ENSIGN Directional

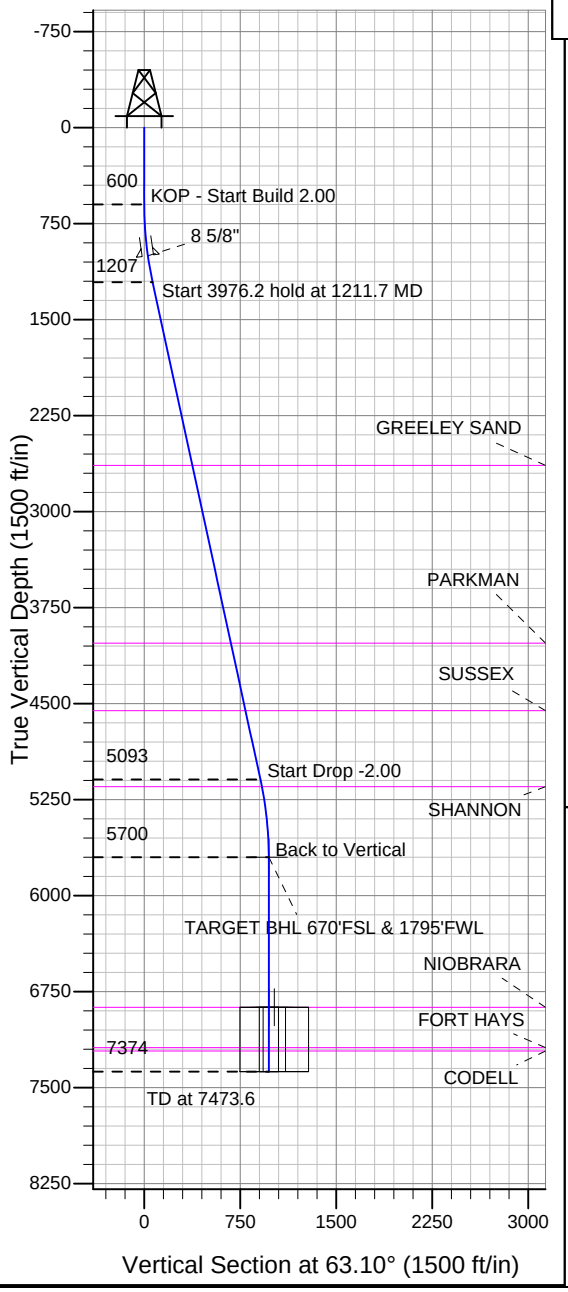
Well Name: Land JG 31-24D

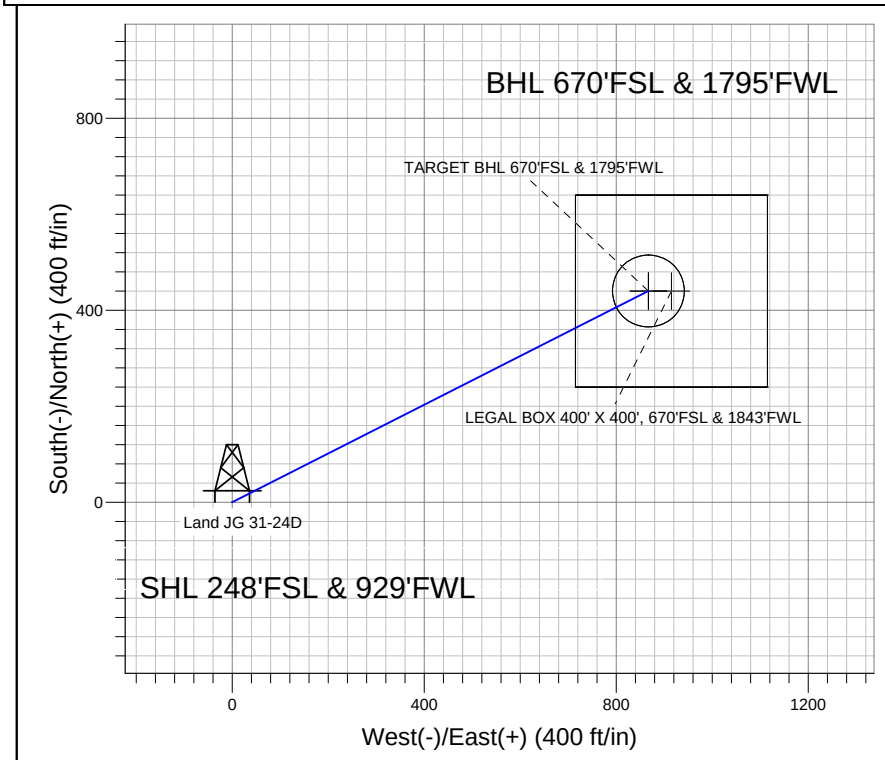
Surface Location: Land JG (East) Pad Sec.31-T2N-R64W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone
Ground Elevation: 4933.0

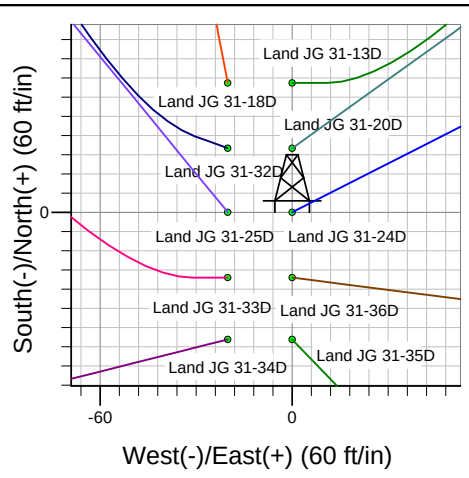
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1276239.60	3251988.99	40.088156	-104.599353	

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

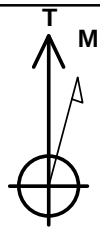
Great Western







Land JG (East) Pad Sec.31-T2N-R64W
Land JG 31-24D
Plan #1 (11-05-12)
15:24, 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 670'FSL & 1795'FWL	5700.0	440.1	867.4	40.089364	-104.596253	Point
LEGAL BOX 400' X 400', 670'FSL & 1843'FWL	6872.0	440.1	915.4	40.089364	-104.596081	**Rectangle (Sides: L400.0 W400.0)**
TARGET CIRCLE 670'FSL & 1795'FWL	6872.0	440.1	867.4	40.089364	-104.596253	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	600.0	0.00	0.00	600.0	0.0	0.0	0.00	0.00	0.0	
3	1211.7	12.23	63.10	1207.0	29.4	58.0	2.00	63.10	65.1	
4	5187.9	12.23	63.10	5093.0	410.7	809.4	0.00	0.00	907.6	
5	5799.6	0.00	0.00	5700.0	440.1	867.4	2.00	180.00	972.6	TARGET BHL 670'FSL & 1795'FWL
6	7473.6	0.00	0.00	7374.0	440.1	867.4	0.00	0.00	972.6	

Great Western

SEC.31-T2N-R64W
Land JG (East) Pad Sec.31-T2N-R64W
Land JG 31-24D

Wellbore #1

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

Standard Planning Report

08 November, 2012

Database:	Landmark	**Local Co-ordinate Reference:**	Well Land JG 31-24D
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 31-24D	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-05-12)		

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 (East) Pad Sec.31-T2N-R64W

Site Position:		**Northing:**	1,276,199.91 ft	**Latitude:**	40.088047
From:	Lat/Long	**Easting:**	3,251,989.40 ft	**Longitude:**	-104.599353
Position Uncertainty:	0.0 ft	**Slot Radius:**	"	**Grid Convergence:**	0.58 °

Well Land JG 31-24D

Well Position	**+N/-S**	39.7 ft	**Northing:**	1,276,239.60 ft	**Latitude:**	40.088156
	+E/-W	0.0 ft	**Easting:**	3,251,988.99 ft	**Longitude:**	-104.599353
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	11/5/2012	8.56	66.78	52,837

Design Plan #1 (11-05-12)

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	63.10

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	
600.0	0.00	0.00	600.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,211.7	12.23	63.10	1,207.0	29.4	58.0	2.00	2.00	0.00	63.10	
5,187.9	12.23	63.10	5,093.0	410.7	809.4	0.00	0.00	0.00	0.00	
5,799.6	0.00	0.00	5,700.0	440.1	867.4	2.00	-2.00	0.00	180.00	TARGET BHL 670'I
7,473.6	0.00	0.00	7,374.0	440.1	867.4	0.00	0.00	0.00	0.00	

Database:	Landmark	**Local Co-ordinate Reference:**	Well Land JG 31-24D
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 31-24D	**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
440.0	0.00	0.00	440.0	0.0	0.0	0.0	0.00	0.00	0.00
480.0	0.00	0.00	480.0	0.0	0.0	0.0	0.00	0.00	0.00
520.0	0.00	0.00	520.0	0.0	0.0	0.0	0.00	0.00	0.00
560.0	0.00	0.00	560.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP - Start Build 2.00									
640.0	0.80	63.10	640.0	0.1	0.2	0.3	2.00	2.00	0.00
680.0	1.60	63.10	680.0	0.5	1.0	1.1	2.00	2.00	0.00
720.0	2.40	63.10	720.0	1.1	2.2	2.5	2.00	2.00	0.00
760.0	3.20	63.10	759.9	2.0	4.0	4.5	2.00	2.00	0.00
800.0	4.00	63.10	799.8	3.2	6.2	7.0	2.00	2.00	0.00
840.0	4.80	63.10	839.7	4.5	9.0	10.0	2.00	2.00	0.00
880.0	5.60	63.10	879.6	6.2	12.2	13.7	2.00	2.00	0.00
920.0	6.40	63.10	919.3	8.1	15.9	17.9	2.00	2.00	0.00
960.0	7.20	63.10	959.1	10.2	20.1	22.6	2.00	2.00	0.00
1,000.0	8.00	63.10	998.7	12.6	24.9	27.9	2.00	2.00	0.00
1,001.3	8.03	63.10	1,000.0	12.7	25.0	28.1	2.00	2.00	0.00
8 5/8"									
1,040.0	8.80	63.10	1,038.3	15.3	30.1	33.7	2.00	2.00	0.00
1,080.0	9.60	63.10	1,077.8	18.2	35.8	40.1	2.00	2.00	0.00
1,120.0	10.40	63.10	1,117.1	21.3	42.0	47.1	2.00	2.00	0.00
1,160.0	11.20	63.10	1,156.4	24.7	48.7	54.6	2.00	2.00	0.00
1,200.0	12.00	63.10	1,195.6	28.3	55.8	62.6	2.00	2.00	0.00
1,211.7	12.23	63.10	1,207.0	29.4	58.0	65.1	2.00	2.00	0.00
Start 3976.2 hold at 1211.7 MD									
1,240.0	12.23	63.10	1,234.7	32.2	63.4	71.1	0.00	0.00	0.00
1,280.0	12.23	63.10	1,273.8	36.0	70.9	79.5	0.00	0.00	0.00
1,320.0	12.23	63.10	1,312.9	39.8	78.5	88.0	0.00	0.00	0.00
1,360.0	12.23	63.10	1,352.0	43.7	86.0	96.5	0.00	0.00	0.00
1,400.0	12.23	63.10	1,391.1	47.5	93.6	105.0	0.00	0.00	0.00
1,440.0	12.23	63.10	1,430.2	51.3	101.2	113.4	0.00	0.00	0.00
1,480.0	12.23	63.10	1,469.3	55.2	108.7	121.9	0.00	0.00	0.00
1,520.0	12.23	63.10	1,508.4	59.0	116.3	130.4	0.00	0.00	0.00
1,560.0	12.23	63.10	1,547.5	62.8	123.8	138.9	0.00	0.00	0.00
1,600.0	12.23	63.10	1,586.5	66.7	131.4	147.3	0.00	0.00	0.00
1,640.0	12.23	63.10	1,625.6	70.5	138.9	155.8	0.00	0.00	0.00
1,680.0	12.23	63.10	1,664.7	74.3	146.5	164.3	0.00	0.00	0.00
1,720.0	12.23	63.10	1,703.8	78.2	154.1	172.8	0.00	0.00	0.00
1,760.0	12.23	63.10	1,742.9	82.0	161.6	181.2	0.00	0.00	0.00
1,800.0	12.23	63.10	1,782.0	85.8	169.2	189.7	0.00	0.00	0.00
1,840.0	12.23	63.10	1,821.1	89.7	176.7	198.2	0.00	0.00	0.00
1,880.0	12.23	63.10	1,860.2	93.5	184.3	206.7	0.00	0.00	0.00

Database:	Landmark	**Local Co-ordinate Reference:**	Well Land JG 31-24D
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 31-24D	**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	12.23	63.10	1,899.3	97.3	191.9	215.1	0.00	0.00	0.00
1,960.0	12.23	63.10	1,938.4	101.2	199.4	223.6	0.00	0.00	0.00
2,000.0	12.23	63.10	1,977.5	105.0	207.0	232.1	0.00	0.00	0.00
2,040.0	12.23	63.10	2,016.6	108.9	214.5	240.6	0.00	0.00	0.00
2,080.0	12.23	63.10	2,055.6	112.7	222.1	249.0	0.00	0.00	0.00
2,120.0	12.23	63.10	2,094.7	116.5	229.7	257.5	0.00	0.00	0.00
2,160.0	12.23	63.10	2,133.8	120.4	237.2	266.0	0.00	0.00	0.00
2,200.0	12.23	63.10	2,172.9	124.2	244.8	274.5	0.00	0.00	0.00
2,240.0	12.23	63.10	2,212.0	128.0	252.3	282.9	0.00	0.00	0.00
2,280.0	12.23	63.10	2,251.1	131.9	259.9	291.4	0.00	0.00	0.00
2,320.0	12.23	63.10	2,290.2	135.7	267.4	299.9	0.00	0.00	0.00
2,360.0	12.23	63.10	2,329.3	139.5	275.0	308.4	0.00	0.00	0.00
2,400.0	12.23	63.10	2,368.4	143.4	282.6	316.8	0.00	0.00	0.00
2,440.0	12.23	63.10	2,407.5	147.2	290.1	325.3	0.00	0.00	0.00
2,480.0	12.23	63.10	2,446.6	151.0	297.7	333.8	0.00	0.00	0.00
2,520.0	12.23	63.10	2,485.7	154.9	305.2	342.3	0.00	0.00	0.00
2,560.0	12.23	63.10	2,524.7	158.7	312.8	350.8	0.00	0.00	0.00
2,600.0	12.23	63.10	2,563.8	162.5	320.4	359.2	0.00	0.00	0.00
2,640.0	12.23	63.10	2,602.9	166.4	327.9	367.7	0.00	0.00	0.00
2,676.9	12.23	63.10	2,639.0	169.9	334.9	375.5	0.00	0.00	0.00
GREELEY SAND									
2,680.0	12.23	63.10	2,642.0	170.2	335.5	376.2	0.00	0.00	0.00
2,720.0	12.23	63.10	2,681.1	174.0	343.0	384.7	0.00	0.00	0.00
2,760.0	12.23	63.10	2,720.2	177.9	350.6	393.1	0.00	0.00	0.00
2,800.0	12.23	63.10	2,759.3	181.7	358.1	401.6	0.00	0.00	0.00
2,840.0	12.23	63.10	2,798.4	185.6	365.7	410.1	0.00	0.00	0.00
2,880.0	12.23	63.10	2,837.5	189.4	373.3	418.6	0.00	0.00	0.00
2,920.0	12.23	63.10	2,876.6	193.2	380.8	427.0	0.00	0.00	0.00
2,960.0	12.23	63.10	2,915.7	197.1	388.4	435.5	0.00	0.00	0.00
3,000.0	12.23	63.10	2,954.8	200.9	395.9	444.0	0.00	0.00	0.00
3,040.0	12.23	63.10	2,993.8	204.7	403.5	452.5	0.00	0.00	0.00
3,080.0	12.23	63.10	3,032.9	208.6	411.1	460.9	0.00	0.00	0.00
3,120.0	12.23	63.10	3,072.0	212.4	418.6	469.4	0.00	0.00	0.00
3,160.0	12.23	63.10	3,111.1	216.2	426.2	477.9	0.00	0.00	0.00
3,200.0	12.23	63.10	3,150.2	220.1	433.7	486.4	0.00	0.00	0.00
3,240.0	12.23	63.10	3,189.3	223.9	441.3	494.8	0.00	0.00	0.00
3,280.0	12.23	63.10	3,228.4	227.7	448.8	503.3	0.00	0.00	0.00
3,320.0	12.23	63.10	3,267.5	231.6	456.4	511.8	0.00	0.00	0.00
3,360.0	12.23	63.10	3,306.6	235.4	464.0	520.3	0.00	0.00	0.00
3,400.0	12.23	63.10	3,345.7	239.2	471.5	528.7	0.00	0.00	0.00
3,440.0	12.23	63.10	3,384.8	243.1	479.1	537.2	0.00	0.00	0.00
3,480.0	12.23	63.10	3,423.9	246.9	486.6	545.7	0.00	0.00	0.00
3,520.0	12.23	63.10	3,462.9	250.7	494.2	554.2	0.00	0.00	0.00
3,560.0	12.23	63.10	3,502.0	254.6	501.8	562.6	0.00	0.00	0.00
3,600.0	12.23	63.10	3,541.1	258.4	509.3	571.1	0.00	0.00	0.00
3,640.0	12.23	63.10	3,580.2	262.3	516.9	579.6	0.00	0.00	0.00
3,680.0	12.23	63.10	3,619.3	266.1	524.4	588.1	0.00	0.00	0.00
3,720.0	12.23	63.10	3,658.4	269.9	532.0	596.5	0.00	0.00	0.00
3,760.0	12.23	63.10	3,697.5	273.8	539.5	605.0	0.00	0.00	0.00
3,800.0	12.23	63.10	3,736.6	277.6	547.1	613.5	0.00	0.00	0.00
3,840.0	12.23	63.10	3,775.7	281.4	554.7	622.0	0.00	0.00	0.00
3,880.0	12.23	63.10	3,814.8	285.3	562.2	630.4	0.00	0.00	0.00
3,920.0	12.23	63.10	3,853.9	289.1	569.8	638.9	0.00	0.00	0.00
3,960.0	12.23	63.10	3,893.0	292.9	577.3	647.4	0.00	0.00	0.00

Database:	Landmark	**Local Co-ordinate Reference:**	Well Land JG 31-24D
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 31-24D	**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	12.23	63.10	3,932.0	296.8	584.9	655.9	0.00	0.00	0.00
4,040.0	12.23	63.10	3,971.1	300.6	592.5	664.4	0.00	0.00	0.00
4,080.0	12.23	63.10	4,010.2	304.4	600.0	672.8	0.00	0.00	0.00
4,098.2	12.23	63.10	4,028.0	306.2	603.4	676.7	0.00	0.00	0.00
PARKMAN									
4,120.0	12.23	63.10	4,049.3	308.3	607.6	681.3	0.00	0.00	0.00
4,160.0	12.23	63.10	4,088.4	312.1	615.1	689.8	0.00	0.00	0.00
4,200.0	12.23	63.10	4,127.5	315.9	622.7	698.3	0.00	0.00	0.00
4,240.0	12.23	63.10	4,166.6	319.8	630.2	706.7	0.00	0.00	0.00
4,280.0	12.23	63.10	4,205.7	323.6	637.8	715.2	0.00	0.00	0.00
4,320.0	12.23	63.10	4,244.8	327.4	645.4	723.7	0.00	0.00	0.00
4,360.0	12.23	63.10	4,283.9	331.3	652.9	732.2	0.00	0.00	0.00
4,400.0	12.23	63.10	4,323.0	335.1	660.5	740.6	0.00	0.00	0.00
4,440.0	12.23	63.10	4,362.1	339.0	668.0	749.1	0.00	0.00	0.00
4,480.0	12.23	63.10	4,401.1	342.8	675.6	757.6	0.00	0.00	0.00
4,520.0	12.23	63.10	4,440.2	346.6	683.2	766.1	0.00	0.00	0.00
4,560.0	12.23	63.10	4,479.3	350.5	690.7	774.5	0.00	0.00	0.00
4,600.0	12.23	63.10	4,518.4	354.3	698.3	783.0	0.00	0.00	0.00
4,636.4	12.23	63.10	4,554.0	357.8	705.2	790.7	0.00	0.00	0.00
SUSSEX									
4,640.0	12.23	63.10	4,557.5	358.1	705.8	791.5	0.00	0.00	0.00
4,680.0	12.23	63.10	4,596.6	362.0	713.4	800.0	0.00	0.00	0.00
4,720.0	12.23	63.10	4,635.7	365.8	720.9	808.4	0.00	0.00	0.00
4,760.0	12.23	63.10	4,674.8	369.6	728.5	816.9	0.00	0.00	0.00
4,800.0	12.23	63.10	4,713.9	373.5	736.1	825.4	0.00	0.00	0.00
4,840.0	12.23	63.10	4,753.0	377.3	743.6	833.9	0.00	0.00	0.00
4,880.0	12.23	63.10	4,792.1	381.1	751.2	842.3	0.00	0.00	0.00
4,920.0	12.23	63.10	4,831.2	385.0	758.7	850.8	0.00	0.00	0.00
4,960.0	12.23	63.10	4,870.3	388.8	766.3	859.3	0.00	0.00	0.00
5,000.0	12.23	63.10	4,909.3	392.6	773.9	867.8	0.00	0.00	0.00
5,040.0	12.23	63.10	4,948.4	396.5	781.4	876.2	0.00	0.00	0.00
5,080.0	12.23	63.10	4,987.5	400.3	789.0	884.7	0.00	0.00	0.00
5,120.0	12.23	63.10	5,026.6	404.1	796.5	893.2	0.00	0.00	0.00
5,160.0	12.23	63.10	5,065.7	408.0	804.1	901.7	0.00	0.00	0.00
5,187.9	12.23	63.10	5,093.0	410.7	809.4	907.6	0.00	0.00	0.00
Start Drop -2.00									
5,200.0	11.99	63.10	5,104.8	411.8	811.6	910.1	2.00	-2.00	0.00
5,240.0	11.19	63.10	5,144.0	415.4	818.8	918.2	2.00	-2.00	0.00
5,244.1	11.11	63.10	5,148.0	415.8	819.5	918.9	2.00	-2.00	0.00
SHANNON									
5,280.0	10.39	63.10	5,183.3	418.8	825.5	925.6	2.00	-2.00	0.00
5,320.0	9.59	63.10	5,222.7	422.0	831.7	932.6	2.00	-2.00	0.00
5,360.0	8.79	63.10	5,262.2	424.9	837.4	939.0	2.00	-2.00	0.00
5,400.0	7.99	63.10	5,301.7	427.5	842.6	944.8	2.00	-2.00	0.00
5,440.0	7.19	63.10	5,341.4	429.9	847.3	950.1	2.00	-2.00	0.00
5,480.0	6.39	63.10	5,381.1	432.0	851.5	954.8	2.00	-2.00	0.00
5,520.0	5.59	63.10	5,420.9	433.9	855.2	959.0	2.00	-2.00	0.00
5,560.0	4.79	63.10	5,460.7	435.6	858.4	962.6	2.00	-2.00	0.00
5,600.0	3.99	63.10	5,500.6	436.9	861.2	965.7	2.00	-2.00	0.00
5,640.0	3.19	63.10	5,540.5	438.1	863.4	968.2	2.00	-2.00	0.00
5,680.0	2.39	63.10	5,580.5	439.0	865.1	970.1	2.00	-2.00	0.00
5,720.0	1.59	63.10	5,620.4	439.6	866.4	971.5	2.00	-2.00	0.00
5,760.0	0.79	63.10	5,660.4	440.0	867.1	972.4	2.00	-2.00	0.00

Database:	Landmark	**Local Co-ordinate Reference:**	Well Land JG 31-24D
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 31-24D	**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)
5,799.6	0.00	0.00	5,700.0	440.1	867.4	972.6	2.00	-2.00	-159.49
Back to Vertical - TARGET BHL 670'FSL & 1795'FWL									
5,800.0	0.00	0.00	5,700.4	440.1	867.4	972.6	0.00	0.00	0.00
5,840.0	0.00	0.00	5,740.4	440.1	867.4	972.6	0.00	0.00	0.00
5,880.0	0.00	0.00	5,780.4	440.1	867.4	972.6	0.00	0.00	0.00
5,920.0	0.00	0.00	5,820.4	440.1	867.4	972.6	0.00	0.00	0.00
5,960.0	0.00	0.00	5,860.4	440.1	867.4	972.6	0.00	0.00	0.00
6,000.0	0.00	0.00	5,900.4	440.1	867.4	972.6	0.00	0.00	0.00
6,040.0	0.00	0.00	5,940.4	440.1	867.4	972.6	0.00	0.00	0.00
6,080.0	0.00	0.00	5,980.4	440.1	867.4	972.6	0.00	0.00	0.00
6,120.0	0.00	0.00	6,020.4	440.1	867.4	972.6	0.00	0.00	0.00
6,160.0	0.00	0.00	6,060.4	440.1	867.4	972.6	0.00	0.00	0.00
6,200.0	0.00	0.00	6,100.4	440.1	867.4	972.6	0.00	0.00	0.00
6,240.0	0.00	0.00	6,140.4	440.1	867.4	972.6	0.00	0.00	0.00
6,280.0	0.00	0.00	6,180.4	440.1	867.4	972.6	0.00	0.00	0.00
6,320.0	0.00	0.00	6,220.4	440.1	867.4	972.6	0.00	0.00	0.00
6,360.0	0.00	0.00	6,260.4	440.1	867.4	972.6	0.00	0.00	0.00
6,400.0	0.00	0.00	6,300.4	440.1	867.4	972.6	0.00	0.00	0.00
6,440.0	0.00	0.00	6,340.4	440.1	867.4	972.6	0.00	0.00	0.00
6,480.0	0.00	0.00	6,380.4	440.1	867.4	972.6	0.00	0.00	0.00
6,520.0	0.00	0.00	6,420.4	440.1	867.4	972.6	0.00	0.00	0.00
6,560.0	0.00	0.00	6,460.4	440.1	867.4	972.6	0.00	0.00	0.00
6,600.0	0.00	0.00	6,500.4	440.1	867.4	972.6	0.00	0.00	0.00
6,640.0	0.00	0.00	6,540.4	440.1	867.4	972.6	0.00	0.00	0.00
6,680.0	0.00	0.00	6,580.4	440.1	867.4	972.6	0.00	0.00	0.00
6,720.0	0.00	0.00	6,620.4	440.1	867.4	972.6	0.00	0.00	0.00
6,760.0	0.00	0.00	6,660.4	440.1	867.4	972.6	0.00	0.00	0.00
6,800.0	0.00	0.00	6,700.4	440.1	867.4	972.6	0.00	0.00	0.00
6,840.0	0.00	0.00	6,740.4	440.1	867.4	972.6	0.00	0.00	0.00
6,880.0	0.00	0.00	6,780.4	440.1	867.4	972.6	0.00	0.00	0.00
6,920.0	0.00	0.00	6,820.4	440.1	867.4	972.6	0.00	0.00	0.00
6,960.0	0.00	0.00	6,860.4	440.1	867.4	972.6	0.00	0.00	0.00
6,971.6	0.00	0.00	6,872.0	440.1	867.4	972.6	0.00	0.00	0.00
NIOBRARA - LEGAL BOX 400' X 400', 670'FSL & 1843'FWL - TARGET CIRCLE 670'FSL & 1795'FWL									
7,000.0	0.00	0.00	6,900.4	440.1	867.4	972.6	0.00	0.00	0.00
7,040.0	0.00	0.00	6,940.4	440.1	867.4	972.6	0.00	0.00	0.00
7,080.0	0.00	0.00	6,980.4	440.1	867.4	972.6	0.00	0.00	0.00
7,120.0	0.00	0.00	7,020.4	440.1	867.4	972.6	0.00	0.00	0.00
7,160.0	0.00	0.00	7,060.4	440.1	867.4	972.6	0.00	0.00	0.00
7,200.0	0.00	0.00	7,100.4	440.1	867.4	972.6	0.00	0.00	0.00
7,240.0	0.00	0.00	7,140.4	440.1	867.4	972.6	0.00	0.00	0.00
7,280.0	0.00	0.00	7,180.4	440.1	867.4	972.6	0.00	0.00	0.00
7,286.6	0.00	0.00	7,187.0	440.1	867.4	972.6	0.00	0.00	0.00
FORT HAYS									
7,313.6	0.00	0.00	7,214.0	440.1	867.4	972.6	0.00	0.00	0.00
CODELL									
7,320.0	0.00	0.00	7,220.4	440.1	867.4	972.6	0.00	0.00	0.00
7,360.0	0.00	0.00	7,260.4	440.1	867.4	972.6	0.00	0.00	0.00
7,400.0	0.00	0.00	7,300.4	440.1	867.4	972.6	0.00	0.00	0.00
7,440.0	0.00	0.00	7,340.4	440.1	867.4	972.6	0.00	0.00	0.00
7,473.6	0.00	0.00	7,374.0	440.1	867.4	972.6	0.00	0.00	0.00
TD at 7473.6									

Database:	Landmark	**Local Co-ordinate Reference:**	Well Land JG 31-24D
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 31-24D	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-05-12)		

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
TARGET BHL 670'FS - plan hits target center - Point	0.00	0.00	5,700.0	440.1	867.4	1,276,688.46	3,252,851.82	40.089364	-104.596253
LEGAL BOX 400' X 4(- plan misses target center by 48.0ft at 6971.6ft MD (6872.0 TVD, 440.1 N, 867.4 E) - Rectangle (sides W400.0 H400.0 D502.0)	0.00	0.00	6,872.0	440.1	915.4	1,276,688.96	3,252,899.84	40.089364	-104.596081
TARGET CIRCLE 67(- plan hits target center - Circle (radius 75.0)	0.00	0.00	6,872.0	440.1	867.4	1,276,688.46	3,252,851.82	40.089364	-104.596253

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
1,001.3	1,000.0	8 5/8"	8-5/8	12-1/4

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,676.9	2,639.0	GREELEY SAND		0.00	
4,098.2	4,028.0	PARKMAN		0.00	
4,636.4	4,554.0	SUSSEX		0.00	
5,244.1	5,148.0	SHANNON		0.00	
6,971.6	6,872.0	NIOBRARA		0.00	
7,286.6	7,187.0	FORT HAYS		0.00	
7,313.6	7,214.0	CODELL		0.00	

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
600.0	600.0	0.0	0.0	KOP - Start Build 2.00
1,211.7	1,207.0	29.4	58.0	Start 3976.2 hold at 1211.7 MD
5,187.9	5,093.0	410.7	809.4	Start Drop -2.00
5,799.6	5,700.0	440.1	867.4	Back to Vertical
7,473.6	7,374.0	440.1	867.4	TD at 7473.6

ENSIGN Directional

Great Western

SEC.31-T2N-R64W
Land JG (East) Pad Sec.31-T2N-R64W
Land JG 31-24D

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

Anticollision Report

08 November, 2012

Company:	Great Western	**Local Co-ordinate Reference:**	Well Land JG 31-24D
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 31-24D	**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 Plan #1 (11-05-12)

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	7,473.6	Plan #1 (11-05-12) (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 31-20D - Wellbore #1 - Plan #1 (11-05-12)	400.0	400.0	20.0	18.5	12.735	CC, ES
Land JG 31-20D - Wellbore #1 - Plan #1 (11-05-12)	600.0	598.9	24.7	22.3	10.046	SF
Land JG 31-36D - Wellbore #1 - Plan #1 (11-05-12)	400.0	400.0	20.4	18.8	12.969	CC
Land JG 31-36D - Wellbore #1 - Plan #1 (11-05-12)	500.0	499.9	20.7	18.7	10.301	ES
Land JG 31-36D - Wellbore #1 - Plan #1 (11-05-12)	600.0	599.5	22.4	19.9	9.157	SF
Land JG (West) Pad Sec.31-T2N-R64W						
Land JG 31-25D - Wellbore #1 - Plan #1 (11-07-12)	600.0	600.0	20.1	17.7	8.148	CC, ES
Land JG 31-25D - Wellbore #1 - Plan #1 (11-07-12)	700.0	700.0	21.7	18.8	7.449	SF
Land JG 31-32D - Wellbore #1 - Plan #1 (11-07-12)	200.0	200.0	28.4	27.7	42.133	CC, ES
Land JG 31-32D - Wellbore #1 - Plan #1 (11-07-12)	500.0	496.4	42.9	40.9	21.186	SF
Land JG 31-33D - Wellbore #1 - Plan #1 (11-07-12)	400.0	400.0	28.7	27.1	18.225	CC, ES
Land JG 31-33D - Wellbore #1 - Plan #1 (11-07-12)	600.0	598.3	33.9	31.5	13.855	SF

Offset Design Land JG (East) Pad Sec.31-T2N-R64W - Land JG 31-20D - 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	0.00	20.0	0.0	20.0				
100.0	100.0	100.0	100.0	0.1	0.1	0.00	20.0	0.0	20.0	19.8	0.22	89.142	
200.0	200.0	200.0	200.0	0.3	0.3	0.00	20.0	0.0	20.0	19.4	0.67	29.714	
300.0	300.0	300.0	300.0	0.6	0.6	0.00	20.0	0.0	20.0	18.9	1.12	17.828	
400.0	400.0	400.0	400.0	0.8	0.8	0.00	20.0	0.0	20.0	18.5	1.57	12.735	CC, ES
500.0	500.0	499.6	499.5	1.0	1.0	3.82	21.0	1.4	21.1	19.1	2.02	10.460	
600.0	600.0	598.9	598.7	1.2	1.2	13.12	24.1	5.6	24.7	22.3	2.46	10.046	SF
700.0	700.0	697.9	697.3	1.5	1.5	-41.69	29.0	12.6	30.4	27.5	2.91	10.451	
800.0	799.8	796.6	795.4	1.7	1.7	-36.82	36.0	22.3	36.8	33.5	3.36	10.950	
900.0	899.5	895.1	892.7	1.9	2.0	-34.01	44.9	34.7	43.6	39.8	3.83	11.392	
1,000.0	998.7	993.4	989.2	2.2	2.4	-32.49	55.7	49.8	50.7	46.4	4.32	11.744	
1,100.0	1,097.5	1,091.4	1,084.7	2.5	2.8	-31.81	68.4	67.5	57.9	53.1	4.83	11.997	
1,200.0	1,195.6	1,189.2	1,179.3	2.8	3.2	-31.69	83.0	87.8	65.4	60.0	5.38	12.148	
1,211.7	1,207.0	1,200.0	1,189.6	2.8	3.3	-31.70	84.7	90.2	66.3	60.8	5.45	12.168	
1,300.0	1,293.4	1,286.7	1,272.6	3.2	3.7	-31.48	99.3	110.6	74.1	68.2	5.98	12.390	

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 31-24D
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 31-24D	**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 31-20D - 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
1,400.0	1,391.1	1,383.5	1,364.3	3.6	4.3	-30.47	117.4	135.9	86.0	79.4	6.60	13.038	
1,500.0	1,488.8	1,479.4	1,454.0	4.0	5.0	-29.04	137.1	163.3	101.0	93.8	7.20	14.017	
1,600.0	1,586.5	1,574.9	1,542.3	4.4	5.6	-27.46	158.4	193.1	119.1	111.2	7.81	15.240	
1,700.0	1,684.3	1,673.0	1,632.5	4.8	6.4	-26.12	180.8	224.4	138.3	129.8	8.43	16.403	
1,800.0	1,782.0	1,771.1	1,722.7	5.3	7.1	-25.10	203.3	255.8	157.5	148.5	9.05	17.404	
1,900.0	1,879.7	1,869.2	1,812.9	5.7	7.9	-24.31	225.7	287.1	176.8	167.1	9.68	18.270	
2,000.0	1,977.5	1,967.3	1,903.1	6.2	8.7	-23.68	248.2	318.4	196.1	185.8	10.31	19.024	
2,100.0	2,075.2	2,065.4	1,993.3	6.6	9.4	-23.15	270.7	349.8	215.4	204.5	10.94	19.687	
2,200.0	2,172.9	2,163.5	2,083.5	7.0	10.2	-22.72	293.1	381.1	234.8	223.2	11.58	20.272	
2,300.0	2,270.7	2,261.6	2,173.7	7.5	11.0	-22.35	315.6	412.4	254.1	241.9	12.22	20.793	
2,400.0	2,368.4	2,359.7	2,263.9	7.9	11.8	-22.03	338.0	443.8	273.5	260.6	12.87	21.258	
2,500.0	2,466.1	2,457.8	2,354.1	8.4	12.6	-21.75	360.5	475.1	292.9	279.4	13.51	21.677	
2,600.0	2,563.8	2,555.9	2,444.3	8.9	13.3	-21.51	382.9	506.5	312.2	298.1	14.16	22.055	
2,700.0	2,661.6	2,654.0	2,534.5	9.3	14.1	-21.30	405.4	537.8	331.6	316.8	14.81	22.398	
2,800.0	2,759.3	2,752.1	2,624.7	9.8	14.9	-21.11	427.8	569.1	351.0	335.6	15.46	22.711	
2,900.0	2,857.0	2,850.2	2,714.9	10.2	15.7	-20.94	450.3	600.5	370.4	354.3	16.11	22.997	
3,000.0	2,954.8	2,948.3	2,805.1	10.7	16.5	-20.79	472.8	631.8	389.8	373.0	16.76	23.259	
3,100.0	3,052.5	3,046.4	2,895.3	11.1	17.3	-20.65	495.2	663.2	409.2	391.8	17.41	23.501	
3,200.0	3,150.2	3,144.5	2,985.5	11.6	18.0	-20.52	517.7	694.5	428.6	410.5	18.06	23.725	
3,300.0	3,247.9	3,242.6	3,075.7	12.0	18.8	-20.41	540.1	725.8	448.0	429.3	18.72	23.932	
3,400.0	3,345.7	3,340.7	3,165.9	12.5	19.6	-20.30	562.6	757.2	467.4	448.0	19.37	24.124	
3,500.0	3,443.4	3,438.8	3,256.1	13.0	20.4	-20.21	585.0	788.5	486.8	466.8	20.03	24.303	
3,600.0	3,541.1	3,536.9	3,346.3	13.4	21.2	-20.12	607.5	819.8	506.2	485.5	20.69	24.470	
3,700.0	3,638.9	3,635.0	3,436.5	13.9	22.0	-20.03	629.9	851.2	525.6	504.2	21.34	24.627	
3,800.0	3,736.6	3,733.0	3,526.8	14.3	22.8	-19.96	652.4	882.5	545.0	523.0	22.00	24.773	
3,900.0	3,834.3	3,831.1	3,617.0	14.8	23.6	-19.89	674.9	913.9	564.4	541.7	22.66	24.911	
4,000.0	3,932.0	3,929.2	3,707.2	15.2	24.4	-19.82	697.3	945.2	583.8	560.5	23.31	25.041	
4,100.0	4,029.8	4,027.3	3,797.4	15.7	25.2	-19.76	719.8	976.5	603.2	579.2	23.97	25.163	
4,200.0	4,127.5	4,125.4	3,887.6	16.2	25.9	-19.70	742.2	1,007.9	622.6	598.0	24.63	25.278	
4,300.0	4,225.2	4,223.5	3,977.8	16.6	26.7	-19.64	764.7	1,039.2	642.0	616.7	25.29	25.387	
4,400.0	4,323.0	4,321.6	4,068.0	17.1	27.5	-19.59	787.1	1,070.6	661.4	635.5	25.95	25.491	
4,500.0	4,420.7	4,419.7	4,158.2	17.5	28.3	-19.54	809.6	1,101.9	680.8	654.2	26.61	25.589	
4,600.0	4,518.4	4,517.8	4,248.4	18.0	29.1	-19.49	832.0	1,133.2	700.3	673.0	27.27	25.682	
4,700.0	4,616.2	4,615.9	4,338.6	18.5	29.9	-19.45	854.5	1,164.6	719.7	691.7	27.93	25.770	
4,800.0	4,713.9	4,714.0	4,428.8	18.9	30.7	-19.41	877.0	1,195.9	739.1	710.5	28.59	25.854	
4,900.0	4,811.6	4,812.1	4,519.0	19.4	31.5	-19.37	899.4	1,227.2	758.5	729.2	29.25	25.934	
5,000.0	4,909.3	4,910.2	4,609.2	19.8	32.3	-19.33	921.9	1,258.6	777.9	748.0	29.91	26.011	
5,100.0	5,007.1	5,008.3	4,699.4	20.3	33.1	-19.30	944.3	1,289.9	797.3	766.7	30.57	26.084	
5,187.9	5,093.0	5,094.5	4,778.7	20.7	33.8	-19.27	964.1	1,317.5	814.4	783.2	31.15	26.145	
5,200.0	5,104.8	5,106.4	4,789.6	20.7	33.9	-19.28	966.8	1,321.3	816.7	785.5	31.22	26.162	
5,300.0	5,203.0	5,206.4	4,881.5	21.1	34.6	-19.34	989.7	1,353.2	838.2	806.4	31.75	26.401	
5,400.0	5,301.7	5,344.0	5,009.5	21.4	35.5	-19.31	1,019.2	1,394.4	860.2	828.0	32.27	26.661	
5,500.0	5,401.0	5,483.5	5,141.5	21.6	36.2	-19.26	1,045.4	1,431.0	880.9	848.2	32.71	26.933	
5,600.0	5,500.6	5,624.8	5,277.3	21.8	36.9	-19.18	1,068.1	1,462.7	900.0	867.0	33.06	27.221	
5,700.0	5,600.5	5,767.9	5,416.6	22.0	37.4	-19.08	1,087.1	1,489.2	917.6	884.3	33.34	27.525	
5,799.6	5,700.0	5,911.9	5,558.3	22.1	37.9	44.15	1,102.1	1,510.2	933.6	900.0	33.53	27.842	
5,900.0	5,800.4	6,059.1	5,704.2	22.2	38.3	44.36	1,113.2	1,525.6	946.3	912.4	33.90	27.912	
6,000.0	5,900.4	6,207.2	5,851.8	22.3	38.5	44.48	1,119.8	1,534.9	953.9	919.7	34.28	27.829	
6,100.0	6,000.4	6,355.8	6,000.4	22.5	38.7	44.52	1,122.1	1,538.0	956.5	921.8	34.64	27.612	
6,200.0	6,100.4	6,455.8	6,100.4	22.6	38.7	44.52	1,122.1	1,538.0	956.5	921.5	34.95	27.364	
6,300.0	6,200.4	6,555.8	6,200.4	22.7	38.8	44.52	1,122.1	1,538.0	956.5	921.2	35.28	27.115	
6,400.0	6,300.4	6,655.8	6,300.4	22.9	38.9	44.52	1,122.1	1,538.0	956.5	920.9	35.60	26.868	

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 31-24D
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 31-24D	**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 31-20D - 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
6,500.0	6,400.4	6,755.8	6,400.4	23.0	39.0	44.52	1,122.1	1,538.0	956.5	920.6	35.92	26.625	
6,600.0	6,500.4	6,855.8	6,500.4	23.1	39.0	44.52	1,122.1	1,538.0	956.5	920.2	36.25	26.383	
6,700.0	6,600.4	6,955.8	6,600.4	23.3	39.1	44.52	1,122.1	1,538.0	956.5	919.9	36.58	26.145	
6,800.0	6,700.4	7,055.8	6,700.4	23.4	39.2	44.52	1,122.1	1,538.0	956.5	919.6	36.92	25.908	
6,900.0	6,800.4	7,155.8	6,800.4	23.5	39.3	44.52	1,122.1	1,538.0	956.5	919.2	37.25	25.675	
7,000.0	6,900.4	7,255.8	6,900.4	23.7	39.4	44.52	1,122.1	1,538.0	956.5	918.9	37.59	25.444	
7,100.0	7,000.4	7,355.8	7,000.4	23.8	39.4	44.52	1,122.1	1,538.0	956.5	918.5	37.93	25.215	
7,200.0	7,100.4	7,455.8	7,100.4	23.9	39.5	44.52	1,122.1	1,538.0	956.5	918.2	38.28	24.990	
7,300.0	7,200.4	7,555.8	7,200.4	24.1	39.6	44.52	1,122.1	1,538.0	956.5	917.9	38.62	24.767	
7,400.0	7,300.4	7,655.8	7,300.4	24.2	39.7	44.52	1,122.1	1,538.0	956.5	917.5	38.97	24.546	
7,473.6	7,374.0	7,729.4	7,374.0	24.3	39.8	44.52	1,122.1	1,538.0	956.5	917.3	39.22	24.386	

Company:	Great Western	**Local Co-ordinate Reference:**	Well Land JG 31-24D
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 31-24D	**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 31-36D - 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	-180.00	-20.4	0.0	20.4				
100.0	100.0	100.0	100.0	0.1	0.1	-180.00	-20.4	0.0	20.4	20.2	0.22	90.781	
200.0	200.0	200.0	200.0	0.3	0.3	-180.00	-20.4	0.0	20.4	19.7	0.67	30.260	
300.0	300.0	300.0	300.0	0.6	0.6	-180.00	-20.4	0.0	20.4	19.3	1.12	18.156	
400.0	400.0	400.0	400.0	0.8	0.8	-180.00	-20.4	0.0	20.4	18.8	1.57	12.969	CC
500.0	500.0	499.9	499.8	1.0	1.0	175.21	-20.6	1.7	20.7	18.7	2.01	10.301	ES
600.0	600.0	599.5	599.3	1.2	1.2	162.07	-21.3	6.9	22.4	19.9	2.44	9.157	SF
700.0	700.0	698.8	698.2	1.5	1.4	85.84	-22.4	15.4	27.1	24.2	2.89	9.369	
800.0	799.8	797.7	796.4	1.7	1.7	78.56	-23.9	27.3	34.5	31.1	3.35	10.309	
900.0	899.5	896.2	893.8	1.9	2.0	75.32	-25.8	42.5	43.9	40.1	3.83	11.467	
1,000.0	998.7	994.3	990.1	2.2	2.4	74.34	-28.2	60.9	55.1	50.8	4.37	12.625	
1,100.0	1,097.5	1,091.9	1,085.2	2.5	2.8	74.57	-30.9	82.5	68.0	63.0	4.97	13.679	
1,200.0	1,195.6	1,189.0	1,179.0	2.8	3.2	75.39	-34.1	107.1	82.4	76.8	5.66	14.574	
1,211.7	1,207.0	1,200.0	1,189.6	2.8	3.3	75.51	-34.5	110.1	84.2	78.5	5.74	14.675	
1,300.0	1,293.4	1,285.4	1,271.3	3.2	3.8	76.02	-37.6	134.6	98.9	92.4	6.43	15.388	
1,400.0	1,391.1	1,381.8	1,362.7	3.6	4.4	75.45	-41.5	165.1	117.6	110.4	7.23	16.275	
1,500.0	1,488.8	1,479.9	1,455.4	4.0	5.0	74.80	-45.5	196.9	137.0	128.9	8.06	17.005	
1,600.0	1,586.5	1,578.0	1,548.2	4.4	5.6	74.31	-49.6	228.6	156.4	147.4	8.90	17.567	
1,700.0	1,684.3	1,676.1	1,640.9	4.8	6.3	73.93	-53.6	260.4	175.7	166.0	9.76	18.008	
1,800.0	1,782.0	1,774.1	1,733.6	5.3	7.0	73.63	-57.7	292.2	195.1	184.5	10.63	18.362	
1,900.0	1,879.7	1,872.2	1,826.3	5.7	7.6	73.38	-61.8	323.9	214.5	203.0	11.50	18.651	
2,000.0	1,977.5	1,970.3	1,919.0	6.2	8.3	73.17	-65.8	355.7	233.9	221.5	12.38	18.889	
2,100.0	2,075.2	2,068.4	2,011.8	6.6	9.0	72.99	-69.9	387.4	253.3	240.0	13.27	19.090	
2,200.0	2,172.9	2,166.5	2,104.5	7.0	9.6	72.84	-73.9	419.2	272.7	258.5	14.16	19.260	
2,300.0	2,270.7	2,264.6	2,197.2	7.5	10.3	72.71	-78.0	451.0	292.1	277.0	15.05	19.406	
2,400.0	2,368.4	2,362.7	2,289.9	7.9	11.0	72.59	-82.0	482.7	311.5	295.5	15.95	19.532	
2,500.0	2,466.1	2,460.8	2,382.7	8.4	11.6	72.49	-86.1	514.5	330.9	314.0	16.85	19.643	
2,600.0	2,563.8	2,558.9	2,475.4	8.9	12.3	72.40	-90.1	546.3	350.3	332.6	17.75	19.740	
2,700.0	2,661.6	2,657.0	2,568.1	9.3	13.0	72.32	-94.2	578.0	369.7	351.1	18.65	19.826	
2,800.0	2,759.3	2,755.1	2,660.8	9.8	13.7	72.25	-98.3	609.8	389.1	369.6	19.55	19.903	
2,900.0	2,857.0	2,853.2	2,753.6	10.2	14.4	72.18	-102.3	641.6	408.5	388.1	20.45	19.972	
3,000.0	2,954.8	2,951.3	2,846.3	10.7	15.0	72.12	-106.4	673.3	427.9	406.6	21.36	20.034	
3,100.0	3,052.5	3,049.4	2,939.0	11.1	15.7	72.07	-110.4	705.1	447.3	425.1	22.27	20.090	
3,200.0	3,150.2	3,147.5	3,031.7	11.6	16.4	72.02	-114.5	736.9	466.7	443.6	23.17	20.141	
3,300.0	3,247.9	3,245.6	3,124.5	12.0	17.1	71.97	-118.5	768.6	486.1	462.1	24.08	20.187	
3,400.0	3,345.7	3,343.7	3,217.2	12.5	17.8	71.93	-122.6	800.4	505.5	480.6	24.99	20.230	
3,500.0	3,443.4	3,441.8	3,309.9	13.0	18.4	71.89	-126.6	832.1	524.9	499.0	25.90	20.269	
3,600.0	3,541.1	3,539.9	3,402.6	13.4	19.1	71.85	-130.7	863.9	544.4	517.5	26.81	20.306	
3,700.0	3,638.9	3,638.0	3,495.4	13.9	19.8	71.82	-134.7	895.7	563.8	536.0	27.72	20.339	
3,800.0	3,736.6	3,736.1	3,588.1	14.3	20.5	71.79	-138.8	927.4	583.2	554.5	28.63	20.370	
3,900.0	3,834.3	3,834.2	3,680.8	14.8	21.2	71.76	-142.9	959.2	602.6	573.0	29.54	20.399	
4,000.0	3,932.0	3,932.3	3,773.5	15.2	21.9	71.73	-146.9	991.0	622.0	591.5	30.45	20.426	
4,100.0	4,029.8	4,030.4	3,866.3	15.7	22.5	71.70	-151.0	1,022.7	641.4	610.0	31.36	20.451	
4,200.0	4,127.5	4,128.5	3,959.0	16.2	23.2	71.68	-155.0	1,054.5	660.8	628.5	32.27	20.475	
4,300.0	4,225.2	4,226.6	4,051.7	16.6	23.9	71.66	-159.1	1,086.3	680.2	647.0	33.19	20.497	
4,400.0	4,323.0	4,324.7	4,144.4	17.1	24.6	71.63	-163.1	1,118.0	699.6	665.5	34.10	20.517	
4,500.0	4,420.7	4,422.8	4,237.2	17.5	25.3	71.61	-167.2	1,149.8	719.0	684.0	35.01	20.537	
4,600.0	4,518.4	4,520.9	4,329.9	18.0	26.0	71.59	-171.2	1,181.5	738.4	702.5	35.92	20.555	
4,700.0	4,616.2	4,619.0	4,422.6	18.5	26.6	71.57	-175.3	1,213.3	757.8	721.0	36.84	20.573	
4,800.0	4,713.9	4,717.1	4,515.3	18.9	27.3	71.56	-179.4	1,245.1	777.2	739.5	37.75	20.589	
4,900.0	4,811.6	4,815.2	4,608.1	19.4	28.0	71.54	-183.4	1,276.8	796.7	758.0	38.66	20.605	
5,000.0	4,909.3	4,913.3	4,700.8	19.8	28.7	71.52	-187.5	1,308.6	816.1	776.5	39.58	20.619	

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 31-24D
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 31-24D	**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 31-36D - 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
5,100.0	5,007.1	5,011.4	4,793.5	20.3	29.4	71.51	-191.5	1,340.4	835.5	795.0	40.49	20.633	
5,187.9	5,093.0	5,100.9	4,878.1	20.7	30.0	71.50	-195.2	1,369.3	852.5	811.2	41.30	20.640	
5,200.0	5,104.8	5,116.4	4,892.8	20.7	30.1	71.54	-195.8	1,374.2	854.8	813.4	41.42	20.636	
5,300.0	5,203.0	5,245.3	5,015.9	21.1	30.7	71.86	-200.7	1,412.0	872.4	830.1	42.30	20.622	
5,400.0	5,301.7	5,375.4	5,141.9	21.4	31.3	72.08	-204.8	1,444.5	887.5	844.4	43.07	20.608	
5,500.0	5,401.0	5,506.8	5,270.4	21.6	31.7	72.21	-208.3	1,471.5	900.2	856.4	43.71	20.595	
5,600.0	5,500.6	5,639.1	5,400.9	21.8	32.1	72.26	-211.0	1,492.8	910.3	866.1	44.22	20.586	
5,700.0	5,600.5	5,772.2	5,533.1	22.0	32.4	72.21	-212.9	1,508.1	917.9	873.3	44.61	20.575	
5,799.6	5,700.0	5,905.3	5,665.9	22.1	32.6	135.19	-214.1	1,517.3	922.8	878.0	44.88	20.564	
5,900.0	5,800.4	6,039.9	5,800.4	22.2	32.8	135.07	-214.5	1,520.5	924.7	879.6	45.11	20.498	
6,000.0	5,900.4	6,139.9	5,900.4	22.3	32.9	135.07	-214.5	1,520.5	924.7	879.3	45.34	20.393	
6,100.0	6,000.4	6,239.9	6,000.4	22.5	32.9	135.07	-214.5	1,520.5	924.7	879.1	45.58	20.287	
6,200.0	6,100.4	6,339.9	6,100.4	22.6	33.0	135.07	-214.5	1,520.5	924.7	878.9	45.82	20.180	
6,300.0	6,200.4	6,439.9	6,200.4	22.7	33.1	135.07	-214.5	1,520.5	924.7	878.6	46.06	20.073	
6,400.0	6,300.4	6,539.9	6,300.4	22.9	33.2	135.07	-214.5	1,520.5	924.7	878.4	46.31	19.966	
6,500.0	6,400.4	6,639.9	6,400.4	23.0	33.3	135.07	-214.5	1,520.5	924.7	878.1	46.56	19.859	
6,600.0	6,500.4	6,739.9	6,500.4	23.1	33.4	135.07	-214.5	1,520.5	924.7	877.9	46.81	19.752	
6,700.0	6,600.4	6,839.9	6,600.4	23.3	33.5	135.07	-214.5	1,520.5	924.7	877.6	47.07	19.645	
6,800.0	6,700.4	6,939.9	6,700.4	23.4	33.6	135.07	-214.5	1,520.5	924.7	877.3	47.33	19.537	
6,900.0	6,800.4	7,039.9	6,800.4	23.5	33.7	135.07	-214.5	1,520.5	924.7	877.1	47.59	19.430	
7,000.0	6,900.4	7,139.9	6,900.4	23.7	33.8	135.07	-214.5	1,520.5	924.7	876.8	47.85	19.323	
7,100.0	7,000.4	7,239.9	7,000.4	23.8	33.9	135.07	-214.5	1,520.5	924.7	876.6	48.12	19.216	
7,200.0	7,100.4	7,339.9	7,100.4	23.9	33.9	135.07	-214.5	1,520.5	924.7	876.3	48.39	19.108	
7,300.0	7,200.4	7,439.9	7,200.4	24.1	34.0	135.07	-214.5	1,520.5	924.7	876.0	48.66	19.002	
7,400.0	7,300.4	7,539.9	7,300.4	24.2	34.1	135.07	-214.5	1,520.5	924.7	875.7	48.94	18.895	
7,473.6	7,374.0	7,613.5	7,374.0	24.3	34.2	135.07	-214.5	1,520.5	924.7	875.5	49.14	18.816	

Company:	Great Western	**Local Co-ordinate Reference:**	Well Land JG 31-24D
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 31-24D	**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 31-25D - 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	-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	-90.01	0.0	-20.1	20.1	18.1	2.02	9.959	
600.0	600.0	600.0	600.0	1.2	1.2	-90.01	0.0	-20.1	20.1	17.7	2.47	8.148	CC, ES
700.0	700.0	700.0	700.0	1.5	1.5	-155.18	0.0	-20.1	21.7	18.8	2.92	7.449	SF
800.0	799.8	799.8	799.8	1.7	1.7	-159.89	0.0	-20.1	26.6	23.2	3.35	7.918	
900.0	899.5	899.5	899.5	1.9	1.9	-164.77	0.0	-20.1	34.9	31.1	3.79	9.191	
1,000.0	998.7	998.7	998.7	2.2	2.1	-168.65	0.0	-20.1	46.7	42.5	4.23	11.041	
1,100.0	1,097.5	1,097.5	1,097.5	2.5	2.4	-171.44	0.0	-20.1	62.2	57.5	4.67	13.305	
1,200.0	1,195.6	1,195.6	1,195.6	2.8	2.6	-173.40	0.0	-20.1	81.1	76.0	5.11	15.870	
1,211.7	1,207.0	1,207.0	1,207.0	2.8	2.6	-173.59	0.0	-20.1	83.5	78.4	5.16	16.185	
1,300.0	1,293.4	1,293.4	1,293.4	3.2	2.8	-174.76	0.0	-20.1	102.1	96.6	5.56	18.366	
1,400.0	1,391.1	1,391.1	1,391.1	3.6	3.0	-175.66	0.0	-20.1	123.3	117.2	6.02	20.474	
1,500.0	1,488.8	1,488.8	1,488.8	4.0	3.2	-176.30	0.0	-20.1	144.4	137.9	6.48	22.271	
1,600.0	1,586.5	1,585.2	1,585.2	4.4	3.4	-176.33	1.0	-20.9	165.9	159.0	6.95	23.886	
1,700.0	1,684.3	1,680.9	1,680.8	4.8	3.7	-175.40	4.4	-23.8	188.3	180.9	7.41	25.417	
1,800.0	1,782.0	1,776.0	1,775.5	5.3	3.9	-173.83	10.3	-28.6	211.8	203.9	7.88	26.877	
1,900.0	1,879.7	1,870.1	1,869.1	5.7	4.1	-171.85	18.4	-35.3	236.5	228.1	8.37	28.270	
2,000.0	1,977.5	1,963.1	1,961.1	6.2	4.3	-169.62	28.9	-43.8	262.6	253.8	8.87	29.604	
2,100.0	2,075.2	2,056.8	2,053.4	6.6	4.6	-167.27	41.4	-54.1	290.2	280.8	9.40	30.864	
2,200.0	2,172.9	2,152.2	2,147.3	7.0	4.9	-165.22	54.5	-64.8	318.4	308.4	9.96	31.972	
2,300.0	2,270.7	2,247.6	2,241.2	7.5	5.2	-163.50	67.5	-75.6	346.9	336.4	10.52	32.959	
2,400.0	2,368.4	2,343.0	2,335.0	7.9	5.5	-162.04	80.6	-86.3	375.6	364.5	11.11	33.822	
2,500.0	2,466.1	2,438.3	2,428.9	8.4	5.8	-160.79	93.6	-97.0	404.5	392.8	11.69	34.598	
2,600.0	2,563.8	2,533.7	2,522.8	8.9	6.1	-159.71	106.7	-107.7	433.6	421.3	12.29	35.291	
2,700.0	2,661.6	2,629.1	2,616.6	9.3	6.4	-158.76	119.7	-118.4	462.8	449.9	12.89	35.914	
2,800.0	2,759.3	2,724.5	2,710.5	9.8	6.8	-157.92	132.8	-129.1	492.1	478.6	13.49	36.476	
2,900.0	2,857.0	2,819.8	2,804.4	10.2	7.1	-157.18	145.9	-139.8	521.5	507.4	14.10	36.985	
3,000.0	2,954.8	2,915.2	2,898.2	10.7	7.4	-156.51	158.9	-150.5	551.0	536.3	14.71	37.448	
3,100.0	3,052.5	3,010.6	2,992.1	11.1	7.8	-155.92	172.0	-161.3	580.5	565.2	15.33	37.871	
3,200.0	3,150.2	3,106.0	3,086.0	11.6	8.1	-155.38	185.0	-172.0	610.1	594.2	15.95	38.258	
3,300.0	3,247.9	3,201.3	3,179.8	12.0	8.5	-154.89	198.1	-182.7	639.7	623.2	16.57	38.614	
3,400.0	3,345.7	3,296.7	3,273.7	12.5	8.8	-154.44	211.1	-193.4	669.4	652.2	17.19	38.942	
3,500.0	3,443.4	3,392.1	3,367.6	13.0	9.2	-154.03	224.2	-204.1	699.1	681.3	17.81	39.245	
3,600.0	3,541.1	3,487.5	3,461.4	13.4	9.6	-153.66	237.2	-214.8	728.8	710.4	18.44	39.525	
3,700.0	3,638.9	3,582.8	3,555.3	13.9	9.9	-153.31	250.3	-225.5	758.6	739.5	19.07	39.786	
3,800.0	3,736.6	3,678.2	3,649.2	14.3	10.3	-152.99	263.3	-236.2	788.3	768.6	19.69	40.029	
3,900.0	3,834.3	3,773.6	3,743.0	14.8	10.6	-152.70	276.4	-246.9	818.1	797.8	20.32	40.256	
4,000.0	3,932.0	3,869.0	3,836.9	15.2	11.0	-152.42	289.5	-257.7	847.9	827.0	20.95	40.469	
4,100.0	4,029.8	3,964.3	3,930.8	15.7	11.4	-152.16	302.5	-268.4	877.8	856.2	21.58	40.668	
4,200.0	4,127.5	4,059.7	4,024.6	16.2	11.7	-151.92	315.6	-279.1	907.6	885.4	22.22	40.854	
4,300.0	4,225.2	4,155.1	4,118.5	16.6	12.1	-151.70	328.6	-289.8	937.5	914.6	22.85	41.030	
4,400.0	4,323.0	4,250.5	4,212.4	17.1	12.5	-151.49	341.7	-300.5	967.4	943.9	23.48	41.196	
4,500.0	4,420.7	4,345.8	4,306.3	17.5	12.9	-151.29	354.7	-311.2	997.2	973.1	24.12	41.352	
4,600.0	4,518.4	4,441.2	4,400.1	18.0	13.2	-151.10	367.8	-321.9	1,027.1	1,002.4	24.75	41.500	
4,700.0	4,616.2	4,537.0	4,494.4	18.5	13.6	-150.93	380.9	-332.7	1,057.0	1,031.7	25.39	41.638	
4,800.0	4,713.9	4,663.8	4,619.7	18.9	14.0	-150.83	396.1	-345.1	1,085.5	1,059.5	26.04	41.686	
4,900.0	4,811.6	4,792.7	4,747.8	19.4	14.3	-150.96	407.1	-354.2	1,111.2	1,084.6	26.64	41.719	
5,000.0	4,909.3	4,923.2	4,878.0	19.8	14.5	-151.32	413.7	-359.6	1,134.1	1,106.9	27.18	41.726	

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 31-24D
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 31-24D	**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 31-25D - 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
5,100.0	5,007.1	5,052.4	5,007.1	20.3	14.7	-151.89	415.7	-361.2	1,154.1	1,126.4	27.67	41.710	
5,187.9	5,093.0	5,138.3	5,093.0	20.7	14.9	-152.31	415.7	-361.2	1,170.6	1,142.5	28.06	41.713	
5,200.0	5,104.8	5,150.1	5,104.8	20.7	14.9	-152.39	415.7	-361.2	1,172.9	1,144.7	28.13	41.700	
5,300.0	5,203.0	5,248.2	5,203.0	21.1	15.1	-152.97	415.7	-361.2	1,189.9	1,161.3	28.60	41.596	
5,400.0	5,301.7	5,347.0	5,301.7	21.4	15.2	-153.44	415.7	-361.2	1,203.8	1,174.8	29.05	41.440	
5,500.0	5,401.0	5,446.3	5,401.0	21.6	15.4	-153.79	415.7	-361.2	1,214.8	1,185.3	29.46	41.232	
5,600.0	5,500.6	5,545.9	5,500.6	21.8	15.6	-154.04	415.7	-361.2	1,222.6	1,192.7	29.84	40.973	
5,700.0	5,600.5	5,645.7	5,600.5	22.0	15.7	-154.19	415.7	-361.2	1,227.3	1,197.1	30.18	40.666	
5,799.6	5,700.0	5,745.3	5,700.0	22.1	15.9	-91.14	415.7	-361.2	1,228.8	1,198.3	30.49	40.306	
5,900.0	5,800.4	5,845.7	5,800.4	22.2	16.1	-91.14	415.7	-361.2	1,228.8	1,198.0	30.83	39.860	
6,000.0	5,900.4	5,945.7	5,900.4	22.3	16.3	-91.14	415.7	-361.2	1,228.8	1,197.7	31.18	39.413	
6,100.0	6,000.4	6,045.7	6,000.4	22.5	16.4	-91.14	415.7	-361.2	1,228.8	1,197.3	31.53	38.972	
6,200.0	6,100.4	6,145.7	6,100.4	22.6	16.6	-91.14	415.7	-361.2	1,228.8	1,197.0	31.89	38.538	
6,300.0	6,200.4	6,245.7	6,200.4	22.7	16.8	-91.14	415.7	-361.2	1,228.8	1,196.6	32.24	38.112	
6,400.0	6,300.4	6,345.7	6,300.4	22.9	17.0	-91.14	415.7	-361.2	1,228.8	1,196.2	32.60	37.691	
6,500.0	6,400.4	6,445.7	6,400.4	23.0	17.1	-91.14	415.7	-361.2	1,228.8	1,195.9	32.96	37.278	
6,600.0	6,500.4	6,545.7	6,500.4	23.1	17.3	-91.14	415.7	-361.2	1,228.8	1,195.5	33.33	36.871	
6,700.0	6,600.4	6,645.7	6,600.4	23.3	17.5	-91.14	415.7	-361.2	1,228.8	1,195.1	33.69	36.471	
6,800.0	6,700.4	6,745.7	6,700.4	23.4	17.7	-91.14	415.7	-361.2	1,228.8	1,194.8	34.06	36.077	
6,900.0	6,800.4	6,845.7	6,800.4	23.5	17.9	-91.14	415.7	-361.2	1,228.8	1,194.4	34.43	35.690	
7,000.0	6,900.4	6,945.7	6,900.4	23.7	18.1	-91.14	415.7	-361.2	1,228.8	1,194.0	34.80	35.309	
7,100.0	7,000.4	7,045.7	7,000.4	23.8	18.2	-91.14	415.7	-361.2	1,228.8	1,193.7	35.18	34.934	
7,200.0	7,100.4	7,145.7	7,100.4	23.9	18.4	-91.14	415.7	-361.2	1,228.8	1,193.3	35.55	34.565	
7,300.0	7,200.4	7,245.7	7,200.4	24.1	18.6	-91.14	415.7	-361.2	1,228.8	1,192.9	35.93	34.203	
7,400.0	7,300.4	7,345.7	7,300.4	24.2	18.8	-91.14	415.7	-361.2	1,228.8	1,192.5	36.31	33.846	
7,473.6	7,374.0	7,419.3	7,374.0	24.3	19.0	-91.14	415.7	-361.2	1,228.8	1,192.3	36.59	33.588	

Company:	Great Western	**Local Co-ordinate Reference:**	Well Land JG 31-24D
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 31-24D	**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 31-32D - 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	-45.16	20.0	-20.1	28.4				
100.0	100.0	100.0	100.0	0.1	0.1	-45.16	20.0	-20.1	28.4	28.2	0.22	126.398	
200.0	200.0	200.0	200.0	0.3	0.3	-45.16	20.0	-20.1	28.4	27.7	0.67	42.133	CC, ES
300.0	300.0	299.1	299.0	0.6	0.6	-46.54	20.6	-21.8	30.0	28.9	1.12	26.871	
400.0	400.0	397.9	397.7	0.8	0.8	-49.90	22.4	-26.6	34.8	33.2	1.56	22.249	
500.0	500.0	496.4	495.9	1.0	1.0	-53.33	25.5	-34.3	42.9	40.9	2.03	21.186	SF
600.0	600.0	594.6	593.5	1.2	1.3	-53.64	31.6	-43.0	53.8	51.3	2.50	21.505	
700.0	700.0	692.0	690.0	1.5	1.6	-116.08	41.0	-52.3	67.9	65.0	2.94	23.103	
800.0	799.8	788.4	785.1	1.7	1.9	-116.11	53.4	-62.1	86.0	82.7	3.39	25.348	
900.0	899.5	883.6	878.5	1.9	2.3	-116.44	68.7	-72.4	108.2	104.3	3.87	27.966	
1,000.0	998.7	977.2	969.7	2.2	2.7	-116.84	86.7	-83.1	134.1	129.8	4.37	30.713	
1,100.0	1,097.5	1,069.2	1,058.7	2.5	3.1	-117.20	107.3	-94.2	163.9	159.0	4.91	33.410	
1,200.0	1,195.6	1,159.4	1,145.1	2.8	3.6	-117.49	130.1	-105.6	197.5	192.0	5.49	35.937	
1,211.7	1,207.0	1,169.7	1,155.0	2.8	3.6	-117.52	133.0	-107.0	201.6	196.0	5.57	36.220	
1,300.0	1,293.4	1,247.8	1,229.1	3.2	4.1	-118.01	155.2	-117.3	234.0	227.8	6.14	38.128	
1,400.0	1,391.1	1,334.7	1,310.8	3.6	4.6	-118.02	182.3	-129.2	272.5	265.7	6.81	40.011	
1,500.0	1,488.8	1,420.1	1,390.2	4.0	5.2	-117.65	211.2	-141.4	312.9	305.4	7.52	41.638	
1,600.0	1,586.5	1,500.0	1,463.7	4.4	5.8	-117.08	240.5	-153.1	355.3	347.1	8.22	43.206	
1,700.0	1,684.3	1,585.6	1,541.3	4.8	6.5	-116.31	274.0	-166.1	399.5	390.5	8.99	44.463	
1,800.0	1,782.0	1,665.6	1,613.0	5.3	7.2	-115.50	307.4	-178.6	445.6	435.9	9.75	45.730	
1,900.0	1,879.7	1,743.7	1,681.9	5.7	7.8	-114.64	341.9	-191.1	493.6	483.1	10.51	46.959	
2,000.0	1,977.5	1,823.6	1,751.5	6.2	8.6	-113.74	379.0	-204.2	543.3	532.0	11.30	48.077	
2,100.0	2,075.2	1,909.8	1,826.3	6.6	9.4	-112.90	419.4	-218.4	593.5	581.4	12.12	48.973	
2,200.0	2,172.9	1,996.0	1,901.1	7.0	10.2	-112.18	459.8	-232.6	643.7	630.8	12.94	49.737	
2,300.0	2,270.7	2,082.2	1,975.9	7.5	11.1	-111.57	500.2	-246.8	694.0	680.3	13.77	50.393	
2,400.0	2,368.4	2,168.4	2,050.7	7.9	11.9	-111.04	540.5	-261.0	744.4	729.8	14.61	50.965	
2,500.0	2,466.1	2,254.6	2,125.6	8.4	12.7	-110.57	580.9	-275.2	794.8	779.4	15.44	51.467	
2,600.0	2,563.8	2,340.8	2,200.4	8.9	13.6	-110.16	621.3	-289.4	845.2	829.0	16.28	51.910	
2,700.0	2,661.6	2,427.0	2,275.2	9.3	14.4	-109.80	661.7	-303.6	895.7	878.6	17.13	52.303	
2,800.0	2,759.3	2,513.2	2,350.0	9.8	15.2	-109.48	702.1	-317.9	946.2	928.2	17.97	52.654	
2,900.0	2,857.0	2,599.4	2,424.8	10.2	16.1	-109.19	742.5	-332.1	996.7	977.9	18.82	52.970	
3,000.0	2,954.8	2,685.6	2,499.6	10.7	16.9	-108.92	782.9	-346.3	1,047.2	1,027.6	19.67	53.254	
3,100.0	3,052.5	2,771.8	2,574.4	11.1	17.8	-108.68	823.3	-360.5	1,097.8	1,077.3	20.51	53.512	
3,200.0	3,150.2	2,858.0	2,649.3	11.6	18.6	-108.47	863.7	-374.7	1,148.3	1,127.0	21.37	53.746	
3,300.0	3,247.9	2,944.2	2,724.1	12.0	19.5	-108.27	904.1	-388.9	1,198.9	1,176.7	22.22	53.960	
3,400.0	3,345.7	3,030.4	2,798.9	12.5	20.3	-108.08	944.4	-403.1	1,249.5	1,226.4	23.07	54.157	
3,500.0	3,443.4	3,116.6	2,873.7	13.0	21.2	-107.91	984.8	-417.3	1,300.1	1,276.2	23.93	54.338	
3,600.0	3,541.1	3,202.8	2,948.5	13.4	22.0	-107.76	1,025.2	-431.5	1,350.7	1,325.9	24.78	54.505	
3,700.0	3,638.9	3,289.0	3,023.3	13.9	22.9	-107.61	1,065.6	-445.7	1,401.3	1,375.6	25.64	54.659	
3,800.0	3,736.6	3,375.2	3,098.1	14.3	23.7	-107.48	1,106.0	-459.9	1,451.9	1,425.4	26.49	54.802	
3,900.0	3,834.3	3,461.4	3,173.0	14.8	24.6	-107.35	1,146.4	-474.1	1,502.5	1,475.1	27.35	54.935	
4,000.0	3,932.0	3,547.6	3,247.8	15.2	25.4	-107.23	1,186.8	-488.3	1,553.1	1,524.9	28.21	55.059	
4,100.0	4,029.8	3,633.8	3,322.6	15.7	26.3	-107.12	1,227.2	-502.5	1,603.7	1,574.7	29.07	55.174	
4,200.0	4,127.5	3,720.0	3,397.4	16.2	27.1	-107.02	1,267.6	-516.7	1,654.4	1,624.4	29.93	55.283	
4,300.0	4,225.2	3,806.2	3,472.2	16.6	28.0	-106.92	1,307.9	-530.9	1,705.0	1,674.2	30.78	55.384	
4,400.0	4,323.0	3,892.4	3,547.0	17.1	28.8	-106.83	1,348.3	-545.2	1,755.6	1,724.0	31.64	55.480	
4,500.0	4,420.7	3,978.6	3,621.8	17.5	29.7	-106.74	1,388.7	-559.4	1,806.3	1,773.8	32.50	55.569	
4,600.0	4,518.4	4,064.8	3,696.7	18.0	30.5	-106.66	1,429.1	-573.6	1,856.9	1,823.5	33.37	55.654	
4,700.0	4,616.2	4,151.0	3,771.5	18.5	31.4	-106.58	1,469.5	-587.8	1,907.6	1,873.3	34.23	55.734	
4,800.0	4,713.9	4,237.2	3,846.3	18.9	32.2	-106.51	1,509.9	-602.0	1,958.2	1,923.1	35.09	55.809	
4,900.0	4,811.6	4,323.4	3,921.1	19.4	33.1	-106.44	1,550.3	-616.2	2,008.8	1,972.9	35.95	55.880	
5,000.0	4,909.3	4,409.6	3,995.9	19.8	33.9	-106.37	1,590.7	-630.4	2,059.5	2,022.7	36.81	55.948	

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 31-24D
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 31-24D	**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 31-32D - 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
5,100.0	5,007.1	4,495.8	4,070.7	20.3	34.8	-106.31	1,631.1	-644.6	2,110.2	2,072.5	37.67	56.012	
5,187.9	5,093.0	4,571.6	4,136.5	20.7	35.5	-106.26	1,666.6	-657.1	2,154.7	2,116.2	38.43	56.066	
5,200.0	5,104.8	4,582.0	4,145.6	20.7	35.6	-106.38	1,671.5	-658.8	2,160.8	2,122.2	38.58	56.015	
5,300.0	5,203.0	4,668.5	4,220.6	21.1	36.5	-107.37	1,712.0	-673.1	2,210.9	2,171.2	39.69	55.700	
5,400.0	5,301.7	4,755.2	4,295.9	21.4	37.3	-108.24	1,752.6	-687.3	2,260.2	2,219.4	40.76	55.447	
5,500.0	5,401.0	4,842.1	4,371.3	21.6	38.2	-108.99	1,793.3	-701.7	2,308.5	2,266.7	41.78	55.259	
5,600.0	5,500.6	4,929.1	4,446.8	21.8	39.0	-109.63	1,834.1	-716.0	2,355.8	2,313.1	42.73	55.137	
5,700.0	5,600.5	5,016.2	4,522.4	22.0	39.9	-110.18	1,874.9	-730.4	2,402.3	2,358.7	43.61	55.081	
5,799.6	5,700.0	5,102.7	4,597.4	22.1	40.8	-47.53	1,915.4	-744.6	2,447.6	2,403.2	44.43	55.090	
5,900.0	5,800.4	5,189.8	4,673.1	22.2	41.6	-47.01	1,956.3	-759.0	2,492.9	2,448.1	44.86	55.577	
6,000.0	5,900.4	5,276.6	4,748.4	22.3	42.5	-46.50	1,996.9	-773.3	2,538.2	2,492.9	45.29	56.050	
6,100.0	6,000.4	5,363.4	4,823.8	22.5	43.3	-46.01	2,037.6	-787.6	2,583.7	2,538.0	45.71	56.519	
6,200.0	6,100.4	5,587.6	5,020.5	22.6	45.2	-44.86	2,138.8	-823.2	2,628.7	2,582.2	46.50	56.533	
6,300.0	6,200.4	6,214.7	5,607.7	22.7	48.7	-42.80	2,343.2	-895.1	2,660.7	2,612.7	48.02	55.414	
6,400.0	6,300.4	6,914.4	6,300.4	22.9	50.3	-42.08	2,423.3	-923.3	2,672.0	2,622.9	49.13	54.389	
6,500.0	6,400.4	7,014.4	6,400.4	23.0	50.4	-42.08	2,423.3	-923.3	2,672.0	2,622.6	49.36	54.136	
6,600.0	6,500.4	7,114.4	6,500.4	23.1	50.4	-42.08	2,423.3	-923.3	2,672.0	2,622.4	49.59	53.880	
6,700.0	6,600.4	7,214.4	6,600.4	23.3	50.5	-42.08	2,423.3	-923.3	2,672.0	2,622.2	49.83	53.622	
6,800.0	6,700.4	7,314.4	6,700.4	23.4	50.6	-42.08	2,423.3	-923.3	2,672.0	2,621.9	50.07	53.365	
6,900.0	6,800.4	7,414.4	6,800.4	23.5	50.6	-42.08	2,423.3	-923.3	2,672.0	2,621.7	50.31	53.106	
7,000.0	6,900.4	7,514.4	6,900.4	23.7	50.7	-42.08	2,423.3	-923.3	2,672.0	2,621.4	50.56	52.847	
7,100.0	7,000.4	7,614.4	7,000.4	23.8	50.7	-42.08	2,423.3	-923.3	2,672.0	2,621.2	50.81	52.588	
7,200.0	7,100.4	7,714.4	7,100.4	23.9	50.8	-42.08	2,423.3	-923.3	2,672.0	2,620.9	51.06	52.329	
7,300.0	7,200.4	7,814.4	7,200.4	24.1	50.9	-42.08	2,423.3	-923.3	2,672.0	2,620.7	51.32	52.069	
7,400.0	7,300.4	7,914.4	7,300.4	24.2	50.9	-42.08	2,423.3	-923.3	2,672.0	2,620.4	51.57	51.809	
7,473.6	7,374.0	7,987.9	7,374.0	24.3	51.0	-42.08	2,423.3	-923.3	2,672.0	2,620.2	51.76	51.619	

Company:	Great Western	**Local Co-ordinate Reference:**	Well Land JG 31-24D
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 31-24D	**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 31-33D - 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	-135.37	-20.4	-20.1	28.7				
100.0	100.0	100.0	100.0	0.1	0.1	-135.37	-20.4	-20.1	28.7	28.4	0.22	127.573	
200.0	200.0	200.0	200.0	0.3	0.3	-135.37	-20.4	-20.1	28.7	28.0	0.67	42.524	
300.0	300.0	300.0	300.0	0.6	0.6	-135.37	-20.4	-20.1	28.7	27.6	1.12	25.515	
400.0	400.0	400.0	400.0	0.8	0.8	-135.37	-20.4	-20.1	28.7	27.1	1.57	18.225	CC, ES
500.0	500.0	499.3	499.2	1.0	1.0	-133.02	-20.4	-21.9	29.9	27.9	2.01	14.887	
600.0	600.0	598.3	598.1	1.2	1.2	-127.07	-20.4	-27.0	33.9	31.5	2.45	13.855	SF
700.0	700.0	697.3	696.8	1.5	1.4	177.43	-20.0	-35.3	42.5	39.6	2.90	14.660	
800.0	799.8	796.3	795.2	1.7	1.7	-174.41	-17.0	-45.3	55.5	52.2	3.35	16.576	
900.0	899.5	894.2	892.3	1.9	2.0	-167.22	-10.9	-56.5	73.1	69.3	3.80	19.209	
1,000.0	998.7	990.7	987.6	2.2	2.3	-161.43	-1.9	-68.8	95.4	91.1	4.27	22.336	
1,100.0	1,097.5	1,085.5	1,080.7	2.5	2.6	-156.90	9.8	-82.1	122.5	117.7	4.76	25.749	
1,200.0	1,195.6	1,178.5	1,171.5	2.8	3.0	-153.33	24.1	-96.3	154.1	148.9	5.27	29.268	
1,211.7	1,207.0	1,189.2	1,181.9	2.8	3.0	-152.97	25.9	-98.0	158.1	152.8	5.33	29.687	
1,300.0	1,293.4	1,269.6	1,259.8	3.2	3.4	-150.59	40.7	-111.4	189.1	183.3	5.82	32.500	
1,400.0	1,391.1	1,359.4	1,346.1	3.6	3.8	-148.06	59.6	-127.3	225.7	219.3	6.41	35.222	
1,500.0	1,488.8	1,449.0	1,431.5	4.0	4.3	-145.68	80.8	-144.1	264.0	256.9	7.03	37.521	
1,600.0	1,586.5	1,540.7	1,518.8	4.4	4.8	-143.74	103.0	-161.5	302.8	295.1	7.68	39.411	
1,700.0	1,684.3	1,632.4	1,606.1	4.8	5.4	-142.24	125.2	-178.9	341.9	333.6	8.35	40.959	
1,800.0	1,782.0	1,724.1	1,693.3	5.3	5.9	-141.05	147.4	-196.4	381.2	372.1	9.02	42.241	
1,900.0	1,879.7	1,815.9	1,780.6	5.7	6.5	-140.08	169.6	-213.8	420.5	410.8	9.71	43.311	
2,000.0	1,977.5	1,907.6	1,867.8	6.2	7.0	-139.28	191.8	-231.2	460.0	449.6	10.40	44.215	
2,100.0	2,075.2	1,999.3	1,955.1	6.6	7.6	-138.60	214.0	-248.7	499.5	488.4	11.10	44.984	
2,200.0	2,172.9	2,091.0	2,042.4	7.0	8.1	-138.02	236.2	-266.1	539.1	527.2	11.81	45.645	
2,300.0	2,270.7	2,182.7	2,129.6	7.5	8.7	-137.52	258.5	-283.5	578.7	566.1	12.52	46.219	
2,400.0	2,368.4	2,274.4	2,216.9	7.9	9.3	-137.09	280.7	-300.9	618.3	605.1	13.23	46.720	
2,500.0	2,466.1	2,366.1	2,304.1	8.4	9.9	-136.71	302.9	-318.4	658.0	644.0	13.95	47.162	
2,600.0	2,563.8	2,457.9	2,391.4	8.9	10.4	-136.37	325.1	-335.8	697.6	683.0	14.67	47.553	
2,700.0	2,661.6	2,549.6	2,478.7	9.3	11.0	-136.06	347.3	-353.2	737.3	721.9	15.39	47.902	
2,800.0	2,759.3	2,641.3	2,565.9	9.8	11.6	-135.79	369.5	-370.7	777.1	760.9	16.12	48.215	
2,900.0	2,857.0	2,733.0	2,653.2	10.2	12.1	-135.55	391.7	-388.1	816.8	799.9	16.84	48.496	
3,000.0	2,954.8	2,824.7	2,740.5	10.7	12.7	-135.32	413.9	-405.5	856.5	839.0	17.57	48.751	
3,100.0	3,052.5	2,916.4	2,827.7	11.1	13.3	-135.12	436.1	-423.0	896.3	878.0	18.30	48.982	
3,200.0	3,150.2	3,008.1	2,915.0	11.6	13.9	-134.93	458.3	-440.4	936.1	917.0	19.03	49.193	
3,300.0	3,247.9	3,099.9	3,002.2	12.0	14.5	-134.76	480.5	-457.8	975.8	956.1	19.76	49.386	
3,400.0	3,345.7	3,191.6	3,089.5	12.5	15.0	-134.61	502.8	-475.2	1,015.6	995.1	20.49	49.563	
3,500.0	3,443.4	3,283.3	3,176.8	13.0	15.6	-134.46	525.0	-492.7	1,055.4	1,034.2	21.22	49.725	
3,600.0	3,541.1	3,375.0	3,264.0	13.4	16.2	-134.33	547.2	-510.1	1,095.2	1,073.2	21.96	49.876	
3,700.0	3,638.9	3,466.7	3,351.3	13.9	16.8	-134.20	569.4	-527.5	1,135.0	1,112.3	22.69	50.015	
3,800.0	3,736.6	3,558.4	3,438.5	14.3	17.3	-134.08	591.6	-545.0	1,174.8	1,151.3	23.43	50.144	
3,900.0	3,834.3	3,650.1	3,525.8	14.8	17.9	-133.97	613.8	-562.4	1,214.6	1,190.4	24.16	50.265	
4,000.0	3,932.0	3,741.9	3,613.1	15.2	18.5	-133.87	636.0	-579.8	1,254.4	1,229.5	24.90	50.377	
4,100.0	4,029.8	3,833.6	3,700.3	15.7	19.1	-133.78	658.2	-597.3	1,294.2	1,268.5	25.64	50.482	
4,200.0	4,127.5	3,925.3	3,787.6	16.2	19.7	-133.69	680.4	-614.7	1,334.0	1,307.6	26.37	50.580	
4,300.0	4,225.2	4,017.0	3,874.8	16.6	20.2	-133.60	702.6	-632.1	1,373.8	1,346.7	27.11	50.672	
4,400.0	4,323.0	4,108.7	3,962.1	17.1	20.8	-133.52	724.8	-649.5	1,413.6	1,385.8	27.85	50.759	
4,500.0	4,420.7	4,200.4	4,049.4	17.5	21.4	-133.44	747.1	-667.0	1,453.4	1,424.8	28.59	50.840	
4,600.0	4,518.4	4,292.1	4,136.6	18.0	22.0	-133.37	769.3	-684.4	1,493.2	1,463.9	29.33	50.917	
4,700.0	4,616.2	4,383.9	4,223.9	18.5	22.6	-133.30	791.5	-701.8	1,533.1	1,503.0	30.07	50.989	
4,800.0	4,713.9	4,475.6	4,311.2	18.9	23.1	-133.24	813.7	-719.3	1,572.9	1,542.1	30.81	51.057	
4,900.0	4,811.6	4,567.3	4,398.4	19.4	23.7	-133.18	835.9	-736.7	1,612.7	1,581.2	31.55	51.122	
5,000.0	4,909.3	4,659.0	4,485.7	19.8	24.3	-133.12	858.1	-754.1	1,652.5	1,620.2	32.29	51.183	

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 31-24D
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 31-24D	**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

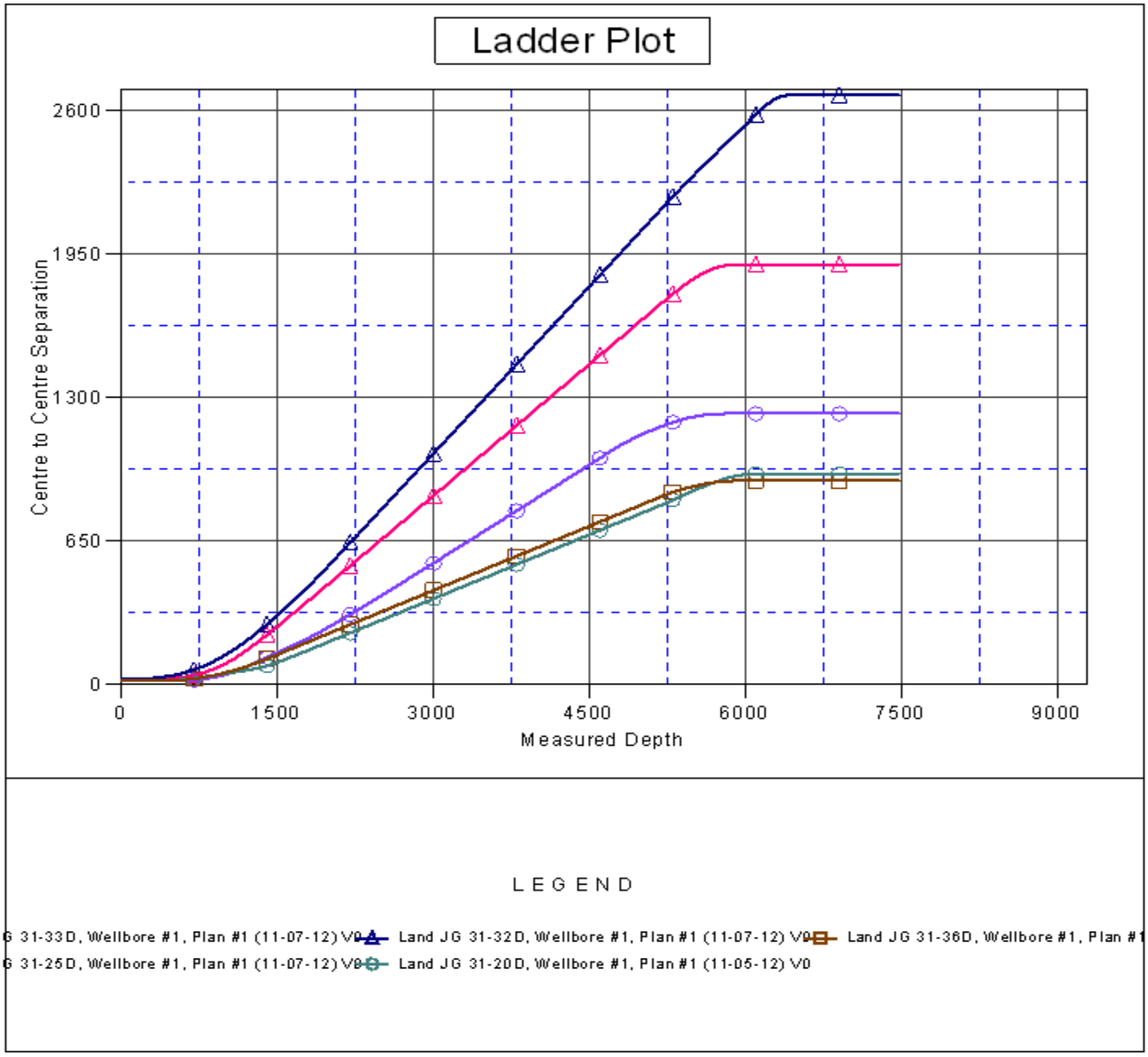
Offset Design Land JG (West) Pad Sec.31-T2N-R64W - Land JG 31-33D - Wellbore #1 - Plan #1 (11-07-12) — **Offset Site Error:** 0.0 ft

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
5,100.0	5,007.1	4,750.7	4,572.9	20.3	24.9	-133.06	880.3	-771.6	1,692.4	1,659.3	33.03	51.241	
5,187.9	5,093.0	4,831.3	4,649.6	20.7	25.4	-133.02	899.8	-786.9	1,727.4	1,693.7	33.68	51.290	
5,200.0	5,104.8	4,842.4	4,660.2	20.7	25.5	-133.09	902.5	-789.0	1,732.2	1,698.4	33.79	51.266	
5,300.0	5,203.0	4,934.7	4,748.0	21.1	26.1	-133.59	924.9	-806.5	1,770.6	1,736.0	34.63	51.129	
5,400.0	5,301.7	5,027.7	4,836.5	21.4	26.7	-133.96	947.4	-824.2	1,806.9	1,771.5	35.43	51.004	
5,500.0	5,401.0	5,130.6	4,934.4	21.6	27.3	-134.19	972.3	-843.7	1,840.9	1,804.7	36.20	50.853	
5,600.0	5,500.6	5,340.2	5,136.3	21.8	28.3	-134.04	1,016.3	-878.3	1,869.2	1,832.1	37.16	50.302	
5,700.0	5,600.5	5,558.7	5,350.6	22.0	29.0	-133.87	1,049.7	-904.5	1,889.2	1,851.2	37.95	49.777	
5,799.6	5,700.0	5,782.3	5,572.6	22.1	29.5	-70.58	1,070.5	-920.8	1,900.3	1,861.7	38.57	49.264	
5,900.0	5,800.4	6,010.4	5,800.4	22.2	29.8	-70.43	1,077.6	-926.4	1,903.7	1,864.7	39.02	48.783	
6,000.0	5,900.4	6,110.4	5,900.4	22.3	29.9	-70.43	1,077.6	-926.4	1,903.7	1,864.4	39.29	48.456	
6,100.0	6,000.4	6,210.4	6,000.4	22.5	30.0	-70.43	1,077.6	-926.4	1,903.7	1,864.1	39.56	48.122	
6,200.0	6,100.4	6,310.4	6,100.4	22.6	30.1	-70.43	1,077.6	-926.4	1,903.7	1,863.8	39.84	47.789	
6,300.0	6,200.4	6,410.4	6,200.4	22.7	30.2	-70.43	1,077.6	-926.4	1,903.7	1,863.6	40.11	47.456	
6,400.0	6,300.4	6,510.4	6,300.4	22.9	30.3	-70.43	1,077.6	-926.4	1,903.7	1,863.3	40.40	47.125	
6,500.0	6,400.4	6,610.4	6,400.4	23.0	30.4	-70.43	1,077.6	-926.4	1,903.7	1,863.0	40.68	46.795	
6,600.0	6,500.4	6,710.4	6,500.4	23.1	30.5	-70.43	1,077.6	-926.4	1,903.7	1,862.7	40.97	46.466	
6,700.0	6,600.4	6,810.4	6,600.4	23.3	30.6	-70.43	1,077.6	-926.4	1,903.7	1,862.4	41.26	46.139	
6,800.0	6,700.4	6,910.4	6,700.4	23.4	30.7	-70.43	1,077.6	-926.4	1,903.7	1,862.1	41.55	45.813	
6,900.0	6,800.4	7,010.4	6,800.4	23.5	30.8	-70.43	1,077.6	-926.4	1,903.7	1,861.8	41.85	45.488	
7,000.0	6,900.4	7,110.4	6,900.4	23.7	30.9	-70.43	1,077.6	-926.4	1,903.7	1,861.5	42.15	45.166	
7,100.0	7,000.4	7,210.4	7,000.4	23.8	31.0	-70.43	1,077.6	-926.4	1,903.7	1,861.2	42.45	44.845	
7,200.0	7,100.4	7,310.4	7,100.4	23.9	31.1	-70.43	1,077.6	-926.4	1,903.7	1,860.9	42.75	44.525	
7,300.0	7,200.4	7,410.4	7,200.4	24.1	31.2	-70.43	1,077.6	-926.4	1,903.7	1,860.6	43.06	44.208	
7,400.0	7,300.4	7,510.4	7,300.4	24.2	31.3	-70.43	1,077.6	-926.4	1,903.7	1,860.3	43.37	43.893	
7,473.6	7,374.0	7,584.0	7,374.0	24.3	31.4	-70.43	1,077.6	-926.4	1,903.7	1,860.1	43.60	43.662	

Company:	Great Western	**Local Co-ordinate Reference:**	Well Land JG 31-24D
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 31-24D	**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 31-24D
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 31-24D
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 31-24D	**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 31-24D
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°