

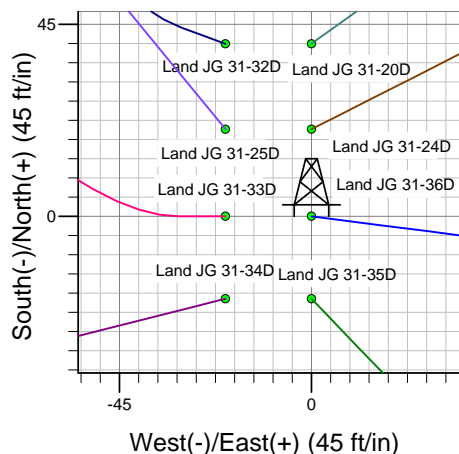
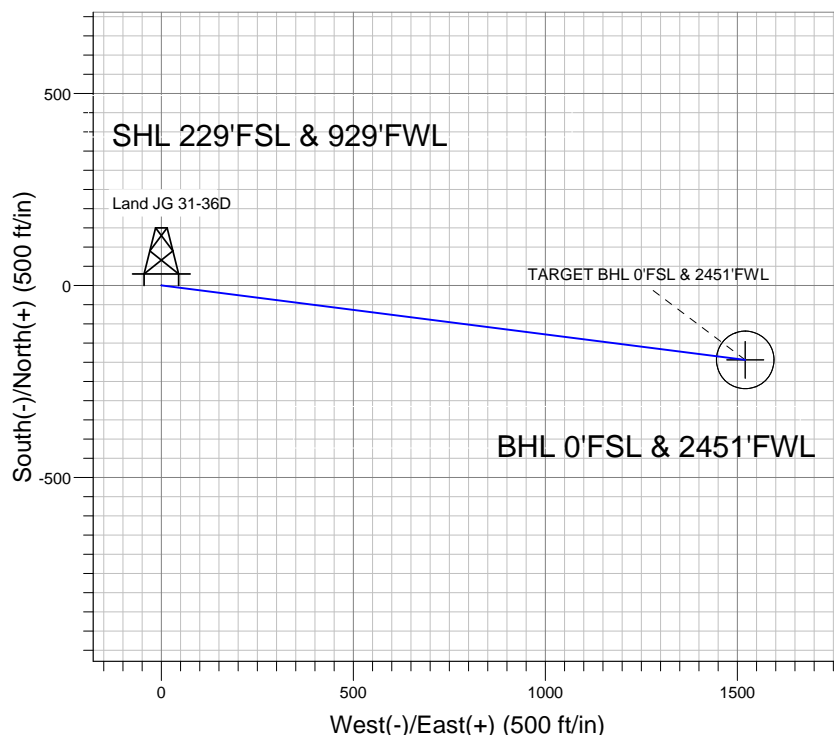
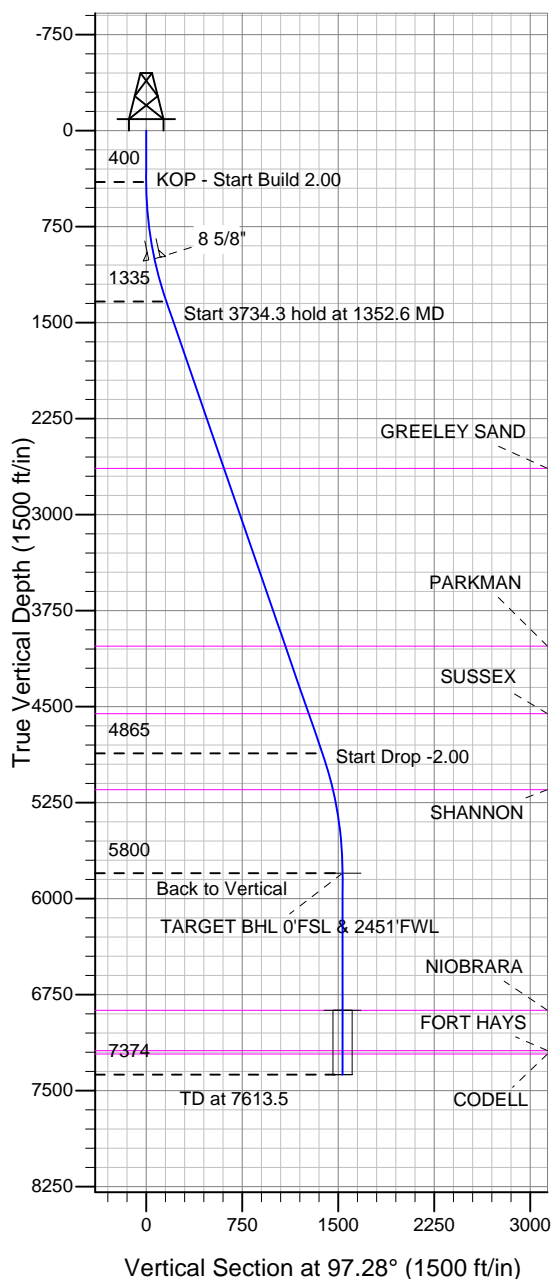
Well Name: Land JG 31-36D

Surface Location: Land JG (East) Pad Sec.31-T2N-R64W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

Ground Elevation: 4933.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1276219.20	3251989.20	40.088100	-104.599353	
Original Well Elev WELL @ 4947.0ft (Original Well Elev)						

Great Western



Land JG (East) Pad Sec.31-T2N-R64W
Land JG 31-36D
Plan #1 (11-05-12)
14:55, November 08 2012



Azimuths to True North
Magnetic North: 8.56°

Magnetic Field
Strength: 52837.4snT
Dip Angle: 66.78°
Date: 11/5/2012
Model: IGRF2010

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
TARGET BHL 0'FSL & 2451'FWL	5800.0	-194.1	1520.5	40.087567	-104.593919	Point
TARGET CIRCLE 0'FSL & 2451'FWL	6872.0	-194.1	1520.5	40.087567	-104.593919	Circle (Radius: 75.0)

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	400.0	0.00	0.00	400.0	0.0	0.0	0.00	0.00	0.0	
3	1352.6	19.05	97.28	1335.1	-19.9	155.7	2.00	97.28	156.9	
4	5086.9	19.05	97.28	4864.9	-174.2	1364.8	0.00	0.00	1375.9	
5	6039.5	0.00	0.00	5800.0	-194.1	1520.5	2.00	180.00	1532.8	TARGET BHL 0'FSL & 2451'FWL
6	7613.5	0.00	0.00	7374.0	-194.1	1520.5	0.00	0.00	1532.8	



Great Western

SEC.31-T2N-R64W

Land JG (East) Pad Sec.31-T2N-R64W

Land JG 31-36D

Wellbore #1

Plan: Plan #1 (11-05-12)

Standard Planning Report

08 November, 2012

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	
400.0	0.00	0.00	400.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,352.6	19.05	97.28	1,335.1	-19.9	155.7	2.00	2.00	0.00	97.28	
5,086.9	19.05	97.28	4,864.9	-174.2	1,364.8	0.00	0.00	0.00	0.00	
6,039.5	0.00	0.00	5,800.0	-194.1	1,520.5	2.00	-2.00	0.00	180.00	TARGET BHL 0'FS
7,613.5	0.00	0.00	7,374.0	-194.1	1,520.5	0.00	0.00	0.00	0.00	

Database:	Landmark	Local Co-ordinate Reference:	Well Land JG 31-36D
Company:	Great Western	TVD Reference:	WELL @ 4947.0ft (Original Well Elev)
Project:	SEC.31-T2N-R64W	MD Reference:	WELL @ 4947.0ft (Original Well Elev)
Site:	Land JG (East) Pad Sec.31-T2N-R64W	North Reference:	True
Well:	Land JG 31-36D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-05-12)		

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
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
KOP - Start Build 2.00									
440.0	0.80	97.28	440.0	0.0	0.3	0.3	2.00	2.00	0.00
480.0	1.60	97.28	480.0	-0.1	1.1	1.1	2.00	2.00	0.00
520.0	2.40	97.28	520.0	-0.3	2.5	2.5	2.00	2.00	0.00
560.0	3.20	97.28	559.9	-0.6	4.4	4.5	2.00	2.00	0.00
600.0	4.00	97.28	599.8	-0.9	6.9	7.0	2.00	2.00	0.00
640.0	4.80	97.28	639.7	-1.3	10.0	10.0	2.00	2.00	0.00
680.0	5.60	97.28	679.6	-1.7	13.6	13.7	2.00	2.00	0.00
720.0	6.40	97.28	719.3	-2.3	17.7	17.9	2.00	2.00	0.00
760.0	7.20	97.28	759.1	-2.9	22.4	22.6	2.00	2.00	0.00
800.0	8.00	97.28	798.7	-3.5	27.7	27.9	2.00	2.00	0.00
840.0	8.80	97.28	838.3	-4.3	33.5	33.7	2.00	2.00	0.00
880.0	9.60	97.28	877.8	-5.1	39.8	40.1	2.00	2.00	0.00
920.0	10.40	97.28	917.1	-6.0	46.7	47.1	2.00	2.00	0.00
960.0	11.20	97.28	956.4	-6.9	54.1	54.6	2.00	2.00	0.00
1,000.0	12.00	97.28	995.6	-7.9	62.1	62.6	2.00	2.00	0.00
1,004.5	12.09	97.28	1,000.0	-8.0	63.0	63.5	2.00	2.00	0.00
8 5/8"									
1,040.0	12.80	97.28	1,034.7	-9.0	70.6	71.2	2.00	2.00	0.00
1,080.0	13.60	97.28	1,073.6	-10.2	79.7	80.3	2.00	2.00	0.00
1,120.0	14.40	97.28	1,112.4	-11.4	89.3	90.0	2.00	2.00	0.00
1,160.0	15.20	97.28	1,151.1	-12.7	99.4	100.2	2.00	2.00	0.00
1,200.0	16.00	97.28	1,189.6	-14.1	110.1	111.0	2.00	2.00	0.00
1,240.0	16.80	97.28	1,228.0	-15.5	121.3	122.3	2.00	2.00	0.00
1,280.0	17.60	97.28	1,266.2	-17.0	133.0	134.1	2.00	2.00	0.00
1,320.0	18.40	97.28	1,304.3	-18.5	145.3	146.5	2.00	2.00	0.00
1,352.6	19.05	97.28	1,335.1	-19.9	155.7	156.9	2.00	2.00	0.00
Start 3734.3 hold at 1352.6 MD									
1,360.0	19.05	97.28	1,342.1	-20.2	158.1	159.3	0.00	0.00	0.00
1,400.0	19.05	97.28	1,379.9	-21.8	171.0	172.4	0.00	0.00	0.00
1,440.0	19.05	97.28	1,417.8	-23.5	184.0	185.5	0.00	0.00	0.00
1,480.0	19.05	97.28	1,455.6	-25.1	196.9	198.5	0.00	0.00	0.00
1,520.0	19.05	97.28	1,493.4	-26.8	209.9	211.6	0.00	0.00	0.00
1,560.0	19.05	97.28	1,531.2	-28.4	222.8	224.6	0.00	0.00	0.00
1,600.0	19.05	97.28	1,569.0	-30.1	235.8	237.7	0.00	0.00	0.00
1,640.0	19.05	97.28	1,606.8	-31.8	248.7	250.7	0.00	0.00	0.00
1,680.0	19.05	97.28	1,644.6	-33.4	261.7	263.8	0.00	0.00	0.00
1,720.0	19.05	97.28	1,682.4	-35.1	274.6	276.9	0.00	0.00	0.00
1,760.0	19.05	97.28	1,720.2	-36.7	287.6	289.9	0.00	0.00	0.00
1,800.0	19.05	97.28	1,758.0	-38.4	300.5	303.0	0.00	0.00	0.00
1,840.0	19.05	97.28	1,795.8	-40.0	313.5	316.0	0.00	0.00	0.00
1,880.0	19.05	97.28	1,833.7	-41.7	326.4	329.1	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Land JG 31-36D
Company:	Great Western	TVD Reference:	WELL @ 4947.0ft (Original Well Elev)
Project:	SEC.31-T2N-R64W	MD Reference:	WELL @ 4947.0ft (Original Well Elev)
Site:	Land JG (East) Pad Sec.31-T2N-R64W	North Reference:	True
Well:	Land JG 31-36D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-05-12)		

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)
1,920.0	19.05	97.28	1,871.5	-43.3	339.4	342.1	0.00	0.00	0.00
1,960.0	19.05	97.28	1,909.3	-45.0	352.3	355.2	0.00	0.00	0.00
2,000.0	19.05	97.28	1,947.1	-46.6	365.3	368.3	0.00	0.00	0.00
2,040.0	19.05	97.28	1,984.9	-48.3	378.2	381.3	0.00	0.00	0.00
2,080.0	19.05	97.28	2,022.7	-49.9	391.2	394.4	0.00	0.00	0.00
2,120.0	19.05	97.28	2,060.5	-51.6	404.1	407.4	0.00	0.00	0.00
2,160.0	19.05	97.28	2,098.3	-53.2	417.1	420.5	0.00	0.00	0.00
2,200.0	19.05	97.28	2,136.1	-54.9	430.0	433.5	0.00	0.00	0.00
2,240.0	19.05	97.28	2,173.9	-56.6	443.0	446.6	0.00	0.00	0.00
2,280.0	19.05	97.28	2,211.7	-58.2	455.9	459.7	0.00	0.00	0.00
2,320.0	19.05	97.28	2,249.6	-59.9	468.9	472.7	0.00	0.00	0.00
2,360.0	19.05	97.28	2,287.4	-61.5	481.9	485.8	0.00	0.00	0.00
2,400.0	19.05	97.28	2,325.2	-63.2	494.8	498.8	0.00	0.00	0.00
2,440.0	19.05	97.28	2,363.0	-64.8	507.8	511.9	0.00	0.00	0.00
2,480.0	19.05	97.28	2,400.8	-66.5	520.7	524.9	0.00	0.00	0.00
2,520.0	19.05	97.28	2,438.6	-68.1	533.7	538.0	0.00	0.00	0.00
2,560.0	19.05	97.28	2,476.4	-69.8	546.6	551.0	0.00	0.00	0.00
2,600.0	19.05	97.28	2,514.2	-71.4	559.6	564.1	0.00	0.00	0.00
2,640.0	19.05	97.28	2,552.0	-73.1	572.5	577.2	0.00	0.00	0.00
2,680.0	19.05	97.28	2,589.8	-74.7	585.5	590.2	0.00	0.00	0.00
2,720.0	19.05	97.28	2,627.6	-76.4	598.4	603.3	0.00	0.00	0.00
2,732.0	19.05	97.28	2,639.0	-76.9	602.3	607.2	0.00	0.00	0.00
GREELEY SAND									
2,760.0	19.05	97.28	2,665.4	-78.1	611.4	616.3	0.00	0.00	0.00
2,800.0	19.05	97.28	2,703.3	-79.7	624.3	629.4	0.00	0.00	0.00
2,840.0	19.05	97.28	2,741.1	-81.4	637.3	642.4	0.00	0.00	0.00
2,880.0	19.05	97.28	2,778.9	-83.0	650.2	655.5	0.00	0.00	0.00
2,920.0	19.05	97.28	2,816.7	-84.7	663.2	668.6	0.00	0.00	0.00
2,960.0	19.05	97.28	2,854.5	-86.3	676.1	681.6	0.00	0.00	0.00
3,000.0	19.05	97.28	2,892.3	-88.0	689.1	694.7	0.00	0.00	0.00
3,040.0	19.05	97.28	2,930.1	-89.6	702.0	707.7	0.00	0.00	0.00
3,080.0	19.05	97.28	2,967.9	-91.3	715.0	720.8	0.00	0.00	0.00
3,120.0	19.05	97.28	3,005.7	-92.9	727.9	733.8	0.00	0.00	0.00
3,160.0	19.05	97.28	3,043.5	-94.6	740.9	746.9	0.00	0.00	0.00
3,200.0	19.05	97.28	3,081.3	-96.2	753.8	760.0	0.00	0.00	0.00
3,240.0	19.05	97.28	3,119.2	-97.9	766.8	773.0	0.00	0.00	0.00
3,280.0	19.05	97.28	3,157.0	-99.5	779.7	786.1	0.00	0.00	0.00
3,320.0	19.05	97.28	3,194.8	-101.2	792.7	799.1	0.00	0.00	0.00
3,360.0	19.05	97.28	3,232.6	-102.9	805.6	812.2	0.00	0.00	0.00
3,400.0	19.05	97.28	3,270.4	-104.5	818.6	825.2	0.00	0.00	0.00
3,440.0	19.05	97.28	3,308.2	-106.2	831.6	838.3	0.00	0.00	0.00
3,480.0	19.05	97.28	3,346.0	-107.8	844.5	851.4	0.00	0.00	0.00
3,520.0	19.05	97.28	3,383.8	-109.5	857.5	864.4	0.00	0.00	0.00
3,560.0	19.05	97.28	3,421.6	-111.1	870.4	877.5	0.00	0.00	0.00
3,600.0	19.05	97.28	3,459.4	-112.8	883.4	890.5	0.00	0.00	0.00
3,640.0	19.05	97.28	3,497.2	-114.4	896.3	903.6	0.00	0.00	0.00
3,680.0	19.05	97.28	3,535.1	-116.1	909.3	916.6	0.00	0.00	0.00
3,720.0	19.05	97.28	3,572.9	-117.7	922.2	929.7	0.00	0.00	0.00
3,760.0	19.05	97.28	3,610.7	-119.4	935.2	942.8	0.00	0.00	0.00
3,800.0	19.05	97.28	3,648.5	-121.0	948.1	955.8	0.00	0.00	0.00
3,840.0	19.05	97.28	3,686.3	-122.7	961.1	968.9	0.00	0.00	0.00
3,880.0	19.05	97.28	3,724.1	-124.3	974.0	981.9	0.00	0.00	0.00
3,920.0	19.05	97.28	3,761.9	-126.0	987.0	995.0	0.00	0.00	0.00
3,960.0	19.05	97.28	3,799.7	-127.7	999.9	1,008.0	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Land JG 31-36D
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Site:	Land JG (East) Pad Sec.31-T2N-R64W	North Reference:	True
Well:	Land JG 31-36D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-05-12)		

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)
4,000.0	19.05	97.28	3,837.5	-129.3	1,012.9	1,021.1	0.00	0.00	0.00
4,040.0	19.05	97.28	3,875.3	-131.0	1,025.8	1,034.2	0.00	0.00	0.00
4,080.0	19.05	97.28	3,913.1	-132.6	1,038.8	1,047.2	0.00	0.00	0.00
4,120.0	19.05	97.28	3,951.0	-134.3	1,051.7	1,060.3	0.00	0.00	0.00
4,160.0	19.05	97.28	3,988.8	-135.9	1,064.7	1,073.3	0.00	0.00	0.00
4,200.0	19.05	97.28	4,026.6	-137.6	1,077.6	1,086.4	0.00	0.00	0.00
4,201.5	19.05	97.28	4,028.0	-137.6	1,078.1	1,086.9	0.00	0.00	0.00
PARKMAN									
4,240.0	19.05	97.28	4,064.4	-139.2	1,090.6	1,099.4	0.00	0.00	0.00
4,280.0	19.05	97.28	4,102.2	-140.9	1,103.5	1,112.5	0.00	0.00	0.00
4,320.0	19.05	97.28	4,140.0	-142.5	1,116.5	1,125.6	0.00	0.00	0.00
4,360.0	19.05	97.28	4,177.8	-144.2	1,129.4	1,138.6	0.00	0.00	0.00
4,400.0	19.05	97.28	4,215.6	-145.8	1,142.4	1,151.7	0.00	0.00	0.00
4,440.0	19.05	97.28	4,253.4	-147.5	1,155.3	1,164.7	0.00	0.00	0.00
4,480.0	19.05	97.28	4,291.2	-149.2	1,168.3	1,177.8	0.00	0.00	0.00
4,520.0	19.05	97.28	4,329.0	-150.8	1,181.3	1,190.8	0.00	0.00	0.00
4,560.0	19.05	97.28	4,366.9	-152.5	1,194.2	1,203.9	0.00	0.00	0.00
4,600.0	19.05	97.28	4,404.7	-154.1	1,207.2	1,217.0	0.00	0.00	0.00
4,640.0	19.05	97.28	4,442.5	-155.8	1,220.1	1,230.0	0.00	0.00	0.00
4,680.0	19.05	97.28	4,480.3	-157.4	1,233.1	1,243.1	0.00	0.00	0.00
4,720.0	19.05	97.28	4,518.1	-159.1	1,246.0	1,256.1	0.00	0.00	0.00
4,758.0	19.05	97.28	4,554.0	-160.6	1,258.3	1,268.5	0.00	0.00	0.00
SUSSEX									
4,760.0	19.05	97.28	4,555.9	-160.7	1,259.0	1,269.2	0.00	0.00	0.00
4,800.0	19.05	97.28	4,593.7	-162.4	1,271.9	1,282.2	0.00	0.00	0.00
4,840.0	19.05	97.28	4,631.5	-164.0	1,284.9	1,295.3	0.00	0.00	0.00
4,880.0	19.05	97.28	4,669.3	-165.7	1,297.8	1,308.4	0.00	0.00	0.00
4,920.0	19.05	97.28	4,707.1	-167.3	1,310.8	1,321.4	0.00	0.00	0.00
4,960.0	19.05	97.28	4,744.9	-169.0	1,323.7	1,334.5	0.00	0.00	0.00
5,000.0	19.05	97.28	4,782.8	-170.6	1,336.7	1,347.5	0.00	0.00	0.00
5,040.0	19.05	97.28	4,820.6	-172.3	1,349.6	1,360.6	0.00	0.00	0.00
5,080.0	19.05	97.28	4,858.4	-174.0	1,362.6	1,373.6	0.00	0.00	0.00
5,086.9	19.05	97.28	4,864.9	-174.2	1,364.8	1,375.9	0.00	0.00	0.00
Start Drop -2.00									
5,120.0	18.39	97.28	4,896.2	-175.6	1,375.3	1,386.5	2.00	-2.00	0.00
5,160.0	17.59	97.28	4,934.3	-177.1	1,387.6	1,398.9	2.00	-2.00	0.00
5,200.0	16.79	97.28	4,972.5	-178.6	1,399.3	1,410.7	2.00	-2.00	0.00
5,240.0	15.99	97.28	5,010.9	-180.1	1,410.5	1,422.0	2.00	-2.00	0.00
5,280.0	15.19	97.28	5,049.4	-181.4	1,421.2	1,432.7	2.00	-2.00	0.00
5,320.0	14.39	97.28	5,088.1	-182.7	1,431.3	1,442.9	2.00	-2.00	0.00
5,360.0	13.59	97.28	5,126.9	-184.0	1,440.9	1,452.6	2.00	-2.00	0.00
5,381.7	13.16	97.28	5,148.0	-184.6	1,445.9	1,457.6	2.00	-2.00	0.00
SHANNON									
5,400.0	12.79	97.28	5,165.8	-185.1	1,450.0	1,461.7	2.00	-2.00	0.00
5,440.0	11.99	97.28	5,204.9	-186.2	1,458.5	1,470.3	2.00	-2.00	0.00
5,480.0	11.19	97.28	5,244.1	-187.2	1,466.4	1,478.3	2.00	-2.00	0.00
5,520.0	10.39	97.28	5,283.4	-188.2	1,473.9	1,485.8	2.00	-2.00	0.00
5,560.0	9.59	97.28	5,322.8	-189.0	1,480.8	1,492.8	2.00	-2.00	0.00
5,600.0	8.79	97.28	5,362.3	-189.8	1,487.1	1,499.2	2.00	-2.00	0.00
5,640.0	7.99	97.28	5,401.8	-190.6	1,492.9	1,505.0	2.00	-2.00	0.00
5,680.0	7.19	97.28	5,441.5	-191.3	1,498.1	1,510.3	2.00	-2.00	0.00
5,720.0	6.39	97.28	5,481.2	-191.9	1,502.8	1,515.0	2.00	-2.00	0.00
5,760.0	5.59	97.28	5,521.0	-192.4	1,507.0	1,519.2	2.00	-2.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Land JG 31-36D
Company:	Great Western	TVD Reference:	WELL @ 4947.0ft (Original Well Elev)
Project:	SEC.31-T2N-R64W	MD Reference:	WELL @ 4947.0ft (Original Well Elev)
Site:	Land JG (East) Pad Sec.31-T2N-R64W	North Reference:	True
Well:	Land JG 31-36D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-05-12)		

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)
5,800.0	4.79	97.28	5,560.8	-192.8	1,510.5	1,522.8	2.00	-2.00	0.00
5,840.0	3.99	97.28	5,600.7	-193.2	1,513.6	1,525.9	2.00	-2.00	0.00
5,880.0	3.19	97.28	5,640.6	-193.5	1,516.1	1,528.4	2.00	-2.00	0.00
5,920.0	2.39	97.28	5,680.6	-193.8	1,518.0	1,530.3	2.00	-2.00	0.00
5,960.0	1.59	97.28	5,720.5	-194.0	1,519.4	1,531.7	2.00	-2.00	0.00
6,000.0	0.79	97.28	5,760.5	-194.1	1,520.2	1,532.5	2.00	-2.00	0.00
6,039.5	0.00	0.00	5,800.0	-194.1	1,520.5	1,532.8	2.00	-2.00	0.00
Back to Vertical - TARGET BHL 0'FSL & 2451'FWL									
6,040.0	0.00	0.00	5,800.5	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
6,080.0	0.00	0.00	5,840.5	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
6,120.0	0.00	0.00	5,880.5	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
6,160.0	0.00	0.00	5,920.5	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
6,200.0	0.00	0.00	5,960.5	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
6,240.0	0.00	0.00	6,000.5	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
6,280.0	0.00	0.00	6,040.5	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
6,320.0	0.00	0.00	6,080.5	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
6,360.0	0.00	0.00	6,120.5	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
6,400.0	0.00	0.00	6,160.5	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
6,440.0	0.00	0.00	6,200.5	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
6,480.0	0.00	0.00	6,240.5	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
6,520.0	0.00	0.00	6,280.5	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
6,560.0	0.00	0.00	6,320.5	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
6,600.0	0.00	0.00	6,360.5	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
6,640.0	0.00	0.00	6,400.5	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
6,680.0	0.00	0.00	6,440.5	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
6,720.0	0.00	0.00	6,480.5	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
6,760.0	0.00	0.00	6,520.5	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
6,800.0	0.00	0.00	6,560.5	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
6,840.0	0.00	0.00	6,600.5	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
6,880.0	0.00	0.00	6,640.5	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
6,920.0	0.00	0.00	6,680.5	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
6,960.0	0.00	0.00	6,720.5	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
7,000.0	0.00	0.00	6,760.5	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
7,040.0	0.00	0.00	6,800.5	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
7,080.0	0.00	0.00	6,840.5	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
7,111.5	0.00	0.00	6,872.0	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
NIOBRARA - TARGET CIRCLE 0'FSL & 2451'FWL									
7,120.0	0.00	0.00	6,880.5	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
7,160.0	0.00	0.00	6,920.5	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
7,200.0	0.00	0.00	6,960.5	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
7,240.0	0.00	0.00	7,000.5	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
7,280.0	0.00	0.00	7,040.5	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
7,320.0	0.00	0.00	7,080.5	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
7,360.0	0.00	0.00	7,120.5	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
7,400.0	0.00	0.00	7,160.5	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
7,426.5	0.00	0.00	7,187.0	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
FORT HAYS									
7,440.0	0.00	0.00	7,200.5	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
7,453.5	0.00	0.00	7,214.0	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
CODELL									
7,480.0	0.00	0.00	7,240.5	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
7,520.0	0.00	0.00	7,280.5	-194.1	1,520.5	1,532.8	0.00	0.00	0.00
7,560.0	0.00	0.00	7,320.5	-194.1	1,520.5	1,532.8	0.00	0.00	0.00

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
400.0	400.0	0.0	0.0	KOP - Start Build 2.00
1,352.6	1,335.1	-19.9	155.7	Start 3734.3 hold at 1352.6 MD
5,086.9	4,864.9	-174.2	1,364.8	Start Drop -2.00
6,039.5	5,800.0	-194.1	1,520.5	Back to Vertical
7,613.5	7,374.0	-194.1	1,520.5	TD at 7613.5



Great Western

SEC.31-T2N-R64W

Land JG (East) Pad Sec.31-T2N-R64W

Land JG 31-36D

Wellbore #1

Plan #1 (11-05-12)

Anticollision Report

08 November, 2012

Company:	Great Western	Local Co-ordinate Reference:	Well Land JG 31-36D
Project:	SEC.31-T2N-R64W	TVD Reference:	WELL @ 4947.0ft (Original Well Elev)
Reference Site:	Land JG (East) Pad Sec.31-T2N-R64W	MD Reference:	WELL @ 4947.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Land JG 31-36D	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 (11-05-12)	Offset TVD Reference:	Offset Datum

Offset Design Land JG (East) Pad Sec.31-T2N-R64W - Land JG 31-24D - Wellbore #1 - Plan #1 (11-05-12)													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		
1,400.0	1,379.9	1,395.1	1,386.3	4.5	3.6	-137.64	67.4	92.7	118.9	111.7	7.21	16.487		
1,500.0	1,474.5	1,493.2	1,482.2	5.1	4.0	-138.27	76.8	111.2	138.3	130.2	8.05	17.189		
1,600.0	1,569.0	1,591.3	1,578.1	5.8	4.4	-138.75	86.2	129.8	157.7	148.8	8.89	17.725		
1,700.0	1,663.5	1,689.4	1,673.9	6.5	4.8	-139.13	95.6	148.3	177.0	167.3	9.76	18.146		
1,800.0	1,758.0	1,787.5	1,769.8	7.1	5.2	-139.43	105.0	166.8	196.4	185.8	10.63	18.482		
1,900.0	1,852.6	1,885.6	1,865.7	7.8	5.7	-139.68	114.5	185.4	215.8	204.3	11.51	18.756		
2,000.0	1,947.1	1,983.7	1,961.6	8.5	6.1	-139.88	123.9	203.9	235.2	222.8	12.39	18.982		
2,100.0	2,041.6	2,081.8	2,057.4	9.2	6.5	-140.06	133.3	222.4	254.6	241.3	13.28	19.172		
2,200.0	2,136.1	2,179.9	2,153.3	9.9	7.0	-140.21	142.7	241.0	274.0	259.8	14.17	19.332		
2,300.0	2,230.6	2,278.0	2,249.2	10.5	7.4	-140.34	152.1	259.5	293.4	278.3	15.07	19.470		
2,400.0	2,325.2	2,376.1	2,345.0	11.2	7.8	-140.45	161.5	278.0	312.8	296.8	15.97	19.590		
2,500.0	2,419.7	2,474.2	2,440.9	11.9	8.3	-140.55	170.9	296.6	332.2	315.3	16.87	19.694		
2,600.0	2,514.2	2,572.3	2,536.8	12.6	8.7	-140.64	180.3	315.1	351.6	333.8	17.77	19.785		
2,700.0	2,608.7	2,670.4	2,632.7	13.3	9.2	-140.72	189.7	333.7	371.0	352.3	18.68	19.866		
2,800.0	2,703.3	2,768.5	2,728.5	14.0	9.6	-140.79	199.1	352.2	390.4	370.8	19.58	19.939		
2,900.0	2,797.8	2,866.6	2,824.4	14.7	10.1	-140.86	208.5	370.7	409.8	389.3	20.49	20.004		
3,000.0	2,892.3	2,964.7	2,920.3	15.4	10.5	-140.92	217.9	389.3	429.2	407.8	21.40	20.062		
3,100.0	2,986.8	3,062.8	3,016.1	16.1	11.0	-140.97	227.3	407.8	448.6	426.3	22.30	20.115		
3,200.0	3,081.3	3,160.9	3,112.0	16.8	11.4	-141.02	236.7	426.3	468.0	444.8	23.21	20.163		
3,300.0	3,175.9	3,259.0	3,207.9	17.5	11.8	-141.07	246.1	444.9	487.4	463.3	24.12	20.207		
3,400.0	3,270.4	3,357.1	3,303.7	18.2	12.3	-141.11	255.5	463.4	506.9	481.8	25.03	20.247		
3,500.0	3,364.9	3,455.2	3,399.6	18.9	12.7	-141.15	264.9	482.0	526.3	500.3	25.95	20.284		
3,600.0	3,459.4	3,553.3	3,495.5	19.5	13.2	-141.19	274.3	500.5	545.7	518.8	26.86	20.318		
3,700.0	3,554.0	3,651.4	3,591.4	20.2	13.6	-141.22	283.7	519.0	565.1	537.3	27.77	20.349		
3,800.0	3,648.5	3,749.5	3,687.2	20.9	14.1	-141.25	293.2	537.6	584.5	555.8	28.68	20.378		
3,900.0	3,743.0	3,847.6	3,783.1	21.6	14.5	-141.28	302.6	556.1	603.9	574.3	29.59	20.405		
4,000.0	3,837.5	3,945.7	3,879.0	22.3	15.0	-141.31	312.0	574.6	623.3	592.8	30.51	20.430		
4,100.0	3,932.0	4,043.8	3,974.8	23.0	15.4	-141.34	321.4	593.2	642.7	611.3	31.42	20.454		
4,200.0	4,026.6	4,141.9	4,070.7	23.7	15.9	-141.36	330.8	611.7	662.1	629.8	32.34	20.476		
4,300.0	4,121.1	4,240.0	4,166.6	24.4	16.3	-141.38	340.2	630.2	681.5	648.3	33.25	20.497		
4,400.0	4,215.6	4,338.1	4,262.5	25.1	16.8	-141.41	349.6	648.8	700.9	666.8	34.16	20.516		
4,500.0	4,310.1	4,436.2	4,358.3	25.8	17.2	-141.43	359.0	667.3	720.3	685.3	35.08	20.534		
4,600.0	4,404.7	4,534.3	4,454.2	26.5	17.7	-141.45	368.4	685.9	739.7	703.7	35.99	20.552		
4,700.0	4,499.2	4,632.4	4,550.1	27.2	18.1	-141.46	377.8	704.4	759.2	722.2	36.91	20.568		
4,800.0	4,593.7	4,730.5	4,645.9	27.9	18.6	-141.48	387.2	722.9	778.6	740.7	37.83	20.583		
4,900.0	4,688.2	4,828.6	4,741.8	28.6	19.0	-141.50	396.6	741.5	798.0	759.2	38.74	20.598		
5,000.0	4,782.8	4,926.7	4,837.7	29.3	19.5	-141.51	406.0	760.0	817.4	777.7	39.66	20.611		
5,086.9	4,864.9	5,011.9	4,921.0	29.9	19.9	-141.53	414.2	776.1	834.2	793.8	40.45	20.623		
5,100.0	4,877.3	5,024.8	4,933.6	30.0	19.9	-141.56	415.4	778.5	836.8	796.2	40.57	20.625		
5,200.0	4,972.5	5,123.2	5,029.7	30.5	20.4	-141.71	424.9	797.1	854.5	813.0	41.44	20.620		
5,300.0	5,068.7	5,219.0	5,123.4	31.0	20.8	-141.69	434.0	815.1	869.5	827.3	42.27	20.570		
5,400.0	5,165.8	5,309.5	5,212.3	31.4	21.1	-141.68	441.6	830.1	882.7	839.7	42.95	20.550		
5,500.0	5,263.7	5,400.0	5,301.7	31.7	21.4	-141.70	447.9	842.6	894.1	850.6	43.54	20.537		
5,600.0	5,362.3	5,491.0	5,392.0	32.0	21.6	-141.75	453.0	852.6	903.7	859.7	44.02	20.529		
5,700.0	5,461.3	5,581.8	5,482.5	32.3	21.8	-141.83	458.8	860.0	911.6	867.2	44.41	20.526		
5,800.0	5,560.8	5,672.8	5,573.2	32.5	21.9	-141.94	459.2	864.9	917.7	873.0	44.71	20.527		
5,900.0	5,660.6	5,763.7	5,664.1	32.6	22.1	-142.07	460.4	867.2	922.1	877.2	44.91	20.531		
6,000.0	5,760.5	5,860.1	5,760.5	32.7	22.2	-142.20	460.5	867.4	924.5	879.4	45.05	20.519		
6,039.5	5,800.0	5,899.6	5,800.0	32.8	22.2	-44.93	460.5	867.4	924.7	879.6	45.11	20.498		
6,100.0	5,860.5	5,960.1	5,860.5	32.8	22.3	-44.93	460.5	867.4	924.7	879.4	45.25	20.435		
6,200.0	5,960.5	6,060.1	5,960.5	32.9	22.4	-44.93	460.5	867.4	924.7	879.2	45.49	20.329		
6,300.0	6,060.5	6,160.1	6,060.5	33.0	22.5	-44.93	460.5	867.4	924.7	879.0	45.72	20.223		

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

Company:	Great Western	Local Co-ordinate Reference:	Well Land JG 31-36D
Project:	SEC.31-T2N-R64W	TVD Reference:	WELL @ 4947.0ft (Original Well Elev)
Reference Site:	Land JG (East) Pad Sec.31-T2N-R64W	MD Reference:	WELL @ 4947.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Land JG 31-36D	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 (11-05-12)	Offset TVD Reference:	Offset Datum

Offset Design Land JG (East) Pad Sec.31-T2N-R64W - Land JG 31-24D - Wellbore #1 - Plan #1 (11-05-12)												Offset Site Error:	0.0 ft
Survey Program: 0-MWD												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
6,400.0	6,160.5	6,260.1	6,160.5	33.1	22.7	-44.93	460.5	867.4	924.7	878.7	45.97	20.116	
6,500.0	6,260.5	6,360.1	6,260.5	33.2	22.8	-44.93	460.5	867.4	924.7	878.5	46.21	20.009	
6,600.0	6,360.5	6,460.1	6,360.5	33.3	22.9	-44.93	460.5	867.4	924.7	878.2	46.46	19.902	
6,700.0	6,460.5	6,560.1	6,460.5	33.3	23.1	-44.93	460.5	867.4	924.7	878.0	46.71	19.795	
6,800.0	6,560.5	6,660.1	6,560.5	33.4	23.2	-44.93	460.5	867.4	924.7	877.7	46.97	19.688	
6,900.0	6,660.5	6,760.1	6,660.5	33.5	23.3	-44.93	460.5	867.4	924.7	877.5	47.23	19.580	
7,000.0	6,760.5	6,860.1	6,760.5	33.6	23.5	-44.93	460.5	867.4	924.7	877.2	47.49	19.473	
7,100.0	6,860.5	6,960.1	6,860.5	33.7	23.6	-44.93	460.5	867.4	924.7	876.9	47.75	19.366	
7,200.0	6,960.5	7,060.1	6,960.5	33.8	23.8	-44.93	460.5	867.4	924.7	876.7	48.01	19.258	
7,300.0	7,060.5	7,160.1	7,060.5	33.9	23.9	-44.93	460.5	867.4	924.7	876.4	48.28	19.151	
7,400.0	7,160.5	7,260.1	7,160.5	34.0	24.0	-44.93	460.5	867.4	924.7	876.1	48.55	19.044	
7,500.0	7,260.5	7,360.1	7,260.5	34.1	24.2	-44.93	460.5	867.4	924.7	875.8	48.83	18.937	
7,600.0	7,360.5	7,460.1	7,360.5	34.2	24.3	-44.93	460.5	867.4	924.7	875.6	49.10	18.831	
7,613.5	7,374.0	7,473.6	7,374.0	34.2	24.3	-44.93	460.5	867.4	924.7	875.5	49.14	18.816	

Offset Design Land JG (East) Pad Sec.31-T2N-R64W - Land JG 31-35D - Wellbore #1 - Plan #1 (11-05-12)													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	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor		
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
0.0	0.0	0.0	0.0	0.0	0.0	180.00	-19.3	0.0	19.3	19.3	0.00	N/A		
100.0	100.0	100.0	100.0	0.1	0.1	180.00	-19.3	0.0	19.3	19.1	0.22	85.919		
200.0	200.0	200.0	200.0	0.3	0.3	180.00	-19.3	0.0	19.3	18.6	0.67	28.640		
300.0	300.0	300.0	300.0	0.6	0.6	180.00	-19.3	0.0	19.3	18.2	1.12	17.184		
400.0	400.0	400.0	400.0	0.8	0.8	180.00	-19.3	0.0	19.3	17.7	1.57	12.274		
500.0	500.0	500.0	500.0	1.0	1.0	87.91	-19.3	0.0	19.2	17.2	2.01	9.539		
518.4	518.3	518.3	518.3	1.0	1.1	90.00	-19.3	0.0	19.2	17.1	2.09	9.167 CC, ES		
600.0	599.8	599.8	599.8	1.2	1.2	103.28	-19.3	0.0	19.7	17.2	2.45	8.049		
700.0	699.5	699.5	699.5	1.4	1.5	124.52	-19.3	0.0	23.3	20.4	2.90	8.030 SF		
800.0	798.7	798.7	798.7	1.7	1.7	142.74	-19.3	0.0	31.8	28.5	3.36	9.483		
900.0	897.5	897.5	897.5	2.0	1.9	154.66	-19.3	0.0	45.3	41.5	3.81	11.900		
1,000.0	995.6	995.6	995.6	2.4	2.1	161.97	-19.3	0.0	63.1	58.9	4.26	14.831		
1,100.0	1,093.1	1,093.1	1,093.1	2.8	2.3	166.57	-19.3	0.0	84.8	80.1	4.70	18.033		
1,200.0	1,189.6	1,189.6	1,189.6	3.3	2.6	169.60	-19.3	0.0	110.2	105.1	5.15	21.383		
1,300.0	1,285.3	1,285.3	1,285.3	3.9	2.8	171.68	-19.3	0.0	139.1	133.5	5.60	24.817		
1,352.6	1,335.1	1,335.1	1,335.1	4.2	2.9	172.53	-19.3	0.0	155.7	149.8	5.84	26.643		
1,400.0	1,379.9	1,379.9	1,379.9	4.5	3.0	173.20	-19.3	0.0	171.0	165.0	6.07	28.172		
1,500.0	1,474.5	1,474.5	1,474.5	5.1	3.2	174.29	-19.3	0.0	203.5	196.9	6.56	31.032		
1,600.0	1,569.0	1,569.0	1,569.0	5.8	3.4	175.08	-19.3	0.0	236.0	229.0	7.05	33.475		
1,700.0	1,663.5	1,663.5	1,663.5	6.5	3.6	175.67	-19.3	0.0	268.6	261.0	7.55	35.581		
1,800.0	1,758.0	1,758.0	1,758.0	7.1	3.8	176.14	-19.3	0.0	301.1	293.1	8.05	37.411		
1,900.0	1,852.6	1,852.6	1,852.6	7.8	4.1	176.52	-19.3	0.0	333.7	325.2	8.55	39.014		
2,000.0	1,947.1	1,947.1	1,947.1	8.5	4.3	176.83	-19.3	0.0	366.3	357.2	9.06	40.428		
2,100.0	2,041.6	2,046.4	2,046.4	9.2	4.5	177.06	-19.6	0.3	398.7	389.1	9.57	41.664		
2,200.0	2,136.1	2,153.3	2,153.2	9.9	4.7	176.97	-22.3	2.8	428.8	418.7	10.07	42.589		
2,300.0	2,230.6	2,261.9	2,261.5	10.5	4.9	176.53	-27.9	8.3	456.3	445.7	10.57	43.158		
2,400.0	2,325.2	2,371.9	2,370.9	11.2	5.1	175.79	-36.7	16.7	481.0	469.9	11.10	43.337		
2,500.0	2,419.7	2,483.1	2,480.8	11.9	5.3	174.79	-48.6	28.1	503.1	491.5	11.66	43.148		
2,600.0	2,514.2	2,583.1	2,579.3	12.6	5.6	173.77	-61.2	40.2	523.6	511.3	12.23	42.809		
2,700.0	2,608.7	2,680.6	2,675.3	13.3	5.8	172.84	-73.5	51.9	544.1	531.3	12.82	42.448		
2,800.0	2,703.3	2,778.1	2,771.3	14.0	6.1	171.99	-85.8	63.7	564.7	551.3	13.42	42.080		
2,900.0	2,797.8	2,875.6	2,867.3	14.7	6.4	171.19	-98.1	75.5	585.5	571.5	14.05	41.687		
3,000.0	2,892.3	2,973.1	2,963.3	15.4	6.7	170.44	-110.4	87.3	606.4	591.7	14.68	41.296		
3,100.0	2,986.8	3,070.6	3,059.3	16.1	7.0	169.75	-122.7	99.1	627.3	612.0	15.34	40.905		
3,200.0	3,081.3	3,168.1	3,155.3	16.8	7.3	169.10	-135.0	110.9	648.4	632.4	16.00	40.519		
3,300.0	3,175.9	3,265.6	3,251.3	17.5	7.7	168.49	-147.3	122.6	669.5	652.8	16.68	40.140		
3,400.0	3,270.4	3,363.1	3,347.3	18.2	8.0	167.92	-159.6	134.4	690.7	673.3	17.37	39.770		
3,500.0	3,364.9	3,460.6	3,443.3	18.9	8.3	167.38	-171.9	146.2	711.9	693.9	18.06	39.411		
3,600.0	3,459.4	3,558.1	3,539.3	19.5	8.7	166.88	-184.1	158.0	733.2	714.5	18.77	39.062		
3,700.0	3,554.0	3,650.6	3,630.4	20.2	9.0	166.43	-195.7	169.0	754.7	735.3	19.46	38.789		
3,800.0	3,648.5	3,734.1	3,712.9	20.9	9.2	166.17	-204.7	177.7	777.6	757.6	20.07	38.741		
3,900.0	3,743.0	3,817.0	3,795.2	21.6	9.4	166.06	-211.9	184.6	802.3	781.7	20.65	38.857		
4,000.0	3,837.5	3,900.0	3,877.9	22.3	9.6	166.10	-217.4	189.9	828.7	807.5	21.19	39.105		
4,100.0	3,932.0	3,980.4	3,958.1	23.0	9.8	166.26	-221.1	193.4	856.7	835.0	21.69	39.492		
4,200.0	4,026.6	4,060.7	4,038.4	23.7	10.0	166.53	-223.2	195.4	886.5	864.3	22.17	39.992		
4,300.0	4,121.1	4,143.4	4,121.1	24.4	10.1	166.91	-223.7	195.9	917.8	895.2	22.61	40.586		
4,400.0	4,215.6	4,237.9	4,215.6	25.1	10.3	167.35	-223.7	195.9	949.7	926.7	23.07	41.174		
4,500.0	4,310.1	4,332.5	4,310.1	25.8	10.5	167.77	-223.7	195.9	981.7	958.2	23.53	41.729		
4,600.0	4,404.7	4,427.0	4,404.7	26.5	10.7	168.16	-223.7	195.9	1,013.7	989.7	23.99	42.258		
4,700.0	4,499.2	4,521.5	4,499.2	27.2	10.8	168.52	-223.7	195.9	1,045.7	1,021.3	24.45	42.763		
4,800.0	4,593.7	4,616.0	4,593.7	27.9	11.0	168.87	-223.7	195.9	1,077.8	1,052.9	24.92	43.245		
4,900.0	4,688.2	4,710.5	4,688.2	28.6	11.2	169.19	-223.7	195.9	1,109.9	1,084.5	25.40	43.705		

Company:	Great Western	Local Co-ordinate Reference:	Well Land JG 31-36D
Project:	SEC.31-T2N-R64W	TVD Reference:	WELL @ 4947.0ft (Original Well Elev)
Reference Site:	Land JG (East) Pad Sec.31-T2N-R64W	MD Reference:	WELL @ 4947.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Land JG 31-36D	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 (11-05-12)	Offset TVD Reference:	Offset Datum

Offset Design Land JG (East) Pad Sec.31-T2N-R64W - Land JG 31-35D - Wellbore #1 - Plan #1 (11-05-12)												Offset Site Error:	0.0 ft
Survey Program: 0-MWD												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,000.0	4,782.8	4,805.1	4,782.8	29.3	11.4	169.50	-223.7	195.9	1,142.0	1,116.2	25.87	44.145	
5,086.9	4,864.9	4,887.2	4,864.9	29.9	11.5	169.75	-223.7	195.9	1,170.0	1,143.7	26.29	44.511	
5,100.0	4,877.3	4,899.6	4,877.3	30.0	11.6	169.81	-223.7	195.9	1,174.2	1,147.8	26.36	44.552	
5,200.0	4,972.5	4,994.8	4,972.5	30.5	11.7	170.17	-223.7	195.9	1,204.3	1,177.5	26.85	44.856	
5,300.0	5,068.7	5,091.0	5,068.7	31.0	11.9	170.48	-223.7	195.9	1,231.2	1,203.8	27.31	45.074	
5,400.0	5,165.8	5,188.2	5,165.8	31.4	12.1	170.74	-223.7	195.9	1,254.7	1,226.9	27.75	45.213	
5,500.0	5,263.7	5,286.0	5,263.7	31.7	12.3	170.95	-223.7	195.9	1,274.9	1,246.7	28.16	45.280	
5,600.0	5,362.3	5,384.6	5,362.3	32.0	12.5	171.12	-223.7	195.9	1,291.7	1,263.1	28.53	45.281	
5,700.0	5,461.3	5,483.6	5,461.3	32.3	12.7	171.26	-223.7	195.9	1,305.1	1,276.2	28.86	45.219	
5,800.0	5,560.8	5,583.1	5,560.8	32.5	12.9	171.35	-223.7	195.9	1,315.0	1,285.9	29.16	45.099	
5,900.0	5,660.6	5,682.9	5,660.6	32.6	13.1	171.41	-223.7	195.9	1,321.6	1,292.2	29.42	44.922	
6,000.0	5,760.5	5,782.9	5,760.5	32.7	13.3	171.44	-223.7	195.9	1,324.7	1,295.0	29.64	44.690	
6,039.5	5,800.0	5,822.3	5,800.0	32.8	13.4	-91.28	-223.7	195.9	1,324.9	1,295.2	29.72	44.579	
6,100.0	5,860.5	5,882.9	5,860.5	32.8	13.5	-91.28	-223.7	195.9	1,324.9	1,295.0	29.93	44.261	
6,200.0	5,960.5	5,982.9	5,960.5	32.9	13.7	-91.28	-223.7	195.9	1,324.9	1,294.6	30.29	43.743	
6,300.0	6,060.5	6,082.9	6,060.5	33.0	13.9	-91.28	-223.7	195.9	1,324.9	1,294.3	30.65	43.234	
6,400.0	6,160.5	6,182.9	6,160.5	33.1	14.1	-91.28	-223.7	195.9	1,324.9	1,293.9	31.00	42.733	
6,500.0	6,260.5	6,282.9	6,260.5	33.2	14.3	-91.28	-223.7	195.9	1,324.9	1,293.6	31.37	42.241	
6,600.0	6,360.5	6,382.9	6,360.5	33.3	14.5	-91.28	-223.7	195.9	1,324.9	1,293.2	31.73	41.758	
6,700.0	6,460.5	6,482.9	6,460.5	33.3	14.7	-91.28	-223.7	195.9	1,324.9	1,292.8	32.09	41.283	
6,800.0	6,560.5	6,582.9	6,560.5	33.4	15.0	-91.28	-223.7	195.9	1,324.9	1,292.5	32.46	40.817	
6,900.0	6,660.5	6,682.9	6,660.5	33.5	15.2	-91.28	-223.7	195.9	1,324.9	1,292.1	32.83	40.358	
7,000.0	6,760.5	6,782.9	6,760.5	33.6	15.4	-91.28	-223.7	195.9	1,324.9	1,291.7	33.20	39.908	
7,100.0	6,860.5	6,882.9	6,860.5	33.7	15.6	-91.28	-223.7	195.9	1,324.9	1,291.4	33.57	39.465	
7,200.0	6,960.5	6,982.9	6,960.5	33.8	15.8	-91.28	-223.7	195.9	1,324.9	1,291.0	33.95	39.030	
7,300.0	7,060.5	7,082.9	7,060.5	33.9	16.0	-91.28	-223.7	195.9	1,324.9	1,290.6	34.32	38.603	
7,400.0	7,160.5	7,182.9	7,160.5	34.0	16.2	-91.28	-223.7	195.9	1,324.9	1,290.2	34.70	38.184	
7,500.0	7,260.5	7,282.9	7,260.5	34.1	16.4	-91.28	-223.7	195.9	1,324.9	1,289.9	35.08	37.771	
7,600.0	7,360.5	7,382.9	7,360.5	34.2	16.6	-91.28	-223.7	195.9	1,324.9	1,289.5	35.46	37.366	
7,613.5	7,374.0	7,396.3	7,374.0	34.2	16.7	-91.28	-223.7	195.9	1,324.9	1,289.4	35.51	37.312	

Company:	Great Western	Local Co-ordinate Reference:	Well Land JG 31-36D
Project:	SEC.31-T2N-R64W	TVD Reference:	WELL @ 4947.0ft (Original Well Elev)
Reference Site:	Land JG (East) Pad Sec.31-T2N-R64W	MD Reference:	WELL @ 4947.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Land JG 31-36D	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 (11-05-12)	Offset TVD Reference:	Offset Datum

Offset Design													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	-44.64	20.4	-20.1	28.7					
100.0	100.0	100.0	100.0	0.1	0.1	-44.64	20.4	-20.1	28.7	28.4	0.22	127.560		
200.0	200.0	200.0	200.0	0.3	0.3	-44.64	20.4	-20.1	28.7	28.0	0.67	42.520		
300.0	300.0	300.0	300.0	0.6	0.6	-44.64	20.4	-20.1	28.7	27.5	1.12	25.512		
400.0	400.0	400.0	400.0	0.8	0.8	-44.64	20.4	-20.1	28.7	27.1	1.57	18.223 CC, ES		
500.0	500.0	500.0	500.0	1.0	1.0	-143.95	20.4	-20.1	30.1	28.1	2.01	14.951		
600.0	599.8	599.8	599.8	1.2	1.2	-149.04	20.4	-20.1	34.4	32.0	2.44	14.084 SF		
700.0	699.5	699.5	699.5	1.4	1.5	-155.07	20.4	-20.1	42.2	39.3	2.89	14.600		
800.0	798.7	798.7	798.7	1.7	1.7	-160.51	20.4	-20.1	53.5	50.1	3.33	16.040		
900.0	897.5	897.5	897.5	2.0	1.9	-164.80	20.4	-20.1	68.4	64.6	3.78	18.100		
1,000.0	995.6	995.6	995.6	2.4	2.1	-168.01	20.4	-20.1	87.0	82.8	4.23	20.576		
1,100.0	1,093.1	1,093.1	1,093.1	2.8	2.3	-170.39	20.4	-20.1	109.1	104.4	4.68	23.333		
1,200.0	1,189.6	1,189.6	1,189.6	3.3	2.6	-172.16	20.4	-20.1	134.7	129.6	5.13	26.280		
1,300.0	1,285.3	1,285.3	1,285.3	3.9	2.8	-173.48	20.4	-20.1	163.7	158.2	5.58	29.359		
1,352.6	1,335.1	1,335.1	1,335.1	4.2	2.9	-174.05	20.4	-20.1	180.4	174.5	5.81	31.017		
1,400.0	1,379.9	1,379.9	1,379.9	4.5	3.0	-174.52	20.4	-20.1	195.8	189.7	6.04	32.393		
1,500.0	1,474.5	1,474.5	1,474.5	5.1	3.2	-175.30	20.4	-20.1	228.3	221.8	6.53	34.955		
1,600.0	1,569.0	1,564.4	1,564.4	5.8	3.4	-175.76	21.0	-20.6	261.4	254.4	7.02	37.266		
1,700.0	1,663.5	1,651.5	1,651.4	6.5	3.6	-175.76	23.5	-22.7	296.8	289.3	7.50	39.546		
1,800.0	1,758.0	1,736.9	1,736.6	7.1	3.8	-175.46	28.0	-26.4	334.2	326.2	7.99	41.805		
1,900.0	1,852.6	1,820.6	1,819.9	7.8	4.0	-174.96	34.3	-31.5	373.8	365.4	8.49	44.046		
2,000.0	1,947.1	1,900.0	1,898.7	8.5	4.2	-174.36	42.0	-37.8	415.6	406.6	8.98	46.290		
2,100.0	2,041.6	1,982.6	1,980.3	9.2	4.4	-173.64	51.7	-45.9	459.3	449.9	9.48	48.429		
2,200.0	2,136.1	2,067.9	2,064.3	9.9	4.6	-172.87	63.3	-55.4	504.7	494.7	10.01	50.448		
2,300.0	2,230.6	2,156.7	2,151.7	10.5	4.9	-172.18	75.5	-65.3	550.3	539.8	10.54	52.232		
2,400.0	2,325.2	2,245.5	2,239.1	11.2	5.2	-171.61	87.6	-75.3	596.0	584.9	11.07	53.833		
2,500.0	2,419.7	2,334.4	2,326.6	11.9	5.4	-171.11	99.8	-85.3	641.7	630.1	11.62	55.244		
2,600.0	2,514.2	2,423.2	2,414.0	12.6	5.7	-170.68	112.0	-95.3	687.4	675.2	12.16	56.524		
2,700.0	2,608.7	2,512.0	2,501.4	13.3	6.0	-170.30	124.1	-105.3	733.1	720.4	12.71	57.674		
2,800.0	2,703.3	2,600.8	2,588.8	14.0	6.3	-169.97	136.3	-115.2	778.9	765.6	13.27	58.713		
2,900.0	2,797.8	2,689.7	2,676.2	14.7	6.6	-169.68	148.4	-125.2	824.7	810.9	13.82	59.653		
3,000.0	2,892.3	2,778.5	2,763.7	15.4	6.9	-169.41	160.6	-135.2	870.5	856.1	14.39	60.509		
3,100.0	2,986.8	2,867.3	2,851.1	16.1	7.3	-169.17	172.8	-145.2	916.3	901.4	14.95	61.291		
3,200.0	3,081.3	2,956.2	2,938.5	16.8	7.6	-168.96	184.9	-155.1	962.1	946.6	15.52	62.008		
3,300.0	3,175.9	3,045.0	3,025.9	17.5	7.9	-168.76	197.1	-165.1	1,008.0	991.9	16.08	62.668		
3,400.0	3,270.4	3,133.8	3,113.4	18.2	8.2	-168.58	209.2	-175.1	1,053.8	1,037.2	16.65	63.276		
3,500.0	3,364.9	3,222.6	3,200.8	18.9	8.6	-168.42	221.4	-185.1	1,099.7	1,082.4	17.23	63.838		
3,600.0	3,459.4	3,311.5	3,288.2	19.5	8.9	-168.27	233.5	-195.0	1,145.5	1,127.7	17.80	64.359		
3,700.0	3,554.0	3,400.3	3,375.6	20.2	9.2	-168.13	245.7	-205.0	1,191.4	1,173.0	18.37	64.842		
3,800.0	3,648.5	3,489.1	3,463.0	20.9	9.6	-168.00	257.9	-215.0	1,237.3	1,218.3	18.95	65.292		
3,900.0	3,743.0	3,577.9	3,550.5	21.6	9.9	-167.88	270.0	-225.0	1,283.1	1,263.6	19.53	65.711		
4,000.0	3,837.5	3,666.8	3,637.9	22.3	10.2	-167.77	282.2	-234.9	1,329.0	1,308.9	20.11	66.103		
4,100.0	3,932.0	3,755.6	3,725.3	23.0	10.6	-167.67	294.3	-244.9	1,374.9	1,354.2	20.68	66.470		
4,200.0	4,026.6	3,844.4	3,812.7	23.7	10.9	-167.57	306.5	-254.9	1,420.8	1,399.5	21.26	66.814		
4,300.0	4,121.1	3,933.2	3,900.2	24.4	11.3	-167.48	318.7	-264.9	1,466.7	1,444.8	21.85	67.137		
4,400.0	4,215.6	4,022.1	3,987.6	25.1	11.6	-167.39	330.8	-274.9	1,512.6	1,490.1	22.43	67.442		
4,500.0	4,310.1	4,110.9	4,075.0	25.8	11.9	-167.31	343.0	-284.8	1,558.4	1,535.4	23.01	67.729		
4,600.0	4,404.7	4,199.7	4,162.4	26.5	12.3	-167.23	355.1	-294.8	1,604.3	1,580.7	23.59	67.999		
4,700.0	4,499.2	4,288.5	4,249.9	27.2	12.6	-167.16	367.3	-304.8	1,650.2	1,626.1	24.18	68.254		
4,800.0	4,593.7	4,377.4	4,337.3	27.9	13.0	-167.10	379.5	-314.8	1,696.1	1,671.4	24.76	68.496		
4,900.0	4,688.2	4,466.2	4,424.7	28.6	13.3	-167.03	391.6	-324.7	1,742.0	1,716.7	25.35	68.725		
5,000.0	4,782.8	4,577.5	4,534.3	29.3	13.7	-166.96	406.6	-337.1	1,787.8	1,761.8	25.98	68.810		

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

Company:	Great Western	Local Co-ordinate Reference:	Well Land JG 31-36D
Project:	SEC.31-T2N-R64W	TVD Reference:	WELL @ 4947.0ft (Original Well Elev)
Reference Site:	Land JG (East) Pad Sec.31-T2N-R64W	MD Reference:	WELL @ 4947.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Land JG 31-36D	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 (11-05-12)	Offset TVD Reference:	Offset Datum

Offset Design													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	-20.1	20.1					
100.0	100.0	100.0	100.0	0.1	0.1	-90.00	0.0	-20.1	20.1	19.9	0.22	89.630		
200.0	200.0	200.0	200.0	0.3	0.3	-90.00	0.0	-20.1	20.1	19.5	0.67	29.877		
300.0	300.0	300.0	300.0	0.6	0.6	-90.00	0.0	-20.1	20.1	19.0	1.12	17.926		
400.0	400.0	400.0	400.0	0.8	0.8	-90.00	0.0	-20.1	20.1	18.6	1.57	12.804 CC, ES		
500.0	500.0	499.2	499.2	1.0	1.0	173.25	0.0	-21.9	23.6	21.6	2.00	11.797 SF		
600.0	599.8	597.7	597.5	1.2	1.2	174.18	0.0	-27.0	34.0	31.5	2.43	13.969		
700.0	699.5	695.2	694.7	1.4	1.4	175.26	0.3	-35.1	51.0	48.1	2.88	17.670		
800.0	798.7	791.6	790.6	1.7	1.7	177.99	3.2	-44.8	73.2	69.9	3.33	21.975		
900.0	897.5	886.2	884.4	2.0	2.0	-178.92	8.9	-55.5	100.6	96.8	3.78	26.595		
1,000.0	995.6	978.5	975.6	2.4	2.3	-176.05	17.2	-67.2	133.2	129.0	4.23	31.453		
1,100.0	1,093.1	1,068.1	1,063.6	2.8	2.6	-173.55	27.9	-79.6	171.0	166.3	4.69	36.447		
1,200.0	1,189.6	1,154.6	1,148.2	3.3	2.9	-171.39	40.6	-92.6	213.9	208.8	5.16	41.490		
1,300.0	1,285.3	1,237.7	1,229.0	3.9	3.2	-169.53	55.0	-106.0	261.8	256.1	5.63	46.507		
1,352.6	1,335.1	1,280.0	1,269.9	4.2	3.4	-168.65	63.2	-113.2	288.8	283.0	5.88	49.117		
1,400.0	1,379.9	1,317.5	1,305.9	4.5	3.6	-168.00	70.9	-119.7	314.0	307.9	6.12	51.283		
1,500.0	1,474.5	1,394.9	1,380.1	5.1	4.0	-166.73	88.2	-133.8	368.3	361.7	6.65	55.397		
1,600.0	1,569.0	1,475.8	1,457.0	5.8	4.5	-165.54	107.7	-149.2	423.9	416.7	7.21	58.785		
1,700.0	1,663.5	1,558.6	1,535.8	6.5	4.9	-164.58	127.7	-164.9	479.7	471.9	7.78	61.688		
1,800.0	1,758.0	1,641.4	1,614.6	7.1	5.4	-163.83	147.8	-180.6	535.5	527.1	8.36	64.090		
1,900.0	1,852.6	1,724.1	1,693.3	7.8	5.9	-163.22	167.8	-196.4	591.4	582.4	8.94	66.121		
2,000.0	1,947.1	1,806.9	1,772.1	8.5	6.4	-162.71	187.9	-212.1	647.3	637.8	9.54	67.838		
2,100.0	2,041.6	1,889.7	1,850.8	9.2	6.9	-162.28	207.9	-227.8	703.2	693.1	10.15	69.298		
2,200.0	2,136.1	1,972.5	1,929.6	9.9	7.4	-161.92	228.0	-243.6	759.2	748.5	10.76	70.554		
2,300.0	2,230.6	2,055.2	2,008.3	10.5	7.9	-161.60	248.0	-259.3	815.2	803.8	11.38	71.646		
2,400.0	2,325.2	2,138.0	2,087.1	11.2	8.4	-161.33	268.0	-275.0	871.2	859.2	12.00	72.601		
2,500.0	2,419.7	2,220.8	2,165.9	11.9	8.9	-161.09	288.1	-290.8	927.2	914.6	12.63	73.441		
2,600.0	2,514.2	2,303.6	2,244.6	12.6	9.5	-160.87	308.1	-306.5	983.3	970.0	13.25	74.185		
2,700.0	2,608.7	2,386.4	2,323.4	13.3	10.0	-160.68	328.2	-322.2	1,039.3	1,025.4	13.89	74.844		
2,800.0	2,703.3	2,469.1	2,402.1	14.0	10.5	-160.51	348.2	-338.0	1,095.3	1,080.8	14.52	75.433		
2,900.0	2,797.8	2,551.9	2,480.9	14.7	11.0	-160.36	368.3	-353.7	1,151.4	1,136.2	15.16	75.962		
3,000.0	2,892.3	2,634.7	2,559.7	15.4	11.5	-160.22	388.3	-369.4	1,207.4	1,191.6	15.80	76.440		
3,100.0	2,986.8	2,717.5	2,638.4	16.1	12.0	-160.09	408.4	-385.1	1,263.5	1,247.1	16.44	76.873		
3,200.0	3,081.3	2,800.2	2,717.2	16.8	12.6	-159.97	428.4	-400.9	1,319.6	1,302.5	17.08	77.267		
3,300.0	3,175.9	2,883.0	2,795.9	17.5	13.1	-159.87	448.4	-416.6	1,375.6	1,357.9	17.72	77.625		
3,400.0	3,270.4	2,965.8	2,874.7	18.2	13.6	-159.77	468.5	-432.3	1,431.7	1,413.3	18.37	77.953		
3,500.0	3,364.9	3,048.6	2,953.5	18.9	14.1	-159.68	488.5	-448.1	1,487.8	1,468.8	19.01	78.254		
3,600.0	3,459.4	3,131.4	3,032.2	19.5	14.6	-159.59	508.6	-463.8	1,543.8	1,524.2	19.66	78.531		
3,700.0	3,554.0	3,214.1	3,111.0	20.2	15.2	-159.51	528.6	-479.5	1,599.9	1,579.6	20.31	78.787		
3,800.0	3,648.5	3,296.9	3,189.7	20.9	15.7	-159.44	548.7	-495.3	1,656.0	1,635.0	20.96	79.024		
3,900.0	3,743.0	3,379.7	3,268.5	21.6	16.2	-159.37	568.7	-511.0	1,712.1	1,690.5	21.61	79.243		
4,000.0	3,837.5	3,462.5	3,347.2	22.3	16.7	-159.31	588.8	-526.7	1,768.2	1,745.9	22.26	79.446		
4,100.0	3,932.0	3,545.3	3,426.0	23.0	17.3	-159.25	608.8	-542.5	1,824.2	1,801.3	22.91	79.636		
4,200.0	4,026.6	3,628.0	3,504.8	23.7	17.8	-159.19	628.9	-558.2	1,880.3	1,856.8	23.56	79.813		
4,300.0	4,121.1	3,710.8	3,583.5	24.4	18.3	-159.14	648.9	-573.9	1,936.4	1,912.2	24.21	79.978		
4,400.0	4,215.6	3,793.6	3,662.3	25.1	18.8	-159.08	668.9	-589.7	1,992.5	1,967.6	24.86	80.133		
4,500.0	4,310.1	3,876.4	3,741.0	25.8	19.4	-159.04	689.0	-605.4	2,048.6	2,023.1	25.52	80.278		
4,600.0	4,404.7	3,959.1	3,819.8	26.5	19.9	-158.99	709.0	-621.1	2,104.7	2,078.5	26.17	80.414		
4,700.0	4,499.2	4,041.9	3,898.6	27.2	20.4	-158.95	729.1	-636.9	2,160.8	2,133.9	26.83	80.542		
4,800.0	4,593.7	4,124.7	3,977.3	27.9	20.9	-158.91	749.1	-652.6	2,216.9	2,189.4	27.48	80.662		
4,900.0	4,688.2	4,207.5	4,056.1	28.6	21.5	-158.87	769.2	-668.3	2,272.9	2,244.8	28.14	80.776		
5,000.0	4,782.8	4,290.3	4,134.8	29.3	22.0	-158.83	789.2	-684.0	2,329.0	2,300.2	28.80	80.883		

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

Survey Design													Offset Site Error:	
Land JG (West) Pad Sec.31-T2N-R64W - Land JG 31-33D - Wellbore #1 - Plan #1 (11-07-12)													Offset Well Error:	
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor		
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N-S (ft)	+E-W (ft)	(ft)	(ft)	(ft)			
5,086.9	4,864.9	4,362.2	4,203.3	29.9	22.4	-158.80	806.6	-697.7	2,377.8	2,348.4	29.37	80.971		
5,100.0	4,877.3	4,373.0	4,213.6	30.0	22.5	-158.86	809.3	-699.8	2,385.1	2,355.6	29.48	80.920		
5,200.0	4,972.5	4,456.9	4,293.4	30.5	23.0	-159.27	829.6	-715.7	2,439.5	2,409.2	30.27	80.585		
5,300.0	5,068.7	4,542.5	4,374.9	31.0	23.6	-159.61	850.3	-732.0	2,491.1	2,460.1	31.04	80.247		
5,400.0	5,165.8	4,629.7	4,457.8	31.4	24.1	-159.88	871.4	-748.6	2,539.9	2,508.1	31.78	79.914		
5,500.0	5,263.7	4,718.4	4,542.1	31.7	24.7	-160.09	892.9	-765.4	2,585.8	2,553.3	32.49	79.589		
5,600.0	5,362.3	4,808.4	4,627.8	32.0	25.3	-160.25	914.7	-782.5	2,628.8	2,595.6	33.16	79.278		
5,700.0	5,461.3	4,899.7	4,714.7	32.3	25.8	-160.36	936.8	-799.9	2,668.8	2,635.0	33.79	78.983		
5,800.0	5,560.8	4,992.1	4,802.6	32.5	26.4	-160.41	959.2	-817.4	2,705.8	2,671.4	34.38	78.706		
5,900.0	5,660.6	5,085.6	4,891.6	32.6	27.0	-160.43	981.8	-835.2	2,739.8	2,704.9	34.92	78.448		
6,000.0	5,760.5	5,176.9	4,987.7	32.7	29.3	-159.57	1,082.8	-914.4	2,764.7	2,728.0	36.68	75.368		
6,039.5	5,800.0	6,010.0	5,800.0	32.8	29.8	-62.16	1,098.0	-926.4	2,767.1	2,729.8	37.27	74.241		
6,100.0	5,860.5	6,070.5	5,860.5	32.8	29.9	-62.16	1,098.0	-926.4	2,767.1	2,729.6	37.43	73.925		
6,200.0	5,960.5	6,170.5	5,960.5	32.9	30.0	-62.16	1,098.0	-926.4	2,767.1	2,729.4	37.70	73.391		
6,300.0	6,060.5	6,270.5	6,060.5	33.0	30.1	-62.16	1,098.0	-926.4	2,767.1	2,729.1	37.98	72.854		
6,400.0	6,160.5	6,370.5	6,160.5	33.1	30.2	-62.16	1,098.0	-926.4	2,767.1	2,728.8	38.26	72.319		
6,500.0	6,260.5	6,470.5	6,260.5	33.2	30.3	-62.16	1,098.0	-926.4	2,767.1	2,728.5	38.55	71.785		
6,600.0	6,360.5	6,570.5	6,360.5	33.3	30.4	-62.16	1,098.0	-926.4	2,767.1	2,728.2	38.83	71.253		
6,700.0	6,460.5	6,670.5	6,460.5	33.3	30.5	-62.16	1,098.0	-926.4	2,767.1	2,727.9	39.12	70.724		
6,800.0	6,560.5	6,770.5	6,560.5	33.4	30.6	-62.16	1,098.0	-926.4	2,767.1	2,727.6	39.42	70.197		
6,900.0	6,660.5	6,870.5	6,660.5	33.5	30.7	-62.16	1,098.0	-926.4	2,767.1	2,727.3	39.71	69.673		
7,000.0	6,760.5	6,970.5	6,760.5	33.6	30.8	-62.16	1,098.0	-926.4	2,767.1	2,727.0	40.01	69.152		
7,100.0	6,860.5	7,070.5	6,860.5	33.7	30.9	-62.16	1,098.0	-926.4	2,767.1	2,726.7	40.32	68.634		
7,200.0	6,960.5	7,170.5	6,960.5	33.8	31.0	-62.16	1,098.0	-926.4	2,767.1	2,726.4	40.62	68.119		
7,300.0	7,060.5	7,270.5	7,060.5	33.9	31.1	-62.16	1,098.0	-926.4	2,767.1	2,726.1	40.93	67.607		
7,400.0	7,160.5	7,370.5	7,160.5	34.0	31.2	-62.16	1,098.0	-926.4	2,767.1	2,725.8	41.24	67.099		
7,500.0	7,260.5	7,470.5	7,260.5	34.1	31.3	-62.16	1,098.0	-926.4	2,767.1	2,725.5	41.55	66.594		
7,600.0	7,360.5	7,570.5	7,360.5	34.2	31.4	-62.16	1,098.0	-926.4	2,767.1	2,725.2	41.87	66.093		
7,613.5	7,374.0	7,584.0	7,374.0	34.2	31.4	-62.16	1,098.0	-926.4	2,767.1	2,725.2	41.91	66.025		

Company:	Great Western	Local Co-ordinate Reference:	Well Land JG 31-36D
Project:	SEC.31-T2N-R64W	TVD Reference:	WELL @ 4947.0ft (Original Well Elev)
Reference Site:	Land JG (East) Pad Sec.31-T2N-R64W	MD Reference:	WELL @ 4947.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Land JG 31-36D	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 (11-05-12)	Offset TVD Reference:	Offset Datum

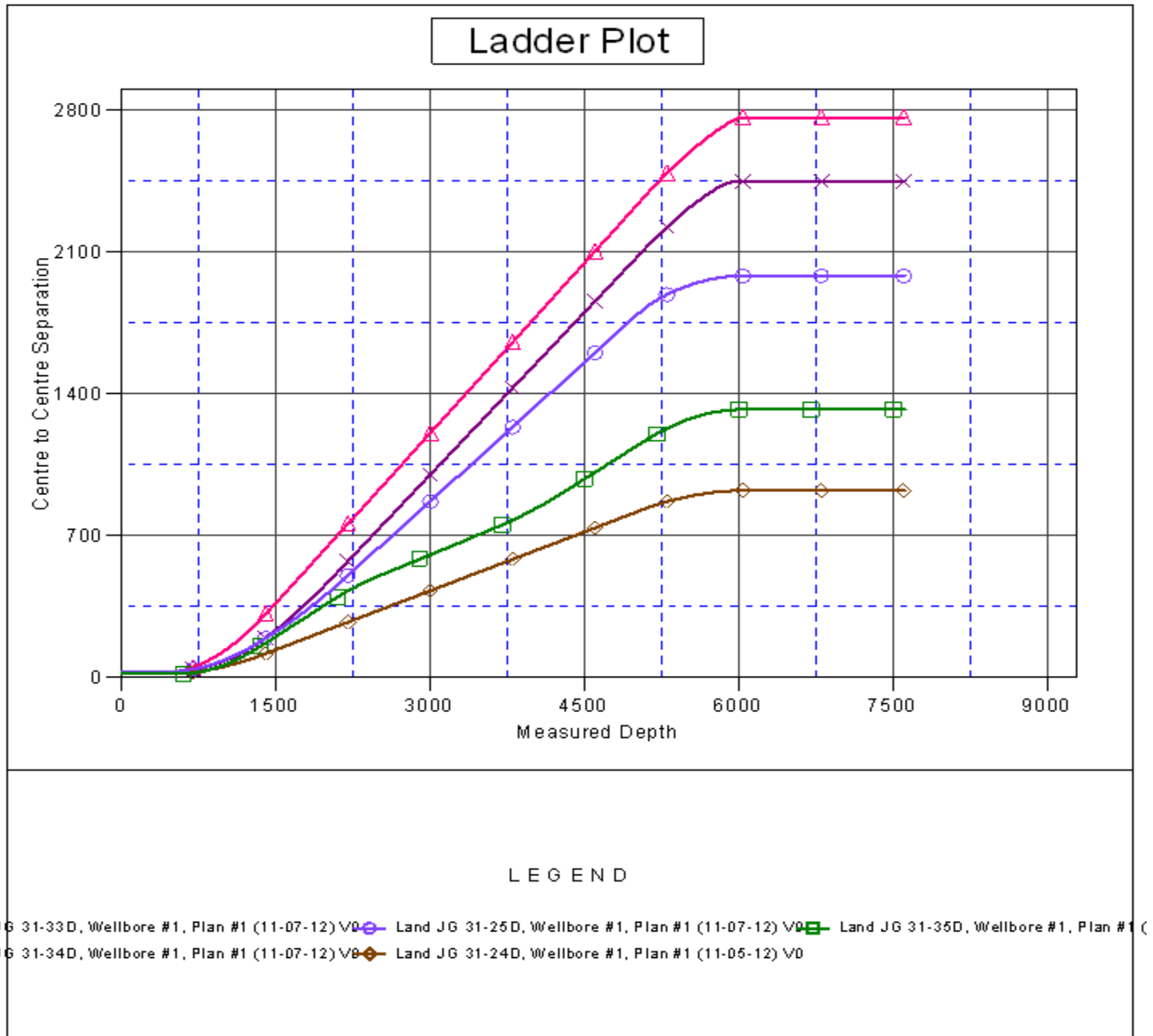
Offset Design Land JG (West) Pad Sec.31-T2N-R64W - Land JG 31-34D - Wellbore #1 - Plan #1 (11-07-12)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Semi Major Axis Highside Tooface (")	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
0.0	0.0	0.0	0.0	0.0	0.0	-133.80	-19.3	-20.1	27.9					
100.0	100.0	100.0	100.0	0.1	0.1	-133.80	-19.3	-20.1	27.9	27.7	0.22	124.173		
200.0	200.0	200.0	200.0	0.3	0.3	-133.80	-19.3	-20.1	27.9	27.2	0.67	41.391		
300.0	300.0	300.0	300.0	0.6	0.6	-133.80	-19.3	-20.1	27.9	26.8	1.12	24.835		
400.0	400.0	400.0	400.0	0.8	0.8	-133.80	-19.3	-20.1	27.9	26.3	1.57	17.739 CC, ES		
500.0	500.0	500.0	500.0	1.0	1.0	131.59	-19.3	-20.1	29.0	27.0	2.01	14.444		
600.0	599.8	599.8	599.8	1.2	1.2	138.40	-19.3	-20.1	32.7	30.3	2.45	13.389 SF		
700.0	699.5	699.5	699.5	1.4	1.5	146.70	-19.3	-20.1	39.7	36.8	2.89	13.722		
800.0	798.7	798.7	798.7	1.7	1.7	154.23	-19.3	-20.1	50.3	47.0	3.34	15.052		
900.0	897.5	897.5	897.5	2.0	1.9	160.15	-19.3	-20.1	64.8	61.0	3.80	17.069		
1,000.0	995.6	995.6	995.6	2.4	2.1	164.52	-19.3	-20.1	83.0	78.8	4.25	19.545		
1,100.0	1,093.1	1,093.1	1,093.1	2.8	2.3	167.70	-19.3	-20.1	104.9	100.2	4.70	22.322		
1,200.0	1,189.6	1,189.6	1,189.6	3.3	2.6	170.03	-19.3	-20.1	130.3	125.2	5.15	25.301		
1,300.0	1,285.3	1,280.9	1,280.9	3.9	2.8	171.59	-19.6	-21.3	160.4	154.8	5.59	28.700		
1,352.6	1,335.1	1,327.5	1,327.4	4.2	2.8	172.14	-20.0	-22.9	178.7	172.9	5.82	30.713		
1,400.0	1,379.9	1,368.8	1,368.8	4.5	2.9	172.56	-20.5	-25.0	196.3	190.3	6.04	32.512		
1,500.0	1,474.5	1,454.6	1,454.3	5.1	3.1	173.11	-22.1	-31.1	235.4	228.9	6.50	36.194		
1,600.0	1,569.0	1,538.3	1,537.5	5.8	3.3	173.34	-24.2	-39.5	277.1	270.1	6.97	39.736		
1,700.0	1,663.5	1,619.8	1,618.3	6.5	3.5	173.39	-26.8	-49.9	321.3	313.9	7.45	43.151		
1,800.0	1,758.0	1,700.0	1,697.5	7.1	3.7	173.33	-30.0	-62.3	368.0	360.1	7.92	46.435		
1,900.0	1,852.6	1,776.0	1,772.2	7.8	3.9	173.19	-33.4	-76.1	416.9	408.5	8.40	49.628		
2,000.0	1,947.1	1,850.8	1,845.2	8.5	4.2	173.00	-37.3	-91.5	468.1	459.2	8.88	52.704		
2,100.0	2,041.6	1,928.7	1,920.9	9.2	4.5	172.79	-41.8	-109.3	521.2	511.8	9.38	55.586		
2,200.0	2,136.1	2,013.2	2,003.0	9.9	4.8	172.58	-46.8	-128.9	574.7	564.8	9.87	58.217		
2,300.0	2,230.6	2,097.7	2,085.0	10.5	5.1	172.41	-51.7	-148.5	628.1	617.7	10.38	60.530		
2,400.0	2,325.2	2,182.2	2,167.1	11.2	5.5	172.27	-56.7	-168.2	681.6	670.7	10.89	62.610		
2,500.0	2,419.7	2,266.7	2,249.1	11.9	5.9	172.14	-61.6	-187.8	735.0	723.6	11.40	64.487		
2,600.0	2,514.2	2,351.2	2,331.2	12.6	6.3	172.04	-66.6	-207.4	788.5	776.6	11.91	66.180		
2,700.0	2,608.7	2,435.7	2,413.2	13.3	6.7	171.95	-71.5	-227.0	842.0	829.5	12.43	67.712		
2,800.0	2,703.3	2,520.2	2,495.3	14.0	7.0	171.87	-76.5	-246.6	895.4	882.5	12.96	69.105		
2,900.0	2,797.8	2,604.7	2,577.3	14.7	7.5	171.79	-81.4	-266.2	948.9	935.4	13.48	70.375		
3,000.0	2,892.3	2,689.2	2,659.4	15.4	7.9	171.73	-86.4	-285.8	1,002.4	988.3	14.01	71.534		
3,100.0	2,986.8	2,773.7	2,741.4	16.1	8.3	171.67	-91.3	-305.4	1,055.8	1,041.3	14.54	72.598		
3,200.0	3,081.3	2,858.2	2,823.4	16.8	8.7	171.62	-96.3	-325.1	1,109.3	1,094.2	15.08	73.576		
3,300.0	3,175.9	2,942.7	2,905.5	17.5	9.1	171.57	-101.2	-344.7	1,162.8	1,147.1	15.61	74.479		
3,400.0	3,270.4	3,027.2	2,987.5	18.2	9.5	171.53	-106.2	-364.3	1,216.2	1,200.1	16.15	75.314		
3,500.0	3,364.9	3,111.7	3,069.6	18.9	9.9	171.49	-111.1	-383.9	1,269.7	1,253.0	16.69	76.088		
3,600.0	3,459.4	3,196.2	3,151.6	19.5	10.4	171.45	-116.1	-403.5	1,323.2	1,305.9	17.23	76.806		
3,700.0	3,554.0	3,280.7	3,233.7	20.2	10.8	171.42	-121.0	-423.1	1,376.6	1,358.9	17.77	77.474		
3,800.0	3,648.5	3,365.2	3,315.7	20.9	11.2	171.39	-126.0	-442.7	1,430.1	1,411.8	18.31	78.098		
3,900.0	3,743.0	3,449.7	3,397.8	21.6	11.6	171.36	-130.9	-462.3	1,483.6	1,464.7	18.86	78.681		
4,000.0	3,837.5	3,534.3	3,479.8	22.3	12.1	171.33	-135.8	-482.0	1,537.1	1,517.7	19.40	79.227		
4,100.0	3,932.0	3,618.8	3,561.8	23.0	12.5	171.31	-140.8	-501.6	1,590.5	1,570.6	19.95	79.739		
4,200.0	4,026.6	3,703.3	3,643.9	23.7	12.9	171.28	-145.7	-521.2	1,644.0	1,623.5	20.49	80.220		
4,300.0	4,121.1	3,787.8	3,725.9	24.4	13.3	171.26	-150.7	-540.8	1,697.5	1,676.4	21.04	80.672		
4,400.0	4,215.6	3,872.3	3,808.0	25.1	13.8	171.24	-155.6	-560.4	1,750.9	1,729.4	21.59	81.098		
4,500.0	4,310.1	3,956.8	3,890.0	25.8	14.2	171.22	-160.6	-580.0	1,804.4	1,782.3	22.14	81.500		
4,600.0	4,404.7	4,041.3	3,972.1	26.5	14.6	171.20	-165.5	-599.6	1,857.9	1,835.2	22.69	81.880		
4,700.0	4,499.2	4,125.8	4,054.1	27.2	15.1	171.18	-170.5	-619.2	1,911.4	1,888.1	23.24	82.239		
4,800.0	4,593.7	4,210.3	4,136.2	27.9	15.5	171.17	-175.4	-638.9	1,964.8	1,941.0	23.79	82.579		
4,900.0	4,688.2	4,294.8	4,218.2	28.6	15.9	171.15	-180.4	-658.5	2,018.3	1,994.0	24.35	82.902		
5,000.0	4,782.8	4,379.3	4,300.2	29.3	16.4	171.14	-185.3	-678.1	2,071.8	2,046.9	24.90	83.207		

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

Survey Design													Offset Site Error:		0.0 ft
Land JG (West) Pad Sec.31-T2N-R64W - Land JG 31-34D - Wellbore #1 - Plan #1 (11-07-12)													Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
5,086.9	4,864.9	4,452.7	4,371.5	29.9	16.8	171.13	-189.6	-695.1	2,118.2	2,092.9	25.38	83.461			
5,100.0	4,877.3	4,463.8	4,382.3	30.0	16.8	171.15	-190.3	-697.7	2,125.2	2,099.8	25.47	83.440			
5,200.0	4,972.5	4,549.4	4,465.5	30.5	17.3	171.31	-195.3	-717.6	2,176.8	2,150.7	26.12	83.349			
5,300.0	5,068.7	4,636.8	4,550.3	31.0	17.7	171.44	-200.4	-737.8	2,225.5	2,198.7	26.74	83.233			
5,400.0	5,165.8	4,725.8	4,636.7	31.4	18.2	171.54	-205.6	-758.5	2,271.1	2,243.7	27.33	83.101			
5,500.0	5,263.7	4,816.2	4,724.5	31.7	18.6	171.61	-210.9	-779.5	2,313.6	2,285.7	27.89	82.955			
5,600.0	5,362.3	4,908.1	4,813.7	32.0	19.1	171.66	-216.3	-800.8	2,352.9	2,324.5	28.42	82.802			
5,700.0	5,461.3	5,001.3	4,904.2	32.3	19.6	171.69	-221.8	-822.5	2,389.1	2,360.1	28.91	82.644			
5,800.0	5,560.8	5,095.7	4,995.8	32.5	20.1	171.69	-227.3	-844.4	2,422.0	2,392.6	29.36	82.482			
5,900.0	5,660.6	5,172.0	5,065.1	32.6	21.6	171.44	-246.4	-920.2	2,445.7	2,415.1	30.56	80.029			
6,000.0	5,760.5	5,267.7	5,160.5	32.7	22.0	171.44	-248.8	-929.5	2,450.3	2,419.1	31.17	78.600			
6,039.5	5,800.0	5,307.1	5,200.0	32.8	22.0	-91.28	-248.8	-929.5	2,450.6	2,419.3	31.27	78.362			
6,100.0	5,860.5	5,367.7	5,260.5	32.8	22.1	-91.28	-248.8	-929.5	2,450.6	2,419.1	31.46	77.883			
6,200.0	5,960.5	5,467.7	5,360.5	32.9	22.2	-91.28	-248.8	-929.5	2,450.6	2,418.8	31.78	77.100			
6,300.0	6,060.5	5,567.7	5,460.5	33.0	22.3	-91.28	-248.8	-929.5	2,450.6	2,418.5	32.11	76.326			
6,400.0	6,160.5	5,667.7	5,560.5	33.1	22.5	-91.28	-248.8	-929.5	2,450.6	2,418.2	32.43	75.559			
6,500.0	6,260.5	5,767.7	5,660.5	33.2	22.6	-91.28	-248.8	-929.5	2,450.6	2,417.8	32.76	74.802			
6,600.0	6,360.5	5,867.7	5,760.5	33.3	22.7	-91.28	-248.8	-929.5	2,450.6	2,417.5	33.09	74.053			
6,700.0	6,460.5	5,967.7	5,860.5	33.3	22.9	-91.28	-248.8	-929.5	2,450.6	2,417.2	33.43	73.313			
6,800.0	6,560.5	6,067.7	5,960.5	33.4	23.0	-91.28	-248.8	-929.5	2,450.6	2,416.8	33.76	72.582			
6,900.0	6,660.5	6,167.7	6,060.5	33.5	23.1	-91.28	-248.8	-929.5	2,450.6	2,416.5	34.10	71.860			
7,000.0	6,760.5	6,267.7	6,160.5	33.6	23.3	-91.28	-248.8	-929.5	2,450.6	2,416.1	34.44	71.147			
7,100.0	6,860.5	6,367.7	6,260.5	33.7	23.4	-91.28	-248.8	-929.5	2,450.6	2,415.8	34.79	70.443			
7,200.0	6,960.5	6,467.7	6,360.5	33.8	23.5	-91.28	-248.8	-929.5	2,450.6	2,415.5	35.13	69.749			
7,300.0	7,060.5	6,567.7	6,460.5	33.9	23.7	-91.28	-248.8	-929.5	2,450.6	2,415.1	35.48	69.063			
7,400.0	7,160.5	6,667.7	6,560.5	34.0	23.8	-91.28	-248.8	-929.5	2,450.6	2,414.8	35.83	68.387			
7,500.0	7,260.5	6,767.7	6,660.5	34.1	23.9	-91.28	-248.8	-929.5	2,450.6	2,414.4	36.19	67.720			
7,600.0	7,360.5	6,867.7	6,760.5	34.2	24.1	-91.28	-248.8	-929.5	2,450.6	2,414.0	36.54	67.061			
7,613.5	7,374.0	7,481.1	7,374.0	34.2	24.1	-91.28	-248.8	-929.5	2,450.6	2,414.0	36.59	66.974			

Company:	Great Western	Local Co-ordinate Reference:	Well Land JG 31-36D
Project:	SEC.31-T2N-R64W	TVD Reference:	WELL @ 4947.0ft (Original Well Elev)
Reference Site:	Land JG (East) Pad Sec.31-T2N-R64W	MD Reference:	WELL @ 4947.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Land JG 31-36D	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 (11-05-12)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4947.0ft (Original Well Elev) Coordinates are relative to: Land JG 31-36D
 Offset Depths are relative to Offset Datum
 Central Meridian is -105.500000 °
 Coordinate System is US State Plane 1983, Colorado Northern Zone
 Grid Convergence at Surface is: 0.58°



Company:	Great Western	Local Co-ordinate Reference:	Well Land JG 31-36D
Project:	SEC.31-T2N-R64W	TVD Reference:	WELL @ 4947.0ft (Original Well Elev)
Reference Site:	Land JG (East) Pad Sec.31-T2N-R64W	MD Reference:	WELL @ 4947.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Land JG 31-36D	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 (11-05-12)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4947.0ft (Original Well Elev) Coordinates are relative to: Land JG 31-36D
Offset Depths are relative to Offset Datum Coordinate System is US State Plane 1983, Colorado Northern Zone
Central Meridian is -105.500000 ° Grid Convergence at Surface is: 0.58°

