PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Stroh 13O-403**

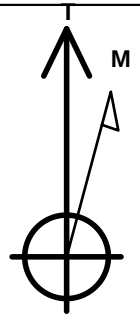
Surface Location: Stroh 13GK-HZ Pad Sec.13-T4N-R67W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone
Ground Elevation: 4804.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1356828.89	3183348.05	40.311030	-104.842540	

RKB - 15' WELL @ 4819.0ft (RKB - 15')

WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 2354'FSL & 1706'FWL, Sec.13	1.0	0.0	0.0	Point
BHL 500'FSL & 2610'FWL, Sec.24	7275.0	-7118.5	920.6	Point



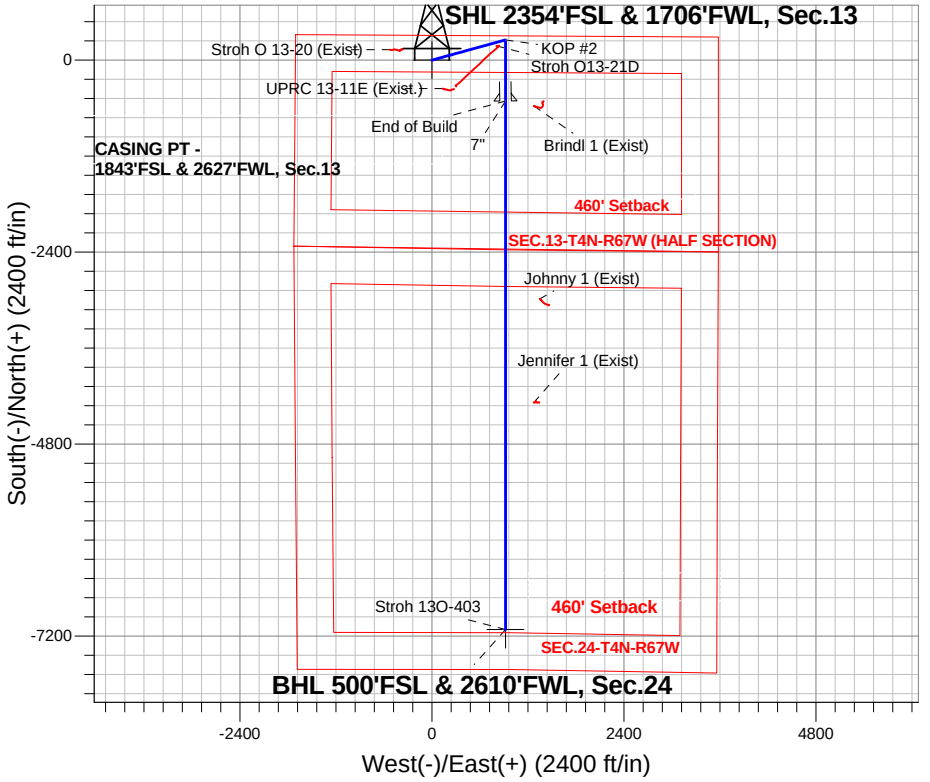
Azimuths to True North
Magnetic North: 8.42°

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

Stroh 13GK-HZ Pad Sec.13-T4N-R67W
Stroh 13O-403
Plan #3 (2-3-15)

ANNOTATIONS

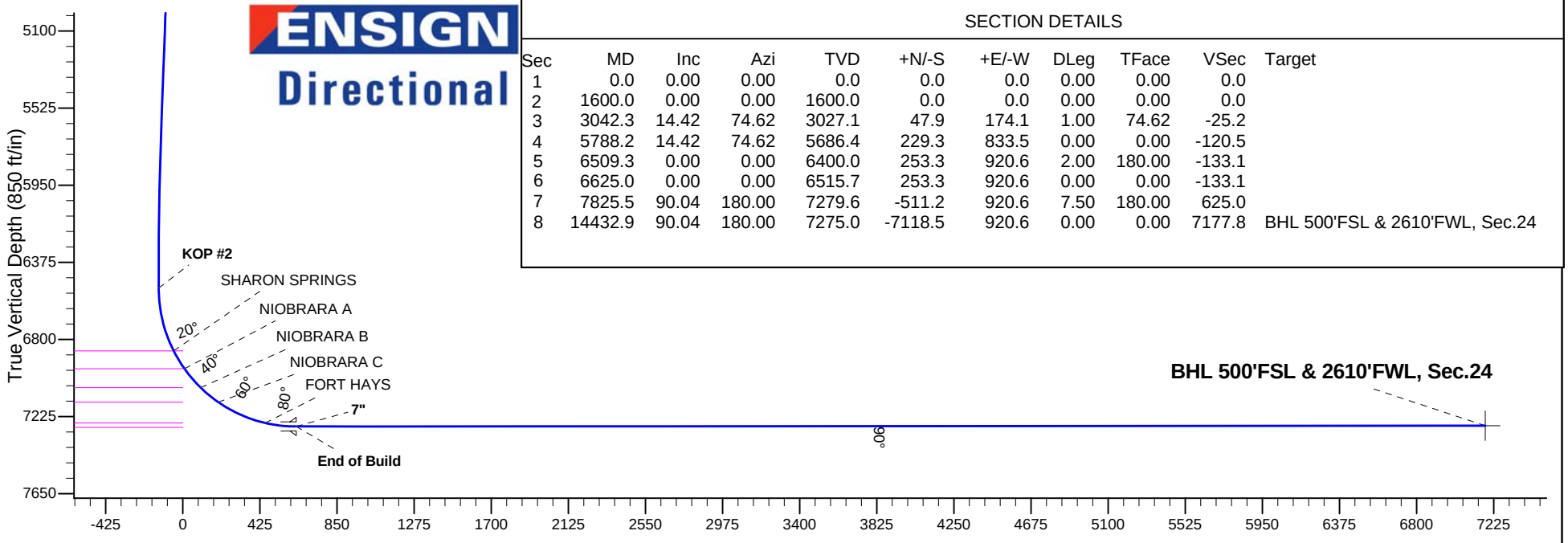
TVD	MD	Annotation
1600.0	1600.0	KOP #1
6515.7	6625.0	KOP #2
7279.6	7825.5	End of Build



ENSIGN Directional

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	1600.0	0.00	0.00	1600.0	0.0	0.0	0.00	0.00	0.0	
3	3042.3	14.42	74.62	3027.1	47.9	174.1	1.00	74.62	-25.2	
4	5788.2	14.42	74.62	5686.4	229.3	833.5	0.00	0.00	-120.5	
5	6509.3	0.00	0.00	6400.0	253.3	920.6	2.00	180.00	-133.1	
6	6625.0	0.00	0.00	6515.7	253.3	920.6	0.00	0.00	-133.1	
7	7825.5	90.04	180.00	7279.6	-511.2	920.6	7.50	180.00	625.0	
8	14432.9	90.04	180.00	7275.0	-7118.5	920.6	0.00	0.00	7177.8	BHL 500'FSL & 2610'FWL, Sec.24



PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.13-T4N-R67W
Stroh 13GK-HZ Pad Sec.13-T4N-R67W
Stroh 13O-403

Wellbore #1

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

Standard Planning Report

04 February, 2015

Database:	landmark	**Local Co-ordinate Reference:**	Well Stroh 13O-403
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**TVD Reference:**	WELL @ 4819.0ft (RKB - 15')
Project:	SEC.13-T4N-R67W	**MD Reference:**	WELL @ 4819.0ft (RKB - 15')
Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	**North Reference:**	True
Well:	Stroh 13O-403	**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	**Latitude:**	40.311030
From:	Lat/Long	**Easting:**	3,183,348.05 ft	**Longitude:**	-104.842540
Position Uncertainty:	0.0 ft	**Slot Radius:**	"	**Grid Convergence:**	0.42 °

Well Stroh 13O-403

Well Position	**+N/-S**	0.0 ft	**Northing:**	1,356,828.89 ft	**Latitude:**	40.311030
	+E/-W	0.0 ft	**Easting:**	3,183,348.05 ft	**Longitude:**	-104.842540
Position Uncertainty		0.0 ft	**Wellhead Elevation:**	ft	**Ground Level:**	4,804.0 ft

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	172.63

Plan Sections

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.00	0.00	0.00	0.00	
3,042.3	14.42	74.62	3,027.1	47.9	174.1	1.00	1.00	0.00	74.62	
5,788.2	14.42	74.62	5,686.4	229.3	833.5	0.00	0.00	0.00	0.00	
6,509.3	0.00	0.00	6,400.0	253.3	920.6	2.00	-2.00	0.00	180.00	
6,625.0	0.00	0.00	6,515.7	253.3	920.6	0.00	0.00	0.00	0.00	
7,825.5	90.04	180.00	7,279.6	-511.2	920.6	7.50	7.50	0.00	180.00	
14,432.9	90.04	180.00	7,275.0	-7,118.5	920.6	0.00	0.00	0.00	0.00	BHL 500'FSL & 261

Database:	landmark	**Local Co-ordinate Reference:**	Well Stroh 13O-403
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Project:	SEC.13-T4N-R67W	**MD Reference:**	WELL @ 4819.0ft (RKB - 15')
Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	**North Reference:**	True
Well:	Stroh 13O-403	**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
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP #1									
1,700.0	1.00	74.62	1,700.0	0.2	0.8	-0.1	1.00	1.00	0.00
1,800.0	2.00	74.62	1,800.0	0.9	3.4	-0.5	1.00	1.00	0.00
1,900.0	3.00	74.62	1,899.9	2.1	7.6	-1.1	1.00	1.00	0.00
2,000.0	4.00	74.62	1,999.7	3.7	13.5	-1.9	1.00	1.00	0.00
2,100.0	5.00	74.62	2,099.4	5.8	21.0	-3.0	1.00	1.00	0.00
2,200.0	6.00	74.62	2,198.9	8.3	30.3	-4.4	1.00	1.00	0.00
2,300.0	7.00	74.62	2,298.3	11.3	41.2	-6.0	1.00	1.00	0.00
2,400.0	8.00	74.62	2,397.4	14.8	53.8	-7.8	1.00	1.00	0.00
2,500.0	9.00	74.62	2,496.3	18.7	68.0	-9.8	1.00	1.00	0.00
2,600.0	10.00	74.62	2,594.9	23.1	83.9	-12.1	1.00	1.00	0.00
2,700.0	11.00	74.62	2,693.3	27.9	101.5	-14.7	1.00	1.00	0.00
2,800.0	12.00	74.62	2,791.2	33.2	120.7	-17.5	1.00	1.00	0.00
2,900.0	13.00	74.62	2,888.9	39.0	141.6	-20.5	1.00	1.00	0.00
3,000.0	14.00	74.62	2,986.1	45.2	164.1	-23.7	1.00	1.00	0.00
3,042.3	14.42	74.62	3,027.1	47.9	174.1	-25.2	1.00	1.00	0.00
3,100.0	14.42	74.62	3,083.0	51.7	188.0	-27.2	0.00	0.00	0.00
3,200.0	14.42	74.62	3,179.8	58.3	212.0	-30.7	0.00	0.00	0.00
3,300.0	14.42	74.62	3,276.7	64.9	236.0	-34.1	0.00	0.00	0.00
3,400.0	14.42	74.62	3,373.5	71.5	260.0	-37.6	0.00	0.00	0.00
3,500.0	14.42	74.62	3,470.4	78.1	284.0	-41.1	0.00	0.00	0.00
3,600.0	14.42	74.62	3,567.2	84.8	308.0	-44.5	0.00	0.00	0.00
3,685.5	14.42	74.62	3,650.0	90.4	328.6	-47.5	0.00	0.00	0.00
PARKMAN									
3,700.0	14.42	74.62	3,664.1	91.4	332.1	-48.0	0.00	0.00	0.00
3,800.0	14.42	74.62	3,760.9	98.0	356.1	-51.5	0.00	0.00	0.00
3,900.0	14.42	74.62	3,857.8	104.6	380.1	-55.0	0.00	0.00	0.00
4,000.0	14.42	74.62	3,954.6	111.2	404.1	-58.4	0.00	0.00	0.00
4,100.0	14.42	74.62	4,051.5	117.8	428.1	-61.9	0.00	0.00	0.00
4,200.0	14.42	74.62	4,148.3	124.4	452.1	-65.4	0.00	0.00	0.00
4,222.4	14.42	74.62	4,170.0	125.9	457.5	-66.2	0.00	0.00	0.00
SUSSEX									
4,300.0	14.42	74.62	4,245.2	131.0	476.2	-68.9	0.00	0.00	0.00
4,400.0	14.42	74.62	4,342.0	137.6	500.2	-72.3	0.00	0.00	0.00
4,500.0	14.42	74.62	4,438.9	144.2	524.2	-75.8	0.00	0.00	0.00
4,600.0	14.42	74.62	4,535.7	150.8	548.2	-79.3	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-403	**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	14.42	74.62	4,632.6	157.4	572.2	-82.8	0.00	0.00	0.00
4,790.3	14.42	74.62	4,720.0	163.4	593.9	-85.9	0.00	0.00	0.00
SHANNON									
4,800.0	14.42	74.62	4,729.4	164.1	596.2	-86.2	0.00	0.00	0.00
4,900.0	14.42	74.62	4,826.3	170.7	620.2	-89.7	0.00	0.00	0.00
5,000.0	14.42	74.62	4,923.1	177.3	644.3	-93.2	0.00	0.00	0.00
5,100.0	14.42	74.62	5,020.0	183.9	668.3	-96.6	0.00	0.00	0.00
5,200.0	14.42	74.62	5,116.8	190.5	692.3	-100.1	0.00	0.00	0.00
5,300.0	14.42	74.62	5,213.7	197.1	716.3	-103.6	0.00	0.00	0.00
5,400.0	14.42	74.62	5,310.5	203.7	740.3	-107.1	0.00	0.00	0.00
5,500.0	14.42	74.62	5,407.4	210.3	764.3	-110.5	0.00	0.00	0.00
5,600.0	14.42	74.62	5,504.2	216.9	788.4	-114.0	0.00	0.00	0.00
5,700.0	14.42	74.62	5,601.1	223.5	812.4	-117.5	0.00	0.00	0.00
5,788.2	14.42	74.62	5,686.4	229.3	833.5	-120.5	0.00	0.00	0.00
5,800.0	14.19	74.62	5,697.9	230.1	836.4	-121.0	2.00	-2.00	0.00
5,900.0	12.19	74.62	5,795.3	236.2	858.4	-124.1	2.00	-2.00	0.00
6,000.0	10.19	74.62	5,893.4	241.3	877.1	-126.8	2.00	-2.00	0.00
6,100.0	8.19	74.62	5,992.1	245.6	892.5	-129.1	2.00	-2.00	0.00
6,200.0	6.19	74.62	6,091.3	248.9	904.5	-130.8	2.00	-2.00	0.00
6,300.0	4.19	74.62	6,190.9	251.3	913.2	-132.1	2.00	-2.00	0.00
6,400.0	2.19	74.62	6,290.7	252.7	918.6	-132.8	2.00	-2.00	0.00
6,500.0	0.19	74.62	6,390.7	253.3	920.6	-133.1	2.00	-2.00	0.00
6,509.3	0.00	0.00	6,400.0	253.3	920.6	-133.1	2.00	-2.00	0.00
6,600.0	0.00	0.00	6,490.7	253.3	920.6	-133.1	0.00	0.00	0.00
6,625.0	0.00	0.00	6,515.7	253.3	920.6	-133.1	0.00	0.00	0.00
KOP #2									
6,700.0	5.63	180.00	6,590.6	249.6	920.6	-129.5	7.50	7.50	0.00
6,800.0	13.13	180.00	6,689.2	233.3	920.6	-113.3	7.50	7.50	0.00
6,900.0	20.63	180.00	6,784.8	204.3	920.6	-84.6	7.50	7.50	0.00
6,985.6	27.04	180.00	6,863.0	169.8	920.6	-50.3	7.50	7.50	0.00
SHARON SPRINGS									
7,000.0	28.13	180.00	6,875.8	163.1	920.6	-43.7	7.50	7.50	0.00
7,100.0	35.63	180.00	6,960.7	110.3	920.6	8.7	7.50	7.50	0.00
7,100.4	35.66	180.00	6,961.0	110.1	920.6	8.9	7.50	7.50	0.00
NIOBRARA A									
7,200.0	43.13	180.00	7,037.9	46.9	920.6	71.5	7.50	7.50	0.00
7,238.0	45.98	180.00	7,065.0	20.2	920.6	98.0	7.50	7.50	0.00
NIOBRARA B									
7,300.0	50.63	180.00	7,106.2	-26.0	920.6	143.9	7.50	7.50	0.00
7,364.5	55.47	180.00	7,145.0	-77.6	920.6	195.0	7.50	7.50	0.00
NIOBRARA C									
7,400.0	58.13	180.00	7,164.4	-107.2	920.6	224.4	7.50	7.50	0.00
7,500.0	65.63	180.00	7,211.5	-195.4	920.6	311.8	7.50	7.50	0.00
7,600.0	73.13	180.00	7,246.7	-288.9	920.6	404.6	7.50	7.50	0.00
7,651.5	76.99	180.00	7,260.0	-338.7	920.6	453.9	7.50	7.50	0.00
FORT HAYS									
7,700.0	80.63	180.00	7,269.4	-386.2	920.6	501.1	7.50	7.50	0.00
7,800.0	88.13	180.00	7,279.2	-485.7	920.6	599.7	7.50	7.50	0.00
7,825.5	90.04	180.00	7,279.6	-511.2	920.6	625.0	7.50	7.50	0.00
End of Build - 7"									
7,900.0	90.04	180.00	7,279.6	-585.7	920.6	698.9	0.00	0.00	0.00
8,000.0	90.04	180.00	7,279.5	-685.7	920.6	798.1	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-403	**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)
8,100.0	90.04	180.00	7,279.4	-785.7	920.6	897.2	0.00	0.00	0.00
8,200.0	90.04	180.00	7,279.4	-885.7	920.6	996.4	0.00	0.00	0.00
8,300.0	90.04	180.00	7,279.3	-985.7	920.6	1,095.6	0.00	0.00	0.00
8,400.0	90.04	180.00	7,279.2	-1,085.7	920.6	1,194.8	0.00	0.00	0.00
8,500.0	90.04	180.00	7,279.1	-1,185.7	920.6	1,293.9	0.00	0.00	0.00
8,600.0	90.04	180.00	7,279.1	-1,285.7	920.6	1,393.1	0.00	0.00	0.00
8,700.0	90.04	180.00	7,279.0	-1,385.7	920.6	1,492.3	0.00	0.00	0.00
8,800.0	90.04	180.00	7,278.9	-1,485.7	920.6	1,591.5	0.00	0.00	0.00
8,900.0	90.04	180.00	7,278.9	-1,585.7	920.6	1,690.6	0.00	0.00	0.00
9,000.0	90.04	180.00	7,278.8	-1,685.7	920.6	1,789.8	0.00	0.00	0.00
9,100.0	90.04	180.00	7,278.7	-1,785.7	920.6	1,889.0	0.00	0.00	0.00
9,200.0	90.04	180.00	7,278.7	-1,885.7	920.6	1,988.2	0.00	0.00	0.00
9,300.0	90.04	180.00	7,278.6	-1,985.7	920.6	2,087.3	0.00	0.00	0.00
9,400.0	90.04	180.00	7,278.5	-2,085.7	920.6	2,186.5	0.00	0.00	0.00
9,500.0	90.04	180.00	7,278.4	-2,185.7	920.6	2,285.7	0.00	0.00	0.00
9,600.0	90.04	180.00	7,278.4	-2,285.7	920.6	2,384.9	0.00	0.00	0.00
9,700.0	90.04	180.00	7,278.3	-2,385.7	920.6	2,484.0	0.00	0.00	0.00
9,800.0	90.04	180.00	7,278.2	-2,485.7	920.6	2,583.2	0.00	0.00	0.00
9,900.0	90.04	180.00	7,278.2	-2,585.7	920.6	2,682.4	0.00	0.00	0.00
10,000.0	90.04	180.00	7,278.1	-2,685.7	920.6	2,781.5	0.00	0.00	0.00
10,100.0	90.04	180.00	7,278.0	-2,785.7	920.6	2,880.7	0.00	0.00	0.00
10,200.0	90.04	180.00	7,278.0	-2,885.7	920.6	2,979.9	0.00	0.00	0.00
10,300.0	90.04	180.00	7,277.9	-2,985.7	920.6	3,079.1	0.00	0.00	0.00
10,400.0	90.04	180.00	7,277.8	-3,085.7	920.6	3,178.2	0.00	0.00	0.00
10,500.0	90.04	180.00	7,277.7	-3,185.7	920.6	3,277.4	0.00	0.00	0.00
10,600.0	90.04	180.00	7,277.7	-3,285.7	920.6	3,376.6	0.00	0.00	0.00
10,700.0	90.04	180.00	7,277.6	-3,385.7	920.6	3,475.8	0.00	0.00	0.00
10,800.0	90.04	180.00	7,277.5	-3,485.7	920.6	3,574.9	0.00	0.00	0.00
10,900.0	90.04	180.00	7,277.5	-3,585.7	920.6	3,674.1	0.00	0.00	0.00
11,000.0	90.04	180.00	7,277.4	-3,685.7	920.6	3,773.3	0.00	0.00	0.00
11,100.0	90.04	180.00	7,277.3	-3,785.7	920.6	3,872.5	0.00	0.00	0.00
11,200.0	90.04	180.00	7,277.3	-3,885.7	920.6	3,971.6	0.00	0.00	0.00
11,300.0	90.04	180.00	7,277.2	-3,985.7	920.6	4,070.8	0.00	0.00	0.00
11,400.0	90.04	180.00	7,277.1	-4,085.7	920.6	4,170.0	0.00	0.00	0.00
11,500.0	90.04	180.00	7,277.0	-4,185.7	920.6	4,269.2	0.00	0.00	0.00
11,600.0	90.04	180.00	7,277.0	-4,285.7	920.6	4,368.3	0.00	0.00	0.00
11,700.0	90.04	180.00	7,276.9	-4,385.7	920.6	4,467.5	0.00	0.00	0.00
11,800.0	90.04	180.00	7,276.8	-4,485.7	920.6	4,566.7	0.00	0.00	0.00
11,900.0	90.04	180.00	7,276.8	-4,585.7	920.6	4,665.9	0.00	0.00	0.00
12,000.0	90.04	180.00	7,276.7	-4,685.7	920.6	4,765.0	0.00	0.00	0.00
12,100.0	90.04	180.00	7,276.6	-4,785.7	920.6	4,864.2	0.00	0.00	0.00
12,200.0	90.04	180.00	7,276.6	-4,885.7	920.6	4,963.4	0.00	0.00	0.00
12,300.0	90.04	180.00	7,276.5	-4,985.7	920.6	5,062.6	0.00	0.00	0.00
12,400.0	90.04	180.00	7,276.4	-5,085.7	920.6	5,161.7	0.00	0.00	0.00
12,500.0	90.04	180.00	7,276.3	-5,185.7	920.6	5,260.9	0.00	0.00	0.00
12,600.0	90.04	180.00	7,276.3	-5,285.7	920.6	5,360.1	0.00	0.00	0.00
12,700.0	90.04	180.00	7,276.2	-5,385.7	920.6	5,459.2	0.00	0.00	0.00
12,800.0	90.04	180.00	7,276.1	-5,485.7	920.6	5,558.4	0.00	0.00	0.00
12,900.0	90.04	180.00	7,276.1	-5,585.7	920.6	5,657.6	0.00	0.00	0.00
13,000.0	90.04	180.00	7,276.0	-5,685.7	920.6	5,756.8	0.00	0.00	0.00
13,100.0	90.04	180.00	7,275.9	-5,785.7	920.6	5,855.9	0.00	0.00	0.00
13,200.0	90.04	180.00	7,275.9	-5,885.7	920.6	5,955.1	0.00	0.00	0.00
13,300.0	90.04	180.00	7,275.8	-5,985.7	920.6	6,054.3	0.00	0.00	0.00

Database:	landmark	**Local Co-ordinate Reference:**	Well Stroh 13O-403
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**TVD Reference:**	WELL @ 4819.0ft (RKB - 15')
Project:	SEC.13-T4N-R67W	**MD Reference:**	WELL @ 4819.0ft (RKB - 15')
Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	**North Reference:**	True
Well:	Stroh 13O-403	**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)
13,400.0	90.04	180.00	7,275.7	-6,085.7	920.6	6,153.5	0.00	0.00	0.00
13,500.0	90.04	180.00	7,275.7	-6,185.7	920.6	6,252.6	0.00	0.00	0.00
13,600.0	90.04	180.00	7,275.6	-6,285.7	920.6	6,351.8	0.00	0.00	0.00
13,700.0	90.04	180.00	7,275.5	-6,385.7	920.6	6,451.0	0.00	0.00	0.00
13,800.0	90.04	180.00	7,275.4	-6,485.7	920.6	6,550.2	0.00	0.00	0.00
13,900.0	90.04	180.00	7,275.4	-6,585.7	920.6	6,649.3	0.00	0.00	0.00
14,000.0	90.04	180.00	7,275.3	-6,685.7	920.6	6,748.5	0.00	0.00	0.00
14,100.0	90.04	180.00	7,275.2	-6,785.7	920.6	6,847.7	0.00	0.00	0.00
14,200.0	90.04	180.00	7,275.2	-6,885.7	920.6	6,946.9	0.00	0.00	0.00
14,300.0	90.04	180.00	7,275.1	-6,985.7	920.6	7,046.0	0.00	0.00	0.00
14,400.0	90.04	180.00	7,275.0	-7,085.7	920.6	7,145.2	0.00	0.00	0.00
14,432.9	90.04	180.00	7,275.0	-7,118.5	920.6	7,177.8	0.00	0.00	0.00

Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
BHL 500'FSL & 2610'I - plan hits target - Point	0.00	0.00	7,275.0	-7,118.5	920.6	1,349,717.72	3,184,321.35	40.291490	-104.839240
SHL 2354'FSL & 170E - plan hits target - Point	0.00	0.00	1.0	0.0	0.0	1,356,828.90	3,183,348.05	40.311030	-104.842540

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,825.5	7,279.6	7"	7	7-1/2

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,685.5	3,650.0	PARKMAN		0.00	
4,222.4	4,170.0	SUSSEX		0.00	
4,790.3	4,720.0	SHANNON		0.00	
6,985.6	6,863.0	SHARON SPRINGS		0.00	
7,100.4	6,961.0	NIOBRARA A		0.00	
7,238.0	7,065.0	NIOBRARA B		0.00	
7,364.5	7,145.0	NIOBRARA C		0.00	
7,651.5	7,260.0	FORT HAYS		0.00	
	7,284.0	CODELL		0.00	

Database:	landmark	**Local Co-ordinate Reference:**	Well Stroh 13O-403
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**TVD Reference:**	WELL @ 4819.0ft (RKB - 15')
Project:	SEC.13-T4N-R67W	**MD Reference:**	WELL @ 4819.0ft (RKB - 15')
Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	**North Reference:**	True
Well:	Stroh 13O-403	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #3 (2-3-15)		

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
1,600.0	1,600.0	0.0	0.0	KOP #1
6,625.0	6,515.7	253.3	920.6	KOP #2
7,825.5	7,279.6	-511.2	920.6	End of Build

ENSIGN Directional

PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.13-T4N-R67W
Stroh 13GK-HZ Pad Sec.13-T4N-R67W
Stroh 13O-403

Wellbore #1
Plan #3 (2-3-15)

Anticollision Report

04 February, 2015

PDC ENERGY
Growing E&P Value

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**Local Co-ordinate Reference:**	Well Stroh 13O-403
Project:	SEC.13-T4N-R67W	**TVD Reference:**	WELL @ 4819.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	**MD Reference:**	WELL @ 4819.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Stroh 13O-403	**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	14,432.9	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)	Distance Between Ellipses (ft)	Separation Factor	Warning
Existing Wells - Sec.13-T4N-R67W						
Brindl 1 (Exist) - Wellbore #1 - Wellbore #1	7,888.2	7,247.3	356.0	320.3	9.958	CC, ES
Brindl 1 (Exist) - Wellbore #1 - Wellbore #1	7,900.0	7,245.9	356.2	320.4	9.930	SF
Jennifer 1 (Exist) - Wellbore #1 - Wellbore #1	11,595.0	7,184.1	352.1	252.9	3.551	CC
Jennifer 1 (Exist) - Wellbore #1 - Wellbore #1	11,600.0	7,184.1	352.1	252.9	3.548	ES, SF
Johnny 1 (Exist) - Wellbore #1 - Wellbore #1	10,299.7	7,186.0	427.0	350.0	5.543	CC
Johnny 1 (Exist) - Wellbore #1 - Wellbore #1	10,300.0	7,186.0	427.0	350.0	5.542	ES, SF
Existing Wells Sec.13-T4N-R67W (Grid North)						
Stroh O 13-20 (Exist) - Wellbore #1 - Wellbore #1	100.0	89.7	390.5	390.3	1,686.306	CC
Stroh O 13-20 (Exist) - Wellbore #1 - Wellbore #1	600.0	587.8	391.5	388.9	152.617	ES
Stroh O 13-20 (Exist) - Wellbore #1 - Wellbore #1	2,700.0	2,673.6	502.0	490.4	43.068	SF
UPRC 13-11E (Exist.) - Wellbore #1 - Wellbore #1	2,779.6	2,756.6	423.8	410.8	32.565	CC
UPRC 13-11E (Exist.) - Wellbore #1 - Wellbore #1	2,800.0	2,776.5	423.8	410.7	32.265	ES
UPRC 13-11E (Exist.) - Wellbore #1 - Wellbore #1	3,800.0	3,747.6	494.4	475.0	25.496	SF
Stroh 13GK-HZ Pad Sec. 13-T4N-R67W						
Stroh 13G-203 - Wellbore #1 - Plan #2 (1-27-15)	166.0	168.0	181.3	180.8	344.705	CC
Stroh 13G-203 - Wellbore #1 - Plan #2 (1-27-15)	200.0	201.9	181.3	180.6	267.180	ES
Stroh 13G-203 - Wellbore #1 - Plan #2 (1-27-15)	1,600.0	1,535.5	343.8	335.9	43.604	SF
Stroh 13G-323 - Wellbore #1 - Plan #3 (1-28-15)	366.3	367.3	150.6	149.2	105.739	CC
Stroh 13G-323 - Wellbore #1 - Plan #3 (1-28-15)	400.0	400.0	150.6	149.0	95.720	ES
Stroh 13G-323 - Wellbore #1 - Plan #3 (1-28-15)	1,600.0	1,563.6	267.8	260.4	35.945	SF
Stroh 13K-223 - Wellbore #1 - Plan #3 (1-28-15)	1,600.0	1,601.0	61.4	54.4	8.803	CC, ES
Stroh 13K-223 - Wellbore #1 - Plan #3 (1-28-15)	1,800.0	1,801.0	64.7	56.9	8.261	SF
Stroh 13K-243 - Wellbore #1 - Plan #3 (1-28-15)	1,366.3	1,367.3	119.9	114.0	20.259	CC
Stroh 13K-243 - Wellbore #1 - Plan #3 (1-28-15)	1,400.0	1,400.0	119.9	113.9	19.761	ES
Stroh 13K-243 - Wellbore #1 - Plan #3 (1-28-15)	1,700.0	1,694.6	128.5	121.1	17.497	SF
Stroh 13K-303 - Wellbore #1 - Plan #2 (1-28-15)	1,566.3	1,567.3	92.0	85.2	13.497	CC
Stroh 13K-303 - Wellbore #1 - Plan #2 (1-28-15)	1,600.0	1,601.0	92.0	85.1	13.204	ES
Stroh 13K-303 - Wellbore #1 - Plan #2 (1-28-15)	1,800.0	1,799.1	97.3	89.5	12.438	SF
Stroh 13O-343 - Wellbore #1 - Plan #2 (1-28-15)	1,600.0	1,600.0	30.7	23.7	4.403	CC, ES
Stroh 13O-343 - Wellbore #1 - Plan #2 (1-28-15)	14,432.9	14,296.4	341.5	88.6	1.350	Level 3, SF
Stroh 13GK-HZ Pad Sec.13-T4N-R67W						
Stroh 13O-223 - Wellbore #1 - Plan #1 (2-3-15)	1,000.0	999.0	27.9	23.6	6.532	CC, ES
Stroh 13O-223 - Wellbore #1 - Plan #1 (2-3-15)	14,432.9	14,289.0	318.0	97.0	1.439	Level 3, SF

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**Local Co-ordinate Reference:**	Well Stroh 13O-403
Project:	SEC.13-T4N-R67W	**TVD Reference:**	WELL @ 4819.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	**MD Reference:**	WELL @ 4819.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Stroh 13O-403	**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 Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Stroh O13-21D Sec.13-T4N-R67W						
Stroh O13-21D - Stroh O13-21D - Stroh O13-21D	5,739.7	5,730.4	49.3	12.1	1.324	Level 3, CC, ES, SF

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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
7,400.0	7,164.4	7,135.7	7,132.1	23.3	15.2	-56.01	-575.4	1,277.6	588.8	558.7	30.07	19.578	
7,500.0	7,211.5	7,183.5	7,179.8	23.5	15.3	-67.32	-574.8	1,277.1	520.7	489.4	31.35	16.610	
7,600.0	7,246.7	7,217.7	7,214.0	23.7	15.4	-77.98	-574.3	1,276.8	456.5	423.7	32.87	13.891	
7,700.0	7,269.4	7,238.9	7,235.2	24.2	15.4	-86.00	-574.0	1,276.7	402.6	368.6	33.99	11.846	
7,800.0	7,279.2	7,247.1	7,243.4	24.7	15.4	-90.21	-573.9	1,276.6	366.8	332.0	34.85	10.526	
7,888.2	7,280.8	7,247.3	7,243.6	25.4	15.4	-90.45	-573.9	1,276.6	356.0	320.3	35.75	9.958	CC, ES
7,900.0	7,279.6	7,245.9	7,242.2	25.5	15.4	-90.42	-573.9	1,276.6	356.2	320.4	35.88	9.930	SF
8,000.0	7,279.5	7,244.2	7,240.5	26.3	15.4	-90.16	-573.9	1,276.6	373.2	336.1	37.05	10.072	
8,100.0	7,279.4	7,242.6	7,238.9	27.3	15.4	-89.89	-573.9	1,276.6	414.2	375.9	38.32	10.809	
8,200.0	7,279.4	7,240.9	7,237.3	28.4	15.4	-89.63	-574.0	1,276.7	473.2	433.5	39.69	11.924	
8,300.0	7,279.3	7,239.3	7,235.6	29.6	15.4	-89.36	-574.0	1,276.7	544.3	503.2	41.12	13.238	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**Local Co-ordinate Reference:**	Well Stroh 13O-403
Project:	SEC.13-T4N-R67W	**TVD Reference:**	WELL @ 4819.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	**MD Reference:**	WELL @ 4819.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Stroh 13O-403	**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

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
11,200.0	7,277.3	7,185.6	7,184.5	78.4	14.7	-90.41	-4,280.7	1,272.7	529.1	437.4	91.72	5.769	
11,300.0	7,277.2	7,185.2	7,184.1	80.3	14.7	-90.35	-4,280.7	1,272.7	459.3	365.7	93.60	4.907	
11,400.0	7,277.1	7,184.8	7,183.8	82.1	14.7	-90.29	-4,280.7	1,272.7	402.5	307.0	95.48	4.215	
11,500.0	7,277.0	7,184.5	7,183.4	83.9	14.7	-90.23	-4,280.7	1,272.7	364.7	267.3	97.36	3.746	
11,595.0	7,277.0	7,184.1	7,183.1	85.7	14.7	-90.17	-4,280.7	1,272.7	352.1	252.9	99.15	3.551	CC
11,600.0	7,277.0	7,184.1	7,183.0	85.8	14.7	-90.17	-4,280.7	1,272.7	352.1	252.9	99.24	3.548	ES, SF
11,700.0	7,276.9	7,183.7	7,182.7	87.7	14.7	-90.11	-4,280.7	1,272.7	367.4	266.3	101.13	3.633	
11,800.0	7,276.8	7,183.4	7,182.3	89.5	14.7	-90.05	-4,280.7	1,272.7	407.4	304.4	103.01	3.955	
11,900.0	7,276.8	7,183.0	7,181.9	91.4	14.7	-89.99	-4,280.7	1,272.7	465.8	360.9	104.90	4.440	
12,000.0	7,276.7	7,182.7	7,181.6	93.2	14.7	-89.94	-4,280.7	1,272.7	536.6	429.8	106.79	5.025	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**Local Co-ordinate Reference:**	Well Stroh 13O-403
Project:	SEC.13-T4N-R67W	**TVD Reference:**	WELL @ 4819.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	**MD Reference:**	WELL @ 4819.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Stroh 13O-403	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
9,900.0	7,278.2	7,186.6	7,184.3	54.9	16.8	-90.46	-2,985.3	1,347.6	584.9	515.2	69.71	8.390	
10,000.0	7,278.1	7,186.5	7,184.1	56.7	16.8	-90.44	-2,985.3	1,347.6	521.7	450.1	71.53	7.293	
10,100.0	7,278.0	7,186.3	7,184.0	58.5	16.8	-90.42	-2,985.3	1,347.6	471.4	398.0	73.36	6.425	
10,200.0	7,278.0	7,186.2	7,183.8	60.2	16.8	-90.40	-2,985.3	1,347.6	438.5	363.3	75.20	5.831	
10,299.7	7,277.9	7,186.0	7,183.7	62.0	16.8	-90.38	-2,985.3	1,347.6	427.0	350.0	77.04	5.543	CC
10,300.0	7,277.9	7,186.0	7,183.7	62.0	16.8	-90.38	-2,985.3	1,347.6	427.0	350.0	77.04	5.542	ES, SF
10,400.0	7,277.8	7,185.9	7,183.5	63.8	16.8	-90.36	-2,985.3	1,347.6	438.6	359.7	78.89	5.560	
10,500.0	7,277.7	7,185.7	7,183.4	65.6	16.8	-90.34	-2,985.3	1,347.6	471.7	390.9	80.74	5.842	
10,600.0	7,277.7	7,185.6	7,183.3	67.4	16.8	-90.32	-2,985.3	1,347.6	522.0	439.4	82.60	6.320	
10,700.0	7,277.6	7,185.5	7,183.1	69.3	16.8	-90.30	-2,985.3	1,347.6	585.3	500.9	84.46	6.931	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**Local Co-ordinate Reference:**	Well Stroh 13O-403
Project:	SEC.13-T4N-R67W	**TVD Reference:**	WELL @ 4819.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	**MD Reference:**	WELL @ 4819.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Stroh 13O-403	**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

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-69.81	134.8	-366.5	390.6				
100.0	100.0	89.7	89.7	0.1	0.1	-69.84	134.6	-366.6	390.5	390.3	0.23	1,686.306	CC
200.0	200.0	189.3	189.3	0.3	0.4	-69.90	134.3	-366.8	390.6	389.9	0.70	558.854	
300.0	300.0	289.3	289.3	0.6	0.6	-69.97	133.9	-367.1	390.8	389.6	1.18	330.443	
400.0	400.0	389.3	389.3	0.8	0.9	-70.08	133.2	-367.6	391.0	389.3	1.67	233.969	
500.0	500.0	489.3	489.3	1.0	1.1	-70.18	132.7	-368.0	391.1	389.0	2.16	181.030	
600.0	600.0	587.8	587.8	1.2	1.3	-70.20	132.6	-368.3	391.5	388.9	2.57	152.617	ES
700.0	700.0	687.3	687.3	1.5	1.4	-70.11	133.4	-368.7	392.1	389.2	2.90	135.314	
800.0	800.0	788.2	788.2	1.7	1.6	-70.01	134.2	-369.1	392.7	389.5	3.26	120.634	
900.0	900.0	887.7	887.7	1.9	1.7	-69.96	134.7	-369.4	393.2	389.6	3.66	107.474	
1,000.0	1,000.0	987.0	987.0	2.1	2.0	-69.91	135.3	-369.9	393.9	389.8	4.09	96.378	
1,100.0	1,100.0	1,086.4	1,086.4	2.4	2.2	-69.84	136.1	-370.6	394.8	390.2	4.53	87.117	
1,200.0	1,200.0	1,184.6	1,184.6	2.6	2.4	-69.78	136.8	-371.5	395.9	390.9	4.99	79.313	
1,300.0	1,300.0	1,285.1	1,285.0	2.8	2.7	-69.73	137.6	-372.6	397.2	391.8	5.47	72.683	
1,400.0	1,400.0	1,386.5	1,386.4	3.0	2.9	-69.69	138.3	-373.5	398.3	392.4	5.95	66.992	
1,500.0	1,500.0	1,487.5	1,487.5	3.3	3.2	-69.67	138.6	-374.2	399.1	392.7	6.43	62.062	
1,600.0	1,600.0	1,587.9	1,587.8	3.5	3.4	-69.66	138.9	-374.7	399.7	392.8	6.91	57.807	
1,700.0	1,700.0	1,687.8	1,687.7	3.7	3.7	-144.32	139.2	-375.2	400.9	393.5	7.38	54.304	
1,800.0	1,800.0	1,786.1	1,786.1	3.9	3.9	-144.53	139.4	-375.9	403.8	396.0	7.83	51.548	
1,900.0	1,899.9	1,885.4	1,885.4	4.1	4.2	-144.94	139.2	-377.1	408.4	400.1	8.28	49.309	
2,000.0	1,999.7	1,986.2	1,986.1	4.3	4.4	-145.50	138.9	-378.3	414.4	405.7	8.73	47.478	
2,100.0	2,099.4	2,085.9	2,085.8	4.6	4.6	-146.21	138.1	-379.5	421.8	412.6	9.15	46.080	
2,200.0	2,198.9	2,185.6	2,185.5	4.8	4.8	-147.11	136.6	-380.8	430.6	421.1	9.56	45.040	
2,300.0	2,298.3	2,282.8	2,282.7	5.0	5.1	-148.06	135.2	-382.2	441.2	431.2	9.97	44.230	
2,400.0	2,397.4	2,380.3	2,380.2	5.3	5.3	-149.12	133.7	-384.1	453.8	443.4	10.40	43.641	
2,500.0	2,496.3	2,479.6	2,479.4	5.6	5.5	-150.35	131.1	-386.4	468.2	457.3	10.82	43.272	
2,600.0	2,594.9	2,577.6	2,577.4	5.9	5.7	-151.60	128.5	-388.5	484.1	472.9	11.24	43.086	
2,700.0	2,693.3	2,673.6	2,673.3	6.2	5.9	-152.83	125.9	-390.8	502.0	490.4	11.66	43.068	SF
2,800.0	2,791.2	2,773.0	2,772.6	6.5	6.1	-154.08	123.4	-393.2	521.9	509.8	12.09	43.168	
2,900.0	2,888.9	2,869.4	2,869.0	6.9	6.4	-155.24	121.2	-395.2	543.1	530.6	12.52	43.379	
3,000.0	2,986.1	2,965.3	2,964.8	7.3	6.6	-156.31	119.7	-397.3	566.4	553.4	12.96	43.699	
3,100.0	3,083.0	3,064.1	3,063.6	7.7	6.8	-157.40	118.5	-399.3	591.1	577.7	13.44	43.985	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**Local Co-ordinate Reference:**	Well Stroh 13O-403
Project:	SEC.13-T4N-R67W	**TVD Reference:**	WELL @ 4819.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	**MD Reference:**	WELL @ 4819.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Stroh 13O-403	**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

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	142.56	-360.7	276.1	454.3				
100.0	100.0	89.1	89.1	0.1	0.1	142.57	-360.7	276.0	454.2	454.0	0.23	1,968.830	
200.0	200.0	189.8	189.8	0.3	0.4	142.61	-360.8	275.7	454.1	453.4	0.71	641.331	
255.7	255.7	244.7	244.7	0.5	0.5	142.65	-361.0	275.4	454.0	453.1	0.97	466.709	
300.0	300.0	288.2	288.1	0.6	0.6	142.69	-361.1	275.3	454.1	452.9	1.18	384.114	
400.0	400.0	390.6	390.6	0.8	0.9	142.75	-361.4	274.9	454.1	452.4	1.65	275.005	
466.8	466.8	455.8	455.8	0.9	1.0	142.77	-361.4	274.6	453.9	452.0	1.91	237.507	
500.0	500.0	487.9	487.9	1.0	1.0	142.77	-361.4	274.6	453.9	451.9	2.04	222.924	
600.0	600.0	587.7	587.6	1.2	1.2	142.79	-361.8	274.7	454.3	451.8	2.43	186.611	
700.0	700.0	690.3	690.3	1.5	1.4	142.82	-362.0	274.5	454.3	451.4	2.87	158.512	
800.0	800.0	790.2	790.2	1.7	1.6	142.86	-361.9	274.1	454.0	450.7	3.31	137.360	
849.6	849.6	838.6	838.6	1.8	1.7	142.90	-362.0	273.8	453.9	450.4	3.52	128.794	
900.0	900.0	887.5	887.5	1.9	1.8	142.92	-362.2	273.7	454.0	450.2	3.75	121.138	
1,000.0	1,000.0	988.1	988.1	2.1	2.1	142.98	-362.7	273.5	454.3	450.1	4.20	108.063	
1,100.0	1,100.0	1,088.4	1,088.4	2.4	2.3	143.06	-363.2	273.1	454.5	449.8	4.69	96.995	
1,200.0	1,200.0	1,189.9	1,189.9	2.6	2.6	143.14	-363.6	272.6	454.4	449.3	5.17	87.891	
1,300.0	1,300.0	1,291.5	1,291.5	2.8	2.8	143.25	-363.8	271.7	454.1	448.4	5.65	80.407	
1,400.0	1,400.0	1,391.1	1,391.0	3.0	3.1	143.36	-363.9	270.7	453.5	447.4	6.12	74.162	
1,500.0	1,500.0	1,491.7	1,491.7	3.3	3.3	143.47	-364.0	269.7	453.0	446.4	6.59	68.753	
1,600.0	1,600.0	1,592.8	1,592.8	3.5	3.6	143.59	-364.0	268.5	452.3	445.3	7.06	64.056	
1,700.0	1,700.0	1,692.2	1,692.1	3.7	3.8	69.23	-364.0	267.1	451.2	443.7	7.52	59.988	
1,800.0	1,800.0	1,793.2	1,793.1	3.9	4.1	69.71	-364.1	265.7	449.5	441.5	7.98	56.321	
1,900.0	1,899.9	1,892.5	1,892.5	4.1	4.3	70.41	-364.1	264.2	447.1	438.7	8.44	52.974	
2,000.0	1,999.7	1,991.3	1,991.3	4.3	4.6	71.34	-364.3	262.7	444.4	435.5	8.91	49.887	
2,100.0	2,099.4	2,091.8	2,091.8	4.6	4.8	72.53	-364.5	261.1	441.3	432.0	9.39	46.999	
2,200.0	2,198.9	2,190.6	2,190.5	4.8	5.1	73.94	-364.7	259.5	437.9	428.0	9.88	44.336	
2,300.0	2,298.3	2,288.8	2,288.6	5.0	5.4	75.56	-365.1	258.0	434.4	424.0	10.37	41.875	
2,400.0	2,397.4	2,388.6	2,388.4	5.3	5.6	77.53	-365.7	256.2	431.0	420.1	10.89	39.566	
2,500.0	2,496.3	2,484.9	2,484.7	5.6	5.9	79.75	-366.6	253.9	427.8	416.4	11.42	37.464	
2,600.0	2,594.9	2,582.2	2,582.0	5.9	6.1	82.26	-368.0	251.5	425.5	413.6	11.97	35.555	
2,700.0	2,693.3	2,679.1	2,678.9	6.2	6.4	85.01	-369.6	249.2	424.1	411.6	12.54	33.823	
2,779.6	2,771.3	2,756.6	2,756.3	6.4	6.6	87.38	-371.0	247.3	423.8	410.8	13.01	32.565 CC	
2,800.0	2,791.2	2,776.5	2,776.2	6.5	6.6	88.00	-371.4	246.8	423.8	410.7	13.13	32.265 ES	
2,900.0	2,888.9	2,872.2	2,871.8	6.9	6.9	91.11	-373.1	244.7	424.8	411.1	13.75	30.900	
3,000.0	2,986.1	2,970.4	2,970.1	7.3	7.1	94.50	-375.0	242.6	427.4	413.0	14.39	29.701	
3,100.0	3,083.0	3,068.8	3,068.4	7.7	7.4	98.05	-376.3	240.1	431.2	416.2	15.06	28.642	
3,200.0	3,179.8	3,166.0	3,165.6	8.1	7.7	101.57	-377.3	237.4	436.4	420.7	15.72	27.760	
3,300.0	3,276.7	3,263.9	3,263.4	8.5	7.9	105.07	-378.1	234.2	443.0	426.6	16.38	27.047	
3,400.0	3,373.5	3,362.9	3,362.3	9.0	8.2	108.55	-378.2	230.7	450.7	433.7	17.02	26.477	
3,500.0	3,470.4	3,460.5	3,459.9	9.5	8.4	111.92	-377.8	226.7	459.5	441.9	17.64	26.042	
3,600.0	3,567.2	3,557.8	3,557.0	9.9	8.6	115.17	-377.0	222.7	469.6	451.4	18.25	25.739	
3,700.0	3,664.1	3,652.1	3,651.3	10.4	8.9	118.23	-376.1	218.4	481.1	462.2	18.83	25.555	
3,800.0	3,760.9	3,747.6	3,746.6	10.9	9.1	121.20	-375.6	213.9	494.4	475.0	19.39	25.496 SF	
3,900.0	3,857.8	3,845.1	3,844.0	11.4	9.4	124.05	-374.6	209.5	508.7	488.7	19.95	25.502	
4,000.0	3,954.6	3,940.2	3,939.1	11.9	9.6	126.67	-373.8	205.5	524.1	503.6	20.49	25.586	
4,100.0	4,051.5	4,036.8	4,035.5	12.3	9.8	129.16	-373.1	201.5	540.7	519.7	21.01	25.732	
4,200.0	4,148.3	4,134.7	4,133.4	12.8	10.1	131.50	-372.2	197.9	557.9	536.4	21.53	25.910	
4,300.0	4,245.2	4,230.8	4,229.4	13.3	10.3	133.64	-371.3	194.7	575.8	553.8	22.04	26.128	
4,400.0	4,342.0	4,327.7	4,326.3	13.8	10.5	135.65	-370.5	191.6	594.4	571.9	22.54	26.374	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**Local Co-ordinate Reference:**	Well Stroh 13O-403
Project:	SEC.13-T4N-R67W	**TVD Reference:**	WELL @ 4819.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	**MD Reference:**	WELL @ 4819.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Stroh 13O-403	**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

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	2.0	2.0	0.0	0.0	-90.00	0.0	-181.3	181.3	181.3	0.00	N/A	
100.0	100.0	102.0	102.0	0.1	0.1	-90.00	0.0	-181.3	181.3	181.0	0.23	790.702	
166.0	166.0	168.0	168.0	0.3	0.3	-90.00	0.0	-181.3	181.3	180.8	0.53	344.705	CC
200.0	200.0	201.9	201.9	0.3	0.3	-90.00	0.0	-181.3	181.3	180.6	0.68	267.180	ES
300.0	300.0	300.0	300.0	0.6	0.6	-89.95	0.2	-182.1	182.1	181.0	1.11	163.383	
400.0	400.0	395.8	395.8	0.8	0.8	-89.81	0.6	-184.6	184.7	183.1	1.55	119.336	
500.0	500.0	492.6	492.5	1.0	1.0	-89.57	1.4	-188.6	188.9	186.9	1.99	94.811	
600.0	600.0	589.3	589.0	1.2	1.2	-89.26	2.5	-194.3	194.7	192.3	2.45	79.591	
700.0	700.0	685.7	685.1	1.5	1.5	-88.89	3.9	-201.5	202.2	199.3	2.91	69.438	
800.0	800.0	781.9	780.9	1.7	1.7	-88.48	5.6	-210.3	211.4	208.0	3.39	62.326	
900.0	900.0	877.7	876.1	1.9	2.0	-88.03	7.6	-220.6	222.2	218.3	3.89	57.178	
1,000.0	1,000.0	973.1	970.8	2.1	2.3	-87.57	9.9	-232.4	234.7	230.3	4.40	53.363	
1,100.0	1,100.0	1,068.1	1,064.8	2.4	2.6	-87.10	12.5	-245.7	248.8	243.9	4.93	50.489	
1,200.0	1,200.0	1,162.7	1,158.1	2.6	2.9	-86.64	15.3	-260.5	264.6	259.1	5.48	48.300	
1,300.0	1,300.0	1,256.7	1,250.7	2.8	3.3	-86.19	18.4	-276.7	282.0	275.9	6.05	46.623	
1,400.0	1,400.0	1,350.1	1,342.4	3.0	3.6	-85.76	21.8	-294.2	301.0	294.4	6.64	45.335	
1,500.0	1,500.0	1,442.9	1,433.2	3.3	4.0	-85.35	25.5	-313.1	321.6	314.4	7.25	44.348	
1,600.0	1,600.0	1,535.5	1,523.4	3.5	4.4	-84.96	29.4	-333.4	343.8	335.9	7.88	43.604	SF
1,700.0	1,700.0	1,632.6	1,617.9	3.7	4.9	-159.17	33.6	-355.3	367.5	360.0	7.43	49.474	
1,800.0	1,800.0	1,729.3	1,712.1	3.9	5.4	-158.89	37.9	-377.1	392.7	384.8	7.87	49.873	
1,900.0	1,899.9	1,825.7	1,805.9	4.1	5.8	-158.72	42.1	-398.9	419.5	411.2	8.32	50.426	
2,000.0	1,999.7	1,921.6	1,899.2	4.3	6.3	-158.63	46.2	-420.5	447.9	439.2	8.76	51.113	
2,100.0	2,099.4	2,017.0	1,992.0	4.6	6.7	-158.61	50.4	-442.0	477.9	468.7	9.20	51.914	
2,200.0	2,198.9	2,111.9	2,084.4	4.8	7.2	-158.65	54.5	-463.4	509.4	499.7	9.64	52.815	
2,300.0	2,298.3	2,206.2	2,176.2	5.0	7.7	-158.73	58.7	-484.7	542.4	532.3	10.08	53.802	
2,400.0	2,397.4	2,300.0	2,267.5	5.3	8.1	-158.85	62.8	-505.9	577.0	566.5	10.52	54.865	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**Local Co-ordinate Reference:**	Well Stroh 13O-403
Project:	SEC.13-T4N-R67W	**TVD Reference:**	WELL @ 4819.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	**MD Reference:**	WELL @ 4819.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Stroh 13O-403	**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

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	1.0	1.0	0.0	0.0	-90.00	0.0	-150.6	150.6				
100.0	100.0	101.0	101.0	0.1	0.1	-90.00	0.0	-150.6	150.6	150.4	0.23	663.395	
200.0	200.0	201.0	201.0	0.3	0.3	-90.00	0.0	-150.6	150.6	149.9	0.68	222.601	
300.0	300.0	301.0	301.0	0.6	0.6	-90.00	0.0	-150.6	150.6	149.5	1.13	133.738	
366.3	366.3	367.3	367.3	0.7	0.7	-90.00	0.0	-150.6	150.6	149.2	1.42	105.739	CC
400.0	400.0	400.0	400.0	0.8	0.8	-90.00	0.0	-150.6	150.6	149.0	1.57	95.720	ES
500.0	500.0	498.4	498.4	1.0	1.0	-89.94	0.1	-151.4	151.5	149.4	2.01	75.377	
600.0	600.0	595.9	595.8	1.2	1.2	-89.78	0.6	-153.9	154.0	151.5	2.44	63.106	
700.0	700.0	693.2	693.0	1.5	1.4	-89.52	1.3	-158.0	158.2	155.3	2.88	54.942	
800.0	800.0	790.3	790.0	1.7	1.6	-89.18	2.3	-163.7	164.1	160.7	3.33	49.306	
900.0	900.0	887.2	886.6	1.9	1.9	-88.78	3.6	-171.0	171.6	167.8	3.79	45.321	
1,000.0	1,000.0	983.8	982.8	2.1	2.1	-88.34	5.2	-179.9	180.8	176.6	4.26	42.465	
1,100.0	1,100.0	1,080.1	1,078.5	2.4	2.4	-87.87	7.1	-190.3	191.7	187.0	4.75	40.405	
1,200.0	1,200.0	1,176.0	1,173.6	2.6	2.7	-87.39	9.2	-202.3	204.3	199.1	5.25	38.924	
1,300.0	1,300.0	1,271.5	1,268.1	2.8	3.0	-86.92	11.6	-215.7	218.5	212.8	5.77	37.872	
1,400.0	1,400.0	1,367.5	1,362.9	3.0	3.3	-86.45	14.3	-230.8	234.4	228.1	6.31	37.137	
1,500.0	1,500.0	1,465.0	1,459.0	3.3	3.6	-86.02	17.2	-247.0	251.1	244.2	6.88	36.516	
1,600.0	1,600.0	1,563.6	1,556.2	3.5	4.0	-85.64	20.1	-263.3	267.8	260.4	7.45	35.945	SF
1,700.0	1,700.0	1,662.0	1,653.3	3.7	4.4	-159.91	23.0	-279.6	285.3	278.0	7.36	38.765	
1,800.0	1,800.0	1,760.2	1,750.0	3.9	4.7	-159.72	25.9	-295.8	304.5	296.7	7.80	39.047	
1,900.0	1,899.9	1,858.0	1,846.4	4.1	5.1	-159.64	28.8	-312.0	325.2	317.0	8.23	39.499	
2,000.0	1,999.7	1,955.5	1,942.5	4.3	5.4	-159.66	31.7	-328.1	347.6	338.9	8.67	40.096	
2,100.0	2,099.4	2,052.6	2,038.2	4.6	5.8	-159.75	34.5	-344.2	371.5	362.4	9.10	40.819	
2,200.0	2,198.9	2,149.2	2,133.5	4.8	6.2	-159.91	37.4	-360.2	397.1	387.6	9.53	41.651	
2,300.0	2,298.3	2,245.4	2,228.4	5.0	6.6	-160.12	40.2	-376.1	424.2	414.3	9.96	42.577	
2,400.0	2,397.4	2,341.2	2,322.8	5.3	6.9	-160.36	43.0	-391.9	452.9	442.5	10.39	43.586	
2,500.0	2,496.3	2,436.4	2,416.7	5.6	7.3	-160.63	45.8	-407.7	483.2	472.4	10.82	44.669	
2,600.0	2,594.9	2,531.2	2,510.0	5.9	7.6	-160.91	48.6	-423.3	515.1	503.9	11.24	45.815	
2,700.0	2,693.3	2,625.3	2,602.9	6.2	8.0	-161.21	51.4	-438.9	548.6	536.9	11.67	47.019	
2,800.0	2,791.2	2,718.9	2,695.1	6.5	8.4	-161.51	54.2	-454.4	583.7	571.6	12.09	48.273	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**Local Co-ordinate Reference:**	Well Stroh 13O-403
Project:	SEC.13-T4N-R67W	**TVD Reference:**	WELL @ 4819.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	**MD Reference:**	WELL @ 4819.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Stroh 13O-403	**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

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	1.0	1.0	0.0	0.0	-90.00	0.0	-61.4	61.4	61.4	0.00	N/A	
100.0	100.0	101.0	101.0	0.1	0.1	-90.00	0.0	-61.4	61.4	61.1	0.23	270.272	
200.0	200.0	201.0	201.0	0.3	0.3	-90.00	0.0	-61.4	61.4	60.7	0.68	90.689	
300.0	300.0	301.0	301.0	0.6	0.6	-90.00	0.0	-61.4	61.4	60.2	1.13	54.486	
400.0	400.0	401.0	401.0	0.8	0.8	-90.00	0.0	-61.4	61.4	59.8	1.58	38.941	
500.0	500.0	501.0	501.0	1.0	1.0	-90.00	0.0	-61.4	61.4	59.3	2.03	30.297	
600.0	600.0	601.0	601.0	1.2	1.2	-90.00	0.0	-61.4	61.4	58.9	2.47	24.793	
700.0	700.0	701.0	701.0	1.5	1.5	-90.00	0.0	-61.4	61.4	58.4	2.92	20.982	
800.0	800.0	801.0	801.0	1.7	1.7	-90.00	0.0	-61.4	61.4	58.0	3.37	18.186	
900.0	900.0	901.0	901.0	1.9	1.9	-90.00	0.0	-61.4	61.4	57.5	3.82	16.048	
1,000.0	1,000.0	1,001.0	1,001.0	2.1	2.1	-90.00	0.0	-61.4	61.4	57.1	4.27	14.360	
1,100.0	1,100.0	1,101.0	1,101.0	2.4	2.4	-90.00	0.0	-61.4	61.4	56.6	4.72	12.993	
1,200.0	1,200.0	1,201.0	1,201.0	2.6	2.6	-90.00	0.0	-61.4	61.4	56.2	5.17	11.863	
1,300.0	1,300.0	1,301.0	1,301.0	2.8	2.8	-90.00	0.0	-61.4	61.4	55.7	5.62	10.915	
1,400.0	1,400.0	1,401.0	1,401.0	3.0	3.0	-90.00	0.0	-61.4	61.4	55.3	6.07	10.106	
1,500.0	1,500.0	1,501.0	1,501.0	3.3	3.3	-90.00	0.0	-61.4	61.4	54.8	6.52	9.410	
1,600.0	1,600.0	1,601.0	1,601.0	3.5	3.5	-90.00	0.0	-61.4	61.4	54.4	6.97	8.803	CC, ES
1,700.0	1,700.0	1,701.0	1,701.0	3.7	3.7	-164.83	0.0	-61.4	62.2	54.8	7.41	8.396	
1,800.0	1,800.0	1,801.0	1,801.0	3.9	3.9	-165.43	0.0	-61.4	64.7	56.9	7.84	8.261	SF
1,900.0	1,899.9	1,900.9	1,900.9	4.1	4.2	-166.33	0.0	-61.4	69.0	60.7	8.26	8.345	
2,000.0	1,999.7	2,000.7	2,000.7	4.3	4.4	-167.42	0.0	-61.4	74.9	66.2	8.69	8.620	
2,100.0	2,099.4	2,101.0	2,101.0	4.6	4.6	-168.05	0.8	-61.0	82.2	73.1	9.12	9.016	
2,200.0	2,198.9	2,201.4	2,201.3	4.8	4.8	-167.79	3.2	-60.0	90.4	80.8	9.54	9.476	
2,300.0	2,298.3	2,301.7	2,301.5	5.0	5.1	-166.88	7.3	-58.2	99.5	89.5	9.96	9.990	
2,400.0	2,397.4	2,401.9	2,401.6	5.3	5.3	-165.51	12.9	-55.8	109.6	99.2	10.39	10.555	
2,500.0	2,496.3	2,502.0	2,501.4	5.6	5.5	-163.81	20.2	-52.7	120.8	110.0	10.81	11.167	
2,600.0	2,594.9	2,602.0	2,600.9	5.9	5.7	-161.92	29.0	-48.9	133.0	121.8	11.25	11.823	
2,700.0	2,693.3	2,701.8	2,700.0	6.2	6.0	-159.91	39.4	-44.4	146.5	134.8	11.70	12.516	
2,800.0	2,791.2	2,801.4	2,798.8	6.5	6.2	-157.87	51.4	-39.3	161.2	149.0	12.17	13.239	
2,900.0	2,888.9	2,900.8	2,897.0	6.9	6.5	-155.84	64.9	-33.5	177.1	164.5	12.66	13.985	
3,000.0	2,986.1	2,999.5	2,994.5	7.3	6.8	-153.90	79.8	-27.1	194.4	181.2	13.18	14.748	
3,100.0	3,083.0	3,097.6	3,091.2	7.7	7.0	-152.42	94.8	-20.6	213.1	199.4	13.74	15.508	
3,200.0	3,179.8	3,195.7	3,187.9	8.1	7.3	-151.22	109.9	-14.2	232.0	217.7	14.33	16.189	
3,300.0	3,276.7	3,293.8	3,284.6	8.5	7.6	-150.20	124.9	-7.7	251.1	236.1	14.94	16.803	
3,400.0	3,373.5	3,391.9	3,381.4	9.0	7.9	-149.32	140.0	-1.2	270.1	254.6	15.56	17.357	
3,500.0	3,470.4	3,490.0	3,478.1	9.5	8.2	-148.56	155.0	5.2	289.3	273.1	16.20	17.857	
3,600.0	3,567.2	3,588.1	3,574.8	9.9	8.5	-147.90	170.1	11.7	308.5	291.6	16.85	18.309	
3,700.0	3,664.1	3,686.2	3,671.5	10.4	8.9	-147.31	185.1	18.2	327.7	310.2	17.50	18.719	
3,800.0	3,760.9	3,784.2	3,768.2	10.9	9.2	-146.79	200.2	24.6	346.9	328.7	18.17	19.091	
3,900.0	3,857.8	3,882.3	3,864.9	11.4	9.5	-146.32	215.2	31.1	366.2	347.3	18.85	19.429	
4,000.0	3,954.6	3,979.9	3,961.2	11.9	9.8	-145.94	229.9	37.4	385.5	366.0	19.51	19.758	
4,100.0	4,051.5	4,076.7	4,057.1	12.3	10.1	-145.99	242.1	42.6	405.1	385.0	20.10	20.157	
4,200.0	4,148.3	4,173.3	4,153.1	12.8	10.3	-146.49	251.2	46.5	425.0	404.3	20.63	20.600	
4,300.0	4,245.2	4,269.4	4,248.9	13.3	10.5	-147.36	257.3	49.2	445.3	424.2	21.12	21.088	
4,400.0	4,342.0	4,364.8	4,344.3	13.8	10.7	-148.54	260.5	50.5	466.1	444.6	21.55	21.628	
4,500.0	4,438.9	4,460.4	4,439.9	14.3	10.8	-149.97	261.0	50.7	487.6	465.7	21.95	22.211	
4,600.0	4,535.7	4,557.2	4,536.7	14.9	11.0	-151.36	261.0	50.7	509.5	487.1	22.37	22.780	
4,700.0	4,632.6	4,654.1	4,633.6	15.4	11.2	-152.64	261.0	50.7	531.7	508.9	22.79	23.331	
4,800.0	4,729.4	4,750.9	4,730.4	15.9	11.4	-153.82	261.0	50.7	554.0	530.8	23.21	23.869	
4,900.0	4,826.3	4,847.8	4,827.3	16.4	11.6	-154.90	261.0	50.7	576.6	553.0	23.64	24.394	
5,000.0	4,923.1	4,944.6	4,924.1	16.9	11.8	-155.91	261.0	50.7	599.4	575.3	24.07	24.906	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**Local Co-ordinate Reference:**	Well Stroh 13O-403
Project:	SEC.13-T4N-R67W	**TVD Reference:**	WELL @ 4819.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	**MD Reference:**	WELL @ 4819.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Stroh 13O-403	**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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**Local Co-ordinate Reference:**	Well Stroh 13O-403
Project:	SEC.13-T4N-R67W	**TVD Reference:**	WELL @ 4819.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	**MD Reference:**	WELL @ 4819.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Stroh 13O-403	**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

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	1.0	1.0	0.0	0.0	-90.00	0.0	-119.9	119.9	119.9	0.00	N/A	
100.0	100.0	101.0	101.0	0.1	0.1	-90.00	0.0	-119.9	119.9	119.7	0.23	528.259	
200.0	200.0	201.0	201.0	0.3	0.3	-90.00	0.0	-119.9	119.9	119.2	0.68	177.256	
300.0	300.0	301.0	301.0	0.6	0.6	-90.00	0.0	-119.9	119.9	118.8	1.13	106.495	
400.0	400.0	401.0	401.0	0.8	0.8	-90.00	0.0	-119.9	119.9	118.3	1.58	76.111	
500.0	500.0	501.0	501.0	1.0	1.0	-90.00	0.0	-119.9	119.9	117.9	2.03	59.217	
600.0	600.0	601.0	601.0	1.2	1.2	-90.00	0.0	-119.9	119.9	117.4	2.47	48.460	
700.0	700.0	701.0	701.0	1.5	1.5	-90.00	0.0	-119.9	119.9	117.0	2.92	41.010	
800.0	800.0	801.0	801.0	1.7	1.7	-90.00	0.0	-119.9	119.9	116.5	3.37	35.546	
900.0	900.0	901.0	901.0	1.9	1.9	-90.00	0.0	-119.9	119.9	116.1	3.82	31.366	
1,000.0	1,000.0	1,001.0	1,001.0	2.1	2.1	-90.00	0.0	-119.9	119.9	115.6	4.27	28.066	
1,100.0	1,100.0	1,101.0	1,101.0	2.4	2.4	-90.00	0.0	-119.9	119.9	115.2	4.72	25.395	
1,200.0	1,200.0	1,201.0	1,201.0	2.6	2.6	-90.00	0.0	-119.9	119.9	114.8	5.17	23.187	
1,300.0	1,300.0	1,301.0	1,301.0	2.8	2.8	-90.00	0.0	-119.9	119.9	114.3	5.62	21.333	
1,366.3	1,366.3	1,367.3	1,367.3	3.0	3.0	-90.00	0.0	-119.9	119.9	114.0	5.92	20.259	CC
1,400.0	1,400.0	1,400.0	1,400.0	3.0	3.0	-90.00	0.0	-119.9	119.9	113.9	6.07	19.761	ES
1,500.0	1,500.0	1,498.9	1,498.9	3.3	3.2	-89.96	0.1	-120.8	120.8	114.3	6.50	18.572	
1,600.0	1,600.0	1,596.8	1,596.8	3.5	3.4	-89.82	0.4	-123.3	123.4	116.4	6.93	17.804	
1,700.0	1,700.0	1,694.6	1,694.4	3.7	3.6	-164.31	0.9	-127.4	128.5	121.1	7.34	17.497	SF
1,800.0	1,800.0	1,792.0	1,791.7	3.9	3.9	-164.30	1.6	-133.2	136.9	129.2	7.75	17.671	
1,900.0	1,899.9	1,888.9	1,888.3	4.1	4.1	-164.39	2.4	-140.6	148.7	140.6	8.16	18.235	
2,000.0	1,999.7	1,985.1	1,984.1	4.3	4.3	-164.54	3.5	-149.6	163.9	155.3	8.56	19.132	
2,100.0	2,099.4	2,080.5	2,078.9	4.6	4.5	-164.73	4.7	-160.0	182.3	173.3	8.97	20.316	
2,200.0	2,198.9	2,175.0	2,172.6	4.8	4.8	-164.94	6.2	-171.9	204.0	194.6	9.38	21.746	
2,300.0	2,298.3	2,268.3	2,265.0	5.0	5.0	-165.15	7.7	-185.1	228.9	219.1	9.79	23.390	
2,400.0	2,397.4	2,361.2	2,356.7	5.3	5.3	-165.35	9.5	-199.8	257.0	246.8	10.19	25.210	
2,500.0	2,496.3	2,456.5	2,450.8	5.6	5.6	-165.58	11.3	-215.3	287.2	276.6	10.60	27.081	
2,600.0	2,594.9	2,551.3	2,544.3	5.9	5.9	-165.82	13.1	-230.7	319.0	308.0	11.01	28.966	
2,700.0	2,693.3	2,645.6	2,637.2	6.2	6.2	-166.08	14.9	-246.0	352.4	341.0	11.42	30.858	
2,800.0	2,791.2	2,739.2	2,729.6	6.5	6.5	-166.33	16.8	-261.2	387.4	375.6	11.83	32.755	
2,900.0	2,888.9	2,832.2	2,821.4	6.9	6.8	-166.59	18.5	-276.4	424.0	411.8	12.23	34.657	
3,000.0	2,986.1	2,924.6	2,912.5	7.3	7.1	-166.84	20.3	-291.4	462.2	449.6	12.64	36.563	
3,100.0	3,083.0	3,016.4	3,003.1	7.7	7.4	-167.13	22.1	-306.3	501.7	488.7	13.07	38.375	
3,200.0	3,179.8	3,108.2	3,093.6	8.1	7.8	-167.42	23.9	-321.2	541.4	527.9	13.53	40.016	
3,300.0	3,276.7	3,200.0	3,184.2	8.5	8.1	-167.67	25.6	-336.2	581.1	567.1	13.99	41.538	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**Local Co-ordinate Reference:**	Well Stroh 13O-403
Project:	SEC.13-T4N-R67W	**TVD Reference:**	WELL @ 4819.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	**MD Reference:**	WELL @ 4819.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Stroh 13O-403	**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

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	1.0	1.0	0.0	0.0	-90.00	0.0	-92.0	92.0	92.0	0.00	N/A	
100.0	100.0	101.0	101.0	0.1	0.1	-90.00	0.0	-92.0	92.0	91.8	0.23	405.408	
200.0	200.0	201.0	201.0	0.3	0.3	-90.00	0.0	-92.0	92.0	91.4	0.68	136.034	
300.0	300.0	301.0	301.0	0.6	0.6	-90.00	0.0	-92.0	92.0	90.9	1.13	81.729	
400.0	400.0	401.0	401.0	0.8	0.8	-90.00	0.0	-92.0	92.0	90.5	1.58	58.411	
500.0	500.0	501.0	501.0	1.0	1.0	-90.00	0.0	-92.0	92.0	90.0	2.03	45.445	
600.0	600.0	601.0	601.0	1.2	1.2	-90.00	0.0	-92.0	92.0	89.6	2.47	37.190	
700.0	700.0	701.0	701.0	1.5	1.5	-90.00	0.0	-92.0	92.0	89.1	2.92	31.473	
800.0	800.0	801.0	801.0	1.7	1.7	-90.00	0.0	-92.0	92.0	88.7	3.37	27.279	
900.0	900.0	901.0	901.0	1.9	1.9	-90.00	0.0	-92.0	92.0	88.2	3.82	24.072	
1,000.0	1,000.0	1,001.0	1,001.0	2.1	2.1	-90.00	0.0	-92.0	92.0	87.8	4.27	21.539	
1,100.0	1,100.0	1,101.0	1,101.0	2.4	2.4	-90.00	0.0	-92.0	92.0	87.3	4.72	19.489	
1,200.0	1,200.0	1,201.0	1,201.0	2.6	2.6	-90.00	0.0	-92.0	92.0	86.9	5.17	17.795	
1,300.0	1,300.0	1,301.0	1,301.0	2.8	2.8	-90.00	0.0	-92.0	92.0	86.4	5.62	16.372	
1,400.0	1,400.0	1,401.0	1,401.0	3.0	3.0	-90.00	0.0	-92.0	92.0	86.0	6.07	15.160	
1,500.0	1,500.0	1,501.0	1,501.0	3.3	3.3	-90.00	0.0	-92.0	92.0	85.5	6.52	14.115	
1,566.3	1,566.3	1,567.3	1,567.3	3.4	3.4	-90.00	0.0	-92.0	92.0	85.2	6.82	13.497	CC
1,600.0	1,600.0	1,601.0	1,601.0	3.5	3.5	-90.00	0.0	-92.0	92.0	85.1	6.97	13.204	ES
1,700.0	1,700.0	1,700.0	1,700.0	3.7	3.7	-164.31	0.7	-92.5	93.4	86.0	7.40	12.610	
1,800.0	1,800.0	1,799.1	1,799.1	3.9	3.9	-163.44	2.9	-93.9	97.3	89.5	7.82	12.438	SF
1,900.0	1,899.9	1,897.9	1,897.7	4.1	4.1	-162.14	6.5	-96.3	104.0	95.7	8.25	12.608	
2,000.0	1,999.7	1,996.3	1,996.0	4.3	4.4	-160.58	11.5	-99.5	113.3	104.7	8.67	13.074	
2,100.0	2,099.4	2,094.2	2,093.6	4.6	4.6	-158.92	17.8	-103.7	125.4	116.4	9.09	13.796	
2,200.0	2,198.9	2,191.6	2,190.5	4.8	4.8	-157.28	25.6	-108.7	140.3	130.8	9.52	14.741	
2,300.0	2,298.3	2,288.3	2,286.6	5.0	5.1	-155.73	34.6	-114.6	158.0	148.0	9.95	15.877	
2,400.0	2,397.4	2,384.2	2,381.8	5.3	5.3	-154.31	44.9	-121.3	178.4	168.0	10.39	17.175	
2,500.0	2,496.3	2,479.3	2,475.8	5.6	5.6	-153.05	56.4	-128.8	201.5	190.7	10.83	18.608	
2,600.0	2,594.9	2,573.3	2,568.6	5.9	5.8	-151.92	69.1	-137.0	227.4	216.1	11.28	20.153	
2,700.0	2,693.3	2,666.3	2,660.1	6.2	6.1	-150.93	82.9	-146.0	255.8	244.1	11.74	21.787	
2,800.0	2,791.2	2,760.0	2,752.1	6.5	6.4	-150.07	97.9	-155.8	286.8	274.5	12.22	23.473	
2,900.0	2,888.9	2,854.5	2,844.9	6.9	6.7	-149.47	113.1	-165.7	319.3	306.6	12.70	25.131	
3,000.0	2,986.1	2,948.6	2,937.2	7.3	7.0	-149.09	128.2	-175.5	353.2	340.0	13.20	26.757	
3,100.0	3,083.0	3,042.2	3,029.1	7.7	7.4	-148.97	143.3	-185.4	388.3	374.6	13.73	28.289	
3,200.0	3,179.8	3,135.8	3,120.9	8.1	7.7	-148.95	158.4	-195.2	423.5	409.2	14.28	29.666	
3,300.0	3,276.7	3,229.4	3,212.8	8.5	8.0	-148.93	173.4	-205.0	458.7	443.9	14.84	30.920	
3,400.0	3,373.5	3,323.0	3,304.6	9.0	8.4	-148.91	188.5	-214.8	494.0	478.6	15.41	32.065	
3,500.0	3,470.4	3,416.6	3,396.5	9.5	8.7	-148.90	203.6	-224.6	529.2	513.2	15.98	33.113	
3,600.0	3,567.2	3,516.9	3,495.0	9.9	9.1	-148.91	219.4	-234.9	564.2	547.6	16.56	34.059	
3,700.0	3,664.1	3,627.9	3,604.6	10.4	9.4	-149.16	234.0	-244.4	597.0	579.8	17.13	34.855	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**Local Co-ordinate Reference:**	Well Stroh 13O-403
Project:	SEC.13-T4N-R67W	**TVD Reference:**	WELL @ 4819.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	**MD Reference:**	WELL @ 4819.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Stroh 13O-403	**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

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-90.00	0.0	-30.7	30.7				
100.0	100.0	100.0	100.0	0.1	0.1	-90.00	0.0	-30.7	30.7	30.5	0.22	136.487	
200.0	200.0	200.0	200.0	0.3	0.3	-90.00	0.0	-30.7	30.7	30.0	0.67	45.496	
300.0	300.0	300.0	300.0	0.6	0.6	-90.00	0.0	-30.7	30.7	29.6	1.12	27.297	
400.0	400.0	400.0	400.0	0.8	0.8	-90.00	0.0	-30.7	30.7	29.1	1.57	19.498	
500.0	500.0	500.0	500.0	1.0	1.0	-90.00	0.0	-30.7	30.7	28.7	2.02	15.165	
600.0	600.0	600.0	600.0	1.2	1.2	-90.00	0.0	-30.7	30.7	28.2	2.47	12.408	
700.0	700.0	700.0	700.0	1.5	1.5	-90.00	0.0	-30.7	30.7	27.8	2.92	10.499	
800.0	800.0	800.0	800.0	1.7	1.7	-90.00	0.0	-30.7	30.7	27.3	3.37	9.099	
900.0	900.0	900.0	900.0	1.9	1.9	-90.00	0.0	-30.7	30.7	26.9	3.82	8.029	
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	-90.00	0.0	-30.7	30.7	26.4	4.27	7.184	
1,100.0	1,100.0	1,100.0	1,100.0	2.4	2.4	-90.00	0.0	-30.7	30.7	26.0	4.72	6.499	
1,200.0	1,200.0	1,200.0	1,200.0	2.6	2.6	-90.00	0.0	-30.7	30.7	25.5	5.17	5.934	
1,300.0	1,300.0	1,300.0	1,300.0	2.8	2.8	-90.00	0.0	-30.7	30.7	25.1	5.62	5.459	
1,400.0	1,400.0	1,400.0	1,400.0	3.0	3.0	-90.00	0.0	-30.7	30.7	24.6	6.07	5.055	
1,500.0	1,500.0	1,500.0	1,500.0	3.3	3.3	-90.00	0.0	-30.7	30.7	24.2	6.52	4.706	
1,600.0	1,600.0	1,600.0	1,600.0	3.5	3.5	-90.00	0.0	-30.7	30.7	23.7	6.97	4.403	CC, ES
1,700.0	1,700.0	1,700.0	1,700.0	3.7	3.7	-165.03	0.0	-30.7	31.5	24.1	7.41	4.256	
1,800.0	1,800.0	1,800.0	1,800.0	3.9	3.9	-166.17	0.0	-30.7	34.1	26.2	7.83	4.347	
1,900.0	1,899.9	1,900.5	1,900.5	4.1	4.2	-167.28	0.3	-29.9	37.5	29.2	8.25	4.542	
2,000.0	1,999.7	2,001.1	2,001.0	4.3	4.4	-167.90	1.4	-27.4	41.0	32.3	8.66	4.729	
2,100.0	2,099.4	2,101.7	2,101.6	4.6	4.6	-168.15	3.1	-23.3	44.5	35.4	9.08	4.904	
2,200.0	2,198.9	2,202.4	2,202.1	4.8	4.8	-168.10	5.4	-17.6	48.1	38.6	9.49	5.068	
2,300.0	2,298.3	2,303.2	2,302.5	5.0	5.0	-167.82	8.5	-10.3	51.7	41.8	9.90	5.222	
2,400.0	2,397.4	2,404.0	2,402.9	5.3	5.3	-167.34	12.2	-1.3	55.4	45.1	10.32	5.367	
2,500.0	2,496.3	2,504.9	2,503.1	5.6	5.5	-166.72	16.6	9.3	59.1	48.4	10.75	5.504	
2,600.0	2,594.9	2,605.8	2,603.2	5.9	5.8	-165.98	21.7	21.6	62.9	51.8	11.17	5.632	
2,700.0	2,693.3	2,706.8	2,703.0	6.2	6.0	-165.13	27.5	35.4	66.8	55.2	11.61	5.753	
2,800.0	2,791.2	2,807.8	2,802.6	6.5	6.3	-164.20	34.0	50.9	70.7	58.6	12.05	5.865	
2,900.0	2,888.9	2,908.4	2,901.5	6.9	6.6	-163.26	41.0	67.8	74.9	62.3	12.51	5.983	
3,000.0	2,986.1	3,008.2	2,999.6	7.3	6.9	-162.72	48.1	84.9	80.4	67.5	12.97	6.200	
3,100.0	3,083.0	3,108.0	3,097.7	7.7	7.3	-162.55	55.2	101.9	87.4	74.0	13.46	6.493	
3,200.0	3,179.8	3,207.7	3,195.7	8.1	7.6	-162.43	62.2	118.9	94.5	80.6	13.98	6.765	
3,300.0	3,276.7	3,307.5	3,293.7	8.5	8.0	-162.33	69.3	135.9	101.7	87.2	14.50	7.013	
3,400.0	3,373.5	3,407.2	3,391.8	9.0	8.3	-162.25	76.4	152.9	108.8	93.8	15.02	7.242	
3,500.0	3,470.4	3,507.0	3,489.8	9.5	8.7	-162.17	83.4	169.9	115.9	100.4	15.56	7.452	
3,600.0	3,567.2	3,606.7	3,587.8	9.9	9.0	-162.11	90.5	186.9	123.1	107.0	16.10	7.646	
3,700.0	3,664.1	3,706.5	3,685.9	10.4	9.4	-162.05	97.6	203.9	130.2	113.5	16.64	7.824	
3,800.0	3,760.9	3,806.2	3,783.9	10.9	9.8	-162.00	104.7	220.9	137.3	120.1	17.19	7.990	
3,900.0	3,857.8	3,905.9	3,881.9	11.4	10.1	-161.95	111.7	237.9	144.4	126.7	17.74	8.143	
4,000.0	3,954.6	4,005.7	3,980.0	11.9	10.5	-161.91	118.8	254.9	151.6	133.3	18.29	8.286	
4,100.0	4,051.5	4,105.4	4,078.0	12.3	10.9	-161.87	125.9	271.9	158.7	139.8	18.85	8.418	
4,200.0	4,148.3	4,205.2	4,176.0	12.8	11.3	-161.83	133.0	288.9	165.8	146.4	19.41	8.542	
4,300.0	4,245.2	4,304.9	4,274.1	13.3	11.7	-161.80	140.0	305.9	173.0	153.0	19.98	8.658	
4,400.0	4,342.0	4,404.7	4,372.1	13.8	12.0	-161.77	147.1	322.9	180.1	159.5	20.54	8.766	
4,500.0	4,438.9	4,504.4	4,470.1	14.3	12.4	-161.74	154.2	339.9	187.2	166.1	21.11	8.867	
4,600.0	4,535.7	4,604.2	4,568.1	14.9	12.8	-161.72	161.3	356.9	194.3	172.7	21.68	8.962	
4,700.0	4,632.6	4,703.9	4,666.2	15.4	13.2	-161.69	168.3	373.9	201.5	179.2	22.26	9.051	
4,800.0	4,729.4	4,803.7	4,764.2	15.9	13.6	-161.67	175.4	390.9	208.6	185.8	22.83	9.136	
4,900.0	4,826.3	4,903.4	4,862.2	16.4	14.0	-161.65	182.5	407.9	215.7	192.3	23.41	9.215	
5,000.0	4,923.1	5,003.1	4,960.3	16.9	14.4	-161.63	189.6	424.9	222.9	198.9	23.99	9.290	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**Local Co-ordinate Reference:**	Well Stroh 13O-403
Project:	SEC.13-T4N-R67W	**TVD Reference:**	WELL @ 4819.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	**MD Reference:**	WELL @ 4819.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Stroh 13O-403	**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

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,100.0	5,020.0	5,102.9	5,058.3	17.4	14.8	-161.61	196.6	441.9	230.0	205.4	24.57	9.361	
5,200.0	5,116.8	5,202.6	5,156.3	17.9	15.2	-161.59	203.7	458.9	237.1	212.0	25.15	9.428	
5,300.0	5,213.7	5,302.4	5,254.4	18.4	15.6	-161.58	210.8	475.9	244.2	218.5	25.73	9.491	
5,400.0	5,310.5	5,402.1	5,352.4	18.9	16.0	-161.56	217.9	492.9	251.4	225.1	26.32	9.552	
5,500.0	5,407.4	5,501.9	5,450.4	19.5	16.4	-161.55	224.9	509.9	258.5	231.6	26.90	9.609	
5,600.0	5,504.2	5,601.6	5,548.5	20.0	16.8	-161.53	232.0	526.9	265.6	238.1	27.49	9.663	
5,700.0	5,601.1	5,701.4	5,646.5	20.5	17.2	-161.52	239.1	543.9	272.8	244.7	28.08	9.715	
5,800.0	5,697.9	5,801.1	5,744.5	21.0	17.6	-161.51	246.2	560.9	279.9	251.2	28.67	9.762	
5,900.0	5,795.3	5,895.0	5,836.9	21.4	17.9	-161.48	252.5	576.2	285.7	256.5	29.25	9.770	
6,000.0	5,893.4	5,986.5	5,927.5	21.7	18.2	-161.48	257.7	588.5	291.0	261.3	29.73	9.788	
6,100.0	5,992.1	6,078.0	6,018.3	22.0	18.4	-161.54	261.7	598.1	295.9	265.8	30.16	9.810	
6,200.0	6,091.3	6,169.3	6,109.3	22.3	18.6	-161.63	264.6	605.1	300.4	269.8	30.54	9.837	
6,300.0	6,190.9	6,260.5	6,200.4	22.5	18.8	-161.77	266.3	609.4	304.4	273.6	30.85	9.868	
6,400.0	6,290.7	6,351.6	6,291.5	22.7	18.9	-161.95	267.0	610.9	308.0	276.9	31.10	9.902	
6,500.0	6,390.7	6,450.8	6,390.7	22.8	19.0	-162.08	267.0	611.0	309.9	278.6	31.35	9.886	
6,600.0	6,490.7	6,551.9	6,491.7	22.9	19.2	-88.17	263.2	611.0	309.8	278.2	31.57	9.814	
6,687.0	6,577.6	6,638.9	6,577.6	23.0	19.2	90.01	249.6	611.0	309.6	278.1	31.53	9.821	
6,700.0	6,590.6	6,651.6	6,589.9	23.0	19.2	89.48	246.8	611.0	309.7	278.2	31.49	9.834	
6,800.0	6,689.2	6,750.0	6,684.0	23.1	19.3	87.07	218.3	611.0	310.1	278.7	31.34	9.894	
6,900.0	6,784.8	6,845.9	6,771.5	23.1	19.3	84.77	179.0	611.0	311.0	279.8	31.20	9.968	
7,000.0	6,875.8	6,940.8	6,852.5	23.1	19.3	82.56	129.7	611.0	312.3	281.2	31.13	10.034	
7,100.0	6,960.7	7,034.5	6,925.9	23.1	19.3	80.51	71.6	611.0	314.0	282.8	31.16	10.077	
7,200.0	7,037.9	7,127.0	6,990.8	23.2	19.3	78.64	5.8	611.0	315.9	284.6	31.33	10.084	
7,300.0	7,106.2	7,218.5	7,046.7	23.2	19.3	76.96	-66.6	611.0	317.9	286.3	31.62	10.054	
7,400.0	7,164.4	7,309.1	7,093.2	23.3	19.5	75.51	-144.3	611.0	319.9	287.8	32.07	9.974	
7,500.0	7,211.5	7,400.0	7,130.3	23.5	19.7	74.29	-227.2	611.0	321.7	289.0	32.68	9.844	
7,600.0	7,246.7	7,488.3	7,156.7	23.7	20.1	73.33	-311.4	611.0	323.3	289.8	33.45	9.664	
7,700.0	7,269.4	7,577.2	7,173.2	24.2	20.6	72.61	-398.7	611.0	324.5	290.1	34.40	9.432	
7,800.0	7,279.2	7,665.7	7,179.5	24.7	21.3	72.15	-487.0	611.0	325.3	289.8	35.54	9.154	
7,900.0	7,279.6	7,763.7	7,178.9	25.5	22.2	71.99	-584.9	611.0	325.6	288.2	37.38	8.711	
8,000.0	7,279.5	7,863.7	7,178.2	26.3	23.3	71.88	-684.9	611.0	325.8	286.2	39.58	8.231	
8,100.0	7,279.4	7,963.7	7,177.4	27.3	24.5	71.77	-784.9	611.0	326.0	284.0	41.99	7.764	
8,200.0	7,279.4	8,063.6	7,176.7	28.4	25.8	71.66	-884.9	611.0	326.2	281.7	44.57	7.320	
8,300.0	7,279.3	8,163.6	7,176.0	29.6	27.1	71.55	-984.9	611.0	326.4	279.1	47.28	6.904	
8,400.0	7,279.2	8,263.6	7,175.2	30.9	28.5	71.44	-1,084.9	611.0	326.6	276.5	50.11	6.518	
8,500.0	7,279.1	8,363.6	7,174.5	32.2	30.0	71.33	-1,184.9	611.0	326.9	273.8	53.03	6.163	
8,600.0	7,279.1	8,463.6	7,173.8	33.7	31.5	71.22	-1,284.9	611.0	327.1	271.0	56.04	5.836	
8,700.0	7,279.0	8,563.6	7,173.0	35.1	33.1	71.11	-1,384.9	611.0	327.3	268.2	59.11	5.537	
8,800.0	7,278.9	8,663.6	7,172.3	36.6	34.7	71.00	-1,484.9	611.0	327.5	265.3	62.24	5.262	
8,900.0	7,278.9	8,763.6	7,171.6	38.2	36.4	70.89	-1,584.9	611.0	327.7	262.3	65.42	5.010	
9,000.0	7,278.8	8,863.6	7,170.8	39.7	38.0	70.78	-1,684.9	611.0	327.9	259.3	68.63	4.778	
9,100.0	7,278.7	8,963.6	7,170.1	41.3	39.7	70.67	-1,784.9	611.0	328.1	256.3	71.89	4.565	
9,200.0	7,278.7	9,063.6	7,169.4	43.0	41.4	70.56	-1,884.9	611.0	328.4	253.2	75.17	4.369	
9,300.0	7,278.6	9,163.6	7,168.6	44.6	43.1	70.45	-1,984.9	611.0	328.6	250.1	78.47	4.187	
9,400.0	7,278.5	9,263.6	7,167.9	46.3	44.9	70.34	-2,084.8	611.0	328.8	247.0	81.80	4.020	
9,500.0	7,278.4	9,363.6	7,167.2	48.0	46.6	70.23	-2,184.8	611.0	329.0	243.9	85.14	3.865	
9,600.0	7,278.4	9,463.6	7,166.4	49.7	48.4	70.12	-2,284.8	611.0	329.3	240.8	88.50	3.720	
9,700.0	7,278.3	9,563.6	7,165.7	51.4	50.2	70.02	-2,384.8	611.0	329.5	237.6	91.88	3.586	
9,800.0	7,278.2	9,663.6	7,165.0	53.2	51.9	69.91	-2,484.8	611.0	329.7	234.5	95.26	3.461	
9,900.0	7,278.2	9,763.6	7,164.2	54.9	53.7	69.80	-2,584.8	611.0	329.9	231.3	98.66	3.344	
10,000.0	7,278.1	9,863.6	7,163.5	56.7	55.5	69.69	-2,684.8	611.0	330.2	228.1	102.06	3.235	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**Local Co-ordinate Reference:**	Well Stroh 13O-403
Project:	SEC.13-T4N-R67W	**TVD Reference:**	WELL @ 4819.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	**MD Reference:**	WELL @ 4819.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Stroh 13O-403	**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

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
10,100.0	7,278.0	9,963.6	7,162.8	58.5	57.4	69.58	-2,784.8	611.0	330.4	224.9	105.47	3.133	
10,200.0	7,278.0	10,063.6	7,162.0	60.2	59.2	69.48	-2,884.8	611.0	330.6	221.7	108.89	3.036	
10,300.0	7,277.9	10,163.6	7,161.3	62.0	61.0	69.37	-2,984.8	611.0	330.9	218.6	112.31	2.946	
10,400.0	7,277.8	10,263.6	7,160.6	63.8	62.8	69.26	-3,084.8	611.0	331.1	215.4	115.73	2.861	
10,500.0	7,277.7	10,363.6	7,159.8	65.6	64.7	69.15	-3,184.8	611.0	331.3	212.2	119.16	2.781	
10,600.0	7,277.7	10,463.6	7,159.1	67.4	66.5	69.05	-3,284.8	611.0	331.6	209.0	122.59	2.705	
10,700.0	7,277.6	10,563.6	7,158.4	69.3	68.3	68.94	-3,384.8	611.0	331.8	205.8	126.03	2.633	
10,800.0	7,277.5	10,663.6	7,157.6	71.1	70.2	68.83	-3,484.8	611.0	332.1	202.6	129.46	2.565	
10,900.0	7,277.5	10,763.6	7,156.9	72.9	72.0	68.73	-3,584.8	611.0	332.3	199.4	132.90	2.500	
11,000.0	7,277.4	10,863.6	7,156.2	74.7	73.9	68.62	-3,684.8	611.0	332.5	196.2	136.33	2.439	
11,100.0	7,277.3	10,963.6	7,155.4	76.6	75.8	68.51	-3,784.8	611.0	332.8	193.0	139.77	2.381	
11,200.0	7,277.3	11,063.6	7,154.7	78.4	77.6	68.41	-3,884.8	611.0	333.0	189.8	143.21	2.325	
11,300.0	7,277.2	11,163.6	7,154.0	80.3	79.5	68.30	-3,984.8	611.0	333.3	186.6	146.64	2.273	
11,400.0	7,277.1	11,263.6	7,153.2	82.1	81.3	68.20	-4,084.7	611.0	333.5	183.4	150.08	2.222	
11,500.0	7,277.0	11,363.6	7,152.5	83.9	83.2	68.09	-4,184.7	611.0	333.8	180.2	153.51	2.174	
11,600.0	7,277.0	11,463.6	7,151.8	85.8	85.1	67.98	-4,284.7	611.0	334.0	177.1	156.94	2.128	
11,700.0	7,276.9	11,563.6	7,151.0	87.7	87.0	67.88	-4,384.7	611.0	334.3	173.9	160.37	2.084	
11,800.0	7,276.8	11,663.6	7,150.3	89.5	88.8	67.77	-4,484.7	611.0	334.5	170.7	163.80	2.042	
11,900.0	7,276.8	11,763.6	7,149.6	91.4	90.7	67.67	-4,584.7	611.0	334.8	167.5	167.22	2.002	
12,000.0	7,276.7	11,863.6	7,148.8	93.2	92.6	67.56	-4,684.7	611.0	335.0	164.4	170.65	1.963	
12,100.0	7,276.6	11,963.6	7,148.1	95.1	94.5	67.46	-4,784.7	611.0	335.3	161.2	174.07	1.926	
12,200.0	7,276.6	12,063.6	7,147.4	97.0	96.4	67.35	-4,884.7	611.0	335.5	158.0	177.49	1.890	
12,300.0	7,276.5	12,163.6	7,146.6	98.8	98.2	67.25	-4,984.7	611.0	335.8	154.9	180.91	1.856	
12,400.0	7,276.4	12,263.6	7,145.9	100.7	100.1	67.15	-5,084.7	611.0	336.0	151.7	184.32	1.823	
12,500.0	7,276.3	12,363.6	7,145.2	102.6	102.0	67.04	-5,184.7	611.0	336.3	148.6	187.73	1.791	
12,600.0	7,276.3	12,463.6	7,144.4	104.5	103.9	66.94	-5,284.7	611.0	336.5	145.4	191.14	1.761	
12,700.0	7,276.2	12,563.6	7,143.7	106.3	105.8	66.83	-5,384.7	611.0	336.8	142.3	194.54	1.731	
12,800.0	7,276.1	12,663.5	7,143.0	108.2	107.7	66.73	-5,484.7	611.0	337.1	139.1	197.94	1.703	
12,900.0	7,276.1	12,763.5	7,142.2	110.1	109.6	66.63	-5,584.7	611.0	337.3	136.0	201.34	1.675	
13,000.0	7,276.0	12,863.5	7,141.5	112.0	111.5	66.52	-5,684.7	611.0	337.6	132.9	204.73	1.649	
13,100.0	7,275.9	12,963.5	7,140.8	113.9	113.3	66.42	-5,784.7	611.0	337.9	129.7	208.12	1.623	
13,200.0	7,275.9	13,063.5	7,140.0	115.7	115.2	66.32	-5,884.7	611.0	338.1	126.6	211.51	1.599	
13,300.0	7,275.8	13,163.5	7,139.3	117.6	117.1	66.21	-5,984.7	611.0	338.4	123.5	214.89	1.575	
13,400.0	7,275.7	13,263.5	7,138.6	119.5	119.0	66.11	-6,084.7	611.0	338.7	120.4	218.27	1.552	
13,500.0	7,275.7	13,363.5	7,137.8	121.4	120.9	66.01	-6,184.6	611.0	338.9	117.3	221.64	1.529	
13,600.0	7,275.6	13,463.5	7,137.1	123.3	122.8	65.91	-6,284.6	611.0	339.2	114.2	225.01	1.507	
13,700.0	7,275.5	13,563.5	7,136.4	125.2	124.7	65.80	-6,384.6	611.0	339.5	111.1	228.38	1.486	Level 3
13,800.0	7,275.4	13,663.5	7,135.6	127.1	126.6	65.70	-6,484.6	611.0	339.7	108.0	231.74	1.466	Level 3
13,900.0	7,275.4	13,763.5	7,134.9	129.0	128.5	65.60	-6,584.6	611.0	340.0	104.9	235.10	1.446	Level 3
14,000.0	7,275.3	13,863.5	7,134.2	130.8	130.4	65.50	-6,684.6	611.0	340.3	101.8	238.46	1.427	Level 3
14,100.0	7,275.2	13,963.5	7,133.4	132.7	132.3	65.40	-6,784.6	611.0	340.6	98.8	241.81	1.408	Level 3
14,200.0	7,275.2	14,063.5	7,132.7	134.6	134.2	65.30	-6,884.6	611.0	340.8	95.7	245.15	1.390	Level 3
14,300.0	7,275.1	14,163.5	7,132.0	136.5	136.1	65.19	-6,984.6	611.0	341.1	92.6	248.50	1.373	Level 3
14,400.0	7,275.0	14,263.5	7,131.2	138.4	138.0	65.09	-7,084.6	611.0	341.4	89.6	251.83	1.356	Level 3
14,432.9	7,275.0	14,296.4	7,131.0	139.0	138.6	65.06	-7,117.5	611.0	341.5	88.6	252.93	1.350	Level 3, SF

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**Local Co-ordinate Reference:**	Well Stroh 13O-403
Project:	SEC.13-T4N-R67W	**TVD Reference:**	WELL @ 4819.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	**MD Reference:**	WELL @ 4819.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Stroh 13O-403	**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-223 - Wellbore #1 - Plan #1 (2-3-15)

Offset Site Error: 0.0 ft

Survey Program: -1-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	-1.0	-1.0	0.0	0.0	90.00	0.0	27.9	27.9				
100.0	100.0	99.0	99.0	0.1	0.1	90.00	0.0	27.9	27.9	27.7	0.22	124.078	
200.0	200.0	199.0	199.0	0.3	0.3	90.00	0.0	27.9	27.9	27.2	0.67	41.429	
300.0	300.0	299.0	299.0	0.6	0.6	90.00	0.0	27.9	27.9	26.8	1.12	24.841	
400.0	400.0	399.0	399.0	0.8	0.8	90.00	0.0	27.9	27.9	26.3	1.57	17.738	
500.0	500.0	499.0	499.0	1.0	1.0	90.00	0.0	27.9	27.9	25.9	2.02	13.794	
600.0	600.0	599.0	599.0	1.2	1.2	90.00	0.0	27.9	27.9	25.4	2.47	11.285	
700.0	700.0	699.0	699.0	1.5	1.5	90.00	0.0	27.9	27.9	25.0	2.92	9.548	
800.0	800.0	799.0	799.0	1.7	1.7	90.00	0.0	27.9	27.9	24.5	3.37	8.275	
900.0	900.0	899.0	899.0	1.9	1.9	90.00	0.0	27.9	27.9	24.1	3.82	7.301	
1,000.0	1,000.0	999.0	999.0	2.1	2.1	90.00	0.0	27.9	27.9	23.6	4.27	6.532	CC, ES
1,100.0	1,100.0	1,098.5	1,098.5	2.4	2.3	89.62	0.2	28.7	28.7	24.0	4.71	6.105	
1,200.0	1,200.0	1,198.0	1,197.9	2.6	2.6	88.62	0.8	31.3	31.3	26.1	5.14	6.088	
1,300.0	1,300.0	1,297.3	1,297.2	2.8	2.8	87.26	1.7	35.5	35.6	30.0	5.58	6.377	
1,400.0	1,400.0	1,396.5	1,396.2	3.0	3.0	85.83	3.0	41.3	41.5	35.5	6.02	6.903	
1,500.0	1,500.0	1,495.4	1,494.8	3.3	3.2	84.51	4.7	48.9	49.3	42.8	6.47	7.616	
1,600.0	1,600.0	1,594.0	1,592.9	3.5	3.4	83.37	6.7	58.0	58.7	51.8	6.93	8.473	
1,700.0	1,700.0	1,692.4	1,690.7	3.7	3.7	7.89	9.2	68.8	69.0	61.7	7.31	9.439	
1,800.0	1,800.0	1,790.6	1,788.1	3.9	4.0	7.31	11.9	81.2	79.3	71.6	7.73	10.257	
1,900.0	1,899.9	1,888.6	1,885.0	4.1	4.2	6.91	15.1	95.1	89.6	81.4	8.16	10.983	
2,000.0	1,999.7	1,986.5	1,981.6	4.3	4.5	6.64	18.5	110.7	99.9	91.3	8.59	11.630	
2,100.0	2,099.4	2,084.2	2,077.7	4.6	4.9	6.47	22.4	127.9	110.1	101.1	9.02	12.209	
2,200.0	2,198.9	2,181.7	2,173.3	4.8	5.2	6.37	26.6	146.6	120.3	110.8	9.45	12.725	
2,300.0	2,298.3	2,279.0	2,268.4	5.0	5.6	6.31	31.1	166.8	130.4	120.5	9.89	13.187	
2,400.0	2,397.4	2,376.2	2,363.0	5.3	6.0	6.30	36.0	188.6	140.6	130.2	10.34	13.600	
2,500.0	2,496.3	2,473.3	2,457.0	5.6	6.4	6.32	41.2	212.0	150.6	139.8	10.78	13.968	
2,600.0	2,594.9	2,570.1	2,550.5	5.9	6.9	6.37	46.8	236.8	160.7	149.4	11.24	14.295	
2,700.0	2,693.3	2,668.3	2,644.9	6.2	7.4	6.44	52.7	263.3	170.4	158.7	11.70	14.563	
2,800.0	2,791.2	2,768.0	2,740.6	6.5	7.9	6.57	58.8	290.4	178.7	166.5	12.17	14.674	
2,900.0	2,888.9	2,867.7	2,836.4	6.9	8.4	6.75	64.8	317.6	185.2	172.5	12.65	14.634	
3,000.0	2,986.1	2,967.6	2,932.3	7.3	9.0	6.98	70.9	344.7	190.0	176.8	13.14	14.459	
3,100.0	3,083.0	3,067.6	3,028.3	7.7	9.5	7.26	77.0	371.9	193.3	179.6	13.65	14.165	
3,200.0	3,179.8	3,167.5	3,124.3	8.1	10.0	7.54	83.1	399.1	196.5	182.3	14.18	13.861	
3,300.0	3,276.7	3,267.5	3,220.3	8.5	10.6	7.80	89.2	426.3	199.7	185.0	14.71	13.573	
3,400.0	3,373.5	3,367.4	3,316.2	9.0	11.2	8.06	95.3	453.5	202.9	187.6	15.25	13.302	
3,500.0	3,470.4	3,467.3	3,412.2	9.5	11.7	8.31	101.4	480.7	206.1	190.3	15.80	13.045	
3,600.0	3,567.2	3,567.3	3,508.2	9.9	12.3	8.56	107.4	507.9	209.3	193.0	16.35	12.802	
3,700.0	3,664.1	3,667.2	3,604.2	10.4	12.8	8.79	113.5	535.0	212.5	195.6	16.90	12.572	
3,800.0	3,760.9	3,767.2	3,700.2	10.9	13.4	9.02	119.6	562.2	215.7	198.3	17.46	12.354	
3,900.0	3,857.8	3,867.1	3,796.2	11.4	14.0	9.25	125.7	589.4	219.0	200.9	18.03	12.147	
4,000.0	3,954.6	3,967.1	3,892.1	11.9	14.6	9.46	131.8	616.6	222.2	203.6	18.59	11.950	
4,100.0	4,051.5	4,067.0	3,988.1	12.3	15.1	9.67	137.9	643.8	225.4	206.2	19.16	11.763	
4,200.0	4,148.3	4,167.0	4,084.1	12.8	15.7	9.88	144.0	671.0	228.6	208.9	19.73	11.585	
4,300.0	4,245.2	4,266.9	4,180.1	13.3	16.3	10.08	150.0	698.2	231.9	211.6	20.31	11.416	
4,400.0	4,342.0	4,366.8	4,276.1	13.8	16.9	10.27	156.1	725.4	235.1	214.2	20.89	11.254	
4,500.0	4,438.9	4,466.8	4,372.0	14.3	17.4	10.46	162.2	752.5	238.3	216.9	21.47	11.100	
4,600.0	4,535.7	4,566.7	4,468.0	14.9	18.0	10.64	168.3	779.7	241.6	219.5	22.06	10.953	
4,700.0	4,632.6	4,666.7	4,564.0	15.4	18.6	10.82	174.4	806.9	244.8	222.2	22.64	10.812	
4,800.0	4,729.4	4,766.6	4,660.0	15.9	19.2	10.99	180.5	834.1	248.1	224.8	23.23	10.677	
4,900.0	4,826.3	4,866.6	4,756.0	16.4	19.8	11.16	186.6	861.3	251.3	227.5	23.82	10.548	
5,000.0	4,923.1	4,966.5	4,852.0	16.9	20.3	11.32	192.7	888.5	254.6	230.1	24.42	10.425	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**Local Co-ordinate Reference:**	Well Stroh 13O-403
Project:	SEC.13-T4N-R67W	**TVD Reference:**	WELL @ 4819.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	**MD Reference:**	WELL @ 4819.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Stroh 13O-403	**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-223 - Wellbore #1 - Plan #1 (2-3-15)

Offset Site Error: 0.0 ft

Survey Program: -1-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,100.0	5,020.0	5,066.5	4,947.9	17.4	20.9	11.48	198.7	915.7	257.8	232.8	25.01	10.306	
5,200.0	5,116.8	5,166.4	5,043.9	17.9	21.5	11.64	204.8	942.8	261.1	235.4	25.61	10.192	
5,300.0	5,213.7	5,266.3	5,139.9	18.4	22.1	11.79	210.9	970.0	264.3	238.1	26.21	10.083	
5,400.0	5,310.5	5,366.3	5,235.9	18.9	22.7	11.94	217.0	997.2	267.6	240.8	26.82	9.978	
5,500.0	5,407.4	5,466.2	5,331.9	19.5	23.3	12.09	223.1	1,024.4	270.8	243.4	27.42	9.877	
5,600.0	5,504.2	5,569.0	5,430.7	20.0	23.8	12.24	229.3	1,052.2	273.9	245.9	28.03	9.774	
5,700.0	5,601.1	5,679.5	5,537.6	20.5	24.3	12.51	235.3	1,079.2	274.3	245.6	28.63	9.578	
5,800.0	5,697.9	5,789.7	5,645.3	21.0	24.7	12.93	240.5	1,102.0	270.8	241.6	29.25	9.260	
5,900.0	5,795.3	5,899.7	5,753.6	21.4	25.1	13.39	244.7	1,120.8	265.7	235.9	29.83	8.906	
6,000.0	5,893.4	6,009.4	5,862.3	21.7	25.3	13.84	247.9	1,135.4	260.2	229.8	30.36	8.570	
6,100.0	5,992.1	6,118.9	5,971.2	22.0	25.6	14.29	250.3	1,146.0	254.4	223.5	30.84	8.249	
6,200.0	6,091.3	6,228.0	6,080.1	22.3	25.8	14.74	251.8	1,152.5	248.2	216.9	31.26	7.940	
6,300.0	6,190.9	6,336.9	6,189.0	22.5	25.9	15.18	252.3	1,154.9	241.7	210.1	31.62	7.643	
6,400.0	6,290.7	6,437.7	6,289.7	22.7	26.0	15.50	252.3	1,154.9	236.3	204.4	31.92	7.404	
6,500.0	6,390.7	6,537.5	6,389.5	22.8	26.1	16.10	250.4	1,154.9	234.4	202.1	32.22	7.275	
6,520.9	6,411.5	6,558.2	6,410.1	22.8	26.1	16.53	248.6	1,154.9	234.3	202.0	32.35	7.244	
6,600.0	6,490.7	6,635.4	6,486.4	22.9	26.2	93.92	237.2	1,154.9	234.9	201.8	33.07	7.103	
6,700.0	6,590.6	6,729.5	6,577.3	23.0	26.2	-80.87	213.0	1,154.9	237.5	203.1	34.43	6.898	
6,800.0	6,689.2	6,821.2	6,662.3	23.1	26.2	-75.88	178.8	1,154.9	242.0	206.3	35.67	6.783	
6,900.0	6,784.8	6,910.8	6,740.9	23.1	26.2	-71.32	135.8	1,154.9	247.9	211.4	36.52	6.787	
7,000.0	6,875.8	7,000.0	6,813.6	23.1	26.2	-67.21	84.2	1,154.9	254.7	217.9	36.85	6.912	
7,100.0	6,960.7	7,084.8	6,876.6	23.1	26.2	-63.73	27.6	1,154.9	262.0	225.4	36.62	7.155	
7,200.0	7,037.9	7,169.7	6,933.0	23.2	26.3	-60.73	-35.8	1,154.9	269.3	233.3	36.00	7.480	
7,300.0	7,106.2	7,250.0	6,979.7	23.2	26.3	-58.31	-101.1	1,154.9	276.2	241.1	35.10	7.870	
7,400.0	7,164.4	7,336.3	7,021.9	23.3	26.4	-56.23	-176.4	1,154.9	282.4	248.1	34.27	8.238	
7,500.0	7,211.5	7,418.4	7,053.9	23.5	26.6	-54.68	-252.0	1,154.9	287.5	253.7	33.81	8.503	
7,600.0	7,246.7	7,500.0	7,077.5	23.7	26.9	-53.57	-330.0	1,154.9	291.4	257.4	34.00	8.570	
7,700.0	7,269.4	7,581.3	7,092.6	24.2	27.2	-52.88	-409.9	1,154.9	293.9	258.9	35.06	8.383	
7,800.0	7,279.2	7,662.3	7,099.1	24.7	27.6	-52.59	-490.6	1,154.9	295.0	258.0	37.03	7.966	
7,900.0	7,279.6	7,756.3	7,098.9	25.5	28.2	-52.53	-584.6	1,154.9	295.3	256.2	39.04	7.563	
8,000.0	7,279.5	7,856.3	7,098.3	26.3	28.9	-52.44	-684.6	1,154.9	295.6	254.6	41.01	7.207	
8,100.0	7,279.4	7,956.3	7,097.7	27.3	29.8	-52.36	-784.6	1,154.9	295.9	252.8	43.13	6.861	
8,200.0	7,279.4	8,056.3	7,097.1	28.4	30.8	-52.28	-884.5	1,154.9	296.2	250.9	45.36	6.531	
8,300.0	7,279.3	8,156.3	7,096.5	29.6	31.8	-52.20	-984.5	1,154.9	296.6	248.9	47.69	6.219	
8,400.0	7,279.2	8,256.3	7,095.9	30.9	33.0	-52.11	-1,084.5	1,154.9	296.9	246.8	50.11	5.925	
8,500.0	7,279.1	8,356.3	7,095.3	32.2	34.2	-52.03	-1,184.5	1,154.9	297.2	244.6	52.60	5.651	
8,600.0	7,279.1	8,456.3	7,094.7	33.7	35.5	-51.95	-1,284.5	1,154.9	297.6	242.4	55.15	5.396	
8,700.0	7,279.0	8,556.3	7,094.0	35.1	36.9	-51.87	-1,384.5	1,154.9	297.9	240.2	57.75	5.158	
8,800.0	7,278.9	8,656.3	7,093.4	36.6	38.3	-51.79	-1,484.5	1,154.9	298.2	237.8	60.40	4.938	
8,900.0	7,278.9	8,756.3	7,092.8	38.2	39.8	-51.70	-1,584.5	1,154.9	298.6	235.5	63.09	4.733	
9,000.0	7,278.8	8,856.3	7,092.2	39.7	41.3	-51.62	-1,684.5	1,154.9	298.9	233.1	65.81	4.542	
9,100.0	7,278.7	8,956.3	7,091.6	41.3	42.8	-51.54	-1,784.5	1,154.9	299.2	230.7	68.55	4.365	
9,200.0	7,278.7	9,056.3	7,091.0	43.0	44.4	-51.46	-1,884.5	1,154.9	299.6	228.3	71.33	4.200	
9,300.0	7,278.6	9,156.3	7,090.4	44.6	46.0	-51.38	-1,984.5	1,154.9	299.9	225.8	74.12	4.046	
9,400.0	7,278.5	9,256.3	7,089.8	46.3	47.6	-51.30	-2,084.5	1,154.9	300.3	223.3	76.93	3.903	
9,500.0	7,278.4	9,356.3	7,089.2	48.0	49.3	-51.22	-2,184.5	1,154.9	300.6	220.8	79.76	3.769	
9,600.0	7,278.4	9,456.3	7,088.6	49.7	50.9	-51.14	-2,284.5	1,154.9	300.9	218.3	82.60	3.643	
9,700.0	7,278.3	9,556.3	7,087.9	51.4	52.6	-51.06	-2,384.5	1,154.9	301.3	215.8	85.45	3.526	
9,800.0	7,278.2	9,656.3	7,087.3	53.2	54.3	-50.98	-2,484.5	1,154.9	301.6	213.3	88.31	3.415	
9,900.0	7,278.2	9,756.3	7,086.7	54.9	56.0	-50.90	-2,584.5	1,154.9	302.0	210.8	91.18	3.312	
10,000.0	7,278.1	9,856.3	7,086.1	56.7	57.8	-50.82	-2,684.5	1,154.9	302.3	208.2	94.06	3.214	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**Local Co-ordinate Reference:**	Well Stroh 13O-403
Project:	SEC.13-T4N-R67W	**TVD Reference:**	WELL @ 4819.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	**MD Reference:**	WELL @ 4819.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Stroh 13O-403	**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-223 - Wellbore #1 - Plan #1 (2-3-15)

Offset Site Error: 0.0 ft

Survey Program: -1-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
10,100.0	7,278.0	9,956.3	7,085.5	58.5	59.5	-50.74	-2,784.5	1,154.9	302.6	205.7	96.94	3.122	
10,200.0	7,278.0	10,056.3	7,084.9	60.2	61.3	-50.66	-2,884.5	1,154.9	303.0	203.2	99.82	3.035	
10,300.0	7,277.9	10,156.3	7,084.3	62.0	63.0	-50.58	-2,984.5	1,154.9	303.3	200.6	102.71	2.953	
10,400.0	7,277.8	10,256.3	7,083.7	63.8	64.8	-50.50	-3,084.5	1,154.9	303.7	198.1	105.61	2.875	
10,500.0	7,277.7	10,356.3	7,083.1	65.6	66.6	-50.42	-3,184.5	1,154.9	304.0	195.5	108.50	2.802	
10,600.0	7,277.7	10,456.3	7,082.4	67.4	68.3	-50.34	-3,284.5	1,154.9	304.4	193.0	111.40	2.732	
10,700.0	7,277.6	10,556.2	7,081.8	69.3	70.1	-50.27	-3,384.5	1,154.9	304.7	190.4	114.30	2.666	
10,800.0	7,277.5	10,656.2	7,081.2	71.1	71.9	-50.19	-3,484.5	1,154.9	305.1	187.9	117.20	2.603	
10,900.0	7,277.5	10,756.2	7,080.6	72.9	73.7	-50.11	-3,584.5	1,154.9	305.4	185.3	120.10	2.543	
11,000.0	7,277.4	10,856.2	7,080.0	74.7	75.5	-50.03	-3,684.5	1,154.9	305.7	182.7	123.00	2.486	
11,100.0	7,277.3	10,956.2	7,079.4	76.6	77.4	-49.95	-3,784.5	1,154.9	306.1	180.2	125.90	2.431	
11,200.0	7,277.3	11,056.2	7,078.8	78.4	79.2	-49.88	-3,884.4	1,154.9	306.4	177.6	128.80	2.379	
11,300.0	7,277.2	11,156.2	7,078.2	80.3	81.0	-49.80	-3,984.4	1,154.9	306.8	175.1	131.70	2.330	
11,400.0	7,277.1	11,256.2	7,077.6	82.1	82.8	-49.72	-4,084.4	1,154.9	307.1	172.5	134.59	2.282	
11,500.0	7,277.0	11,356.2	7,076.9	83.9	84.7	-49.65	-4,184.4	1,154.9	307.5	170.0	137.49	2.237	
11,600.0	7,277.0	11,456.2	7,076.3	85.8	86.5	-49.57	-4,284.4	1,154.9	307.8	167.5	140.38	2.193	
11,700.0	7,276.9	11,556.2	7,075.7	87.7	88.3	-49.49	-4,384.4	1,154.9	308.2	164.9	143.27	2.151	
11,800.0	7,276.8	11,656.2	7,075.1	89.5	90.2	-49.42	-4,484.4	1,154.9	308.5	162.4	146.16	2.111	
11,900.0	7,276.8	11,756.2	7,074.5	91.4	92.0	-49.34	-4,584.4	1,154.9	308.9	159.9	149.05	2.073	
12,000.0	7,276.7	11,856.2	7,073.9	93.2	93.9	-49.26	-4,684.4	1,154.9	309.3	157.3	151.93	2.036	
12,100.0	7,276.6	11,956.2	7,073.3	95.1	95.7	-49.19	-4,784.4	1,154.9	309.6	154.8	154.81	2.000	
12,200.0	7,276.6	12,056.2	7,072.7	97.0	97.6	-49.11	-4,884.4	1,154.9	310.0	152.3	157.69	1.966	
12,300.0	7,276.5	12,156.2	7,072.1	98.8	99.5	-49.04	-4,984.4	1,154.9	310.3	149.8	160.56	1.933	
12,400.0	7,276.4	12,256.2	7,071.4	100.7	101.3	-48.96	-5,084.4	1,154.9	310.7	147.2	163.43	1.901	
12,500.0	7,276.3	12,356.2	7,070.8	102.6	103.2	-48.89	-5,184.4	1,154.9	311.0	144.7	166.30	1.870	
12,600.0	7,276.3	12,456.2	7,070.2	104.5	105.0	-48.81	-5,284.4	1,154.9	311.4	142.2	169.17	1.841	
12,700.0	7,276.2	12,556.2	7,069.6	106.3	106.9	-48.74	-5,384.4	1,154.9	311.7	139.7	172.03	1.812	
12,800.0	7,276.1	12,656.2	7,069.0	108.2	108.8	-48.66	-5,484.4	1,154.9	312.1	137.2	174.89	1.785	
12,900.0	7,276.1	12,756.2	7,068.4	110.1	110.6	-48.59	-5,584.4	1,154.9	312.5	134.7	177.74	1.758	
13,000.0	7,276.0	12,856.2	7,067.8	112.0	112.5	-48.51	-5,684.4	1,154.9	312.8	132.2	180.59	1.732	
13,100.0	7,275.9	12,956.2	7,067.2	113.9	114.4	-48.44	-5,784.4	1,154.9	313.2	129.7	183.44	1.707	
13,200.0	7,275.9	13,056.2	7,066.6	115.7	116.3	-48.36	-5,884.4	1,154.9	313.5	127.2	186.28	1.683	
13,300.0	7,275.8	13,156.2	7,066.0	117.6	118.1	-48.29	-5,984.4	1,154.9	313.9	124.8	189.12	1.660	
13,400.0	7,275.7	13,256.2	7,065.3	119.5	120.0	-48.22	-6,084.4	1,154.9	314.2	122.3	191.96	1.637	
13,500.0	7,275.7	13,356.2	7,064.7	121.4	121.9	-48.14	-6,184.4	1,154.9	314.6	119.8	194.79	1.615	
13,600.0	7,275.6	13,456.2	7,064.1	123.3	123.8	-48.07	-6,284.4	1,154.9	315.0	117.4	197.62	1.594	
13,700.0	7,275.5	13,556.2	7,063.5	125.2	125.7	-48.00	-6,384.4	1,154.9	315.3	114.9	200.44	1.573	
13,800.0	7,275.4	13,656.2	7,062.9	127.1	127.5	-47.92	-6,484.4	1,154.9	315.7	112.4	203.26	1.553	
13,900.0	7,275.4	13,756.2	7,062.3	129.0	129.4	-47.85	-6,584.4	1,154.9	316.1	110.0	206.08	1.534	
14,000.0	7,275.3	13,856.2	7,061.7	130.8	131.3	-47.78	-6,684.4	1,154.9	316.4	107.5	208.89	1.515	
14,100.0	7,275.2	13,956.2	7,061.1	132.7	133.2	-47.71	-6,784.4	1,154.9	316.8	105.1	211.69	1.496	Level 3
14,200.0	7,275.2	14,056.2	7,060.5	134.6	135.1	-47.63	-6,884.3	1,154.9	317.1	102.6	214.50	1.479	Level 3
14,300.0	7,275.1	14,156.2	7,059.8	136.5	137.0	-47.56	-6,984.3	1,154.9	317.5	100.2	217.30	1.461	Level 3
14,400.0	7,275.0	14,256.2	7,059.2	138.4	138.8	-47.49	-7,084.3	1,154.9	317.9	97.8	220.09	1.444	Level 3
14,432.9	7,275.0	14,289.0	7,059.0	139.0	139.5	-47.47	-7,117.2	1,154.9	318.0	97.0	221.01	1.439	Level 3, SF

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**Local Co-ordinate Reference:**	Well Stroh 13O-403
Project:	SEC.13-T4N-R67W	**TVD Reference:**	WELL @ 4819.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	**MD Reference:**	WELL @ 4819.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Stroh 13O-403	**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-

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	2.0	2.0	0.0	0.0	136.90	-327.9	306.8	449.0				
100.0	100.0	102.3	102.3	0.1	0.1	136.90	-327.8	306.8	449.0	448.8	0.23	1,973.692	
200.0	200.0	202.6	202.6	0.3	0.2	136.90	-327.7	306.7	448.9	448.3	0.56	794.615	
300.0	300.0	303.0	303.0	0.6	0.3	136.89	-327.6	306.6	448.7	447.8	0.90	497.276	
400.0	400.0	403.3	403.3	0.8	0.5	136.88	-327.4	306.5	448.4	447.2	1.24	361.732	
500.0	500.0	503.8	503.8	1.0	0.6	136.87	-327.1	306.3	448.1	446.5	1.61	278.765	
600.0	600.0	604.8	604.8	1.2	0.8	136.89	-326.8	305.9	447.6	445.6	2.05	218.197	
700.0	700.0	705.1	705.1	1.5	1.0	136.92	-326.4	305.3	446.9	444.5	2.49	179.747	
800.0	800.0	805.5	805.5	1.7	1.2	136.92	-325.9	304.8	446.2	443.3	2.92	152.573	
900.0	900.0	906.1	906.1	1.9	1.5	136.94	-325.4	304.1	445.4	442.0	3.37	132.308	
1,000.0	1,000.0	1,006.6	1,006.6	2.1	1.7	136.97	-324.8	303.2	444.4	440.6	3.81	116.636	
1,100.0	1,100.0	1,107.0	1,107.0	2.4	1.9	137.02	-324.3	302.2	443.3	439.1	4.25	104.237	
1,200.0	1,200.0	1,207.8	1,207.8	2.6	2.1	137.10	-323.9	300.9	442.1	437.4	4.70	94.147	
1,300.0	1,300.0	1,310.1	1,310.0	2.8	2.3	137.22	-323.3	299.2	440.6	435.5	5.14	85.722	
1,400.0	1,400.0	1,412.3	1,412.3	3.0	2.6	137.22	-321.7	297.7	438.5	432.9	5.58	78.517	
1,500.0	1,500.0	1,509.7	1,509.6	3.3	2.8	137.18	-319.9	296.5	436.2	430.2	6.01	72.525	
1,595.3	1,595.3	1,597.4	1,597.3	3.5	2.9	137.01	-318.4	296.8	435.3	428.9	6.40	68.008	
1,600.0	1,600.0	1,601.7	1,601.5	3.5	2.9	137.00	-318.4	296.9	435.3	428.9	6.42	67.810	
1,700.0	1,700.0	1,697.8	1,697.6	3.7	3.1	62.05	-316.7	299.7	435.6	428.8	6.82	63.901	
1,800.0	1,800.0	1,802.8	1,802.5	3.9	3.3	61.62	-313.1	304.3	434.9	427.7	7.24	60.045	
1,900.0	1,899.9	1,898.8	1,898.2	4.1	3.5	61.25	-308.8	309.3	433.2	425.5	7.66	56.577	
2,000.0	1,999.7	1,995.4	1,994.6	4.3	3.8	60.92	-304.3	315.7	431.6	423.5	8.08	53.434	
2,100.0	2,099.4	2,095.7	2,094.3	4.6	4.0	60.44	-298.0	324.5	429.4	420.9	8.53	50.366	
2,200.0	2,198.9	2,199.8	2,197.6	4.8	4.2	59.98	-290.3	334.1	426.0	417.0	9.00	47.312	
2,300.0	2,298.3	2,299.5	2,296.6	5.0	4.5	59.74	-282.2	342.8	420.9	411.4	9.48	44.383	
2,400.0	2,397.4	2,398.4	2,394.5	5.3	4.8	59.49	-273.4	352.8	415.3	405.4	9.98	41.601	
2,500.0	2,496.3	2,501.3	2,496.4	5.6	5.0	59.27	-263.1	363.8	408.5	398.0	10.52	38.820	
2,600.0	2,594.9	2,599.5	2,593.0	5.9	5.3	58.86	-250.9	376.0	400.5	389.4	11.09	36.130	
2,700.0	2,693.3	2,697.3	2,688.5	6.2	5.7	58.06	-236.5	391.5	392.5	380.8	11.70	33.550	
2,800.0	2,791.2	2,795.4	2,783.3	6.5	6.1	56.82	-218.9	409.6	383.5	371.2	12.35	31.053	
2,900.0	2,888.9	2,896.8	2,881.5	6.9	6.4	55.82	-201.6	428.1	374.2	361.2	13.02	28.734	
3,000.0	2,986.1	2,994.6	2,976.6	7.3	6.8	55.28	-185.7	444.6	363.5	349.8	13.71	26.509	
3,100.0	3,083.0	3,088.1	3,067.0	7.7	7.2	54.54	-169.7	462.5	353.2	338.8	14.45	24.449	
3,200.0	3,179.8	3,192.5	3,167.5	8.1	7.7	53.38	-150.7	483.3	342.8	327.5	15.25	22.482	
3,300.0	3,276.7	3,290.4	3,261.4	8.5	8.2	51.99	-131.4	503.2	332.0	316.0	16.04	20.702	
3,400.0	3,373.5	3,388.3	3,354.9	9.0	8.6	50.34	-111.8	524.1	322.1	305.3	16.83	19.134	
3,500.0	3,470.4	3,486.1	3,448.4	9.5	9.1	48.56	-92.1	545.1	312.6	295.0	17.61	17.751	
3,600.0	3,567.2	3,582.3	3,540.5	9.9	9.6	46.80	-73.5	566.2	304.2	285.8	18.36	16.572	
3,700.0	3,664.1	3,685.0	3,638.6	10.4	10.1	44.81	-53.6	588.8	296.1	277.0	19.12	15.492	
3,800.0	3,760.9	3,783.4	3,732.3	10.9	10.7	42.45	-32.8	610.6	287.8	267.9	19.85	14.501	
3,900.0	3,857.8	3,880.8	3,824.3	11.4	11.3	39.52	-10.4	633.5	280.6	260.0	20.53	13.667	
4,000.0	3,954.6	3,979.1	3,916.8	11.9	11.8	36.19	13.1	657.0	274.2	253.0	21.15	12.964	
4,100.0	4,051.5	4,078.7	4,010.5	12.3	12.4	32.77	36.6	681.0	269.0	247.3	21.69	12.402	
4,200.0	4,148.3	4,179.5	4,106.5	12.8	13.0	29.85	57.6	703.6	263.8	241.6	22.20	11.886	
4,300.0	4,245.2	4,286.8	4,210.0	13.3	13.5	27.55	76.3	725.0	257.5	234.8	22.71	11.335	
4,400.0	4,342.0	4,388.7	4,309.0	13.8	13.9	25.82	92.1	743.0	249.6	226.4	23.22	10.750	
4,500.0	4,438.9	4,491.7	4,409.7	14.3	14.3	24.46	106.3	758.9	239.8	216.1	23.73	10.105	
4,600.0	4,535.7	4,591.2	4,507.3	14.9	14.7	23.24	119.2	774.2	230.2	206.0	24.22	9.503	
4,700.0	4,632.6	4,694.8	4,609.1	15.4	15.1	22.26	131.3	788.7	219.6	194.8	24.73	8.877	
4,800.0	4,729.4	4,798.0	4,711.1	15.9	15.5	21.78	141.5	801.0	207.0	181.7	25.28	8.189	
4,900.0	4,826.3	4,900.4	4,812.5	16.4	15.8	21.63	150.4	811.0	192.5	166.7	25.84	7.450	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**Local Co-ordinate Reference:**	Well Stroh 13O-403
Project:	SEC.13-T4N-R67W	**TVD Reference:**	WELL @ 4819.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	**MD Reference:**	WELL @ 4819.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Stroh 13O-403	**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

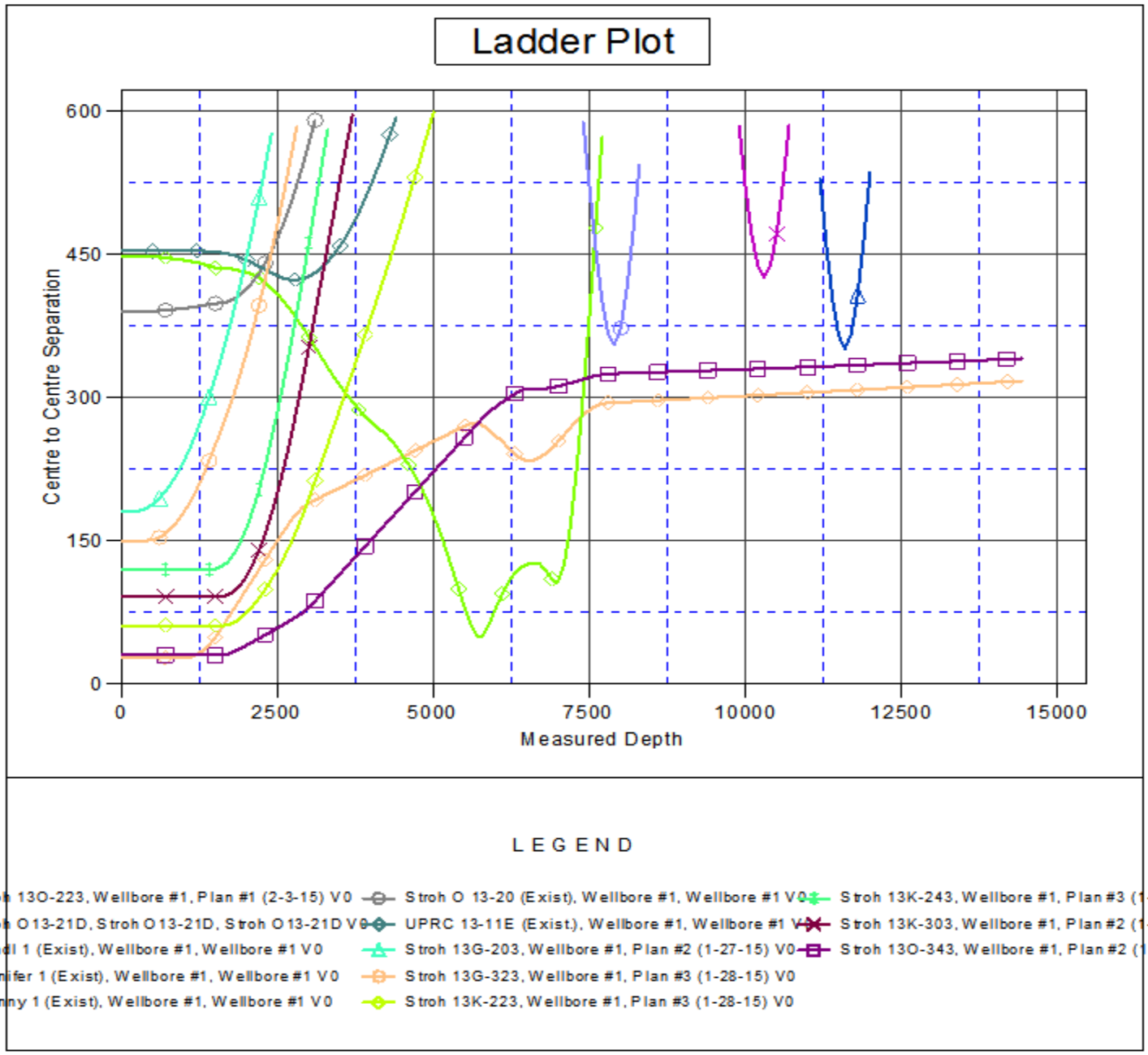
Survey Program: 475- **Offset Well Error:** 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,000.0	4,923.1	5,001.2	4,912.6	16.9	16.1	21.65	158.8	819.8	176.9	150.5	26.42	6.698	
5,100.0	5,020.0	5,103.2	5,014.1	17.4	16.3	22.23	165.9	826.7	159.6	132.6	27.06	5.899	
5,200.0	5,116.8	5,203.3	5,114.0	17.9	16.6	23.84	171.0	831.4	140.6	112.7	27.85	5.048	
5,300.0	5,213.7	5,302.5	5,213.1	18.4	16.8	26.69	174.7	834.8	120.7	91.8	28.83	4.184	
5,400.0	5,310.5	5,401.1	5,311.6	18.9	16.9	31.18	177.7	837.0	100.1	70.0	30.12	3.324	
5,500.0	5,407.4	5,498.8	5,409.2	19.5	17.1	38.86	179.6	838.2	80.0	48.1	31.96	2.504	
5,600.0	5,504.2	5,595.9	5,506.4	20.0	17.2	52.35	180.5	838.4	61.9	27.3	34.59	1.790	
5,700.0	5,601.1	5,692.3	5,602.7	20.5	17.3	75.29	180.0	838.0	50.5	13.4	37.09	1.362	Level 3
5,739.7	5,639.5	5,730.4	5,640.8	20.7	17.4	86.77	179.3	837.5	49.3	12.1	37.27	1.324	Level 3, CC, ES, SF
5,800.0	5,697.9	5,788.3	5,698.7	21.0	17.5	104.43	178.1	836.5	52.0	15.8	36.17	1.438	Level 3
5,900.0	5,795.3	5,885.4	5,795.8	21.4	17.6	126.18	176.0	834.5	64.7	31.5	33.19	1.950	
6,000.0	5,893.4	5,983.2	5,893.5	21.7	17.7	138.58	174.7	832.4	80.2	48.8	31.42	2.554	
6,100.0	5,992.1	6,082.4	5,992.7	22.0	17.8	146.08	174.1	830.2	94.8	64.2	30.62	3.095	
6,200.0	6,091.3	6,181.1	6,091.4	22.3	17.9	150.72	173.9	828.1	107.1	76.8	30.35	3.530	
6,300.0	6,190.9	6,281.0	6,191.3	22.5	18.0	153.75	173.9	825.9	116.6	86.3	30.31	3.848	
6,400.0	6,290.7	6,381.2	6,291.4	22.7	18.2	155.79	174.5	823.9	122.9	92.5	30.39	4.044	
6,500.0	6,390.7	6,480.7	6,391.0	22.8	18.3	156.94	175.1	822.0	125.9	95.3	30.53	4.122	
6,600.0	6,490.7	6,581.1	6,491.4	22.9	18.4	-127.62	175.7	819.8	127.2	96.4	30.80	4.129	
6,700.0	6,590.6	6,680.7	6,590.9	23.0	18.6	54.47	176.2	818.0	126.2	95.4	30.76	4.102	
6,800.0	6,689.2	6,778.8	6,689.0	23.1	18.7	61.99	176.6	815.8	119.2	88.7	30.48	3.910	
6,900.0	6,784.8	6,875.2	6,785.4	23.1	18.8	75.39	175.4	814.8	109.7	78.4	31.21	3.514	
6,961.1	6,841.1	6,930.5	6,840.6	23.1	18.9	86.92	175.3	813.9	106.9	74.2	32.66	3.272	
7,000.0	6,875.8	6,965.2	6,875.3	23.1	18.9	95.23	175.6	813.1	108.3	74.4	33.86	3.197	
7,100.0	6,960.7	7,052.0	6,962.1	23.1	19.1	115.91	176.0	811.4	127.4	91.4	35.99	3.539	
7,200.0	7,037.9	7,130.8	7,040.9	23.2	19.2	130.81	175.0	811.6	168.2	132.8	35.43	4.747	
7,300.0	7,106.2	7,194.5	7,104.5	23.2	19.3	138.61	175.0	810.7	229.1	195.6	33.47	6.845	
7,400.0	7,164.4	7,252.7	7,162.8	23.3	19.4	142.82	175.4	809.7	303.6	272.3	31.27	9.709	
7,500.0	7,211.5	7,299.5	7,209.6	23.5	19.4	143.31	175.7	809.1	387.5	357.7	29.74	13.029	
7,600.0	7,246.7	7,334.2	7,244.3	23.7	19.5	139.45	176.0	808.8	478.1	448.3	29.83	16.029	
7,700.0	7,269.4	7,356.3	7,266.4	24.2	19.5	127.71	176.1	808.5	573.4	540.6	32.80	17.483	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	**Local Co-ordinate Reference:**	Well Stroh 13O-403
Project:	SEC.13-T4N-R67W	**TVD Reference:**	WELL @ 4819.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	**MD Reference:**	WELL @ 4819.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Stroh 13O-403	**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 @ 4819.0ft (RKB - 15')
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °

Coordinates are relative to: Stroh 13O-403
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-403
Project:	SEC.13-T4N-R67W	**TVD Reference:**	WELL @ 4819.0ft (RKB - 15')
Reference Site:	Stroh 13GK-HZ Pad Sec.13-T4N-R67W	**MD Reference:**	WELL @ 4819.0ft (RKB - 15')
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Stroh 13O-403	**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 @ 4819.0ft (RKB - 15')
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