

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Guttersen 31Y-441**

Surface Location: Guttersen 31Y-201 Pad Sec.31-T3N-R63W

North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

Ground Elevation: 4836.0

+N/-S

+E/-W

Northing

Easting

Latitude

Longitude

Slot

0.0

0.0

1308211.613287124.44

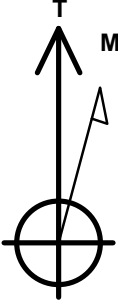
40.174870

-104.472460

RKB - 15' WELL @ 4851.0ft (RKB - 15')

WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
BHL 500' FNL, 517' FEL	6830.0	4695.8	-142.5	Point



Azimuths to True North

Magnetic North: 8.42°

Magnetic Field

Strength: 52837.5snT

Dip Angle: 66.85°

Date: 5/31/2013

Model: IGRF2010

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

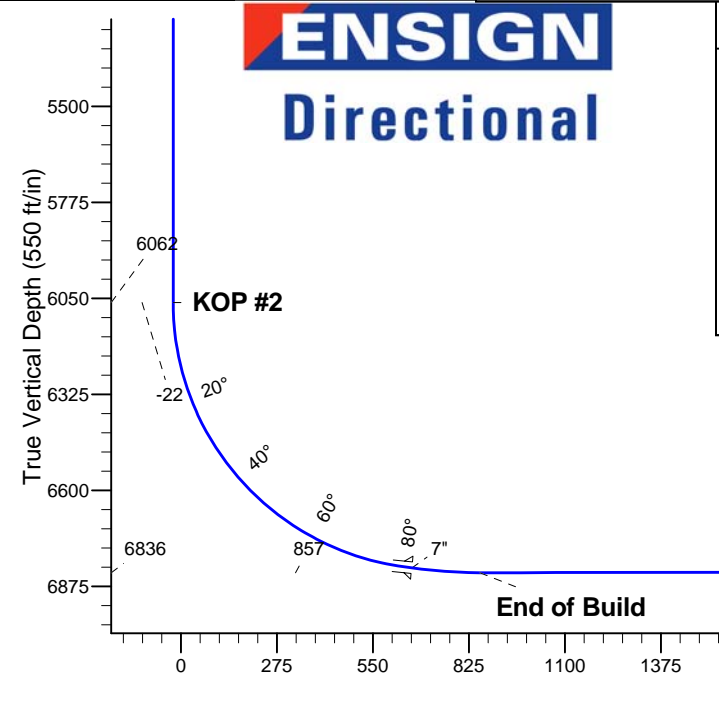
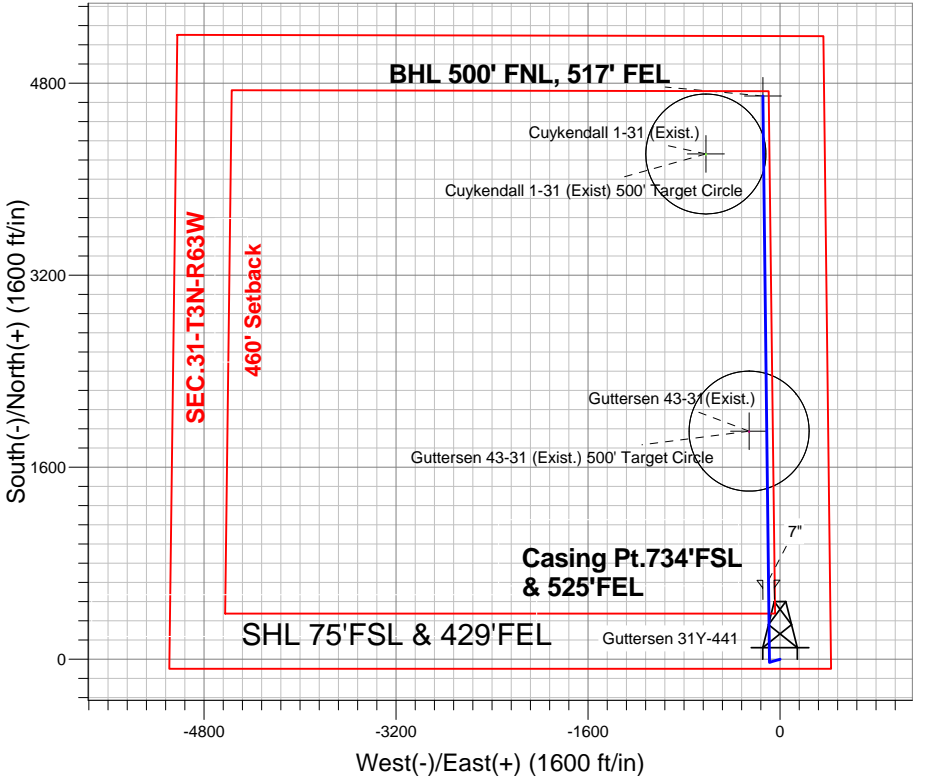
Guttersen 31Y-441

Plan #1 (5-31-13)

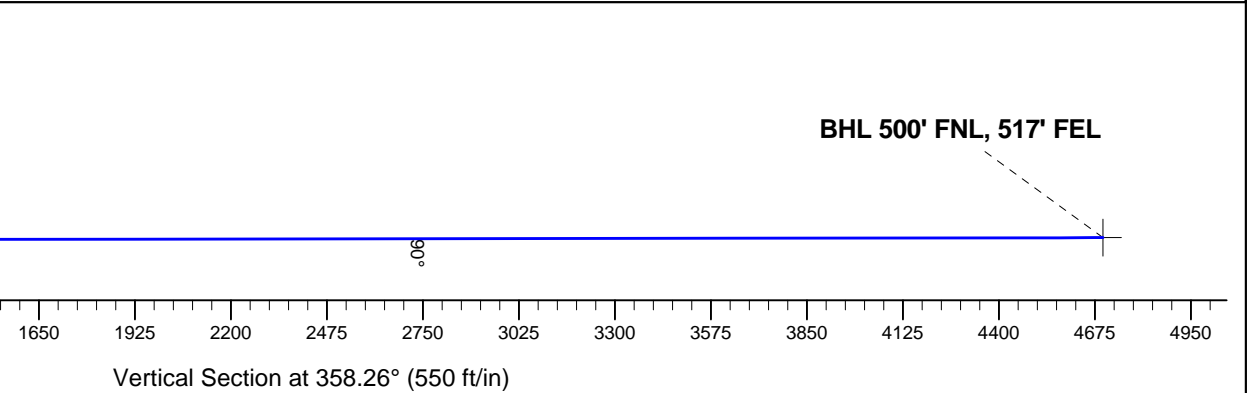
14:27, May 31 2013

ANNOTATIONS

TVD	MD	Annotation
3000.0	3000.0	KOP #1
6062.2	6066.9	KOP #2
6836.0	7382.7	End of Build



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	3000.0	0.00	0.00	3000.0	0.0	0.0	0.00	0.00	0.0	
3	3346.2	6.92	254.14	3345.3	-5.7	-20.1	2.00	254.14	-5.1	
4	3758.5	6.92	254.14	3754.7	-19.3	-67.9	0.00	0.00	-17.2	
5	4104.7	0.00	0.00	4100.0	-25.0	-88.0	2.00	180.00	-22.3	
6	6066.9	0.00	0.00	6062.2	-25.0	-88.0	0.00	0.00	-22.3	
7	7186.9	84.00	359.34	6822.0	659.0	-95.9	7.50	359.34	661.7	
8	7260.9	84.00	359.34	6829.7	732.6	-96.7	0.00	0.00	735.2	
9	7382.7	90.09	359.34	6836.0	854.2	-98.1	5.00	-0.02	856.8	
10	11224.6	90.09	359.34	6830.0	4695.8	-142.5	0.00	0.00	4698.0	BHL 500' FNL, 517' FEL





PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.31-T3N-R63W

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

Guttersen 31Y-441

Wellbore #1

Plan: Plan #1 (5-31-13)

Standard Planning Report

31 May, 2013

Database:	Landmark	Local Co-ordinate Reference:	Well Guttersen 31Y-441
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4851.0ft (RKB - 15')
Project:	SEC.31-T3N-R63W	MD Reference:	WELL @ 4851.0ft (RKB - 15')
Site:	Guttersen 31Y-201 Pad Sec.31-T3N-R63W	North Reference:	True
Well:	Guttersen 31Y-441	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (5-31-13)		

Project	SEC.31-T3N-R63W, Weld County, Colorado		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

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

Well	Guttersen 31Y-441					
Well Position	+N-S	0.0 ft	Northing:	1,308,211.61 ft	Latitude:	40.174870
	+E-W	-30.7 ft	Easting:	3,287,124.44 ft	Longitude:	-104.472460
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,836.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/31/2013	8.42	66.85	52,837

Design	Plan #1 (5-31-13)			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	358.26

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	
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
3,346.2	6.92	254.14	3,345.3	-5.7	-20.1	2.00	2.00	0.00	254.14	
3,758.5	6.92	254.14	3,754.7	-19.3	-67.9	0.00	0.00	0.00	0.00	
4,104.7	0.00	0.00	4,100.0	-25.0	-88.0	2.00	-2.00	0.00	180.00	
6,066.9	0.00	0.00	6,062.2	-25.0	-88.0	0.00	0.00	0.00	0.00	
7,186.9	84.00	359.34	6,822.0	659.0	-95.9	7.50	7.50	0.00	359.34	
7,260.9	84.00	359.34	6,829.7	732.6	-96.7	0.00	0.00	0.00	0.00	
7,382.7	90.09	359.34	6,836.0	854.2	-98.1	5.00	5.00	0.00	-0.02	
11,224.6	90.09	359.34	6,830.0	4,695.8	-142.5	0.00	0.00	0.00	0.00	BHL 500' FNL, 517'

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Project:	SEC.31-T3N-R63W	MD Reference:	WELL @ 4851.0ft (RKB - 15')
Site:	Guttersen 31Y-201 Pad Sec.31-T3N-R63W	North Reference:	True
Well:	Guttersen 31Y-441	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (5-31-13)		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N-S (ft)	+E-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
1.0	0.00	0.00	1.0	0.0	0.0	0.0	0.00	0.00	0.00
Guttersen 43-31 (Exist.) 500' Target Circle									
14.0	0.00	0.00	14.0	0.0	0.0	0.0	0.00	0.00	0.00
Cuykendall 1-31 (Exist) 500' Target Circle									
40.0	0.00	0.00	40.0	0.0	0.0	0.0	0.00	0.00	0.00
80.0	0.00	0.00	80.0	0.0	0.0	0.0	0.00	0.00	0.00
120.0	0.00	0.00	120.0	0.0	0.0	0.0	0.00	0.00	0.00
160.0	0.00	0.00	160.0	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
240.0	0.00	0.00	240.0	0.0	0.0	0.0	0.00	0.00	0.00
280.0	0.00	0.00	280.0	0.0	0.0	0.0	0.00	0.00	0.00
320.0	0.00	0.00	320.0	0.0	0.0	0.0	0.00	0.00	0.00
360.0	0.00	0.00	360.0	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
440.0	0.00	0.00	440.0	0.0	0.0	0.0	0.00	0.00	0.00
480.0	0.00	0.00	480.0	0.0	0.0	0.0	0.00	0.00	0.00
520.0	0.00	0.00	520.0	0.0	0.0	0.0	0.00	0.00	0.00
560.0	0.00	0.00	560.0	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
640.0	0.00	0.00	640.0	0.0	0.0	0.0	0.00	0.00	0.00
680.0	0.00	0.00	680.0	0.0	0.0	0.0	0.00	0.00	0.00
720.0	0.00	0.00	720.0	0.0	0.0	0.0	0.00	0.00	0.00
760.0	0.00	0.00	760.0	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
840.0	0.00	0.00	840.0	0.0	0.0	0.0	0.00	0.00	0.00
880.0	0.00	0.00	880.0	0.0	0.0	0.0	0.00	0.00	0.00
920.0	0.00	0.00	920.0	0.0	0.0	0.0	0.00	0.00	0.00
960.0	0.00	0.00	960.0	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
1,040.0	0.00	0.00	1,040.0	0.0	0.0	0.0	0.00	0.00	0.00
1,080.0	0.00	0.00	1,080.0	0.0	0.0	0.0	0.00	0.00	0.00
1,120.0	0.00	0.00	1,120.0	0.0	0.0	0.0	0.00	0.00	0.00
1,160.0	0.00	0.00	1,160.0	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
1,240.0	0.00	0.00	1,240.0	0.0	0.0	0.0	0.00	0.00	0.00
1,280.0	0.00	0.00	1,280.0	0.0	0.0	0.0	0.00	0.00	0.00
1,320.0	0.00	0.00	1,320.0	0.0	0.0	0.0	0.00	0.00	0.00
1,360.0	0.00	0.00	1,360.0	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
1,440.0	0.00	0.00	1,440.0	0.0	0.0	0.0	0.00	0.00	0.00
1,480.0	0.00	0.00	1,480.0	0.0	0.0	0.0	0.00	0.00	0.00
1,520.0	0.00	0.00	1,520.0	0.0	0.0	0.0	0.00	0.00	0.00
1,560.0	0.00	0.00	1,560.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,640.0	0.00	0.00	1,640.0	0.0	0.0	0.0	0.00	0.00	0.00
1,680.0	0.00	0.00	1,680.0	0.0	0.0	0.0	0.00	0.00	0.00
1,720.0	0.00	0.00	1,720.0	0.0	0.0	0.0	0.00	0.00	0.00
1,760.0	0.00	0.00	1,760.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,840.0	0.00	0.00	1,840.0	0.0	0.0	0.0	0.00	0.00	0.00
1,880.0	0.00	0.00	1,880.0	0.0	0.0	0.0	0.00	0.00	0.00
1,920.0	0.00	0.00	1,920.0	0.0	0.0	0.0	0.00	0.00	0.00

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Site:	Guttersen 31Y-201 Pad Sec.31-T3N-R63W	North Reference:	True
Well:	Guttersen 31Y-441	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (5-31-13)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
1,960.0	0.00	0.00	1,960.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,040.0	0.00	0.00	2,040.0	0.0	0.0	0.0	0.00	0.00	0.00
2,080.0	0.00	0.00	2,080.0	0.0	0.0	0.0	0.00	0.00	0.00
2,120.0	0.00	0.00	2,120.0	0.0	0.0	0.0	0.00	0.00	0.00
2,160.0	0.00	0.00	2,160.0	0.0	0.0	0.0	0.00	0.00	0.00
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
2,240.0	0.00	0.00	2,240.0	0.0	0.0	0.0	0.00	0.00	0.00
2,280.0	0.00	0.00	2,280.0	0.0	0.0	0.0	0.00	0.00	0.00
2,320.0	0.00	0.00	2,320.0	0.0	0.0	0.0	0.00	0.00	0.00
2,360.0	0.00	0.00	2,360.0	0.0	0.0	0.0	0.00	0.00	0.00
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	0.00
2,440.0	0.00	0.00	2,440.0	0.0	0.0	0.0	0.00	0.00	0.00
2,480.0	0.00	0.00	2,480.0	0.0	0.0	0.0	0.00	0.00	0.00
2,520.0	0.00	0.00	2,520.0	0.0	0.0	0.0	0.00	0.00	0.00
2,560.0	0.00	0.00	2,560.0	0.0	0.0	0.0	0.00	0.00	0.00
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	0.00
2,640.0	0.00	0.00	2,640.0	0.0	0.0	0.0	0.00	0.00	0.00
2,680.0	0.00	0.00	2,680.0	0.0	0.0	0.0	0.00	0.00	0.00
2,720.0	0.00	0.00	2,720.0	0.0	0.0	0.0	0.00	0.00	0.00
2,760.0	0.00	0.00	2,760.0	0.0	0.0	0.0	0.00	0.00	0.00
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	0.00
2,840.0	0.00	0.00	2,840.0	0.0	0.0	0.0	0.00	0.00	0.00
2,880.0	0.00	0.00	2,880.0	0.0	0.0	0.0	0.00	0.00	0.00
2,920.0	0.00	0.00	2,920.0	0.0	0.0	0.0	0.00	0.00	0.00
2,960.0	0.00	0.00	2,960.0	0.0	0.0	0.0	0.00	0.00	0.00
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP #1									
3,040.0	0.80	254.14	3,040.0	-0.1	-0.3	-0.1	2.00	2.00	0.00
3,080.0	1.60	254.14	3,080.0	-0.3	-1.1	-0.3	2.00	2.00	0.00
3,120.0	2.40	254.14	3,120.0	-0.7	-2.4	-0.6	2.00	2.00	0.00
3,160.0	3.20	254.14	3,159.9	-1.2	-4.3	-1.1	2.00	2.00	0.00
3,200.0	4.00	254.14	3,199.8	-1.9	-6.7	-1.7	2.00	2.00	0.00
3,240.0	4.80	254.14	3,239.7	-2.7	-9.7	-2.5	2.00	2.00	0.00
3,280.0	5.60	254.14	3,279.6	-3.7	-13.2	-3.3	2.00	2.00	0.00
3,320.0	6.40	254.14	3,319.3	-4.9	-17.2	-4.4	2.00	2.00	0.00
3,346.2	6.92	254.14	3,345.3	-5.7	-20.1	-5.1	2.00	2.00	0.00
3,360.0	6.92	254.14	3,359.1	-6.2	-21.7	-5.5	0.00	0.00	0.00
3,400.0	6.92	254.14	3,398.8	-7.5	-26.3	-6.7	0.00	0.00	0.00
3,440.0	6.92	254.14	3,438.5	-8.8	-31.0	-7.9	0.00	0.00	0.00
3,480.0	6.92	254.14	3,478.2	-10.1	-35.6	-9.0	0.00	0.00	0.00
3,520.0	6.92	254.14	3,517.9	-11.4	-40.2	-10.2	0.00	0.00	0.00
3,560.0	6.92	254.14	3,557.6	-12.8	-44.9	-11.4	0.00	0.00	0.00
3,600.0	6.92	254.14	3,597.3	-14.1	-49.5	-12.6	0.00	0.00	0.00
3,640.0	6.92	254.14	3,637.0	-15.4	-54.2	-13.7	0.00	0.00	0.00
3,680.0	6.92	254.14	3,676.7	-16.7	-58.8	-14.9	0.00	0.00	0.00
3,720.0	6.92	254.14	3,716.4	-18.0	-63.4	-16.1	0.00	0.00	0.00
3,758.5	6.92	254.14	3,754.7	-19.3	-67.9	-17.2	0.00	0.00	0.00
3,760.0	6.89	254.14	3,756.1	-19.3	-68.1	-17.3	2.00	-2.00	0.00
3,800.0	6.09	254.14	3,795.9	-20.6	-72.4	-18.4	2.00	-2.00	0.00
3,840.0	5.29	254.14	3,835.7	-21.7	-76.2	-19.3	2.00	-2.00	0.00
3,880.0	4.49	254.14	3,875.5	-22.6	-79.5	-20.2	2.00	-2.00	0.00
3,920.0	3.69	254.14	3,915.4	-23.4	-82.3	-20.9	2.00	-2.00	0.00

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Well:	Guttersen 31Y-441	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (5-31-13)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
3,960.0	2.89	254.14	3,955.4	-24.0	-84.5	-21.4	2.00	-2.00	0.00
4,000.0	2.09	254.14	3,995.3	-24.5	-86.2	-21.9	2.00	-2.00	0.00
4,040.0	1.29	254.14	4,035.3	-24.8	-87.3	-22.1	2.00	-2.00	0.00
4,080.0	0.49	254.14	4,075.3	-25.0	-87.9	-22.3	2.00	-2.00	0.00
4,104.7	0.00	0.00	4,100.0	-25.0	-88.0	-22.3	2.00	-2.00	0.00
4,120.0	0.00	0.00	4,115.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
4,160.0	0.00	0.00	4,155.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
4,200.0	0.00	0.00	4,195.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
4,240.0	0.00	0.00	4,235.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
4,280.0	0.00	0.00	4,275.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
4,320.0	0.00	0.00	4,315.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
4,360.0	0.00	0.00	4,355.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
4,400.0	0.00	0.00	4,395.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
4,440.0	0.00	0.00	4,435.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
4,480.0	0.00	0.00	4,475.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
4,520.0	0.00	0.00	4,515.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
4,560.0	0.00	0.00	4,555.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
4,600.0	0.00	0.00	4,595.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
4,640.0	0.00	0.00	4,635.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
4,680.0	0.00	0.00	4,675.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
4,720.0	0.00	0.00	4,715.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
4,760.0	0.00	0.00	4,755.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
4,800.0	0.00	0.00	4,795.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
4,840.0	0.00	0.00	4,835.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
4,880.0	0.00	0.00	4,875.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
4,920.0	0.00	0.00	4,915.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
4,960.0	0.00	0.00	4,955.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
5,000.0	0.00	0.00	4,995.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
5,040.0	0.00	0.00	5,035.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
5,080.0	0.00	0.00	5,075.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
5,120.0	0.00	0.00	5,115.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
5,160.0	0.00	0.00	5,155.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
5,200.0	0.00	0.00	5,195.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
5,240.0	0.00	0.00	5,235.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
5,280.0	0.00	0.00	5,275.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
5,320.0	0.00	0.00	5,315.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
5,360.0	0.00	0.00	5,355.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
5,400.0	0.00	0.00	5,395.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
5,440.0	0.00	0.00	5,435.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
5,480.0	0.00	0.00	5,475.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
5,520.0	0.00	0.00	5,515.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
5,560.0	0.00	0.00	5,555.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
5,600.0	0.00	0.00	5,595.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
5,640.0	0.00	0.00	5,635.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
5,680.0	0.00	0.00	5,675.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
5,720.0	0.00	0.00	5,715.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
5,760.0	0.00	0.00	5,755.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
5,800.0	0.00	0.00	5,795.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
5,840.0	0.00	0.00	5,835.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
5,880.0	0.00	0.00	5,875.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
5,920.0	0.00	0.00	5,915.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
5,960.0	0.00	0.00	5,955.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
6,000.0	0.00	0.00	5,995.3	-25.0	-88.0	-22.3	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Guttersen 31Y-441
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4851.0ft (RKB - 15')
Project:	SEC.31-T3N-R63W	MD Reference:	WELL @ 4851.0ft (RKB - 15')
Site:	Guttersen 31Y-201 Pad Sec.31-T3N-R63W	North Reference:	True
Well:	Guttersen 31Y-441	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (5-31-13)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
6,040.0	0.00	0.00	6,035.3	-25.0	-88.0	-22.3	0.00	0.00	0.00
6,066.9	0.00	0.00	6,062.2	-25.0	-88.0	-22.3	0.00	0.00	0.00
KOP #2									
6,080.0	0.98	359.34	6,075.3	-24.9	-88.0	-22.2	7.50	7.50	0.00
6,120.0	3.98	359.34	6,115.3	-23.2	-88.0	-20.5	7.50	7.50	0.00
6,160.0	6.98	359.34	6,155.1	-19.3	-88.1	-16.7	7.50	7.50	0.00
6,200.0	9.98	359.34	6,194.6	-13.4	-88.1	-10.8	7.50	7.50	0.00
6,240.0	12.98	359.34	6,233.8	-5.5	-88.2	-2.8	7.50	7.50	0.00
6,280.0	15.98	359.34	6,272.6	4.5	-88.3	7.2	7.50	7.50	0.00
6,320.0	18.98	359.34	6,310.7	16.5	-88.5	19.2	7.50	7.50	0.00
6,360.0	21.98	359.34	6,348.2	30.5	-88.6	33.2	7.50	7.50	0.00
6,400.0	24.98	359.34	6,384.9	46.5	-88.8	49.1	7.50	7.50	0.00
6,440.0	27.98	359.34	6,420.7	64.3	-89.0	67.0	7.50	7.50	0.00
6,480.0	30.98	359.34	6,455.5	84.0	-89.3	86.7	7.50	7.50	0.00
6,520.0	33.98	359.34	6,489.2	105.5	-89.5	108.1	7.50	7.50	0.00
6,560.0	36.98	359.34	6,521.8	128.7	-89.8	131.3	7.50	7.50	0.00
6,600.0	39.98	359.34	6,553.1	153.6	-90.1	156.2	7.50	7.50	0.00
6,640.0	42.98	359.34	6,583.0	180.1	-90.4	182.7	7.50	7.50	0.00
6,680.0	45.98	359.34	6,611.6	208.1	-90.7	210.7	7.50	7.50	0.00
6,720.0	48.98	359.34	6,638.6	237.6	-91.0	240.2	7.50	7.50	0.00
6,760.0	51.98	359.34	6,664.1	268.4	-91.4	271.1	7.50	7.50	0.00
6,800.0	54.98	359.34	6,687.9	300.6	-91.8	303.2	7.50	7.50	0.00
6,840.0	57.98	359.34	6,709.9	333.9	-92.1	336.5	7.50	7.50	0.00
6,880.0	60.98	359.34	6,730.3	368.3	-92.5	371.0	7.50	7.50	0.00
6,920.0	63.98	359.34	6,748.7	403.8	-92.9	406.4	7.50	7.50	0.00
6,960.0	66.98	359.34	6,765.3	440.2	-93.4	442.8	7.50	7.50	0.00
7,000.0	69.98	359.34	6,780.0	477.4	-93.8	480.0	7.50	7.50	0.00
7,040.0	72.98	359.34	6,792.7	515.3	-94.2	517.9	7.50	7.50	0.00
7,080.0	75.98	359.34	6,803.4	553.9	-94.7	556.5	7.50	7.50	0.00
7,120.0	78.98	359.34	6,812.1	592.9	-95.1	595.5	7.50	7.50	0.00
7,160.0	81.98	359.34	6,818.7	632.3	-95.6	635.0	7.50	7.50	0.00
7,186.9	84.00	359.34	6,822.0	659.0	-95.9	661.6	7.50	7.50	0.00
7"									
7,200.0	84.00	359.34	6,823.3	672.1	-96.0	674.7	0.00	0.00	0.00
7,240.0	84.00	359.34	6,827.5	711.8	-96.5	714.4	0.00	0.00	0.00
7,260.9	84.00	359.34	6,829.7	732.6	-96.7	735.2	0.00	0.00	0.00
7,280.0	84.95	359.34	6,831.5	751.6	-96.9	754.2	5.00	5.00	0.00
7,320.0	86.95	359.34	6,834.4	791.5	-97.4	794.1	5.00	5.00	0.00
7,360.0	88.95	359.34	6,835.8	831.5	-97.9	834.1	5.00	5.00	0.00
7,382.7	90.09	359.34	6,836.0	854.2	-98.1	856.8	5.00	5.00	0.00
End of Build									
7,400.0	90.09	359.34	6,836.0	871.5	-98.3	874.1	0.00	0.00	0.00
7,440.0	90.09	359.34	6,835.9	911.5	-98.8	914.1	0.00	0.00	0.00
7,480.0	90.09	359.34	6,835.8	951.5	-99.3	954.1	0.00	0.00	0.00
7,520.0	90.09	359.34	6,835.8	991.5	-99.7	994.1	0.00	0.00	0.00
7,560.0	90.09	359.34	6,835.7	1,031.5	-100.2	1,034.1	0.00	0.00	0.00
7,600.0	90.09	359.34	6,835.6	1,071.5	-100.6	1,074.1	0.00	0.00	0.00
7,640.0	90.09	359.34	6,835.6	1,111.5	-101.1	1,114.0	0.00	0.00	0.00
7,680.0	90.09	359.34	6,835.5	1,151.5	-101.6	1,154.0	0.00	0.00	0.00
7,720.0	90.09	359.34	6,835.5	1,191.5	-102.0	1,194.0	0.00	0.00	0.00
7,760.0	90.09	359.34	6,835.4	1,231.5	-102.5	1,234.0	0.00	0.00	0.00
7,800.0	90.09	359.34	6,835.3	1,271.5	-102.9	1,274.0	0.00	0.00	0.00
7,840.0	90.09	359.34	6,835.3	1,311.5	-103.4	1,314.0	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Guttersen 31Y-441
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4851.0ft (RKB - 15')
Project:	SEC.31-T3N-R63W	MD Reference:	WELL @ 4851.0ft (RKB - 15')
Site:	Guttersen 31Y-201 Pad Sec.31-T3N-R63W	North Reference:	True
Well:	Guttersen 31Y-441	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (5-31-13)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N-S (ft)	+E-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
7,880.0	90.09	359.34	6,835.2	1,351.5	-103.9	1,354.0	0.00	0.00	0.00
7,920.0	90.09	359.34	6,835.1	1,391.5	-104.3	1,394.0	0.00	0.00	0.00
7,960.0	90.09	359.34	6,835.1	1,431.5	-104.8	1,434.0	0.00	0.00	0.00
8,000.0	90.09	359.34	6,835.0	1,471.5	-105.3	1,474.0	0.00	0.00	0.00
8,040.0	90.09	359.34	6,835.0	1,511.5	-105.7	1,514.0	0.00	0.00	0.00
8,080.0	90.09	359.34	6,834.9	1,551.5	-106.2	1,554.0	0.00	0.00	0.00
8,120.0	90.09	359.34	6,834.8	1,591.5	-106.6	1,594.0	0.00	0.00	0.00
8,160.0	90.09	359.34	6,834.8	1,631.5	-107.1	1,634.0	0.00	0.00	0.00
8,200.0	90.09	359.34	6,834.7	1,671.5	-107.6	1,673.9	0.00	0.00	0.00
8,240.0	90.09	359.34	6,834.6	1,711.4	-108.0	1,713.9	0.00	0.00	0.00
8,280.0	90.09	359.34	6,834.6	1,751.4	-108.5	1,753.9	0.00	0.00	0.00
8,320.0	90.09	359.34	6,834.5	1,791.4	-109.0	1,793.9	0.00	0.00	0.00
8,360.0	90.09	359.34	6,834.5	1,831.4	-109.4	1,833.9	0.00	0.00	0.00
8,400.0	90.09	359.34	6,834.4	1,871.4	-109.9	1,873.9	0.00	0.00	0.00
8,440.0	90.09	359.34	6,834.3	1,911.4	-110.3	1,913.9	0.00	0.00	0.00
8,480.0	90.09	359.34	6,834.3	1,951.4	-110.8	1,953.9	0.00	0.00	0.00
8,520.0	90.09	359.34	6,834.2	1,991.4	-111.3	1,993.9	0.00	0.00	0.00
8,560.0	90.09	359.34	6,834.1	2,031.4	-111.7	2,033.9	0.00	0.00	0.00
8,600.0	90.09	359.34	6,834.1	2,071.4	-112.2	2,073.9	0.00	0.00	0.00
8,640.0	90.09	359.34	6,834.0	2,111.4	-112.6	2,113.9	0.00	0.00	0.00
8,680.0	90.09	359.34	6,834.0	2,151.4	-113.1	2,153.9	0.00	0.00	0.00
8,720.0	90.09	359.34	6,833.9	2,191.4	-113.6	2,193.9	0.00	0.00	0.00
8,760.0	90.09	359.34	6,833.8	2,231.4	-114.0	2,233.8	0.00	0.00	0.00
8,800.0	90.09	359.34	6,833.8	2,271.4	-114.5	2,273.8	0.00	0.00	0.00
8,840.0	90.09	359.34	6,833.7	2,311.4	-115.0	2,313.8	0.00	0.00	0.00
8,880.0	90.09	359.34	6,833.7	2,351.4	-115.4	2,353.8	0.00	0.00	0.00
8,920.0	90.09	359.34	6,833.6	2,391.4	-115.9	2,393.8	0.00	0.00	0.00
8,960.0	90.09	359.34	6,833.5	2,431.4	-116.3	2,433.8	0.00	0.00	0.00
9,000.0	90.09	359.34	6,833.5	2,471.4	-116.8	2,473.8	0.00	0.00	0.00
9,040.0	90.09	359.34	6,833.4	2,511.4	-117.3	2,513.8	0.00	0.00	0.00
9,080.0	90.09	359.34	6,833.3	2,551.4	-117.7	2,553.8	0.00	0.00	0.00
9,120.0	90.09	359.34	6,833.3	2,591.4	-118.2	2,593.8	0.00	0.00	0.00
9,160.0	90.09	359.34	6,833.2	2,631.4	-118.7	2,633.8	0.00	0.00	0.00
9,200.0	90.09	359.34	6,833.2	2,671.4	-119.1	2,673.8	0.00	0.00	0.00
9,240.0	90.09	359.34	6,833.1	2,711.4	-119.6	2,713.8	0.00	0.00	0.00
9,280.0	90.09	359.34	6,833.0	2,751.4	-120.0	2,753.8	0.00	0.00	0.00
9,320.0	90.09	359.34	6,833.0	2,791.4	-120.5	2,793.7	0.00	0.00	0.00
9,360.0	90.09	359.34	6,832.9	2,831.4	-121.0	2,833.7	0.00	0.00	0.00
9,400.0	90.09	359.34	6,832.8	2,871.4	-121.4	2,873.7	0.00	0.00	0.00
9,440.0	90.09	359.34	6,832.8	2,911.4	-121.9	2,913.7	0.00	0.00	0.00
9,480.0	90.09	359.34	6,832.7	2,951.4	-122.3	2,953.7	0.00	0.00	0.00
9,520.0	90.09	359.34	6,832.7	2,991.4	-122.8	2,993.7	0.00	0.00	0.00
9,560.0	90.09	359.34	6,832.6	3,031.4	-123.3	3,033.7	0.00	0.00	0.00
9,600.0	90.09	359.34	6,832.5	3,071.4	-123.7	3,073.7	0.00	0.00	0.00
9,640.0	90.09	359.34	6,832.5	3,111.4	-124.2	3,113.7	0.00	0.00	0.00
9,680.0	90.09	359.34	6,832.4	3,151.4	-124.7	3,153.7	0.00	0.00	0.00
9,720.0	90.09	359.34	6,832.3	3,191.3	-125.1	3,193.7	0.00	0.00	0.00
9,760.0	90.09	359.34	6,832.3	3,231.3	-125.6	3,233.7	0.00	0.00	0.00
9,800.0	90.09	359.34	6,832.2	3,271.3	-126.0	3,273.7	0.00	0.00	0.00
9,840.0	90.09	359.34	6,832.2	3,311.3	-126.5	3,313.7	0.00	0.00	0.00
9,880.0	90.09	359.34	6,832.1	3,351.3	-127.0	3,353.6	0.00	0.00	0.00
9,920.0	90.09	359.34	6,832.0	3,391.3	-127.4	3,393.6	0.00	0.00	0.00
9,960.0	90.09	359.34	6,832.0	3,431.3	-127.9	3,433.6	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Guttersen 31Y-441
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4851.0ft (RKB - 15')
Project:	SEC.31-T3N-R63W	MD Reference:	WELL @ 4851.0ft (RKB - 15')
Site:	Guttersen 31Y-201 Pad Sec.31-T3N-R63W	North Reference:	True
Well:	Guttersen 31Y-441	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (5-31-13)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
10,000.0	90.09	359.34	6,831.9	3,471.3	-128.4	3,473.6	0.00	0.00	0.00
10,040.0	90.09	359.34	6,831.8	3,511.3	-128.8	3,513.6	0.00	0.00	0.00
10,080.0	90.09	359.34	6,831.8	3,551.3	-129.3	3,553.6	0.00	0.00	0.00
10,120.0	90.09	359.34	6,831.7	3,591.3	-129.7	3,593.6	0.00	0.00	0.00
10,160.0	90.09	359.34	6,831.7	3,631.3	-130.2	3,633.6	0.00	0.00	0.00
10,200.0	90.09	359.34	6,831.6	3,671.3	-130.7	3,673.6	0.00	0.00	0.00
10,240.0	90.09	359.34	6,831.5	3,711.3	-131.1	3,713.6	0.00	0.00	0.00
10,280.0	90.09	359.34	6,831.5	3,751.3	-131.6	3,753.6	0.00	0.00	0.00
10,320.0	90.09	359.34	6,831.4	3,791.3	-132.0	3,793.6	0.00	0.00	0.00
10,360.0	90.09	359.34	6,831.3	3,831.3	-132.5	3,833.6	0.00	0.00	0.00
10,400.0	90.09	359.34	6,831.3	3,871.3	-133.0	3,873.6	0.00	0.00	0.00
10,440.0	90.09	359.34	6,831.2	3,911.3	-133.4	3,913.5	0.00	0.00	0.00
10,480.0	90.09	359.34	6,831.2	3,951.3	-133.9	3,953.5	0.00	0.00	0.00
10,520.0	90.09	359.34	6,831.1	3,991.3	-134.4	3,993.5	0.00	0.00	0.00
10,560.0	90.09	359.34	6,831.0	4,031.3	-134.8	4,033.5	0.00	0.00	0.00
10,600.0	90.09	359.34	6,831.0	4,071.3	-135.3	4,073.5	0.00	0.00	0.00
10,640.0	90.09	359.34	6,830.9	4,111.3	-135.7	4,113.5	0.00	0.00	0.00
10,680.0	90.09	359.34	6,830.8	4,151.3	-136.2	4,153.5	0.00	0.00	0.00
10,720.0	90.09	359.34	6,830.8	4,191.3	-136.7	4,193.5	0.00	0.00	0.00
10,760.0	90.09	359.34	6,830.7	4,231.3	-137.1	4,233.5	0.00	0.00	0.00
10,800.0	90.09	359.34	6,830.7	4,271.3	-137.6	4,273.5	0.00	0.00	0.00
10,840.0	90.09	359.34	6,830.6	4,311.3	-138.1	4,313.5	0.00	0.00	0.00
10,880.0	90.09	359.34	6,830.5	4,351.3	-138.5	4,353.5	0.00	0.00	0.00
10,920.0	90.09	359.34	6,830.5	4,391.3	-139.0	4,393.5	0.00	0.00	0.00
10,960.0	90.09	359.34	6,830.4	4,431.3	-139.4	4,433.5	0.00	0.00	0.00
11,000.0	90.09	359.34	6,830.3	4,471.3	-139.9	4,473.4	0.00	0.00	0.00
11,040.0	90.09	359.34	6,830.3	4,511.3	-140.4	4,513.4	0.00	0.00	0.00
11,080.0	90.09	359.34	6,830.2	4,551.3	-140.8	4,553.4	0.00	0.00	0.00
11,120.0	90.09	359.34	6,830.2	4,591.3	-141.3	4,593.4	0.00	0.00	0.00
11,160.0	90.09	359.34	6,830.1	4,631.2	-141.7	4,633.4	0.00	0.00	0.00
11,200.0	90.09	359.34	6,830.0	4,671.2	-142.2	4,673.4	0.00	0.00	0.00
11,224.6	90.09	359.34	6,830.0	4,695.8	-142.5	4,698.0	0.00	0.00	0.00
BHL 500' FNL, 517' FEL									

Casing Points				
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,186.9	6,822.0	7"	7	8-3/4

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
3,000.0	3,000.0	0.0	0.0	KOP #1
6,066.9	6,062.2	-25.0	-88.0	KOP #2
7,382.7	6,836.0	854.2	-98.1	End of Build



PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.31-T3N-R63W

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

Guttersen 31Y-441

Wellbore #1

Plan #1 (5-31-13)

Anticollision Report

31 May, 2013

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Guttersen 31Y-441
Project:	SEC.31-T3N-R63W	TVD Reference:	WELL @ 4851.0ft (RKB - 15')
Reference Site:	Guttersen 31Y-201 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4851.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Guttersen 31Y-441	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (5-31-13)	Offset TVD Reference:	Offset Datum

Offset Design Guttersen 31Y-201 Pad Sec.31-T3N-R63W - Guttersen 31T-221 - Wellbore #1 - Plan #1 (5-31-13)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-90.01	-90.01	0.0	-27.9	27.9				
100.0	100.0	100.0	100.0	0.1	0.1	-90.01	-90.01	0.0	-27.9	27.9	27.7	0.22	124.328	
200.0	200.0	200.0	200.0	0.3	0.3	-90.01	-90.01	0.0	-27.9	27.9	27.3	0.67	41.443	
300.0	300.0	300.0	300.0	0.6	0.6	-90.01	-90.01	0.0	-27.9	27.9	26.8	1.12	24.866	
400.0	400.0	400.0	400.0	0.8	0.8	-90.01	-90.01	0.0	-27.9	27.9	26.4	1.57	17.761	
500.0	500.0	500.0	500.0	1.0	1.0	-90.01	-90.01	0.0	-27.9	27.9	25.9	2.02	13.814	
600.0	600.0	600.0	600.0	1.2	1.2	-90.01	-90.01	0.0	-27.9	27.9	25.5	2.47	11.303	
700.0	700.0	700.0	700.0	1.5	1.5	-90.01	-90.01	0.0	-27.9	27.9	25.0	2.92	9.564	
800.0	800.0	800.0	800.0	1.7	1.7	-90.01	-90.01	0.0	-27.9	27.9	24.6	3.37	8.289	
900.0	900.0	900.0	900.0	1.9	1.9	-90.01	-90.01	0.0	-27.9	27.9	24.1	3.82	7.313	
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	-90.01	-90.01	0.0	-27.9	27.9	23.7	4.27	6.544 CC, ES	
1,100.0	1,100.0	1,099.0	1,099.0	2.4	2.3	-90.23	-90.23	-0.1	-29.7	29.7	25.0	4.70	6.307	
1,200.0	1,200.0	1,197.8	1,197.6	2.6	2.5	-90.77	-90.77	-0.5	-34.8	34.8	29.7	5.13	6.790	
1,300.0	1,300.0	1,296.1	1,295.5	2.8	2.8	-91.37	-91.37	-1.0	-43.2	43.4	37.9	5.57	7.799	
1,400.0	1,400.0	1,395.4	1,394.3	3.0	3.0	-91.86	-91.86	-1.7	-53.6	54.0	47.9	6.02	8.957	
1,500.0	1,500.0	1,494.8	1,493.2	3.3	3.2	-92.19	-92.19	-2.4	-64.1	64.5	58.0	6.49	9.938	
1,600.0	1,600.0	1,594.3	1,592.1	3.5	3.5	-92.42	-92.42	-3.2	-74.6	75.0	68.1	6.96	10.775	
1,700.0	1,700.0	1,693.7	1,691.0	3.7	3.8	-92.60	-92.60	-3.9	-85.0	85.6	78.1	7.45	11.496	
1,800.0	1,800.0	1,793.2	1,789.9	3.9	4.0	-92.74	-92.74	-4.6	-95.5	96.1	88.2	7.93	12.120	
1,900.0	1,900.0	1,892.6	1,888.8	4.2	4.3	-92.85	-92.85	-5.3	-106.0	106.7	98.3	8.42	12.667	
2,000.0	2,000.0	1,992.0	1,987.6	4.4	4.6	-92.94	-92.94	-6.0	-116.4	117.2	108.3	8.92	13.147	
2,100.0	2,100.0	2,091.5	2,086.5	4.6	4.8	-93.02	-93.02	-6.7	-126.9	127.8	118.4	9.41	13.574	
2,200.0	2,200.0	2,190.9	2,185.4	4.8	5.1	-93.08	-93.08	-7.4	-137.3	138.3	128.4	9.91	13.953	
2,300.0	2,300.0	2,290.4	2,284.3	5.1	5.4	-93.14	-93.14	-8.1	-147.8	148.9	138.4	10.41	14.294	
2,400.0	2,400.0	2,389.8	2,383.2	5.3	5.7	-93.19	-93.19	-8.8	-158.3	159.4	148.5	10.92	14.601	
2,500.0	2,500.0	2,489.3	2,482.1	5.5	6.0	-93.23	-93.23	-9.5	-168.7	169.9	158.5	11.42	14.878	
2,600.0	2,600.0	2,588.7	2,581.0	5.7	6.3	-93.27	-93.27	-10.2	-179.2	180.5	168.6	11.93	15.131	
2,700.0	2,700.0	2,688.1	2,679.9	6.0	6.5	-93.30	-93.30	-10.9	-189.7	191.0	178.6	12.44	15.361	
2,800.0	2,800.0	2,787.6	2,778.7	6.2	6.8	-93.33	-93.33	-11.6	-200.1	201.6	188.6	12.94	15.572	
2,900.0	2,900.0	2,887.0	2,877.6	6.4	7.1	-93.35	-93.35	-12.3	-210.6	212.1	198.7	13.45	15.767	
3,000.0	3,000.0	2,986.5	2,976.5	6.6	7.4	-93.38	-93.38	-13.1	-221.0	222.7	208.7	13.96	15.946	
3,100.0	3,100.0	3,086.1	3,075.6	6.8	7.7	12.51	12.51	-13.8	-231.5	231.5	217.9	13.59	17.042	
3,200.0	3,199.8	3,185.9	3,174.9	7.0	8.0	12.74	12.74	-14.5	-242.0	237.0	223.0	14.00	16.928	
3,300.0	3,299.5	3,285.9	3,274.3	7.2	8.3	13.16	13.16	-15.2	-252.5	239.0	224.6	14.40	16.597	
3,400.0	3,398.8	3,385.8	3,373.7	7.4	8.6	13.75	13.75	-15.9	-263.1	238.2	223.4	14.82	16.077	
3,500.0	3,498.0	3,485.8	3,473.1	7.7	8.9	14.36	14.36	-16.6	-273.6	237.0	221.8	15.25	15.545	
3,600.0	3,597.3	3,585.8	3,572.5	7.9	9.2	14.98	14.98	-17.3	-284.1	235.9	220.2	15.69	15.039	
3,700.0	3,696.6	3,685.7	3,671.9	8.1	9.5	15.61	15.61	-18.0	-294.6	234.8	218.7	16.13	14.559	
3,791.1	3,787.1	3,776.8	3,762.4	8.3	9.8	16.14	16.14	-18.7	-304.2	234.4	217.8	16.54	14.169	
3,800.0	3,795.9	3,785.7	3,771.3	8.4	9.8	16.22	16.22	-18.7	-305.1	234.0	217.4	16.58	14.111	
3,900.0	3,895.5	3,885.6	3,870.7	8.6	10.1	16.64	16.64	-19.4	-315.6	236.0	219.0	17.05	13.844	
4,000.0	3,995.3	3,985.5	3,970.0	8.8	10.4	16.84	16.84	-20.2	-326.2	241.4	223.9	17.49	13.798	
4,100.0	4,095.3	4,085.1	4,069.0	9.0	10.7	16.81	16.81	-20.9	-336.6	250.1	232.2	17.90	13.967	
4,200.0	4,195.3	4,184.6	4,167.9	9.2	11.0	-89.24	-89.24	-21.6	-347.1	260.6	242.2	18.34	14.207	
4,300.0	4,295.3	4,284.0	4,266.8	9.4	11.3	-89.42	-89.42	-22.3	-357.6	271.1	252.3	18.79	14.423	
4,400.0	4,395.3	4,383.4	4,365.7	9.6	11.6	-89.59	-89.59	-23.0	-368.0	281.6	262.3	19.25	14.629	
4,500.0	4,495.3	4,482.9	4,464.6	9.8	11.9	-89.74	-89.74	-23.7	-378.5	292.1	272.4	19.70	14.826	
4,600.0	4,595.3	4,590.1	4,571.3	10.0	12.1	-89.88	-89.88	-24.4	-388.8	301.8	281.6	20.16	14.972	
4,700.0	4,695.3	4,701.8	4,682.7	10.3	12.4	-89.97	-89.97	-24.8	-395.5	307.8	287.2	20.58	14.954	
4,800.0	4,795.3	4,813.8	4,794.7	10.5	12.5	-90.00	-90.00	-25.0	-397.9	309.9	288.9	21.01	14.755	
4,900.0	4,895.3	4,914.4	4,895.3	10.7	12.7	-90.00	-90.00	-25.0	-397.9	309.9	288.5	21.42	14.467	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Guttersen 31Y-441
Project:	SEC.31-T3N-R63W	TVD Reference:	WELL @ 4851.0ft (RKB - 15')
Reference Site:	Guttersen 31Y-201 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4851.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Guttersen 31Y-441	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (5-31-13)	Offset TVD Reference:	Offset Datum

Offset Design Guttersen 31Y-201 Pad Sec.31-T3N-R63W - Guttersen 31T-221 - Wellbore #1 - Plan #1 (5-31-13)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
5,000.0	4,995.3	5,014.4	4,995.3	10.9	12.9	-90.00	-25.0	-397.9	309.9	288.1	21.85	14.186		
5,100.0	5,095.3	5,114.4	5,095.3	11.2	13.1	-90.00	-25.0	-397.9	309.9	287.7	22.27	13.916		
5,200.0	5,195.3	5,214.4	5,195.3	11.4	13.2	-90.00	-25.0	-397.9	309.9	287.2	22.70	13.655		
5,300.0	5,295.3	5,314.4	5,295.3	11.6	13.4	-90.00	-25.0	-397.9	309.9	286.8	23.12	13.404		
5,400.0	5,395.3	5,414.4	5,395.3	11.8	13.6	-90.00	-25.0	-397.9	309.9	286.4	23.55	13.161		
5,500.0	5,495.3	5,514.4	5,495.3	12.0	13.8	-90.00	-25.0	-397.9	309.9	286.0	23.98	12.926		
5,600.0	5,595.3	5,614.4	5,595.3	12.3	14.0	-90.00	-25.0	-397.9	309.9	285.5	24.41	12.699		
5,700.0	5,695.3	5,714.4	5,695.3	12.5	14.2	-90.00	-25.0	-397.9	309.9	285.1	24.84	12.480		
5,800.0	5,795.3	5,814.4	5,795.3	12.7	14.3	-90.00	-25.0	-397.9	309.9	284.7	25.27	12.267		
5,859.7	5,855.0	5,874.1	5,855.0	12.8	14.5	-90.00	-25.0	-397.9	309.9	284.4	25.52	12.144		
5,900.0	5,895.3	5,914.3	5,895.2	12.9	14.5	-89.96	-24.8	-397.9	309.9	284.3	25.70	12.062		
6,000.0	5,995.3	6,012.9	5,993.4	13.1	14.7	-88.37	-16.2	-398.1	310.2	284.1	26.13	11.871		
6,100.0	6,095.3	6,107.9	6,086.2	13.4	14.9	-84.06	4.0	-398.3	311.7	285.2	26.56	11.737		
6,200.0	6,194.6	6,200.0	6,173.0	13.6	15.1	-80.05	34.4	-398.7	314.9	288.0	26.98	11.672		
6,300.0	6,291.7	6,289.8	6,253.6	13.8	15.2	-76.30	73.9	-399.1	319.5	292.1	27.37	11.673		
6,400.0	6,384.9	6,377.7	6,327.5	14.0	15.4	-72.89	121.5	-399.7	324.9	297.2	27.71	11.725		
6,500.0	6,472.5	6,463.9	6,394.2	14.3	15.7	-69.83	176.1	-400.4	330.9	302.9	28.03	11.806		
6,600.0	6,553.1	6,550.0	6,454.2	14.6	16.0	-67.13	237.7	-401.1	337.1	308.7	28.37	11.882		
6,700.0	6,625.3	6,632.4	6,504.8	15.0	16.4	-64.89	302.7	-401.9	343.1	314.3	28.80	11.913		
6,800.0	6,687.9	6,715.1	6,548.2	15.6	16.9	-63.01	373.0	-402.8	348.6	319.2	29.40	11.858		
6,900.0	6,739.7	6,800.0	6,584.7	16.3	17.6	-61.48	449.6	-403.7	353.3	323.0	30.26	11.675		
7,000.0	6,780.0	6,878.2	6,610.6	17.2	18.3	-60.41	523.4	-404.6	357.0	325.6	31.42	11.361		
7,100.0	6,808.0	6,959.1	6,629.2	18.3	19.2	-59.67	602.1	-405.6	359.6	326.6	32.96	10.909		
7,200.0	6,823.3	7,039.7	6,639.4	19.5	20.1	-59.30	682.0	-406.6	361.0	326.2	34.86	10.356		
7,300.0	6,833.1	7,124.8	6,641.5	20.8	21.2	-58.38	767.0	-407.6	364.8	328.1	36.77	9.923		
7,400.0	6,836.0	7,224.7	6,641.0	22.1	22.6	-57.88	866.9	-408.8	366.6	327.5	39.16	9.363		
7,500.0	6,835.8	7,324.7	6,640.6	23.6	24.0	-57.85	966.9	-410.0	366.8	325.1	41.69	8.799		
7,600.0	6,835.6	7,424.7	6,640.2	25.1	25.5	-57.82	1,066.9	-411.2	367.0	322.7	44.33	8.279		
7,700.0	6,835.5	7,524.7	6,639.8	26.7	27.1	-57.79	1,166.9	-412.5	367.2	320.1	47.06	7.803		
7,800.0	6,835.3	7,624.7	6,639.4	28.3	28.7	-57.76	1,266.9	-413.7	367.4	317.5	49.86	7.369		
7,900.0	6,835.2	7,724.7	6,638.9	29.9	30.3	-57.73	1,366.9	-414.9	367.6	314.9	52.72	6.973		
8,000.0	6,835.0	7,824.7	6,638.5	31.6	32.0	-57.70	1,466.9	-416.1	367.8	312.1	55.63	6.611		
8,100.0	6,834.9	7,924.7	6,638.1	33.3	33.7	-57.68	1,566.8	-417.3	368.0	309.4	58.58	6.281		
8,200.0	6,834.7	8,024.7	6,637.7	35.0	35.4	-57.65	1,666.8	-418.5	368.2	306.6	61.57	5.979		
8,300.0	6,834.6	8,124.7	6,637.3	36.8	37.2	-57.62	1,766.8	-419.8	368.4	303.8	64.59	5.703		
8,400.0	6,834.4	8,224.7	6,636.9	38.6	38.9	-57.59	1,866.8	-421.0	368.6	300.9	67.64	5.448		
8,500.0	6,834.2	8,324.7	6,636.4	40.3	40.7	-57.56	1,966.8	-422.2	368.7	298.0	70.72	5.214		
8,600.0	6,834.1	8,424.7	6,636.0	42.1	42.5	-57.53	2,066.8	-423.4	368.9	295.1	73.81	4.999		
8,700.0	6,833.9	8,524.7	6,635.6	43.9	44.3	-57.50	2,166.8	-424.6	369.1	292.2	76.92	4.799		
8,800.0	6,833.8	8,624.7	6,635.2	45.7	46.1	-57.47	2,266.8	-425.8	369.3	289.3	80.04	4.614		
8,900.0	6,833.6	8,724.7	6,634.8	47.6	47.9	-57.44	2,366.8	-427.1	369.5	286.3	83.18	4.442		
9,000.0	6,833.5	8,824.7	6,634.3	49.4	49.7	-57.41	2,466.8	-428.3	369.7	283.4	86.33	4.283		
9,100.0	6,833.3	8,924.7	6,633.9	51.2	51.6	-57.38	2,566.8	-429.5	369.9	280.4	89.49	4.134		
9,200.0	6,833.2	9,024.7	6,633.5	53.1	53.4	-57.35	2,666.8	-430.7	370.1	277.4	92.66	3.994		
9,300.0	6,833.0	9,124.7	6,633.1	54.9	55.2	-57.32	2,766.7	-431.9	370.3	274.5	95.83	3.864		
9,400.0	6,832.8	9,224.7	6,632.7	56.8	57.1	-57.30	2,866.7	-433.2	370.5	271.5	99.02	3.742		
9,500.0	6,832.7	9,324.7	6,632.2	58.6	59.0	-57.27	2,966.7	-434.4	370.7	268.5	102.21	3.627		
9,600.0	6,832.5	9,424.7	6,631.8	60.5	60.8	-57.24	3,066.7	-435.6	370.9	265.5	105.40	3.519		
9,700.0	6,832.4	9,524.7	6,631.4	62.3	62.7	-57.21	3,166.7	-436.8	371.1	262.5	108.60	3.417		
9,800.0	6,832.2	9,624.7	6,631.0	64.2	64.5	-57.18	3,266.7	-438.0	371.3	259.5	111.81	3.321		
9,900.0	6,832.1	9,724.7	6,630.6	66.1	66.4	-57.15	3,366.7	-439.2	371.5	256.5	115.01	3.230		

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Guttersten 31Y-441
Project:	SEC.31-T3N-R63W	TVD Reference:	WELL @ 4851.0ft (RKB - 15')
Reference Site:	Guttersten 31Y-201 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4851.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Guttersten 31Y-441	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (5-31-13)	Offset TVD Reference:	Offset Datum

Offset Design Guttersten 31Y-201 Pad Sec.31-T3N-R63W - Guttersten 31T-221 - Wellbore #1 - Plan #1 (5-31-13)												Offset Site Error:	0.0 ft
Survey Program: 0-MWD												Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
10,000.0	6,831.9	9,824.7	6,630.1	68.0	68.3	-57.12	3,466.7	-440.5	371.7	253.4	118.22	3.144	
10,100.0	6,831.8	9,924.7	6,629.7	69.8	70.2	-57.09	3,566.7	-441.7	371.9	250.4	121.44	3.062	
10,200.0	6,831.6	10,024.7	6,629.3	71.7	72.0	-57.06	3,666.7	-442.9	372.1	247.4	124.65	2.985	
10,300.0	6,831.4	10,124.7	6,628.9	73.6	73.9	-57.04	3,766.7	-444.1	372.3	244.4	127.87	2.911	
10,400.0	6,831.3	10,224.7	6,628.5	75.5	75.8	-57.01	3,866.6	-445.3	372.4	241.4	131.09	2.841	
10,500.0	6,831.1	10,324.7	6,628.1	77.4	77.7	-56.98	3,966.6	-446.5	372.6	238.3	134.31	2.774	
10,600.0	6,831.0	10,424.7	6,627.6	79.3	79.6	-56.95	4,066.6	-447.8	372.8	235.3	137.54	2.711	
10,700.0	6,830.8	10,524.7	6,627.2	81.1	81.4	-56.92	4,166.6	-449.0	373.0	232.3	140.76	2.650	
10,800.0	6,830.7	10,624.7	6,626.8	83.0	83.3	-56.89	4,266.6	-450.2	373.2	229.2	143.99	2.592	
10,900.0	6,830.5	10,724.7	6,626.4	84.9	85.2	-56.86	4,366.6	-451.4	373.4	226.2	147.21	2.537	
11,000.0	6,830.3	10,824.7	6,626.0	86.8	87.1	-56.84	4,466.6	-452.6	373.6	223.2	150.44	2.484	
11,100.0	6,830.2	10,924.7	6,625.5	88.7	89.0	-56.81	4,566.6	-453.8	373.8	220.2	153.67	2.433	
11,200.0	6,830.0	11,024.7	6,625.1	90.6	90.9	-56.78	4,666.6	-455.1	374.0	217.1	156.89	2.384	
11,224.6	6,830.0	11,049.3	6,625.0	91.1	91.4	-56.77	4,691.1	-455.4	374.1	216.4	157.69	2.372 SF	

Guttersen 31Y-201 Pad Sec.31-T3N-R63W - Guttersen 31T-401 - Wellbore #1 - Plan #1 (5-31-13)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD							Offset Well Error:						0.0 ft	
Reference		Offset		Semi Major Axis			Distance				Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)		Minimum Separation (ft)	Separation Factor	
0.0	0.0	0.0	0.0	0.0	0.0	-90.00	0.0	-58.7	58.7					
100.0	100.0	100.0	100.0	0.1	0.1	-90.00	0.0	-58.7	58.7	58.5	0.22	261.089		
200.0	200.0	200.0	200.0	0.3	0.3	-90.00	0.0	-58.7	58.7	58.0	0.67	87.030 CC, ES		
300.0	300.0	298.0	297.9	0.6	0.5	-90.06	-0.1	-60.4	60.4	59.3	1.11	54.455		
400.0	400.0	395.7	395.5	0.8	0.8	-90.22	-0.3	-65.4	65.5	64.0	1.55	42.242		
500.0	500.0	493.0	492.4	1.0	1.0	-90.45	-0.6	-73.6	74.0	72.0	2.02	36.705		
600.0	600.0	589.9	588.7	1.2	1.3	-90.68	-1.0	-85.1	85.9	83.4	2.51	34.178		
700.0	700.0	689.1	687.0	1.5	1.6	-90.88	-1.5	-98.1	99.0	96.0	3.04	32.597		
800.0	800.0	788.2	785.3	1.7	1.9	-91.04	-2.0	-111.1	112.1	108.5	3.57	31.408		
900.0	900.0	887.3	883.6	1.9	2.2	-91.16	-2.5	-124.1	125.2	121.1	4.11	30.487		
1,000.0	1,000.0	986.5	981.9	2.1	2.6	-91.26	-3.0	-137.1	138.4	133.7	4.65	29.758		
1,100.0	1,100.0	1,085.6	1,080.1	2.4	2.9	-91.34	-3.5	-150.1	151.5	146.3	5.19	29.169		
1,200.0	1,200.0	1,184.7	1,178.4	2.6	3.2	-91.41	-4.0	-163.1	164.6	158.8	5.74	28.683		
1,300.0	1,300.0	1,283.9	1,276.7	2.8	3.5	-91.47	-4.5	-176.1	177.7	171.4	6.28	28.276		
1,400.0	1,400.0	1,383.0	1,375.0	3.0	3.9	-91.52	-5.0	-189.1	190.8	184.0	6.83	27.931		
1,500.0	1,500.0	1,482.2	1,473.2	3.3	4.2	-91.56	-5.5	-202.1	203.9	196.6	7.38	27.635		
1,600.0	1,600.0	1,581.3	1,571.5	3.5	4.5	-91.60	-6.0	-215.1	217.1	209.1	7.93	27.377		
1,700.0	1,700.0	1,680.4	1,669.8	3.7	4.9	-91.63	-6.5	-228.1	230.2	221.7	8.48	27.152		
1,800.0	1,800.0	1,779.6	1,768.1	3.9	5.2	-91.66	-7.0	-241.1	243.3	234.3	9.03	26.953		
1,900.0	1,900.0	1,878.7	1,866.4	4.2	5.5	-91.69	-7.5	-254.1	256.4	246.8	9.58	26.777		
2,000.0	2,000.0	1,977.8	1,964.6	4.4	5.9	-91.72	-8.0	-267.1	269.5	259.4	10.13	26.618		
2,100.0	2,100.0	2,077.0	2,062.9	4.6	6.2	-91.74	-8.5	-280.1	282.7	272.0	10.68	26.476		
2,200.0	2,200.0	2,176.1	2,161.2	4.8	6.5	-91.76	-9.0	-293.1	295.8	284.6	11.23	26.347		
2,300.0	2,300.0	2,275.2	2,259.5	5.1	6.9	-91.78	-9.5	-306.1	308.9	297.1	11.78	26.230		
2,400.0	2,400.0	2,374.4	2,357.8	5.3	7.2	-91.80	-10.0	-319.1	322.0	309.7	12.33	26.123		
2,500.0	2,500.0	2,473.5	2,456.0	5.5	7.5	-91.81	-10.5	-332.1	335.1	322.3	12.88	26.025		
2,600.0	2,600.0	2,572.6	2,554.3	5.7	7.9	-91.83	-11.0	-345.1	348.3	334.8	13.43	25.935		
2,700.0	2,700.0	2,671.8	2,652.6	6.0	8.2	-91.84	-11.5	-358.1	361.4	347.4	13.98	25.852		
2,800.0	2,800.0	2,770.9	2,750.9	6.2	8.5	-91.85	-12.0	-371.1	374.5	360.0	14.53	25.775		
2,900.0	2,900.0	2,870.1	2,849.1	6.4	8.9	-91.86	-12.5	-384.1	387.6	372.5	15.08	25.704		
3,000.0	3,000.0	2,969.2	2,947.4	6.6	9.2	-91.87	-13.0	-397.1	400.7	385.1	15.63	25.637		
3,100.0	3,100.0	3,068.5	3,045.9	6.8	9.5	13.98	-13.5	-410.1	412.2	398.2	13.99	29.473		
3,200.0	3,199.8	3,168.2	3,144.7	7.0	9.9	14.10	-14.0	-423.2	420.3	405.8	14.42	29.144		
3,300.0	3,299.5	3,268.1	3,243.7	7.2	10.2	14.35	-14.5	-436.3	425.0	410.1	14.84	28.627		
3,400.0	3,398.8	3,368.0	3,342.8	7.4	10.5	14.71	-15.0	-449.4	426.8	411.5	15.27	27.941		
3,500.0	3,498.0	3,467.9	3,441.9	7.7	10.9	15.09	-15.5	-462.5	428.3	412.5	15.72	27.247		
3,600.0	3,597.3	3,567.9	3,541.0	7.9	11.2	15.46	-16.0	-475.6	429.8	413.6	16.16	26.587		
3,700.0	3,696.6	3,667.8	3,640.0	8.1	11.6	15.83	-16.5	-488.7	431.3	414.7	16.61	25.958		
3,800.0	3,795.9	3,767.8	3,739.1	8.4	11.9	16.20	-17.0	-501.8	433.1	416.0	17.08	25.364		
3,900.0	3,895.5	3,867.7	3,838.1	8.6	12.2	16.47	-17.5	-514.9	437.7	420.2	17.54	24.960		
4,000.0	3,995.3	3,967.3	3,936.9	8.8	12.6	16.63	-18.0	-527.9	445.7	427.7	17.98	24.791		
4,100.0	4,095.3	4,066.7	4,035.4	9.0	12.9	16.68	-18.5	-541.0	456.9	438.6	18.38	24.857		
4,200.0	4,195.3	4,165.8	4,133.7	9.2	13.2	-89.26	-19.0	-554.0	470.0	451.2	18.83	24.961		
4,300.0	4,295.3	4,265.0	4,232.0	9.4	13.6	-89.34	-19.5	-567.0	483.2	463.9	19.29	25.044		
4,400.0	4,395.3	4,364.1	4,330.3	9.6	13.9	-89.42	-20.0	-580.0	496.3	476.5	19.75	25.122		
4,500.0	4,495.3	4,463.2	4,428.6	9.8	14.2	-89.49	-20.5	-592.9	509.4	489.1	20.22	25.197		
4,600.0	4,595.3	4,562.4	4,526.8	10.0	14.6	-89.56	-21.0	-605.9	522.5	501.8	20.68	25.268		
4,700.0	4,695.3	4,661.5	4,625.1	10.3	14.9	-89.62	-21.5	-618.9	535.6	514.4	21.14	25.336		
4,800.0	4,795.3	4,760.6	4,723.4	10.5	15.2	-89.69	-22.0	-631.9	548.7	527.1	21.60	25.401		
4,900.0	4,895.3	4,859.8	4,821.7	10.7	15.6	-89.74	-22.5	-644.9	561.8	539.7	22.06	25.463		
5,000.0	4,995.3	4,958.9	4,919.9	10.9	15.9	-89.80	-23.0	-657.9	574.9	552.4	22.53	25.522		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Guttersen 31Y-441
Project:	SEC.31-T3N-R63W	TVD Reference:	WELL @ 4851.0ft (RKB - 15')
Reference Site:	Guttersen 31Y-201 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4851.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Guttersen 31Y-441	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (5-31-13)	Offset TVD Reference:	Offset Datum

Offset Design Guttersen 31Y-201 Pad Sec.31-T3N-R63W - Guttersen 31T-401 - Wellbore #1 - Plan #1 (5-31-13)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,100.0	5,095.3	5,058.0	5,018.2	11.2	16.3	-89.85	-89.85	-23.5	-670.9	588.0	565.0	22.99	25.579	
5,200.0	5,195.3	5,157.2	5,116.5	11.4	16.6	-89.90	-89.90	-24.0	-683.9	601.1	577.7	23.45	25.634	
5,300.0	5,295.3	5,281.2	5,239.7	11.6	16.9	-89.96	-89.96	-24.5	-697.8	612.4	588.5	23.91	25.607	
5,400.0	5,395.3	5,408.3	5,366.5	11.8	17.1	-89.99	-89.99	-24.9	-706.6	619.2	594.9	24.36	25.421	
5,500.0	5,495.3	5,535.8	5,494.0	12.0	17.3	-90.00	-90.00	-25.0	-709.7	621.7	596.9	24.80	25.070	
5,600.0	5,595.3	5,637.1	5,595.3	12.3	17.5	-90.00	-90.00	-25.0	-709.7	621.7	596.5	25.21	24.662	
5,700.0	5,695.3	5,737.1	5,695.3	12.5	17.6	-90.00	-90.00	-25.0	-709.7	621.7	596.1	25.62	24.269	
5,800.0	5,795.3	5,837.1	5,795.3	12.7	17.7	-90.00	-90.00	-25.0	-709.7	621.7	595.7	26.03	23.886	
5,900.0	5,895.3	5,937.1	5,895.3	12.9	17.9	-90.00	-90.00	-25.0	-709.7	621.7	595.2	26.44	23.515	
6,000.0	5,995.3	6,037.1	5,995.3	13.1	18.0	-90.00	-90.00	-25.0	-709.7	621.7	594.8	26.85	23.154	
6,057.4	6,052.7	6,094.5	6,052.7	13.3	18.1	-89.41	-89.41	-25.0	-709.7	621.7	594.6	27.08	22.959	
6,100.0	6,095.3	6,136.8	6,095.0	13.4	18.2	-89.34	-89.34	-24.3	-709.7	621.7	594.4	27.25	22.811	
6,200.0	6,194.6	6,235.9	6,193.4	13.6	18.3	-89.35	-89.35	-13.7	-709.8	621.7	594.0	27.65	22.484	
6,300.0	6,291.7	6,335.0	6,289.6	13.8	18.5	-89.37	-89.37	9.6	-710.1	621.7	593.7	28.04	22.171	
6,400.0	6,384.9	6,434.1	6,382.1	14.0	18.6	-89.40	-89.40	45.2	-710.5	621.7	593.2	28.46	21.844	
6,500.0	6,472.5	6,533.2	6,469.2	14.3	18.8	-89.45	-89.45	92.4	-711.1	621.7	592.7	28.97	21.461	
6,600.0	6,553.1	6,632.5	6,549.5	14.6	19.0	-89.50	-89.50	150.5	-711.8	621.7	592.1	29.63	20.982	
6,700.0	6,625.3	6,731.8	6,621.7	15.0	19.3	-89.56	-89.56	218.6	-712.6	621.7	591.2	30.51	20.377	
6,800.0	6,687.9	6,831.2	6,684.4	15.6	19.6	-89.62	-89.62	295.6	-713.5	621.8	590.1	31.67	19.633	
6,900.0	6,739.7	6,930.7	6,736.7	16.3	20.1	-89.70	-89.70	380.2	-714.5	621.8	588.7	33.14	18.762	
7,000.0	6,780.0	7,030.3	6,777.7	17.2	20.7	-89.78	-89.78	470.9	-715.6	621.8	586.9	34.94	17.798	
7,100.0	6,808.0	7,130.0	6,806.5	18.3	21.5	-89.86	-89.86	566.3	-716.7	621.9	584.8	37.04	16.789	
7,200.0	6,823.3	7,229.9	6,822.6	19.5	22.4	-89.94	-89.94	664.8	-717.9	621.9	582.5	39.40	15.783	
7,300.0	6,833.1	7,329.8	6,832.6	20.8	23.5	-89.96	-89.96	764.2	-719.1	621.9	579.9	41.99	14.811	
7,400.0	6,836.0	7,429.8	6,836.0	22.1	24.8	-90.01	-90.01	864.1	-720.2	621.9	577.2	44.74	13.902	
7,500.0	6,835.8	7,529.8	6,835.9	23.6	26.1	-90.01	-90.01	964.1	-721.4	622.0	574.3	47.64	13.055	
7,600.0	6,835.6	7,629.8	6,835.7	25.1	27.5	-90.01	-90.01	1,064.1	-722.6	622.0	571.3	50.67	12.276	
7,700.0	6,835.5	7,729.8	6,835.6	26.7	28.9	-90.01	-90.01	1,164.1	-723.8	622.0	568.2	53.80	11.563	
7,800.0	6,835.3	7,829.8	6,835.4	28.3	30.4	-90.01	-90.01	1,264.1	-725.0	622.1	565.0	57.01	10.911	
7,900.0	6,835.2	7,929.8	6,835.2	29.9	32.0	-90.01	-90.01	1,364.1	-726.1	622.1	561.8	60.30	10.316	
8,000.0	6,835.0	8,029.8	6,835.1	31.6	33.6	-90.01	-90.01	1,464.1	-727.3	622.1	558.5	63.66	9.773	
8,100.0	6,834.9	8,129.8	6,834.9	33.3	35.2	-90.01	-90.01	1,564.1	-728.5	622.1	555.1	67.06	9.277	
8,200.0	6,834.7	8,229.8	6,834.8	35.0	36.8	-90.01	-90.01	1,664.1	-729.7	622.2	551.7	70.52	8.823	
8,300.0	6,834.6	8,329.8	6,834.6	36.8	38.5	-90.00	-90.00	1,764.1	-730.9	622.2	548.2	74.01	8.408	
8,400.0	6,834.4	8,429.8	6,834.5	38.6	40.2	-90.00	-90.00	1,864.1	-732.1	622.2	544.7	77.53	8.026	
8,500.0	6,834.2	8,529.8	6,834.3	40.3	42.0	-90.00	-90.00	1,964.1	-733.2	622.3	541.2	81.08	7.674	
8,600.0	6,834.1	8,629.8	6,834.1	42.1	43.7	-90.00	-90.00	2,064.1	-734.4	622.3	537.6	84.66	7.350	
8,700.0	6,833.9	8,729.8	6,834.0	43.9	45.4	-90.00	-90.00	2,164.1	-735.6	622.3	534.1	88.26	7.051	
8,800.0	6,833.8	8,829.8	6,833.8	45.7	47.2	-90.00	-90.00	2,264.0	-736.8	622.3	530.5	91.88	6.773	
8,900.0	6,833.6	8,929.8	6,833.7	47.6	49.0	-90.00	-90.00	2,364.0	-738.0	622.4	526.8	95.52	6.516	
9,000.0	6,833.5	9,029.8	6,833.5	49.4	50.8	-90.00	-90.00	2,464.0	-739.2	622.4	523.2	99.17	6.276	
9,100.0	6,833.3	9,129.8	6,833.4	51.2	52.6	-90.00	-90.00	2,564.0	-740.3	622.4	519.6	102.84	6.052	
9,200.0	6,833.2	9,229.8	6,833.2	53.1	54.4	-90.00	-90.00	2,664.0	-741.5	622.5	515.9	106.52	5.843	
9,300.0	6,833.0	9,329.8	6,833.0	54.9	56.2	-90.00	-90.00	2,764.0	-742.7	622.5	512.3	110.21	5.648	
9,400.0	6,832.8	9,429.8	6,832.9	56.8	58.0	-90.00	-90.00	2,864.0	-743.9	622.5	508.6	113.91	5.465	
9,500.0	6,832.7	9,529.8	6,832.7	58.6	59.9	-90.00	-90.00	2,964.0	-745.1	622.5	504.9	117.63	5.293	
9,600.0	6,832.5	9,629.8	6,832.6	60.5	61.7	-90.00	-90.00	3,064.0	-746.3	622.6	501.2	121.34	5.131	
9,700.0	6,832.4	9,729.8	6,832.4	62.3	63.5	-90.00	-90.00	3,164.0	-747.4	622.6	497.5	125.07	4.978	
9,800.0	6,832.2	9,829.8	6,832.3	64.2	65.4	-90.00	-90.00	3,264.0	-748.6	622.6	493.8	128.81	4.834	
9,900.0	6,832.1	9,929.8	6,832.1	66.1	67.2	-90.00	-90.00	3,364.0	-749.8	622.6	490.1	132.55	4.698	
10,000.0	6,831.9	10,029.8	6,831.9	68.0	69.1	-90.00	-90.00	3,464.0	-751.0	622.7	486.4	136.29	4.569	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Guttersten 31Y-441
Project:	SEC.31-T3N-R63W	TVD Reference:	WELL @ 4851.0ft (RKB - 15')
Reference Site:	Guttersten 31Y-201 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4851.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Guttersten 31Y-441	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (5-31-13)	Offset TVD Reference:	Offset Datum

Offset Design Guttersten 31Y-201 Pad Sec.31-T3N-R63W - Guttersten 31T-401 - Wellbore #1 - Plan #1 (5-31-13)												Offset Site Error:	0.0 ft
Survey Program: 0-MWD												Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (ft)	Separation Factor	Warning
Reference	Offset	Reference	Offset	(ft)	(ft)		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)			
10,100.0	6,831.8	10,129.8	6,831.8	69.8	70.9	-90.00	3,564.0	-752.2	622.7	482.7	140.04	4.447	
10,200.0	6,831.6	10,229.8	6,831.6	71.7	72.8	-90.00	3,664.0	-753.3	622.7	478.9	143.80	4.331	
10,300.0	6,831.4	10,329.8	6,831.5	73.6	74.6	-90.00	3,763.9	-754.5	622.8	475.2	147.56	4.220	
10,400.0	6,831.3	10,429.8	6,831.3	75.5	76.5	-90.00	3,863.9	-755.7	622.8	471.5	151.33	4.116	
10,500.0	6,831.1	10,529.8	6,831.2	77.4	78.4	-90.00	3,963.9	-756.9	622.8	467.7	155.09	4.016	
10,600.0	6,831.0	10,629.8	6,831.0	79.3	80.3	-90.00	4,063.9	-758.1	622.8	464.0	158.87	3.921	
10,700.0	6,830.8	10,729.8	6,830.8	81.1	82.1	-90.00	4,163.9	-759.3	622.9	460.2	162.64	3.830	
10,800.0	6,830.7	10,829.8	6,830.7	83.0	84.0	-90.00	4,263.9	-760.4	622.9	456.5	166.42	3.743	
10,900.0	6,830.5	10,929.8	6,830.5	84.9	85.9	-90.00	4,363.9	-761.6	622.9	452.7	170.20	3.660	
11,000.0	6,830.3	11,029.8	6,830.4	86.8	87.8	-90.00	4,463.9	-762.8	623.0	449.0	173.99	3.580	
11,100.0	6,830.2	11,129.8	6,830.2	88.7	89.6	-90.00	4,563.9	-764.0	623.0	445.2	177.78	3.504	
11,200.0	6,830.0	11,229.8	6,830.1	90.6	91.5	-90.00	4,663.9	-765.2	623.0	441.4	181.57	3.431	
11,224.6	6,830.0	11,254.4	6,830.0	91.1	92.0	-90.00	4,688.4	-765.5	623.0	440.5	182.50	3.414 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Guttersen 31Y-441
Project:	SEC.31-T3N-R63W	TVD Reference:	WELL @ 4851.0ft (RKB - 15')
Reference Site:	Guttersen 31Y-201 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4851.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Guttersen 31Y-441	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (5-31-13)	Offset TVD Reference:	Offset Datum

Offset Design Guttersen 31Y-201 Pad Sec.31-T3N-R63W - Guttersen 31Y-201 - Wellbore #1 - Plan #1 (5-31-13)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	90.01	90.01	0.0	30.7	30.7				
100.0	100.0	100.0	100.0	0.1	0.1	90.01	90.01	0.0	30.7	30.7	30.5	0.22	136.761	
200.0	200.0	200.0	200.0	0.3	0.3	90.01	90.01	0.0	30.7	30.7	30.1	0.67	45.587	
300.0	300.0	300.0	300.0	0.6	0.6	90.01	90.01	0.0	30.7	30.7	29.6	1.12	27.352	
400.0	400.0	400.0	400.0	0.8	0.8	90.01	90.01	0.0	30.7	30.7	29.2	1.57	19.537	
500.0	500.0	500.0	500.0	1.0	1.0	90.01	90.01	0.0	30.7	30.7	28.7	2.02	15.196	
600.0	600.0	600.0	600.0	1.2	1.2	90.01	90.01	0.0	30.7	30.7	28.3	2.47	12.433	
700.0	700.0	700.0	700.0	1.5	1.5	90.01	90.01	0.0	30.7	30.7	27.8	2.92	10.520	
800.0	800.0	800.0	800.0	1.7	1.7	90.01	90.01	0.0	30.7	30.7	27.4	3.37	9.117	
900.0	900.0	900.0	900.0	1.9	1.9	90.01	90.01	0.0	30.7	30.7	26.9	3.82	8.045	
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	90.01	90.01	0.0	30.7	30.7	26.5	4.27	7.198 CC, ES	
1,100.0	1,100.0	1,099.2	1,099.2	2.4	2.3	90.29	91.03	-0.2	32.0	32.0	27.3	4.70	6.810	
1,200.0	1,200.0	1,198.2	1,198.1	2.6	2.5	91.03	91.96	-0.6	35.8	35.9	30.8	5.13	7.001	
1,300.0	1,300.0	1,297.2	1,296.9	2.8	2.8	91.96	92.73	-1.4	42.2	42.3	36.8	5.56	7.609	
1,400.0	1,400.0	1,396.9	1,396.4	3.0	3.0	92.73	93.30	-2.4	49.5	49.6	43.6	6.00	8.267	
1,500.0	1,500.0	1,496.7	1,495.8	3.3	3.2	93.30	93.74	-3.3	56.7	57.0	50.5	6.46	8.827	
1,600.0	1,600.0	1,596.4	1,595.3	3.5	3.4	93.74	94.09	-4.2	64.0	64.3	57.4	6.91	9.307	
1,700.0	1,700.0	1,696.1	1,694.7	3.7	3.7	94.09	94.38	-5.1	71.3	71.7	64.3	7.37	9.723	
1,800.0	1,800.0	1,795.8	1,794.2	3.9	3.9	94.38	94.61	-6.0	78.6	79.0	71.2	7.83	10.086	
1,900.0	1,900.0	1,895.6	1,893.7	4.2	4.1	94.61	94.81	-6.9	85.9	86.4	78.1	8.30	10.405	
2,000.0	2,000.0	1,995.3	1,993.1	4.4	4.4	94.81	94.98	-7.8	93.1	93.7	84.9	8.77	10.687	
2,100.0	2,100.0	2,095.0	2,092.6	4.6	4.6	94.98	95.13	-8.8	100.4	101.1	91.8	9.24	10.938	
2,200.0	2,200.0	2,194.8	2,192.0	4.8	4.9	95.13	95.26	-9.7	107.7	108.4	98.7	9.71	11.163	
2,300.0	2,300.0	2,294.5	2,291.5	5.1	5.1	95.26	95.37	-10.6	115.0	115.8	105.6	10.19	11.366	
2,400.0	2,400.0	2,394.2	2,390.9	5.3	5.4	95.37	95.56	-11.5	122.3	123.1	112.5	10.66	11.549	
2,500.0	2,500.0	2,493.9	2,490.4	5.5	5.6	95.56	95.65	-12.4	129.5	130.5	119.3	11.14	11.716	
2,600.0	2,600.0	2,593.7	2,589.9	5.7	5.9	95.65	95.72	-13.3	136.8	137.8	126.2	11.61	11.868	
2,700.0	2,700.0	2,693.4	2,689.3	6.0	6.1	95.72	95.79	-14.2	144.1	145.2	133.1	12.09	12.007	
2,800.0	2,800.0	2,793.1	2,788.8	6.2	6.4	95.79	95.85	-15.2	151.4	152.5	140.0	12.57	12.135	
2,900.0	2,900.0	2,892.9	2,888.2	6.4	6.7	95.85	95.88	-16.1	158.7	159.9	146.9	13.05	12.253	
3,000.0	3,000.0	2,992.6	2,987.7	6.6	6.9	95.88	95.93	-17.0	165.9	167.3	153.7	13.53	12.362	
3,100.0	3,100.0	3,092.2	3,087.0	6.8	7.2	-158.38	95.97	-17.9	173.2	176.2	162.7	13.50	13.052	
3,200.0	3,199.8	3,191.4	3,186.0	7.0	7.4	-158.83	96.00	-18.8	180.5	188.4	174.5	13.89	13.567	
3,300.0	3,299.5	3,290.2	3,284.5	7.2	7.7	-159.53	96.03	-19.7	187.7	203.9	189.6	14.26	14.295	
3,400.0	3,398.8	3,388.4	3,382.5	7.4	7.9	-160.44	96.03	-20.6	194.8	222.2	207.5	14.66	15.159	
3,500.0	3,498.0	3,486.6	3,480.4	7.7	8.2	-161.29	96.03	-21.5	202.0	240.8	225.7	15.07	15.976	
3,600.0	3,597.3	3,584.8	3,578.3	7.9	8.4	-162.01	96.03	-22.4	209.2	259.5	244.0	15.50	16.747	
3,700.0	3,696.6	3,683.0	3,676.2	8.1	8.7	-162.64	96.03	-23.3	216.3	278.3	262.3	15.92	17.477	
3,800.0	3,795.9	3,785.8	3,778.8	8.4	8.9	-163.25	96.03	-24.2	223.4	296.3	280.0	16.37	18.100	
3,900.0	3,895.5	3,893.5	3,886.4	8.6	9.2	-163.74	96.03	-24.8	228.1	309.2	292.3	16.83	18.376	
4,000.0	3,995.3	4,002.0	3,994.9	8.8	9.4	-164.03	96.03	-25.0	229.7	315.9	298.6	17.27	18.293	
4,100.0	4,095.3	4,102.4	4,095.3	9.0	9.5	-164.14	96.03	-25.0	229.7	317.7	300.1	17.68	17.973	
4,200.0	4,195.3	4,202.4	4,195.3	9.2	9.7	90.00	96.03	-25.0	229.7	317.7	299.7	18.08	17.571	
4,300.0	4,295.3	4,302.4	4,295.3	9.4	9.9	90.00	96.03	-25.0	229.7	317.7	299.2	18.51	17.164	
4,400.0	4,395.3	4,402.4	4,395.3	9.6	10.1	90.00	96.03	-25.0	229.7	317.7	298.8	18.94	16.775	
4,500.0	4,495.3	4,502.4	4,495.3	9.8	10.3	90.00	96.03	-25.0	229.7	317.7	298.4	19.37	16.403	
4,600.0	4,595.3	4,602.4	4,595.3	10.0	10.5	90.00	96.03	-25.0	229.7	317.7	297.9	19.80	16.046	
4,700.0	4,695.3	4,702.4	4,695.3	10.3	10.7	90.00	96.03	-25.0	229.7	317.7	297.5	20.23	15.703	
4,800.0	4,795.3	4,802.4	4,795.3	10.5	10.9	90.00	96.03	-25.0	229.7	317.7	297.1	20.67	15.375	
4,900.0	4,895.3	4,902.4	4,895.3	10.7	11.1	90.00	96.03	-25.0	229.7	317.7	296.6	21.10	15.059	
5,000.0	4,995.3	5,002.4	4,995.3	10.9	11.3	90.00	96.03	-25.0	229.7	317.7	296.2	21.53	14.755	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Guttersen 31Y-441
Project:	SEC.31-T3N-R63W	TVD Reference:	WELL @ 4851.0ft (RKB - 15')
Reference Site:	Guttersen 31Y-201 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4851.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Guttersen 31Y-441	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (5-31-13)	Offset TVD Reference:	Offset Datum

Offset Design Guttersen 31Y-201 Pad Sec.31-T3N-R63W - Guttersen 31Y-201 - Wellbore #1 - Plan #1 (5-31-13)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
5,100.0	5,095.3	5,102.4	5,095.3	11.2	11.5	90.00	-25.0	229.7	317.7	295.8	21.97	14.464		
5,200.0	5,195.3	5,202.4	5,195.3	11.4	11.7	90.00	-25.0	229.7	317.7	295.3	22.40	14.183		
5,300.0	5,295.3	5,302.4	5,295.3	11.6	11.9	90.00	-25.0	229.7	317.7	294.9	22.84	13.912		
5,400.0	5,395.3	5,402.4	5,395.3	11.8	12.1	90.00	-25.0	229.7	317.7	294.5	23.28	13.651		
5,500.0	5,495.3	5,502.4	5,495.3	12.0	12.4	90.00	-25.0	229.7	317.7	294.0	23.71	13.400		
5,600.0	5,595.3	5,602.4	5,595.3	12.3	12.6	90.00	-25.0	229.7	317.7	293.6	24.15	13.157		
5,700.0	5,695.3	5,702.4	5,695.3	12.5	12.8	90.00	-25.0	229.7	317.7	293.2	24.59	12.923		
5,800.0	5,795.3	5,802.4	5,795.3	12.7	13.0	90.00	-25.0	229.7	317.7	292.7	25.02	12.697		
5,900.0	5,895.3	5,902.5	5,895.4	12.9	13.2	89.96	-24.8	229.7	317.7	292.3	25.46	12.478		
5,958.6	5,953.9	5,961.2	5,953.9	13.1	13.3	89.31	-21.2	229.7	317.7	292.0	25.72	12.354		
6,000.0	5,995.3	6,002.1	5,994.5	13.1	13.4	88.38	-16.0	229.6	317.8	291.9	25.90	12.270		
6,100.0	6,095.3	6,098.0	6,088.1	13.4	13.6	85.42	4.5	229.4	318.8	292.5	26.32	12.111		
6,200.0	6,194.6	6,190.8	6,175.6	13.6	13.8	81.44	35.4	229.0	321.5	294.7	26.73	12.025		
6,300.0	6,291.7	6,281.3	6,256.6	13.8	14.0	77.69	75.5	228.5	325.5	298.4	27.13	11.998		
6,400.0	6,384.9	6,369.8	6,330.7	14.0	14.2	74.25	123.8	228.0	330.5	303.0	27.51	12.013		
6,500.0	6,472.5	6,456.5	6,397.5	14.3	14.4	71.14	179.1	227.3	336.2	308.3	27.91	12.048		
6,600.0	6,553.1	6,541.8	6,456.6	14.6	14.8	68.40	240.4	226.6	342.2	313.8	28.34	12.074		
6,700.0	6,625.3	6,625.8	6,507.8	15.0	15.3	66.05	307.0	225.8	348.1	319.2	28.86	12.060		
6,800.0	6,687.9	6,708.7	6,551.0	15.6	15.9	64.08	377.8	224.9	353.5	324.0	29.52	11.977		
6,900.0	6,739.7	6,790.9	6,585.8	16.3	16.7	62.49	452.1	224.0	358.3	328.0	30.38	11.796		
7,000.0	6,780.0	6,872.3	6,612.3	17.2	17.5	61.27	529.1	223.1	362.2	330.7	31.49	11.501		
7,100.0	6,808.0	6,950.0	6,629.8	18.3	18.4	60.45	604.7	222.2	365.1	332.2	32.87	11.106		
7,200.0	6,823.3	7,034.0	6,640.0	19.5	19.4	59.95	688.1	221.2	366.8	332.1	34.63	10.590		
7,300.0	6,833.1	7,118.4	6,641.3	20.8	20.6	58.93	772.4	220.2	370.9	334.4	36.46	10.173		
7,400.0	6,836.0	7,218.3	6,639.7	22.1	22.0	58.27	872.3	219.0	373.1	334.4	38.66	9.650		
7,500.0	6,835.8	7,318.3	6,638.2	23.6	23.5	58.08	972.3	217.8	373.8	332.6	41.15	9.084		
7,600.0	6,835.6	7,418.3	6,636.7	25.1	25.0	57.90	1,072.2	216.6	374.5	330.7	43.74	8.562		
7,700.0	6,835.5	7,518.3	6,635.1	26.7	26.6	57.72	1,172.2	215.4	375.2	328.8	46.40	8.085		
7,800.0	6,835.3	7,618.3	6,633.6	28.3	28.2	57.54	1,272.2	214.2	375.9	326.7	49.14	7.650		
7,900.0	6,835.2	7,718.3	6,632.1	29.9	29.9	57.36	1,372.1	213.0	376.6	324.7	51.93	7.253		
8,000.0	6,835.0	7,818.3	6,630.5	31.6	31.6	57.18	1,472.1	211.8	377.3	322.5	54.76	6.891		
8,100.0	6,834.9	7,918.2	6,629.0	33.3	33.3	57.00	1,572.1	210.6	378.0	320.4	57.62	6.560		
8,200.0	6,834.7	8,018.2	6,627.4	35.0	35.0	56.82	1,672.1	209.4	378.7	318.2	60.52	6.259		
8,300.0	6,834.6	8,118.2	6,625.9	36.8	36.8	56.64	1,772.0	208.2	379.5	316.0	63.43	5.982		
8,400.0	6,834.4	8,218.2	6,624.4	38.6	38.6	56.47	1,872.0	207.0	380.2	313.8	66.37	5.729		
8,500.0	6,834.2	8,318.2	6,622.8	40.3	40.3	56.29	1,972.0	205.8	380.9	311.6	69.32	5.495		
8,600.0	6,834.1	8,418.2	6,621.3	42.1	42.1	56.11	2,071.9	204.6	381.6	309.4	72.28	5.280		
8,700.0	6,833.9	8,518.2	6,619.8	43.9	44.0	55.94	2,171.9	203.4	382.4	307.1	75.24	5.082		
8,800.0	6,833.8	8,618.2	6,618.2	45.7	45.8	55.76	2,271.9	202.2	383.1	304.9	78.22	4.898		
8,900.0	6,833.6	8,718.2	6,616.7	47.6	47.6	55.59	2,371.9	201.0	383.9	302.7	81.20	4.728		
9,000.0	6,833.5	8,818.2	6,615.2	49.4	49.4	55.42	2,471.8	199.9	384.6	300.4	84.18	4.569		
9,100.0	6,833.3	8,918.1	6,613.6	51.2	51.3	55.24	2,571.8	198.7	385.4	298.2	87.16	4.421		
9,200.0	6,833.2	9,018.1	6,612.1	53.1	53.1	55.07	2,671.8	197.5	386.1	296.0	90.14	4.283		
9,300.0	6,833.0	9,118.1	6,610.6	54.9	55.0	54.90	2,771.7	196.3	386.9	293.7	93.12	4.154		
9,400.0	6,832.8	9,218.1	6,609.0	56.8	56.8	54.73	2,871.7	195.1	387.6	291.5	96.10	4.034		
9,500.0	6,832.7	9,318.1	6,607.5	58.6	58.7	54.56	2,971.7	193.9	388.4	289.3	99.08	3.920		
9,600.0	6,832.5	9,418.1	6,605.9	60.5	60.6	54.39	3,071.7	192.7	389.2	287.1	102.05	3.813		
9,700.0	6,832.4	9,518.1	6,604.4	62.3	62.4	54.22	3,171.6	191.5	389.9	284.9	105.02	3.713		
9,800.0	6,832.2	9,618.1	6,602.9	64.2	64.3	54.05	3,271.6	190.3	390.7	282.7	107.98	3.618		
9,900.0	6,832.1	9,718.1	6,601.3	66.1	66.2	53.89	3,371.6	189.1	391.5	280.5	110.94	3.529		
10,000.0	6,831.9	9,818.1	6,599.8	68.0	68.0	53.72	3,471.5	187.9	392.3	278.4	113.89	3.444		

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Guttersen 31Y-441
Project:	SEC.31-T3N-R63W	TVD Reference:	WELL @ 4851.0ft (RKB - 15')
Reference Site:	Guttersen 31Y-201 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4851.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Guttersen 31Y-441	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (5-31-13)	Offset TVD Reference:	Offset Datum

Offset Design Guttersen 31Y-201 Pad Sec.31-T3N-R63W - Guttersen 31Y-201 - Wellbore #1 - Plan #1 (5-31-13)												Offset Site Error:	0.0 ft
Survey Program: 0-MWD												Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
10,100.0	6,831.8	9,918.1	6,598.3	69.8	69.9	53.56	3,571.5	186.7	393.1	276.2	116.84	3.364	
10,200.0	6,831.6	10,018.0	6,596.7	71.7	71.8	53.39	3,671.5	185.5	393.8	274.1	119.78	3.288	
10,300.0	6,831.4	10,118.0	6,595.2	73.6	73.7	53.23	3,771.5	184.3	394.6	271.9	122.71	3.216	
10,400.0	6,831.3	10,218.0	6,593.7	75.5	75.6	53.06	3,871.4	183.1	395.4	269.8	125.63	3.147	
10,500.0	6,831.1	10,318.0	6,592.1	77.4	77.5	52.90	3,971.4	181.9	396.2	267.7	128.55	3.082	
10,600.0	6,831.0	10,418.0	6,590.6	79.3	79.3	52.74	4,071.4	180.7	397.0	265.6	131.46	3.020	
10,700.0	6,830.8	10,518.0	6,589.1	81.1	81.2	52.57	4,171.3	179.5	397.8	263.5	134.37	2.961	
10,800.0	6,830.7	10,618.0	6,587.5	83.0	83.1	52.41	4,271.3	178.3	398.6	261.4	137.26	2.904	
10,900.0	6,830.5	10,718.0	6,586.0	84.9	85.0	52.25	4,371.3	177.1	399.4	259.3	140.15	2.850	
11,000.0	6,830.3	10,818.0	6,584.4	86.8	86.9	52.09	4,471.3	175.9	400.3	257.2	143.03	2.799	
11,100.0	6,830.2	10,918.0	6,582.9	88.7	88.8	51.93	4,571.2	174.7	401.1	255.2	145.90	2.749	
11,200.0	6,830.0	11,017.9	6,581.4	90.6	90.6	51.77	4,671.2	173.5	401.9	253.2	148.70	2.703	
11,224.6	6,830.0	11,042.5	6,581.0	91.1	91.0	51.74	4,695.8	173.2	402.1	252.8	149.32	2.693 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Guttersten 31Y-441
Project:	SEC.31-T3N-R63W	TVD Reference:	WELL @ 4851.0ft (RKB - 15')
Reference Site:	Guttersten 31Y-201 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4851.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Guttersten 31Y-441	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (5-31-13)	Offset TVD Reference:	Offset Datum

Offset Design Guttersten 31Y-201 Pad Sec.31-T3N-R63W - Guttersten 43-31(Exist.) - Wellbore #1 - Wellbore #1												Offset Site Error:	0.0 ft
Survey Program: 7300-UNKNOWN												Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
7,500.0	6,835.8	6,835.8	6,835.8	23.6	136.7	-90.57	1,901.6	-257.1	943.4	783.1	160.25	5.887	
7,600.0	6,835.6	6,835.6	6,835.6	25.1	136.7	-90.51	1,901.6	-257.1	844.8	683.0	161.77	5.222	
7,700.0	6,835.5	6,835.5	6,835.5	26.7	136.7	-90.44	1,901.6	-257.1	746.5	583.1	163.34	4.570	
7,800.0	6,835.3	6,835.3	6,835.3	28.3	136.7	-90.38	1,901.6	-257.1	648.7	483.8	164.95	3.933	
7,900.0	6,835.2	6,835.2	6,835.2	29.9	136.7	-90.32	1,901.6	-257.1	551.8	385.2	166.60	3.312	
8,000.0	6,835.0	6,835.0	6,835.0	31.6	136.7	-90.26	1,901.6	-257.1	456.2	287.9	168.28	2.711	
8,100.0	6,834.9	6,834.9	6,834.9	33.3	136.7	-90.20	1,901.6	-257.1	362.9	192.9	169.98	2.135	
8,200.0	6,834.7	6,834.7	6,834.7	35.0	136.7	-90.14	1,901.6	-257.1	274.5	102.8	171.71	1.598	
8,300.0	6,834.6	6,834.6	6,834.6	36.8	136.7	-90.08	1,901.6	-257.1	197.4	23.9	173.46	1.138 Level 2	
8,400.0	6,834.4	6,834.4	6,834.4	38.6	136.7	-90.02	1,901.6	-257.1	150.3	-25.0	175.22	0.858 Level 1	
8,431.9	6,834.3	6,834.3	6,834.3	39.1	136.7	-90.00	1,901.6	-257.1	146.8	-29.0	175.79	0.835 Level 1, CC, ES, SF	
8,500.0	6,834.2	6,834.2	6,834.2	40.3	136.7	-89.96	1,901.6	-257.1	161.9	-15.1	177.00	0.914 Level 1	
8,600.0	6,834.1	6,834.1	6,834.1	42.1	136.7	-89.90	1,901.6	-257.1	223.2	44.4	178.79	1.248 Level 2	
8,700.0	6,833.9	6,833.9	6,833.9	43.9	136.7	-89.84	1,901.6	-257.1	305.7	125.1	180.59	1.693	
8,800.0	6,833.8	6,833.8	6,833.8	45.7	136.7	-89.78	1,901.6	-257.1	396.3	213.9	182.40	2.173	
8,900.0	6,833.6	6,833.6	6,833.6	47.6	136.7	-89.72	1,901.6	-257.1	490.6	306.4	184.21	2.663	
9,000.0	6,833.5	6,833.5	6,833.5	49.4	136.7	-89.65	1,901.6	-257.1	586.8	400.7	186.04	3.154	
9,100.0	6,833.3	6,833.3	6,833.3	51.2	136.7	-89.59	1,901.6	-257.1	684.0	496.2	187.87	3.641	
9,200.0	6,833.2	6,833.2	6,833.2	53.1	136.7	-89.53	1,901.6	-257.1	782.0	592.3	189.71	4.122	
9,300.0	6,833.0	6,833.0	6,833.0	54.9	136.7	-89.47	1,901.6	-257.1	880.4	688.9	191.55	4.596	
9,400.0	6,832.8	6,832.8	6,832.8	56.8	136.7	-89.41	1,901.6	-257.1	979.2	785.8	193.40	5.063	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Guttersen 31Y-441
Project:	SEC.31-T3N-R63W	TVD Reference:	WELL @ 4851.0ft (RKB - 15')
Reference Site:	Guttersen 31Y-201 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4851.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Guttersen 31Y-441	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (5-31-13)	Offset TVD Reference:	Offset Datum

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

Coordinates are relative to: Guttersen 31Y-441
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.66°



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Guttersen 31Y-441
Project:	SEC.31-T3N-R63W	TVD Reference:	WELL @ 4851.0ft (RKB - 15')
Reference Site:	Guttersen 31Y-201 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4851.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Guttersen 31Y-441	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (5-31-13)	Offset TVD Reference:	Offset Datum

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

Coordinates are relative to: Guttersen 31Y-441
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.66°

