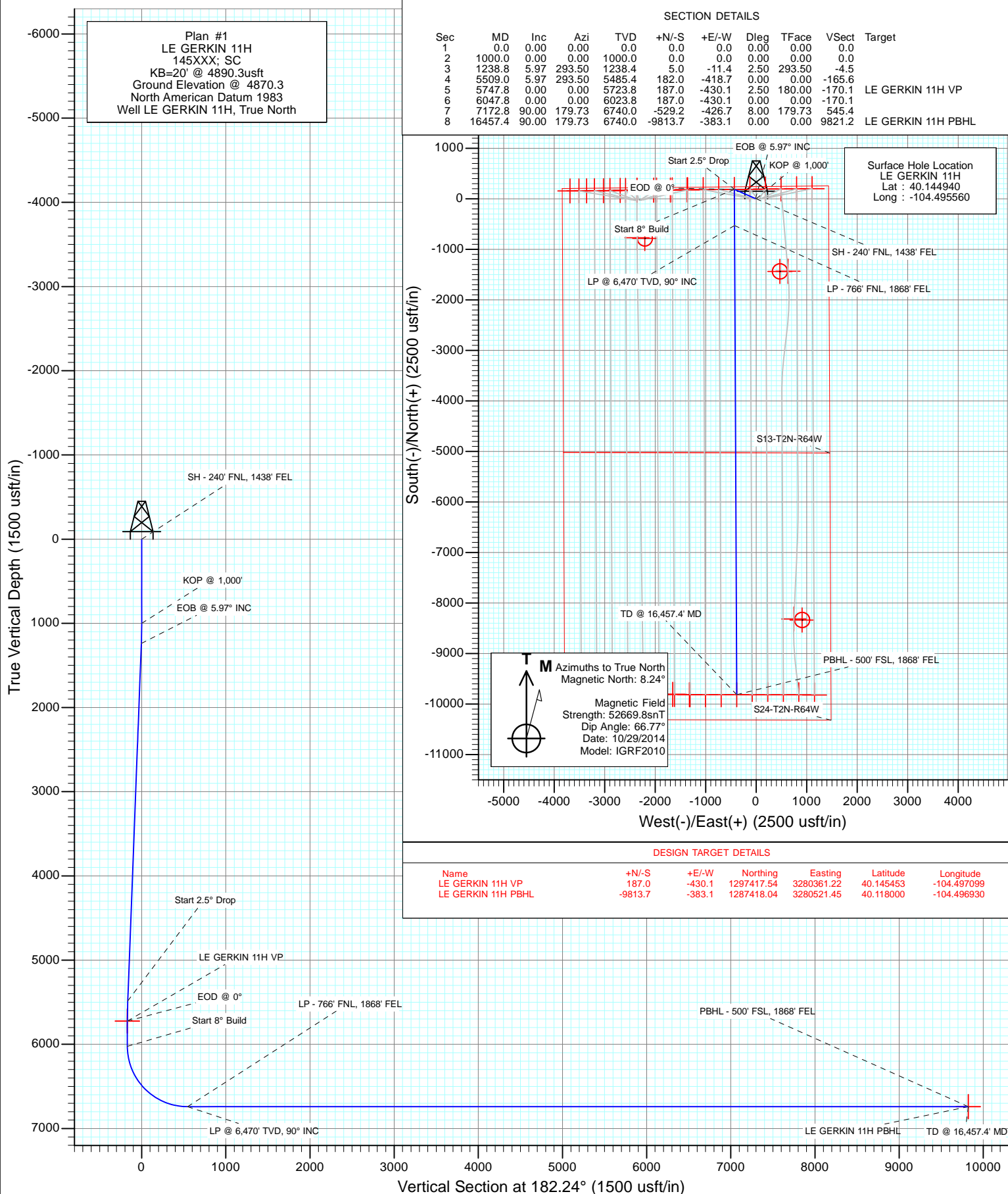
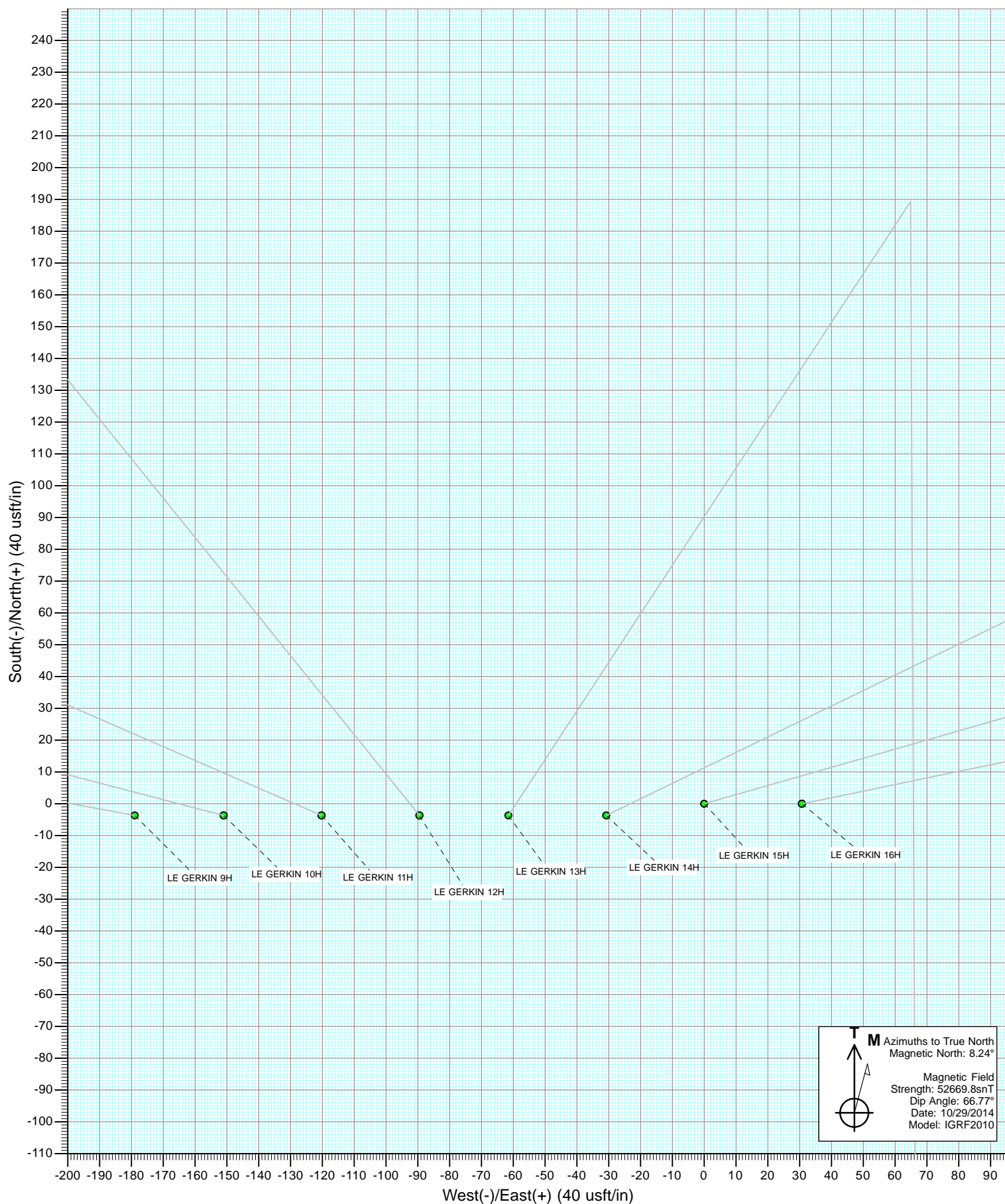
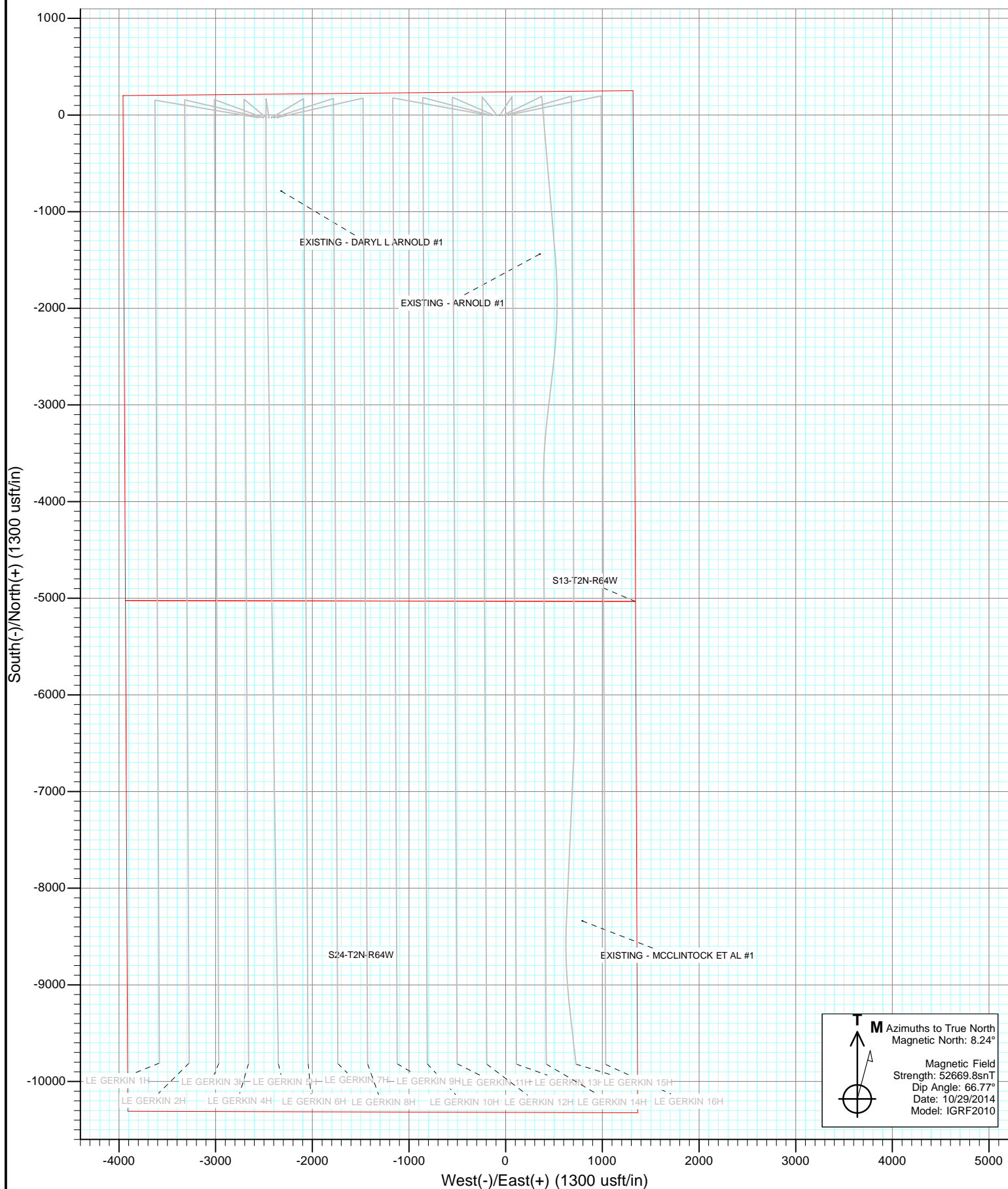




Project: Weld County, Colorado
Site: S13-T2N-R64W (LE GERKIN PADS)
Well: LE GERKIN 11H
Wellbore: HZ
Design: Plan #1







Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well LE GERKIN 11H
Company:	Red Hawk Petroleum	TVD Reference:	KB=20' @ 4890.3usft
Project:	Weld County, Colorado	MD Reference:	KB=20' @ 4890.3usft
Site:	S13-T2N-R64W (LE GERKIN PADS)	North Reference:	True
Well:	LE GERKIN 11H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Project	Weld County, Colorado		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site		S13-T2N-R64W (LE GERKIN PADS)			
Site Position:		Northing:	1,297,185.96 usft	Latitude:	40.144880
From:	Lat/Long	Easting:	3,278,344.88 usft	Longitude:	-104.504320
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.64 °

Well	LE GERKIN 11H					
Well Position	+N/-S	0.0 usft	Northing:	1,297,235.43 usft	Latitude:	40.144940
	+E/-W	0.0 usft	Easting:	3,280,793.41 usft	Longitude:	-104.495560
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	4,870.3 usft

Wellbore	HZ				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	10/29/2014	8.24	66.77	52,670

Design	Plan #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	182.24

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,238.8	5.97	293.50	1,238.4	5.0	-11.4	2.50	2.50	0.00	293.50	
5,509.0	5.97	293.50	5,485.4	182.0	-418.7	0.00	0.00	0.00	0.00	
5,747.8	0.00	0.00	5,723.8	187.0	-430.1	2.50	-2.50	0.00	180.00	LE GERKIN 11H VP
6,047.8	0.00	0.00	6,023.8	187.0	-430.1	0.00	0.00	0.00	0.00	
7,172.8	90.00	179.73	6,740.0	-529.2	-426.7	8.00	8.00	15.98	179.73	
16,457.4	90.00	179.73	6,740.0	-9,813.7	-383.1	0.00	0.00	0.00	0.00	LE GERKIN 11H PBH

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well LE GERKIN 11H
Company:	Red Hawk Petroleum	TVD Reference:	KB=20' @ 4890.3usft
Project:	Weld County, Colorado	MD Reference:	KB=20' @ 4890.3usft
Site:	S13-T2N-R64W (LE GERKIN PADS)	North Reference:	True
Well:	LE GERKIN 11H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Comments / Formations
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
0.5	0.00	0.00	0.5	0.0	0.0	0.0	0.00	0.00	SH - 240' FNL, 1438' FEL
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	KOP @ 1,000'
1,100.0	2.50	293.50	1,100.0	0.9	-2.0	-0.8	2.50	2.50	
1,200.0	5.00	293.50	1,199.7	3.5	-8.0	-3.2	2.50	2.50	
1,238.8	5.97	293.50	1,238.4	5.0	-11.4	-4.5	2.50	2.50	EOB @ 5.97° INC
1,300.0	5.97	293.50	1,299.2	7.5	-17.2	-6.8	0.00	0.00	
1,400.0	5.97	293.50	1,398.7	11.6	-26.8	-10.6	0.00	0.00	
1,500.0	5.97	293.50	1,498.2	15.8	-36.3	-14.4	0.00	0.00	
1,600.0	5.97	293.50	1,597.6	19.9	-45.9	-18.1	0.00	0.00	
1,700.0	5.97	293.50	1,697.1	24.1	-55.4	-21.9	0.00	0.00	
1,800.0	5.97	293.50	1,796.5	28.2	-64.9	-25.7	0.00	0.00	
1,900.0	5.97	293.50	1,896.0	32.4	-74.5	-29.4	0.00	0.00	
2,000.0	5.97	293.50	1,995.4	36.5	-84.0	-33.2	0.00	0.00	
2,100.0	5.97	293.50	2,094.9	40.7	-93.5	-37.0	0.00	0.00	
2,200.0	5.97	293.50	2,194.4	44.8	-103.1	-40.8	0.00	0.00	
2,300.0	5.97	293.50	2,293.8	49.0	-112.6	-44.5	0.00	0.00	
2,400.0	5.97	293.50	2,393.3	53.1	-122.2	-48.3	0.00	0.00	
2,500.0	5.97	293.50	2,492.7	57.3	-131.7	-52.1	0.00	0.00	
2,600.0	5.97	293.50	2,592.2	61.4	-141.2	-55.8	0.00	0.00	
2,700.0	5.97	293.50	2,691.6	65.6	-150.8	-59.6	0.00	0.00	
2,800.0	5.97	293.50	2,791.1	69.7	-160.3	-63.4	0.00	0.00	
2,900.0	5.97	293.50	2,890.6	73.8	-169.8	-67.2	0.00	0.00	
3,000.0	5.97	293.50	2,990.0	78.0	-179.4	-70.9	0.00	0.00	
3,100.0	5.97	293.50	3,089.5	82.1	-188.9	-74.7	0.00	0.00	
3,200.0	5.97	293.50	3,188.9	86.3	-198.5	-78.5	0.00	0.00	
3,300.0	5.97	293.50	3,288.4	90.4	-208.0	-82.3	0.00	0.00	
3,400.0	5.97	293.50	3,387.8	94.6	-217.5	-86.0	0.00	0.00	
3,500.0	5.97	293.50	3,487.3	98.7	-227.1	-89.8	0.00	0.00	
3,600.0	5.97	293.50	3,586.8	102.9	-236.6	-93.6	0.00	0.00	
3,700.0	5.97	293.50	3,686.2	107.0	-246.2	-97.3	0.00	0.00	
3,800.0	5.97	293.50	3,785.7	111.2	-255.7	-101.1	0.00	0.00	
3,900.0	5.97	293.50	3,885.1	115.3	-265.2	-104.9	0.00	0.00	
4,000.0	5.97	293.50	3,984.6	119.5	-274.8	-108.7	0.00	0.00	
4,100.0	5.97	293.50	4,084.1	123.6	-284.3	-112.4	0.00	0.00	
4,200.0	5.97	293.50	4,183.5	127.8	-293.8	-116.2	0.00	0.00	
4,300.0	5.97	293.50	4,283.0	131.9	-303.4	-120.0	0.00	0.00	
4,400.0	5.97	293.50	4,382.4	136.1	-312.9	-123.7	0.00	0.00	
4,500.0	5.97	293.50	4,481.9	140.2	-322.5	-127.5	0.00	0.00	
4,600.0	5.97	293.50	4,581.3	144.3	-332.0	-131.3	0.00	0.00	
4,700.0	5.97	293.50	4,680.8	148.5	-341.5	-135.1	0.00	0.00	
4,800.0	5.97	293.50	4,780.3	152.6	-351.1	-138.8	0.00	0.00	
4,900.0	5.97	293.50	4,879.7	156.8	-360.6	-142.6	0.00	0.00	

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well LE GERKIN 11H
Company:	Red Hawk Petroleum	TVD Reference:	KB=20' @ 4890.3usft
Project:	Weld County, Colorado	MD Reference:	KB=20' @ 4890.3usft
Site:	S13-T2N-R64W (LE GERKIN PADS)	North Reference:	True
Well:	LE GERKIN 11H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Comments / Formations
5,000.0	5.97	293.50	4,979.2	160.9	-370.1	-146.4	0.00	0.00	
5,100.0	5.97	293.50	5,078.6	165.1	-379.7	-150.1	0.00	0.00	
5,200.0	5.97	293.50	5,178.1	169.2	-389.2	-153.9	0.00	0.00	
5,300.0	5.97	293.50	5,277.5	173.4	-398.8	-157.7	0.00	0.00	
5,400.0	5.97	293.50	5,377.0	177.5	-408.3	-161.5	0.00	0.00	
5,509.0	5.97	293.50	5,485.4	182.0	-418.7	-165.6	0.00	0.00	Start 2.5° Drop
5,600.0	3.70	293.50	5,576.1	185.1	-425.7	-168.4	2.50	-2.50	
5,700.0	1.20	293.50	5,676.0	186.8	-429.6	-169.9	2.50	-2.50	
5,747.8	0.00	0.00	5,723.8	187.0	-430.1	-170.1	2.50	-2.50	EOD @ 0°
5,800.0	0.00	0.00	5,776.0	187.0	-430.1	-170.1	0.00	0.00	
5,900.0	0.00	0.00	5,876.0	187.0	-430.1	-170.1	0.00	0.00	
6,000.0	0.00	0.00	5,976.0	187.0	-430.1	-170.1	0.00	0.00	
6,047.8	0.00	0.00	6,023.8	187.0	-430.1	-170.1	0.00	0.00	Start 8° Build
6,050.0	0.17	179.73	6,026.0	187.0	-430.1	-170.1	8.00	8.00	
6,100.0	4.17	179.73	6,075.9	185.1	-430.1	-168.2	8.00	8.00	
6,150.0	8.17	179.73	6,125.6	179.7	-430.1	-162.8	8.00	8.00	
6,200.0	12.17	179.73	6,174.8	170.9	-430.0	-154.0	8.00	8.00	
6,250.0	16.17	179.73	6,223.3	158.7	-430.0	-141.8	8.00	8.00	
6,300.0	20.17	179.73	6,270.8	143.1	-429.9	-126.2	8.00	8.00	
6,350.0	24.17	179.73	6,317.1	124.2	-429.8	-107.3	8.00	8.00	
6,400.0	28.17	179.73	6,362.0	102.1	-429.7	-85.3	8.00	8.00	
6,450.0	32.17	179.73	6,405.2	77.0	-429.6	-60.2	8.00	8.00	
6,500.0	36.17	179.73	6,446.5	48.9	-429.5	-32.1	8.00	8.00	
6,550.0	40.17	179.73	6,485.8	18.0	-429.3	-1.3	8.00	8.00	
6,600.0	44.17	179.73	6,522.9	-15.5	-429.1	32.3	8.00	8.00	
6,650.0	48.17	179.73	6,557.5	-51.6	-429.0	68.3	8.00	8.00	
6,700.0	52.17	179.73	6,589.5	-90.0	-428.8	106.6	8.00	8.00	
6,750.0	56.17	179.73	6,618.8	-130.5	-428.6	147.1	8.00	8.00	
6,800.0	60.17	179.73	6,645.1	-173.0	-428.4	189.6	8.00	8.00	
6,850.0	64.17	179.73	6,668.5	-217.2	-428.2	233.7	8.00	8.00	
6,900.0	68.17	179.73	6,688.7	-262.9	-428.0	279.4	8.00	8.00	
6,950.0	72.17	179.73	6,705.6	-309.9	-427.8	326.4	8.00	8.00	
7,000.0	76.17	179.73	6,719.2	-358.0	-427.5	374.4	8.00	8.00	
7,050.0	80.17	179.73	6,729.5	-407.0	-427.3	423.3	8.00	8.00	
7,100.0	84.17	179.73	6,736.3	-456.5	-427.1	472.8	8.00	8.00	
7,150.0	88.17	179.73	6,739.6	-506.4	-426.8	522.6	8.00	8.00	
7,172.8	90.00	179.73	6,740.0	-529.2	-426.7	545.4	8.00	8.00	LP - 766' FNL, 1868' FEL - LP @ 6,470' TVD, 9
7,200.0	90.00	179.73	6,740.0	-556.4	-426.6	572.6	0.00	0.00	
7,300.0	90.00	179.73	6,740.0	-656.4	-426.1	672.5	0.00	0.00	
7,400.0	90.00	179.73	6,740.0	-756.4	-425.7	772.4	0.00	0.00	
7,500.0	90.00	179.73	6,740.0	-856.4	-425.2	872.3	0.00	0.00	
7,600.0	90.00	179.73	6,740.0	-956.4	-424.7	972.2	0.00	0.00	
7,700.0	90.00	179.73	6,740.0	-1,056.4	-424.3	1,072.1	0.00	0.00	
7,800.0	90.00	179.73	6,740.0	-1,156.4	-423.8	1,172.0	0.00	0.00	
7,900.0	90.00	179.73	6,740.0	-1,256.4	-423.3	1,271.9	0.00	0.00	
8,000.0	90.00	179.73	6,740.0	-1,356.4	-422.9	1,371.8	0.00	0.00	
8,100.0	90.00	179.73	6,740.0	-1,456.4	-422.4	1,471.7	0.00	0.00	
8,200.0	90.00	179.73	6,740.0	-1,556.4	-421.9	1,571.6	0.00	0.00	
8,300.0	90.00	179.73	6,740.0	-1,656.4	-421.4	1,671.5	0.00	0.00	
8,400.0	90.00	179.73	6,740.0	-1,756.4	-421.0	1,771.4	0.00	0.00	
8,500.0	90.00	179.73	6,740.0	-1,856.4	-420.5	1,871.3	0.00	0.00	
8,600.0	90.00	179.73	6,740.0	-1,956.4	-420.0	1,971.2	0.00	0.00	

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well LE GERKIN 11H
Company:	Red Hawk Petroleum	TVD Reference:	KB=20' @ 4890.3usft
Project:	Weld County, Colorado	MD Reference:	KB=20' @ 4890.3usft
Site:	S13-T2N-R64W (LE GERKIN PADS)	North Reference:	True
Well:	LE GERKIN 11H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Comments / Formations
8,700.0	90.00	179.73	6,740.0	-2,056.3	-419.6	2,071.2	0.00	0.00	
8,800.0	90.00	179.73	6,740.0	-2,156.3	-419.1	2,171.1	0.00	0.00	
8,900.0	90.00	179.73	6,740.0	-2,256.3	-418.6	2,271.0	0.00	0.00	
9,000.0	90.00	179.73	6,740.0	-2,356.3	-418.2	2,370.9	0.00	0.00	
9,100.0	90.00	179.73	6,740.0	-2,456.3	-417.7	2,470.8	0.00	0.00	
9,200.0	90.00	179.73	6,740.0	-2,556.3	-417.2	2,570.7	0.00	0.00	
9,300.0	90.00	179.73	6,740.0	-2,656.3	-416.8	2,670.6	0.00	0.00	
9,400.0	90.00	179.73	6,740.0	-2,756.3	-416.3	2,770.5	0.00	0.00	
9,500.0	90.00	179.73	6,740.0	-2,856.3	-415.8	2,870.4	0.00	0.00	
9,600.0	90.00	179.73	6,740.0	-2,956.3	-415.3	2,970.3	0.00	0.00	
9,700.0	90.00	179.73	6,740.0	-3,056.3	-414.9	3,070.2	0.00	0.00	
9,800.0	90.00	179.73	6,740.0	-3,156.3	-414.4	3,170.1	0.00	0.00	
9,900.0	90.00	179.73	6,740.0	-3,256.3	-413.9	3,270.0	0.00	0.00	
10,000.0	90.00	179.73	6,740.0	-3,356.3	-413.5	3,369.9	0.00	0.00	
10,100.0	90.00	179.73	6,740.0	-3,456.3	-413.0	3,469.8	0.00	0.00	
10,200.0	90.00	179.73	6,740.0	-3,556.3	-412.5	3,569.7	0.00	0.00	
10,300.0	90.00	179.73	6,740.0	-3,656.3	-412.1	3,669.6	0.00	0.00	
10,400.0	90.00	179.73	6,740.0	-3,756.3	-411.6	3,769.5	0.00	0.00	
10,500.0	90.00	179.73	6,740.0	-3,856.3	-411.1	3,869.4	0.00	0.00	
10,600.0	90.00	179.73	6,740.0	-3,956.3	-410.6	3,969.3	0.00	0.00	
10,700.0	90.00	179.73	6,740.0	-4,056.3	-410.2	4,069.2	0.00	0.00	
10,800.0	90.00	179.73	6,740.0	-4,156.3	-409.7	4,169.1	0.00	0.00	
10,900.0	90.00	179.73	6,740.0	-4,256.3	-409.2	4,269.1	0.00	0.00	
11,000.0	90.00	179.73	6,740.0	-4,356.3	-408.8	4,369.0	0.00	0.00	
11,100.0	90.00	179.73	6,740.0	-4,456.3	-408.3	4,468.9	0.00	0.00	
11,200.0	90.00	179.73	6,740.0	-4,556.3	-407.8	4,568.8	0.00	0.00	
11,300.0	90.00	179.73	6,740.0	-4,656.3	-407.4	4,668.7	0.00	0.00	
11,400.0	90.00	179.73	6,740.0	-4,756.3	-406.9	4,768.6	0.00	0.00	
11,500.0	90.00	179.73	6,740.0	-4,856.3	-406.4	4,868.5	0.00	0.00	
11,600.0	90.00	179.73	6,740.0	-4,956.3	-406.0	4,968.4	0.00	0.00	
11,700.0	90.00	179.73	6,740.0	-5,056.3	-405.5	5,068.3	0.00	0.00	
11,800.0	90.00	179.73	6,740.0	-5,156.3	-405.0	5,168.2	0.00	0.00	
11,900.0	90.00	179.73	6,740.0	-5,256.3	-404.5	5,268.1	0.00	0.00	
12,000.0	90.00	179.73	6,740.0	-5,356.3	-404.1	5,368.0	0.00	0.00	
12,100.0	90.00	179.73	6,740.0	-5,456.3	-403.6	5,467.9	0.00	0.00	
12,200.0	90.00	179.73	6,740.0	-5,556.3	-403.1	5,567.8	0.00	0.00	
12,300.0	90.00	179.73	6,740.0	-5,656.3	-402.7	5,667.7	0.00	0.00	
12,400.0	90.00	179.73	6,740.0	-5,756.3	-402.2	5,767.6	0.00	0.00	
12,500.0	90.00	179.73	6,740.0	-5,856.3	-401.7	5,867.5	0.00	0.00	
12,600.0	90.00	179.73	6,740.0	-5,956.3	-401.3	5,967.4	0.00	0.00	
12,700.0	90.00	179.73	6,740.0	-6,056.3	-400.8	6,067.3	0.00	0.00	
12,800.0	90.00	179.73	6,740.0	-6,156.3	-400.3	6,167.2	0.00	0.00	
12,900.0	90.00	179.73	6,740.0	-6,256.3	-399.8	6,267.1	0.00	0.00	
13,000.0	90.00	179.73	6,740.0	-6,356.3	-399.4	6,367.0	0.00	0.00	
13,100.0	90.00	179.73	6,740.0	-6,456.3	-398.9	6,466.9	0.00	0.00	
13,200.0	90.00	179.73	6,740.0	-6,556.3	-398.4	6,566.9	0.00	0.00	
13,300.0	90.00	179.73	6,740.0	-6,656.3	-398.0	6,666.8	0.00	0.00	
13,400.0	90.00	179.73	6,740.0	-6,756.3	-397.5	6,766.7	0.00	0.00	
13,500.0	90.00	179.73	6,740.0	-6,856.3	-397.0	6,866.6	0.00	0.00	
13,600.0	90.00	179.73	6,740.0	-6,956.3	-396.6	6,966.5	0.00	0.00	
13,700.0	90.00	179.73	6,740.0	-7,056.3	-396.1	7,066.4	0.00	0.00	
13,800.0	90.00	179.73	6,740.0	-7,156.3	-395.6	7,166.3	0.00	0.00	

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well LE GERKIN 11H
Company:	Red Hawk Petroleum	TVD Reference:	KB=20' @ 4890.3usft
Project:	Weld County, Colorado	MD Reference:	KB=20' @ 4890.3usft
Site:	S13-T2N-R64W (LE GERKIN PADS)	North Reference:	True
Well:	LE GERKIN 11H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Comments / Formations
13,900.0	90.00	179.73	6,740.0	-7,256.3	-395.2	7,266.2	0.00	0.00	
14,000.0	90.00	179.73	6,740.0	-7,356.3	-394.7	7,366.1	0.00	0.00	
14,100.0	90.00	179.73	6,740.0	-7,456.3	-394.2	7,466.0	0.00	0.00	
14,200.0	90.00	179.73	6,740.0	-7,556.3	-393.7	7,565.9	0.00	0.00	
14,300.0	90.00	179.73	6,740.0	-7,656.3	-393.3	7,665.8	0.00	0.00	
14,400.0	90.00	179.73	6,740.0	-7,756.3	-392.8	7,765.7	0.00	0.00	
14,500.0	90.00	179.73	6,740.0	-7,856.3	-392.3	7,865.6	0.00	0.00	
14,600.0	90.00	179.73	6,740.0	-7,956.3	-391.9	7,965.5	0.00	0.00	
14,700.0	90.00	179.73	6,740.0	-8,056.3	-391.4	8,065.4	0.00	0.00	
14,800.0	90.00	179.73	6,740.0	-8,156.3	-390.9	8,165.3	0.00	0.00	
14,900.0	90.00	179.73	6,740.0	-8,256.3	-390.5	8,265.2	0.00	0.00	
15,000.0	90.00	179.73	6,740.0	-8,356.3	-390.0	8,365.1	0.00	0.00	
15,100.0	90.00	179.73	6,740.0	-8,456.3	-389.5	8,465.0	0.00	0.00	
15,200.0	90.00	179.73	6,740.0	-8,556.3	-389.0	8,564.9	0.00	0.00	
15,300.0	90.00	179.73	6,740.0	-8,656.3	-388.6	8,664.8	0.00	0.00	
15,400.0	90.00	179.73	6,740.0	-8,756.3	-388.1	8,764.8	0.00	0.00	
15,500.0	90.00	179.73	6,740.0	-8,856.3	-387.6	8,864.7	0.00	0.00	
15,600.0	90.00	179.73	6,740.0	-8,956.3	-387.2	8,964.6	0.00	0.00	
15,700.0	90.00	179.73	6,740.0	-9,056.3	-386.7	9,064.5	0.00	0.00	
15,800.0	90.00	179.73	6,740.0	-9,156.3	-386.2	9,164.4	0.00	0.00	
15,900.0	90.00	179.73	6,740.0	-9,256.3	-385.8	9,264.3	0.00	0.00	
16,000.0	90.00	179.73	6,740.0	-9,356.3	-385.3	9,364.2	0.00	0.00	
16,100.0	90.00	179.73	6,740.0	-9,456.3	-384.8	9,464.1	0.00	0.00	
16,200.0	90.00	179.73	6,740.0	-9,556.3	-384.4	9,564.0	0.00	0.00	
16,300.0	90.00	179.73	6,740.0	-9,656.3	-383.9	9,663.9	0.00	0.00	
16,400.0	90.00	179.73	6,740.0	-9,756.3	-383.4	9,763.8	0.00	0.00	
16,457.4	90.00	179.73	6,740.0	-9,813.7	-383.1	9,821.1	0.00	0.00	PBHL - 500' FSL, 1868' FEL

Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
LE GERKIN 11H VP - hit/miss target - Shape - Point	0.00	0.00	5,723.8	187.0	-430.1	1,297,417.54	3,280,361.22	40.145453	-104.497099
LE GERKIN 11H PBHL - plan hits target center - Point	0.00	0.00	6,740.0	-9,813.7	-383.1	1,287,418.04	3,280,521.45	40.118000	-104.496930

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well LE GERKIN 11H
Company:	Red Hawk Petroleum	TVD Reference:	KB=20' @ 4890.3usft
Project:	Weld County, Colorado	MD Reference:	KB=20' @ 4890.3usft
Site:	S13-T2N-R64W (LE GERKIN PADS)	North Reference:	True
Well:	LE GERKIN 11H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
0.5	0.5	0.0	0.0	SH - 240' FNL, 1438' FEL
1,000.0	1,000.0	0.0	0.0	KOP @ 1,000'
1,238.8	1,238.4	5.0	-11.4	EOB @ 5.97° INC
5,509.0	5,485.4	182.0	-418.7	Start 2.5° Drop
5,747.8	5,723.8	187.0	-430.1	EOD @ 0°
6,047.8	6,023.8	187.0	-430.1	Start 8° Build
7,172.8	6,740.0	-529.2	-426.7	LP - 766' FNL, 1868' FEL
7,172.8	6,740.0	-529.2	-426.7	LP @ 6,470' TVD, 90° INC
16,457.4	6,740.0	-9,813.7	-383.1	PBHL - 500' FSL, 1868' FEL
16,457.4	6,740.0	-9,813.7	-383.1	TD @ 16,457.4' MD

Red Hawk Petroleum

Weld County, Colorado

S13-T2N-R64W (LE GERKIN PADS)

LE GERKIN 11H

HZ

Plan #1

Anticollision Report

30 October, 2014

Cathedral Energy Services

Anticollision Report

Company:	Red Hawk Petroleum	Local Co-ordinate Reference:	Well LE GERKIN 11H
Project:	Weld County, Colorado	TVD Reference:	KB=20' @ 4890.3usft
Reference Site:	S13-T2N-R64W (LE GERKIN PADS)	MD Reference:	KB=20' @ 4890.3usft
Site Error:	0.0usft	North Reference:	True
Reference Well:	LE GERKIN 11H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0usft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Reference	Plan #1		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.0usft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 200.0usft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma		

Survey Tool Program		Date	10/30/2014		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.0	16,457.4	Plan #1 (HZ)	Geolink MWD	Geolink MWD	

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
S13-T2N-R64W (LE GERKIN PADS)						
EXISTING - ARNOLD #1 - EXISTING - EXISTING - NO S						Out of range
EXISTING - DARYL L ARNOLD #1 - EXISTING - EXISTI						Out of range
EXISTING - MCCLINTOCK ET AL #1 - EXISTING - EXIS						Out of range
LE GERKIN 10H - HZ - Plan #1	1,000.0	1,000.0	30.8	27.3	8.989	CC
LE GERKIN 10H - HZ - Plan #1	1,200.0	1,197.4	31.1	27.0	7.569	ES
LE GERKIN 10H - HZ - Plan #1	1,300.0	1,296.1	32.4	27.9	7.246	SF
LE GERKIN 12H - HZ - Plan #1	1,000.0	1,000.0	30.8	27.3	8.989	CC, ES
LE GERKIN 12H - HZ - Plan #1	1,200.0	1,201.0	34.2	30.1	8.294	SF
LE GERKIN 13H - HZ - Plan #1	1,000.0	1,000.0	58.7	55.3	17.162	CC, ES
LE GERKIN 13H - HZ - Plan #1	1,100.0	1,098.5	61.9	58.1	16.432	SF
LE GERKIN 14H - HZ - Plan #1	1,000.0	1,000.0	89.5	86.0	26.151	CC, ES
LE GERKIN 14H - HZ - Plan #1	1,100.0	1,096.5	93.4	89.6	24.813	SF
LE GERKIN 15H - HZ - Plan #1	1,000.0	1,000.0	120.3	116.8	35.157	CC, ES
LE GERKIN 15H - HZ - Plan #1	1,100.0	1,095.0	124.2	120.5	33.048	SF
LE GERKIN 16H - HZ - Plan #1	1,000.0	1,000.0	151.0	147.6	44.143	CC, ES
LE GERKIN 16H - HZ - Plan #1	1,200.0	1,186.6	166.9	162.8	40.820	SF
LE GERKIN 1H - HZ - Plan #3						Out of range
LE GERKIN 2H - HZ - Plan #3						Out of range
LE GERKIN 3H - HZ - Plan #3						Out of range
LE GERKIN 4H - HZ - Plan #3						Out of range
LE GERKIN 5H - HZ - Plan #3						Out of range
LE GERKIN 6H - HZ - Plan #3						Out of range
LE GERKIN 7H - HZ - Plan #3						Out of range
LE GERKIN 8H - HZ - Plan #3						Out of range
LE GERKIN 9H - HZ - Plan #1	1,000.0	1,000.0	58.7	55.3	17.162	CC
LE GERKIN 9H - HZ - Plan #1	1,200.0	1,195.1	59.1	55.0	14.396	ES
LE GERKIN 9H - HZ - Plan #1	1,300.0	1,292.6	60.4	56.0	13.559	SF

Cathedral Energy Services

Anticollision Report

Company:	Red Hawk Petroleum	Local Co-ordinate Reference:	Well LE GERKIN 11H
Project:	Weld County, Colorado	TVD Reference:	KB=20' @ 4890.3usft
Reference Site:	S13-T2N-R64W (LE GERKIN PADS)	MD Reference:	KB=20' @ 4890.3usft
Site Error:	0.0usft	North Reference:	True
Reference Well:	LE GERKIN 11H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0usft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S13-T2N-R64W (LE GERKIN PADS) - LE GERKIN 10H - HZ - Plan #1													Offset Site Error:	0.0 usft
Survey Program: 0-Geolink MWD													Offset Well Error:	0.0 usft
Reference		Offset		Semi Major Axis		Distance		Total		Separation		Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Uncertainty Axis			
0.0	0.0	0.0	0.0	0.0	0.0	-90.00	0.0	-30.8	30.8					
100.0	100.0	100.0	100.0	0.1	0.1	-90.00	0.0	-30.8	30.8	30.5	0.28	110.120		
200.0	200.0	200.0	200.0	0.3	0.3	-90.00	0.0	-30.8	30.8	30.1	0.63	48.942		
300.0	300.0	300.0	300.0	0.5	0.5	-90.00	0.0	-30.8	30.8	29.8	0.98	31.463		
400.0	400.0	400.0	400.0	0.7	0.7	-90.00	0.0	-30.8	30.8	29.4	1.33	23.183		
500.0	500.0	500.0	500.0	0.8	0.8	-90.00	0.0	-30.8	30.8	29.1	1.68	18.353		
600.0	600.0	600.0	600.0	1.0	1.0	-90.00	0.0	-30.8	30.8	28.7	2.02	15.189		
700.0	700.0	700.0	700.0	1.2	1.2	-90.00	0.0	-30.8	30.8	28.4	2.37	12.955		
800.0	800.0	800.0	800.0	1.4	1.4	-90.00	0.0	-30.8	30.8	28.0	2.72	11.294		
900.0	900.0	900.0	900.0	1.5	1.5	-90.00	0.0	-30.8	30.8	27.7	3.07	10.011		
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	-90.00	0.0	-30.8	30.8	27.3	3.42	8.989 CC		
1,100.0	1,100.0	1,098.7	1,098.7	1.9	1.9	-24.10	0.5	-32.8	30.8	27.1	3.77	8.188		
1,200.0	1,199.7	1,197.4	1,197.2	2.1	2.1	-25.88	2.1	-39.0	31.1	27.0	4.11	7.569 ES		
1,300.0	1,299.2	1,296.1	1,295.3	2.3	2.3	-28.07	4.8	-49.2	32.4	27.9	4.47	7.246 SF		
1,400.0	1,398.7	1,394.8	1,392.8	2.5	2.5	-28.01	8.5	-63.5	37.4	32.5	4.83	7.738		
1,500.0	1,498.2	1,494.6	1,491.2	2.7	2.8	-27.27	12.7	-79.6	43.9	38.7	5.19	8.454		
1,600.0	1,597.6	1,594.3	1,589.6	2.9	3.0	-26.71	16.9	-95.6	50.5	44.9	5.56	9.073		
1,700.0	1,697.1	1,694.1	1,688.0	3.1	3.3	-26.29	21.0	-111.6	57.0	51.1	5.93	9.614		
1,800.0	1,796.5	1,793.9	1,786.4	3.4	3.6	-25.95	25.2	-127.6	63.6	57.3	6.30	10.090		
1,900.0	1,896.0	1,893.7	1,884.8	3.6	3.9	-25.68	29.4	-143.7	70.2	63.5	6.67	10.513		
2,000.0	1,995.4	1,993.5	1,983.2	3.8	4.3	-25.45	33.6	-159.7	76.7	69.7	7.05	10.890		
2,100.0	2,094.9	2,093.3	2,081.6	4.1	4.6	-25.26	37.7	-175.7	83.3	75.9	7.42	11.228		
2,200.0	2,194.4	2,193.0	2,180.0	4.3	4.9	-25.09	41.9	-191.8	89.9	82.1	7.79	11.533		
2,300.0	2,293.8	2,292.8	2,278.4	4.6	5.2	-24.95	46.1	-207.8	96.4	88.3	8.17	11.810		
2,400.0	2,393.3	2,392.6	2,376.8	4.8	5.5	-24.83	50.2	-223.8	103.0	94.5	8.54	12.063		
2,500.0	2,492.7	2,492.4	2,475.2	5.0	5.9	-24.72	54.4	-239.8	109.6	100.7	8.91	12.294		
2,600.0	2,592.2	2,592.2	2,573.6	5.3	6.2	-24.62	58.6	-255.9	116.2	106.9	9.29	12.505		
2,700.0	2,691.6	2,692.0	2,672.0	5.5	6.5	-24.54	62.8	-271.9	122.7	113.1	9.66	12.701		
2,800.0	2,791.1	2,791.8	2,770.4	5.8	6.8	-24.46	66.9	-287.9	129.3	119.3	10.04	12.881		
2,900.0	2,890.6	2,891.5	2,868.8	6.0	7.2	-24.39	71.1	-303.9	135.9	125.5	10.41	13.048		
3,000.0	2,990.0	2,991.3	2,967.2	6.3	7.5	-24.33	75.3	-320.0	142.4	131.7	10.79	13.204		
3,100.0	3,089.5	3,091.1	3,065.6	6.5	7.8	-24.27	79.4	-336.0	149.0	137.9	11.16	13.349		
3,200.0	3,188.9	3,190.9	3,164.0	6.8	8.2	-24.22	83.6	-352.0	155.6	144.1	11.54	13.484		
3,300.0	3,288.4	3,290.7	3,262.4	7.0	8.5	-24.17	87.8	-368.1	162.2	150.2	11.91	13.610		
3,400.0	3,387.8	3,390.5	3,360.8	7.3	8.8	-24.12	92.0	-384.1	168.7	156.4	12.29	13.729		
3,500.0	3,487.3	3,490.2	3,459.2	7.5	9.2	-24.08	96.1	-400.1	175.3	162.6	12.67	13.841		
3,600.0	3,586.8	3,590.0	3,557.6	7.8	9.5	-24.04	100.3	-416.1	181.9	168.8	13.04	13.946		
3,700.0	3,686.2	3,689.8	3,656.0	8.0	9.8	-24.01	104.5	-432.2	188.5	175.0	13.42	14.045		
3,800.0	3,785.7	3,789.6	3,754.4	8.3	10.2	-23.97	108.6	-448.2	195.0	181.2	13.79	14.139		

Cathedral Energy Services

Anticollision Report

Company:	Red Hawk Petroleum	Local Co-ordinate Reference:	Well LE GERKIN 11H
Project:	Weld County, Colorado	TVD Reference:	KB=20' @ 4890.3usft
Reference Site:	S13-T2N-R64W (LE GERKIN PADS)	MD Reference:	KB=20' @ 4890.3usft
Site Error:	0.0usft	North Reference:	True
Reference Well:	LE GERKIN 11H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0usft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S13-T2N-R64W (LE GERKIN PADS) - LE GERKIN 12H - HZ - Plan #1													Offset Site Error:	0.0 usft
Survey Program: 0-Geolink MWD													Offset Well Error:	0.0 usft
Reference		Offset		Semi Major Axis		Distance		Total		Separation		Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Uncertainty Axis	Factor		
0.0	0.0	0.0	0.0	0.0	0.0	90.00	0.0	30.8	30.8					
100.0	100.0	100.0	100.0	0.1	0.1	90.00	0.0	30.8	30.8	30.5	0.28	110.120		
200.0	200.0	200.0	200.0	0.3	0.3	90.00	0.0	30.8	30.8	30.1	0.63	48.942		
300.0	300.0	300.0	300.0	0.5	0.5	90.00	0.0	30.8	30.8	29.8	0.98	31.463		
400.0	400.0	400.0	400.0	0.7	0.7	90.00	0.0	30.8	30.8	29.4	1.33	23.183		
500.0	500.0	500.0	500.0	0.8	0.8	90.00	0.0	30.8	30.8	29.1	1.68	18.353		
600.0	600.0	600.0	600.0	1.0	1.0	90.00	0.0	30.8	30.8	28.7	2.02	15.189		
700.0	700.0	700.0	700.0	1.2	1.2	90.00	0.0	30.8	30.8	28.4	2.37	12.955		
800.0	800.0	800.0	800.0	1.4	1.4	90.00	0.0	30.8	30.8	28.0	2.72	11.294		
900.0	900.0	900.0	900.0	1.5	1.5	90.00	0.0	30.8	30.8	27.7	3.07	10.011		
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	90.00	0.0	30.8	30.8	27.3	3.42	8.989 CC, ES		
1,100.0	1,100.0	1,100.8	1,100.8	1.9	1.9	154.94	1.7	29.4	31.4	27.6	3.77	8.322		
1,200.0	1,199.7	1,201.0	1,200.8	2.1	2.1	152.61	5.8	26.1	34.2	30.1	4.12	8.294 SF		
1,300.0	1,299.2	1,300.8	1,300.5	2.3	2.3	153.02	9.9	22.8	40.1	35.6	4.48	8.956		
1,400.0	1,398.7	1,400.6	1,400.1	2.5	2.4	153.52	14.0	19.4	46.3	41.5	4.84	9.569		
1,500.0	1,498.2	1,500.4	1,499.8	2.7	2.6	153.91	18.1	16.1	52.5	47.3	5.20	10.092		
1,600.0	1,597.6	1,600.2	1,599.5	2.9	2.8	154.21	22.2	12.8	58.7	53.2	5.57	10.544		
1,700.0	1,697.1	1,700.0	1,699.1	3.1	3.0	154.46	26.4	9.5	64.9	59.0	5.94	10.937		
1,800.0	1,796.5	1,799.8	1,798.8	3.4	3.2	154.66	30.5	6.2	71.2	64.9	6.31	11.283		
1,900.0	1,896.0	1,899.6	1,898.5	3.6	3.4	154.83	34.6	2.8	77.4	70.7	6.68	11.589		
2,000.0	1,995.4	1,999.4	1,998.1	3.8	3.6	154.97	38.7	-0.5	83.6	76.6	7.05	11.862		
2,100.0	2,094.9	2,099.2	2,097.8	4.1	3.8	155.10	42.8	-3.8	89.8	82.4	7.42	12.106		
2,200.0	2,194.4	2,199.0	2,197.5	4.3	4.0	155.20	46.9	-7.1	96.0	88.2	7.79	12.326		
2,300.0	2,293.8	2,298.8	2,297.1	4.6	4.2	155.30	51.0	-10.4	102.3	94.1	8.16	12.526		
2,400.0	2,393.3	2,398.6	2,396.8	4.8	4.3	155.38	55.2	-13.8	108.5	99.9	8.54	12.707		
2,500.0	2,492.7	2,498.5	2,496.5	5.0	4.5	155.46	59.3	-17.1	114.7	105.8	8.91	12.873		
2,600.0	2,592.2	2,598.3	2,596.1	5.3	4.7	155.53	63.4	-20.4	120.9	111.6	9.28	13.025		
2,700.0	2,691.6	2,698.1	2,695.8	5.5	4.9	155.59	67.5	-23.7	127.1	117.5	9.66	13.165		
2,800.0	2,791.1	2,797.9	2,795.5	5.8	5.1	155.64	71.6	-27.0	133.4	123.3	10.03	13.294		
2,900.0	2,890.6	2,897.7	2,895.1	6.0	5.3	155.69	75.7	-30.4	139.6	129.2	10.41	13.414		
3,000.0	2,990.0	2,997.5	2,994.8	6.3	5.5	155.74	79.8	-33.7	145.8	135.0	10.78	13.525		
3,100.0	3,089.5	3,097.3	3,094.5	6.5	5.7	155.78	84.0	-37.0	152.0	140.9	11.15	13.629		
3,200.0	3,188.9	3,197.1	3,194.1	6.8	5.9	155.82	88.1	-40.3	158.2	146.7	11.53	13.725		
3,300.0	3,288.4	3,296.9	3,293.8	7.0	6.1	155.85	92.2	-43.6	164.5	152.6	11.90	13.815		
3,400.0	3,387.8	3,396.7	3,393.5	7.3	6.3	155.89	96.3	-46.9	170.7	158.4	12.28	13.900		
3,500.0	3,487.3	3,496.5	3,493.1	7.5	6.5	155.92	100.4	-50.3	176.9	164.3	12.66	13.979		
3,600.0	3,586.8	3,596.3	3,592.8	7.8	6.7	155.95	104.5	-53.6	183.1	170.1	13.03	14.054		
3,700.0	3,686.2	3,696.1	3,692.5	8.0	6.9	155.97	108.6	-56.9	189.4	175.9	13.41	14.125		
3,800.0	3,785.7	3,795.9	3,792.1	8.3	7.1	156.00	112.8	-60.2	195.6	181.8	13.78	14.191		

Cathedral Energy Services

Anticollision Report

Company:	Red Hawk Petroleum	Local Co-ordinate Reference:	Well LE GERKIN 11H
Project:	Weld County, Colorado	TVD Reference:	KB=20' @ 4890.3usft
Reference Site:	S13-T2N-R64W (LE GERKIN PADS)	MD Reference:	KB=20' @ 4890.3usft
Site Error:	0.0usft	North Reference:	True
Reference Well:	LE GERKIN 11H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0usft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S13-T2N-R64W (LE GERKIN PADS) - LE GERKIN 13H - HZ - Plan #1													Offset Site Error: 0.0 usft
Survey Program: 0-Geolink MWD													Offset Well Error: 0.0 usft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	90.00	0.0	58.7	58.7				
100.0	100.0	100.0	100.0	0.1	0.1	90.00	0.0	58.7	58.7	58.4	0.28	210.229	
200.0	200.0	200.0	200.0	0.3	0.3	90.00	0.0	58.7	58.7	58.1	0.63	93.435	
300.0	300.0	300.0	300.0	0.5	0.5	90.00	0.0	58.7	58.7	57.7	0.98	60.066	
400.0	400.0	400.0	400.0	0.7	0.7	90.00	0.0	58.7	58.7	57.4	1.33	44.259	
500.0	500.0	500.0	500.0	0.8	0.8	90.00	0.0	58.7	58.7	57.0	1.68	35.038	
600.0	600.0	600.0	600.0	1.0	1.0	90.00	0.0	58.7	58.7	56.7	2.02	28.997	
700.0	700.0	700.0	700.0	1.2	1.2	90.00	0.0	58.7	58.7	56.3	2.37	24.733	
800.0	800.0	800.0	800.0	1.4	1.4	90.00	0.0	58.7	58.7	56.0	2.72	21.562	
900.0	900.0	900.0	900.0	1.5	1.5	90.00	0.0	58.7	58.7	55.6	3.07	19.112	
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	90.00	0.0	58.7	58.7	55.3	3.42	17.162 CC, ES	
1,100.0	1,100.0	1,098.5	1,098.5	1.9	1.9	155.62	1.8	59.9	61.9	58.1	3.77	16.432 SF	
1,200.0	1,199.7	1,197.9	1,197.7	2.1	2.1	154.40	5.9	62.6	70.6	66.5	4.11	17.169	
1,300.0	1,299.2	1,297.1	1,296.9	2.3	2.2	154.55	10.0	65.3	82.6	78.1	4.47	18.488	
1,400.0	1,398.7	1,396.4	1,396.0	2.5	2.4	154.77	14.2	68.0	94.8	90.0	4.83	19.649	
1,500.0	1,498.2	1,495.6	1,495.1	2.7	2.6	154.95	18.3	70.7	107.1	101.9	5.19	20.639	
1,600.0	1,597.6	1,594.9	1,594.2	2.9	2.8	155.09	22.5	73.4	119.4	113.8	5.55	21.493	
1,700.0	1,697.1	1,694.1	1,693.4	3.1	3.0	155.20	26.6	76.1	131.6	125.7	5.92	22.236	
1,800.0	1,796.5	1,793.4	1,792.5	3.4	3.2	155.30	30.8	78.9	143.9	137.6	6.29	22.888	
1,900.0	1,896.0	1,892.6	1,891.6	3.6	3.4	155.37	34.9	81.6	156.1	149.5	6.65	23.464	
2,000.0	1,995.4	1,991.9	1,990.7	3.8	3.5	155.44	39.1	84.3	168.4	161.4	7.02	23.977	
2,100.0	2,094.9	2,091.1	2,089.8	4.1	3.7	155.50	43.2	87.0	180.7	173.3	7.39	24.436	
2,200.0	2,194.4	2,190.4	2,189.0	4.3	3.9	155.55	47.4	89.7	192.9	185.2	7.76	24.850	

Cathedral Energy Services

Anticollision Report

Company:	Red Hawk Petroleum	Local Co-ordinate Reference:	Well LE GERKIN 11H
Project:	Weld County, Colorado	TVD Reference:	KB=20' @ 4890.3usft
Reference Site:	S13-T2N-R64W (LE GERKIN PADS)	MD Reference:	KB=20' @ 4890.3usft
Site Error:	0.0usft	North Reference:	True
Reference Well:	LE GERKIN 11H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0usft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S13-T2N-R64W (LE GERKIN PADS) - LE GERKIN 14H - HZ - Plan #1													Offset Site Error: 0.0 usft
Survey Program: 0-Geolink MWD													Offset Well Error: 0.0 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Total Uncertainty Axis	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.0	0.0	0.0	0.0	0.0	0.0	90.00	0.0	89.5	89.5				
100.0	100.0	100.0	100.0	0.1	0.1	90.00	0.0	89.5	89.5	89.2	0.28	320.350	
200.0	200.0	200.0	200.0	0.3	0.3	90.00	0.0	89.5	89.5	88.8	0.63	142.378	
300.0	300.0	300.0	300.0	0.5	0.5	90.00	0.0	89.5	89.5	88.5	0.98	91.529	
400.0	400.0	400.0	400.0	0.7	0.7	90.00	0.0	89.5	89.5	88.1	1.33	67.442	
500.0	500.0	500.0	500.0	0.8	0.8	90.00	0.0	89.5	89.5	87.8	1.68	53.392	
600.0	600.0	600.0	600.0	1.0	1.0	90.00	0.0	89.5	89.5	87.4	2.02	44.186	
700.0	700.0	700.0	700.0	1.2	1.2	90.00	0.0	89.5	89.5	87.1	2.37	37.688	
800.0	800.0	800.0	800.0	1.4	1.4	90.00	0.0	89.5	89.5	86.7	2.72	32.856	
900.0	900.0	900.0	900.0	1.5	1.5	90.00	0.0	89.5	89.5	86.4	3.07	29.123	
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	90.00	0.0	89.5	89.5	86.0	3.42	26.151 CC, ES	
1,100.0	1,100.0	1,096.5	1,096.4	1.9	1.9	156.43	0.9	91.3	93.4	89.6	3.76	24.813 SF	
1,200.0	1,199.7	1,192.1	1,191.8	2.1	2.1	156.25	3.5	96.7	105.0	100.9	4.10	25.603	
1,300.0	1,299.2	1,288.9	1,288.3	2.3	2.2	156.12	7.6	105.1	122.8	118.4	4.45	27.614	
1,400.0	1,398.7	1,387.2	1,386.1	2.5	2.5	156.08	11.9	113.9	141.2	136.4	4.80	29.392	
1,500.0	1,498.2	1,485.5	1,483.9	2.7	2.7	156.05	16.1	122.6	159.6	154.4	5.16	30.910	
1,600.0	1,597.6	1,583.8	1,581.7	2.9	2.9	156.02	20.4	131.4	178.0	172.5	5.52	32.218	
1,700.0	1,697.1	1,682.1	1,679.5	3.1	3.1	156.00	24.7	140.2	196.4	190.5	5.89	33.356	

Cathedral Energy Services

Anticollision Report

Company:	Red Hawk Petroleum	Local Co-ordinate Reference:	Well LE GERKIN 11H
Project:	Weld County, Colorado	TVD Reference:	KB=20' @ 4890.3usft
Reference Site:	S13-T2N-R64W (LE GERKIN PADS)	MD Reference:	KB=20' @ 4890.3usft
Site Error:	0.0usft	North Reference:	True
Reference Well:	LE GERKIN 11H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0usft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S13-T2N-R64W (LE GERKIN PADS) - LE GERKIN 15H - HZ - Plan #1													Offset Site Error: 0.0 usft
Survey Program: 0-Geolink MWD													Offset Well Error: 0.0 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Total Uncertainty Axis	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.0	0.0	0.0	0.0	0.0	0.0	88.26	3.6	120.2	120.3				
100.0	100.0	100.0	100.0	0.1	0.1	88.26	3.6	120.2	120.3	120.0	0.28	430.667	
200.0	200.0	200.0	200.0	0.3	0.3	88.26	3.6	120.2	120.3	119.6	0.63	191.408	
300.0	300.0	300.0	300.0	0.5	0.5	88.26	3.6	120.2	120.3	119.3	0.98	123.048	
400.0	400.0	400.0	400.0	0.7	0.7	88.26	3.6	120.2	120.3	118.9	1.33	90.667	
500.0	500.0	500.0	500.0	0.8	0.8	88.26	3.6	120.2	120.3	118.6	1.68	71.778	
600.0	600.0	600.0	600.0	1.0	1.0	88.26	3.6	120.2	120.3	118.2	2.02	59.402	
700.0	700.0	700.0	700.0	1.2	1.2	88.26	3.6	120.2	120.3	117.9	2.37	50.667	
800.0	800.0	800.0	800.0	1.4	1.4	88.26	3.6	120.2	120.3	117.5	2.72	44.171	
900.0	900.0	900.0	900.0	1.5	1.5	88.26	3.6	120.2	120.3	117.2	3.07	39.152	
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	88.26	3.6	120.2	120.3	116.8	3.42	35.157 CC, ES	
1,100.0	1,100.0	1,095.0	1,095.0	1.9	1.9	154.91	4.2	122.1	124.2	120.5	3.76	33.048 SF	
1,200.0	1,199.7	1,189.1	1,188.9	2.1	2.1	155.27	5.8	127.7	136.2	132.1	4.09	33.254	
1,300.0	1,299.2	1,281.6	1,280.9	2.3	2.2	155.75	8.4	136.8	155.1	150.7	4.43	35.007	
1,400.0	1,398.7	1,372.8	1,371.2	2.5	2.5	155.89	12.0	149.3	178.2	173.4	4.77	37.331	

Cathedral Energy Services

Anticollision Report

Company:	Red Hawk Petroleum	Local Co-ordinate Reference:	Well LE GERKIN 11H
Project:	Weld County, Colorado	TVD Reference:	KB=20' @ 4890.3usft
Reference Site:	S13-T2N-R64W (LE GERKIN PADS)	MD Reference:	KB=20' @ 4890.3usft
Site Error:	0.0usft	North Reference:	True
Reference Well:	LE GERKIN 11H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0usft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S13-T2N-R64W (LE GERKIN PADS) - LE GERKIN 16H - HZ - Plan #1													Offset Site Error: 0.0 usft
Survey Program: 0-Geolink MWD													Offset Well Error: 0.0 usft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	88.62	3.6	151.0	151.0				
100.0	100.0	100.0	100.0	0.1	0.1	88.62	3.6	151.0	151.0	150.7	0.28	540.747	
200.0	200.0	200.0	200.0	0.3	0.3	88.62	3.6	151.0	151.0	150.4	0.63	240.332	
300.0	300.0	300.0	300.0	0.5	0.5	88.62	3.6	151.0	151.0	150.0	0.98	154.499	
400.0	400.0	400.0	400.0	0.7	0.7	88.62	3.6	151.0	151.0	149.7	1.33	113.842	
500.0	500.0	500.0	500.0	0.8	0.8	88.62	3.6	151.0	151.0	149.3	1.68	90.125	
600.0	600.0	600.0	600.0	1.0	1.0	88.62	3.6	151.0	151.0	149.0	2.02	74.586	
700.0	700.0	700.0	700.0	1.2	1.2	88.62	3.6	151.0	151.0	148.6	2.37	63.617	
800.0	800.0	800.0	800.0	1.4	1.4	88.62	3.6	151.0	151.0	148.3	2.72	55.461	
900.0	900.0	900.0	900.0	1.5	1.5	88.62	3.6	151.0	151.0	147.9	3.07	49.159	
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	88.62	3.6	151.0	151.0	147.6	3.42	44.143 CC, ES	
1,100.0	1,100.0	1,093.8	1,093.7	1.9	1.9	155.27	4.0	152.8	155.0	151.2	3.76	41.252	
1,200.0	1,199.7	1,186.6	1,186.4	2.1	2.0	155.67	5.2	158.4	166.9	162.8	4.09	40.820 SF	
1,300.0	1,299.2	1,277.9	1,277.2	2.3	2.2	156.24	7.1	167.4	186.0	181.6	4.42	42.042	

Cathedral Energy Services

Anticollision Report

Company:	Red Hawk Petroleum	Local Co-ordinate Reference:	Well LE GERKIN 11H
Project:	Weld County, Colorado	TVD Reference:	KB=20' @ 4890.3usft
Reference Site:	S13-T2N-R64W (LE GERKIN PADS)	MD Reference:	KB=20' @ 4890.3usft
Site Error:	0.0usft	North Reference:	True
Reference Well:	LE GERKIN 11H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0usft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S13-T2N-R64W (LE GERKIN PADS) - LE GERKIN 9H - HZ - Plan #1													Offset Site Error:	0.0 usft
Survey Program: 0-Geolink MWD													Offset Well Error:	0.0 usft
Reference		Offset		Semi Major Axis			Distance					Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	-90.00	0.0	-58.7	58.7					
100.0	100.0	100.0	100.0	0.1	0.1	-90.00	0.0	-58.7	58.7	58.4	0.28	210.229		
200.0	200.0	200.0	200.0	0.3	0.3	-90.00	0.0	-58.7	58.7	58.1	0.63	93.435		
300.0	300.0	300.0	300.0	0.5	0.5	-90.00	0.0	-58.7	58.7	57.7	0.98	60.066		
400.0	400.0	400.0	400.0	0.7	0.7	-90.00	0.0	-58.7	58.7	57.4	1.33	44.259		
500.0	500.0	500.0	500.0	0.8	0.8	-90.00	0.0	-58.7	58.7	57.0	1.68	35.038		
600.0	600.0	600.0	600.0	1.0	1.0	-90.00	0.0	-58.7	58.7	56.7	2.02	28.997		
700.0	700.0	700.0	700.0	1.2	1.2	-90.00	0.0	-58.7	58.7	56.3	2.37	24.733		
800.0	800.0	800.0	800.0	1.4	1.4	-90.00	0.0	-58.7	58.7	56.0	2.72	21.562		
900.0	900.0	900.0	900.0	1.5	1.5	-90.00	0.0	-58.7	58.7	55.6	3.07	19.112		
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	-90.00	0.0	-58.7	58.7	55.3	3.42	17.162 CC		
1,100.0	1,100.0	1,097.5	1,097.5	1.9	1.9	-23.96	0.4	-60.7	58.8	55.0	3.76	15.622		
1,200.0	1,199.7	1,195.1	1,194.8	2.1	2.1	-25.33	1.5	-66.9	59.1	55.0	4.11	14.396 ES		
1,300.0	1,299.2	1,292.6	1,291.8	2.3	2.3	-27.24	3.4	-77.1	60.4	56.0	4.46	13.559 SF		
1,400.0	1,398.7	1,389.9	1,388.0	2.5	2.5	-28.20	6.0	-91.2	65.6	60.8	4.82	13.624		
1,500.0	1,498.2	1,486.6	1,482.9	2.7	2.8	-28.15	9.3	-109.3	74.9	69.7	5.18	14.459		
1,600.0	1,597.6	1,583.9	1,577.7	2.9	3.1	-27.47	13.2	-131.1	87.8	82.2	5.54	15.839		
1,700.0	1,697.1	1,683.0	1,674.1	3.1	3.5	-26.86	17.4	-153.9	101.4	95.5	5.91	17.147		
1,800.0	1,796.5	1,782.1	1,770.4	3.4	3.9	-26.40	21.6	-176.7	115.0	108.7	6.28	18.300		
1,900.0	1,896.0	1,881.1	1,866.7	3.6	4.3	-26.04	25.8	-199.5	128.6	121.9	6.65	19.323		
2,000.0	1,995.4	1,980.2	1,963.0	3.8	4.7	-25.74	29.9	-222.3	142.2	135.1	7.02	20.238		
2,100.0	2,094.9	2,079.3	2,059.3	4.1	5.1	-25.50	34.1	-245.0	155.8	148.4	7.40	21.060		
2,200.0	2,194.4	2,178.3	2,155.7	4.3	5.5	-25.30	38.3	-267.8	169.4	161.6	7.77	21.802		
2,300.0	2,293.8	2,277.4	2,252.0	4.6	5.9	-25.12	42.4	-290.6	183.0	174.8	8.14	22.475		
2,400.0	2,393.3	2,376.5	2,348.3	4.8	6.3	-24.97	46.6	-313.4	196.6	188.1	8.51	23.090		

Cathedral Energy Services

Anticollision Report

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Reference Depths are relative to KB=20' @ 4890.3usft
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °

Coordinates are relative to: LE GERKIN 11H
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.65°

