

PETROLEUM DEVELOPMENT CORP Weld County CO

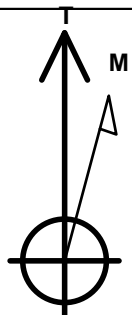
Well Name: **Stroh 130-223**

Surface Location: Stroh 13GK-HZ Pad Sec.13-T4N-R67W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone
Ground Elevation: 4803.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1356829.09	3183375.93	40.311030	-104.842440	
RKB - 15' WELL @ 4818.0ft (RKB - 15')						

WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 2355'FSL & 1736'FWL, Sec.13	1.0	0.0	0.0	Point
BHL 500'FSL & 2409'FEL, Sec.24	7059.0	-7122.1	1127.0	Point



Azimuths to True North
Magnetic North: 8.42°

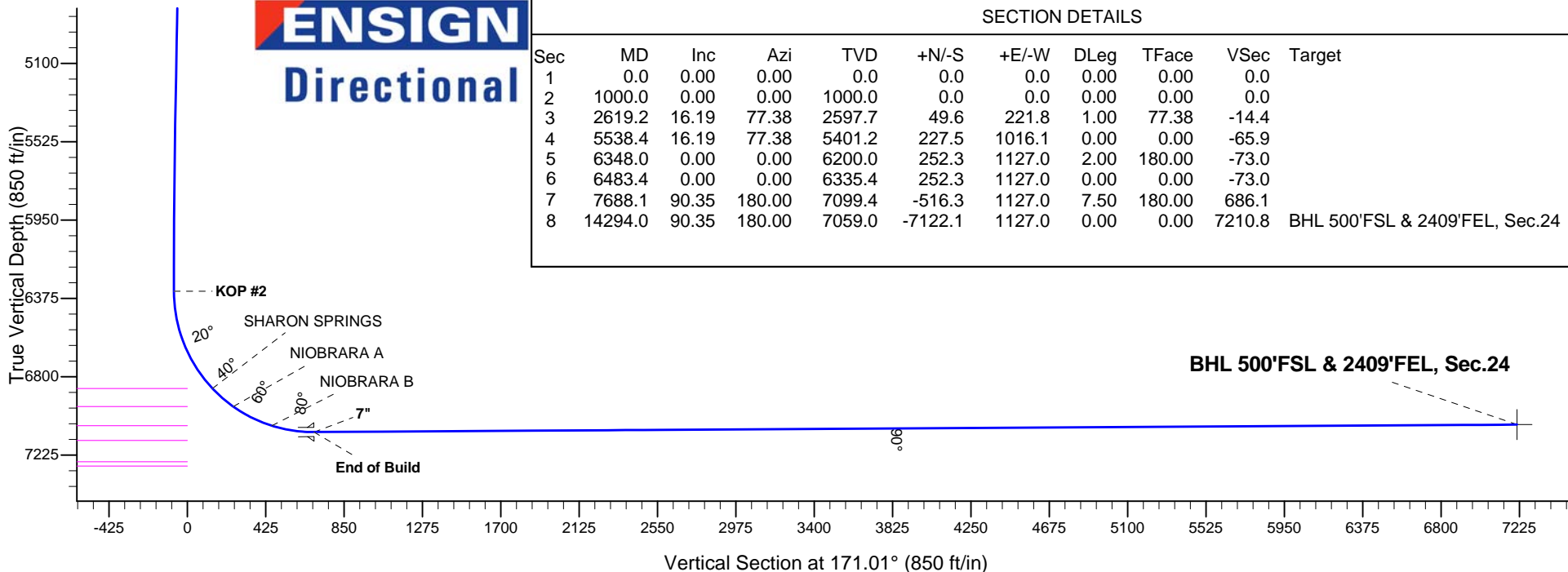
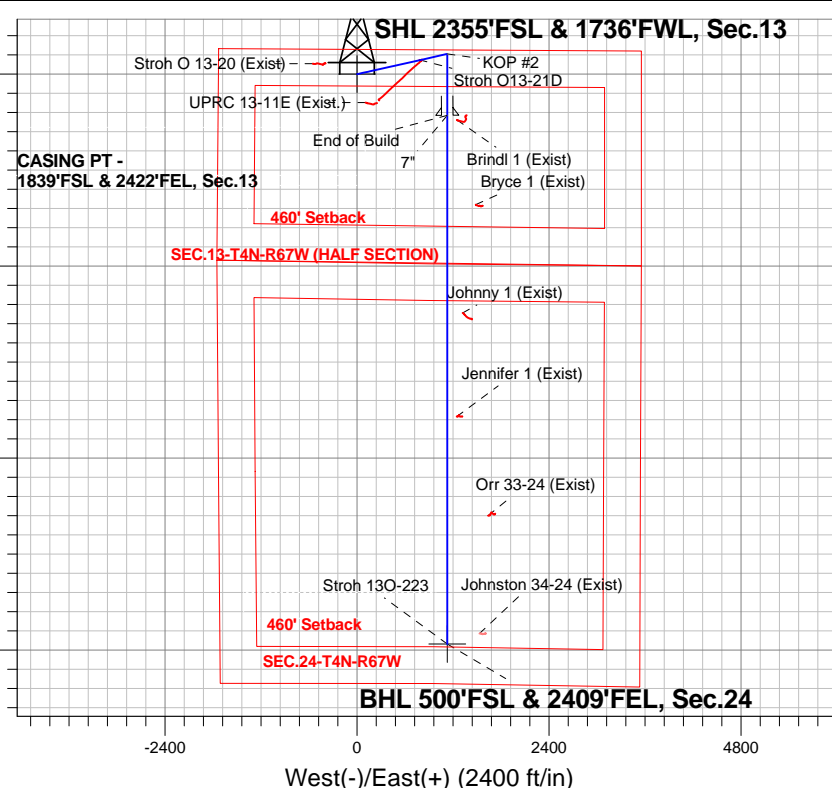
Magnetic Field
Strength: 52703.3srT
Dip Angle: 66.84°
Date: 12/31/2014
Model: IGRF2010

Stroh 13GK-HZ Pad Sec.13-T4N-R67W
Stroh 130-223
Plan #3 (2-3-15)

ANNOTATIONS

TVD	MD	Annotation
1000.0	1000.0	KOP #1
6335.4	6483.4	KOP #2
7099.4	7688.1	End of Build

South(-)/North(+) (2400 ft/in)



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	1000.0	0.00	0.00	1000.0	0.0	0.0	0.00	0.00	0.0	
3	2619.2	16.19	77.38	2597.7	49.6	221.8	1.00	77.38	-14.4	
4	5538.4	16.19	77.38	5401.2	227.5	1016.1	0.00	0.00	-65.9	
5	6348.0	0.00	0.00	6200.0	252.3	1127.0	2.00	180.00	-73.0	
6	6483.4	0.00	0.00	6335.4	252.3	1127.0	0.00	0.00	-73.0	
7	7688.1	90.35	180.00	7099.4	-516.3	1127.0	7.50	180.00	686.1	
8	14294.0	90.35	180.00	7059.0	-7122.1	1127.0	0.00	0.00	7210.8	BHL 500'FSL & 2409'FEL, Sec.24



PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.13-T4N-R67W

Stroh 13GK-HZ Pad Sec.13-T4N-R67W

Stroh 13O-223

Wellbore #1

Plan: Plan #3 (2-3-15)

Standard Planning Report

04 February, 2015

Database:	landmark	Local Co-ordinate Reference:	Well Stroh 13O-223
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4818.0ft (RKB - 15')
Project:	SEC.13-T4N-R67W	MD Reference:	WELL @ 4818.0ft (RKB - 15')
Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	North Reference:	True
Well:	Stroh 13O-223	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #3 (2-3-15)		

Project	SEC.13-T4N-R67W, Weld County, Colorado		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site	Stroh 13GK-HZ Pad Sec.13-T4N-R67W		
Site Position:		Northing:	1,356,828.90 ft
From:	Lat/Long	Easting:	3,183,348.05 ft
Position Uncertainty:	0.0 ft	Slot Radius:	"
		Latitude:	40.311030
		Longitude:	-104.842540
		Grid Convergence:	0.42 °

Well	Stroh 13O-223		
Well Position	+N/-S	0.0 ft	Northing:
	+E/-W	27.9 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	12/31/2014	8.42	66.84	52,703

Design	Plan #3 (2-3-15)			
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	171.01

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,619.2	16.19	77.38	2,597.7	49.6	221.8	1.00	1.00	0.00	77.38	
5,538.4	16.19	77.38	5,401.2	227.5	1,016.1	0.00	0.00	0.00	0.00	
6,348.0	0.00	0.00	6,200.0	252.3	1,127.0	2.00	-2.00	0.00	180.00	
6,483.4	0.00	0.00	6,335.4	252.3	1,127.0	0.00	0.00	0.00	0.00	
7,688.1	90.35	180.00	7,099.4	-516.3	1,127.0	7.50	7.50	0.00	180.00	
14,294.0	90.35	180.00	7,059.0	-7,122.1	1,127.0	0.00	0.00	0.00	0.00	BHL 500'FSL & 24C

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Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4818.0ft (RKB - 15')
Project:	SEC.13-T4N-R67W	MD Reference:	WELL @ 4818.0ft (RKB - 15')
Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	North Reference:	True
Well:	Stroh 13O-223	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #3 (2-3-15)		

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
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP #1									
1,100.0	1.00	77.38	1,100.0	0.2	0.9	-0.1	1.00	1.00	0.00
1,200.0	2.00	77.38	1,200.0	0.8	3.4	-0.2	1.00	1.00	0.00
1,300.0	3.00	77.38	1,299.9	1.7	7.7	-0.5	1.00	1.00	0.00
1,400.0	4.00	77.38	1,399.7	3.0	13.6	-0.9	1.00	1.00	0.00
1,500.0	5.00	77.38	1,499.4	4.8	21.3	-1.4	1.00	1.00	0.00
1,600.0	6.00	77.38	1,598.9	6.9	30.6	-2.0	1.00	1.00	0.00
1,700.0	7.00	77.38	1,698.3	9.3	41.7	-2.7	1.00	1.00	0.00
1,800.0	8.00	77.38	1,797.4	12.2	54.4	-3.5	1.00	1.00	0.00
1,900.0	9.00	77.38	1,896.3	15.4	68.8	-4.5	1.00	1.00	0.00
2,000.0	10.00	77.38	1,994.9	19.0	84.9	-5.5	1.00	1.00	0.00
2,100.0	11.00	77.38	2,093.3	23.0	102.7	-6.7	1.00	1.00	0.00
2,200.0	12.00	77.38	2,191.2	27.4	122.2	-7.9	1.00	1.00	0.00
2,300.0	13.00	77.38	2,288.9	32.1	143.3	-9.3	1.00	1.00	0.00
2,400.0	14.00	77.38	2,386.1	37.2	166.1	-10.8	1.00	1.00	0.00
2,500.0	15.00	77.38	2,482.9	42.6	190.5	-12.3	1.00	1.00	0.00
2,600.0	16.00	77.38	2,579.3	48.5	216.6	-14.0	1.00	1.00	0.00
2,619.2	16.19	77.38	2,597.7	49.6	221.8	-14.4	1.00	1.00	0.00
2,700.0	16.19	77.38	2,675.3	54.6	243.8	-15.8	0.00	0.00	0.00
2,800.0	16.19	77.38	2,771.4	60.7	271.0	-17.6	0.00	0.00	0.00
2,900.0	16.19	77.38	2,867.4	66.8	298.2	-19.3	0.00	0.00	0.00
3,000.0	16.19	77.38	2,963.4	72.8	325.4	-21.1	0.00	0.00	0.00
3,100.0	16.19	77.38	3,059.5	78.9	352.6	-22.9	0.00	0.00	0.00
3,200.0	16.19	77.38	3,155.5	85.0	379.8	-24.6	0.00	0.00	0.00
3,300.0	16.19	77.38	3,251.5	91.1	407.0	-26.4	0.00	0.00	0.00
3,400.0	16.19	77.38	3,347.6	97.2	434.3	-28.1	0.00	0.00	0.00
3,500.0	16.19	77.38	3,443.6	103.3	461.5	-29.9	0.00	0.00	0.00
3,600.0	16.19	77.38	3,539.6	109.4	488.7	-31.7	0.00	0.00	0.00
3,700.0	16.19	77.38	3,635.7	115.5	515.9	-33.4	0.00	0.00	0.00
3,714.9	16.19	77.38	3,650.0	116.4	520.0	-33.7	0.00	0.00	0.00
PARKMAN									
3,800.0	16.19	77.38	3,731.7	121.6	543.1	-35.2	0.00	0.00	0.00
3,900.0	16.19	77.38	3,827.7	127.7	570.3	-37.0	0.00	0.00	0.00
4,000.0	16.19	77.38	3,923.8	133.8	597.5	-38.7	0.00	0.00	0.00
4,100.0	16.19	77.38	4,019.8	139.9	624.7	-40.5	0.00	0.00	0.00
4,200.0	16.19	77.38	4,115.8	145.9	651.9	-42.3	0.00	0.00	0.00
4,256.4	16.19	77.38	4,170.0	149.4	667.3	-43.2	0.00	0.00	0.00
SUSSEX									
4,300.0	16.19	77.38	4,211.9	152.0	679.2	-44.0	0.00	0.00	0.00
4,400.0	16.19	77.38	4,307.9	158.1	706.4	-45.8	0.00	0.00	0.00
4,500.0	16.19	77.38	4,403.9	164.2	733.6	-47.5	0.00	0.00	0.00
4,600.0	16.19	77.38	4,500.0	170.3	760.8	-49.3	0.00	0.00	0.00

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Project:	SEC.13-T4N-R67W	MD Reference:	WELL @ 4818.0ft (RKB - 15')
Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	North Reference:	True
Well:	Stroh 13O-223	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #3 (2-3-15)		

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)
4,700.0	16.19	77.38	4,596.0	176.4	788.0	-51.1	0.00	0.00	0.00
4,800.0	16.19	77.38	4,692.0	182.5	815.2	-52.8	0.00	0.00	0.00
4,829.1	16.19	77.38	4,720.0	184.3	823.1	-53.3	0.00	0.00	0.00
SHANNON									
4,900.0	16.19	77.38	4,788.1	188.6	842.4	-54.6	0.00	0.00	0.00
5,000.0	16.19	77.38	4,884.1	194.7	869.6	-56.4	0.00	0.00	0.00
5,100.0	16.19	77.38	4,980.1	200.8	896.8	-58.1	0.00	0.00	0.00
5,200.0	16.19	77.38	5,076.2	206.9	924.1	-59.9	0.00	0.00	0.00
5,300.0	16.19	77.38	5,172.2	213.0	951.3	-61.7	0.00	0.00	0.00
5,400.0	16.19	77.38	5,268.2	219.0	978.5	-63.4	0.00	0.00	0.00
5,500.0	16.19	77.38	5,364.3	225.1	1,005.7	-65.2	0.00	0.00	0.00
5,538.4	16.19	77.38	5,401.2	227.5	1,016.1	-65.9	0.00	0.00	0.00
5,600.0	14.96	77.38	5,460.5	231.1	1,032.3	-66.9	2.00	-2.00	0.00
5,700.0	12.96	77.38	5,557.5	236.4	1,055.8	-68.4	2.00	-2.00	0.00
5,800.0	10.96	77.38	5,655.3	240.9	1,076.0	-69.7	2.00	-2.00	0.00
5,900.0	8.96	77.38	5,753.8	244.7	1,092.9	-70.8	2.00	-2.00	0.00
6,000.0	6.96	77.38	5,852.9	247.7	1,106.4	-71.7	2.00	-2.00	0.00
6,100.0	4.96	77.38	5,952.3	250.0	1,116.6	-72.4	2.00	-2.00	0.00
6,200.0	2.96	77.38	6,052.1	251.5	1,123.3	-72.8	2.00	-2.00	0.00
6,300.0	0.96	77.38	6,152.0	252.2	1,126.6	-73.0	2.00	-2.00	0.00
6,348.0	0.00	0.00	6,200.0	252.3	1,127.0	-73.0	2.00	-2.00	0.00
6,400.0	0.00	0.00	6,252.0	252.3	1,127.0	-73.0	0.00	0.00	0.00
6,483.4	0.00	0.00	6,335.4	252.3	1,127.0	-73.0	0.00	0.00	0.00
KOP #2									
6,500.0	1.24	180.00	6,352.0	252.1	1,127.0	-72.9	7.49	7.49	0.00
6,600.0	8.74	180.00	6,451.6	243.4	1,127.0	-64.3	7.50	7.50	0.00
6,700.0	16.24	180.00	6,549.1	221.8	1,127.0	-42.9	7.50	7.50	0.00
6,800.0	23.74	180.00	6,643.0	187.6	1,127.0	-9.2	7.50	7.50	0.00
6,900.0	31.24	180.00	6,731.7	141.5	1,127.0	36.4	7.50	7.50	0.00
7,000.0	38.74	180.00	6,813.5	84.2	1,127.0	93.0	7.50	7.50	0.00
7,065.8	43.68	180.00	6,863.0	40.9	1,127.0	135.8	7.50	7.50	0.00
SHARON SPRINGS									
7,100.0	46.24	180.00	6,887.2	16.7	1,127.0	159.7	7.50	7.50	0.00
7,200.0	53.74	180.00	6,951.5	-59.9	1,127.0	235.3	7.50	7.50	0.00
7,216.4	54.97	180.00	6,961.0	-73.2	1,127.0	248.4	7.50	7.50	0.00
NIORARA A									
7,300.0	61.24	180.00	7,005.2	-144.1	1,127.0	318.5	7.50	7.50	0.00
7,400.0	68.74	180.00	7,047.4	-234.7	1,127.0	408.0	7.50	7.50	0.00
7,453.4	72.75	180.00	7,065.0	-285.1	1,127.0	457.7	7.50	7.50	0.00
NIORARA B									
7,500.0	76.24	180.00	7,077.5	-330.0	1,127.0	502.1	7.50	7.50	0.00
7,600.0	83.74	180.00	7,094.8	-428.4	1,127.0	599.3	7.50	7.50	0.00
7,688.1	90.35	180.00	7,099.4	-516.3	1,127.0	686.1	7.50	7.50	0.00
End of Build - 7"									
7,700.0	90.35	180.00	7,099.3	-528.2	1,127.0	697.9	0.00	0.00	0.00
7,800.0	90.35	180.00	7,098.7	-628.2	1,127.0	796.7	0.00	0.00	0.00
7,900.0	90.35	180.00	7,098.1	-728.2	1,127.0	895.4	0.00	0.00	0.00
8,000.0	90.35	180.00	7,097.4	-828.2	1,127.0	994.2	0.00	0.00	0.00
8,100.0	90.35	180.00	7,096.8	-928.2	1,127.0	1,093.0	0.00	0.00	0.00
8,200.0	90.35	180.00	7,096.2	-1,028.2	1,127.0	1,191.7	0.00	0.00	0.00
8,300.0	90.35	180.00	7,095.6	-1,128.2	1,127.0	1,290.5	0.00	0.00	0.00
8,400.0	90.35	180.00	7,095.0	-1,228.2	1,127.0	1,389.3	0.00	0.00	0.00

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Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	North Reference:	True
Well:	Stroh 13O-223	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #3 (2-3-15)		

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)
8,500.0	90.35	180.00	7,094.4	-1,328.2	1,127.0	1,488.0	0.00	0.00	0.00
8,600.0	90.35	180.00	7,093.8	-1,428.2	1,127.0	1,586.8	0.00	0.00	0.00
8,700.0	90.35	180.00	7,093.2	-1,528.2	1,127.0	1,685.6	0.00	0.00	0.00
8,800.0	90.35	180.00	7,092.6	-1,628.2	1,127.0	1,784.4	0.00	0.00	0.00
8,900.0	90.35	180.00	7,092.0	-1,728.2	1,127.0	1,883.1	0.00	0.00	0.00
9,000.0	90.35	180.00	7,091.3	-1,828.2	1,127.0	1,981.9	0.00	0.00	0.00
9,100.0	90.35	180.00	7,090.7	-1,928.2	1,127.0	2,080.7	0.00	0.00	0.00
9,200.0	90.35	180.00	7,090.1	-2,028.2	1,127.0	2,179.4	0.00	0.00	0.00
9,300.0	90.35	180.00	7,089.5	-2,128.2	1,127.0	2,278.2	0.00	0.00	0.00
9,400.0	90.35	180.00	7,088.9	-2,228.2	1,127.0	2,377.0	0.00	0.00	0.00
9,500.0	90.35	180.00	7,088.3	-2,328.2	1,127.0	2,475.7	0.00	0.00	0.00
9,600.0	90.35	180.00	7,087.7	-2,428.2	1,127.0	2,574.5	0.00	0.00	0.00
9,700.0	90.35	180.00	7,087.1	-2,528.2	1,127.0	2,673.3	0.00	0.00	0.00
9,800.0	90.35	180.00	7,086.5	-2,628.2	1,127.0	2,772.0	0.00	0.00	0.00
9,900.0	90.35	180.00	7,085.8	-2,728.2	1,127.0	2,870.8	0.00	0.00	0.00
10,000.0	90.35	180.00	7,085.2	-2,828.2	1,127.0	2,969.6	0.00	0.00	0.00
10,100.0	90.35	180.00	7,084.6	-2,928.2	1,127.0	3,068.4	0.00	0.00	0.00
10,200.0	90.35	180.00	7,084.0	-3,028.2	1,127.0	3,167.1	0.00	0.00	0.00
10,300.0	90.35	180.00	7,083.4	-3,128.2	1,127.0	3,265.9	0.00	0.00	0.00
10,400.0	90.35	180.00	7,082.8	-3,228.2	1,127.0	3,364.7	0.00	0.00	0.00
10,500.0	90.35	180.00	7,082.2	-3,328.2	1,127.0	3,463.4	0.00	0.00	0.00
10,600.0	90.35	180.00	7,081.6	-3,428.2	1,127.0	3,562.2	0.00	0.00	0.00
10,700.0	90.35	180.00	7,081.0	-3,528.2	1,127.0	3,661.0	0.00	0.00	0.00
10,800.0	90.35	180.00	7,080.3	-3,628.2	1,127.0	3,759.7	0.00	0.00	0.00
10,900.0	90.35	180.00	7,079.7	-3,728.2	1,127.0	3,858.5	0.00	0.00	0.00
11,000.0	90.35	180.00	7,079.1	-3,828.2	1,127.0	3,957.3	0.00	0.00	0.00
11,100.0	90.35	180.00	7,078.5	-3,928.2	1,127.0	4,056.0	0.00	0.00	0.00
11,200.0	90.35	180.00	7,077.9	-4,028.2	1,127.0	4,154.8	0.00	0.00	0.00
11,300.0	90.35	180.00	7,077.3	-4,128.2	1,127.0	4,253.6	0.00	0.00	0.00
11,400.0	90.35	180.00	7,076.7	-4,228.2	1,127.0	4,352.4	0.00	0.00	0.00
11,500.0	90.35	180.00	7,076.1	-4,328.2	1,127.0	4,451.1	0.00	0.00	0.00
11,600.0	90.35	180.00	7,075.5	-4,428.2	1,127.0	4,549.9	0.00	0.00	0.00
11,700.0	90.35	180.00	7,074.8	-4,528.2	1,127.0	4,648.7	0.00	0.00	0.00
11,800.0	90.35	180.00	7,074.2	-4,628.2	1,127.0	4,747.4	0.00	0.00	0.00
11,900.0	90.35	180.00	7,073.6	-4,728.2	1,127.0	4,846.2	0.00	0.00	0.00
12,000.0	90.35	180.00	7,073.0	-4,828.2	1,127.0	4,945.0	0.00	0.00	0.00
12,100.0	90.35	180.00	7,072.4	-4,928.1	1,127.0	5,043.7	0.00	0.00	0.00
12,200.0	90.35	180.00	7,071.8	-5,028.1	1,127.0	5,142.5	0.00	0.00	0.00
12,300.0	90.35	180.00	7,071.2	-5,128.1	1,127.0	5,241.3	0.00	0.00	0.00
12,400.0	90.35	180.00	7,070.6	-5,228.1	1,127.0	5,340.0	0.00	0.00	0.00
12,500.0	90.35	180.00	7,070.0	-5,328.1	1,127.0	5,438.8	0.00	0.00	0.00
12,600.0	90.35	180.00	7,069.3	-5,428.1	1,127.0	5,537.6	0.00	0.00	0.00
12,700.0	90.35	180.00	7,068.7	-5,528.1	1,127.0	5,636.3	0.00	0.00	0.00
12,800.0	90.35	180.00	7,068.1	-5,628.1	1,127.0	5,735.1	0.00	0.00	0.00
12,900.0	90.35	180.00	7,067.5	-5,728.1	1,127.0	5,833.9	0.00	0.00	0.00
13,000.0	90.35	180.00	7,066.9	-5,828.1	1,127.0	5,932.7	0.00	0.00	0.00
13,100.0	90.35	180.00	7,066.3	-5,928.1	1,127.0	6,031.4	0.00	0.00	0.00
13,200.0	90.35	180.00	7,065.7	-6,028.1	1,127.0	6,130.2	0.00	0.00	0.00
13,300.0	90.35	180.00	7,065.1	-6,128.1	1,127.0	6,229.0	0.00	0.00	0.00
13,400.0	90.35	180.00	7,064.5	-6,228.1	1,127.0	6,327.7	0.00	0.00	0.00
13,500.0	90.35	180.00	7,063.9	-6,328.1	1,127.0	6,426.5	0.00	0.00	0.00
13,600.0	90.35	180.00	7,063.2	-6,428.1	1,127.0	6,525.3	0.00	0.00	0.00
13,700.0	90.35	180.00	7,062.6	-6,528.1	1,127.0	6,624.0	0.00	0.00	0.00

Database:	landmark	Local Co-ordinate Reference:	Well Stroh 13O-223
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4818.0ft (RKB - 15')
Project:	SEC.13-T4N-R67W	MD Reference:	WELL @ 4818.0ft (RKB - 15')
Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	North Reference:	True
Well:	Stroh 13O-223	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #3 (2-3-15)		

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)
13,800.0	90.35	180.00	7,062.0	-6,628.1	1,127.0	6,722.8	0.00	0.00	0.00
13,900.0	90.35	180.00	7,061.4	-6,728.1	1,127.0	6,821.6	0.00	0.00	0.00
14,000.0	90.35	180.00	7,060.8	-6,828.1	1,127.0	6,920.3	0.00	0.00	0.00
14,100.0	90.35	180.00	7,060.2	-6,928.1	1,127.0	7,019.1	0.00	0.00	0.00
14,200.0	90.35	180.00	7,059.6	-7,028.1	1,127.0	7,117.9	0.00	0.00	0.00
14,294.0	90.35	180.00	7,059.0	-7,122.1	1,127.0	7,210.8	0.00	0.00	0.00

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
SHL 2355'FSL & 1736'FSL - plan hits target - Point	0.00	0.00	1.0	0.0	0.0	1,356,829.11	3,183,375.93	40.311030	-104.842440
BHL 500'FSL & 2409'FSL - plan hits target - Point	0.00	0.00	7,059.0	-7,122.1	1,127.0	1,349,715.82	3,184,555.69	40.291480	-104.838400

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
7,688.1	7,099.4	7"	7	7-1/2	

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
3,714.9	3,650.0	PARKMAN		0.00		
4,256.4	4,170.0	SUSSEX		0.00		
4,829.1	4,720.0	SHANNON		0.00		
7,065.8	6,863.0	SHARON SPRINGS		0.00		
7,216.4	6,961.0	NIOBRARA A		0.00		
7,453.4	7,065.0	NIOBRARA B		0.00		
	7,145.0	NIOBRARA C		0.00		
	7,260.0	FORT HAYS		0.00		
	7,284.0	CODELL		0.00		

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	+E/-W (ft)	Comment
1,000.0	1,000.0	0.0	0.0	KOP #1
6,483.4	6,335.4	49.6	221.8	KOP #2
7,688.1	7,099.4	227.5	1,016.1	End of Build



PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.13-T4N-R67W

Stroh 13GK-HZ Pad Sec.13-T4N-R67W

Stroh 13O-223

Wellbore #1

Plan #3 (2-3-15)

Anticollision Report

04 February, 2015



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Stroh 13O-223
Project:	SEC.13-T4N-R67W	TVD Reference:	WELL @ 4818.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	MD Reference:	WELL @ 4818.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Stroh 13O-223	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 #3 (2-3-15)	Offset TVD Reference:	Offset Datum

Reference	Plan #3 (2-3-15)		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.0ft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 600.0ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma		

Survey Tool Program	Date	2/4/2015		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	14,294.0	Plan #3 (2-3-15) (Wellbore #1)	MWD	MWD - Standard

Summary						
Site Name Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Between Ellipses (ft)	Separation Factor	Warning
Existing Wells - Sec.13-T4N-R67W						
Brindl 1 (Exist) - Wellbore #1 - Wellbore #1	7,747.5	7,065.6	123.6	88.0	3.471	CC, ES, SF
Bryce 1 (Exist) - Wellbore #1 - Wellbore #1	8,806.9	7,089.4	357.8	304.8	6.745	CC, ES, SF
Jennifer 1 (Exist) - Wellbore #1 - Wellbore #1	11,452.7	6,984.4	118.9	20.2	1.205	Level 2, CC, ES, SF
Johnny 1 (Exist) - Wellbore #1 - Wellbore #1	10,157.2	6,992.6	194.3	117.6	2.534	CC, ES, SF
Johnston 34-24 (Exist) - Wellbore #1 - Wellbore #1	14,161.5	6,975.3	408.6	257.3	2.700	CC, ES
Johnston 34-24 (Exist) - Wellbore #1 - Wellbore #1	14,200.0	6,975.3	410.4	258.4	2.699	SF
Orr 33-24 (Exist) - Wellbore #1 - Wellbore #1	12,692.0	6,981.9	511.5	387.4	4.123	CC
Orr 33-24 (Exist) - Wellbore #1 - Wellbore #1	12,700.0	6,981.8	511.6	387.3	4.118	ES, SF
Existing Wells Sec.13-T4N-R67W (Grid North)						
Stroh O 13-20 (Exist) - Wellbore #1 - Wellbore #1	100.0	90.7	416.8	416.5	1,790.276	CC
Stroh O 13-20 (Exist) - Wellbore #1 - Wellbore #1	600.0	588.7	417.9	415.3	162.794	ES
Stroh O 13-20 (Exist) - Wellbore #1 - Wellbore #1	2,400.0	2,366.7	585.9	575.5	56.308	SF
UPRC 13-11E (Exist.) - Wellbore #1 - Wellbore #1	2,285.6	2,264.6	406.5	395.6	37.263	CC
UPRC 13-11E (Exist.) - Wellbore #1 - Wellbore #1	2,300.0	2,278.4	406.5	395.5	36.949	ES
UPRC 13-11E (Exist.) - Wellbore #1 - Wellbore #1	3,200.0	3,136.5	492.2	475.2	28.814	SF
Stroh 13GK-HZ Pad Sec. 13-T4N-R67W						
Stroh 13G-203 - Wellbore #1 - Plan #2 (1-27-15)	165.6	168.6	209.2	208.6	397.229	CC
Stroh 13G-203 - Wellbore #1 - Plan #2 (1-27-15)	200.0	202.9	209.2	208.5	307.350	ES
Stroh 13G-203 - Wellbore #1 - Plan #2 (1-27-15)	1,400.0	1,343.1	341.5	335.6	57.265	SF
Stroh 13G-323 - Wellbore #1 - Plan #3 (1-28-15)	366.0	368.0	178.5	177.1	125.259	CC
Stroh 13G-323 - Wellbore #1 - Plan #3 (1-28-15)	400.0	401.9	178.5	176.9	113.145	ES
Stroh 13G-323 - Wellbore #1 - Plan #3 (1-28-15)	1,300.0	1,267.3	253.7	248.2	46.226	SF
Stroh 13K-223 - Wellbore #1 - Plan #3 (1-28-15)	1,000.0	1,002.0	89.2	85.0	20.876	CC, ES
Stroh 13K-223 - Wellbore #1 - Plan #3 (1-28-15)	1,400.0	1,401.7	102.9	96.9	17.137	SF
Stroh 13K-243 - Wellbore #1 - Plan #3 (1-28-15)	1,000.0	1,002.0	147.8	143.5	34.575	CC, ES
Stroh 13K-243 - Wellbore #1 - Plan #3 (1-28-15)	1,500.0	1,498.5	170.0	163.6	26.482	SF
Stroh 13K-303 - Wellbore #1 - Plan #2 (1-28-15)	1,000.0	1,002.0	119.9	115.6	28.052	CC, ES
Stroh 13K-303 - Wellbore #1 - Plan #2 (1-28-15)	1,600.0	1,600.9	150.7	143.8	21.936	SF
Stroh 13O-343 - Wellbore #1 - Plan #2 (1-28-15)	1,000.0	1,001.0	58.6	54.3	13.707	CC, ES
Stroh 13O-343 - Wellbore #1 - Plan #2 (1-28-15)	14,294.0	14,297.4	548.6	273.2	1.992	SF
Stroh 13GK-HZ Pad Sec.13-T4N-R67W						
Stroh 13O-403 - Wellbore #1 - Plan #3 (2-3-15)	1,000.0	1,001.0	27.9	23.6	6.527	CC, ES
Stroh 13O-403 - Wellbore #1 - Plan #3 (2-3-15)	14,294.0	14,432.9	318.0	96.8	1.438	Level 3, SF

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 Stroh 13O-223
Project:	SEC.13-T4N-R67W	TVD Reference:	WELL @ 4818.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	MD Reference:	WELL @ 4818.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Stroh 13O-223	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 #3 (2-3-15)	Offset TVD Reference:	Offset Datum

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						
Stroh O13-21D Sec.13-T4N-R67W						
Stroh O13-21D - Stroh O13-21D - Stroh O13-21D	4,600.0	4,595.5	53.1	24.6	1.866	ES, SF
Stroh O13-21D - Stroh O13-21D - Stroh O13-21D	4,643.4	4,638.1	52.5	24.8	1.896	CC

Offset Design Existing Wells - Sec.13-T4N-R67W - Brindl 1 (Exist) - Wellbore #1 - Wellbore #1												Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS												Offset Well Error:	0.0 ft
Reference	Offset	Semi Major Axis			Distance								Warning
Measured Depth (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	
7,200.0	6,951.5	6,920.2	6,916.6	26.3	14.7	-22.63	-576.6	1,253.1	531.9	504.1	27.77	19.151	
7,300.0	7,005.2	6,974.8	6,971.1	26.4	14.9	-31.61	-576.3	1,252.3	449.9	423.4	26.50	16.978	
7,400.0	7,047.4	7,016.7	7,013.0	26.6	14.9	-46.17	-576.0	1,251.5	363.3	335.2	28.07	12.942	
7,500.0	7,077.5	7,045.6	7,041.9	26.9	15.0	-66.03	-575.8	1,250.9	275.3	243.3	31.98	8.608	
7,600.0	7,094.8	7,062.2	7,058.5	27.3	15.1	-83.81	-575.7	1,250.7	192.4	158.0	34.32	5.605	
7,700.0	7,099.3	7,066.1	7,062.4	27.8	15.1	-91.13	-575.7	1,250.6	132.4	97.3	35.08	3.775	
7,747.5	7,099.0	7,065.6	7,061.9	28.1	15.1	-90.89	-575.7	1,250.6	123.6	88.0	35.61	3.471	CC, ES, SF
7,800.0	7,098.7	7,065.0	7,061.4	28.5	15.1	-90.63	-575.7	1,250.6	134.3	98.1	36.19	3.710	
7,900.0	7,098.1	7,063.9	7,060.3	29.3	15.1	-90.13	-575.7	1,250.6	196.3	158.9	37.42	5.246	
8,000.0	7,097.4	7,062.9	7,059.2	30.2	15.1	-89.63	-575.7	1,250.7	281.1	242.4	38.75	7.256	
8,100.0	7,096.8	7,061.8	7,058.1	31.2	15.1	-89.12	-575.7	1,250.7	373.6	333.4	40.15	9.304	
8,200.0	7,096.2	7,060.7	7,057.0	32.3	15.0	-88.61	-575.7	1,250.7	469.1	427.5	41.62	11.272	
8,300.0	7,095.6	7,059.6	7,055.9	33.5	15.0	-88.10	-575.7	1,250.7	566.2	523.0	43.14	13.124	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Stroh 13O-223
Project:	SEC.13-T4N-R67W	TVD Reference:	WELL @ 4818.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	MD Reference:	WELL @ 4818.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Stroh 13O-223	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 #3 (2-3-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells - Sec.13-T4N-R67W - Bryce 1 (Exist) - Wellbore #1 - Wellbore #1												Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (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	
8,400.0	7,095.0	7,095.4	7,094.5	34.8	16.9	-91.61	-1,635.1	1,484.7	541.8	495.5	46.32	11.697	
8,500.0	7,094.4	7,093.9	7,093.0	36.1	16.9	-91.37	-1,635.1	1,484.8	471.4	423.4	47.92	9.836	
8,600.0	7,093.8	7,092.4	7,091.6	37.5	16.9	-91.13	-1,635.1	1,484.8	413.3	363.7	49.57	8.339	
8,700.0	7,093.2	7,091.0	7,090.1	39.0	16.9	-90.89	-1,635.1	1,484.8	373.4	322.2	51.24	7.288	
8,800.0	7,092.6	7,089.5	7,088.6	40.4	16.9	-90.66	-1,635.1	1,484.8	357.9	304.9	52.93	6.761	
8,806.9	7,092.5	7,089.4	7,088.5	40.6	16.9	-90.64	-1,635.1	1,484.8	357.8	304.8	53.05	6.745	CC, ES, SF
8,900.0	7,092.0	7,088.1	7,087.2	42.0	16.9	-90.43	-1,635.1	1,484.8	369.7	315.1	54.65	6.765	
9,000.0	7,091.3	7,086.6	7,085.8	43.5	16.9	-90.20	-1,635.1	1,484.8	406.6	350.2	56.39	7.211	
9,100.0	7,090.7	7,085.2	7,084.4	45.1	16.9	-89.97	-1,635.2	1,484.9	462.5	404.4	58.14	7.955	
9,200.0	7,090.1	7,083.8	7,083.0	46.7	16.9	-89.75	-1,635.2	1,484.9	531.5	471.6	59.91	8.873	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Stroh 13O-223
Project:	SEC.13-T4N-R67W	TVD Reference:	WELL @ 4818.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	MD Reference:	WELL @ 4818.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Stroh 13O-223	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 #3 (2-3-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells - Sec.13-T4N-R67W - Jennifer 1 (Exist) - Wellbore #1 - Wellbore #1												Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS												Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical 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
10,900.0	7,079.7	6,986.3	6,985.2	76.3	14.3	-91.37	-4,280.9	1,246.0	565.4	477.1	88.31	6.402	
11,000.0	7,079.1	6,985.9	6,984.9	78.2	14.3	-91.21	-4,280.9	1,246.0	468.1	377.9	90.19	5.190	
11,100.0	7,078.5	6,985.6	6,984.5	80.0	14.3	-91.04	-4,280.9	1,246.0	372.2	280.2	92.08	4.043	
11,200.0	7,077.9	6,985.3	6,984.2	81.8	14.3	-90.88	-4,280.9	1,246.0	279.3	185.4	93.96	2.973	
11,300.0	7,077.3	6,984.9	6,983.8	83.6	14.3	-90.72	-4,280.9	1,246.0	193.6	97.7	95.85	2.020	
11,400.0	7,076.7	6,984.6	6,983.5	85.5	14.3	-90.56	-4,280.9	1,246.0	130.1	32.4	97.74	1.331	Level 3
11,452.7	7,076.4	6,984.4	6,983.3	86.4	14.3	-90.47	-4,280.9	1,246.0	118.9	20.2	98.74	1.205	Level 2, CC, ES, SF
11,500.0	7,076.1	6,984.2	6,983.2	87.3	14.3	-90.39	-4,280.9	1,246.0	128.0	28.4	99.63	1.285	Level 3
11,600.0	7,075.5	6,983.9	6,982.8	89.2	14.3	-90.23	-4,280.9	1,246.0	189.3	87.8	101.53	1.865	
11,700.0	7,074.8	6,983.6	6,982.5	91.0	14.3	-90.07	-4,280.9	1,246.0	274.4	171.0	103.42	2.653	
11,800.0	7,074.2	6,983.2	6,982.2	92.8	14.3	-89.91	-4,280.9	1,246.0	367.1	261.8	105.31	3.486	
11,900.0	7,073.6	6,982.9	6,981.8	94.7	14.3	-89.75	-4,280.9	1,246.0	462.8	355.6	107.21	4.317	
12,000.0	7,073.0	6,982.6	6,981.5	96.6	14.3	-89.59	-4,280.9	1,246.0	560.0	450.9	109.10	5.133	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Stroh 13O-223
Project:	SEC.13-T4N-R67W	TVD Reference:	WELL @ 4818.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	MD Reference:	WELL @ 4818.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Stroh 13O-223	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 #3 (2-3-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells - Sec.13-T4N-R67W - Johnny 1 (Exist) - Wellbore #1 - Wellbore #1												Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (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	
9,600.0	7,087.7	6,996.3	6,994.0	53.4	16.4	-91.68	-2,985.4	1,321.2	590.1	523.7	66.41	8.885	
9,700.0	7,087.1	6,995.7	6,993.3	55.1	16.4	-91.49	-2,985.4	1,321.3	496.7	428.5	68.23	7.280	
9,800.0	7,086.5	6,995.0	6,992.7	56.8	16.4	-91.30	-2,985.4	1,321.3	406.6	336.5	70.07	5.803	
9,900.0	7,085.8	6,994.4	6,992.0	58.5	16.4	-91.11	-2,985.4	1,321.3	322.3	250.4	71.90	4.482	
10,000.0	7,085.2	6,993.7	6,991.4	60.3	16.4	-90.91	-2,985.4	1,321.3	249.9	176.1	73.75	3.388	
10,100.0	7,084.6	6,993.0	6,990.7	62.0	16.4	-90.71	-2,985.4	1,321.3	202.5	126.9	75.60	2.679	
10,157.2	7,084.3	6,992.6	6,990.3	63.0	16.4	-90.59	-2,985.4	1,321.3	194.3	117.6	76.66	2.534 CC, ES, SF	
10,200.0	7,084.0	6,992.3	6,990.0	63.8	16.4	-90.51	-2,985.4	1,321.3	198.9	121.5	77.45	2.568	
10,300.0	7,083.4	6,991.6	6,989.3	65.6	16.4	-90.30	-2,985.4	1,321.3	241.1	161.8	79.31	3.040	
10,400.0	7,082.8	6,990.9	6,988.6	67.3	16.4	-90.09	-2,985.4	1,321.3	311.0	229.8	81.18	3.831	
10,500.0	7,082.2	6,990.2	6,987.9	69.1	16.4	-89.88	-2,985.4	1,321.3	394.0	311.0	83.04	4.745	
10,600.0	7,081.6	6,989.5	6,987.1	70.9	16.4	-89.66	-2,985.4	1,321.3	483.5	398.6	84.91	5.695	
10,700.0	7,081.0	6,988.7	6,986.4	72.7	16.4	-89.44	-2,985.4	1,321.3	576.5	489.7	86.78	6.643	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Stroh 13O-223
Project:	SEC.13-T4N-R67W	TVD Reference:	WELL @ 4818.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	MD Reference:	WELL @ 4818.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Stroh 13O-223	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 #3 (2-3-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells - Sec.13-T4N-R67W - Johnston 34-24 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (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		
13,800.0	7,062.0	6,975.2	6,974.4	130.2	15.6	-90.92	-6,989.7	1,535.6	545.6	401.1	144.46	3.777		
13,900.0	7,061.4	6,975.2	6,974.4	132.1	15.6	-90.93	-6,989.7	1,535.6	485.1	338.8	146.36	3.315		
14,000.0	7,060.8	6,975.3	6,974.5	134.0	15.6	-90.93	-6,989.7	1,535.6	439.4	291.1	148.26	2.964		
14,100.0	7,060.2	6,975.3	6,974.5	135.9	15.6	-90.94	-6,989.7	1,535.6	413.2	263.1	150.17	2.752		
14,161.5	7,059.8	6,975.3	6,974.5	137.1	15.6	-90.94	-6,989.7	1,535.6	408.6	257.3	151.34	2.700 CC, ES		
14,200.0	7,059.6	6,975.3	6,974.6	137.8	15.6	-90.95	-6,989.7	1,535.6	410.4	258.4	152.07	2.699 SF		
14,294.0	7,059.0	6,975.4	6,974.6	139.6	15.6	-90.95	-6,989.7	1,535.6	429.6	275.7	153.86	2.792		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Stroh 13O-223
Project:	SEC.13-T4N-R67W	TVD Reference:	WELL @ 4818.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	MD Reference:	WELL @ 4818.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Stroh 13O-223	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 #3 (2-3-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells - Sec.13-T4N-R67W - Orr 33-24 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (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		
12,400.0	7,070.6	6,983.9	6,982.1	104.0	16.2	-90.71	-5,520.1	1,638.5	589.0	470.4	118.52	4.969		
12,500.0	7,070.0	6,983.2	6,981.5	105.9	16.2	-90.64	-5,520.1	1,638.5	546.3	425.9	120.42	4.537		
12,600.0	7,069.3	6,982.5	6,980.8	107.7	16.2	-90.56	-5,520.1	1,638.5	519.7	397.4	122.32	4.249		
12,692.0	7,068.8	6,981.9	6,980.1	109.4	16.2	-90.49	-5,520.1	1,638.5	511.5	387.4	124.07	4.123 CC		
12,700.0	7,068.7	6,981.8	6,980.1	109.6	16.2	-90.48	-5,520.1	1,638.5	511.6	387.3	124.22	4.118 ES, SF		
12,800.0	7,068.1	6,981.1	6,979.4	111.5	16.2	-90.41	-5,520.1	1,638.5	522.8	396.7	126.12	4.145		
12,900.0	7,067.5	6,980.4	6,978.7	113.3	16.2	-90.33	-5,520.1	1,638.5	552.2	424.2	128.02	4.313		
13,000.0	7,066.9	6,979.8	6,978.0	115.2	16.2	-90.25	-5,520.1	1,638.5	597.1	467.2	129.92	4.596		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Stroh 13O-223
Project:	SEC.13-T4N-R67W	TVD Reference:	WELL @ 4818.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	MD Reference:	WELL @ 4818.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Stroh 13O-223	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 #3 (2-3-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.13-T4N-R67W (Grid North) - Stroh O 13-20 (Exist) - Wellbore #1 - Wellbore #1												Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS												Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	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
0.0	0.0	0.0	0.0	0.0	0.0	-71.13	134.8	-394.3	416.8				
100.0	100.0	90.7	90.7	0.1	0.1	-71.16	134.6	-394.4	416.8	416.5	0.23	1,790.276 CC	
200.0	200.0	190.2	190.2	0.3	0.4	-71.21	134.3	-394.7	416.9	416.2	0.70	594.466	
300.0	300.0	290.1	290.1	0.6	0.6	-71.28	133.9	-395.0	417.1	415.9	1.18	352.019	
400.0	400.0	390.2	390.2	0.8	0.9	-71.39	133.2	-395.5	417.3	415.6	1.67	249.376	
500.0	500.0	490.2	490.2	1.0	1.2	-71.47	132.7	-395.9	417.5	415.3	2.16	193.011	
600.0	600.0	588.7	588.7	1.2	1.3	-71.49	132.6	-396.2	417.9	415.3	2.57	162.794 ES	
700.0	700.0	688.2	688.2	1.5	1.4	-71.41	133.4	-396.6	418.5	415.6	2.90	144.359	
800.0	800.0	789.1	789.1	1.7	1.6	-71.32	134.2	-397.0	419.1	415.8	3.26	128.669	
900.0	900.0	888.6	888.6	1.9	1.7	-71.27	134.7	-397.3	419.6	415.9	3.66	114.615	
1,000.0	1,000.0	987.8	987.8	2.1	2.0	-71.21	135.3	-397.8	420.2	416.1	4.09	102.770	
1,100.0	1,100.0	1,087.2	1,087.1	2.3	2.2	-148.58	136.1	-398.4	421.8	417.3	4.52	93.290	
1,200.0	1,200.0	1,185.2	1,185.2	2.6	2.4	-148.69	136.8	-399.4	425.2	420.2	4.96	85.708	
1,300.0	1,299.9	1,285.6	1,285.6	2.8	2.7	-148.91	137.6	-400.5	430.2	424.8	5.42	79.440	
1,400.0	1,399.7	1,386.9	1,386.8	3.0	2.9	-149.26	138.3	-401.4	436.5	430.7	5.88	74.252	
1,500.0	1,499.4	1,487.6	1,487.6	3.2	3.2	-149.72	138.6	-402.1	444.1	437.7	6.35	69.950	
1,600.0	1,598.9	1,587.5	1,587.4	3.5	3.4	-150.28	138.9	-402.6	452.9	446.1	6.82	66.434	
1,700.0	1,698.3	1,686.7	1,686.7	3.7	3.7	-150.90	139.2	-403.1	463.4	456.1	7.29	63.582	
1,800.0	1,797.4	1,783.8	1,783.7	4.0	3.9	-151.59	139.4	-403.8	475.6	467.8	7.75	61.371	
1,900.0	1,896.3	1,881.8	1,881.7	4.3	4.2	-152.40	139.2	-405.0	489.7	481.5	8.21	59.643	
2,000.0	1,994.9	1,981.2	1,981.1	4.6	4.4	-153.27	138.9	-406.1	505.5	496.9	8.67	58.291	
2,100.0	2,093.3	2,079.2	2,079.1	4.9	4.6	-154.20	138.1	-407.3	522.9	513.7	9.11	57.374	
2,200.0	2,191.2	2,177.0	2,176.9	5.3	4.8	-155.20	136.8	-408.6	541.9	532.4	9.54	56.815	
2,300.0	2,288.9	2,272.3	2,272.1	5.7	5.0	-156.19	135.4	-409.9	562.8	552.9	9.97	56.463	
2,400.0	2,386.1	2,366.7	2,366.5	6.1	5.2	-157.16	134.0	-411.7	585.9	575.5	10.41	56.308 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Stroh 13O-223
Project:	SEC.13-T4N-R67W	TVD Reference:	WELL @ 4818.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	MD Reference:	WELL @ 4818.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Stroh 13O-223	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 #3 (2-3-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.13-T4N-R67W (Grid North) - UPRC 13-11E (Exist.) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	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	145.46	-360.7	248.2	437.9					
100.0	100.0	90.1	90.1	0.1	0.1	145.47	-360.7	248.2	437.8	437.6	0.23	1,887.282		
200.0	200.0	190.6	190.6	0.3	0.4	145.52	-360.8	247.8	437.7	437.0	0.71	616.240		
247.8	247.8	237.8	237.8	0.4	0.5	145.55	-360.9	247.6	437.7	436.7	0.94	466.716		
300.0	300.0	289.0	289.0	0.6	0.6	145.59	-361.1	247.4	437.7	436.6	1.18	369.583		
400.0	400.0	391.5	391.5	0.8	0.9	145.65	-361.4	247.0	437.7	436.1	1.65	264.783		
464.8	464.8	454.8	454.8	0.9	1.0	145.68	-361.4	246.7	437.6	435.7	1.91	229.684		
500.0	500.0	488.9	488.9	1.0	1.0	145.68	-361.4	246.7	437.6	435.6	2.04	214.747		
600.0	600.0	588.6	588.6	1.2	1.2	145.69	-361.8	246.8	437.9	435.5	2.44	179.787		
700.0	700.0	691.2	691.2	1.5	1.4	145.73	-362.0	246.6	438.0	435.1	2.87	152.723		
800.0	800.0	791.1	791.1	1.7	1.6	145.78	-361.9	246.2	437.7	434.4	3.31	132.364		
844.8	844.8	834.8	834.8	1.8	1.7	145.81	-362.0	245.9	437.6	434.1	3.51	124.862		
900.0	900.0	888.5	888.4	1.9	1.8	145.84	-362.2	245.8	437.7	434.0	3.75	116.735		
1,000.0	1,000.0	989.0	989.0	2.1	2.1	145.90	-362.7	245.6	438.1	433.9	4.21	104.153		
1,100.0	1,100.0	1,089.3	1,089.3	2.3	2.3	68.70	-363.2	245.2	438.0	433.3	4.68	93.636		
1,200.0	1,200.0	1,190.7	1,190.7	2.6	2.6	69.12	-363.6	244.7	437.0	431.9	5.14	84.962		
1,300.0	1,299.9	1,292.0	1,292.0	2.8	2.8	69.79	-363.8	243.8	435.2	429.6	5.61	77.619		
1,400.0	1,399.7	1,391.3	1,391.3	3.0	3.1	70.69	-363.9	242.8	432.6	426.6	6.07	71.304		
1,500.0	1,499.4	1,491.5	1,491.5	3.2	3.3	71.83	-364.0	241.8	429.7	423.1	6.54	65.685		
1,600.0	1,598.9	1,591.9	1,591.9	3.5	3.6	73.23	-364.0	240.6	426.2	419.2	7.02	60.673		
1,700.0	1,698.3	1,690.5	1,690.5	3.7	3.8	74.87	-364.0	239.3	422.4	414.9	7.52	56.177		
1,800.0	1,797.4	1,790.4	1,790.3	4.0	4.1	76.81	-364.1	237.8	418.6	410.6	8.04	52.076		
1,900.0	1,896.3	1,888.7	1,888.6	4.3	4.3	78.99	-364.1	236.3	414.8	406.3	8.58	48.375		
2,000.0	1,994.9	1,986.1	1,986.1	4.6	4.6	81.41	-364.2	234.9	411.6	402.4	9.14	45.032		
2,100.0	2,093.3	2,084.7	2,084.6	4.9	4.8	84.14	-364.5	233.3	408.9	399.2	9.73	42.007		
2,200.0	2,191.2	2,182.2	2,182.1	5.3	5.1	87.10	-364.7	231.7	407.1	396.7	10.36	39.311		
2,285.6	2,274.8	2,264.6	2,264.5	5.6	5.3	89.77	-365.0	230.5	406.5	395.6	10.91	37.263 CC		
2,300.0	2,288.9	2,278.4	2,278.3	5.7	5.3	90.24	-365.0	230.3	406.5	395.5	11.00	36.949 ES		
2,400.0	2,386.1	2,374.9	2,374.8	6.1	5.6	93.64	-365.6	228.6	407.6	395.9	11.68	34.905		
2,500.0	2,482.9	2,469.0	2,468.8	6.5	5.8	97.21	-366.4	226.4	410.7	398.3	12.37	33.205		
2,600.0	2,579.3	2,563.4	2,563.2	7.0	6.1	100.92	-367.8	224.1	416.4	403.3	13.07	31.848		
2,700.0	2,675.3	2,657.7	2,657.5	7.5	6.3	104.71	-369.3	221.8	424.5	410.7	13.78	30.796		
2,800.0	2,771.4	2,752.9	2,752.6	8.1	6.6	108.40	-371.0	219.5	434.8	420.3	14.48	30.026		
2,900.0	2,867.4	2,847.7	2,847.4	8.6	6.8	111.89	-372.6	217.4	446.9	431.7	15.16	29.480		
3,000.0	2,963.4	2,943.1	2,942.8	9.1	7.1	115.19	-374.5	215.3	460.8	445.0	15.82	29.135		
3,100.0	3,059.5	3,040.5	3,040.1	9.7	7.3	118.42	-376.0	213.0	476.0	459.5	16.46	28.915		
3,200.0	3,155.5	3,136.5	3,136.1	10.2	7.6	121.44	-377.1	210.4	492.2	475.2	17.08	28.814 SF		
3,300.0	3,251.5	3,232.2	3,231.7	10.8	7.8	124.33	-377.9	207.4	509.8	492.1	17.68	28.831		
3,400.0	3,347.6	3,329.3	3,328.8	11.3	8.1	127.11	-378.3	204.1	528.3	510.1	18.26	28.938		
3,500.0	3,443.6	3,426.1	3,425.5	11.9	8.3	129.78	-378.0	200.2	547.7	528.9	18.80	29.126		
3,600.0	3,539.6	3,522.1	3,521.4	12.5	8.6	132.28	-377.3	196.3	567.9	548.5	19.33	29.382		
3,700.0	3,635.7	3,616.7	3,615.9	13.0	8.8	134.62	-376.4	192.2	588.9	569.1	19.83	29.698		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Stroh 13O-223
Project:	SEC.13-T4N-R67W	TVD Reference:	WELL @ 4818.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	MD Reference:	WELL @ 4818.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Stroh 13O-223	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 #3 (2-3-15)	Offset TVD Reference:	Offset Datum

Offset Design Stroh 13GK-HZ Pad Sec. 13-T4N-R67W - Stroh 13G-203 - Wellbore #1 - Plan #2 (1-27-15)													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	3.0	3.0	0.0	0.0	-90.00	-90.00	0.0	-209.2	209.2	209.2	0.00	N/A	
100.0	100.0	103.0	103.0	0.1	0.1	-90.00	-90.00	0.0	-209.2	209.2	208.9	0.23	903.491	
165.6	165.6	168.6	168.6	0.3	0.3	-90.00	-90.00	0.0	-209.2	209.2	208.6	0.53	397.229 CC	
200.0	200.0	202.9	202.9	0.3	0.3	-90.00	-90.00	0.0	-209.2	209.2	208.5	0.68	307.350 ES	
300.0	300.0	300.0	300.0	0.6	0.6	-89.96	-89.96	0.2	-210.0	210.0	208.9	1.11	188.406	
400.0	400.0	395.9	395.9	0.8	0.8	-89.83	-89.83	0.6	-212.5	212.6	211.0	1.55	137.352	
500.0	500.0	492.3	492.1	1.0	1.0	-89.63	-89.63	1.4	-216.5	216.8	214.8	1.99	108.856	
600.0	600.0	588.5	588.2	1.2	1.2	-89.36	-89.36	2.5	-222.1	222.6	220.2	2.44	91.049	
700.0	700.0	684.4	683.9	1.5	1.5	-89.03	-89.03	3.9	-229.3	230.1	227.2	2.91	79.073	
800.0	800.0	780.1	779.2	1.7	1.7	-88.66	-88.66	5.6	-238.0	239.2	235.8	3.39	70.602	
900.0	900.0	875.5	874.0	1.9	2.0	-88.26	-88.26	7.5	-248.2	250.0	246.1	3.88	64.398	
1,000.0	1,000.0	970.5	968.2	2.1	2.3	-87.84	-87.84	9.8	-260.0	262.5	258.1	4.39	59.737	
1,100.0	1,100.0	1,065.0	1,061.7	2.3	2.6	-164.80	-164.80	12.4	-273.2	277.4	272.7	4.66	59.542	
1,200.0	1,200.0	1,158.7	1,154.2	2.6	2.9	-164.45	-164.45	15.2	-287.7	295.5	290.4	5.09	58.036	
1,300.0	1,299.9	1,251.4	1,245.6	2.8	3.2	-164.17	-164.17	18.3	-303.6	316.9	311.4	5.53	57.335	
1,400.0	1,399.7	1,343.1	1,335.6	3.0	3.6	-163.95	-163.95	21.6	-320.8	341.5	335.6	5.96	57.265 SF	
1,500.0	1,499.4	1,433.7	1,424.1	3.2	4.0	-163.79	-163.79	25.1	-339.1	369.3	362.9	6.40	57.705	
1,600.0	1,598.9	1,522.8	1,511.1	3.5	4.4	-163.67	-163.67	28.9	-358.4	400.1	393.3	6.84	58.508	
1,700.0	1,698.3	1,616.8	1,602.5	3.7	4.8	-163.59	-163.59	33.0	-379.6	433.4	426.1	7.28	59.498	
1,800.0	1,797.4	1,710.5	1,693.8	4.0	5.3	-163.58	-163.58	37.0	-400.8	468.2	460.4	7.73	60.592	
1,900.0	1,896.3	1,803.7	1,784.4	4.3	5.7	-163.60	-163.60	41.1	-421.8	504.5	496.4	8.17	61.762	
2,000.0	1,994.9	1,896.2	1,874.5	4.6	6.2	-163.66	-163.66	45.1	-442.7	542.5	533.9	8.61	62.993	
2,100.0	2,093.3	1,988.0	1,963.9	4.9	6.6	-163.74	-163.74	49.1	-463.4	582.0	572.9	9.05	64.276	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Stroh 13O-223
Project:	SEC.13-T4N-R67W	TVD Reference:	WELL @ 4818.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	MD Reference:	WELL @ 4818.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Stroh 13O-223	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 #3 (2-3-15)	Offset TVD Reference:	Offset Datum

Offset Design Stroh 13GK-HZ Pad Sec. 13-T4N-R67W - Stroh 13G-323 - Wellbore #1 - Plan #3 (1-28-15)													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)	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	-90.00	0.0	-178.5	178.5	178.5	0.00	N/A		
100.0	100.0	102.0	102.0	0.1	0.1	-90.00	0.0	-178.5	178.5	178.3	0.23	778.537		
200.0	200.0	202.0	202.0	0.3	0.3	-90.00	0.0	-178.5	178.5	177.8	0.68	262.950		
300.0	300.0	302.0	302.0	0.6	0.6	-90.00	0.0	-178.5	178.5	177.4	1.13	158.189		
366.0	366.0	368.0	368.0	0.7	0.7	-90.00	0.0	-178.5	178.5	177.1	1.42	125.259 CC		
400.0	400.0	401.9	401.9	0.8	0.8	-90.00	0.0	-178.5	178.5	176.9	1.58	113.145 ES		
500.0	500.0	500.0	500.0	1.0	1.0	-89.95	0.2	-179.3	179.4	177.3	2.01	89.117		
600.0	600.0	595.9	595.9	1.2	1.2	-89.81	0.6	-181.8	181.9	179.4	2.44	74.537		
700.0	700.0	692.8	692.6	1.5	1.4	-89.59	1.3	-185.9	186.1	183.2	2.88	64.649		
800.0	800.0	789.4	789.1	1.7	1.6	-89.30	2.3	-191.5	192.0	188.6	3.33	57.714		
900.0	900.0	885.9	885.3	1.9	1.9	-88.96	3.6	-198.8	199.5	195.7	3.78	52.714		
1,000.0	1,000.0	982.1	981.1	2.1	2.1	-88.57	5.2	-207.6	208.7	204.4	4.26	49.038		
1,100.0	1,100.0	1,077.8	1,076.3	2.3	2.4	-165.56	7.0	-217.9	220.4	215.8	4.63	47.600		
1,200.0	1,200.0	1,172.9	1,170.6	2.6	2.7	-165.25	9.1	-229.7	235.4	230.3	5.06	46.541		
1,300.0	1,299.9	1,267.3	1,264.0	2.8	3.0	-165.01	11.5	-243.0	253.7	248.2	5.49	46.226 SF		
1,400.0	1,399.7	1,360.7	1,356.2	3.0	3.3	-164.84	14.1	-257.6	275.2	269.3	5.92	46.490		
1,500.0	1,499.4	1,457.4	1,451.5	3.2	3.6	-164.73	17.0	-273.6	299.3	292.9	6.36	47.074		
1,600.0	1,598.9	1,554.0	1,546.8	3.5	4.0	-164.72	19.8	-289.6	325.0	318.2	6.79	47.839		
1,700.0	1,698.3	1,650.2	1,641.6	3.7	4.3	-164.77	22.7	-305.5	352.3	345.1	7.23	48.723		
1,800.0	1,797.4	1,745.9	1,735.9	4.0	4.7	-164.86	25.5	-321.3	381.3	373.6	7.67	49.727		
1,900.0	1,896.3	1,841.1	1,829.8	4.3	5.0	-165.00	28.3	-337.1	411.9	403.7	8.10	50.821		
2,000.0	1,994.9	1,935.8	1,923.1	4.6	5.4	-165.16	31.1	-352.7	444.0	435.5	8.54	51.992		
2,100.0	2,093.3	2,029.9	2,015.9	4.9	5.7	-165.34	33.9	-368.3	477.8	468.8	8.98	53.229		
2,200.0	2,191.2	2,123.4	2,108.1	5.3	6.1	-165.53	36.6	-383.8	513.2	503.7	9.41	54.520		
2,300.0	2,288.9	2,216.3	2,199.6	5.7	6.4	-165.73	39.4	-399.1	550.1	540.3	9.85	55.858		
2,400.0	2,386.1	2,308.5	2,290.5	6.1	6.8	-165.93	42.1	-414.4	588.6	578.4	10.28	57.236		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Stroh 13O-223
Project:	SEC.13-T4N-R67W	TVD Reference:	WELL @ 4818.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	MD Reference:	WELL @ 4818.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Stroh 13O-223	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 #3 (2-3-15)	Offset TVD Reference:	Offset Datum

Offset Design Stroh 13GK-HZ Pad Sec. 13-T4N-R67W - Stroh 13K-223 - Wellbore #1 - Plan #3 (1-28-15)													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 (ft)	Offset (ft)	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	
0.0	0.0	2.0	2.0	0.0	0.0	-90.00	0.0	-89.2	89.2	89.2	0.00	N/A		
100.0	100.0	102.0	102.0	0.1	0.1	-90.00	0.0	-89.2	89.2	89.0	0.23	389.269		
200.0	200.0	202.0	202.0	0.3	0.3	-90.00	0.0	-89.2	89.2	88.6	0.68	131.475		
300.0	300.0	302.0	302.0	0.6	0.6	-90.00	0.0	-89.2	89.2	88.1	1.13	79.094		
400.0	400.0	402.0	402.0	0.8	0.8	-90.00	0.0	-89.2	89.2	87.7	1.58	56.560		
500.0	500.0	502.0	502.0	1.0	1.0	-90.00	0.0	-89.2	89.2	87.2	2.03	44.019		
600.0	600.0	602.0	602.0	1.2	1.2	-90.00	0.0	-89.2	89.2	86.8	2.48	36.030		
700.0	700.0	702.0	702.0	1.5	1.5	-90.00	0.0	-89.2	89.2	86.3	2.93	30.496		
800.0	800.0	802.0	802.0	1.7	1.7	-90.00	0.0	-89.2	89.2	85.9	3.38	26.435		
900.0	900.0	902.0	902.0	1.9	1.9	-90.00	0.0	-89.2	89.2	85.4	3.83	23.329		
1,000.0	1,000.0	1,002.0	1,002.0	2.1	2.1	-90.00	0.0	-89.2	89.2	85.0	4.28	20.876 CC, ES		
1,100.0	1,100.0	1,102.0	1,102.0	2.3	2.4	-167.50	0.0	-89.2	90.1	85.4	4.71	19.115		
1,200.0	1,200.0	1,202.0	1,202.0	2.6	2.6	-167.85	0.0	-89.2	92.7	87.5	5.14	18.017		
1,300.0	1,299.9	1,301.9	1,301.9	2.8	2.8	-168.38	0.0	-89.2	96.9	91.3	5.57	17.390		
1,400.0	1,399.7	1,401.7	1,401.7	3.0	3.0	-169.05	0.0	-89.2	102.9	96.9	6.01	17.137 SF		
1,500.0	1,499.4	1,501.4	1,501.4	3.2	3.3	-169.81	0.0	-89.2	110.6	104.2	6.44	17.184		
1,600.0	1,598.9	1,600.9	1,600.9	3.5	3.5	-170.60	0.0	-89.2	120.1	113.2	6.87	17.477		
1,700.0	1,698.3	1,700.3	1,700.3	3.7	3.7	-171.39	0.0	-89.2	131.3	123.9	7.30	17.973		
1,800.0	1,797.4	1,799.4	1,799.4	4.0	3.9	-172.15	0.0	-89.2	144.2	136.4	7.74	18.638		
1,900.0	1,896.3	1,898.3	1,898.3	4.3	4.2	-172.86	0.0	-89.2	158.8	150.7	8.17	19.446		
2,000.0	1,994.9	1,996.9	1,996.9	4.6	4.4	-173.51	0.0	-89.2	175.2	166.6	8.60	20.375		
2,100.0	2,093.3	2,096.9	2,096.9	4.9	4.6	-173.90	0.8	-88.9	192.9	183.9	9.03	21.359		
2,200.0	2,191.2	2,196.9	2,196.9	5.3	4.8	-173.85	3.1	-87.9	211.5	202.0	9.47	22.345		
2,300.0	2,288.9	2,296.9	2,296.8	5.7	5.0	-173.47	7.1	-86.2	230.9	221.0	9.90	23.328		
2,400.0	2,386.1	2,396.8	2,396.5	6.1	5.3	-172.84	12.6	-83.8	251.2	240.9	10.34	24.303		
2,500.0	2,482.9	2,496.7	2,496.1	6.5	5.5	-172.02	19.8	-80.8	272.5	261.7	10.78	25.268		
2,600.0	2,579.3	2,596.4	2,595.3	7.0	5.7	-171.05	28.5	-77.0	294.6	283.4	11.24	26.219		
2,700.0	2,675.3	2,696.1	2,694.3	7.5	6.0	-170.00	38.8	-72.6	317.2	305.5	11.73	27.031		
2,800.0	2,771.4	2,795.9	2,793.3	8.1	6.2	-168.82	50.7	-67.5	339.2	326.9	12.26	27.668		
2,900.0	2,867.4	2,895.8	2,892.1	8.6	6.5	-167.52	64.2	-61.7	360.6	347.8	12.81	28.157		
3,000.0	2,963.4	2,994.9	2,989.9	9.1	6.7	-166.16	79.1	-55.3	381.5	368.1	13.38	28.522		
3,100.0	3,059.5	3,092.3	3,085.9	9.7	7.0	-164.91	94.0	-48.9	402.5	388.5	13.96	28.825		
3,200.0	3,155.5	3,189.7	3,182.0	10.2	7.3	-163.79	109.0	-42.4	423.7	409.1	14.57	29.081		
3,300.0	3,251.5	3,287.1	3,278.0	10.8	7.6	-162.77	123.9	-36.0	445.0	429.8	15.19	29.298		
3,400.0	3,347.6	3,384.5	3,374.1	11.3	7.9	-161.84	138.8	-29.6	466.4	450.6	15.82	29.480		
3,500.0	3,443.6	3,481.9	3,470.1	11.9	8.2	-160.99	153.8	-23.2	487.9	471.4	16.46	29.633		
3,600.0	3,539.6	3,579.4	3,566.2	12.5	8.5	-160.22	168.7	-16.8	509.5	492.4	17.12	29.760		
3,700.0	3,635.7	3,676.8	3,662.2	13.0	8.8	-159.51	183.7	-10.4	531.2	513.4	17.79	29.866		
3,800.0	3,731.7	3,774.2	3,758.3	13.6	9.2	-158.85	198.6	-3.9	553.0	534.5	18.46	29.954		
3,900.0	3,827.7	3,871.6	3,854.3	14.2	9.5	-158.25	213.6	2.5	574.8	555.7	19.14	30.026		
4,000.0	3,923.8	3,967.6	3,949.0	14.7	9.8	-157.71	228.2	8.8	596.7	576.9	19.82	30.111		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Stroh 13O-223
Project:	SEC.13-T4N-R67W	TVD Reference:	WELL @ 4818.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	MD Reference:	WELL @ 4818.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Stroh 13O-223	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 #3 (2-3-15)	Offset TVD Reference:	Offset Datum

Offset Design Stroh 13GK-HZ Pad Sec. 13-T4N-R67W - Stroh 13K-243 - Wellbore #1 - Plan #3 (1-28-15)													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 (ft)	Offset (ft)	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	-90.00	0.0	-147.8	147.8	147.8	0.00	N/A		
100.0	100.0	102.0	102.0	0.1	0.1	-90.00	0.0	-147.8	147.8	147.6	0.23	644.726		
200.0	200.0	202.0	202.0	0.3	0.3	-90.00	0.0	-147.8	147.8	147.1	0.68	217.755		
300.0	300.0	302.0	302.0	0.6	0.6	-90.00	0.0	-147.8	147.8	146.7	1.13	131.000		
400.0	400.0	402.0	402.0	0.8	0.8	-90.00	0.0	-147.8	147.8	146.2	1.58	93.678		
500.0	500.0	502.0	502.0	1.0	1.0	-90.00	0.0	-147.8	147.8	145.8	2.03	72.907		
600.0	600.0	602.0	602.0	1.2	1.2	-90.00	0.0	-147.8	147.8	145.3	2.48	59.675		
700.0	700.0	702.0	702.0	1.5	1.5	-90.00	0.0	-147.8	147.8	144.9	2.93	50.509		
800.0	800.0	802.0	802.0	1.7	1.7	-90.00	0.0	-147.8	147.8	144.4	3.38	43.783		
900.0	900.0	902.0	902.0	1.9	1.9	-90.00	0.0	-147.8	147.8	144.0	3.83	38.638		
1,000.0	1,000.0	1,002.0	1,002.0	2.1	2.1	-90.00	0.0	-147.8	147.8	143.5	4.28	34.575 CC, ES		
1,100.0	1,100.0	1,102.0	1,102.0	2.3	2.4	-167.45	0.0	-147.8	148.7	143.9	4.71	31.541		
1,200.0	1,200.0	1,202.0	1,202.0	2.6	2.6	-167.66	0.0	-147.8	151.2	146.1	5.14	29.406		
1,300.0	1,299.9	1,301.9	1,301.9	2.8	2.8	-168.00	0.0	-147.8	155.5	149.9	5.57	27.898		
1,400.0	1,399.7	1,401.6	1,401.6	3.0	3.0	-168.44	0.0	-147.8	161.5	155.5	6.00	26.888		
1,500.0	1,499.4	1,498.5	1,498.5	3.2	3.2	-168.90	0.1	-148.7	170.0	163.6	6.42	26.482 SF		
1,600.0	1,598.9	1,594.8	1,594.8	3.5	3.4	-169.33	0.4	-151.1	181.9	175.1	6.83	26.652		
1,700.0	1,698.3	1,690.5	1,690.4	3.7	3.6	-169.71	0.9	-155.1	197.2	190.0	7.24	27.259		
1,800.0	1,797.4	1,785.4	1,785.1	4.0	3.8	-170.03	1.5	-160.7	215.8	208.2	7.65	28.230		
1,900.0	1,896.3	1,879.3	1,878.7	4.3	4.1	-170.30	2.4	-167.7	237.7	229.7	8.06	29.507		
2,000.0	1,994.9	1,972.1	1,971.1	4.6	4.3	-170.51	3.4	-176.1	262.8	254.4	8.47	31.043		
2,100.0	2,093.3	2,063.6	2,062.2	4.9	4.5	-170.67	4.5	-185.9	291.1	282.3	8.88	32.796		
2,200.0	2,191.2	2,153.8	2,151.6	5.3	4.7	-170.79	5.8	-197.0	322.6	313.3	9.29	34.734		
2,300.0	2,288.9	2,242.5	2,239.5	5.7	5.0	-170.88	7.3	-209.2	357.1	347.4	9.70	36.827		
2,400.0	2,386.1	2,329.6	2,325.5	6.1	5.2	-170.93	8.9	-222.5	394.6	384.5	10.11	39.046		
2,500.0	2,482.9	2,420.3	2,415.0	6.5	5.5	-170.98	10.6	-237.3	434.6	424.1	10.52	41.298		
2,600.0	2,579.3	2,511.3	2,504.7	7.0	5.8	-171.05	12.4	-252.1	476.2	465.3	10.94	43.528		
2,700.0	2,675.3	2,601.7	2,594.0	7.5	6.1	-171.17	14.1	-266.8	518.9	507.5	11.39	45.555		
2,800.0	2,771.4	2,692.1	2,683.2	8.1	6.3	-171.28	15.9	-281.5	561.6	549.7	11.85	47.381		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Stroh 13O-223
Project:	SEC.13-T4N-R67W	TVD Reference:	WELL @ 4818.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	MD Reference:	WELL @ 4818.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Stroh 13O-223	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 #3 (2-3-15)	Offset TVD Reference:	Offset Datum

Offset Design Stroh 13GK-HZ Pad Sec. 13-T4N-R67W - Stroh 13K-303 - Wellbore #1 - Plan #2 (1-28-15)													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 (ft)	Offset (ft)	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	-90.00	0.0	-119.9	119.9	119.9	0.00	N/A		
100.0	100.0	102.0	102.0	0.1	0.1	-90.00	0.0	-119.9	119.9	119.7	0.23	523.080		
200.0	200.0	202.0	202.0	0.3	0.3	-90.00	0.0	-119.9	119.9	119.2	0.68	176.669		
300.0	300.0	302.0	302.0	0.6	0.6	-90.00	0.0	-119.9	119.9	118.8	1.13	106.283		
400.0	400.0	402.0	402.0	0.8	0.8	-90.00	0.0	-119.9	119.9	118.3	1.58	76.003		
500.0	500.0	502.0	502.0	1.0	1.0	-90.00	0.0	-119.9	119.9	117.9	2.03	59.151		
600.0	600.0	602.0	602.0	1.2	1.2	-90.00	0.0	-119.9	119.9	117.4	2.48	48.416		
700.0	700.0	702.0	702.0	1.5	1.5	-90.00	0.0	-119.9	119.9	117.0	2.93	40.979		
800.0	800.0	802.0	802.0	1.7	1.7	-90.00	0.0	-119.9	119.9	116.5	3.38	35.522		
900.0	900.0	902.0	902.0	1.9	1.9	-90.00	0.0	-119.9	119.9	116.1	3.83	31.348		
1,000.0	1,000.0	1,002.0	1,002.0	2.1	2.1	-90.00	0.0	-119.9	119.9	115.6	4.28	28.052 CC, ES		
1,100.0	1,100.0	1,102.0	1,102.0	2.3	2.4	-167.47	0.0	-119.9	120.8	116.1	4.71	25.624		
1,200.0	1,200.0	1,202.0	1,202.0	2.6	2.6	-167.73	0.0	-119.9	123.3	118.2	5.14	23.983		
1,300.0	1,299.9	1,301.9	1,301.9	2.8	2.8	-168.14	0.0	-119.9	127.6	122.0	5.57	22.894		
1,400.0	1,399.7	1,401.7	1,401.7	3.0	3.0	-168.66	0.0	-119.9	133.6	127.6	6.01	22.244		
1,500.0	1,499.4	1,501.4	1,501.4	3.2	3.3	-169.27	0.0	-119.9	141.3	134.8	6.44	21.946		
1,600.0	1,598.9	1,600.9	1,600.9	3.5	3.5	-169.94	0.0	-119.9	150.7	143.8	6.87	21.936 SF		
1,700.0	1,698.3	1,698.9	1,698.9	3.7	3.7	-170.34	0.7	-120.4	162.3	155.0	7.30	22.238		
1,800.0	1,797.4	1,796.4	1,796.4	4.0	3.9	-170.31	2.8	-121.8	176.4	168.7	7.72	22.843		
1,900.0	1,896.3	1,893.4	1,893.3	4.3	4.1	-169.93	6.3	-124.0	193.1	185.0	8.15	23.695		
2,000.0	1,994.9	1,989.8	1,989.5	4.6	4.4	-169.29	11.1	-127.2	212.4	203.8	8.58	24.754		
2,100.0	2,093.3	2,085.4	2,084.8	4.9	4.6	-168.49	17.2	-131.1	234.2	225.2	9.01	25.986		
2,200.0	2,191.2	2,180.2	2,179.2	5.3	4.8	-167.59	24.6	-135.9	258.5	249.1	9.45	27.362		
2,300.0	2,288.9	2,273.9	2,272.4	5.7	5.0	-166.64	33.2	-141.5	285.4	275.5	9.89	28.857		
2,400.0	2,386.1	2,366.7	2,364.4	6.1	5.3	-165.67	42.9	-147.9	314.9	304.6	10.34	30.445		
2,500.0	2,482.9	2,458.3	2,455.1	6.5	5.5	-164.70	53.8	-154.9	346.9	336.1	10.81	32.107		
2,600.0	2,579.3	2,548.6	2,544.3	7.0	5.8	-163.76	65.7	-162.7	381.5	370.2	11.28	33.818		
2,700.0	2,675.3	2,637.8	2,632.2	7.5	6.0	-162.92	78.6	-171.1	418.0	406.2	11.79	35.440		
2,800.0	2,771.4	2,727.2	2,719.9	8.1	6.3	-162.09	92.6	-180.2	455.5	443.1	12.33	36.934		
2,900.0	2,867.4	2,819.5	2,810.6	8.6	6.6	-161.31	107.5	-189.9	493.3	480.4	12.89	38.264		
3,000.0	2,963.4	2,911.9	2,901.2	9.1	6.9	-160.64	122.3	-199.6	531.2	517.8	13.46	39.463		
3,100.0	3,059.5	3,004.3	2,991.9	9.7	7.2	-160.06	137.2	-209.3	569.2	555.1	14.04	40.540		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Stroh 13O-223
Project:	SEC.13-T4N-R67W	TVD Reference:	WELL @ 4818.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	MD Reference:	WELL @ 4818.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Stroh 13O-223	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 #3 (2-3-15)	Offset TVD Reference:	Offset Datum

Offset Design Stroh 13GK-HZ Pad Sec. 13-T4N-R67W - Stroh 13O-343 - Wellbore #1 - Plan #2 (1-28-15)													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 (ft)	Offset (ft)	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	
0.0	0.0	1.0	1.0	0.0	0.0	-90.00	0.0	-58.6	58.6	58.6	0.00	N/A		
100.0	100.0	101.0	101.0	0.1	0.1	-90.00	0.0	-58.6	58.6	58.3	0.23	257.987		
200.0	200.0	201.0	201.0	0.3	0.3	-90.00	0.0	-58.6	58.6	57.9	0.68	86.567		
300.0	300.0	301.0	301.0	0.6	0.6	-90.00	0.0	-58.6	58.6	57.4	1.13	52.009		
400.0	400.0	401.0	401.0	0.8	0.8	-90.00	0.0	-58.6	58.6	57.0	1.58	37.171		
500.0	500.0	501.0	501.0	1.0	1.0	-90.00	0.0	-58.6	58.6	56.5	2.03	28.920		
600.0	600.0	601.0	601.0	1.2	1.2	-90.00	0.0	-58.6	58.6	56.1	2.47	23.666		
700.0	700.0	701.0	701.0	1.5	1.5	-90.00	0.0	-58.6	58.6	55.6	2.92	20.028		
800.0	800.0	801.0	801.0	1.7	1.7	-90.00	0.0	-58.6	58.6	55.2	3.37	17.360		
900.0	900.0	901.0	901.0	1.9	1.9	-90.00	0.0	-58.6	58.6	54.7	3.82	15.318		
1,000.0	1,000.0	1,001.0	1,001.0	2.1	2.1	-90.00	0.0	-58.6	58.6	54.3	4.27	13.707 CC, ES		
1,100.0	1,100.0	1,101.0	1,101.0	2.3	2.4	-167.56	0.0	-58.6	59.4	54.7	4.71	12.612		
1,200.0	1,200.0	1,201.0	1,201.0	2.6	2.6	-168.08	0.0	-58.6	62.0	56.8	5.14	12.057		
1,300.0	1,299.9	1,300.9	1,300.9	2.8	2.8	-168.85	0.0	-58.6	66.3	60.7	5.57	11.892		
1,400.0	1,399.7	1,400.7	1,400.7	3.0	3.0	-169.77	0.0	-58.6	72.3	66.2	6.00	12.036		
1,500.0	1,499.4	1,500.4	1,500.4	3.2	3.3	-170.76	0.0	-58.6	80.0	73.5	6.44	12.429		
1,600.0	1,598.9	1,599.9	1,599.9	3.5	3.5	-171.73	0.0	-58.6	89.5	82.6	6.87	13.026		
1,700.0	1,698.3	1,699.3	1,699.3	3.7	3.7	-172.64	0.0	-58.6	100.7	93.4	7.30	13.790		
1,800.0	1,797.4	1,798.4	1,798.4	4.0	3.9	-173.47	0.0	-58.6	113.6	105.9	7.73	14.695		
1,900.0	1,896.3	1,899.4	1,899.4	4.3	4.1	-174.11	0.3	-57.8	127.5	119.4	8.16	15.628		
2,000.0	1,994.9	2,000.7	2,000.7	4.6	4.4	-174.51	1.4	-55.3	141.5	132.9	8.58	16.488		
2,100.0	2,093.3	2,102.3	2,102.2	4.9	4.6	-174.71	3.1	-51.2	155.4	146.4	9.00	17.266		
2,200.0	2,191.2	2,204.1	2,203.8	5.3	4.8	-174.78	5.5	-45.4	169.4	160.0	9.43	17.970		
2,300.0	2,288.9	2,306.2	2,305.5	5.7	5.0	-174.73	8.6	-37.9	183.4	173.6	9.86	18.607		
2,400.0	2,386.1	2,408.4	2,407.3	6.1	5.3	-174.60	12.4	-28.8	197.5	187.2	10.29	19.183		
2,500.0	2,482.9	2,511.0	2,509.2	6.5	5.5	-174.40	16.9	-17.9	211.5	200.8	10.73	19.703		
2,600.0	2,579.3	2,613.8	2,611.0	7.0	5.8	-174.14	22.2	-5.3	225.6	214.4	11.18	20.170		
2,700.0	2,675.3	2,716.9	2,713.0	7.5	6.1	-173.83	28.1	9.0	239.1	227.4	11.67	20.487		
2,800.0	2,771.4	2,820.4	2,815.0	8.1	6.4	-173.44	34.8	25.1	250.9	238.7	12.17	20.609		
2,900.0	2,867.4	2,921.7	2,914.6	8.6	6.7	-172.99	41.9	42.2	261.3	248.6	12.68	20.601		
3,000.0	2,963.4	3,021.1	3,012.3	9.1	7.0	-172.58	49.0	59.2	271.6	258.4	13.20	20.575		
3,100.0	3,059.5	3,120.6	3,110.1	9.7	7.3	-172.20	56.0	76.1	281.8	268.1	13.72	20.543		
3,200.0	3,155.5	3,220.0	3,207.8	10.2	7.7	-171.84	63.1	93.1	292.1	277.9	14.25	20.504		
3,300.0	3,251.5	3,319.5	3,305.6	10.8	8.0	-171.51	70.2	110.0	302.4	287.7	14.78	20.461		
3,400.0	3,347.6	3,418.9	3,403.3	11.3	8.3	-171.20	77.2	127.0	312.8	297.4	15.32	20.415		
3,500.0	3,443.6	3,518.4	3,501.0	11.9	8.7	-170.91	84.3	143.9	323.1	307.2	15.86	20.366		
3,600.0	3,539.6	3,617.8	3,598.8	12.5	9.1	-170.63	91.3	160.9	333.4	317.0	16.41	20.315		
3,700.0	3,635.7	3,717.3	3,696.5	13.0	9.4	-170.38	98.4	177.8	343.8	326.8	16.97	20.263		
3,800.0	3,731.7	3,816.8	3,794.3	13.6	9.8	-170.14	105.4	194.8	354.1	336.6	17.52	20.209		
3,900.0	3,827.7	3,916.2	3,892.0	14.2	10.2	-169.91	112.5	211.7	364.4	346.4	18.08	20.156		
4,000.0	3,923.8	4,015.7	3,989.8	14.7	10.5	-169.69	119.5	228.7	374.8	356.2	18.65	20.102		
4,100.0	4,019.8	4,115.1	4,087.5	15.3	10.9	-169.49	126.6	245.6	385.2	366.0	19.21	20.048		
4,200.0	4,115.8	4,214.6	4,185.2	15.9	11.3	-169.30	133.6	262.6	395.5	375.7	19.78	19.994		
4,300.0	4,211.9	4,314.0	4,283.0	16.5	11.7	-169.12	140.7	279.5	405.9	385.5	20.35	19.941		
4,400.0	4,307.9	4,413.5	4,380.7	17.0	12.1	-168.94	147.7	296.5	416.3	395.3	20.93	19.889		
4,500.0	4,403.9	4,512.9	4,478.5	17.6	12.5	-168.78	154.8	313.4	426.6	405.1	21.51	19.838		
4,600.0	4,500.0	4,612.4	4,576.2	18.2	12.8	-168.62	161.9	330.4	437.0	414.9	22.09	19.787		
4,700.0	4,596.0	4,711.8	4,674.0	18.8	13.2	-168.47	168.9	347.3	447.4	424.7	22.67	19.737		
4,800.0	4,692.0	4,811.3	4,771.7	19.4	13.6	-168.33	176.0	364.3	457.8	434.5	23.25	19.688		
4,900.0	4,788.1	4,910.7	4,869.4	19.9	14.0	-168.19	183.0	381.2	468.2	444.3	23.84	19.640		
5,000.0	4,884.1	5,010.2	4,967.2	20.5	14.4	-168.06	190.1	398.2	478.6	454.1	24.43	19.593		

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 Stroh 13O-223
Project:	SEC.13-T4N-R67W	TVD Reference:	WELL @ 4818.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	MD Reference:	WELL @ 4818.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Stroh 13O-223	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 #3 (2-3-15)	Offset TVD Reference:	Offset Datum

Offset Design Stroh 13GK-HZ Pad Sec. 13-T4N-R67W - Stroh 13O-343 - Wellbore #1 - Plan #2 (1-28-15)													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
5,100.0	4,980.1	5,109.6	5,064.9	21.1	14.8	-167.93		197.1	415.1	489.0	464.0	25.01	19.547	
5,200.0	5,076.2	5,209.1	5,162.7	21.7	15.2	-167.81		204.2	432.1	499.4	473.8	25.61	19.502	
5,300.0	5,172.2	5,308.5	5,260.4	22.3	15.6	-167.70		211.2	449.0	509.8	483.6	26.20	19.459	
5,400.0	5,268.2	5,408.0	5,358.2	22.9	16.0	-167.59		218.3	466.0	520.2	493.4	26.79	19.416	
5,500.0	5,364.3	5,507.4	5,455.9	23.4	16.4	-167.48		225.3	482.9	530.6	503.2	27.39	19.374	
5,600.0	5,460.5	5,607.0	5,553.7	24.0	16.8	-167.39		232.4	499.9	540.3	512.3	28.02	19.285	
5,700.0	5,557.5	5,706.7	5,651.8	24.4	17.2	-167.23		239.5	516.9	546.9	518.3	28.63	19.101	
5,800.0	5,655.3	5,806.6	5,750.0	24.7	17.6	-166.98		246.6	533.9	550.2	520.9	29.23	18.825	
5,900.0	5,753.8	5,900.0	5,841.9	25.1	17.9	-166.69		252.8	549.0	550.9	521.1	29.75	18.519	
5,930.7	5,784.1	5,920.8	5,862.5	25.1	18.0	-166.63		254.1	552.0	550.9	521.0	29.86	18.447	
6,000.0	5,852.9	5,979.8	5,920.8	25.3	18.2	-166.48		257.3	559.8	550.8	520.7	30.15	18.268	
6,100.0	5,952.3	6,064.8	6,005.2	25.6	18.4	-166.27		261.2	569.0	550.1	519.6	30.52	18.028	
6,200.0	6,052.1	6,149.8	6,089.9	25.7	18.6	-166.10		264.0	575.9	548.7	517.9	30.82	17.803	
6,300.0	6,152.0	6,234.9	6,174.8	25.9	18.7	-165.95		266.0	580.5	546.7	515.6	31.07	17.593	
6,400.0	6,252.0	6,320.1	6,260.0	26.0	18.9	-88.46		266.9	582.8	544.5	513.1	31.35	17.369	
6,462.6	6,314.6	6,375.7	6,315.6	26.0	18.9	91.59		267.0	583.1	544.2	512.6	31.56	17.243	
6,500.0	6,352.0	6,413.1	6,353.0	26.1	19.0	91.57		267.0	583.1	544.2	512.5	31.69	17.173	
6,600.0	6,451.6	6,513.8	6,453.7	26.2	19.1	92.37		266.1	583.1	544.4	512.3	32.13	16.946	
6,700.0	6,549.1	6,617.0	6,556.1	26.2	19.2	93.43		254.0	583.1	545.0	512.5	32.47	16.785	
6,800.0	6,643.0	6,721.7	6,657.4	26.2	19.3	94.42		227.7	583.1	545.6	513.0	32.66	16.708	
6,900.0	6,731.7	6,827.8	6,755.4	26.2	19.3	95.35		187.3	583.1	546.4	513.6	32.72	16.696	
7,000.0	6,813.5	6,935.3	6,847.9	26.2	19.3	96.18		132.9	583.1	547.2	514.4	32.74	16.714	
7,100.0	6,887.2	7,043.9	6,932.9	26.2	19.3	96.90		65.2	583.1	548.0	515.2	32.79	16.709	
7,200.0	6,951.5	7,153.7	7,008.0	26.3	19.3	97.49		-14.6	583.1	548.7	515.6	33.02	16.615	
7,300.0	7,005.2	7,264.3	7,071.4	26.4	19.4	97.95		-105.1	583.1	549.3	515.7	33.57	16.364	
7,400.0	7,047.4	7,375.5	7,121.3	26.6	19.6	98.25		-204.5	583.1	549.7	515.1	34.52	15.923	
7,500.0	7,077.5	7,487.2	7,156.4	26.9	20.1	98.40		-310.4	583.1	549.9	513.9	35.95	15.296	
7,600.0	7,094.8	7,599.0	7,175.7	27.3	20.8	98.39		-420.3	583.1	549.9	512.0	37.84	14.530	
7,700.0	7,099.3	7,707.5	7,179.3	27.8	21.7	98.27		-528.8	583.1	549.7	509.6	40.08	13.714	
7,800.0	7,098.7	7,807.5	7,178.6	28.5	22.7	98.25		-628.8	583.1	549.7	507.4	42.30	12.993	
7,900.0	7,098.1	7,907.5	7,177.8	29.3	23.8	98.24		-728.8	583.1	549.6	504.9	44.74	12.285	
8,000.0	7,097.4	8,007.5	7,177.1	30.2	25.0	98.23		-828.8	583.1	549.6	502.3	47.36	11.606	
8,100.0	7,096.8	8,107.5	7,176.4	31.2	26.3	98.22		-928.8	583.1	549.6	499.5	50.13	10.964	
8,200.0	7,096.2	8,207.5	7,175.6	32.3	27.7	98.20		-1,028.8	583.1	549.6	496.6	53.03	10.364	
8,300.0	7,095.6	8,307.5	7,174.9	33.5	29.2	98.19		-1,128.8	583.1	549.6	493.5	56.03	9.808	
8,400.0	7,095.0	8,407.5	7,174.2	34.8	30.7	98.18		-1,228.8	583.1	549.6	490.4	59.13	9.293	
8,500.0	7,094.4	8,507.5	7,173.4	36.1	32.2	98.17		-1,328.8	583.1	549.5	487.2	62.31	8.819	
8,600.0	7,093.8	8,607.5	7,172.7	37.5	33.8	98.15		-1,428.8	583.1	549.5	484.0	65.56	8.382	
8,700.0	7,093.2	8,707.5	7,172.0	39.0	35.4	98.14		-1,528.8	583.1	549.5	480.6	68.86	7.980	
8,800.0	7,092.6	8,807.5	7,171.2	40.4	37.1	98.13		-1,628.8	583.1	549.5	477.3	72.21	7.609	
8,900.0	7,092.0	8,907.5	7,170.5	42.0	38.8	98.11		-1,728.8	583.1	549.5	473.9	75.61	7.267	
9,000.0	7,091.3	9,007.5	7,169.8	43.5	40.4	98.10		-1,828.8	583.1	549.5	470.4	79.04	6.951	
9,100.0	7,090.7	9,107.5	7,169.0	45.1	42.2	98.09		-1,928.8	583.1	549.4	466.9	82.51	6.659	
9,200.0	7,090.1	9,207.5	7,168.3	46.7	43.9	98.08		-2,028.8	583.1	549.4	463.4	86.00	6.388	
9,300.0	7,089.5	9,307.5	7,167.6	48.3	45.6	98.06		-2,128.8	583.1	549.4	459.9	89.53	6.137	
9,400.0	7,088.9	9,407.5	7,166.8	50.0	47.4	98.05		-2,228.8	583.1	549.4	456.3	93.07	5.903	
9,500.0	7,088.3	9,507.5	7,166.1	51.7	49.2	98.04		-2,328.8	583.1	549.4	452.7	96.63	5.685	
9,600.0	7,087.7	9,607.5	7,165.4	53.4	50.9	98.03		-2,428.8	583.1	549.4	449.1	100.22	5.482	
9,700.0	7,087.1	9,707.5	7,164.6	55.1	52.7	98.01		-2,528.8	583.1	549.3	445.5	103.81	5.291	
9,800.0	7,086.5	9,807.5	7,163.9	56.8	54.5	98.00		-2,628.8	583.1	549.3	441.9	107.43	5.113	
9,900.0	7,085.8	9,907.5	7,163.2	58.5	56.3	97.99		-2,728.7	583.1	549.3	438.2	111.05	4.946	

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 Stroh 13O-223
Project:	SEC.13-T4N-R67W	TVD Reference:	WELL @ 4818.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	MD Reference:	WELL @ 4818.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Stroh 13O-223	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 #3 (2-3-15)	Offset TVD Reference:	Offset Datum

Offset Design Stroh 13GK-HZ Pad Sec. 13-T4N-R67W - Stroh 13O-343 - Wellbore #1 - Plan #2 (1-28-15)													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
10,000.0	7,085.2	10,007.5	7,162.4	60.3	58.2	97.98	97.98	-2,828.7	583.1	549.3	434.6	114.69	4.789	
10,100.0	7,084.6	10,107.5	7,161.7	62.0	60.0	97.96	97.96	-2,928.7	583.1	549.3	430.9	118.34	4.641	
10,200.0	7,084.0	10,207.5	7,161.0	63.8	61.8	97.95	97.95	-3,028.7	583.1	549.3	427.2	122.00	4.502	
10,300.0	7,083.4	10,307.5	7,160.2	65.6	63.6	97.94	97.94	-3,128.7	583.1	549.2	423.6	125.67	4.370	
10,400.0	7,082.8	10,407.5	7,159.5	67.3	65.5	97.93	97.93	-3,228.7	583.1	549.2	419.9	129.35	4.246	
10,500.0	7,082.2	10,507.5	7,158.8	69.1	67.3	97.91	97.91	-3,328.7	583.1	549.2	416.2	133.03	4.128	
10,600.0	7,081.6	10,607.5	7,158.0	70.9	69.2	97.90	97.90	-3,428.7	583.1	549.2	412.5	136.72	4.017	
10,700.0	7,081.0	10,707.5	7,157.3	72.7	71.0	97.89	97.89	-3,528.7	583.1	549.2	408.7	140.42	3.911	
10,800.0	7,080.3	10,807.5	7,156.6	74.5	72.9	97.87	97.87	-3,628.7	583.1	549.2	405.0	144.13	3.810	
10,900.0	7,079.7	10,907.5	7,155.8	76.3	74.7	97.86	97.86	-3,728.7	583.1	549.1	401.3	147.84	3.714	
11,000.0	7,079.1	11,007.5	7,155.1	78.2	76.6	97.85	97.85	-3,828.7	583.1	549.1	397.6	151.55	3.623	
11,100.0	7,078.5	11,107.5	7,154.4	80.0	78.4	97.84	97.84	-3,928.7	583.1	549.1	393.8	155.27	3.536	
11,200.0	7,077.9	11,207.5	7,153.6	81.8	80.3	97.82	97.82	-4,028.7	583.1	549.1	390.1	159.00	3.453	
11,300.0	7,077.3	11,307.5	7,152.9	83.6	82.2	97.81	97.81	-4,128.7	583.1	549.1	386.3	162.72	3.374	
11,400.0	7,076.7	11,407.5	7,152.2	85.5	84.0	97.80	97.80	-4,228.7	583.1	549.1	382.6	166.46	3.298	
11,500.0	7,076.1	11,507.5	7,151.5	87.3	85.9	97.79	97.79	-4,328.7	583.1	549.0	378.8	170.19	3.226	
11,600.0	7,075.5	11,607.5	7,150.7	89.2	87.8	97.77	97.77	-4,428.7	583.1	549.0	375.1	173.93	3.157	
11,700.0	7,074.8	11,707.5	7,150.0	91.0	89.7	97.76	97.76	-4,528.7	583.1	549.0	371.3	177.68	3.090	
11,800.0	7,074.2	11,807.5	7,149.3	92.8	91.5	97.75	97.75	-4,628.7	583.1	549.0	367.6	181.42	3.026	
11,900.0	7,073.6	11,907.5	7,148.5	94.7	93.4	97.74	97.74	-4,728.7	583.1	549.0	363.8	185.17	2.965	
12,000.0	7,073.0	12,007.5	7,147.8	96.6	95.3	97.72	97.72	-4,828.7	583.1	549.0	360.0	188.92	2.906	
12,100.0	7,072.4	12,107.5	7,147.1	98.4	97.2	97.71	97.71	-4,928.7	583.1	548.9	356.3	192.68	2.849	
12,200.0	7,071.8	12,207.5	7,146.3	100.3	99.1	97.70	97.70	-5,028.7	583.1	548.9	352.5	196.43	2.794	
12,300.0	7,071.2	12,307.5	7,145.6	102.1	100.9	97.69	97.69	-5,128.7	583.1	548.9	348.7	200.19	2.742	
12,400.0	7,070.6	12,407.5	7,144.9	104.0	102.8	97.67	97.67	-5,228.7	583.1	548.9	344.9	203.95	2.691	
12,500.0	7,070.0	12,507.5	7,144.1	105.9	104.7	97.66	97.66	-5,328.7	583.1	548.9	341.2	207.72	2.642	
12,600.0	7,069.3	12,607.5	7,143.4	107.7	106.6	97.65	97.65	-5,428.7	583.1	548.9	337.4	211.48	2.595	
12,700.0	7,068.7	12,707.5	7,142.7	109.6	108.5	97.63	97.63	-5,528.7	583.1	548.8	333.6	215.25	2.550	
12,800.0	7,068.1	12,807.5	7,141.9	111.5	110.4	97.62	97.62	-5,628.7	583.1	548.8	329.8	219.02	2.506	
12,900.0	7,067.5	12,907.5	7,141.2	113.3	112.3	97.61	97.61	-5,728.7	583.1	548.8	326.0	222.79	2.463	
13,000.0	7,066.9	13,007.5	7,140.5	115.2	114.2	97.60	97.60	-5,828.7	583.1	548.8	322.2	226.56	2.422	
13,100.0	7,066.3	13,107.5	7,139.7	117.1	116.1	97.58	97.58	-5,928.7	583.1	548.8	318.4	230.34	2.382	
13,200.0	7,065.7	13,207.5	7,139.0	119.0	118.0	97.57	97.57	-6,028.7	583.1	548.8	314.6	234.11	2.344	
13,300.0	7,065.1	13,307.5	7,138.3	120.8	119.9	97.56	97.56	-6,128.7	583.1	548.7	310.9	237.89	2.307	
13,400.0	7,064.5	13,407.5	7,137.5	122.7	121.8	97.55	97.55	-6,228.7	583.1	548.7	307.1	241.67	2.271	
13,500.0	7,063.9	13,507.5	7,136.8	124.6	123.7	97.53	97.53	-6,328.6	583.1	548.7	303.3	245.45	2.236	
13,600.0	7,063.2	13,607.5	7,136.1	126.5	125.6	97.52	97.52	-6,428.6	583.1	548.7	299.5	249.23	2.202	
13,700.0	7,062.6	13,707.5	7,135.3	128.4	127.4	97.51	97.51	-6,528.6	583.1	548.7	295.7	253.01	2.169	
13,800.0	7,062.0	13,807.5	7,134.6	130.2	129.3	97.50	97.50	-6,628.6	583.1	548.7	291.9	256.79	2.137	
13,900.0	7,061.4	13,907.5	7,133.9	132.1	131.2	97.48	97.48	-6,728.6	583.1	548.6	288.1	260.58	2.105	
14,000.0	7,060.8	14,007.5	7,133.1	134.0	133.1	97.47	97.47	-6,828.6	583.1	548.6	284.3	264.36	2.075	
14,100.0	7,060.2	14,107.5	7,132.4	135.9	135.0	97.46	97.46	-6,928.6	583.1	548.6	280.5	268.15	2.046	
14,200.0	7,059.6	14,207.5	7,131.7	137.8	136.9	97.45	97.45	-7,028.6	583.1	548.6	276.7	271.94	2.017	
14,267.3	7,059.2	14,274.8	7,131.2	139.1	138.2	97.44	97.44	-7,095.9	583.1	548.6	274.1	274.49	1.999	
14,294.0	7,059.0	14,297.4	7,131.0	139.6	138.7	97.43	97.43	-7,118.5	583.1	548.6	273.2	275.42	1.992 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Stroh 13O-223
Project:	SEC.13-T4N-R67W	TVD Reference:	WELL @ 4818.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	MD Reference:	WELL @ 4818.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Stroh 13O-223	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 #3 (2-3-15)	Offset TVD Reference:	Offset Datum

Offset Design Stroh 13GK-HZ Pad Sec.13-T4N-R67W - Stroh 13O-403 - Wellbore #1 - Plan #3 (2-3-15)													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
0.0	0.0	1.0	1.0	0.0	0.0	-89.99	-89.99	0.0	-27.9	27.9	27.9	0.00	N/A	
100.0	100.0	101.0	101.0	0.1	0.1	-89.99	-89.99	0.0	-27.9	27.9	27.7	0.23	122.851	
200.0	200.0	201.0	201.0	0.3	0.3	-89.99	-89.99	0.0	-27.9	27.9	27.2	0.68	41.222	
300.0	300.0	301.0	301.0	0.6	0.6	-89.99	-89.99	0.0	-27.9	27.9	26.8	1.13	24.766	
400.0	400.0	401.0	401.0	0.8	0.8	-89.99	-89.99	0.0	-27.9	27.9	26.3	1.58	17.700	
500.0	500.0	501.0	501.0	1.0	1.0	-89.99	-89.99	0.0	-27.9	27.9	25.9	2.03	13.771	
600.0	600.0	601.0	601.0	1.2	1.2	-89.99	-89.99	0.0	-27.9	27.9	25.4	2.47	11.270	
700.0	700.0	701.0	701.0	1.5	1.5	-89.99	-89.99	0.0	-27.9	27.9	25.0	2.92	9.537	
800.0	800.0	801.0	801.0	1.7	1.7	-89.99	-89.99	0.0	-27.9	27.9	24.5	3.37	8.266	
900.0	900.0	901.0	901.0	1.9	1.9	-89.99	-89.99	0.0	-27.9	27.9	24.1	3.82	7.294	
1,000.0	1,000.0	1,001.0	1,001.0	2.1	2.1	-89.99	-89.99	0.0	-27.9	27.9	23.6	4.27	6.527 CC, ES	
1,100.0	1,100.0	1,101.0	1,101.0	2.3	2.4	-167.75	-167.75	0.0	-27.9	28.7	24.0	4.71	6.101	
1,200.0	1,200.0	1,201.0	1,201.0	2.6	2.6	-168.76	-168.76	0.0	-27.9	31.3	26.2	5.14	6.090	
1,300.0	1,299.9	1,300.9	1,300.9	2.8	2.8	-170.12	-170.12	0.0	-27.9	35.6	30.0	5.57	6.389	
1,400.0	1,399.7	1,400.7	1,400.7	3.0	3.0	-171.56	-171.56	0.0	-27.9	41.6	35.6	6.00	6.933	
1,500.0	1,499.4	1,500.4	1,500.4	3.2	3.3	-172.88	-172.88	0.0	-27.9	49.4	43.0	6.44	7.676	
1,600.0	1,598.9	1,599.9	1,599.9	3.5	3.5	-174.03	-174.03	0.0	-27.9	58.9	52.1	6.87	8.579	
1,700.0	1,698.3	1,700.5	1,700.5	3.7	3.7	-174.89	-174.89	0.2	-27.0	69.3	62.0	7.29	9.508	
1,800.0	1,797.4	1,801.2	1,801.2	4.0	3.9	-175.47	-175.47	0.9	-24.5	79.7	72.0	7.71	10.348	
1,900.0	1,896.3	1,902.2	1,902.0	4.3	4.1	-175.86	-175.86	2.1	-20.2	90.2	82.0	8.12	11.098	
2,000.0	1,994.9	2,003.3	2,003.0	4.6	4.3	-176.11	-176.11	3.8	-14.2	100.6	92.0	8.54	11.769	
2,100.0	2,093.3	2,104.6	2,104.0	4.9	4.6	-176.28	-176.28	5.9	-6.5	111.0	102.0	8.97	12.370	
2,200.0	2,191.2	2,206.1	2,205.0	5.3	4.8	-176.37	-176.37	8.5	3.0	121.3	111.9	9.40	12.909	
2,300.0	2,288.9	2,307.8	2,306.0	5.7	5.1	-176.41	-176.41	11.6	14.2	131.7	121.9	9.83	13.393	
2,400.0	2,386.1	2,409.7	2,407.0	6.1	5.3	-176.41	-176.41	15.2	27.2	142.0	131.8	10.27	13.826	
2,500.0	2,482.9	2,511.8	2,507.9	6.5	5.6	-176.37	-176.37	19.2	41.9	152.3	141.6	10.72	14.214	
2,600.0	2,579.3	2,614.0	2,608.7	7.0	5.9	-176.31	-176.31	23.7	58.4	162.6	151.5	11.17	14.559	
2,700.0	2,675.3	2,716.5	2,709.5	7.5	6.2	-176.22	-176.22	28.8	76.7	172.3	160.6	11.66	14.777	
2,800.0	2,771.4	2,819.4	2,810.2	8.1	6.6	-176.07	-176.07	34.3	96.7	180.2	168.1	12.17	14.815	
2,900.0	2,867.4	2,922.4	2,910.7	8.6	7.0	-175.86	-175.86	40.3	118.6	186.4	173.7	12.68	14.698	
3,000.0	2,963.4	3,025.7	3,011.1	9.1	7.4	-175.60	-175.60	46.8	142.3	190.8	177.6	13.21	14.445	
3,100.0	3,059.5	3,126.2	3,108.4	9.7	7.8	-175.32	-175.32	53.5	166.4	194.0	180.3	13.73	14.126	
3,200.0	3,155.5	3,226.2	3,205.2	10.2	8.2	-175.05	-175.05	60.1	190.4	197.2	182.9	14.27	13.824	
3,300.0	3,251.5	3,326.1	3,302.0	10.8	8.7	-174.78	-174.78	66.7	214.4	200.4	185.6	14.80	13.539	
3,400.0	3,347.6	3,426.0	3,398.8	11.3	9.1	-174.52	-174.52	73.3	238.4	203.6	188.3	15.35	13.269	
3,500.0	3,443.6	3,526.0	3,495.6	11.9	9.6	-174.27	-174.27	79.9	262.4	206.8	190.9	15.89	13.015	
3,600.0	3,539.6	3,625.9	3,592.4	12.5	10.0	-174.03	-174.03	86.5	286.4	210.1	193.6	16.44	12.774	
3,700.0	3,635.7	3,725.9	3,689.2	13.0	10.5	-173.80	-173.80	93.1	310.4	213.3	196.3	17.00	12.545	
3,800.0	3,731.7	3,825.8	3,785.9	13.6	11.0	-173.57	-173.57	99.7	334.4	216.5	198.9	17.56	12.329	
3,900.0	3,827.7	3,925.8	3,882.7	14.2	11.5	-173.35	-173.35	106.3	358.4	219.7	201.6	18.13	12.123	
4,000.0	3,923.8	4,025.7	3,979.5	14.7	12.0	-173.14	-173.14	112.9	382.4	223.0	204.3	18.69	11.928	
4,100.0	4,019.8	4,125.7	4,076.3	15.3	12.5	-172.93	-172.93	119.5	406.4	226.2	206.9	19.26	11.742	
4,200.0	4,115.8	4,225.6	4,173.1	15.9	13.0	-172.73	-172.73	126.1	430.4	229.4	209.6	19.84	11.566	
4,300.0	4,211.9	4,325.5	4,269.9	16.5	13.5	-172.53	-172.53	132.7	454.4	232.7	212.3	20.42	11.397	
4,400.0	4,307.9	4,425.5	4,366.7	17.0	14.0	-172.34	-172.34	139.3	478.4	235.9	214.9	21.00	11.237	
4,500.0	4,403.9	4,525.4	4,463.5	17.6	14.5	-172.15	-172.15	145.9	502.4	239.2	217.6	21.58	11.084	
4,600.0	4,500.0	4,625.4	4,560.3	18.2	15.0	-171.97	-171.97	152.5	526.4	242.4	220.3	22.16	10.938	
4,700.0	4,596.0	4,725.3	4,657.1	18.8	15.5	-171.80	-171.80	159.1	550.4	245.7	222.9	22.75	10.798	
4,800.0	4,692.0	4,825.3	4,753.9	19.4	16.0	-171.62	-171.62	165.7	574.4	248.9	225.6	23.34	10.664	
4,900.0	4,788.1	4,925.2	4,850.7	19.9	16.5	-171.46	-171.46	172.3	598.4	252.2	228.3	23.94	10.536	
5,000.0	4,884.1	5,025.2	4,947.5	20.5	17.0	-171.30	-171.30	178.9	622.4	255.5	230.9	24.53	10.413	

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 Stroh 130-223
Project:	SEC.13-T4N-R67W	TVD Reference:	WELL @ 4818.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	MD Reference:	WELL @ 4818.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Stroh 130-223	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 #3 (2-3-15)	Offset TVD Reference:	Offset Datum

Offset Design Stroh 13GK-HZ Pad Sec.13-T4N-R67W - Stroh 130-403 - Wellbore #1 - Plan #3 (2-3-15)													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	4,980.1	5,125.1	5,044.3	21.1	17.5	-171.14		185.5	646.4	258.7	233.6	25.13	10.296	
5,200.0	5,076.2	5,225.0	5,141.1	21.7	18.0	-170.98		192.1	670.4	262.0	236.3	25.73	10.183	
5,300.0	5,172.2	5,325.0	5,237.9	22.3	18.6	-170.83		198.7	694.4	265.2	238.9	26.33	10.074	
5,400.0	5,268.2	5,424.9	5,334.7	22.9	19.1	-170.68		205.3	718.4	268.5	241.6	26.93	9.970	
5,500.0	5,364.3	5,524.9	5,431.4	23.4	19.6	-170.54		212.0	742.4	271.8	244.2	27.54	9.870	
5,600.0	5,460.5	5,624.8	5,528.3	24.0	20.1	-170.38		218.6	766.4	274.4	246.2	28.17	9.739	
5,700.0	5,557.5	5,724.8	5,625.1	24.4	20.6	-170.10		225.2	790.4	273.8	245.0	28.79	9.510	
5,800.0	5,655.3	5,821.6	5,718.9	24.7	21.1	-169.71		231.5	813.5	270.0	240.7	29.37	9.195	
5,900.0	5,753.8	5,913.2	5,808.2	25.1	21.4	-169.30		236.9	833.1	265.3	235.5	29.86	8.886	
6,000.0	5,852.9	6,004.9	5,898.1	25.3	21.7	-168.90		241.6	850.0	260.3	230.0	30.30	8.591	
6,100.0	5,952.3	6,100.0	5,992.1	25.6	22.0	-168.49		245.6	864.6	255.0	224.3	30.70	8.306	
6,200.0	6,052.1	6,188.7	6,080.0	25.7	22.3	-168.11		248.5	875.4	249.4	218.3	31.03	8.035	
6,300.0	6,152.0	6,280.8	6,171.7	25.9	22.5	-167.71		250.9	883.9	243.4	212.1	31.32	7.772	
6,400.0	6,252.0	6,373.2	6,263.9	26.0	22.6	-89.96		252.4	889.6	237.7	206.0	31.65	7.511	
6,500.0	6,352.0	6,465.8	6,356.4	26.1	22.8	90.29		253.2	892.4	234.7	202.7	32.02	7.329	
6,546.7	6,398.7	6,509.3	6,400.0	26.1	22.8	90.89		253.3	892.7	234.4	202.1	32.26	7.265	
6,600.0	6,451.6	6,561.9	6,452.6	26.2	22.9	92.39		253.3	892.7	234.5	201.8	32.70	7.172	
6,700.0	6,549.1	6,660.9	6,551.6	26.2	23.0	97.26		252.5	892.7	236.3	202.4	33.97	6.958	
6,800.0	6,643.0	6,763.9	6,653.8	26.2	23.1	102.63		240.7	892.7	240.5	205.3	35.20	6.831	
6,900.0	6,731.7	6,870.4	6,756.9	26.2	23.1	107.69		214.2	892.7	246.5	210.6	35.96	6.856	
7,000.0	6,813.5	6,980.7	6,858.6	26.2	23.1	112.30		172.0	892.7	254.1	218.0	36.10	7.038	
7,100.0	6,887.2	7,094.9	6,956.5	26.2	23.1	116.36		113.3	892.7	262.5	226.8	35.65	7.362	
7,200.0	6,951.5	7,212.9	7,047.3	26.3	23.2	119.82		38.0	892.7	271.1	236.2	34.82	7.785	
7,300.0	7,005.2	7,334.7	7,127.6	26.4	23.2	122.65		-53.4	892.7	279.1	245.1	34.00	8.209	
7,400.0	7,047.4	7,459.9	7,194.0	26.6	23.4	124.83		-159.3	892.7	286.0	252.5	33.53	8.530	
7,500.0	7,077.5	7,587.7	7,243.1	26.9	23.7	126.35		-277.2	892.7	291.2	257.2	33.95	8.577	
7,600.0	7,094.8	7,717.4	7,272.1	27.3	24.2	127.21		-403.4	892.7	294.3	258.8	35.50	8.289	
7,700.0	7,099.3	7,842.7	7,279.6	27.8	25.0	127.43		-528.4	892.7	295.1	257.0	38.02	7.761	
7,800.0	7,098.7	7,942.7	7,279.5	28.5	25.8	127.51		-628.4	892.7	295.4	255.5	39.92	7.400	
7,900.0	7,098.1	8,042.7	7,279.5	29.3	26.7	127.59		-728.4	892.7	295.7	253.8	41.96	7.047	
8,000.0	7,097.4	8,142.7	7,279.4	30.2	27.8	127.67		-828.4	892.7	296.1	251.9	44.14	6.708	
8,100.0	7,096.8	8,242.7	7,279.3	31.2	28.9	127.76		-928.3	892.7	296.4	250.0	46.42	6.385	
8,200.0	7,096.2	8,342.7	7,279.3	32.3	30.2	127.84		-1,028.3	892.7	296.7	247.9	48.79	6.081	
8,300.0	7,095.6	8,442.7	7,279.2	33.5	31.5	127.92		-1,128.3	892.7	297.1	245.8	51.24	5.797	
8,400.0	7,095.0	8,542.7	7,279.1	34.8	32.8	128.00		-1,228.3	892.7	297.4	243.6	53.76	5.531	
8,500.0	7,094.4	8,642.7	7,279.0	36.1	34.3	128.09		-1,328.3	892.7	297.7	241.4	56.34	5.284	
8,600.0	7,093.8	8,742.7	7,279.0	37.5	35.7	128.17		-1,428.3	892.7	298.1	239.1	58.97	5.054	
8,700.0	7,093.2	8,842.7	7,278.9	39.0	37.3	128.25		-1,528.3	892.7	298.4	236.7	61.64	4.841	
8,800.0	7,092.6	8,942.7	7,278.8	40.4	38.8	128.33		-1,628.3	892.7	298.7	234.4	64.34	4.643	
8,900.0	7,092.0	9,042.7	7,278.8	42.0	40.4	128.41		-1,728.3	892.7	299.1	232.0	67.07	4.459	
9,000.0	7,091.3	9,142.7	7,278.7	43.5	42.0	128.49		-1,828.3	892.7	299.4	229.6	69.83	4.287	
9,100.0	7,090.7	9,242.7	7,278.6	45.1	43.7	128.57		-1,928.3	892.7	299.7	227.1	72.62	4.127	
9,200.0	7,090.1	9,342.7	7,278.6	46.7	45.3	128.66		-2,028.3	892.7	300.1	224.6	75.42	3.979	
9,300.0	7,089.5	9,442.7	7,278.5	48.3	47.0	128.74		-2,128.3	892.7	300.4	222.2	78.24	3.840	
9,400.0	7,088.9	9,542.7	7,278.4	50.0	48.7	128.82		-2,228.3	892.7	300.7	219.7	81.07	3.710	
9,500.0	7,088.3	9,642.7	7,278.3	51.7	50.4	128.90		-2,328.3	892.7	301.1	217.2	83.92	3.588	
9,600.0	7,087.7	9,742.7	7,278.3	53.4	52.2	128.98		-2,428.3	892.7	301.4	214.6	86.78	3.474	
9,700.0	7,087.1	9,842.7	7,278.2	55.1	53.9	129.06		-2,528.3	892.7	301.8	212.1	89.64	3.366	
9,800.0	7,086.5	9,942.7	7,278.1	56.8	55.7	129.14		-2,628.3	892.7	302.1	209.6	92.51	3.265	
9,900.0	7,085.8	10,042.7	7,278.1	58.5	57.4	129.22		-2,728.3	892.7	302.4	207.1	95.39	3.171	
10,000.0	7,085.2	10,142.7	7,278.0	60.3	59.2	129.30		-2,828.3	892.7	302.8	204.5	98.28	3.081	

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 Stroh 13O-223
Project:	SEC.13-T4N-R67W	TVD Reference:	WELL @ 4818.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	MD Reference:	WELL @ 4818.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Stroh 13O-223	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 #3 (2-3-15)	Offset TVD Reference:	Offset Datum

Offset Design Stroh 13GK-HZ Pad Sec.13-T4N-R67W - Stroh 13O-403 - Wellbore #1 - Plan #3 (2-3-15)													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 (ft)	Offset (ft)	Semi Major Axis (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
10,100.0	7,084.6	10,242.7	7,277.9	62.0	61.0	129.37	129.37	-2,928.3	892.7	303.1	202.0	101.17	2.996	
10,200.0	7,084.0	10,342.7	7,277.9	63.8	62.8	129.45	129.45	-3,028.3	892.7	303.5	199.4	104.06	2.916	
10,300.0	7,083.4	10,442.7	7,277.8	65.6	64.6	129.53	129.53	-3,128.3	892.7	303.8	196.9	106.96	2.841	
10,400.0	7,082.8	10,542.7	7,277.7	67.3	66.4	129.61	129.61	-3,228.3	892.7	304.2	194.3	109.85	2.769	
10,500.0	7,082.2	10,642.7	7,277.6	69.1	68.2	129.69	129.69	-3,328.3	892.7	304.5	191.8	112.75	2.701	
10,600.0	7,081.6	10,742.7	7,277.6	70.9	70.0	129.77	129.77	-3,428.3	892.7	304.9	189.2	115.65	2.636	
10,700.0	7,081.0	10,842.7	7,277.5	72.7	71.9	129.85	129.85	-3,528.3	892.7	305.2	186.7	118.55	2.574	
10,800.0	7,080.3	10,942.7	7,277.4	74.5	73.7	129.92	129.92	-3,628.3	892.7	305.6	184.1	121.45	2.516	
10,900.0	7,079.7	11,042.7	7,277.4	76.3	75.5	130.00	130.00	-3,728.3	892.7	305.9	181.5	124.35	2.460	
11,000.0	7,079.1	11,142.7	7,277.3	78.2	77.4	130.08	130.08	-3,828.3	892.7	306.2	179.0	127.25	2.407	
11,100.0	7,078.5	11,242.7	7,277.2	80.0	79.2	130.16	130.16	-3,928.3	892.7	306.6	176.4	130.15	2.356	
11,200.0	7,077.9	11,342.7	7,277.2	81.8	81.0	130.23	130.23	-4,028.3	892.7	306.9	173.9	133.05	2.307	
11,300.0	7,077.3	11,442.7	7,277.1	83.6	82.9	130.31	130.31	-4,128.3	892.7	307.3	171.3	135.95	2.260	
11,400.0	7,076.7	11,542.6	7,277.0	85.5	84.7	130.39	130.39	-4,228.3	892.7	307.6	168.8	138.84	2.216	
11,500.0	7,076.1	11,642.6	7,276.9	87.3	86.6	130.46	130.46	-4,328.3	892.7	308.0	166.3	141.73	2.173	
11,600.0	7,075.5	11,742.6	7,276.9	89.2	88.4	130.54	130.54	-4,428.3	892.7	308.3	163.7	144.62	2.132	
11,700.0	7,074.8	11,842.6	7,276.8	91.0	90.3	130.62	130.62	-4,528.3	892.7	308.7	161.2	147.51	2.093	
11,800.0	7,074.2	11,942.6	7,276.7	92.8	92.2	130.69	130.69	-4,628.3	892.7	309.1	158.7	150.40	2.055	
11,900.0	7,073.6	12,042.6	7,276.7	94.7	94.0	130.77	130.77	-4,728.3	892.7	309.4	156.1	153.28	2.019	
12,000.0	7,073.0	12,142.6	7,276.6	96.6	95.9	130.84	130.84	-4,828.3	892.7	309.8	153.6	156.16	1.984	
12,100.0	7,072.4	12,242.6	7,276.5	98.4	97.8	130.92	130.92	-4,928.3	892.7	310.1	151.1	159.03	1.950	
12,200.0	7,071.8	12,342.6	7,276.5	100.3	99.6	131.00	131.00	-5,028.3	892.7	310.5	148.6	161.91	1.918	
12,300.0	7,071.2	12,442.6	7,276.4	102.1	101.5	131.07	131.07	-5,128.3	892.7	310.8	146.0	164.78	1.886	
12,400.0	7,070.6	12,542.6	7,276.3	104.0	103.4	131.15	131.15	-5,228.3	892.7	311.2	143.5	167.65	1.856	
12,500.0	7,070.0	12,642.6	7,276.2	105.9	105.3	131.22	131.22	-5,328.3	892.7	311.5	141.0	170.51	1.827	
12,600.0	7,069.3	12,742.6	7,276.2	107.7	107.1	131.30	131.30	-5,428.3	892.7	311.9	138.5	173.37	1.799	
12,700.0	7,068.7	12,842.6	7,276.1	109.6	109.0	131.37	131.37	-5,528.3	892.7	312.2	136.0	176.23	1.772	
12,800.0	7,068.1	12,942.6	7,276.0	111.5	110.9	131.44	131.44	-5,628.3	892.7	312.6	133.5	179.08	1.746	
12,900.0	7,067.5	13,042.6	7,276.0	113.3	112.8	131.52	131.52	-5,728.3	892.7	313.0	131.0	181.93	1.720	
13,000.0	7,066.9	13,142.6	7,275.9	115.2	114.7	131.59	131.59	-5,828.3	892.7	313.3	128.5	184.77	1.696	
13,100.0	7,066.3	13,242.6	7,275.8	117.1	116.5	131.67	131.67	-5,928.3	892.7	313.7	126.1	187.62	1.672	
13,200.0	7,065.7	13,342.6	7,275.8	119.0	118.4	131.74	131.74	-6,028.3	892.7	314.0	123.6	190.45	1.649	
13,300.0	7,065.1	13,442.6	7,275.7	120.8	120.3	131.81	131.81	-6,128.3	892.7	314.4	121.1	193.29	1.627	
13,400.0	7,064.5	13,542.6	7,275.6	122.7	122.2	131.89	131.89	-6,228.3	892.7	314.8	118.6	196.12	1.605	
13,500.0	7,063.9	13,642.6	7,275.6	124.6	124.1	131.96	131.96	-6,328.3	892.7	315.1	116.2	198.95	1.584	
13,600.0	7,063.2	13,742.6	7,275.5	126.5	126.0	132.03	132.03	-6,428.3	892.7	315.5	113.7	201.77	1.564	
13,700.0	7,062.6	13,842.6	7,275.4	128.4	127.9	132.11	132.11	-6,528.3	892.7	315.8	111.3	204.59	1.544	
13,800.0	7,062.0	13,942.6	7,275.3	130.2	129.8	132.18	132.18	-6,628.3	892.7	316.2	108.8	207.40	1.525	
13,900.0	7,061.4	14,042.6	7,275.3	132.1	131.6	132.25	132.25	-6,728.3	892.7	316.6	106.4	210.21	1.506	
14,000.0	7,060.8	14,142.6	7,275.2	134.0	133.5	132.32	132.32	-6,828.3	892.7	316.9	103.9	213.01	1.488 Level 3	
14,100.0	7,060.2	14,242.6	7,275.1	135.9	135.4	132.40	132.40	-6,928.3	892.7	317.3	101.5	215.82	1.470 Level 3	
14,200.0	7,059.6	14,342.6	7,275.1	137.8	137.3	132.47	132.47	-7,028.3	892.7	317.7	99.1	218.61	1.453 Level 3	
14,294.0	7,059.0	14,432.9	7,275.0	139.6	139.0	132.53	132.53	-7,118.5	892.7	318.0	96.8	221.19	1.438 Level 3, SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Stroh 130-223
Project:	SEC.13-T4N-R67W	TVD Reference:	WELL @ 4818.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	MD Reference:	WELL @ 4818.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Stroh 130-223	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 #3 (2-3-15)	Offset TVD Reference:	Offset Datum

Offset Design Stroh O13-21D Sec.13-T4N-R67W - Stroh O13-21D - Stroh O13-21D - Stroh O13-21D													Offset Site Error:	0.0 ft
Survey Program: 475-Reference													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
0.0	0.0	3.0	3.0	0.0	0.0	139.62	-327.9	278.9	430.4					
100.0	100.0	103.3	103.3	0.1	0.1	139.61	-327.8	278.9	430.4	430.2	0.23	1,882.798		
200.0	200.0	203.6	203.6	0.3	0.2	139.61	-327.7	278.8	430.3	429.7	0.57	760.239		
300.0	300.0	303.9	303.9	0.6	0.3	139.61	-327.6	278.7	430.1	429.2	0.90	476.105		
400.0	400.0	404.2	404.2	0.8	0.5	139.60	-327.3	278.6	429.9	428.6	1.24	346.438		
500.0	500.0	504.7	504.7	1.0	0.6	139.59	-327.1	278.4	429.5	427.9	1.61	266.864		
600.0	600.0	605.7	605.7	1.2	0.8	139.61	-326.8	278.0	429.0	427.0	2.05	208.961		
700.0	700.0	705.9	705.9	1.5	1.0	139.64	-326.4	277.4	428.4	425.9	2.49	172.152		
800.0	800.0	806.4	806.4	1.7	1.2	139.65	-325.9	276.9	427.6	424.7	2.93	146.133		
900.0	900.0	906.9	906.9	1.9	1.5	139.67	-325.4	276.2	426.8	423.4	3.37	126.727		
1,000.0	1,000.0	1,007.3	1,007.3	2.1	1.7	139.71	-324.8	275.3	425.8	422.0	3.81	111.718		
1,100.0	1,100.0	1,107.7	1,107.6	2.3	1.9	62.51	-324.3	274.3	424.4	420.1	4.24	99.996		
1,200.0	1,200.0	1,208.3	1,208.2	2.6	2.1	62.94	-323.9	273.0	422.0	417.3	4.67	90.397		
1,300.0	1,299.9	1,310.4	1,310.4	2.8	2.3	63.65	-323.3	271.3	418.6	413.5	5.10	82.100		
1,400.0	1,399.7	1,412.5	1,412.4	3.0	2.6	64.48	-321.7	269.8	413.8	408.2	5.53	74.763		
1,500.0	1,499.4	1,509.9	1,509.8	3.2	2.8	65.49	-319.9	268.6	408.2	402.2	5.96	68.450		
1,600.0	1,598.9	1,602.6	1,602.5	3.5	2.9	66.50	-318.3	269.0	403.2	396.8	6.38	63.230		
1,700.0	1,698.3	1,700.0	1,699.9	3.7	3.1	67.51	-316.6	271.9	399.1	392.3	6.81	58.580		
1,800.0	1,797.4	1,805.2	1,804.9	4.0	3.3	68.56	-313.0	276.5	393.8	386.5	7.30	53.975		
1,900.0	1,896.3	1,902.0	1,901.4	4.3	3.6	69.61	-308.6	281.6	387.6	379.8	7.78	49.805		
2,000.0	1,994.9	2,000.2	1,999.3	4.6	3.8	70.75	-304.0	288.2	381.7	373.4	8.30	46.006		
2,100.0	2,093.3	2,102.2	2,100.7	4.9	4.0	71.82	-297.5	297.2	374.9	366.1	8.86	42.321		
2,200.0	2,191.2	2,205.5	2,203.2	5.3	4.3	73.07	-289.8	306.7	367.1	357.6	9.47	38.777		
2,300.0	2,288.9	2,304.8	2,301.9	5.7	4.5	74.61	-281.8	315.5	358.1	348.0	10.10	35.465		
2,400.0	2,386.1	2,405.9	2,402.0	6.1	4.8	76.28	-272.7	325.7	348.8	338.0	10.78	32.359		
2,500.0	2,482.9	2,508.5	2,503.5	6.5	5.1	78.19	-262.3	336.7	338.6	327.1	11.52	29.405		
2,600.0	2,579.3	2,611.4	2,604.7	7.0	5.4	80.02	-249.3	349.8	327.0	314.7	12.31	26.563		
2,700.0	2,675.3	2,716.6	2,707.3	7.5	5.8	81.31	-233.2	367.0	314.3	301.2	13.18	23.852		
2,800.0	2,771.4	2,815.0	2,802.3	8.1	6.1	81.98	-215.4	385.4	300.2	286.1	14.05	21.360		
2,900.0	2,867.4	2,912.1	2,896.4	8.6	6.5	82.95	-199.1	402.7	286.8	271.9	14.91	19.235		
3,000.0	2,963.4	3,011.5	2,992.9	9.1	6.9	84.22	-182.9	419.7	273.9	258.1	15.81	17.322		
3,100.0	3,059.5	3,111.7	3,089.7	9.7	7.3	85.01	-165.5	439.5	260.9	244.1	16.76	15.566		
3,200.0	3,155.5	3,214.4	3,188.5	10.2	7.8	85.78	-146.5	459.8	246.8	229.0	17.73	13.915		
3,300.0	3,251.5	3,313.9	3,283.9	10.8	8.3	86.32	-126.7	480.2	231.7	212.9	18.72	12.374		
3,400.0	3,347.6	3,413.3	3,378.8	11.3	8.8	86.68	-106.7	501.6	216.6	196.9	19.73	10.978		
3,500.0	3,443.6	3,510.0	3,471.3	11.9	9.3	87.05	-87.4	522.4	201.7	181.0	20.72	9.735		
3,600.0	3,539.6	3,608.0	3,565.0	12.5	9.7	87.45	-68.7	544.0	187.8	166.1	21.72	8.650		
3,700.0	3,635.7	3,710.2	3,662.7	13.0	10.3	87.91	-48.5	566.4	173.2	150.5	22.75	7.613		
3,800.0	3,731.7	3,811.4	3,758.8	13.6	10.8	88.02	-26.6	589.1	157.0	133.2	23.83	6.587		
3,900.0	3,827.7	3,911.5	3,853.2	14.2	11.4	87.38	-3.1	613.0	139.4	114.4	24.95	5.586		
4,000.0	3,923.8	4,009.7	3,945.5	14.7	12.0	86.36	20.5	636.5	121.3	95.2	26.08	4.650		
4,100.0	4,019.8	4,106.4	4,036.8	15.3	12.6	85.39	42.7	659.5	104.1	77.0	27.18	3.831		
4,200.0	4,115.8	4,202.3	4,128.4	15.9	13.1	85.78	61.8	680.6	89.4	61.2	28.19	3.173		
4,300.0	4,211.9	4,300.6	4,223.3	16.5	13.5	88.97	78.6	699.6	76.7	47.7	29.07	2.639		
4,400.0	4,307.9	4,398.7	4,318.7	17.0	14.0	95.20	93.6	716.8	65.9	36.2	29.65	2.222		
4,500.0	4,403.9	4,497.0	4,415.0	17.6	14.4	106.00	107.0	731.8	57.8	28.3	29.50	1.958		
4,600.0	4,500.0	4,595.5	4,511.4	18.2	14.8	119.27	119.8	746.9	53.1	24.6	28.45	1.866 ES, SF		
4,643.4	4,541.7	4,638.1	4,553.2	18.5	14.9	125.76	124.9	753.1	52.5	24.8	27.71	1.896 CC		
4,700.0	4,596.0	4,693.3	4,607.6	18.8	15.1	134.51	131.2	760.6	53.6	26.9	26.62	2.012		
4,800.0	4,692.0	4,790.4	4,703.5	19.4	15.4	148.64	140.8	772.2	60.5	35.4	25.05	2.414		
4,900.0	4,788.1	4,887.8	4,800.1	19.9	15.7	159.58	149.3	782.0	72.6	48.2	24.43	2.972		

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 Stroh 13O-223
Project:	SEC.13-T4N-R67W	TVD Reference:	WELL @ 4818.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	MD Reference:	WELL @ 4818.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Stroh 13O-223	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 #3 (2-3-15)	Offset TVD Reference:	Offset Datum

Offset Design Stroh O13-21D Sec.13-T4N-R67W - Stroh O13-21D - Stroh O13-21D - Stroh O13-21D													Offset Site Error:	0.0 ft
Survey Program: 475-Reference													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Semi Major Axis Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
5,000.0	4,884.1	4,985.1	4,896.6	20.5	16.0	167.33	157.5	790.6	87.9	63.3	24.55	3.580		
5,100.0	4,980.1	5,080.6	4,991.6	21.1	16.3	172.43	164.5	797.5	106.1	81.1	25.01	4.243		
5,200.0	5,076.2	5,175.5	5,086.2	21.7	16.5	175.55	169.8	802.4	127.4	101.8	25.58	4.982		
5,300.0	5,172.2	5,270.7	5,181.3	22.3	16.7	177.36	173.5	806.0	150.7	124.5	26.14	5.765		
5,400.0	5,268.2	5,365.4	5,275.9	22.9	16.9	178.59	176.7	808.5	175.3	148.6	26.68	6.570		
5,500.0	5,364.3	5,459.9	5,370.4	23.4	17.0	179.32	179.0	809.9	201.2	174.0	27.19	7.398		
5,600.0	5,460.5	5,553.7	5,464.2	24.0	17.2	179.68	180.2	810.6	227.5	199.8	27.71	8.208		
5,700.0	5,557.5	5,648.7	5,559.2	24.4	17.3	179.77	180.4	810.4	251.7	223.5	28.19	8.931		
5,800.0	5,655.3	5,742.5	5,653.0	24.7	17.4	179.56	179.1	809.5	273.7	245.1	28.59	9.574		
5,900.0	5,753.8	5,838.7	5,749.1	25.1	17.5	179.26	176.9	807.6	293.4	264.4	28.94	10.137		
6,000.0	5,852.9	5,938.2	5,848.6	25.3	17.6	179.07	175.2	805.5	309.6	280.3	29.27	10.576		
6,100.0	5,952.3	6,037.7	5,948.0	25.6	17.7	179.02	174.2	803.3	322.4	292.8	29.57	10.901		
6,200.0	6,052.1	6,137.5	6,047.8	25.7	17.8	179.09	174.0	801.2	331.4	301.6	29.85	11.103		
6,300.0	6,152.0	6,237.9	6,148.2	25.9	18.0	179.16	173.8	799.0	337.0	306.9	30.09	11.201		
6,400.0	6,252.0	6,338.2	6,248.5	26.0	18.1	-103.31	174.2	796.8	339.4	309.0	30.38	11.172		
6,500.0	6,352.0	6,439.1	6,349.4	26.1	18.2	76.88	174.8	795.0	341.0	310.3	30.73	11.097		
6,600.0	6,451.6	6,537.6	6,447.8	26.2	18.4	78.45	175.4	792.8	341.1	310.1	31.07	10.979		
6,700.0	6,549.1	6,636.0	6,546.2	26.2	18.5	82.26	176.0	791.0	339.2	307.5	31.70	10.702		
6,783.5	6,627.9	6,713.3	6,623.5	26.2	18.6	86.74	176.3	789.4	338.1	305.7	32.48	10.410		
6,800.0	6,643.0	6,728.1	6,638.2	26.2	18.6	87.72	176.4	789.1	338.2	305.5	32.66	10.354		
6,900.0	6,731.7	6,822.1	6,732.3	26.2	18.8	94.79	176.3	787.3	341.5	307.6	33.90	10.074		
7,000.0	6,813.5	6,900.9	6,811.0	26.2	18.9	101.23	175.3	786.6	352.4	317.7	34.79	10.130		
7,100.0	6,887.2	6,971.3	6,881.4	26.2	19.0	106.85	175.6	785.1	377.2	342.0	35.17	10.726		
7,200.0	6,951.5	7,040.4	6,950.5	26.3	19.1	111.65	176.0	783.7	416.6	381.5	35.08	11.875		
7,300.0	7,005.2	7,100.0	7,010.1	26.4	19.1	114.35	175.4	783.6	469.1	434.4	34.76	13.495		
7,400.0	7,047.4	7,140.9	7,051.0	26.6	19.2	113.47	174.9	783.6	534.5	499.7	34.81	15.356		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Stroh 13O-223
Project:	SEC.13-T4N-R67W	TVD Reference:	WELL @ 4818.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	MD Reference:	WELL @ 4818.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Stroh 13O-223	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 #3 (2-3-15)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4818.0ft (RKB - 15')

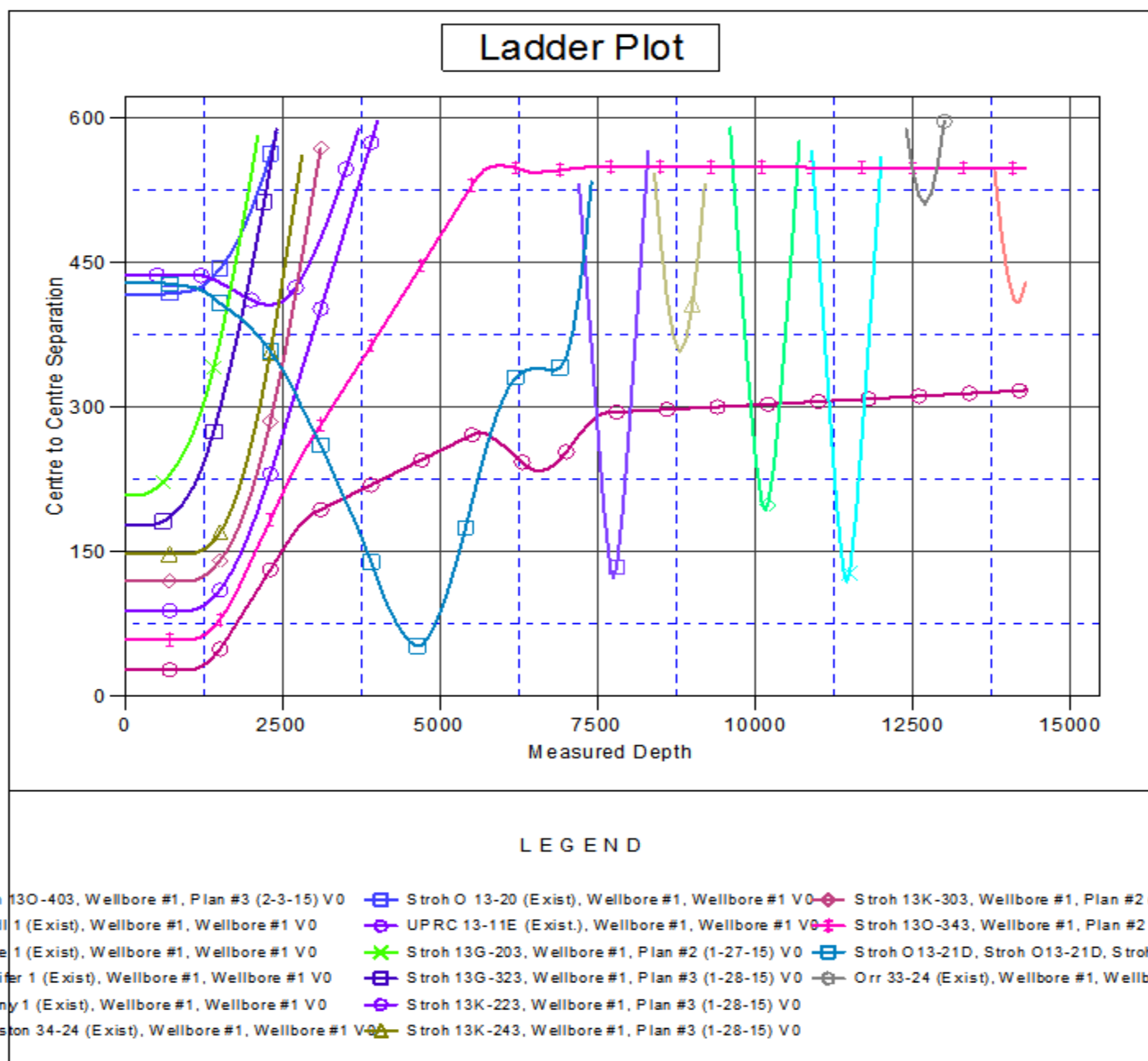
Offset Depths are relative to Offset Datum

Central Meridian is -105.500000 °

Coordinates are relative to: Stroh 13O-223

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.42°



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Stroh 13O-223
Project:	SEC.13-T4N-R67W	TVD Reference:	WELL @ 4818.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	MD Reference:	WELL @ 4818.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
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Reference Depths are relative to WELL @ 4818.0ft (RKB - 15')

Offset Depths are relative to Offset Datum

Central Meridian is -105.500000 °

Coordinates are relative to: Stroh 13O-223

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.42°

