Datum

Central Meridian is -105.500000 °

Coordinates are relative to: Sater 19J-443

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.65°



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sater 19J-443
Project:	SEC.19-T4N-R63W	TVD Reference:	WELL @ 4673.0ft (RKB - 13')
Reference Site:	Sater 4N63W19E Pad Sec.19-T4N-R63W	MD Reference:	WELL @ 4673.0ft (RKB - 13')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sater 19J-443	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (2-11-15)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4673.0ft (RKB - 13')

Offset Depths are relative to Offset Datum

Central Meridian is -105.500000 °

Coordinates are relative to: Sater 19J-443

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.65°

