ENSIGN Directional

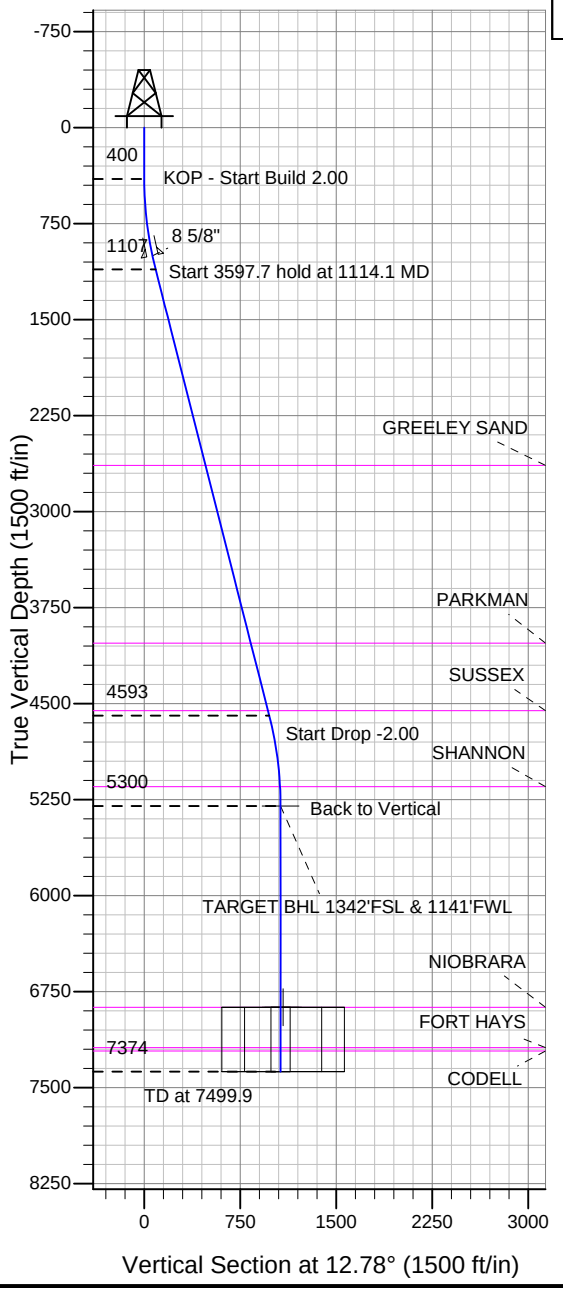
Well Name: Land JG 31-19D

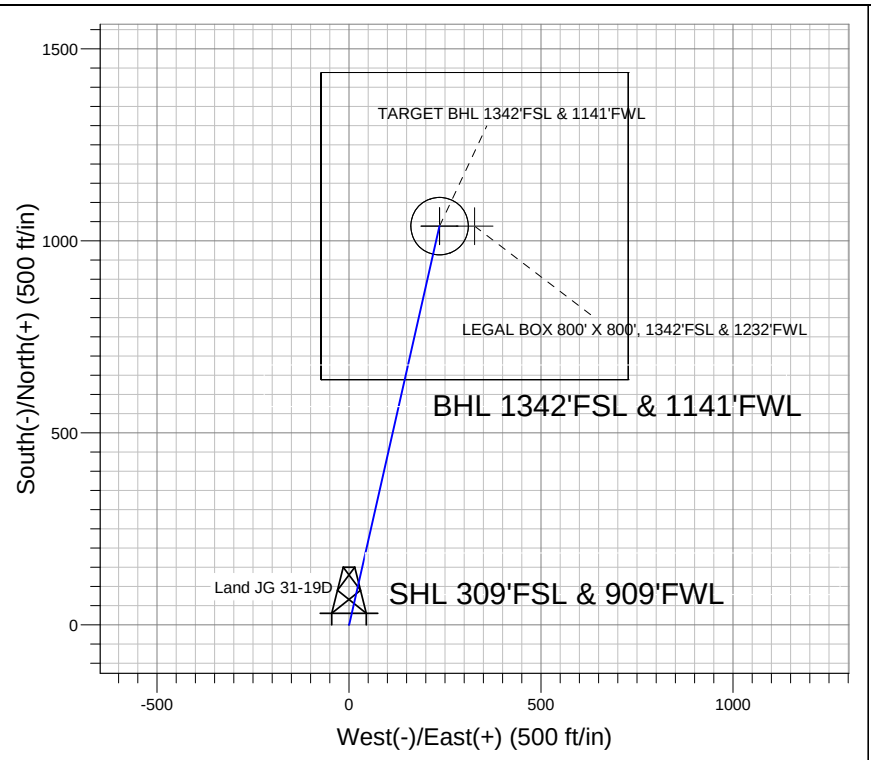
Surface Location: Land JG (West) Pad Sec.31-T2N-R64W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone
Ground Elevation: 4933.0

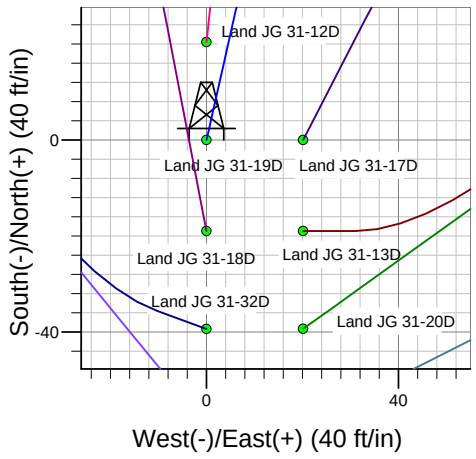
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1276298.77	3251968.25	40.088319	-104.599425	

Original Well Elev WELL @ 4947.0ft (Original Well Elev)

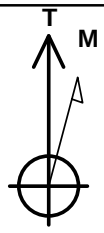
Great Western







Land JG (West) Pad Sec.31-T2N-R64W
Land JG 31-19D
Plan #1 (11-07-12)
7:35, November 09 2012



Azimuths to True North
Magnetic North: 8.56°

Magnetic Field
Strength: 52836.9snT
Dip Angle: 66.78°
Date: 11/7/2012
Model: IGRF2010

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
TARGET BHL 1342'FSL & 1141'FWL	5300.0	1038.2	235.6	40.091169	-104.598583	Point
LEGAL BOX 800' X 800', 1342'FSL & 1232'FWL	6872.0	1038.2	326.6	40.091169	-104.598258	Rectangle (Sides: L800.0 W800.0)
TARGET CIRCLE 1342'FSL & 1141'FWL	6872.0	1038.2	235.6	40.091169	-104.598583	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	1114.1	14.28	12.78	1106.7	86.3	19.6	2.00	12.78	88.5	
4	4711.8	14.28	12.78	4593.3	951.9	216.0	0.00	0.00	976.1	
5	5425.9	0.00	0.00	5300.0	1038.2	235.6	2.00	180.00	1064.6	TARGET BHL 1342'FSL & 1141'FWL
6	7499.9	0.00	0.00	7374.0	1038.2	235.6	0.00	0.00	1064.6	

Great Western

SEC.31-T2N-R64W
Land JG (West) Pad Sec.31-T2N-R64W
Land JG 31-19D

Wellbore #1

Plan: Plan #1 (11-07-12)

Standard Planning Report

08 November, 2012

Database:	Landmark	**Local Co-ordinate Reference:**	Well Land JG 31-19D
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 (West) Pad Sec.31-T2N-R64W	**North Reference:**	True
Well:	Land JG 31-19D	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-07-12)		

Project SEC.31-T2N-R64W, Weld County, CO

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site Land JG (West) Pad Sec.31-T2N-R64W

Site Position:		**Northing:**	1,276,199.70 ft	**Latitude:**	40.088047
From:	Lat/Long	**Easting:**	3,251,969.25 ft	**Longitude:**	-104.599425
Position Uncertainty:	0.0 ft	**Slot Radius:**	"	**Grid Convergence:**	0.58 °

Well Land JG 31-19D

Well Position	**+N/-S**	99.1 ft	**Northing:**	1,276,298.77 ft	**Latitude:**	40.088319
	+E/-W	0.0 ft	**Easting:**	3,251,968.25 ft	**Longitude:**	-104.599425
Position Uncertainty		0.0 ft	**Wellhead Elevation:**	ft	**Ground Level:**	4,933.0 ft

Wellbore Wellbore #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	11/7/2012	8.56	66.78	52,837

Design Plan #1 (11-07-12)

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	12.78

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	
1,114.1	14.28	12.78	1,106.7	86.3	19.6	2.00	2.00	0.00	12.78	
4,711.8	14.28	12.78	4,593.3	951.9	216.0	0.00	0.00	0.00	0.00	
5,425.9	0.00	0.00	5,300.0	1,038.2	235.6	2.00	-2.00	0.00	180.00	TARGET BHL 1342
7,499.9	0.00	0.00	7,374.0	1,038.2	235.6	0.00	0.00	0.00	0.00	

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Site:	Land JG (West) Pad Sec.31-T2N-R64W	**North Reference:**	True
Well:	Land JG 31-19D	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-07-12)		

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	12.78	440.0	0.3	0.1	0.3	2.00	2.00	0.00
480.0	1.60	12.78	480.0	1.1	0.2	1.1	2.00	2.00	0.00
520.0	2.40	12.78	520.0	2.5	0.6	2.5	2.00	2.00	0.00
560.0	3.20	12.78	559.9	4.4	1.0	4.5	2.00	2.00	0.00
600.0	4.00	12.78	599.8	6.8	1.5	7.0	2.00	2.00	0.00
640.0	4.80	12.78	639.7	9.8	2.2	10.0	2.00	2.00	0.00
680.0	5.60	12.78	679.6	13.3	3.0	13.7	2.00	2.00	0.00
720.0	6.40	12.78	719.3	17.4	4.0	17.9	2.00	2.00	0.00
760.0	7.20	12.78	759.1	22.0	5.0	22.6	2.00	2.00	0.00
800.0	8.00	12.78	798.7	27.2	6.2	27.9	2.00	2.00	0.00
840.0	8.80	12.78	838.3	32.9	7.5	33.7	2.00	2.00	0.00
880.0	9.60	12.78	877.8	39.1	8.9	40.1	2.00	2.00	0.00
920.0	10.40	12.78	917.1	45.9	10.4	47.1	2.00	2.00	0.00
960.0	11.20	12.78	956.4	53.2	12.1	54.6	2.00	2.00	0.00
1,000.0	12.00	12.78	995.6	61.1	13.9	62.6	2.00	2.00	0.00
1,004.5	12.09	12.78	1,000.0	62.0	14.1	63.5	2.00	2.00	0.00
8 5/8"									
1,040.0	12.80	12.78	1,034.7	69.4	15.8	71.2	2.00	2.00	0.00
1,080.0	13.60	12.78	1,073.6	78.3	17.8	80.3	2.00	2.00	0.00
1,114.1	14.28	12.78	1,106.7	86.3	19.6	88.5	2.00	2.00	0.00
Start 3597.7 hold at 1114.1 MD									
1,120.0	14.28	12.78	1,112.4	87.8	19.9	90.0	0.00	0.00	0.00
1,160.0	14.28	12.78	1,151.2	97.4	22.1	99.9	0.00	0.00	0.00
1,200.0	14.28	12.78	1,190.0	107.0	24.3	109.7	0.00	0.00	0.00
1,240.0	14.28	12.78	1,228.7	116.6	26.5	119.6	0.00	0.00	0.00
1,280.0	14.28	12.78	1,267.5	126.3	28.6	129.5	0.00	0.00	0.00
1,320.0	14.28	12.78	1,306.3	135.9	30.8	139.3	0.00	0.00	0.00
1,360.0	14.28	12.78	1,345.0	145.5	33.0	149.2	0.00	0.00	0.00
1,400.0	14.28	12.78	1,383.8	155.1	35.2	159.1	0.00	0.00	0.00
1,440.0	14.28	12.78	1,422.6	164.8	37.4	168.9	0.00	0.00	0.00
1,480.0	14.28	12.78	1,461.3	174.4	39.6	178.8	0.00	0.00	0.00
1,520.0	14.28	12.78	1,500.1	184.0	41.8	188.7	0.00	0.00	0.00
1,560.0	14.28	12.78	1,538.8	193.6	43.9	198.5	0.00	0.00	0.00
1,600.0	14.28	12.78	1,577.6	203.2	46.1	208.4	0.00	0.00	0.00
1,640.0	14.28	12.78	1,616.4	212.9	48.3	218.3	0.00	0.00	0.00
1,680.0	14.28	12.78	1,655.1	222.5	50.5	228.1	0.00	0.00	0.00
1,720.0	14.28	12.78	1,693.9	232.1	52.7	238.0	0.00	0.00	0.00
1,760.0	14.28	12.78	1,732.7	241.7	54.9	247.9	0.00	0.00	0.00
1,800.0	14.28	12.78	1,771.4	251.4	57.0	257.8	0.00	0.00	0.00
1,840.0	14.28	12.78	1,810.2	261.0	59.2	267.6	0.00	0.00	0.00
1,880.0	14.28	12.78	1,849.0	270.6	61.4	277.5	0.00	0.00	0.00

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Site:	Land JG (West) Pad Sec.31-T2N-R64W	**North Reference:**	True
Well:	Land JG 31-19D	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-07-12)		

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	14.28	12.78	1,887.7	280.2	63.6	287.4	0.00	0.00	0.00
1,960.0	14.28	12.78	1,926.5	289.9	65.8	297.2	0.00	0.00	0.00
2,000.0	14.28	12.78	1,965.2	299.5	68.0	307.1	0.00	0.00	0.00
2,040.0	14.28	12.78	2,004.0	309.1	70.1	317.0	0.00	0.00	0.00
2,080.0	14.28	12.78	2,042.8	318.7	72.3	326.8	0.00	0.00	0.00
2,120.0	14.28	12.78	2,081.5	328.3	74.5	336.7	0.00	0.00	0.00
2,160.0	14.28	12.78	2,120.3	338.0	76.7	346.6	0.00	0.00	0.00
2,200.0	14.28	12.78	2,159.1	347.6	78.9	356.4	0.00	0.00	0.00
2,240.0	14.28	12.78	2,197.8	357.2	81.1	366.3	0.00	0.00	0.00
2,280.0	14.28	12.78	2,236.6	366.8	83.2	376.2	0.00	0.00	0.00
2,320.0	14.28	12.78	2,275.4	376.5	85.4	386.0	0.00	0.00	0.00
2,360.0	14.28	12.78	2,314.1	386.1	87.6	395.9	0.00	0.00	0.00
2,400.0	14.28	12.78	2,352.9	395.7	89.8	405.8	0.00	0.00	0.00
2,440.0	14.28	12.78	2,391.6	405.3	92.0	415.6	0.00	0.00	0.00
2,480.0	14.28	12.78	2,430.4	415.0	94.2	425.5	0.00	0.00	0.00
2,520.0	14.28	12.78	2,469.2	424.6	96.3	435.4	0.00	0.00	0.00
2,560.0	14.28	12.78	2,507.9	434.2	98.5	445.2	0.00	0.00	0.00
2,600.0	14.28	12.78	2,546.7	443.8	100.7	455.1	0.00	0.00	0.00
2,640.0	14.28	12.78	2,585.5	453.4	102.9	465.0	0.00	0.00	0.00
2,680.0	14.28	12.78	2,624.2	463.1	105.1	474.8	0.00	0.00	0.00
2,695.2	14.28	12.78	2,639.0	466.7	105.9	478.6	0.00	0.00	0.00
GREELEY SAND									
2,720.0	14.28	12.78	2,663.0	472.7	107.3	484.7	0.00	0.00	0.00
2,760.0	14.28	12.78	2,701.8	482.3	109.4	494.6	0.00	0.00	0.00
2,800.0	14.28	12.78	2,740.5	491.9	111.6	504.4	0.00	0.00	0.00
2,840.0	14.28	12.78	2,779.3	501.6	113.8	514.3	0.00	0.00	0.00
2,880.0	14.28	12.78	2,818.0	511.2	116.0	524.2	0.00	0.00	0.00
2,920.0	14.28	12.78	2,856.8	520.8	118.2	534.1	0.00	0.00	0.00
2,960.0	14.28	12.78	2,895.6	530.4	120.4	543.9	0.00	0.00	0.00
3,000.0	14.28	12.78	2,934.3	540.1	122.5	553.8	0.00	0.00	0.00
3,040.0	14.28	12.78	2,973.1	549.7	124.7	563.7	0.00	0.00	0.00
3,080.0	14.28	12.78	3,011.9	559.3	126.9	573.5	0.00	0.00	0.00
3,120.0	14.28	12.78	3,050.6	568.9	129.1	583.4	0.00	0.00	0.00
3,160.0	14.28	12.78	3,089.4	578.6	131.3	593.3	0.00	0.00	0.00
3,200.0	14.28	12.78	3,128.2	588.2	133.5	603.1	0.00	0.00	0.00
3,240.0	14.28	12.78	3,166.9	597.8	135.6	613.0	0.00	0.00	0.00
3,280.0	14.28	12.78	3,205.7	607.4	137.8	622.9	0.00	0.00	0.00
3,320.0	14.28	12.78	3,244.4	617.0	140.0	632.7	0.00	0.00	0.00
3,360.0	14.28	12.78	3,283.2	626.7	142.2	642.6	0.00	0.00	0.00
3,400.0	14.28	12.78	3,322.0	636.3	144.4	652.5	0.00	0.00	0.00
3,440.0	14.28	12.78	3,360.7	645.9	146.6	662.3	0.00	0.00	0.00
3,480.0	14.28	12.78	3,399.5	655.5	148.7	672.2	0.00	0.00	0.00
3,520.0	14.28	12.78	3,438.3	665.2	150.9	682.1	0.00	0.00	0.00
3,560.0	14.28	12.78	3,477.0	674.8	153.1	691.9	0.00	0.00	0.00
3,600.0	14.28	12.78	3,515.8	684.4	155.3	701.8	0.00	0.00	0.00
3,640.0	14.28	12.78	3,554.6	694.0	157.5	711.7	0.00	0.00	0.00
3,680.0	14.28	12.78	3,593.3	703.7	159.7	721.5	0.00	0.00	0.00
3,720.0	14.28	12.78	3,632.1	713.3	161.8	731.4	0.00	0.00	0.00
3,760.0	14.28	12.78	3,670.8	722.9	164.0	741.3	0.00	0.00	0.00
3,800.0	14.28	12.78	3,709.6	732.5	166.2	751.1	0.00	0.00	0.00
3,840.0	14.28	12.78	3,748.4	742.1	168.4	761.0	0.00	0.00	0.00
3,880.0	14.28	12.78	3,787.1	751.8	170.6	770.9	0.00	0.00	0.00
3,920.0	14.28	12.78	3,825.9	761.4	172.8	780.7	0.00	0.00	0.00
3,960.0	14.28	12.78	3,864.7	771.0	174.9	790.6	0.00	0.00	0.00

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Site:	Land JG (West) Pad Sec.31-T2N-R64W	**North Reference:**	True
Well:	Land JG 31-19D	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-07-12)		

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	14.28	12.78	3,903.4	780.6	177.1	800.5	0.00	0.00	0.00
4,040.0	14.28	12.78	3,942.2	790.3	179.3	810.4	0.00	0.00	0.00
4,080.0	14.28	12.78	3,981.0	799.9	181.5	820.2	0.00	0.00	0.00
4,120.0	14.28	12.78	4,019.7	809.5	183.7	830.1	0.00	0.00	0.00
4,128.5	14.28	12.78	4,028.0	811.6	184.1	832.2	0.00	0.00	0.00
PARKMAN									
4,160.0	14.28	12.78	4,058.5	819.1	185.9	840.0	0.00	0.00	0.00
4,200.0	14.28	12.78	4,097.3	828.8	188.1	849.8	0.00	0.00	0.00
4,240.0	14.28	12.78	4,136.0	838.4	190.2	859.7	0.00	0.00	0.00
4,280.0	14.28	12.78	4,174.8	848.0	192.4	869.6	0.00	0.00	0.00
4,320.0	14.28	12.78	4,213.5	857.6	194.6	879.4	0.00	0.00	0.00
4,360.0	14.28	12.78	4,252.3	867.3	196.8	889.3	0.00	0.00	0.00
4,400.0	14.28	12.78	4,291.1	876.9	199.0	899.2	0.00	0.00	0.00
4,440.0	14.28	12.78	4,329.8	886.5	201.2	909.0	0.00	0.00	0.00
4,480.0	14.28	12.78	4,368.6	896.1	203.3	918.9	0.00	0.00	0.00
4,520.0	14.28	12.78	4,407.4	905.7	205.5	928.8	0.00	0.00	0.00
4,560.0	14.28	12.78	4,446.1	915.4	207.7	938.6	0.00	0.00	0.00
4,600.0	14.28	12.78	4,484.9	925.0	209.9	948.5	0.00	0.00	0.00
4,640.0	14.28	12.78	4,523.7	934.6	212.1	958.4	0.00	0.00	0.00
4,671.3	14.28	12.78	4,554.0	942.1	213.8	966.1	0.00	0.00	0.00
SUSSEX									
4,680.0	14.28	12.78	4,562.4	944.2	214.3	968.2	0.00	0.00	0.00
4,711.8	14.28	12.78	4,593.3	951.9	216.0	976.1	0.00	0.00	0.00
Start Drop -2.00									
4,720.0	14.12	12.78	4,601.2	953.8	216.4	978.1	2.00	-2.00	0.00
4,760.0	13.32	12.78	4,640.0	963.1	218.5	987.6	2.00	-2.00	0.00
4,800.0	12.52	12.78	4,679.0	971.8	220.5	996.5	2.00	-2.00	0.00
4,840.0	11.72	12.78	4,718.1	980.0	222.4	1,004.9	2.00	-2.00	0.00
4,880.0	10.92	12.78	4,757.4	987.7	224.1	1,012.8	2.00	-2.00	0.00
4,920.0	10.12	12.78	4,796.7	994.8	225.7	1,020.1	2.00	-2.00	0.00
4,960.0	9.32	12.78	4,836.1	1,001.4	227.2	1,026.8	2.00	-2.00	0.00
5,000.0	8.52	12.78	4,875.6	1,007.4	228.6	1,033.0	2.00	-2.00	0.00
5,040.0	7.72	12.78	4,915.2	1,012.9	229.8	1,038.7	2.00	-2.00	0.00
5,080.0	6.92	12.78	4,954.9	1,017.9	231.0	1,043.8	2.00	-2.00	0.00
5,120.0	6.12	12.78	4,994.6	1,022.3	232.0	1,048.3	2.00	-2.00	0.00
5,160.0	5.32	12.78	5,034.4	1,026.2	232.9	1,052.3	2.00	-2.00	0.00
5,200.0	4.52	12.78	5,074.3	1,029.6	233.6	1,055.7	2.00	-2.00	0.00
5,240.0	3.72	12.78	5,114.2	1,032.4	234.2	1,058.6	2.00	-2.00	0.00
5,273.9	3.04	12.78	5,148.0	1,034.3	234.7	1,060.6	2.00	-2.00	0.00
SHANNON									
5,280.0	2.92	12.78	5,154.1	1,034.6	234.8	1,060.9	2.00	-2.00	0.00
5,320.0	2.12	12.78	5,194.1	1,036.3	235.2	1,062.7	2.00	-2.00	0.00
5,360.0	1.32	12.78	5,234.1	1,037.5	235.4	1,063.9	2.00	-2.00	0.00
5,400.0	0.52	12.78	5,274.1	1,038.1	235.6	1,064.5	2.00	-2.00	0.00
5,425.9	0.00	0.00	5,300.0	1,038.2	235.6	1,064.6	2.00	-2.00	0.00
Back to Vertical - TARGET BHL 1342'FSL & 1141'FWL									
5,440.0	0.00	0.00	5,314.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
5,480.0	0.00	0.00	5,354.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
5,520.0	0.00	0.00	5,394.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
5,560.0	0.00	0.00	5,434.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
5,600.0	0.00	0.00	5,474.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
5,640.0	0.00	0.00	5,514.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
5,680.0	0.00	0.00	5,554.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00

Database:	Landmark	**Local Co-ordinate Reference:**	Well Land JG 31-19D
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 (West) Pad Sec.31-T2N-R64W	**North Reference:**	True
Well:	Land JG 31-19D	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-07-12)		

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)
5,720.0	0.00	0.00	5,594.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
5,760.0	0.00	0.00	5,634.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
5,800.0	0.00	0.00	5,674.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
5,840.0	0.00	0.00	5,714.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
5,880.0	0.00	0.00	5,754.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
5,920.0	0.00	0.00	5,794.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
5,960.0	0.00	0.00	5,834.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
6,000.0	0.00	0.00	5,874.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
6,040.0	0.00	0.00	5,914.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
6,080.0	0.00	0.00	5,954.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
6,120.0	0.00	0.00	5,994.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
6,160.0	0.00	0.00	6,034.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
6,200.0	0.00	0.00	6,074.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
6,240.0	0.00	0.00	6,114.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
6,280.0	0.00	0.00	6,154.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
6,320.0	0.00	0.00	6,194.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
6,360.0	0.00	0.00	6,234.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
6,400.0	0.00	0.00	6,274.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
6,440.0	0.00	0.00	6,314.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
6,480.0	0.00	0.00	6,354.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
6,520.0	0.00	0.00	6,394.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
6,560.0	0.00	0.00	6,434.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
6,600.0	0.00	0.00	6,474.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
6,640.0	0.00	0.00	6,514.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
6,680.0	0.00	0.00	6,554.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
6,720.0	0.00	0.00	6,594.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
6,760.0	0.00	0.00	6,634.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
6,800.0	0.00	0.00	6,674.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
6,840.0	0.00	0.00	6,714.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
6,880.0	0.00	0.00	6,754.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
6,920.0	0.00	0.00	6,794.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
6,960.0	0.00	0.00	6,834.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
6,997.9	0.00	0.00	6,872.0	1,038.2	235.6	1,064.6	0.00	0.00	0.00
NIOBRARA - LEGAL BOX 800' X 800', 1342'FSL & 1232'FWL - TARGET CIRCLE 1342'FSL & 1141'FWL									
7,000.0	0.00	0.00	6,874.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
7,040.0	0.00	0.00	6,914.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
7,080.0	0.00	0.00	6,954.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
7,120.0	0.00	0.00	6,994.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
7,160.0	0.00	0.00	7,034.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
7,200.0	0.00	0.00	7,074.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
7,240.0	0.00	0.00	7,114.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
7,280.0	0.00	0.00	7,154.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
7,320.0	0.00	0.00	7,194.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
7,339.9	0.00	0.00	7,214.0	1,038.2	235.6	1,064.6	0.00	0.00	0.00
CODELL									
7,360.0	0.00	0.00	7,234.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
7,400.0	0.00	0.00	7,274.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
7,412.9	0.00	0.00	7,287.0	1,038.2	235.6	1,064.6	0.00	0.00	0.00
FORT HAYS									
7,440.0	0.00	0.00	7,314.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
7,480.0	0.00	0.00	7,354.1	1,038.2	235.6	1,064.6	0.00	0.00	0.00
7,499.9	0.00	0.00	7,374.0	1,038.2	235.6	1,064.6	0.00	0.00	0.00
TD at 7499.9									

Database:	Landmark	**Local Co-ordinate Reference:**	Well Land JG 31-19D
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 (West) Pad Sec.31-T2N-R64W	**North Reference:**	True
Well:	Land JG 31-19D	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-07-12)		

Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
LEGAL BOX 800' X 8(- plan misses target center by 91.1ft at 6997.9ft MD (6872.0 TVD, 1038.2 N, 235.6 E) - Rectangle (sides W800.0 H800.0 D502.0)	0.00	0.00	6,872.0	1,038.2	326.6	1,277,340.19	3,252,284.32	40.091169	-104.598258
TARGET BHL 1342'F: - plan hits target center - Point	0.00	0.00	5,300.0	1,038.2	235.6	1,277,339.31	3,252,193.27	40.091169	-104.598583
TARGET CIRCLE 13 - plan hits target center - Circle (radius 75.0)	0.00	0.00	6,872.0	1,038.2	235.6	1,277,339.31	3,252,193.27	40.091169	-104.598583

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
1,004.5	1,000.0	8 5/8"	8-5/8	12-1/4

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,695.2	2,639.0	GREELEY SAND		0.00	
4,128.5	4,028.0	PARKMAN		0.00	
4,671.3	4,554.0	SUSSEX		0.00	
5,273.9	5,148.0	SHANNON		0.00	
6,997.9	6,872.0	NIOBRARA		0.00	
7,339.9	7,214.0	CODELL		0.00	
7,412.9	7,287.0	FORT HAYS		0.00	

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
400.0	400.0	0.0	0.0	KOP - Start Build 2.00
1,114.1	1,106.7	86.3	19.6	Start 3597.7 hold at 1114.1 MD
4,711.8	4,593.3	951.9	216.0	Start Drop -2.00
5,425.9	5,300.0	1,038.2	235.6	Back to Vertical
7,499.9	7,374.0	1,038.2	235.6	TD at 7499.9

ENSIGN Directional

Great Western

SEC.31-T2N-R64W
Land JG (West) Pad Sec.31-T2N-R64W
Land JG 31-19D

Wellbore #1
Plan #1 (11-07-12)

Anticollision Report

08 November, 2012

Company:	Great Western	**Local Co-ordinate Reference:**	Well Land JG 31-19D
Project:	SEC.31-T2N-R64W	**TVD Reference:**	WELL @ 4947.0ft (Original Well Elev)
Reference Site:	Land JG (West) Pad Sec.31-T2N-R64W	**MD Reference:**	WELL @ 4947.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Land JG 31-19D	**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 (11-07-12)	**Offset TVD Reference:**	Offset Datum

Reference Plan #1 (11-07-12)

Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	**Error Model:**	ISCWSA
Depth Range:	Unlimited	**Scan Method:**	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 10,000.0ft	**Error Surface:**	Elliptical Conic
Warning Levels Evaluated at:	2.00 **Sigma**		

Survey Tool Program **Date** 11/8/2012

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	7,499.9	Plan #1 (11-07-12) (Wellbore #1)	MWD	MWD - Standard

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Land JG (East) Pad Sec.31-T2N-R64W						
Land JG 31-13D - Wellbore #1 - Plan #1 (11-05-12)	200.0	200.0	27.7	27.0	41.015	CC, ES
Land JG 31-13D - Wellbore #1 - Plan #1 (11-05-12)	1,500.0	1,486.8	157.5	147.9	16.530	SF
Land JG 31-17D - Wellbore #1 - Plan #1 (11-05-12)	559.7	559.7	19.6	17.4	8.574	CC
Land JG 31-17D - Wellbore #1 - Plan #1 (11-05-12)	600.0	599.8	19.8	17.3	8.008	ES
Land JG 31-17D - Wellbore #1 - Plan #1 (11-05-12)	1,800.0	1,802.7	82.8	70.7	6.865	SF
Land JG (West) Pad Sec.31-T2N-R64W						
Land JG 31-12D - Wellbore #1 - Plan #1 (11-07-12)	200.0	200.0	20.4	19.7	30.248	CC, ES
Land JG 31-12D - Wellbore #1 - Plan #1 (11-07-12)	1,200.0	1,181.3	83.8	78.3	15.137	SF
Land JG 31-18D - Wellbore #1 - Plan #1 (11-07-12)	400.0	400.0	18.9	17.4	12.043	CC, ES
Land JG 31-18D - Wellbore #1 - Plan #1 (11-07-12)	1,900.0	1,906.7	117.3	104.2	8.951	SF

Offset Design Land JG (East) Pad Sec.31-T2N-R64W - Land JG 31-13D - Wellbore #1 - Plan #1 (11-05-12) **Offset Site Error:** 0.0 ft

Survey Program: 0-MWD **Offset Well Error:** 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	133.24	-18.9	20.1	27.7				
100.0	100.0	100.0	100.0	0.1	0.1	133.24	-18.9	20.1	27.7	27.4	0.22	123.044	
200.0	200.0	200.0	200.0	0.3	0.3	133.24	-18.9	20.1	27.7	27.0	0.67	41.015	CC, ES
300.0	300.0	299.3	299.2	0.6	0.6	130.91	-18.9	21.9	28.9	27.8	1.11	26.008	
400.0	400.0	398.3	398.1	0.8	0.8	125.05	-18.9	27.0	33.0	31.5	1.56	21.206	
500.0	500.0	497.5	497.0	1.0	1.0	107.19	-18.6	35.3	40.5	38.5	2.02	20.073	
600.0	599.8	597.2	596.2	1.2	1.3	103.84	-15.5	45.4	49.3	46.8	2.48	19.848	
700.0	699.5	696.8	694.9	1.5	1.6	101.40	-9.2	56.8	58.8	55.8	2.98	19.727	
800.0	798.7	796.3	793.1	1.7	1.9	99.55	0.2	69.5	69.0	65.5	3.53	19.532	
900.0	897.5	895.6	890.6	2.0	2.3	98.12	12.8	83.5	79.9	75.7	4.16	19.206	
1,000.0	995.6	994.8	987.4	2.4	2.7	96.99	28.4	98.8	91.4	86.5	4.87	18.744	
1,100.0	1,093.1	1,093.9	1,083.3	2.8	3.1	96.06	47.1	115.4	103.4	97.7	5.69	18.176	
1,114.1	1,106.7	1,107.9	1,096.7	2.9	3.2	95.94	50.0	117.8	105.2	99.4	5.81	18.088	
1,200.0	1,190.0	1,192.9	1,178.1	3.2	3.7	94.88	68.9	133.1	116.0	109.4	6.60	17.572	
1,300.0	1,286.9	1,291.5	1,271.7	3.7	4.2	92.45	93.6	152.1	128.9	121.3	7.56	17.060	
1,400.0	1,383.8	1,389.5	1,363.6	4.2	4.9	89.13	121.1	172.2	142.6	134.0	8.54	16.699	
1,500.0	1,480.7	1,486.8	1,453.7	4.6	5.5	85.23	151.2	193.2	157.5	147.9	9.53	16.530	SF

Company:	Great Western	**Local Co-ordinate Reference:**	Well Land JG 31-19D
Project:	SEC.31-T2N-R64W	**TVD Reference:**	WELL @ 4947.0ft (Original Well Elev)
Reference Site:	Land JG (West) Pad Sec.31-T2N-R64W	**MD Reference:**	WELL @ 4947.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Land JG 31-19D	**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 (11-07-12)	**Offset TVD Reference:**	Offset Datum

Offset Design Land JG (East) Pad Sec.31-T2N-R64W - Land JG 31-13D - Wellbore #1 - Plan #1 (11-05-12)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
1,600.0	1,577.6	1,583.1	1,541.6	5.1	6.3	80.99	183.9	215.2	173.9	163.5	10.49	16.575	
1,700.0	1,674.5	1,678.2	1,627.1	5.6	7.0	76.64	218.8	237.9	192.5	181.1	11.43	16.844	
1,800.0	1,771.4	1,771.9	1,709.9	6.1	7.9	72.33	255.8	261.3	213.4	201.1	12.31	17.332	
1,900.0	1,868.3	1,864.9	1,790.7	6.6	8.7	68.17	294.9	285.5	236.9	223.8	13.14	18.028	
2,000.0	1,965.2	1,960.4	1,873.2	7.1	9.6	64.47	335.9	310.6	262.1	248.2	13.95	18.784	
2,100.0	2,062.2	2,055.9	1,955.7	7.6	10.5	61.41	376.9	335.8	288.1	273.4	14.75	19.541	
2,200.0	2,159.1	2,151.3	2,038.2	8.1	11.5	58.86	417.9	360.9	314.8	299.3	15.53	20.275	
2,300.0	2,256.0	2,246.8	2,120.6	8.6	12.4	56.70	458.9	386.0	342.0	325.7	16.31	20.975	
2,400.0	2,352.9	2,342.3	2,203.1	9.1	13.3	54.86	500.0	411.2	369.6	352.5	17.08	21.637	
2,500.0	2,449.8	2,437.8	2,285.6	9.6	14.2	53.27	541.0	436.3	397.4	379.6	17.86	22.260	
2,600.0	2,546.7	2,533.3	2,368.1	10.1	15.2	51.89	582.0	461.4	425.6	406.9	18.63	22.843	
2,700.0	2,643.6	2,628.8	2,450.6	10.6	16.1	50.68	623.0	486.6	453.9	434.5	19.41	23.390	
2,800.0	2,740.5	2,724.3	2,533.1	11.1	17.0	49.61	664.0	511.7	482.4	462.2	20.18	23.901	
2,900.0	2,837.4	2,819.7	2,615.6	11.6	18.0	48.66	705.0	536.9	511.0	490.1	20.96	24.380	
3,000.0	2,934.3	2,915.2	2,698.1	12.1	18.9	47.81	746.0	562.0	539.8	518.0	21.74	24.828	
3,100.0	3,031.2	3,010.7	2,780.5	12.6	19.9	47.04	787.0	587.1	568.6	546.1	22.52	25.248	
3,200.0	3,128.2	3,106.2	2,863.0	13.1	20.8	46.35	828.0	612.3	597.5	574.2	23.30	25.641	
3,300.0	3,225.1	3,201.7	2,945.5	13.6	21.7	45.73	869.0	637.4	626.6	602.5	24.09	26.011	
3,400.0	3,322.0	3,297.2	3,028.0	14.1	22.7	45.15	910.0	662.5	655.6	630.7	24.87	26.359	
3,500.0	3,418.9	3,392.7	3,110.5	14.6	23.6	44.63	951.0	687.7	684.7	659.1	25.66	26.686	
3,600.0	3,515.8	3,488.1	3,193.0	15.1	24.6	44.15	992.1	712.8	713.9	687.5	26.45	26.995	
3,700.0	3,612.7	3,583.6	3,275.5	15.6	25.5	43.71	1,033.1	737.9	743.1	715.9	27.23	27.286	
3,800.0	3,709.6	3,679.1	3,357.9	16.2	26.4	43.30	1,074.1	763.1	772.4	744.3	28.02	27.561	
3,900.0	3,806.5	3,774.6	3,440.4	16.7	27.4	42.92	1,115.1	788.2	801.6	772.8	28.81	27.822	
4,000.0	3,903.4	3,870.1	3,522.9	17.2	28.3	42.56	1,156.1	813.3	831.0	801.4	29.60	28.068	
4,100.0	4,000.3	3,965.6	3,605.4	17.7	29.3	42.23	1,197.1	838.5	860.3	829.9	30.40	28.302	
4,200.0	4,097.3	4,061.1	3,687.9	18.2	30.2	41.93	1,238.1	863.6	889.7	858.5	31.19	28.525	
4,300.0	4,194.2	4,156.5	3,770.4	18.7	31.2	41.64	1,279.1	888.7	919.1	887.1	31.98	28.736	
4,400.0	4,291.1	4,252.0	3,852.9	19.2	32.1	41.37	1,320.1	913.9	948.5	915.7	32.78	28.937	
4,500.0	4,388.0	4,347.5	3,935.4	19.7	33.1	41.11	1,361.1	939.0	977.9	944.3	33.57	29.129	
4,600.0	4,484.9	4,443.0	4,017.8	20.2	34.0	40.88	1,402.1	964.1	1,007.3	973.0	34.37	29.312	
4,700.0	4,581.8	4,538.5	4,100.3	20.7	34.9	40.65	1,443.1	989.3	1,036.8	1,001.6	35.16	29.486	
4,711.8	4,593.3	4,549.8	4,110.1	20.8	35.1	40.62	1,448.0	992.2	1,040.3	1,005.0	35.26	29.506	
4,800.0	4,679.0	4,633.6	4,182.5	21.1	35.9	40.76	1,484.0	1,014.3	1,067.2	1,031.3	35.95	29.687	
4,900.0	4,777.0	4,727.8	4,263.9	21.5	36.8	40.84	1,524.4	1,039.1	1,100.2	1,063.6	36.63	30.038	
5,000.0	4,875.6	4,820.9	4,344.3	21.8	37.7	40.87	1,564.4	1,063.6	1,135.7	1,098.5	37.23	30.504	
5,100.0	4,974.8	4,912.8	4,423.6	22.0	38.7	40.85	1,603.9	1,087.8	1,173.8	1,136.0	37.77	31.080	
5,200.0	5,074.3	5,003.3	4,501.9	22.3	39.5	40.79	1,642.8	1,111.6	1,214.3	1,176.1	38.23	31.762	
5,300.0	5,174.1	5,092.5	4,578.9	22.4	40.4	40.71	1,681.1	1,135.1	1,257.5	1,218.8	38.63	32.548	
5,400.0	5,274.1	5,180.1	4,654.6	22.6	41.3	40.62	1,718.7	1,158.2	1,303.1	1,264.1	38.98	33.433	
5,425.9	5,300.0	5,202.6	4,674.0	22.6	41.5	53.38	1,728.3	1,164.1	1,315.4	1,276.3	39.06	33.679	
5,500.0	5,374.1	5,266.5	4,729.3	22.7	42.2	52.80	1,755.8	1,180.9	1,350.7	1,311.5	39.15	34.496	
5,600.0	5,474.1	5,352.9	4,803.9	22.8	43.0	52.06	1,792.9	1,203.7	1,398.5	1,359.2	39.32	35.570	
5,700.0	5,574.1	5,439.3	4,878.5	22.9	43.9	51.37	1,830.0	1,226.4	1,446.5	1,407.0	39.50	36.619	
5,800.0	5,674.1	5,525.7	4,953.1	23.0	44.7	50.72	1,867.1	1,249.1	1,494.7	1,455.0	39.71	37.643	
5,900.0	5,774.1	5,612.1	5,027.8	23.1	45.6	50.12	1,904.2	1,271.9	1,543.0	1,503.0	39.93	38.641	
6,000.0	5,874.1	5,698.5	5,102.4	23.2	46.4	49.54	1,941.3	1,294.6	1,591.4	1,551.2	40.17	39.613	
6,100.0	5,974.1	5,784.8	5,177.0	23.3	47.3	49.01	1,978.4	1,317.4	1,639.9	1,599.5	40.43	40.560	
6,200.0	6,074.1	5,871.2	5,251.6	23.5	48.2	48.50	2,015.5	1,340.1	1,688.6	1,647.9	40.71	41.482	
6,300.0	6,174.1	5,957.6	5,326.3	23.6	49.0	48.02	2,052.6	1,362.8	1,737.4	1,696.4	41.00	42.379	
6,400.0	6,274.1	6,121.9	5,469.6	23.7	50.3	47.20	2,121.0	1,404.8	1,785.1	1,743.7	41.38	43.143	
6,500.0	6,374.1	6,355.0	5,680.2	23.8	51.9	46.28	2,206.1	1,456.9	1,826.7	1,784.8	41.89	43.606	

Company:	Great Western	**Local Co-ordinate Reference:**	Well Land JG 31-19D
Project:	SEC.31-T2N-R64W	**TVD Reference:**	WELL @ 4947.0ft (Original Well Elev)
Reference Site:	Land JG (West) Pad Sec.31-T2N-R64W	**MD Reference:**	WELL @ 4947.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Land JG 31-19D	**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 (11-07-12)	**Offset TVD Reference:**	Offset Datum

Offset Design Land JG (East) Pad Sec.31-T2N-R64W - Land JG 31-13D - Wellbore #1 - Plan #1 (11-05-12)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
6,600.0	6,474.1	6,605.3	5,914.6	24.0	53.3	45.56	2,280.8	1,502.7	1,860.8	1,818.3	42.47	43.809	
6,700.0	6,574.1	6,870.7	6,170.4	24.1	54.4	45.03	2,340.7	1,539.4	1,886.6	1,843.5	43.08	43.795	
6,800.0	6,674.1	7,147.6	6,443.1	24.2	55.3	44.69	2,381.4	1,564.3	1,903.4	1,859.7	43.66	43.598	
6,900.0	6,774.1	7,431.4	6,725.9	24.3	55.7	44.55	2,399.6	1,575.5	1,910.7	1,866.5	44.17	43.254	
7,000.0	6,874.1	7,579.5	6,874.1	24.5	55.8	44.54	2,400.4	1,576.0	1,911.0	1,866.5	44.50	42.942	
7,100.0	6,974.1	7,679.5	6,974.1	24.6	55.9	44.54	2,400.4	1,576.0	1,911.0	1,866.3	44.79	42.670	
7,200.0	7,074.1	7,779.5	7,074.1	24.7	55.9	44.54	2,400.4	1,576.0	1,911.0	1,866.0	45.07	42.398	
7,300.0	7,174.1	7,879.5	7,174.1	24.9	56.0	44.54	2,400.4	1,576.0	1,911.0	1,865.7	45.36	42.128	
7,400.0	7,274.1	7,979.5	7,274.1	25.0	56.0	44.54	2,400.4	1,576.0	1,911.0	1,865.4	45.66	41.858	
7,499.9	7,374.0	8,079.5	7,374.0	25.1	56.1	44.54	2,400.4	1,576.0	1,911.0	1,865.1	45.95	41.590	

Company:	Great Western	**Local Co-ordinate Reference:**	Well Land JG 31-19D
Project:	SEC.31-T2N-R64W	**TVD Reference:**	WELL @ 4947.0ft (Original Well Elev)
Reference Site:	Land JG (West) Pad Sec.31-T2N-R64W	**MD Reference:**	WELL @ 4947.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Land JG 31-19D	**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 (11-07-12)	**Offset TVD Reference:**	Offset Datum

Offset Design Land JG (East) Pad Sec.31-T2N-R64W - Land JG 31-17D - Wellbore #1 - Plan #1 (11-05-12) **Offset Site Error:** 0.0 ft

Survey Program: 0-MWD **Offset Well Error:** 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	90.01	0.0	20.1	20.1				
100.0	100.0	100.0	100.0	0.1	0.1	90.01	0.0	20.1	20.1	19.9	0.22	89.630	
200.0	200.0	200.0	200.0	0.3	0.3	90.01	0.0	20.1	20.1	19.5	0.67	29.877	
300.0	300.0	300.0	300.0	0.6	0.6	90.01	0.0	20.1	20.1	19.0	1.12	17.926	
400.0	400.0	400.0	400.0	0.8	0.8	90.01	0.0	20.1	20.1	18.6	1.57	12.804	
500.0	500.0	500.0	500.0	1.0	1.0	82.16	0.0	20.1	19.8	17.8	2.02	9.809	
559.7	559.7	559.7	559.7	1.2	1.1	90.00	0.0	20.1	19.6	17.4	2.29	8.574	CC
600.0	599.8	599.8	599.8	1.2	1.2	97.30	0.0	20.1	19.8	17.3	2.47	8.008	ES
700.0	699.5	699.6	699.6	1.5	1.5	115.38	1.5	20.9	22.2	19.3	2.94	7.575	
800.0	798.7	799.6	799.5	1.7	1.7	127.88	6.2	23.3	27.1	23.7	3.41	7.957	
900.0	897.5	899.8	899.3	2.0	1.9	135.34	13.9	27.3	33.6	29.7	3.90	8.612	
1,000.0	995.6	1,000.2	998.9	2.4	2.2	139.47	24.8	32.9	41.1	36.7	4.42	9.292	
1,100.0	1,093.1	1,100.8	1,098.3	2.8	2.5	141.55	38.8	40.1	49.3	44.3	4.98	9.897	
1,114.1	1,106.7	1,115.0	1,112.3	2.9	2.5	141.73	41.0	41.3	50.5	45.5	5.07	9.971	
1,200.0	1,190.0	1,201.7	1,197.2	3.2	2.8	141.68	56.0	49.0	57.2	51.6	5.62	10.179	
1,300.0	1,286.9	1,302.7	1,295.7	3.7	3.2	139.24	76.2	59.4	63.0	56.6	6.35	9.913	
1,400.0	1,383.8	1,403.7	1,393.2	4.2	3.6	134.66	99.6	71.4	67.0	59.8	7.22	9.276	
1,500.0	1,480.7	1,504.5	1,489.6	4.6	4.1	128.04	125.9	85.0	69.9	61.6	8.26	8.460	
1,600.0	1,577.6	1,604.7	1,584.3	5.1	4.7	119.43	155.0	100.0	72.6	63.1	9.47	7.666	
1,700.0	1,674.5	1,704.2	1,677.1	5.6	5.3	109.08	186.9	116.4	76.4	65.6	10.79	7.086	
1,800.0	1,771.4	1,802.7	1,767.7	6.1	6.0	97.73	221.2	134.0	82.8	70.7	12.06	6.865	SF
1,900.0	1,868.3	1,900.4	1,856.3	6.6	6.7	86.55	257.7	152.8	92.9	79.7	13.15	7.061	
2,000.0	1,965.2	1,998.3	1,944.9	7.1	7.5	77.49	294.6	171.9	106.0	92.0	14.03	7.555	
2,100.0	2,062.2	2,096.1	2,033.5	7.6	8.3	70.52	331.6	190.9	121.2	106.4	14.79	8.198	
2,200.0	2,159.1	2,194.0	2,122.1	8.1	9.0	65.14	368.6	210.0	137.8	122.3	15.48	8.901	
2,300.0	2,256.0	2,291.9	2,210.7	8.6	9.8	60.93	405.6	229.0	155.4	139.2	16.16	9.614	
2,400.0	2,352.9	2,389.8	2,299.3	9.1	10.6	57.58	442.6	248.1	173.5	156.7	16.83	10.311	
2,500.0	2,449.8	2,487.6	2,387.9	9.6	11.4	54.87	479.5	267.1	192.2	174.7	17.51	10.980	
2,600.0	2,546.7	2,585.5	2,476.5	10.1	12.2	52.64	516.5	286.2	211.2	193.0	18.19	11.613	
2,700.0	2,643.6	2,683.4	2,565.1	10.6	13.0	50.78	553.5	305.2	230.5	211.6	18.88	12.209	
2,800.0	2,740.5	2,781.3	2,653.7	11.1	13.8	49.20	590.5	324.2	249.9	230.3	19.57	12.769	
2,900.0	2,837.4	2,879.1	2,742.3	11.6	14.6	47.85	627.5	343.3	269.5	249.3	20.28	13.292	
3,000.0	2,934.3	2,977.0	2,830.9	12.1	15.4	46.69	664.5	362.3	289.3	268.3	20.99	13.783	
3,100.0	3,031.2	3,074.9	2,919.5	12.6	16.2	45.67	701.4	381.4	309.1	287.4	21.71	14.241	
3,200.0	3,128.2	3,172.8	3,008.1	13.1	17.0	44.78	738.4	400.4	329.0	306.6	22.43	14.671	
3,300.0	3,225.1	3,270.6	3,096.6	13.6	17.8	43.99	775.4	419.5	349.0	325.9	23.15	15.074	
3,400.0	3,322.0	3,368.5	3,185.2	14.1	18.6	43.28	812.4	438.5	369.1	345.2	23.89	15.452	
3,500.0	3,418.9	3,466.4	3,273.8	14.6	19.4	42.65	849.4	457.6	389.2	364.6	24.62	15.807	
3,600.0	3,515.8	3,564.2	3,362.4	15.1	20.2	42.08	886.3	476.6	409.3	384.0	25.36	16.142	
3,700.0	3,612.7	3,662.1	3,451.0	15.6	21.1	41.56	923.3	495.6	429.5	403.4	26.10	16.456	
3,800.0	3,709.6	3,760.0	3,539.6	16.2	21.9	41.09	960.3	514.7	449.7	422.8	26.84	16.753	
3,900.0	3,806.5	3,857.9	3,628.2	16.7	22.7	40.66	997.3	533.7	469.9	442.3	27.59	17.034	
4,000.0	3,903.4	3,955.7	3,716.8	17.2	23.5	40.26	1,034.3	552.8	490.2	461.8	28.34	17.299	
4,100.0	4,000.3	4,053.6	3,805.4	17.7	24.3	39.90	1,071.3	571.8	510.5	481.4	29.09	17.550	
4,200.0	4,097.3	4,151.5	3,894.0	18.2	25.1	39.56	1,108.2	590.9	530.7	500.9	29.84	17.788	
4,300.0	4,194.2	4,249.4	3,982.6	18.7	25.9	39.25	1,145.2	609.9	551.1	520.5	30.59	18.014	
4,400.0	4,291.1	4,347.2	4,071.2	19.2	26.7	38.96	1,182.2	629.0	571.4	540.0	31.34	18.229	
4,500.0	4,388.0	4,445.1	4,159.8	19.7	27.5	38.69	1,219.2	648.0	591.7	559.6	32.10	18.434	
4,600.0	4,484.9	4,543.0	4,248.4	20.2	28.4	38.44	1,256.2	667.1	612.1	579.2	32.86	18.628	
4,700.0	4,581.8	4,640.9	4,337.0	20.7	29.2	38.20	1,293.1	686.1	632.4	598.8	33.61	18.814	
4,711.8	4,593.3	4,652.4	4,347.4	20.8	29.3	38.18	1,297.5	688.4	634.8	601.1	33.70	18.835	
4,800.0	4,679.0	4,738.5	4,425.3	21.1	30.0	38.15	1,330.0	705.1	653.8	619.5	34.33	19.043	

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

Company:	Great Western	**Local Co-ordinate Reference:**	Well Land JG 31-19D
Project:	SEC.31-T2N-R64W	**TVD Reference:**	WELL @ 4947.0ft (Original Well Elev)
Reference Site:	Land JG (West) Pad Sec.31-T2N-R64W	**MD Reference:**	WELL @ 4947.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Land JG 31-19D	**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 (11-07-12)	**Offset TVD Reference:**	Offset Datum

Offset Design Land JG (East) Pad Sec.31-T2N-R64W - Land JG 31-17D - Wellbore #1 - Plan #1 (11-05-12)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,900.0	4,777.0	4,835.4	4,513.0	21.5	30.8	38.00	1,366.7	724.0	677.9	643.0	34.92	19.414	
5,000.0	4,875.6	4,931.5	4,600.0	21.8	31.6	37.73	1,403.0	742.6	704.7	669.3	35.41	19.903	
5,100.0	4,974.8	5,026.6	4,686.1	22.0	32.4	37.38	1,438.9	761.2	734.3	698.5	35.81	20.505	
5,200.0	5,074.3	5,120.6	4,771.2	22.3	33.2	36.95	1,474.4	779.5	766.6	730.5	36.13	21.220	
5,300.0	5,174.1	5,242.0	4,882.0	22.4	34.0	36.24	1,518.6	802.2	800.3	764.0	36.32	22.032	
5,400.0	5,274.1	5,370.1	5,001.0	22.6	34.7	35.50	1,560.7	823.9	832.9	796.5	36.42	22.870	
5,425.9	5,300.0	5,403.7	5,032.6	22.6	34.9	48.09	1,571.0	829.2	841.2	804.8	36.44	23.087	
5,500.0	5,374.1	5,501.2	5,124.9	22.7	35.4	47.32	1,598.8	843.5	863.7	827.2	36.50	23.663	
5,600.0	5,474.1	5,636.3	5,254.4	22.8	36.0	46.45	1,632.8	861.0	890.5	853.8	36.66	24.293	
5,700.0	5,574.1	5,774.8	5,389.0	22.9	36.6	45.76	1,662.0	876.0	912.9	876.1	36.87	24.763	
5,800.0	5,674.1	5,916.4	5,528.0	23.0	37.0	45.23	1,685.8	888.3	930.9	893.8	37.12	25.079	
5,900.0	5,774.1	6,060.3	5,670.5	23.1	37.4	44.85	1,703.7	897.5	944.3	906.9	37.40	25.247	
6,000.0	5,874.1	6,205.9	5,815.5	23.2	37.7	44.61	1,715.3	903.5	952.9	915.1	37.71	25.271	
6,100.0	5,974.1	6,352.5	5,961.9	23.3	37.9	44.51	1,720.4	906.1	956.6	918.5	38.02	25.160	
6,200.0	6,074.1	6,464.6	6,074.1	23.5	38.0	44.50	1,720.6	906.2	956.7	918.4	38.32	24.968	
6,300.0	6,174.1	6,564.6	6,174.1	23.6	38.0	44.50	1,720.6	906.2	956.7	918.1	38.61	24.780	
6,400.0	6,274.1	6,664.6	6,274.1	23.7	38.1	44.50	1,720.6	906.2	956.7	917.8	38.90	24.593	
6,500.0	6,374.1	6,764.6	6,374.1	23.8	38.2	44.50	1,720.6	906.2	956.7	917.5	39.20	24.407	
6,600.0	6,474.1	6,864.6	6,474.1	24.0	38.3	44.50	1,720.6	906.2	956.7	917.2	39.50	24.222	
6,700.0	6,574.1	6,964.6	6,574.1	24.1	38.3	44.50	1,720.6	906.2	956.7	916.9	39.80	24.038	
6,800.0	6,674.1	7,064.6	6,674.1	24.2	38.4	44.50	1,720.6	906.2	956.7	916.6	40.11	23.856	
6,900.0	6,774.1	7,164.6	6,774.1	24.3	38.5	44.50	1,720.6	906.2	956.7	916.3	40.41	23.674	
7,000.0	6,874.1	7,264.6	6,874.1	24.5	38.6	44.50	1,720.6	906.2	956.7	916.0	40.72	23.494	
7,100.0	6,974.1	7,364.6	6,974.1	24.6	38.7	44.50	1,720.6	906.2	956.7	915.7	41.04	23.315	
7,200.0	7,074.1	7,464.6	7,074.1	24.7	38.7	44.50	1,720.6	906.2	956.7	915.4	41.35	23.137	
7,300.0	7,174.1	7,564.6	7,174.1	24.9	38.8	44.50	1,720.6	906.2	956.7	915.1	41.67	22.961	
7,400.0	7,274.1	7,664.6	7,274.1	25.0	38.9	44.50	1,720.6	906.2	956.7	914.7	41.99	22.786	
7,499.9	7,374.0	7,764.6	7,374.0	25.1	39.0	44.50	1,720.6	906.2	956.7	914.4	42.31	22.612	

Company:	Great Western	**Local Co-ordinate Reference:**	Well Land JG 31-19D
Project:	SEC.31-T2N-R64W	**TVD Reference:**	WELL @ 4947.0ft (Original Well Elev)
Reference Site:	Land JG (West) Pad Sec.31-T2N-R64W	**MD Reference:**	WELL @ 4947.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Land JG 31-19D	**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 (11-07-12)	**Offset TVD Reference:**	Offset Datum

Offset Design Land JG (West) Pad Sec.31-T2N-R64W - Land JG 31-12D - Wellbore #1 - Plan #1 (11-07-12) — **Offset Site Error:** 0.0 ft

Survey Program: 0-MWD — **Offset Well Error:** 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	0.00	20.4	0.0	20.4				
100.0	100.0	100.0	100.0	0.1	0.1	0.00	20.4	0.0	20.4	20.2	0.22	90.744	
200.0	200.0	200.0	200.0	0.3	0.3	0.00	20.4	0.0	20.4	19.7	0.67	30.248	CC, ES
300.0	300.0	299.3	299.2	0.6	0.6	0.48	22.1	0.2	22.1	21.0	1.12	19.668	
400.0	400.0	398.3	398.1	0.8	0.8	1.54	27.2	0.7	27.3	25.7	1.58	17.235	
500.0	500.0	497.0	496.5	1.0	1.0	-10.63	35.7	1.6	34.2	32.2	2.04	16.798	
600.0	599.8	595.5	594.2	1.2	1.3	-10.78	47.5	2.9	41.1	38.6	2.49	16.501	
700.0	699.5	693.7	691.2	1.5	1.6	-11.35	62.6	4.5	48.0	45.0	2.95	16.262	
800.0	798.7	791.7	787.5	1.7	2.0	-12.18	80.9	6.5	54.9	51.5	3.42	16.039	
900.0	897.5	889.5	882.8	2.0	2.4	-13.19	102.5	8.8	61.8	57.9	3.91	15.809	
1,000.0	995.6	987.0	977.2	2.4	2.9	-14.31	127.2	11.5	68.7	64.3	4.42	15.557	
1,100.0	1,093.1	1,084.3	1,070.4	2.8	3.4	-15.51	155.0	14.5	75.7	70.7	4.95	15.273	
1,114.1	1,106.7	1,098.1	1,083.4	2.9	3.5	-15.68	159.2	14.9	76.6	71.6	5.03	15.234	
1,200.0	1,190.0	1,181.3	1,162.3	3.2	4.0	-16.55	185.9	17.8	83.8	78.3	5.54	15.137	SF
1,300.0	1,286.9	1,277.7	1,252.5	3.7	4.6	-17.04	219.6	21.4	95.3	89.2	6.15	15.502	
1,400.0	1,383.8	1,373.3	1,340.7	4.2	5.3	-17.10	255.9	25.3	110.1	103.3	6.76	16.287	
1,500.0	1,480.7	1,467.8	1,426.8	4.6	6.0	-16.87	294.8	29.5	128.0	120.6	7.39	17.324	
1,600.0	1,577.6	1,561.1	1,510.4	5.1	6.7	-16.48	335.9	33.9	149.2	141.1	8.02	18.595	
1,700.0	1,674.5	1,654.0	1,592.4	5.6	7.5	-16.02	379.4	38.6	173.3	164.7	8.66	20.019	
1,800.0	1,771.4	1,750.8	1,677.3	6.1	8.4	-15.60	425.6	43.6	198.6	189.2	9.31	21.329	
1,900.0	1,868.3	1,847.5	1,762.1	6.6	9.3	-15.27	471.9	48.6	223.8	213.8	9.96	22.458	
2,000.0	1,965.2	1,944.3	1,847.0	7.1	10.2	-15.02	518.1	53.6	249.0	238.4	10.62	23.437	
2,100.0	2,062.2	2,041.0	1,931.8	7.6	11.0	-14.80	564.3	58.5	274.2	262.9	11.29	24.294	
2,200.0	2,159.1	2,137.8	2,016.7	8.1	11.9	-14.63	610.6	63.5	299.5	287.5	11.96	25.048	
2,300.0	2,256.0	2,234.6	2,101.5	8.6	12.8	-14.48	656.8	68.5	324.7	312.1	12.63	25.717	
2,400.0	2,352.9	2,331.3	2,186.4	9.1	13.7	-14.35	703.1	73.5	349.9	336.6	13.30	26.314	
2,500.0	2,449.8	2,428.1	2,271.2	9.6	14.6	-14.24	749.3	78.4	375.2	361.2	13.97	26.850	
2,600.0	2,546.7	2,524.8	2,356.1	10.1	15.4	-14.15	795.5	83.4	400.4	385.8	14.65	27.333	
2,700.0	2,643.6	2,621.6	2,440.9	10.6	16.3	-14.06	841.8	88.4	425.7	410.3	15.33	27.771	
2,800.0	2,740.5	2,718.4	2,525.8	11.1	17.2	-13.99	888.0	93.4	450.9	434.9	16.01	28.169	
2,900.0	2,837.4	2,815.1	2,610.6	11.6	18.1	-13.92	934.2	98.3	476.1	459.5	16.69	28.533	
3,000.0	2,934.3	2,911.9	2,695.5	12.1	19.0	-13.86	980.5	103.3	501.4	484.0	17.37	28.867	
3,100.0	3,031.2	3,008.6	2,780.3	12.6	19.9	-13.81	1,026.7	108.3	526.6	508.6	18.05	29.175	
3,200.0	3,128.2	3,105.4	2,865.2	13.1	20.8	-13.76	1,072.9	113.3	551.9	533.1	18.73	29.459	
3,300.0	3,225.1	3,202.2	2,950.0	13.6	21.7	-13.71	1,119.2	118.2	577.1	557.7	19.42	29.721	
3,400.0	3,322.0	3,298.9	3,034.9	14.1	22.6	-13.67	1,165.4	123.2	602.4	582.3	20.10	29.965	
3,500.0	3,418.9	3,395.7	3,119.8	14.6	23.4	-13.63	1,211.7	128.2	627.6	606.8	20.79	30.192	
3,600.0	3,515.8	3,492.4	3,204.6	15.1	24.3	-13.60	1,257.9	133.2	652.9	631.4	21.47	30.404	
3,700.0	3,612.7	3,589.2	3,289.5	15.6	25.2	-13.56	1,304.1	138.1	678.1	655.9	22.16	30.602	
3,800.0	3,709.6	3,686.0	3,374.3	16.2	26.1	-13.53	1,350.4	143.1	703.3	680.5	22.84	30.788	
3,900.0	3,806.5	3,782.7	3,459.2	16.7	27.0	-13.51	1,396.6	148.1	728.6	705.1	23.53	30.962	
4,000.0	3,903.4	3,879.5	3,544.0	17.2	27.9	-13.48	1,442.8	153.1	753.8	729.6	24.22	31.126	
4,100.0	4,000.3	3,976.2	3,628.9	17.7	28.8	-13.45	1,489.1	158.0	779.1	754.2	24.91	31.280	
4,200.0	4,097.3	4,073.0	3,713.7	18.2	29.7	-13.43	1,535.3	163.0	804.3	778.7	25.59	31.426	
4,300.0	4,194.2	4,169.8	3,798.6	18.7	30.6	-13.41	1,581.5	168.0	829.6	803.3	26.28	31.564	
4,400.0	4,291.1	4,266.5	3,883.4	19.2	31.5	-13.39	1,627.8	172.9	854.8	827.8	26.97	31.694	
4,500.0	4,388.0	4,363.3	3,968.3	19.7	32.3	-13.37	1,674.0	177.9	880.1	852.4	27.66	31.818	
4,600.0	4,484.9	4,460.0	4,053.1	20.2	33.2	-13.35	1,720.3	182.9	905.3	877.0	28.35	31.936	
4,700.0	4,581.8	4,556.8	4,138.0	20.7	34.1	-13.33	1,766.5	187.9	930.6	901.5	29.04	32.047	
4,711.8	4,593.3	4,568.3	4,148.0	20.8	34.2	-13.33	1,772.0	188.5	933.5	904.4	29.12	32.060	
4,800.0	4,679.0	4,653.2	4,222.5	21.1	35.0	-13.41	1,812.6	192.8	957.1	927.5	29.62	32.312	
4,900.0	4,777.0	4,748.7	4,306.2	21.5	35.9	-13.47	1,858.2	197.7	986.8	956.7	30.11	32.778	

Company:	Great Western	**Local Co-ordinate Reference:**	Well Land JG 31-19D
Project:	SEC.31-T2N-R64W	**TVD Reference:**	WELL @ 4947.0ft (Original Well Elev)
Reference Site:	Land JG (West) Pad Sec.31-T2N-R64W	**MD Reference:**	WELL @ 4947.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Land JG 31-19D	**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 (11-07-12)	**Offset TVD Reference:**	Offset Datum

Offset Design Land JG (West) Pad Sec.31-T2N-R64W - Land JG 31-12D - Wellbore #1 - Plan #1 (11-07-12)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,000.0	4,875.6	4,843.0	4,389.0	21.8	36.8	-13.51	1,903.3	202.6	1,019.8	989.3	30.53	33.399	
5,100.0	4,974.8	4,936.2	4,470.7	22.0	37.6	-13.53	1,947.8	207.4	1,056.0	1,025.1	30.90	34.174	
5,200.0	5,074.3	5,028.1	4,551.3	22.3	38.5	-13.53	1,991.7	212.1	1,095.3	1,064.1	31.20	35.101	
5,300.0	5,174.1	5,124.1	4,635.5	22.4	39.3	-13.51	2,037.5	217.0	1,137.7	1,106.3	31.46	36.162	
5,400.0	5,274.1	5,275.2	4,770.2	22.6	40.4	-13.33	2,105.6	224.4	1,180.5	1,148.7	31.78	37.141	
5,425.9	5,300.0	5,315.2	4,806.4	22.6	40.7	-0.50	2,122.4	226.2	1,191.3	1,159.4	31.85	37.401	
5,500.0	5,374.1	5,432.1	4,913.7	22.7	41.4	-0.22	2,168.7	231.1	1,220.6	1,188.3	32.26	37.830	
5,600.0	5,474.1	5,596.3	5,067.3	22.8	42.3	0.08	2,226.2	237.3	1,255.7	1,222.8	32.85	38.224	
5,700.0	5,574.1	5,767.2	5,230.5	22.9	43.1	0.33	2,276.7	242.8	1,285.3	1,251.8	33.43	38.447	
5,800.0	5,674.1	5,944.0	5,402.1	23.0	43.8	0.52	2,318.7	247.3	1,309.0	1,275.0	33.99	38.512	
5,900.0	5,774.1	6,125.6	5,580.8	23.1	44.4	0.66	2,350.7	250.7	1,326.7	1,292.2	34.52	38.433	
6,000.0	5,874.1	6,310.6	5,764.6	23.2	44.8	0.75	2,371.8	253.0	1,338.1	1,303.1	35.01	38.224	
6,100.0	5,974.1	6,497.7	5,951.4	23.3	45.0	0.79	2,381.0	254.0	1,343.1	1,307.6	35.44	37.894	
6,200.0	6,074.1	6,620.4	6,074.1	23.5	45.1	0.79	2,381.4	254.0	1,343.3	1,307.5	35.77	37.549	
6,300.0	6,174.1	6,720.4	6,174.1	23.6	45.2	0.79	2,381.4	254.0	1,343.3	1,307.2	36.09	37.220	
6,400.0	6,274.1	6,820.4	6,274.1	23.7	45.2	0.79	2,381.4	254.0	1,343.3	1,306.9	36.41	36.893	
6,500.0	6,374.1	6,920.4	6,374.1	23.8	45.3	0.79	2,381.4	254.0	1,343.3	1,306.5	36.73	36.569	
6,600.0	6,474.1	7,020.4	6,474.1	24.0	45.3	0.79	2,381.4	254.0	1,343.3	1,306.2	37.06	36.249	
6,700.0	6,574.1	7,120.4	6,574.1	24.1	45.4	0.79	2,381.4	254.0	1,343.3	1,305.9	37.38	35.932	
6,800.0	6,674.1	7,220.4	6,674.1	24.2	45.5	0.79	2,381.4	254.0	1,343.3	1,305.6	37.71	35.618	
6,900.0	6,774.1	7,320.4	6,774.1	24.3	45.5	0.79	2,381.4	254.0	1,343.3	1,305.2	38.04	35.308	
7,000.0	6,874.1	7,420.4	6,874.1	24.5	45.6	0.79	2,381.4	254.0	1,343.3	1,304.9	38.38	35.000	
7,100.0	6,974.1	7,520.4	6,974.1	24.6	45.7	0.79	2,381.4	254.0	1,343.3	1,304.6	38.71	34.697	
7,200.0	7,074.1	7,620.4	7,074.1	24.7	45.7	0.79	2,381.4	254.0	1,343.3	1,304.2	39.05	34.396	
7,300.0	7,174.1	7,720.4	7,174.1	24.9	45.8	0.79	2,381.4	254.0	1,343.3	1,303.9	39.39	34.099	
7,400.0	7,274.1	7,820.4	7,274.1	25.0	45.9	0.79	2,381.4	254.0	1,343.3	1,303.5	39.74	33.805	
7,462.9	7,337.0	7,883.3	7,337.0	25.1	45.9	0.79	2,381.4	254.0	1,343.3	1,303.3	39.95	33.622	
7,499.9	7,374.0	7,910.3	7,364.0	25.1	45.9	0.79	2,381.4	254.0	1,343.3	1,303.2	40.07	33.528	

Company:	Great Western	**Local Co-ordinate Reference:**	Well Land JG 31-19D
Project:	SEC.31-T2N-R64W	**TVD Reference:**	WELL @ 4947.0ft (Original Well Elev)
Reference Site:	Land JG (West) Pad Sec.31-T2N-R64W	**MD Reference:**	WELL @ 4947.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Land JG 31-19D	**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 (11-07-12)	**Offset TVD Reference:**	Offset Datum

Offset Design Land JG (West) Pad Sec.31-T2N-R64W - Land JG 31-18D - Wellbore #1 - Plan #1 (11-07-12) **Offset Site Error:** 0.0 ft

Survey Program: 0-MWD **Offset Well Error:** 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	180.00	-18.9	0.0	18.9	18.9	0.00	N/A	
100.0	100.0	100.0	100.0	0.1	0.1	180.00	-18.9	0.0	18.9	18.7	0.22	84.298	
200.0	200.0	200.0	200.0	0.3	0.3	180.00	-18.9	0.0	18.9	18.3	0.67	28.099	
300.0	300.0	300.0	300.0	0.6	0.6	180.00	-18.9	0.0	18.9	17.8	1.12	16.860	
400.0	400.0	400.0	400.0	0.8	0.8	180.00	-18.9	0.0	18.9	17.4	1.57	12.043	CC, ES
500.0	500.0	500.0	500.0	1.0	1.0	168.28	-18.9	0.0	20.7	18.6	2.03	10.194	
600.0	599.8	599.8	599.8	1.2	1.2	170.62	-18.9	0.0	25.8	23.3	2.48	10.398	
700.0	699.5	700.6	700.5	1.5	1.5	173.88	-17.2	-0.3	32.8	29.8	2.93	11.169	
800.0	798.7	801.5	801.3	1.7	1.7	178.05	-12.0	-1.3	40.0	36.6	3.38	11.823	
900.0	897.5	902.5	902.0	2.0	1.9	-177.34	-3.3	-3.0	47.6	43.8	3.84	12.422	
1,000.0	995.6	1,003.7	1,002.4	2.4	2.2	-172.58	8.9	-5.3	55.9	51.6	4.31	12.993	
1,100.0	1,093.1	1,105.0	1,102.3	2.8	2.5	-167.87	24.6	-8.4	65.0	60.2	4.81	13.521	
1,114.1	1,106.7	1,119.3	1,116.4	2.9	2.5	-167.21	27.1	-8.8	66.4	61.5	4.89	13.587	
1,200.0	1,190.0	1,206.4	1,201.8	3.2	2.8	-163.07	43.8	-12.0	73.8	68.4	5.39	13.696	
1,300.0	1,286.9	1,307.9	1,300.7	3.7	3.2	-157.56	66.5	-16.4	80.5	74.5	6.07	13.267	
1,400.0	1,383.8	1,409.3	1,398.5	4.2	3.7	-151.11	92.6	-21.4	85.6	78.7	6.89	12.432	
1,500.0	1,480.7	1,510.3	1,495.0	4.6	4.2	-143.56	121.9	-27.0	89.8	81.9	7.88	11.392	
1,600.0	1,577.6	1,610.6	1,589.8	5.1	4.7	-134.88	154.3	-33.2	94.0	84.9	9.07	10.359	
1,700.0	1,674.5	1,710.1	1,682.6	5.6	5.4	-125.23	189.7	-40.0	99.3	88.9	10.43	9.527	
1,800.0	1,771.4	1,808.4	1,773.5	6.1	6.0	-115.88	226.3	-47.0	107.1	95.2	11.81	9.068	
1,900.0	1,868.3	1,906.7	1,864.4	6.6	6.7	-107.94	262.9	-54.0	117.3	104.2	13.10	8.951	SF
2,000.0	1,965.2	2,004.9	1,955.3	7.1	7.4	-101.35	299.4	-61.0	129.4	115.1	14.30	9.047	
2,100.0	2,062.2	2,103.1	2,046.2	7.6	8.1	-95.93	336.0	-68.1	142.9	127.5	15.42	9.269	
2,200.0	2,159.1	2,201.4	2,137.1	8.1	8.8	-91.46	372.6	-75.1	157.5	141.0	16.47	9.560	
2,300.0	2,256.0	2,299.6	2,228.0	8.6	9.5	-87.76	409.2	-82.1	172.9	155.4	17.48	9.887	
2,400.0	2,352.9	2,397.9	2,318.9	9.1	10.2	-84.66	445.8	-89.1	188.8	170.4	18.47	10.226	
2,500.0	2,449.8	2,496.1	2,409.8	9.6	10.9	-82.06	482.4	-96.1	205.3	185.8	19.42	10.567	
2,600.0	2,546.7	2,594.3	2,500.7	10.1	11.7	-79.84	518.9	-103.1	222.0	201.7	20.37	10.901	
2,700.0	2,643.6	2,692.6	2,591.6	10.6	12.4	-77.93	555.5	-110.1	239.1	217.8	21.30	11.224	
2,800.0	2,740.5	2,790.8	2,682.6	11.1	13.1	-76.27	592.1	-117.2	256.4	234.2	22.23	11.534	
2,900.0	2,837.4	2,889.1	2,773.5	11.6	13.8	-74.83	628.7	-124.2	273.9	250.7	23.15	11.829	
3,000.0	2,934.3	2,987.3	2,864.4	12.1	14.5	-73.56	665.3	-131.2	291.5	267.4	24.07	12.110	
3,100.0	3,031.2	3,085.6	2,955.3	12.6	15.3	-72.43	701.9	-138.2	309.2	284.2	24.98	12.376	
3,200.0	3,128.2	3,183.8	3,046.2	13.1	16.0	-71.43	738.5	-145.2	327.0	301.1	25.90	12.628	
3,300.0	3,225.1	3,282.0	3,137.1	13.6	16.7	-70.53	775.0	-152.2	345.0	318.2	26.81	12.866	
3,400.0	3,322.0	3,380.3	3,228.0	14.1	17.4	-69.71	811.6	-159.2	363.0	335.3	27.73	13.092	
3,500.0	3,418.9	3,478.5	3,318.9	14.6	18.2	-68.98	848.2	-166.3	381.1	352.4	28.64	13.306	
3,600.0	3,515.8	3,576.8	3,409.8	15.1	18.9	-68.31	884.8	-173.3	399.2	369.6	29.55	13.509	
3,700.0	3,612.7	3,675.0	3,500.7	15.6	19.6	-67.70	921.4	-180.3	417.3	386.9	30.46	13.701	
3,800.0	3,709.6	3,773.3	3,591.6	16.2	20.4	-67.14	958.0	-187.3	435.6	404.2	31.37	13.883	
3,900.0	3,806.5	3,871.5	3,682.5	16.7	21.1	-66.63	994.5	-194.3	453.8	421.5	32.29	14.056	
4,000.0	3,903.4	3,969.7	3,773.4	17.2	21.8	-66.15	1,031.1	-201.3	472.1	438.9	33.20	14.220	
4,100.0	4,000.3	4,068.0	3,864.3	17.7	22.6	-65.71	1,067.7	-208.3	490.4	456.3	34.11	14.376	
4,200.0	4,097.3	4,166.2	3,955.2	18.2	23.3	-65.30	1,104.3	-215.3	508.7	473.7	35.03	14.525	
4,300.0	4,194.2	4,264.5	4,046.1	18.7	24.0	-64.93	1,140.9	-222.4	527.1	491.2	35.94	14.667	
4,400.0	4,291.1	4,362.7	4,137.0	19.2	24.7	-64.57	1,177.5	-229.4	545.5	508.6	36.85	14.802	
4,500.0	4,388.0	4,460.9	4,227.9	19.7	25.5	-64.24	1,214.1	-236.4	563.9	526.1	37.77	14.931	
4,600.0	4,484.9	4,559.2	4,318.9	20.2	26.2	-63.93	1,250.6	-243.4	582.3	543.6	38.68	15.054	
4,700.0	4,581.8	4,657.4	4,409.8	20.7	26.9	-63.64	1,287.2	-250.4	600.7	561.2	39.60	15.172	
4,711.8	4,593.3	4,669.1	4,420.5	20.8	27.0	-63.61	1,291.6	-251.2	602.9	563.2	39.70	15.185	
4,800.0	4,679.0	4,755.5	4,500.5	21.1	27.7	-63.56	1,323.8	-257.4	619.8	579.3	40.48	15.312	
4,900.0	4,777.0	4,853.1	4,590.8	21.5	28.4	-63.29	1,360.1	-264.4	640.4	599.2	41.19	15.548	

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

Company:	Great Western	**Local Co-ordinate Reference:**	Well Land JG 31-19D
Project:	SEC.31-T2N-R64W	**TVD Reference:**	WELL @ 4947.0ft (Original Well Elev)
Reference Site:	Land JG (West) Pad Sec.31-T2N-R64W	**MD Reference:**	WELL @ 4947.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Land JG 31-19D	**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 (11-07-12)	**Offset TVD Reference:**	Offset Datum

Offset Design Land JG (West) Pad Sec.31-T2N-R64W - Land JG 31-18D - Wellbore #1 - Plan #1 (11-07-12)

Offset Site Error: 0.0 ft

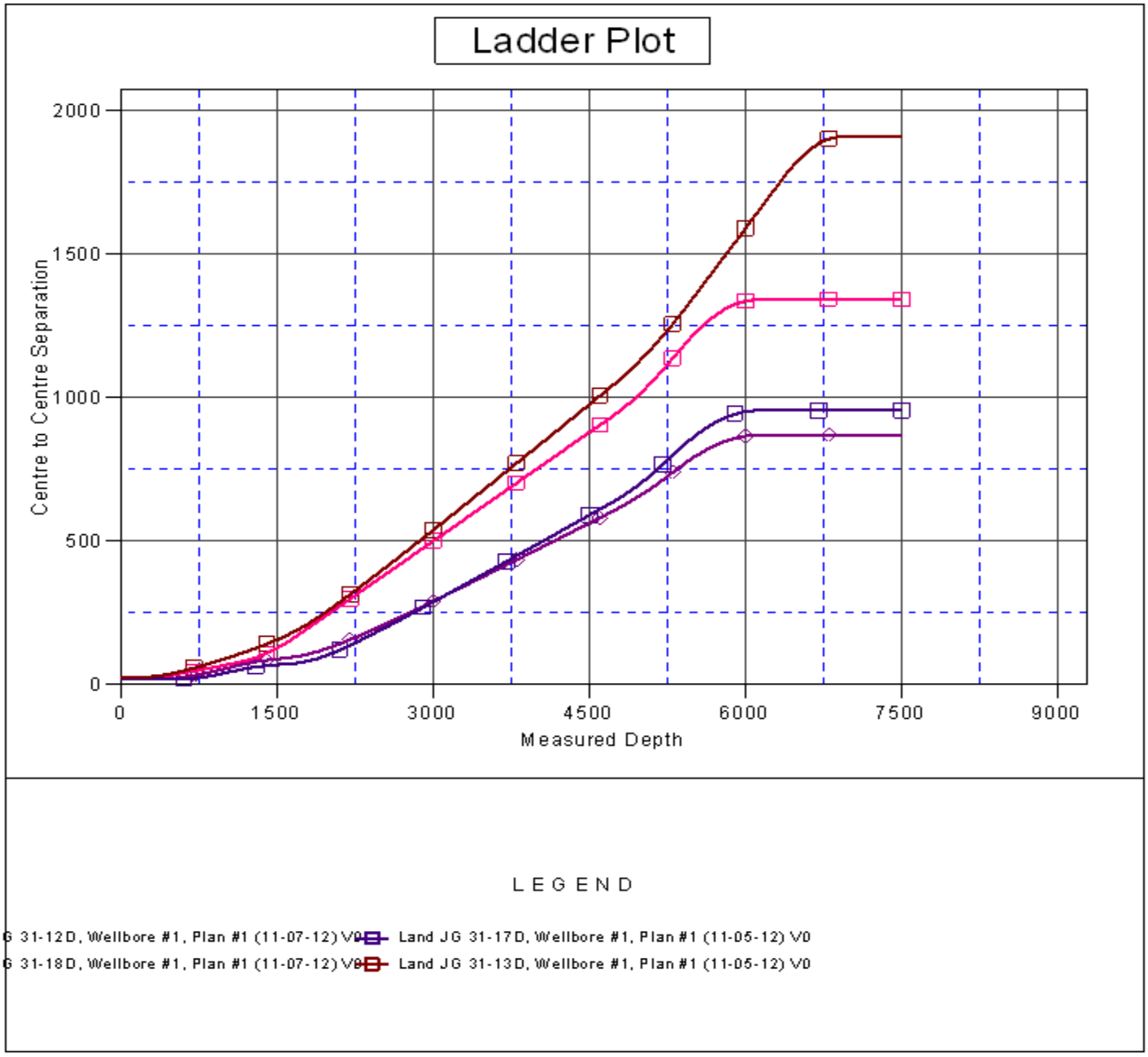
Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,000.0	4,875.6	4,950.1	4,680.6	21.8	29.1	-62.82	1,396.2	-271.3	662.7	620.9	41.78	15.860	
5,100.0	4,974.8	5,046.4	4,769.7	22.0	29.8	-62.18	1,432.1	-278.2	686.6	644.4	42.26	16.248	
5,200.0	5,074.3	5,141.8	4,858.0	22.3	30.6	-61.41	1,467.6	-285.0	712.5	669.9	42.62	16.716	
5,300.0	5,174.1	5,245.4	4,954.0	22.4	31.3	-60.39	1,505.9	-292.3	740.1	697.2	42.85	17.270	
5,400.0	5,274.1	5,366.2	5,067.3	22.6	32.0	-59.14	1,546.9	-300.2	767.2	724.3	42.92	17.876	
5,425.9	5,300.0	5,397.9	5,097.3	22.6	32.1	-46.04	1,556.8	-302.1	774.0	731.1	42.92	18.036	
5,500.0	5,374.1	5,489.4	5,184.6	22.7	32.6	-44.86	1,583.8	-307.3	792.6	749.8	42.83	18.507	
5,600.0	5,474.1	5,615.9	5,306.6	22.8	33.1	-43.52	1,616.5	-313.5	814.8	772.1	42.78	19.046	
5,700.0	5,574.1	5,745.1	5,432.7	22.9	33.6	-42.45	1,644.4	-318.9	833.6	790.8	42.81	19.472	
5,800.0	5,674.1	5,876.8	5,562.3	23.0	34.0	-41.62	1,667.1	-323.3	848.7	805.8	42.90	19.781	
5,900.0	5,774.1	6,010.4	5,694.7	23.1	34.3	-41.03	1,684.1	-326.5	859.9	816.8	43.05	19.973	
6,000.0	5,874.1	6,145.3	5,829.2	23.2	34.6	-40.66	1,695.2	-328.6	867.1	823.9	43.25	20.049	
6,100.0	5,974.1	6,281.0	5,964.8	23.3	34.8	-40.50	1,699.9	-329.5	870.2	826.7	43.49	20.008	
6,200.0	6,074.1	6,390.3	6,074.1	23.5	34.8	-40.49	1,700.2	-329.6	870.4	826.6	43.75	19.895	
6,300.0	6,174.1	6,490.3	6,174.1	23.6	34.9	-40.49	1,700.2	-329.6	870.4	826.4	44.00	19.779	
6,400.0	6,274.1	6,590.3	6,274.1	23.7	35.0	-40.49	1,700.2	-329.6	870.4	826.1	44.26	19.663	
6,500.0	6,374.1	6,690.3	6,374.1	23.8	35.1	-40.49	1,700.2	-329.6	870.4	825.8	44.53	19.548	
6,600.0	6,474.1	6,790.3	6,474.1	24.0	35.2	-40.49	1,700.2	-329.6	870.4	825.6	44.79	19.432	
6,700.0	6,574.1	6,890.3	6,574.1	24.1	35.3	-40.49	1,700.2	-329.6	870.4	825.3	45.06	19.316	
6,800.0	6,674.1	6,990.3	6,674.1	24.2	35.3	-40.49	1,700.2	-329.6	870.4	825.0	45.33	19.201	
6,900.0	6,774.1	7,090.3	6,774.1	24.3	35.4	-40.49	1,700.2	-329.6	870.4	824.8	45.60	19.085	
7,000.0	6,874.1	7,190.3	6,874.1	24.5	35.5	-40.49	1,700.2	-329.6	870.4	824.5	45.88	18.970	
7,100.0	6,974.1	7,290.3	6,974.1	24.6	35.6	-40.49	1,700.2	-329.6	870.4	824.2	46.16	18.855	
7,200.0	7,074.1	7,390.3	7,074.1	24.7	35.7	-40.49	1,700.2	-329.6	870.4	823.9	46.44	18.741	
7,300.0	7,174.1	7,490.3	7,174.1	24.9	35.8	-40.49	1,700.2	-329.6	870.4	823.6	46.73	18.627	
7,400.0	7,274.1	7,590.3	7,274.1	25.0	35.9	-40.49	1,700.2	-329.6	870.4	823.4	47.01	18.513	
7,499.9	7,374.0	7,690.2	7,374.0	25.1	36.0	-40.49	1,700.2	-329.6	870.4	823.1	47.30	18.400	

Company:	Great Western	**Local Co-ordinate Reference:**	Well Land JG 31-19D
Project:	SEC.31-T2N-R64W	**TVD Reference:**	WELL @ 4947.0ft (Original Well Elev)
Reference Site:	Land JG (West) Pad Sec.31-T2N-R64W	**MD Reference:**	WELL @ 4947.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Land JG 31-19D	**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 (11-07-12)	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to WELL @ 4947.0ft (Original Well Elev) Coordinates are relative to: Land JG 31-19D
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°



Company:	Great Western	**Local Co-ordinate Reference:**	Well Land JG 31-19D
Project:	SEC.31-T2N-R64W	**TVD Reference:**	WELL @ 4947.0ft (Original Well Elev)
Reference Site:	Land JG (West) Pad Sec.31-T2N-R64W	**MD Reference:**	WELL @ 4947.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Land JG 31-19D	**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 (11-07-12)	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to WELL @ 4947.0ft (Original Well Elev) Coordinates are relative to: Land JG 31-19D
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°